MANKATO PLANNING COMMISSION
Regular Meeting November 18, 2026 - 6:00 p.m.
Intergovernmental Center
Council Chambers
****

Any person speaking to the Commission shall give to the Secretary of the Commission the NAME and HOME ADDRESS of such person prior to speaking.
****

1. **CALL TO ORDER**

2. **APPROVAL OF AGENDA**

3. **APPROVAL OF MINUTES**

   1. **Draft October 28, 2026 Planning Commission meeting minutes**

4. **OLD BUSINESS**

5. **NEW BUSINESS**

   1. CY50-26

      Request of TOLD Development Company for a certificate of design compliance for a new structure in the Highway Gateway Overlay District and for an easement vacation. The subject properties are described as Lot 1 and Lot 2, Block 2, Victory Commercial Park Subdivision (Blue Earth County PID R010909102004, R010904300021, R010909102002, and R010904300020, etal).

      The anticipated date of City Council action is December 14, 2026.

   2. CY51-26

Request of ISG on behalf of the property owner, Front Street Plaza, LLC, for a final plat review of Front Street Place. The subject properties are described as Parcel 1: Lots 1, 2, 3, 13, 14 and 15 of Auditor's Plat No. 5 Mankato with exceptions; AND, Parcel 2: Easterly 157 feet of the northerly 22 feet of Lot 4 and also the easterly 143 feet of the middle 22 feet of said Lot 4 in Block 1, Warren's Addition to Mankato; otherwise also described as Lot 4 of Auditor's Plat No. 17 and light well on Lot 5 of said Auditor's Plat No. 17; AND, Parcel 3: Outlot B, Pike Street Subdivision No. 3, City of Mankato, Blue Earth County, Minnesota; AND, Parcel 4: Lots 5 and 6, and the vacated alley adjacent thereto, of Auditor's Plat No. 17, Rearrangement of part of Auditor's Plat No. 5, City of Mankato; AND, Parcel 5: Lot Twelve (12), Auditor's Plat #17, Re-Arrangement of part of Auditor's Plat #5, except: All that part of Lot No. 12 lying East of Southerly extension of Westerly line of Lot No. 8, both of said lots being in the City of Mankato and according to Auditor's Plat #17; AND, Parcel 6: That part of Lot Sixteen (16), Auditor's Plat #17, Rearrangement of Auditor's Plat #5, and Lot Twenty-one (21), Auditor's Plat #17, Re-Arrangement of Part of Auditor's Plat #5, according to the Plat thereof; AND, Parcel 7: the Westerly 48 feet of the following described parcel: The Easterly 140 feet of Lots 9 and 10 of Auditor's Plat No. 5, Mankato, of Block 84, Bruner's Plat of Mankato, Lot 1 and part of Lot 2 of Van Brunt's North Row, Block 2 of Oakwood Addition to Mankato, and Block 1 Warrens Addition to Mankato, said tract of land fronting on Front Street in said City 38 feet and extending along Liberty Street a distance of 140 feet and being rectangular in form; AND, Parcel 8: Lot 7, Auditor's Plat No.17, Rearrangement of Part of Auditor's Plat No. 5; AND, Parcel 9: Lot Eight (8), Auditor's Plat No.17, Rearrangement of Part of Auditor's Plat No. 5 and Part of Lots Nine (9) and Ten (10) Auditor's Plat No. 5 and a part of Lot Twelve (12) Auditor's Plat No.17 and All that part of Lot 9 according to Auditor's Plat No. 5 lying West of the southerly extension of the westerly line of Lot No. 8, according to Auditor's Plat No. 17; AND, Parcel 10: The Easterly 92 feet of the following described parcel: The Easterly 140 feet of Lots 9 and 10 of Auditor's Plat No. 5, Mankato, of Block 84, Bruner's Plat of Mankato, Lot 1 and part of Lot 2 of Van Brunt's North Row, Block 2 of Oakwood Addition to Mankato, and Block 1 Warrens Addition to Mankato, said tract of land fronting on Front Street in said City 38 feet and extending along Liberty Street a distance of 140 feet and being rectangular in form; AND, Parcel 11: Outlot A, Warren Street Subdivision; AND, Parcel 12: Outlot A, Pike Street Subdivision No. 3, City of Mankato; AND, Parcel 13: part of Lot 14, Auditor's Plat No. 5, on file and of record with the Blue Earth County Recorder, described as: Commencing at the southeasterly corner of Lot 5, Block 9, City of Mankato by E.D. Bruner, according to the plat thereof on file and of record with the Blue Earth County Recorder, all being in City of Mankato, Blue Earth County, Minnesota (All those lands lying between Warren Street, South Front Street, Liberty Street and Riverfront Drive).

The anticipated date of City Council action is December 14, 2026.

6. **MISCELLANEOUS**

7. **ADJOURNMENT**

Planning Commission Regular Meeting **3. 1.**

Meeting Date: 11/18/2026

Title

Draft October 28, 2026 Planning Commission meeting minutes

Attachments

Draft 10-28-26 PC Meeting minutes

MINUTES

Mankato Planning Commission
October 28, 2026 - 6:00 p.m.
IGC - Council Chambers

1. CALL TO ORDER

Chair Zehnder called the meeting to order at 6:00 p.m.

Commissioner's Present: Chair Zehnder, Mr. Dieken, Mr. Wilke, Ms. Bigham, Mr. Filipovitch, Mr. Iddings, Ms. Surdy.

Staff Present: Mark Konz-Director of Community Development, Travis Johnson- Permit Technician, Bennett Hanson-Planner, Brittany Mitchell-Planning & Zoning Administrator, Nick Peterson-Senior Management Analyst, Matt Wood-Financial Analyst.

2. APPROVAL OF AGENDA

Mr. Wilke made a motion to approve the agenda. Mr. Dieken seconded the motion. The motion carried unanimously.

3. APPROVAL OF MINUTES

Mr. Filipovitch made a motion to approve the minutes from September 23rd, 2026. Mr. Iddings seconded the motion. The motion carried unanimously.

1. **September 23, 2026 Draft Planning Commission meeting minutes**

4. OLD BUSINESS

No old business

5. NEW BUSINESS

1. CY49-26

Request of the Planning Agency to review the proposed 2027-2031 Capital Infrastructure Plan.

Mr. Konz reports that staff submits the following findings:

1. The plan conforms to the goals of the Mankato Land Use Plan.
2. The plan conforms to the goals of the Mankato Parks and Open Spaces Plan.
3. The plan conforms to the goals of the Mankato Strategic Plan.

Mr. Konz reports that staff recommend approval of the Community Investment Plan.

Mr. Konz introduced Mr. Peterson and Mr. Wood, who were present to speak with the Planning Commission and answer questions regarding the Community Investment Program (CIP).

Mr. Peterson explained that the CIP is a multi-year plan used to identify, prioritize, budget, and plan for necessary improvements to city infrastructure and facilities. These include streets, parks, utilities (including water and wastewater facilities), as well as major projects and purchases such as airport improvements, park upgrades, and City vehicles.

As part of the review and approval process, the Planning Commission is responsible for reviewing the CIP and determining whether the plan is consistent with the goals of the Land Use Plan.

Each Planning Commission member was provided with a packet outlining the CIP. Mr. Peterson and Mr. Wood walked the Planning Commission members through the packet, highlighting various projects and providing additional information as they reviewed the plan.

Chair Zehnder asked about the Minnesota River Trail reconstruction project and what the proposed work would entail.

Mr. Konz explained that the project involves reconstructing the trail area from Main Street northward. The work would primarily consist of pavement replacement. He noted that the city is also responsible for maintaining pavement on other city-owned properties, not just streets.

Ms. Surdy asked what the proposed first-floor remodel at the Intergovernmental Center would entail.

Mr. Peterson indicated that he believed the project involved the central registration area currently occupied by the school district.

Ms. Surdy then asked about the necessity of the proposed work.

Mr. Peterson explained that there have been ongoing discussions regarding the potential reuse of the space; however, he was not familiar with the specific details of the proposed changes or what would be relocated.

Ms. Surdy asked about the security camera system upgrades and expansions listed under the Information Technology section of the CIP, specifically whether the improvements would apply to the city as a whole or primarily to internal city facilities.

Mr. Peterson explained that the City of Mankato has nearly $500 million in assets throughout the community and that security cameras may be located at various city-owned facilities and properties, including dumping stations and parks with restroom facilities. He noted that these cameras are intended to support the safety and security of these locations. He also referenced the presence of cameras in the downtown bar area as a means of helping maintain public safety.

Ms. Surdy asked about the mass transit budget and whether it included funding for expanding transit service beyond Highway 22 towards Eagle Lake.

Mr. Konz explained that the City of Mankato conducts a Transit Development Plan approximately every three years. This plan evaluates the overall transit system and establishes goals and priorities for future improvements. He noted that the most recent plan was completed approximately three years ago and that ridership has increased significantly since then.

Mr. Konz explained that the plan allows the city to evaluate the existing transit system and identify areas where service could be improved. He noted that the area Ms. Surdy referenced would be considered as part of that evaluation.

Ms. Surdy further asked whether the Transit Development Plan would include only the City's bus system or if it would also address rail service to the Twin Cities.

Mr. Konz clarified that the City of Mankato's mass transit system only includes transit services operating within the local community.

Ms. Surdy then asked about the public safety equipment budget, specifically the radio replacements listed as an annual expense, and whether those costs were related to normal wear and tear.

Mr. Peterson explained that approximately five to six years ago, the city completed a large-scale replacement of its public safety radios, which resulted in an expense of nearly $1 million. He noted that the city has since been setting aside funds in anticipation of another large-scale replacement, which is expected to occur approximately every 10 years. The goal is to have roughly half of the anticipated replacement costs covered through these accumulated funds.

Ms. Surdy asked where individuals could find additional information about what each of the CIP line items entail.

Mr. Peterson indicated that the full plan is available on the city's website. He also noted that individuals with specific questions could contact 311 and be directed to the appropriate city staff member.

Ms. Bigham questioned the Parks CIP projects and asked about a line item identified as restricted (park dedication), which showed an approximate balance of $946,000. She asked where those funds originated.

Mr. Peterson explained that when new developments occur, developers may be required to dedicate land for park purposes or make a payment in lieu of dedicating land. Those payments are set aside for specific park-related purposes. He noted that the funds had previously been reported elsewhere but were moved to this section of the Parks budget for better visibility. The funds are considered restricted because state statutes specify how they may be used. He further explained that the general parks capital fund allows for more flexibility in how funds are spent, whereas park dedication funds must be used for specific eligible purposes.

Chair Zehnder opened the public hearing for comment. With no one wishing to speak, the public hearing was closed.

Mr. Dieken made a motion to approve CY49-26. Mr. Wilke seconded the motion and passed unanimously.

The anticipated date of City Council action is December 7, 2026.

2. CY47-26

Request of Jon Kietzer for a conditional use permit to allow apartments above the ground floor in the CBD-C, Central Business District Core. The subject property is described as the southerly 22 feet of Lot 5, Block 14, Map of Mankato (100 and 112 E. Walnut Street).

Mr. Hanson reports that staff respectfully submits the following findings of fact:

1. The use, apartments located above the ground floor, is one of the conditional uses listed in CBD-C, Central Business District Core zoning district.
2. The request is in keeping with the comprehensive planning policies of the city as identified uses and policies associated with each use are outlined.
3. The proposed use, when considered with the recommended conditions, does not interfere with or diminish the use of property in the immediate vicinity.
4. The property is currently served by public facilities and services.
5. The proposed use does not cause undue traffic congestion.
6. There are no impacts on natural or environmental features.
7. The proposal will not cause a negative cumulative effect, when considered in conjunction with the cumulative effect of various special uses of all types on the immediate neighborhood, and the effect of the proposed type of conditional use upon the city as a whole.
8. The proposal complies with all other applicable regulations of the district in which it is located and other applicable ordinances.
9. The proposal will not jeopardize the public's health, safety, or general welfare, and conditions of approval are outlined here to address operational issues that may present themselves with the proposed use.

Mr. Hanson reports that staff recommends approval of the conditional use permit to allow apartments above the ground floor with the following conditions:

1. The applicant shall petition the Special Service District for the necessary parking for the development.
2. The applicant shall obtain a rental license prior to occupancy.
3. A building permit shall be obtained prior to any activity occurring on the site.
4. Parking assessments and stall locations will be addressed and managed in conformance with the standards of the Special Service District, the Mankato City Code and per the Ordinance establishing said district.
5. If new exterior lighting is provided, it shall comply with the Mankato City Code.

Ms. Surdy questioned where the applicant intended to provide the five additional parking spaces.

Mr. Hanson stated that the applicant had indicated that, because the property is located within the Central Business District, there are generally no parking requirements for multifamily residential units. He noted that the previous office use had greater parking demand and that the five additional spaces were the applicant's stated intent. He added that the applicant could potentially provide additional information regarding the proposed parking.

Mr. Konz added that parking requirements are generally addressed through the Parking Assessment District. He noted that the property is already included in the district for some of its existing uses and that the assessment would be modified to determine whether the proposed use creates a need for additional parking. If additional parking is determined to be necessary, the applicant will be asked to provide it via the assessment district.

Jon Kietzer, 4100 Hillside Lane, Madison Lake, MN 56063. Mr. Kietzer was present at the Planning Commission meeting to answer any questions from commission members.

Chair Zehnder opened the public hearing for comment. With no one wishing to speak, the public hearing was closed.

Mr. Iddings made a motion to approve CY47-26. Ms. Bigham seconded the motion and passed unanimously.

The anticipated date of City Council action is November 9, 2026.

3. CY48-26

Request of the Planning Agency to amend Chapter 10 of Mankato City Code related to cannabis and definitions generally.

Ms. Mitchell reports that on November 25, 2024, the City of Mankato City Council adopted zoning standards that defined license types and where they are allowed to operate. With implementation of the ordinance, minor clarifications and updates are necessary for accurate regulation.

As of January 2026, Medical Cannabis Combination businesses are no longer a recognized form of a retail cannabis license. The state determined these previous combination licenses will now transfer to Cannabis Macrobusinesses. The new license type is required to register and count toward the City of Mankato retail cap.

An update has been made to the code provision (sec. 6-380(c)) relating to tribal cannabis retailers. Tribal cannabis retailers are not required to register with the city pursuant to their tribal compacts. However, a city may count such retailers towards its available registrations.

Updated the definition of lower potency hemp edible to reflect a statutory change.

Updated the definition of school for better clarity related to buffer zones: School means a public school, as defined in Minnesota Statutes section 120A.05, subdivisions 9, 11, 13, and 17, or a nonpublic school, or church or religious organization in which a child is provided instruction in compliance with this section and Minnesota Statutes section 120A.24, but does not include a home school.

Mr. Wilke questioned whether there were any buffer requirements for a cannabis cultivator located within city limits.

Ms. Mitchell indicated that there were no buffer requirements.

Mr. Wilke further questioned whether the City of Mankato had the authority to establish a minimum buffer requirement for that specific type of business.

Mr. Konz stated that the city would need to review the matter with the City Attorney but noted that any currently established uses would likely be grandfathered in. Therefore, any new buffer requirements would apply to future uses that are not currently established. He indicated that this is something that could be further evaluated and brought back to the Planning Commission next month as a miscellaneous item.

Mr. Wilke stated that he would appreciate further consideration of the matter, noting that his neighborhood is located near a cannabis cultivator and that several neighbors have expressed concerns.

Mr. Konz indicated that the city believes there may be operational changes that could help address some of the concerns. He noted that city staff have had numerous conversations with the current cultivator to ensure that all possible methods are being used to minimize potential impacts moving forward.

Ms. Surdy indicated that Blue Earth County may have an ordinance that the city could review and evaluate.

Mr. Konz stated that he could not comment on Blue Earth County's regulations. He explained that the city followed the guidance provided by the State of Minnesota when adopting its ordinance. He noted that other jurisdictions may have taken different approaches, but the city's direction was to follow the process and guidance provided by the state legislature. He clarified that this did not mean other approaches were necessarily wrong or better, but rather that the City of Mankato followed the guidance it received.

Chair Zehnder opened the public hearing for comment. With no one wishing to speak, the public hearing was closed.

Mr. Dieken made a motion to approve CY48-26. Ms. Surdy seconded the motion and passed unanimously.

6. MISCELLANEOUS

Mr. Konz indicated that there is a possibility of holding an additional meeting in December to discuss a development district that will be reviewed by the EDA in November. He noted that the city would like to maintain the flexibility to hold a meeting on December 16 and asked members to confirm their availability. He recommended that members plan for the additional meeting but stated that he would provide further updates at a later date.

7. ADJOURNMENT

There being no further business, Ms. Surdy moved to adjourn the meeting. The motion was seconded by Mr. Wilke with all in favor. The meeting adjourned at 6:38 pm.

MINUTES APPROVED.

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Chair, Mankato Planning Commission

Meeting Date: 11/18/2026

Title

CY50-26

Request of TOLD Development Company for a certificate of design compliance for a new structure in the Highway Gateway Overlay District and for an easement vacation. The subject properties are described as Lot 1 and Lot 2, Block 2, Victory Commercial Park Subdivision (Blue Earth County PID R010909102004, R010904300021, R010909102002, and R010904300020, etal).

The anticipated date of City Council action is December 14, 2026.

Applicant

The applicant is TOLD Development Company.

Request

The applicant is requesting a certificate of design compliance for a new structure in the Highway Gateway Overlay District and an easement vacation.

Location

The subject properties are described as Lot 1 and Lot 2, Block 2, Victory Commercial Park Subdivision (Blue Earth County PIDs R010909102004, R010904300021, R010909102002, and R010904300020, etal). The subject properties are associated with the addresses 1550 & 1560 Interlachen Drive.

Existing Land Use

The property is currently vacant. The Land Use Plan designates this property for commercial development.

Zoning

The property is zoned B-3, Highway Business District.

Environmentally Sensitive Areas

There are no known environmentally sensitive areas on the subject site.

Public Utilities

The subject site will be served by connections to services located within Interlachen Drive.

City Code

Mankato City Code Section 10-781 pertaining to the Highway Gateway Overlay District can be found at this link: https://library.municode.com/mn/mankato/codes/code_of_ordinances?nodeId=PTIICOOR_CH10LAUSDE_ARTVCODI_DIV9GTGAOVDI_SDIVHGHIGAOVDI

Mankato City Code Section 10-852 pertaining to Certificate of Design Compliance can be found here:https://library.municode.com/mn/mankato/codes/code_of_ordinances?nodeId=PTIICOOR_CH10LAUSDE_ARTVCODI_DIV9GTGAOVDI_SDVIGADERECEDECO

Mankato Charter Sec. 10.04.b. pertaining to easements on private property can be found here: https://library.municode.com/mn/mankato/codes/code_of_ordinances?nodeId=PTICH_CH10MIPR_S10.04.BVAEAPRPR

Site Plan Review Comments

The Site Plan and Traffic Advisory Committee reviewed the request at their November 4, 2026, meeting and provided comments. The comments, and the applicant's November 9, 2026, response Memorandum, are included in the "Attachments" section of this report.

Review

The applicant, TOLD Development Company, is requesting a certificate of design compliance for a new structure in the Highway Gateway Overlay District and an easement vacation. The subject properties are described as Lot 1 and Lot 2, Block 2, Victory Commercial Park Subdivision (Blue Earth County PIDs R010909102004, R010904300021, R010909102002, and R010904300020, etal). The subject properties are associated with the addresses 1550 & 1560 Interlachen Drive.

Certificate of Design Compliance:
The proposed use, a restaurant, Texas Roadhouse, is a permitted use in the B-3, Highway Business District.

The subject property is subject to the Highway Gateway Overlay District standards. As such, the applicant is requesting a certificate of design compliance for the construction of a new structure in the Highway Gateway Overlay District.

The Highway Gateway Overlay District is intended to promote high-quality design in the city's gateways. The areas included within this district are located at major entryways into the city and are located in commercial and office zoning districts. The design features and standards included in the Code are not only to create a positive first impression upon entering the city, but also to establish an image and character that is uniquely Mankato's.

The proposed approximately 11,000 square foot structure is shown on the westerly side of the two lots, and two driveways are shown from Interlachen Drive. The applicant proposes to have the development considered a zoning lot and intends to maintain ownership of both lots and execute reciprocal access and parking agreements for the subject zoning lot.

The applicant has provided engineering documentation regarding the anticipated traffic on the subject development. The provided documentation indicates that the Victory Commercial Park Subdivision traffic impact analysis, dated September 18, 2022, prepared by SEH, noted that the study projected anticipated traffic based on the subject property being commercial land. Further the memo states that the study included restaurants as data input for the calculations of the subdivision report. The findings of the memoranda articulate that the proposed Texas Roadhouse restaurant conforms to the planned use and traffic generation planned for the subdivision.

The proposed development achieves the Highway Gateway Overlay District interior lot 15' minimum and 150' maximum front yard setbacks. The 150' maximum

setback line runs, approximately, through the center of the proposed structure. Because the applicant proposes to maintain the lots under singular ownership and consider the development a zoning lot, the side setbacks will be achieved.

The development achieves the Code provisions for parking by providing 196 parking stalls in the proposed parking lot. The restaurant proposes to have 308 seats and 40 employees, thus requiring 97 parking stalls to meet City Code standards. The parking standard for a restaurant is one space per each four seats, one space for each two employees on a major shift, one space for each delivery vehicle, and one space for customer food pick-up.

The applicant's site plan identifies a bike rack on the northern side of the structure, demonstrating that bicycle parking is provided to achieve the Mankato City Code, which requires off-street bicycle parking spaces equal to five percent of the total number of automobile off-street parking spaces provided.

The applicant outlines that off-street loading at Texas Roadhouse restaurants do not typically utilize a designated loading space, as deliveries are scheduled during the early morning hours prior to the restaurant opening for business. During these times, the parking lot is largely unoccupied, and ample parking spaces are available to accommodate delivery vehicles without impacting customer parking or onsite circulation. Delivery trucks are proposed to temporarily park adjacent to the designated service entrance at the side of the building while loading and unloading activities occur. This operational model has been successfully implemented at numerous Texas Roadhouse locations nationwide and minimizes the need for a dedicated loading space that would otherwise remain unused for most of the day. Mankato City Code standards state that space allocated to any off-street loading use shall not, while so allocated, be used to satisfy off-street parking requirements of two, short-berth, 10 feet wide by 35 feet deep loading docks. Given the proposed hours of delivery, and the excess parking provided in the parking lot, the off-street loading plan achieves the intent of the Code.

Floor plans for the proposed use include a 308-seat restaurant space along with cooking and kitchen spaces, restrooms and other accessory areas typical of a restaurant. Indoor and outdoor waiting patio areas are shown. The applicant's narrative states that, *"the outdoor patio will be for customers to wait, and the assumption is if the liquor license allows the restaurant to include the outdoor patio, customers could purchase a beverage and come outside to the waiting area (access from the lobby) while waiting for their table. This outdoor patio will have a rail to keep the customers from exiting to the parking lot."* A recommended condition is included herein that the applicant obtains a liquor license in accordance with the Mankato City Code.

Exterior elevations on the proposed structure are proposed to include brick, fiber cement board siding and trim, shutters, and a metal roof. The exterior walls are shown in an earth-toned brown color, and there are green trim elements around the architectural elements. As proposed, exterior elevations will have brick to the parapet areas, and the towers will have fiber cement siding. The highway gateway overlay district encourages brick, and allows stucco, or other similar durable cement-based material, not to exceed 20 percent of a wall area. The applicant is updating the exterior elevations to include fiber cement wall elevation percentages proposed at 17% on the westerly elevation, 0% on the northern elevation, 22% on the eastern elevation and 28% on the southerly elevation.

The applicant has provided a landscaping plan that shows a landscaping screen on the northern Interlachen Drive, side of the parking lot and on the southern Victory Drive, side of the subject property to achieve the highway gateway screening standards. The code specifies that wherever a surface parking area faces a street frontage, the parking area shall be screened from the street with a wall fence, or hedge, to a minimum of four feet nor more than eight feet in height, nor be less than 80 percent opaque. This screening must be accomplished in the setback area between ten feet and 15 feet from the right-of-way line. Incorporated into the landscaping are 6' evergreen trees and 2 1/2" caliper deciduous trees to achieve the Code standards. A recommended condition of approval includes that, at the time of building permit submission, a landscaping plan be provided that contemplates screening on the easterly side of the parking lot to achieve the Mankato City Code. Interior landscaping is provided to meet the Mankato City Code, which requires that at least five percent of the area of the parking lot be interior landscaping island. For this site, 3,471 square feet of interior islands are required, and the site plans show 4,102 square feet of interior landscaping islands.

The applicant has provided lighting cut sheets and made modifications to fixtures based on Site Plan and Traffic Advisory Committee comments. A photometric plan has been provided for review and, with slight clarification, appears to meet the maximum 1/2-foot candle lighting level at the property line. A recommended condition is included herein.

The applicant will be required to obtain a separate sign permit for any desired exterior signage, and a recommended condition of approval is included. Because of the zoning lot configuration and the singular ownership, the applicant intends to utilize shared signage for this site and future development on the currently vacant parcel.

Easement Vacation:

The applicant proposes reconfiguring the existing two lots by an administrative lot split to make the parcel that will contain the Texas Roadhouse restaurant larger. The code allows the lot split to be handled administratively. However, because of the proposed lot reconfiguration, vacation of the underlying standard drainage and utility easement is desired. A new standard easement will then be dedicated along the adjusted property boundary.

The applicant has submitted the proposed easement vacation to the utility companies as is standard with a vacation request.

A recommended condition of approval is included that, in conjunction with the administrative lot split execution, the new easement documentation and the reciprocal easement documents be provided to City Staff.

Findings

Staff respectfully submits the following findings of fact related to the Certificate of Design Compliance:

1. The property is located in the Highway Gateway Overlay District and the proposed value of the project exceeds $500,000.
2. The proposed development, including the implementation of the recommended conditions, conforms to the standards of the Highway Gateway Overlay District, as noted under the Mankato City Code.
3. The design of the building elevations largely reflects approved finishes in the Highway Gateway Overlay District, including brick and fiber cement panels at acceptable percentages.

Staff respectfully submits the following findings of fact related to the proposed utility easement vacation:

1. The owner of the property has petitioned to vacate the easement.
2. The proposed vacation is necessary for the development of the subject parcels.
3. The proposed vacation easement areas will be re-established on the new property line in accordance with Mankato City Code subdivision standards.

Recommendation

Staff recommends approval of the Certificate of Design Compliance for the construction of a new structure in the Highway Gateway Overlay District, HGT, with the following recommended conditions of approval:

1. If alcohol will be served at the premises, the applicant shall obtain a liquor license from the City of Mankato prior to operations.
2. All exterior light fixtures shall achieve Mankato City Code standards, and lighting cut sheets shall be provided with the building permit submission for final review and approval.
3. A photometric plan achieving Mankato City Code standards, showing the lighting level at all property lines, shall be provided at the time of building permit submission for final review and approval.
4. At the time of building permit submission, a landscaping plan shall be provided that meets the Mankato City Code, including consideration for screening on the easterly side of the parking lot.
5. The applicant shall apply for separate sign permit(s) for any desired signage prior to signage fabrication or installation.
6. Singular ownership of the two lots shall be maintained for consideration of the subject development as a zoning lot.

Staff recommends approval of the private easement vacation with the following recommended conditions of approval:

1. In conjunction with the administrative lot split execution, the new drainage and utility easement documentation and the reciprocal easement documentation shall be provided to the City.

Attachments

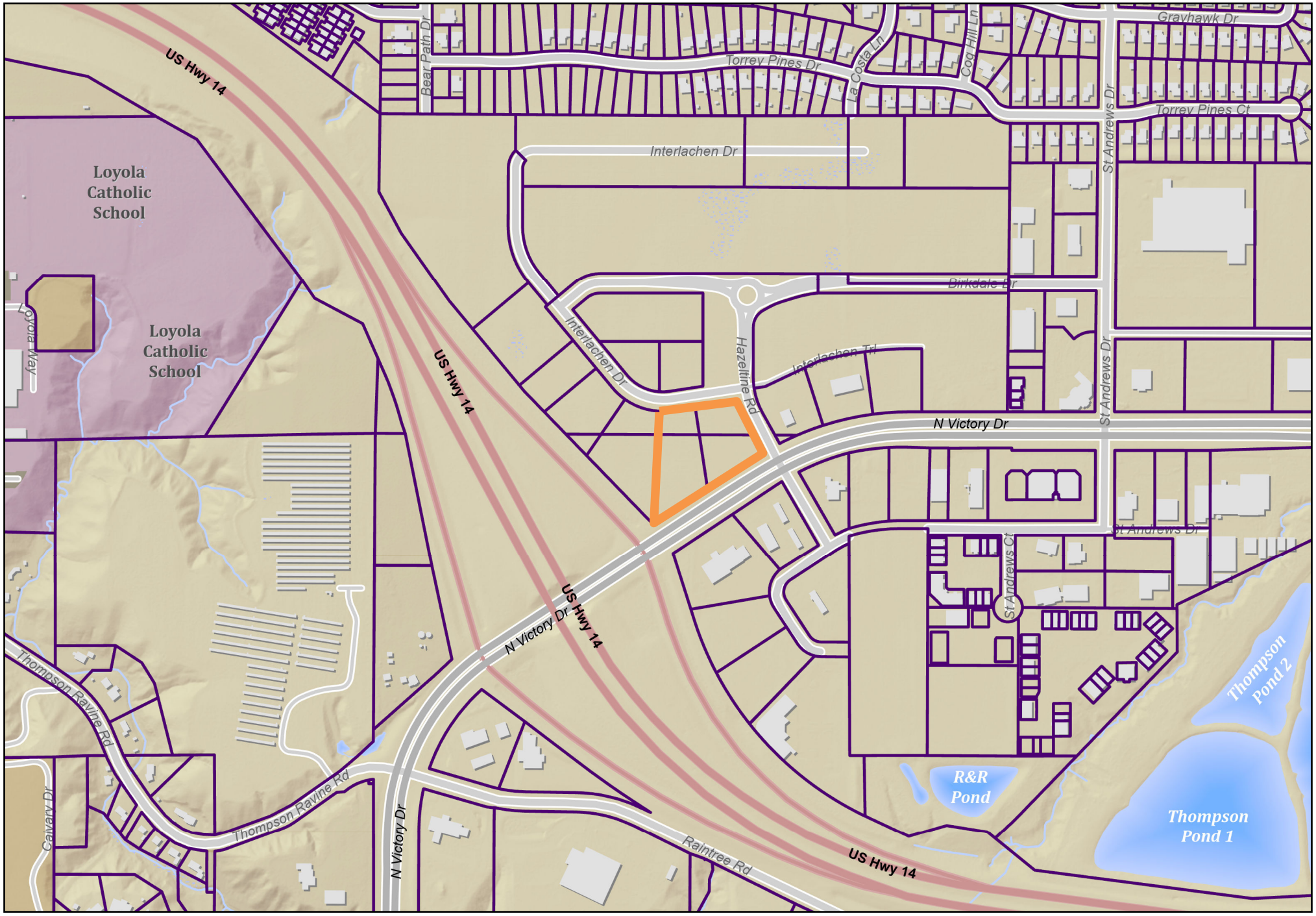
General Location Map

Aerial

Site Plan

Landscaping Plan
Exterior elevations
Material Sample Board
Floor Plan
Easement Vacation Exhibit
Grading Plan
Hydrant, Snow, & Emergency Vehicle Plan
Existing Conditions
Drainage and Sanitary Plan
SWPPP
Stormwater Memo
Civil Details
Traffic Statement
Administrative Lot Split
Lighting Cut Sheets
Lighting Photometric Plan
Signage Plan
Site Plan and Traffic Advisory Comments and Applicant responses

General Location Map



N W E S

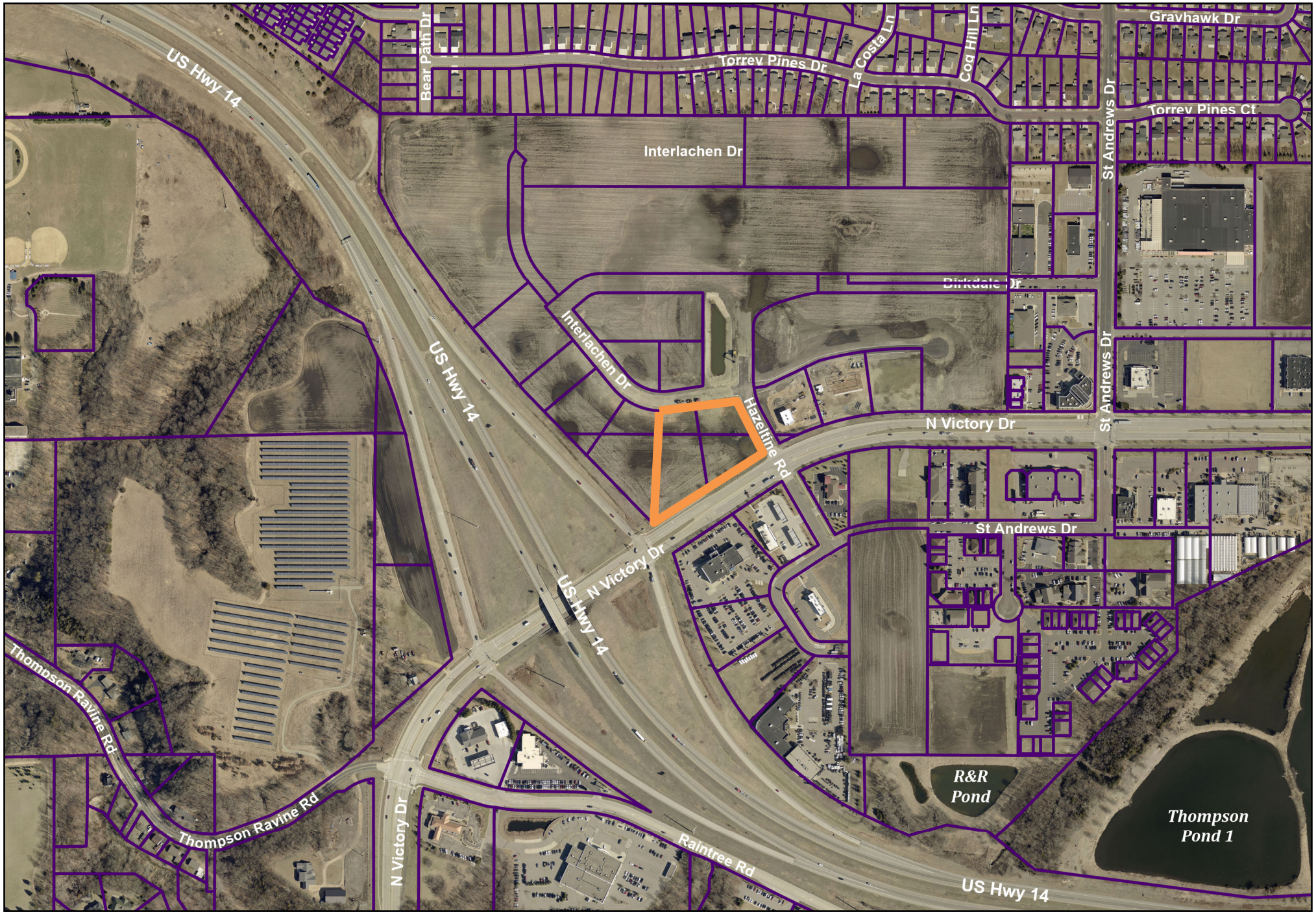
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Produced by: City of Mankato GIS
Published: October 26, 2026

City of Mankato — Leading the way...

Aerial Map



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Produced by: City of Mankato GIS
Published: October 26, 2026

City of Mankato — Leading the way...

SITE DATA	
ZONING - B-3, HIGHWAY BUSINESS DISTRICT	LOT AREA (MINIMUM) = 10,000 SQ. FT. LOT WIDTH (MINIMUM) - 150 FEET MAX. GROUND COVERAGE = 75% BY ALL STRUCTURES MAX. BUILDING HEIGHT = NO HEIGHT
SETBACKS FRONT MAIN & ACCESSORY BUILDING - 15 FEET PARKING AREAS - 15 FEET	STALL COUNT 308 SEATS (1 STALL PER 4 REQUIRED) 40 TOTAL EMPLOYEES (ASSUMING 1 PER EMPLOYEE) 117 STALLS REQUIRED 196 STALLS PROVIDED
SIDE MAIN & ACCESSORY BUILDING - 6 FEET PARKING AREAS - 3 FEET	INTERIOR LANDSCAPING TOTAL PARKING AREA = 69,415 SF INTERIOR LANDSCAPE AREA REQUIRED 5% = 3,471 SF **INTERIOR LANDSCAPE AREA PROVIDED = 4,102 SF = 5.91%**
REAR MAIN & ACCESSORY BUILDING - 6 FEET PARKING AREAS - 3 FEET	

LEGEND

- BITUMINOUS PAVEMENT SECTION (SEE PLAN NOTES)
- 4" CONCRETE WALK
- 6" CONCRETE WALK
- 6" THICKENED EDGE WALK
- 8" CONCRETE DRIVEWAY
- B618 C&G (UNLESS NOTED OTHERWISE, SEE GRADING PLAN)

NOTE:
A CITY RIGHT OF WAY PERMIT SHALL BE SECURED PRIOR TO DIRVEWAY WORK IN THE RIGHT OF WAY.

NOTE:
CONNECTIONS TO EX. CURB & GUTTER AND SIDEWALK SHALL BE TIED WITH REBAR.

DRIVEWAY AND SIDEWALK CONSTRUCTION IN THE RIGHT OF WAY SHALL BE IN CONFORMANCE WITH MNDOT STANDARD PLANS 5-297.250 & 5-297.254

DRIVEWAY AND SIDEWALK CONSTRUCTION IN THE RIGHT OF WAY SHALL BE IN CONFORMANCE WITH MNDOT STANDARD PLANS 5-297.250 & 5-297.254

INTERLACHEN DRIVE

HAZELTINE ROAD

VICTORY DRIVE

PUBLIC WALK ACCESS

15' SETBACK

NOTE:
THE OWNER IS RETAINING OWNERSHIP OF THE EASTERN PARCEL AND WILL ESTABLISH ANY NECESSARY EASEMENTS FOR UTILITIES AND PARKING TO ACCOMMODATE FUTURE DEVELOPMENT

TRANSFORMER BY OTHERS

TRASH ENCLOSURE

BIKE RACK

9'X19' STALL, TYP.

GAS METER & CONNECTION BY OTHERS

COMMUNICATIONS CONNECTION BY OTHERS

TEXAS ROADHOUSE
1550 INTERLACHEN DRIVE
FFE=1003.25

150-FT MAXIMUM SETBACK

6" CONCRETE PAVEMENT AT ADA STALLS

F&I: TYPICAL ALL
BOLLARDS

F&I: TYPICAL ALL
HANDICAP SYMBOL & SIGN & WHEEL STOPS
(SEE ADA STALL LAYOUT DETAIL)

6' BUILDING SETBACK
3' PARKING SETBACK

STALL COUNT, TYP.

SIGN (DESIGN BY OTHERS)

I=997.61

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HORZ. SCALE 0 30 60 FEET

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NOT FOR CONSTRUCTION

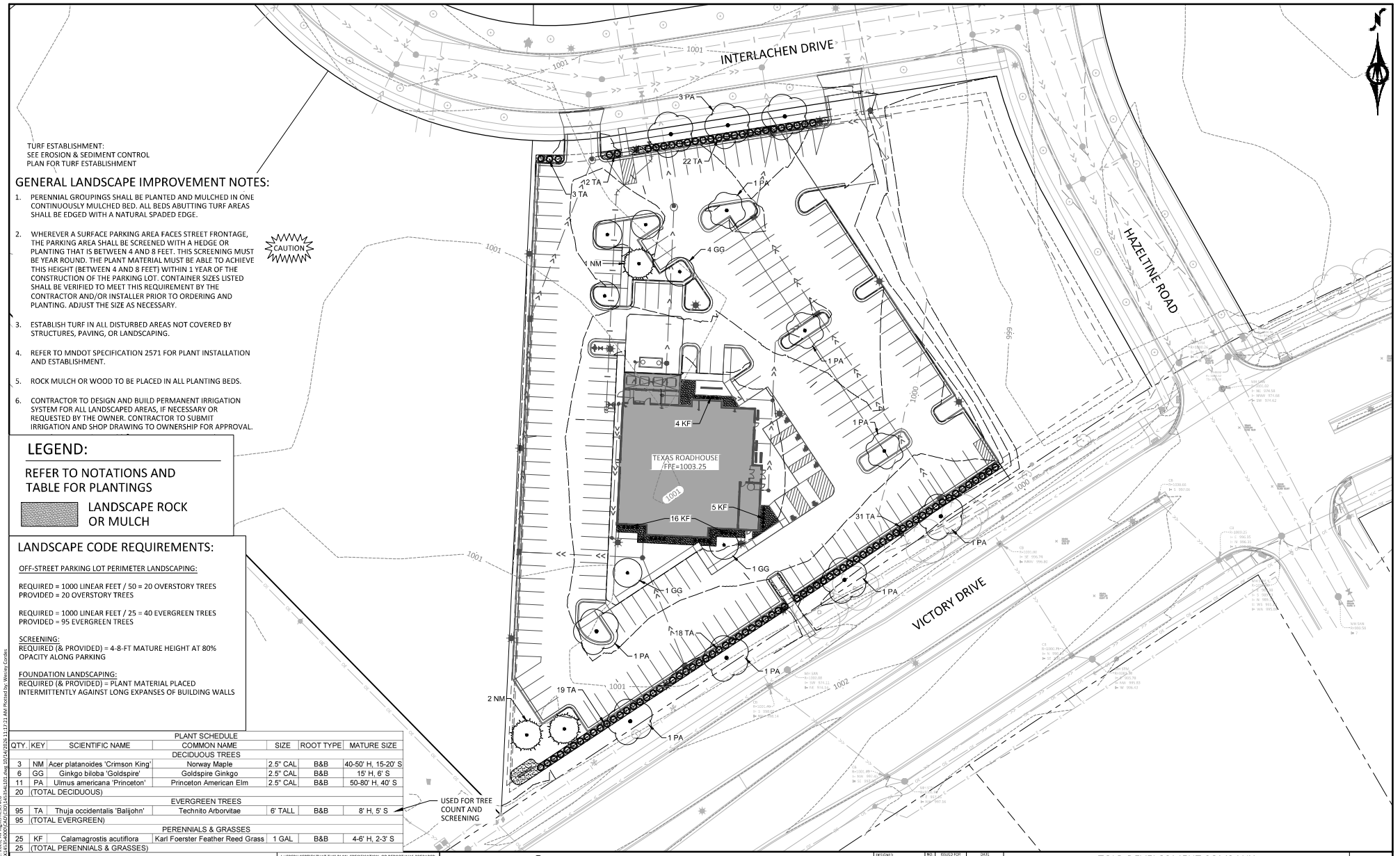
ALEC W. PIETZ, P.E.
LIC. NO. 59617 DATE XX/XX/XXXX

BOLTON & MENK
1960 PREMIER DRIVE
MANKATO, MN 56001
Phone: (507) 625-4171
Email: Mankato@bolton-menk.com
www.bolton-menk.com

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CHECKED			
AWP			
CLIENT PROJ. NO.			
26X.145354			

TOLD DEVELOPMENT COMPANY
MANKATO TEXAS ROADHOUSE
SITE PLAN

SHEET C2.01



TURF ESTABLISHMENT:
SEE EROSION & SEDIMENT CONTROL PLAN FOR TURF ESTABLISHMENT

GENERAL LANDSCAPE IMPROVEMENT NOTES:

1. PERENNIAL GROUPINGS SHALL BE PLANTED AND MULCHED IN ONE CONTINUOUSLY MULCHED BED. ALL BEDS ABUTTING TURF AREAS SHALL BE EDGED WITH A NATURAL SPADED EDGE.
2. WHEREVER A SURFACE PARKING AREA FACES STREET FRONTAGE, THE PARKING AREA SHALL BE SCREENED WITH A HEDGE OR PLANTING THAT IS BETWEEN 4 AND 8 FEET. THIS SCREENING MUST BE YEAR ROUND. THE PLANT MATERIAL MUST BE ABLE TO ACHIEVE THIS HEIGHT (BETWEEN 4 AND 8 FEET) WITHIN 1 YEAR OF THE CONSTRUCTION OF THE PARKING LOT. CONTAINER SIZES LISTED SHALL BE VERIFIED TO MEET THIS REQUIREMENT BY THE CONTRACTOR AND/OR INSTALLER PRIOR TO ORDERING AND PLANTING. ADJUST THE SIZE AS NECESSARY.
3. ESTABLISH TURF IN ALL DISTURBED AREAS NOT COVERED BY STRUCTURES, PAVING, OR LANDSCAPING.
4. REFER TO MNDOT SPECIFICATION 2571 FOR PLANT INSTALLATION AND ESTABLISHMENT.
5. ROCK MULCH OR WOOD TO BE PLACED IN ALL PLANTING BEDS.
6. CONTRACTOR TO DESIGN AND BUILD PERMANENT IRRIGATION SYSTEM FOR ALL LANDSCAPED AREAS, IF NECESSARY OR REQUESTED BY THE OWNER. CONTRACTOR TO SUBMIT IRRIGATION AND SHOP DRAWING TO OWNERSHIP FOR APPROVAL.

CAUTION

LEGEND:

REFER TO NOTATIONS AND TABLE FOR PLANTINGS

LANDSCAPE ROCK OR MULCH

LANDSCAPE CODE REQUIREMENTS:

OFF-STREET PARKING LOT PERIMETER LANDSCAPING:

REQUIRED = 1000 LINEAR FEET / 50 = 20 OVERSTORY TREES
PROVIDED = 20 OVERSTORY TREES

REQUIRED = 1000 LINEAR FEET / 25 = 40 EVERGREEN TREES
PROVIDED = 95 EVERGREEN TREES

SCREENING:
REQUIRED (& PROVIDED) = 4-8-FT MATURE HEIGHT AT 80% OPACITY ALONG PARKING

FOUNDATION LANDSCAPING:
REQUIRED (& PROVIDED) = PLANT MATERIAL PLACED INTERMITTENTLY AGAINST LONG EXPANSES OF BUILDING WALLS

PLANT SCHEDULE

QTY.	KEY	SCIENTIFIC NAME	COMMON NAME	SIZE	ROOT TYPE	MATURE SIZE
		DECIDUOUS TREES				
3	NM	Acer platanoides 'Crimson King'	Norway Maple	2.5" CAL	B&B	40-50' H, 15-20' S
6	GG	Ginkgo biloba 'Goldspire'	Goldspire Ginkgo	2.5" CAL	B&B	15' H, 6' S
11	PA	Ulmus americana 'Princeton'	Princeton American Elm	2.5" CAL	B&B	50-80' H, 40' S
20	(TOTAL DECIDUOUS)					
		EVERGREEN TREES				
95	TA	Thuja occidentalis 'Baljohn'	Technito Arborvitae	6' TALL	B&B	8' H, 5' S
95	(TOTAL EVERGREEN)					
		PERENNIALS & GRASSES				
25	KF	Calamagrostis acutiflora	Karl Foerster Feather Reed Grass	1 GAL	B&B	4-6' H, 2-3' S
25	(TOTAL PERENNIALS & GRASSES)					

USED FOR TREE COUNT AND SCREENING

HORZ. SCALE 0 30 60 FEET

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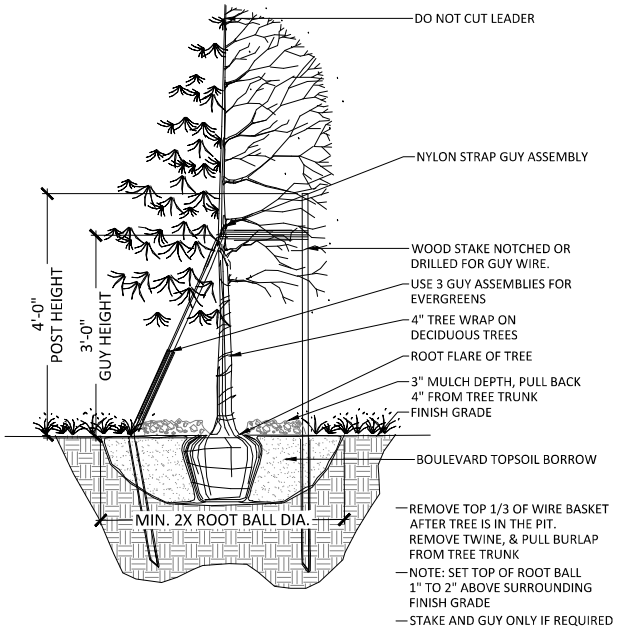
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DRAWN	AWP
CHECKED	AWP
CLIENT PROJ. NO.	26X.145354

NO.	ISSUED FOR	DATE

TOLD DEVELOPMENT COMPANY
MANKATO TEXAS ROADHOUSE
LANDSCAPE
LANDSCAPE PLAN

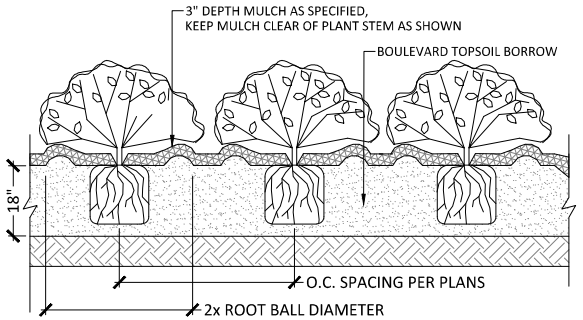
SHEET L1.01

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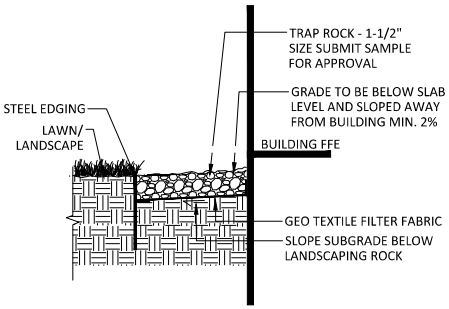
1 TREE PLANTING

SCALE: N.T.S.



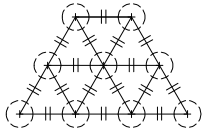
2 PERENNIAL / SHRUB PLANTING

SCALE: N.T.S.



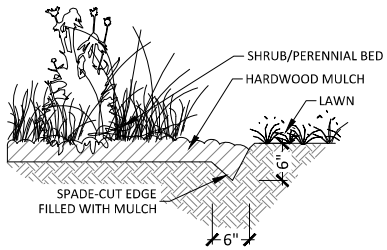
3 LANDSCAPING ROCK EDGING @ BUILDING

SCALE: N.T.S.



4 PERENNIAL PLANT SPACING

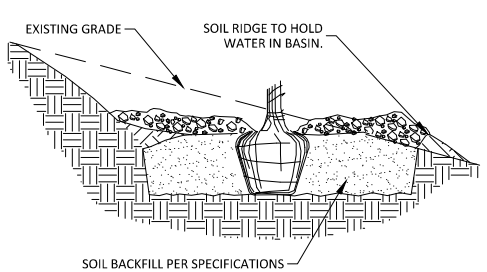
SCALE: N.T.S.



NOTE: SPADE-CUT EDGE TO BE INCIDENTAL TO PLANT MATERIAL AND SHALL BE USED WHERE ALL LANDSCAPE BEDS MEET ADJACENT LAWN AREAS.

5 SECTION: SPADE-CUT EDGE

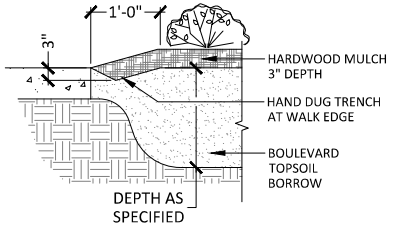
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ON 2:1 SLOPES OR GREATER, DO NOT CONSTRUCT THE UPHILL HALF OF THE WATERING BASIN.

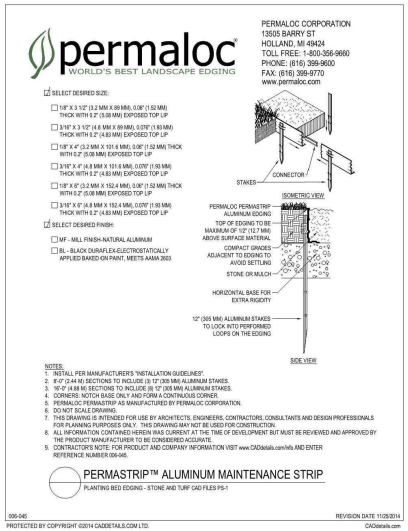
6 TREE PLANTING ON SLOPES

SCALE: N.T.S.



7 PLANTING EDGE AT HARDSCAPE SURFACE

SCALE: N.T.S.



GENERAL NOTES:

1. MASTER PLANT SCHEDULE: ALL PLANT MATERIALS ARE LISTED IN THE MASTER PLANT SCHEDULE. IF THERE IS A CONFLICT BETWEEN THE QUANTITIES SHOWN ON THE DRAWING AND THE QUANTITIES SHOWN IN THE PLANT SCHEDULE, THE PLAN QUANTITIES SHALL PREVAIL.
2. ALL DISTURBED AREAS SHALL RECEIVE SOD PER EROSION AND SEDIMENT CONTROL PLANS.
3. CONTRACTOR TO PRESERVE AND PROTECT EXISTING TREES AND SHRUBS, UNLESS OTHERWISE NOTED. ANY PLANT MATERIAL DAMAGED DUE TO CONTRACTOR NEGLIGENCE SHALL BE REPLACED AT CONTRACTOR'S EXPENSE.
4. PLANTINGS TO FOLLOW MNDOT'S SPEC SECTION 25.71 UNLESS NOTED OTHERWISE ON THE DRAWINGS.
5. LOW-GROW PRAIRIE SEED MIX REFERENCED IN DRAWINGS TO BE SPECIFIED AS MNDOT'S LOW MAINTENANCE TURF SEED MIX (25-131).

IRRIGATION NOTES:

1. CONTRACTOR RESPONSIBLE FOR DESIGN AND BUILD OF THE IRRIGATION SYSTEM COMPLETE, INCLUDING DRIP IRRIGATION IN PLANTING AREAS, SPRAY IRRIGATION IN TURF AREAS, BACKFLOW PREVENTOR, PRESSURE REGULATOR, GATE VALVES, AND ALL OTHER COMPONENTS NECESSARY FOR THE COMPLETE INSTALLATION AND OPERATION OF THE IRRIGATION SYSTEM.
2. CONTROLLER SHALL BE LOCATED WITHIN BUILDING, REFER TO MEP PLANS FOR ADDITIONAL INFORMATION.

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LIC. NO. 59617 DATE XX/XX/XXXX

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TOLD DEVELOPMENT COMPANY
MANKATO TEXAS ROADHOUSE
LANDSCAPE
LANDSCAPE NOTES & DETAILS

SHEET L1.02

A2.1 - EXTERIOR ELEVATIONS



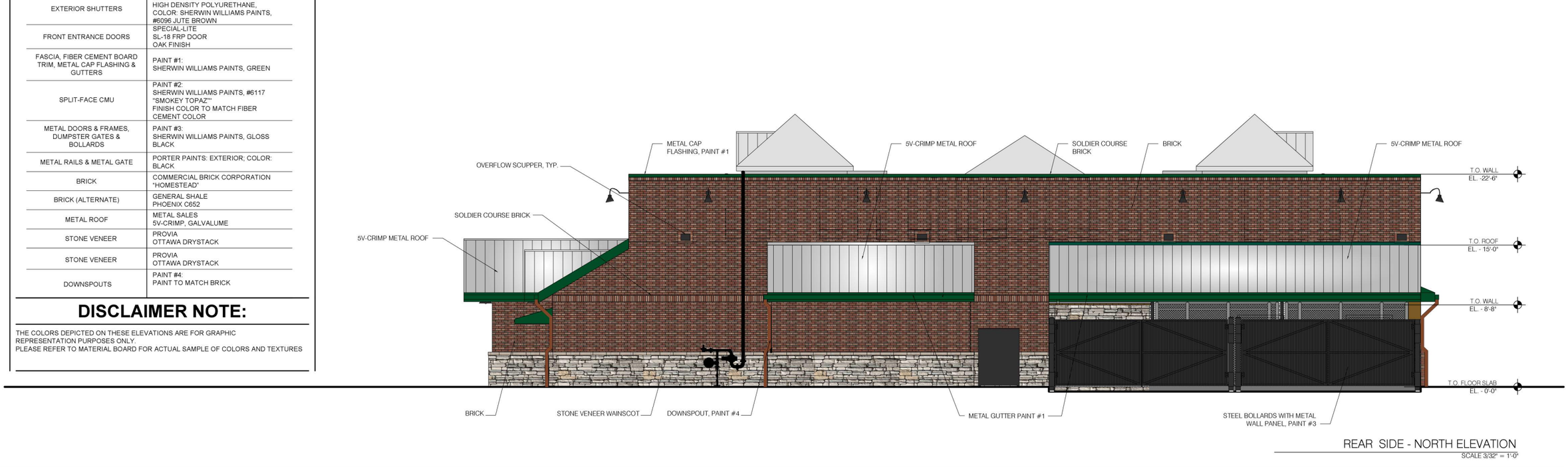
FRONT SIDE - SOUTH ELEVATION
SCALE 3/32" = 1'-0"

EXTERIOR FINISH SCHEDULE

FIBER CEMENT BOARD SIDING & TRIM	ALLURA LAP SIDING, RUSTIC CEDAR 8.25" (7" EXPOSURE) COLOR: SUMMER WHEAT ALLURA VERTICAL PANEL, RUSTIC 8" OC GROOVE, COLOR: SUMMER WHEAT
EXTERIOR SHUTTERS	WHOLESALE MILLWORK HIGH DENSITY POLYURETHANE, COLOR: SHERWIN WILLIAMS PAINTS, #6096 JUTE BROWN
FRONT ENTRANCE DOORS	SPECIAL-LITE SL-18 FRP DOOR OAK FINISH
FASCIA, FIBER CEMENT BOARD TRIM, METAL CAP FLASHING & GUTTERS	PAINT #1: SHERWIN WILLIAMS PAINTS, GREEN
SPLIT-FACE CMU	PAINT #2: SHERWIN WILLIAMS PAINTS, #6117 "SMOKEY TOPAZ"" FINISH COLOR TO MATCH FIBER CEMENT COLOR
METAL DOORS & FRAMES, DUMPSTER GATES & BOLLARDS	PAINT #3: SHERWIN WILLIAMS PAINTS, GLOSS BLACK
METAL RAILS & METAL GATE	PORTER PAINTS: EXTERIOR; COLOR: BLACK
BRICK	COMMERCIAL BRICK CORPORATION "HOMESTEAD"
BRICK (ALTERNATE)	GENERAL SHALE PHOENIX C652
METAL ROOF	METAL SALES 5V-CRIMP, GALVALUME
STONE VENEER	PROVIA OTTAWA DRYSTACK
STONE VENEER	PROVIA OTTAWA DRYSTACK
DOWNSPOUTS	PAINT #4: PAINT TO MATCH BRICK

DISCLAIMER NOTE:

THE COLORS DEPICTED ON THESE ELEVATIONS ARE FOR GRAPHIC REPRESENTATION PURPOSES ONLY.
PLEASE REFER TO MATERIAL BOARD FOR ACTUAL SAMPLE OF COLORS AND TEXTURES



REAR SIDE - NORTH ELEVATION
SCALE 3/32" = 1'-0"

PROJECT TITLE: TEXAS ROADHOUSE
ADDRESS: NEC HIGHWAY 14 AND NORTH VICTORY DRIVE
MANKATO, MN.

DATE 11-16-2026

NORR

A2.2 - EXTERIOR ELEVATIONS



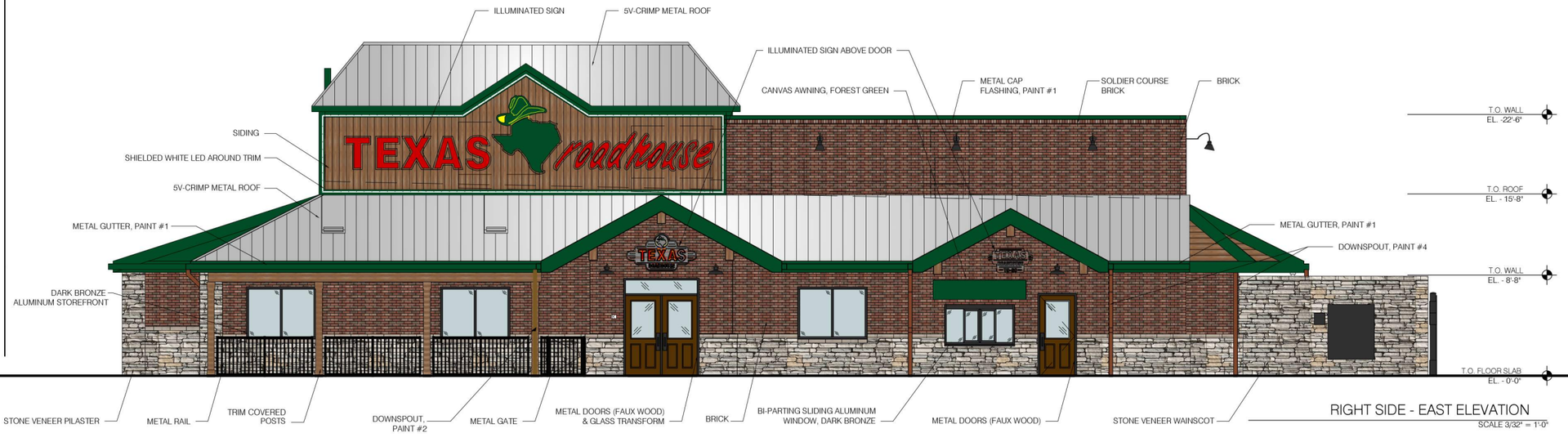
LEFT SIDE - WEST ELEVATION
SCALE 3/32" = 1'-0"

EXTERIOR FINISH SCHEDULE

FIBER CEMENT BOARD SIDING & TRIM	ALLURA LAP SIDING, RUSTIC CEDAR 8.25" (7" EXPOSURE) COLOR: SUMMER WHEAT ALLURA VERTICAL PANEL, RUSTIC 8" OC GROOVE, COLOR: SUMMER WHEAT
EXTERIOR SHUTTERS	WHOLESALE MILLWORK HIGH DENSITY POLYURETHANE, COLOR: SHERWIN WILLIAMS PAINTS, #6096 JUTE BROWN
FRONT ENTRANCE DOORS	SPECIAL-LITE SL-18 FRP DOOR OAK FINISH
FASCIA, FIBER CEMENT BOARD TRIM, METAL CAP FLASHING & GUTTERS	PAINT #1: SHERWIN WILLIAMS PAINTS, GREEN
DOWNSPOUT & SPLIT-FACE CMU	PAINT #2: SHERWIN WILLIAMS PAINTS, #6117 "SMOKEY TOPAZ"" FINISH COLOR TO MATCH FIBER CEMENT COLOR
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STONE VENEER	PROVIA OTTAWA DRYSTACK
DOWNSPOUTS	PAINT #4: PAINT TO MATCH BRICK

DISCLAIMER NOTE:

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PLEASE REFER TO MATERIAL BOARD FOR ACTUAL SAMPLE OF COLORS AND TEXTURES



RIGHT SIDE - EAST ELEVATION
SCALE 3/32" = 1'-0"

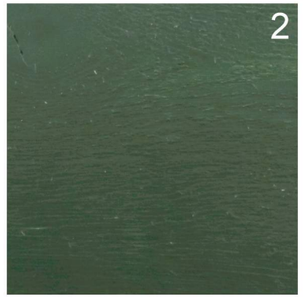
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ADDRESS: NEC HIGHWAY 14 AND NORTH VICTORY DRIVE
MANKATO, MN.

DATE 11-16-2026

NORR

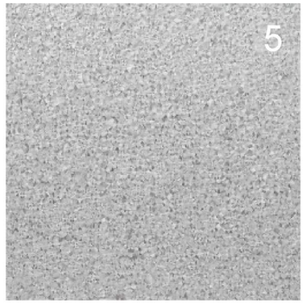
MB1.0 MATERIAL BOARD



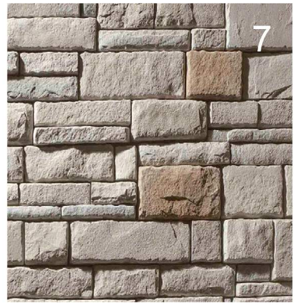








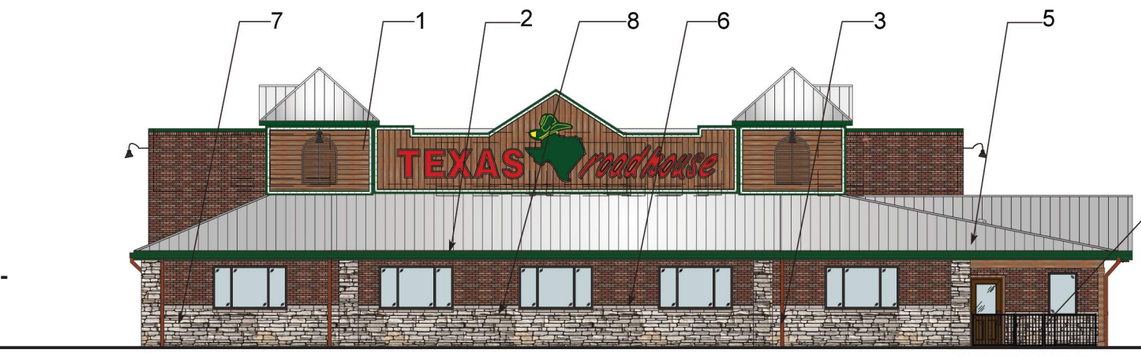




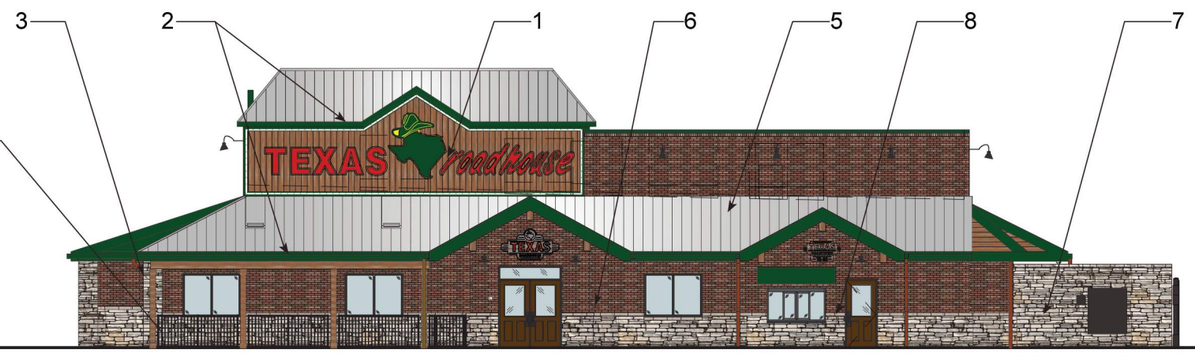


EXTERIOR FINISH SCHEDULE

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2	TRIM, METAL FLASHING & GUTTERS	PAINT #1: SHERWIN WILLIAMS PAINTS, GREEN
3	DOWNSPOUTS	PAINT #4: PAINT TO MATCH BRICK
4	METAL DOORS & FRAMES, DUMPSTER GATES & BOLLARDS	PAINT #3: SHERWIN WILLIAMS PAINTS, GLOSS BLACK
5	METAL ROOF	METAL SALES 5V - CRIMP, GALVALUME
6	BRICK	COMMERCIAL BRICK CORPORATION "HOMESTEAD"
7	STONE VENEER	PROVA - OTTAWA DRYSTACK
8	STONE SILL / LEDGE WALL CAP	ARRISCRAFT: ARRIS.CAST SILL/LEDGE: SL 484 - LIMESTONE WALL CAP: WC2 104 - LIMESTONE



SIDE ELEVATION



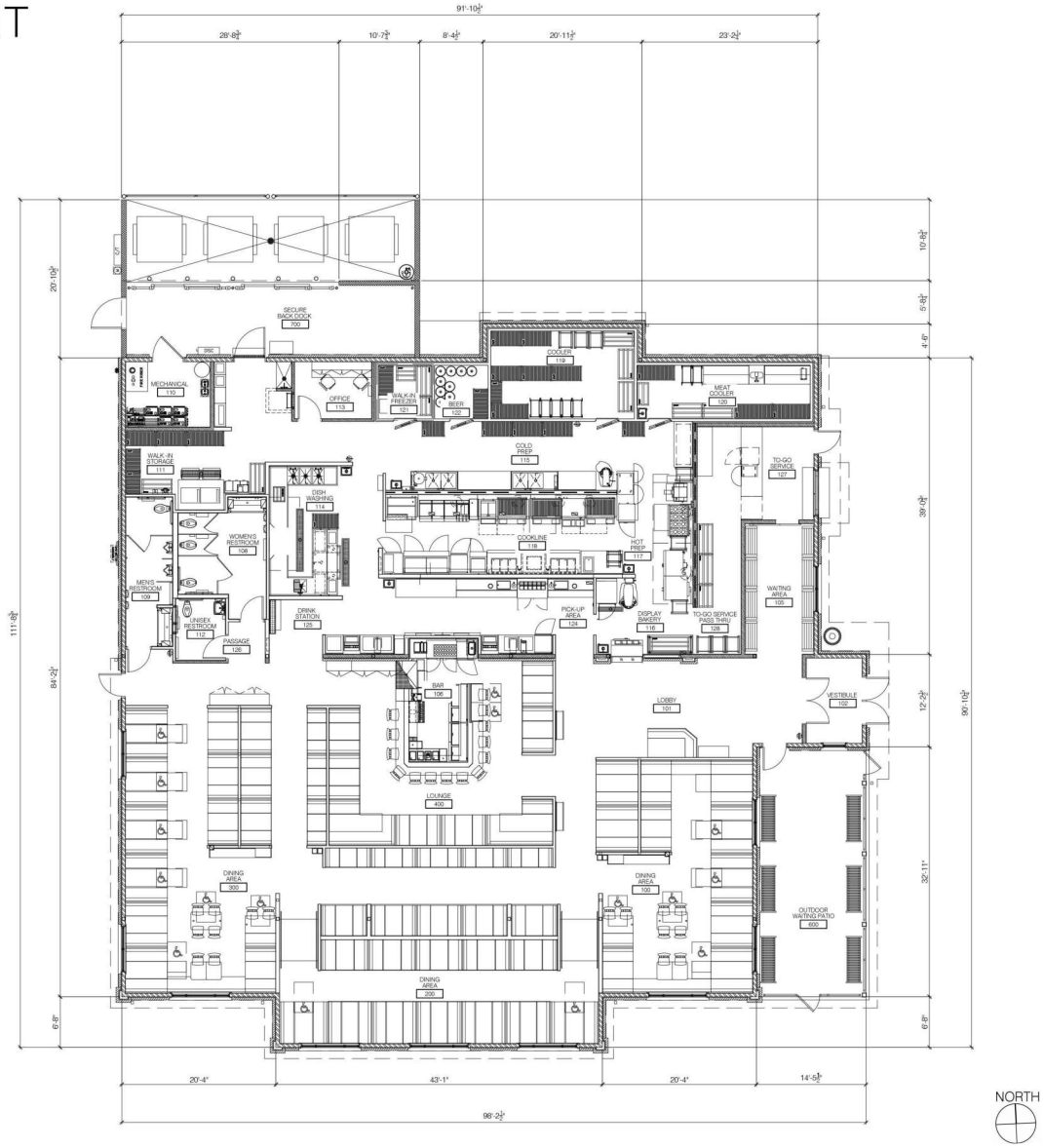
FRONT ELEVATION

PROJECT TITLE: TEXAS ROADHOUSE
ADDRESS: NEC HIGHWAY 14 AND NORTH VICTORY DRIVE
MANKATO, MN.

DATE 11-16-2026

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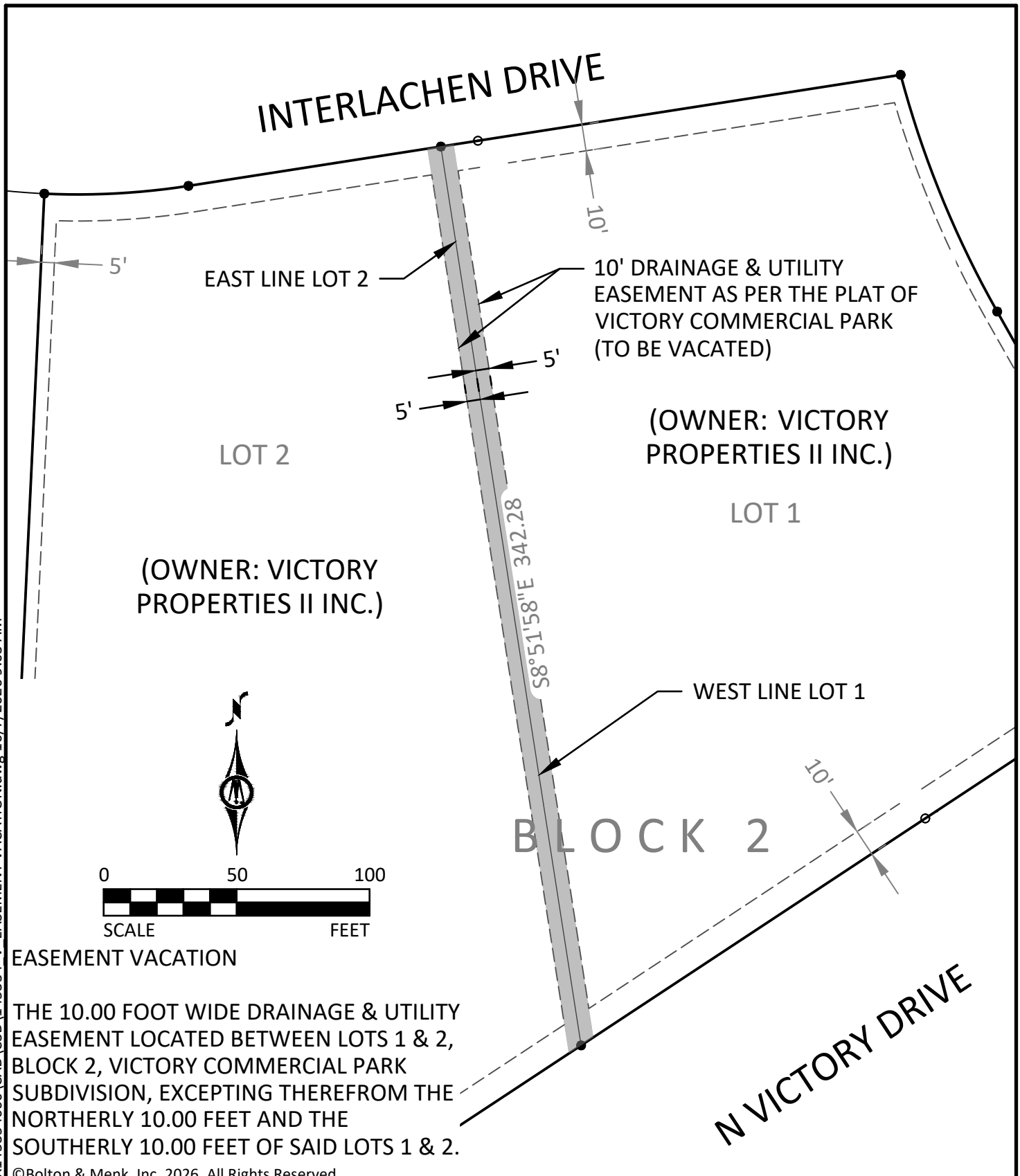
A1.0 - FLOOR PLAN EXHIBIT



PROJECT TITLE: TEXAS ROADHOUSE
ADDRESS: NEC HIGHWAY 14 AND NORTH VICTORY DRIVE
MANKATO, MN.

DATE 10-15-2026

NORR



EASEMENT VACATION

THE 10.00 FOOT WIDE DRAINAGE & UTILITY EASEMENT LOCATED BETWEEN LOTS 1 & 2, BLOCK 2, VICTORY COMMERCIAL PARK SUBDIVISION, EXCEPTING THEREFROM THE NORTHERLY 10.00 FEET AND THE SOUTHERLY 10.00 FEET OF SAID LOTS 1 & 2.

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EASEMENT VACATION EXHIBIT

MANKATO, MINNESOTA

BOLTON & MENK

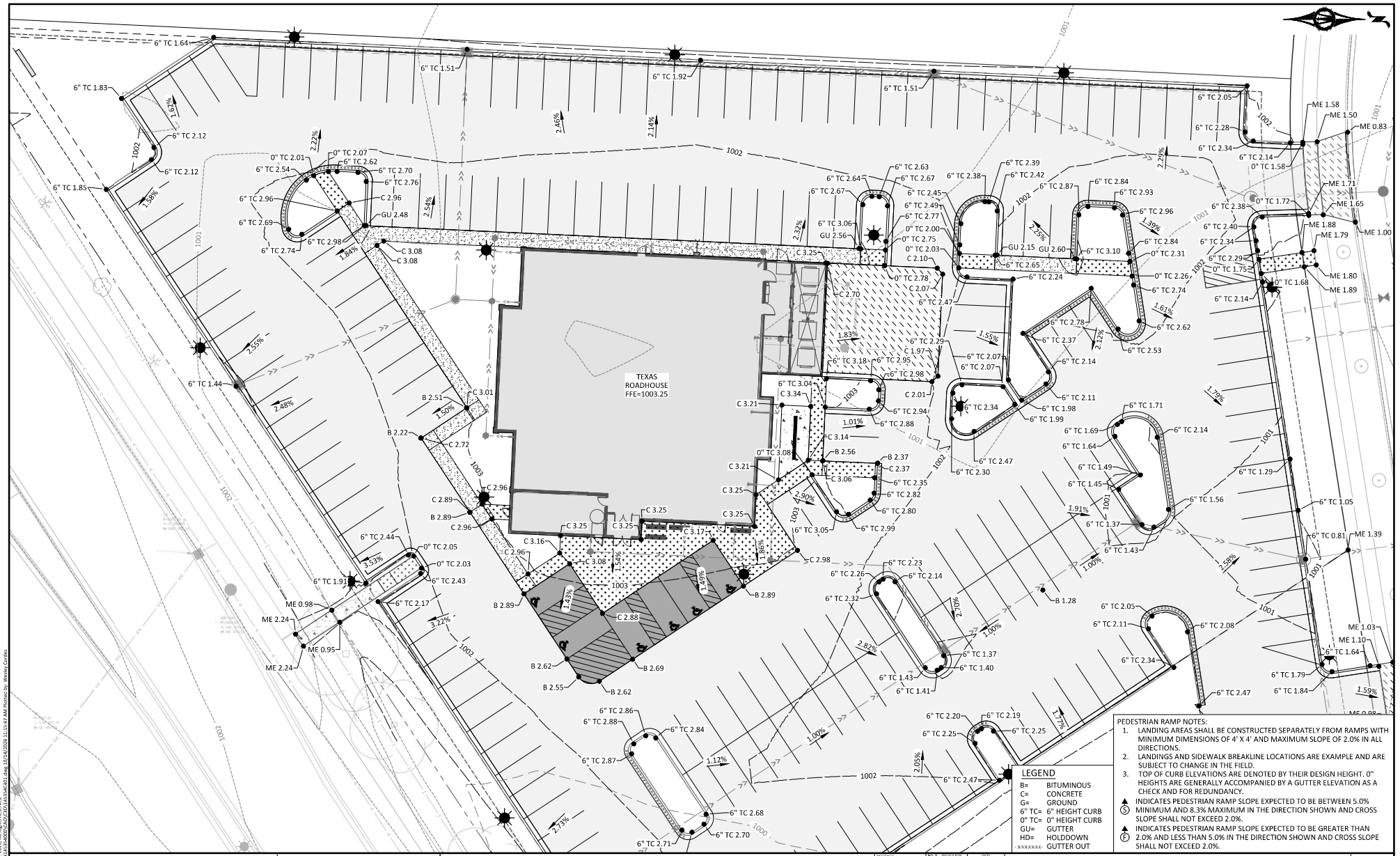
1960 Premier Drive
Mankato, MN 56001
Phone: (507) 625-4171

LOTS 1 & 2
BLOCK 2
VICTORY COMMERCIAL PARK

FOR: TOLD DEVELOPMENT COMPANY

JOB NUMBER: 26X.145354 FIELD BOOK: DRAWN BY: WSC

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PEDESTRIAN RAMP NOTES:

1. LANDING AREAS SHALL BE CONSTRUCTED SEPARATELY FROM RAMPS WITH MINIMUM DIMENSIONS OF 4' X 4' AND MAXIMUM SLOPE OF 2.0% IN ALL DIRECTIONS.
2. LANDINGS AND SIDEWALK BREAKLINE LOCATIONS ARE EXAMPLE AND ARE SUBJECT TO CHANGE IN THE FIELD.
3. TOP OF CURB ELEVATIONS ARE DENOTED BY THEIR DESIGN HEIGHT. 0" HEIGHTS ARE GENERALLY ACCOMPANIED BY A GUTTER ELEVATION AS A CHECK AND FOR REDUNDANCY.

▲ INDICATES PEDESTRIAN RAMP SLOPE EXPECTED TO BE BETWEEN 5.0% (S) MINIMUM AND 8.3% MAXIMUM IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%.

▲ INDICATES PEDESTRIAN RAMP SLOPE EXPECTED TO BE GREATER THAN (F) 2.0% AND LESS THAN 5.0% IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%.

LEGEND

B=	BITUMINOUS
C=	CONCRETE
G=	GROUND
6" TC=	6" HEIGHT CURB
0" TC=	0" HEIGHT CURB
GU=	GUTTER
HD=	HOLDDOWN
XXXXXXX	GUTTER OUT

HORZ. SCALE 0 15 30 FEET

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NOT FOR CONSTRUCTION

ALEC W. PIETZ, P.E. LIC. NO. 59617 DATE XX/XX/XXXX

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MANKATO, MN 56001
Phone: (507) 625-4171
Email: Mankato@bolton-menk.com
www.bolton-menk.com

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TOLD DEVELOPMENT COMPANY

MANKATO TEXAS ROADHOUSE

GRADING PLAN WEST

SHEET C4.01

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PEDESTRIAN RAMP NOTES:

1. LANDING AREAS SHALL BE CONSTRUCTED SEPARATELY FROM RAMPS WITH MINIMUM DIMENSIONS OF 4' X 4' AND MAXIMUM SLOPE OF 2.0% IN ALL DIRECTIONS.
2. LANDINGS AND SIDEWALK BREAKLINE LOCATIONS ARE EXAMPLE AND ARE SUBJECT TO CHANGE IN THE FIELD.
3. TOP OF CURB ELEVATIONS ARE DENOTED BY THEIR DESIGN HEIGHT. 0" HEIGHTS ARE GENERALLY ACCOMPANIED BY A GUTTER ELEVATION AS A CHECK AND FOR REDUNDANCY.

▲ INDICATES PEDESTRIAN RAMP SLOPE EXPECTED TO BE BETWEEN 5.0% (S) MINIMUM AND 8.3% MAXIMUM IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%.

▲ INDICATES PEDESTRIAN RAMP SLOPE EXPECTED TO BE GREATER THAN (F) 2.0% AND LESS THAN 5.0% IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%.

HORZ. SCALE 0 15 30 FEET

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MANKATO TEXAS ROADHOUSE
GRADING PLAN EAST

SHEET C4.02

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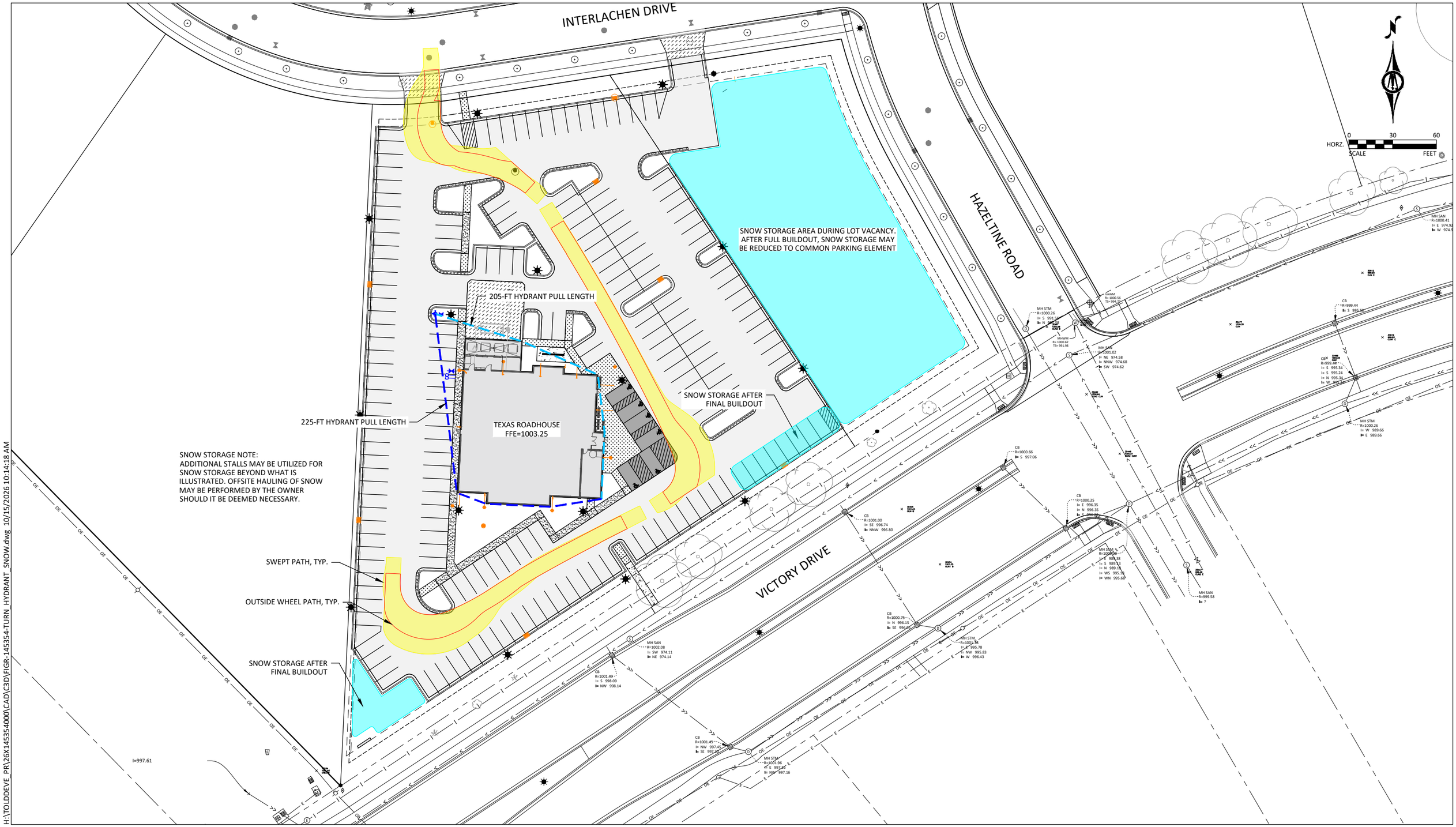
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MANKATO, MINNESOTA

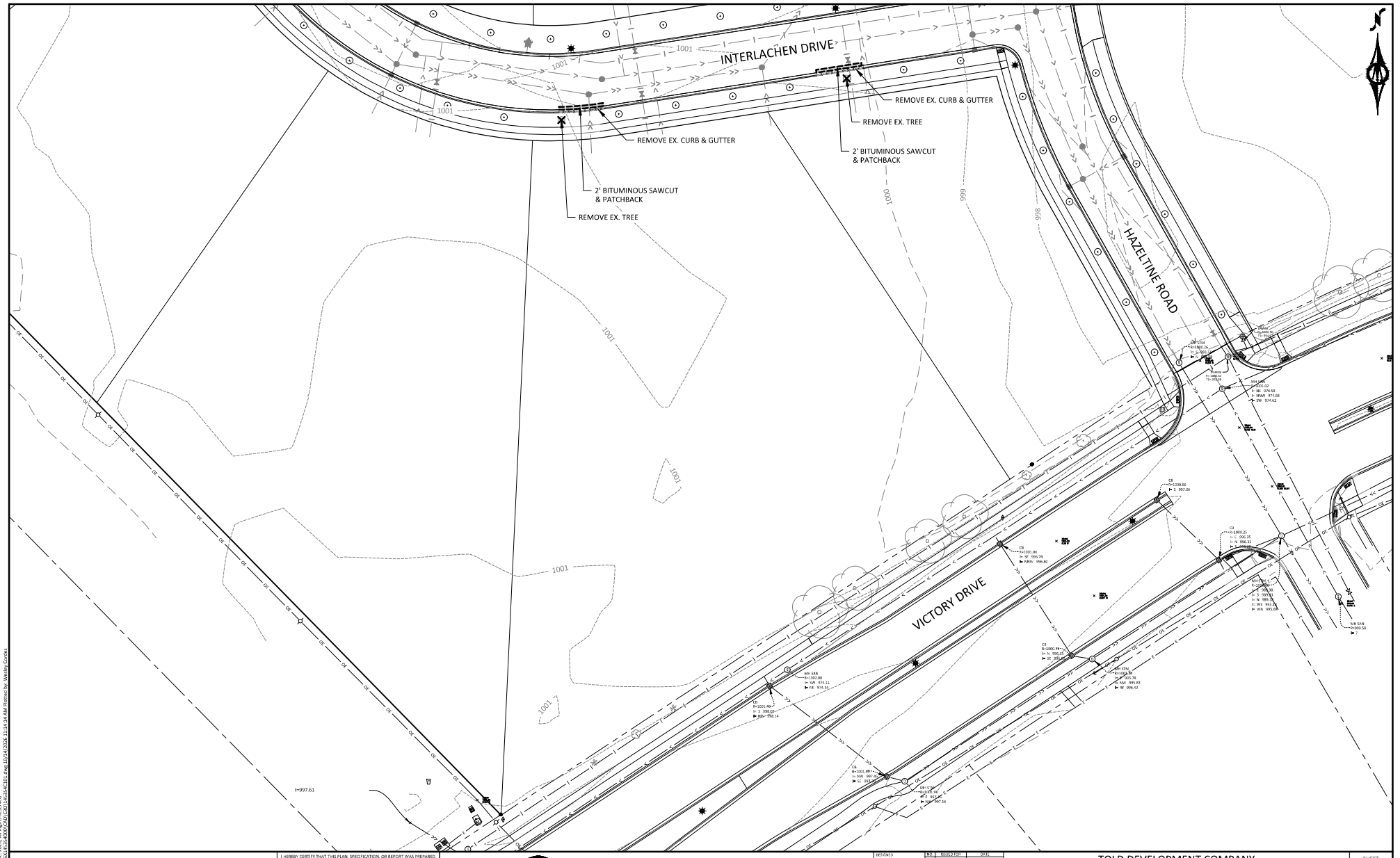
TURNING MOVEMENTS, SNOW MANAGEMENT, AND HYDRANT COVERAGE

OCTOBER 2026

BOLTON & MENK



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HORZ. SCALE 0 30 60 FEET

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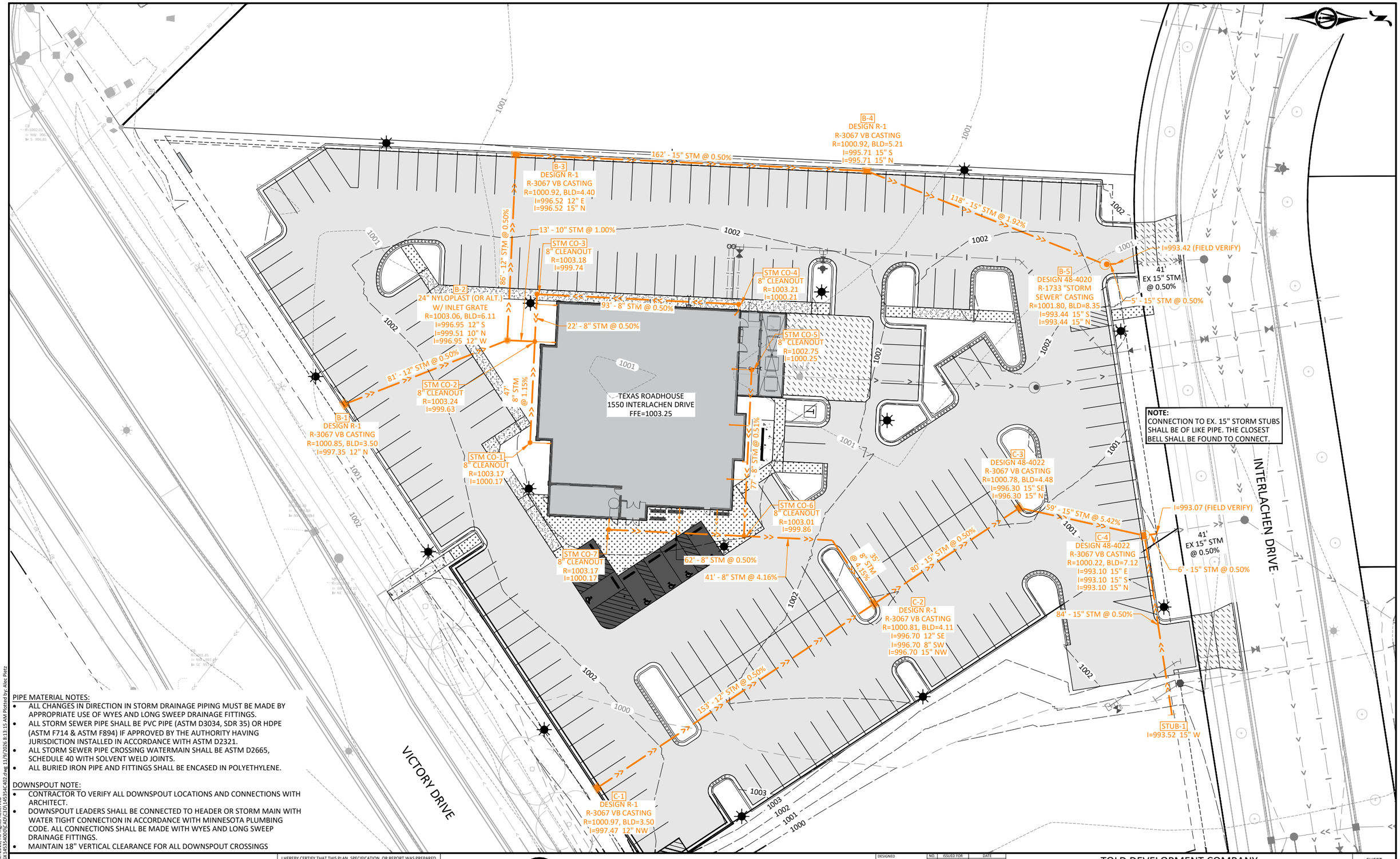
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TOLD DEVELOPMENT COMPANY
MANKATO TEXAS ROADHOUSE
EXISTING CONDITIONS & REMOVALS PLAN

SHEET C1.01



NOTE:
CONNECTION TO EX. 15" STORM STUBS SHALL BE OF LIKE PIPE. THE CLOSEST BELL SHALL BE FOUND TO CONNECT.

PIPE MATERIAL NOTES:

- ALL CHANGES IN DIRECTION IN STORM DRAINAGE PIPING MUST BE MADE BY APPROPRIATE USE OF WYES AND LONG SWEEP DRAINAGE FITTINGS.
- ALL STORM SEWER PIPE SHALL BE PVC PIPE (ASTM D3034, SDR 35) OR HDPE (ASTM F714 & ASTM F894) IF APPROVED BY THE AUTHORITY HAVING JURISDICTION INSTALLED IN ACCORDANCE WITH ASTM D2321.
- ALL STORM SEWER PIPE CROSSING WATERMAIN SHALL BE ASTM D2665, SCHEDULE 40 WITH SOLVENT WELD JOINTS.
- ALL BURIED IRON PIPE AND FITTINGS SHALL BE ENCASED IN POLYETHYLENE.

DOWNSPOUT NOTE:

- CONTRACTOR TO VERIFY ALL DOWNSPOUT LOCATIONS AND CONNECTIONS WITH ARCHITECT.
- DOWNSPOUT LEADERS SHALL BE CONNECTED TO HEADER OR STORM MAIN WITH WATER TIGHT CONNECTION IN ACCORDANCE WITH MINNESOTA PLUMBING CODE. ALL CONNECTIONS SHALL BE MADE WITH WYES AND LONG SWEEP DRAINAGE FITTINGS.
- MAINTAIN 18" VERTICAL CLEARANCE FOR ALL DOWNSPOUT CROSSINGS

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HORZ. 0 20 40
SCALE FEET

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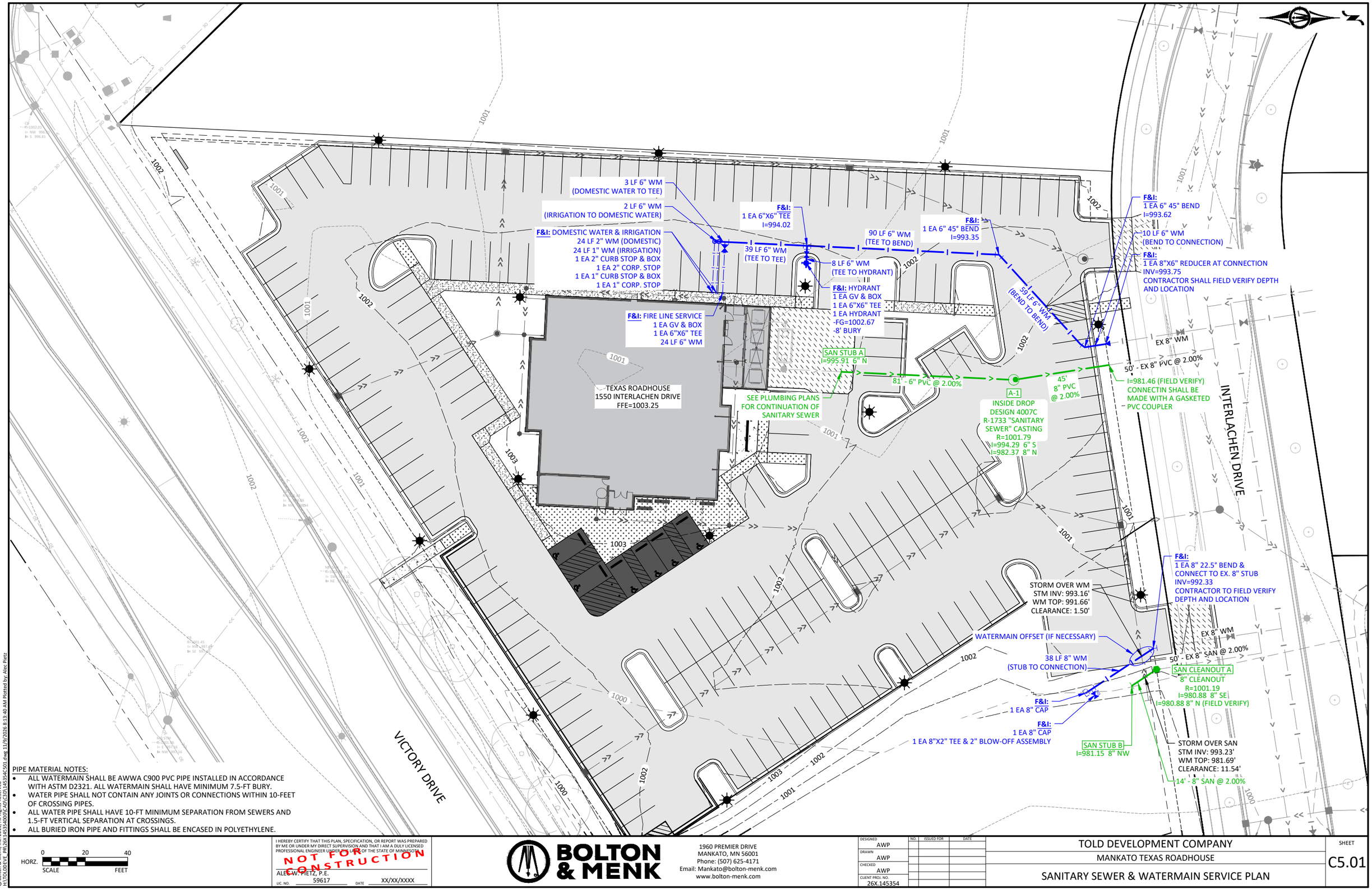
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TOLD DEVELOPMENT COMPANY
MANKATO TEXAS ROADHOUSE
DRAINAGE PLAN

SHEET C4.04



PIPE MATERIAL NOTES:

- ALL WATERMAIN SHALL BE AWWA C900 PVC PIPE INSTALLED IN ACCORDANCE WITH ASTM D2321. ALL WATERMAIN SHALL HAVE MINIMUM 7.5-FT BURY.
- WATER PIPE SHALL NOT CONTAIN ANY JOINTS OR CONNECTIONS WITHIN 10-FEET OF CROSSING PIPES.
- ALL WATER PIPE SHALL HAVE 10-FT MINIMUM SEPARATION FROM SEWERS AND 1.5-FT VERTICAL SEPARATION AT CROSSINGS.
- ALL BURIED IRON PIPE AND FITTINGS SHALL BE ENCASED IN POLYETHYLENE.

HORZ. SCALE 0 20 40 FEET

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MANKATO TEXAS ROADHOUSE
SANITARY SEWER & WATERMAIN SERVICE PLAN

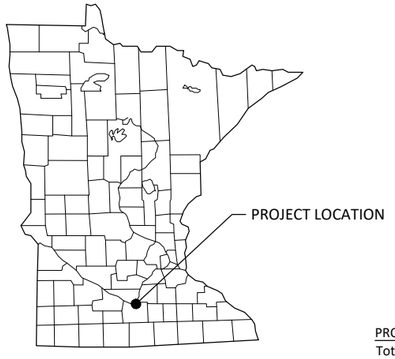
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STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

MANKATO TEXAS ROADHOUSE

CITY OF NORTH MANKATO
NICOLLET COUNTY COUNTY, MINNESOTA



LEGEND

- 1-MILE BOUNDARY
- PROJECT BOUNDARY
- NATIONAL WETLANDS INVENTORY
- PROTECTED AND/OR IMPAIRED WATERS

RESPONSIBLE PARTIES:
The Contractor and Owner will be joint applicants under the MPCA's General Stormwater Permit for Construction Activity as required by the National Pollutant Discharge Elimination System (NPDES) Phase II program.

The Contractor shall provide one or more trained Construction SWPPP Manager(s) knowledgeable and experienced in the application of erosion prevention and sediment control BMPs that will oversee the implementation of the SWPPP, and the installation, inspection and maintenance of the erosion prevention and sediment control BMPs.

A Construction SWPPP Manager must be available for an on-site inspection within 72 hours upon request by the MPCA.

	COMPANY	CONTACT PERSON	PHONE
OWNER:	TOLD DEVELOPMENT COMPANY	TBD	XXX-XXX-XXXX
SWPPP DESIGNER:	BOLTON & MENK, INC.	WESLEY S. CORDES, P.E.	507-978-4179
CONTRACTOR:	TBD	TBD	TBD
CONSTRUCTION SWPPP MANAGER:	TBD	TBD	TBD
PARTY RESPONSIBLE FOR LONG TERM O&M:	TBD	TBD	TBD

The SWPPP Designer, Construction SWPPP Manager, and BMP Installer must have appropriate training. Documentation showing training commensurate with the job duties and responsibilities is required to be included in the SWPPP prior to any work beginning on the site. Training documentation for the SWPPP Designer is included on the Narrative sheet. The Contractor shall attach training documentation to this SWPPP for the Construction SWPPP Manager and BMP Installer prior to the start of construction. This information shall be kept up to date until the project NOT is filed.

ADDITIONAL COMPENSATION
Payment for all work associated with Erosion and Sediment Control shall be as described in the Project Manual. Unless otherwise authorized by the Owner no additional payment shall be made for any work required to administer and maintain the site erosion and sediment control in compliance with the Minnesota Pollution Control Agency (MPCA) - General Stormwater Permit for Construction Activity (MN R100001) including but not limited to inspection, maintenance, and removal of BMPs or addition of BMPs to accommodate Contractor phasing.

DOCUMENT RETENTION
Permittees must make the SWPPP, including all inspection reports, maintenance records, training records and other information required by this permit, available to federal, state, and local officials within three (3) days upon request for the duration of the permit and for three (3) years following the NOT.

GENERAL STORMWATER DISCHARGE REQUIREMENTS
All requirements listed in Section 5.1 of the Permit for the design of the permanent stormwater management system and discharge have been included in the preparation of this SWPPP. These include but are not limited to:

1. The expected amount, frequency, intensity, and duration of precipitation.
2. The nature of stormwater runoff and run-on at the site
3. Peak flow rates and stormwater volumes to minimize erosion at outlets and downstream channel and stream bank erosion.
4. The range of soil particle sizes expected to be present on the site.

Permanent stormwater treatment systems for this project have been designed in accordance with the guidance in the MN Stormwater Manual in place at the time of bidding. Copies of the design information and calculations are part of this SWPPP and will be provided in digital format upon written request to the Engineer.

PROJECT AREAS:

Total Project Size (disturbed area) =	2.61	ACRES
Existing area of impervious surface =	0.00	ACRES
Post construction area of impervious surface =	2.02	ACRES
Total new impervious surface area created =	2.02	ACRES

Planned Construction Start Date:	SPRING 2027
Estimated Construction Completion Date:	FALL 2027

PERMANENT STORMWATER MANAGEMENT SYSTEM:
Type of storm water management used if more than 1 acre of new impervious surface is created:

	Wet Sedimentation Basin
	Infiltration/Filtration
X	Regional Pond
	Permanent Stormwater Management Not Required

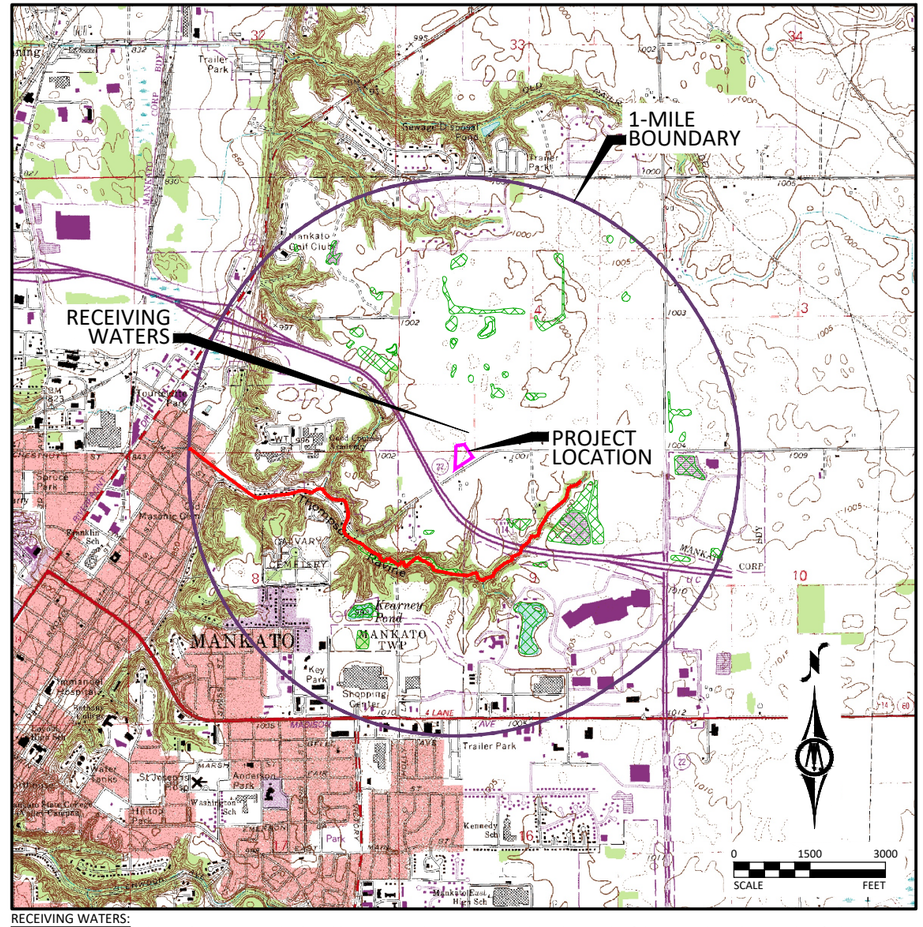
PROJECT LOCATION:

COUNTY	TOWNSHIP	RANGE	SECTION	LATITUDE	LONGITUDE
BLUE EARTH	T108N	R26W	4,9	44.1811° N	93.9645° W

BMP SUMMARY	QUANTITY	UNIT
STABILIZED CONSTRUCTION EXIT	2	EACH
INLET PROTECTION	12	EACH
PERIMETER CONTROL	1,401	LIN FEET
TURF GRASS ESTABLISHMENT (RT) (W/ FERTILIZER AND MULCH	0.39	ACRE
NOTE: QUANTITIES LISTED ACCOUNT FOR INTERIM CONDITION INSTALLATION. ADDITIONAL INSTALLATIONS MAY BE NECESSARY AS A RESULT OF SCHEDULING,MAINTENANCE AND FINAL BUILD OUT.		

DESCRIPTION OF CONSTRUCTION ACTIVITIES AND STORMWATER MANAGEMENT:
Construction activities include: Site grading, drainage improvements, water and sanitary service, building construction, temporary erosion and sediment control, and permanent stabilization.

Stormwater currently discharges by overland flow to adjacent properties and right-of-way of which some may remain on site due to recent constructed improvements. Consistent with the subdivision drainage plan, the property will drain via on site storm sewer to public storm sewer within Interlachen Drive to a regional basin within the subdivision. The proposed project impervious area is in conformance with the maximum allowable impervious area per the subdivision drainage plan.



RECEIVING WATERS:
Receiving waters, including surface water, wetlands, Public Waters, and stormwater ponds, within 1-mile of the project boundary are identified on the USGS 7.5 min quad map above. Receiving waters that are impaired, the impairment, and WLA are listed as follows. All specific BMPs relative to construction activities listed in the permit for special, prohibited, restricted, or impaired have been incorporated into this plan. All specific BMPs listed in approved TMDLs and those BMPs listed for construction related waste load allocations have also been incorporated.

NAME OF WATER BODY	TYPE (ditch, pond, wetland, lake, etc.)	Special, Prohibited, Restricted Water [1]	Flows to Impaired Water Within 1-Mile [2]	USEPA Approved Construction Related TMDL [3]
REGIONAL POND	POND	NO	NO	N/A

[1] Special, prohibited, and restricted waters are listed in Section 23 of the MN Construction Stormwater General Permit (MNR100001).
[2] Identified as impaired under section 303 (d) of the federal Clean Water Act for phosphorus, turbidity, TSS, dissolved oxygen, and/or aquatic biota.
[3] Construction Related TMDLs include those related to: phosphorus, turbidity, TSS, dissolved oxygen, and/or aquatic biota.

IMPLEMENTATION SCHEDULE AND PHASING: The Contractor is required to provide an updated schedule and site management plan meeting the minimum requirements of Section 1717 of the Minnesota Standard Specifications for Construction.

1) Submit SWPPP Updates to Engineer. Submittal shall include any requested changes to the SWPPP, including but not limited to: Trained Personnel, Locations for Stockpiles, Concrete Washout, Sanitation Facilities, Types and Locations of Erosion & Sediment Control. Failure to submit updates shall be considered acceptance of the SWPPP as designed with no changes.
2) Install perimeter sediment control, inlet protection, and construction exit.
3) Remove existing surfaces as required.
4) Complete site and utility improvements.
5) Install additional inlet protection as needed.
6) Reestablish turf.
7) Repeat steps 2-6 as necessary throughout the project.
8) Add additional temporary BMPs as necessary during construction based on inspection reports.
9) Ensure final stabilization measures are complete.
10) Provide digital copy of all Field SWPPP Documentation including Inspection Reports and SWPPP Revisions to the Owner.
11) Submit Notice of Termination (NOT) to MPCA. NOTE: The NOT must be submitted to MPCA before Final Stabilization is considered complete.

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NOT FOR CONSTRUCTION
ALEC W. PIETZ, P.E.
LIC. NO. 59617 DATE XX/XX/XXXX

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TOLD DEVELOPMENT COMPANY
MANKATO TEXAS ROADHOUSE
STORMWATER POLLUTION PREVENTION PLAN
PROJECT INFORMATION & LOCATION MAP

SHEET C3.01

Information contained in this SWPPP narrative sheet summarizes requirements of the GENERAL PERMIT AUTHORIZATION TO DISCHARGE STORMWATER ASSOCIATED WITH CONSTRUCTION ACTIVITY UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM/STATE DISPOSAL SYSTEM PROGRAM - Permit No: MN RI0000I (Permit) as they apply to this project. All provisions of the Permit including those not specifically cited herein shall apply to this project. The Contractor is responsible to be familiar with and comply with all conditions of the permit. The full text of the Permit is available at: https://www.pca.state.mn.us/sites/default/files/wq-strm2-80a.pdf

SWPPP AMENDMENTS AND SUBMITTALS

Contractor must prepare and submit to the Engineer a SWPPP amendment as necessary to include additional Best Management Practices (BMPs) to correct problems identified or address the following situations.

1. Contact information and training documentation for Construction SWPPP Manager and BMP Installer,
2. There is a change in construction method of phasing, operation, maintenance, weather or seasonal conditions not anticipated during the design of the SWPPP including but not limited to:
    a. Types and/or Locations of BMPs
    b. Material Storage and Spill Response
    c. Fueling Plans
    d. Locations for Stockpiles, Concrete Washout, and Sanitation Facilities and
    e. Project Phasing
3. It is determined that the SWPPP is not achieving objectives of minimizing pollutants in stormwater discharges associated with construction activity, or
4. The SWPPP is not consistent with the terms and conditions of the permit.

The Contractor may implement SWPPP amendments immediately and is not required to wait for Engineer review of the submittal. The responsibility for completeness of SWPPP amendments and compliance with the Permit lies with the Contractor. Review, comment, or lack of comment by the Engineer on a SWPPP amendment shall not absolve the responsibilities of the Contractor in any way.

If a change order is issued for a design change the SWPPP amendment will be prepared by the Engineer and included in the change order.

In addition to SWPPP amendments, the Contractor shall submit to the Engineer Weekly Erosion and Sediment Control Schedule meeting the requirements of MnDOT 1717.

The Contractor shall keep copies of all SWPPP amendments, Weekly Erosion and Sediment Control Schedules, inspection logs, and maintenance logs with the field copy of the SWPPP. A PDF copy of these documents will be provided along with a copy of the final Field Copy of the SWPPP to the Engineer along with the signed Notice of Termination when final stabilization is complete.

EROSION PREVENTION PRACTICES

Stormwater conveyance channels shall be routed around unstabilized areas. Erosion controls and velocity dissipation devices shall be used at outlets within and along the length of any constructed conveyance channel.

The normal wetted perimeter of all ditches or swales, including storm water management pond slopes, that drain waters from the site must be stabilized within 200' of any property edge or discharge point, including storm sewer inlets, within 24 hours of connection.

Temporary or permanent ditches or swales used as sediment containment during construction do not need to be stabilized during temporary period of use and shall be stabilized within 24 hours after no longer used as sediment containment.

Mulch, hydromulch, tackifier, or similar practice shall not be used in any portion of the wetted perimeter of a temporary or permanent drainage ditch or swale section with a continuous slope of greater than 2 percent.

Energy dissipation shall be installed at all temporary or permanent pipe outlets within 24 hours of connection to a surface water or permanent stormwater treatment system.

The Contractor shall phase construction and use construction methods to the extent practical to minimize exposed soils. The project phasing shall be documented in the Weekly Erosion and Sediment Control Schedule.

SEDIMENT CONTROL PRACTICES

Down gradient BMPs including perimeter BMPs must be in place before up gradient land- disturbing activities begin and shall remain in place until final stabilization.

All BMPs that have been adjusted or removed to accommodate short-term activities shall be re-installed or replaced the earlier of the end of the work day or before the next precipitation event even if the activity is not complete.

Inlet BMPs may be removed for specific safety concerns. The BMPs shall be replaced as soon as the safety concern is resolved. The removal shall be documented in the SWPPP as a SWPPP amendment.

Temporary stockpiles must have sediment control BMPs. The Contractor shall prepare and submit to the Engineer a SWPPP amendment showing the location of temporary stockpiles and the BMPs for each stockpile. The SWPPP amendment must meet the minimum requirements of Section 9 of the Permit.

Soil compaction shall be minimized and topsoil shall be preserved, unless infeasible or if construction activities dictate soil compaction or topsoil stripping.

The use of polymers, flocculants, or other sedimentation treatment chemicals are not proposed as part of this SWPPP as designed by the Engineer. If methods or phasing of construction require the use of any of these chemicals, the Contractor shall prepare and submit to the Engineer a SWPPP amendment that meets the minimum requirements of Section 9 of the Permit.

TEMPORARY SEDIMENTATION BASINS

A temporary sedimentation basin has not been included in this SWPPP as designed by the Engineer. If a basin is later determined to be desirable or necessary the Contractor shall prepare and submit to the Engineer a SWPPP amendment. Temporary sedimentation basins shall meet or exceed the minimum requirements of Section 14 of the Permit and shall include a basin draining plan meeting or exceeding the minimum requirements of Section 10 of the Permit. Where the site discharges to Special and/or Impaired Waters the SWPPP amendment shall also meet or exceed the minimum requirements of Section 23 of the permit.

DEWATERING

A dewatering plan has not been included in this SWPPP as designed by the Engineer. If dewatering is required for this project, the Contractor shall prepare and submit to the Engineer a SWPPP amendment. All dewatering shall meet or exceed the minimum requirements of Section 10 of the Permit.

POLLUTION PREVENTION

Products and materials that have the potential to leach pollutants that are stored on the site must be stored in a manner designed to minimize contact with stormwater. Materials that are not a source of potential contamination to stormwater or that are designed for exposure to stormwater are not required to be covered.

Hazardous materials including but not limited to pesticides, fertilizer, petroleum products, curing compounds and toxic waste must be properly stored and protected from stormwater exposure as recommended by the manufacturer in an access restricted area.

Solid waste must be stored, collected and disposed of in compliance with Minnesota Administrative Rules Chapter 7035.

Portable toilets must be positioned so that they are secure and will not be tipped or knocked over. Sanitary waste must be disposed of properly in accordance with Minn. R. CH 7041.

Exterior vehicle or equipment washing on the project site shall be limited to a defined area of the site. No engine degreasing is allowed on site. A sign must be installed adjacent to each washout facility that requires site personnel to utilize the proper facilities for disposal of concrete and other washout wastes.

The Contractor shall prepare and submit a SWPPP amendment detailing the location and BMPs proposed for storage of materials, solid waste, portable toilets, and exterior vehicle or equipment washing on the site. The SWPPP amendment shall include a spill prevention and response plan that is appropriate for the materials proposed to be on the site. The SWPPP amendment shall meet or exceed the minimum requirements of Section 12 of the Permit.

INSPECTION & MAINTENANCE

A trained person shall routinely inspect the entire construction site at the time interval indicated on this sheet of the SWPPP during active construction and within 24-hours after a rainfall event greater than 0.5 inches in 24 hours. Following an inspection that occurs within 24-hours after a rainfall event, the next inspection must be conducted at the time interval indicated in the Receiving Waters Table found on the SITE PLAN AND INFORMATION SHEET of the SWPPP.

All inspections and maintenance conducted during construction must be recorded on the day it is completed and must be retained with the SWPPP. Inspection report forms are available in the Project Specifications. Inspection report forms other than those provided shall be approved by the engineer.

The Contractor may request a change in inspection schedule for the following conditions:

a. Inspections of areas with permanent cover to be reduced to once per month,
b. Inspections of areas that have permanent cover and have had no construction activity for 12 months to be suspended until construction resumes,
c. Inspections of areas where construction is suspended due to frozen ground conditions, inspections to be suspended until the earlier of within 24 hours of runoff occurring, or upon resuming construction.

No change in inspection schedule shall occur until authorized by the Engineer.

Inspections must include:

1. All erosion prevention and sediment control BMPs and Pollution Prevention Management Measures to ensure integrity and effectiveness.
2. Surface waters, including drainage ditches and conveyance systems for evidence of erosion and sediment deposition.
3. Construction site vehicle exit locations, streets and curb and gutter systems within and adjacent to the project for sedimentation from erosion or tracked sediment from vehicles.
4. Infiltration areas to ensure that no sediment from ongoing construction activity is reaching the infiltration area and that equipment is not being driven across the infiltration area.

All non-functioning BMPs and those BMPs where sediment reaches one-half (1/2) of the depth of the BMP, or in the case of sediment basins one-half (1/2) of the storage volume, must be repaired, replaced, or supplemented by the end of the next business day after discovery, or as soon as field conditions allow.

Permittees must repair, replace or supplement all nonfunctional BMPs with functional BMPs by the end of the next business day after discovery, or as soon as field conditions allow.

Any sediment that escapes the site must be removed and the area stabilized within 7 calendar days of discovery unless precluded by legal, regulatory, or physical access in which case the work shall be completed within 7 calendar days of authorization. Paved surfaces such as streets shall have any escaped or tracked sediment removed by the end of the day that it is discovered. Sediment release, other than paved surfaces that can be cleaned up with street sweeping shall be reported immediately upon discovery to the Engineer.

PUBLIC WATER RESTRICTIONS:

For public waters that have been promulgated "work in water restrictions" during fish spawning time frames, all exposed soil areas that are within 200 feet of the water's edge, and drain to these waters must complete stabilization within 24-hours during the time period. MN DNR permits are not valid for work in waters that are designated as infested waters unless accompanied by an Infested Waters Permit or written notification has been obtained from MN DNR stating that such permit is not required. There is no exception for pre-existing permits. If a MN DNR Permit has been issued for the project and the water is later designated as infested, the Contractor shall halt all work covered by the MN DNR Permit until an Infested Waters Permit is obtained or that written notification is obtained stating that such permit is not required.

FINAL STABILIZATION

Final Stabilization is not complete until all the following requirements have been met:

1. Substantial Completion has been reached and no ground disturbing activities are anticipated.
2. Permanent cover has been installed with an established minimum uniform perennial vegetation density of 70 percent of its expected final growth. Vegetation is not required in areas where no vegetation is proposed by this project such as impervious surfaces or the base of a sand filter.
3. Accumulated sediment has been removed from all permanent stormwater treatment systems as necessary to ensure the system is operating as designed.
4. All sediment has been removed from conveyance systems
5. All temporary synthetic erosion prevention and sediment control BMPs have been removed. BMPs designated on the SWPPP to remain to decompose on-site may remain.
6. For residential construction only, permit coverage terminates on individual lots if the structures are finished and temporary erosion prevention and downgradient perimeter control is complete, the residence sells to the homeowner, and the permittee distributes the MPCA's "Homeowner Fact Sheet" to the homeowner.
7. For agricultural land only (e.g., pipelines across cropland), the disturbed land must be returned to its preconstruction agricultural use prior to submitting the NOT.

SITE STABILIZATION COMPLETION:

Stabilization of exposed soils shall begin immediately and shall be completed after the construction activity has temporarily or permanently ceased no later than:	14 calendar days

SITE INSPECTION INTERVAL:

A trained person shall routinely inspect the entire construction site during active construction at an interval of no more than:	7 calendar days

SPECIAL ENVIRONMENTAL CONSIDERATIONS AND PERMITS:

1)	Was an environmental review required for this project or any part of a common plan of development or sale that includes all or any portion of this project?	NO
2)	Does any portion of the site have the potential to affect threatened or endangered species or their critical habitat?	NO
3)	Does any portion of this site discharge to a Calcareous fen.	NO
4)	Will any portion of the site potentially affect properties listed on the National Register of Historic Places or a known or discovered archeological site?	NO
5)	Have any Karst features have been identified in the project vicinity?	NO
6)	Is compliance with temporary or permanent stormwater management design requirements infeasible for this project?	NO
7)	Has the MN DNR promulgated "work in water restrictions" for any Public Water this site disharges to during fish spawning?	NO

SWPPP DESIGNER TRAINING DOCUMENTATION:

UNIVERSITY OF MINNESOTA

Wesley Cordes

Design of Construction SWPPP (May 31 2028)

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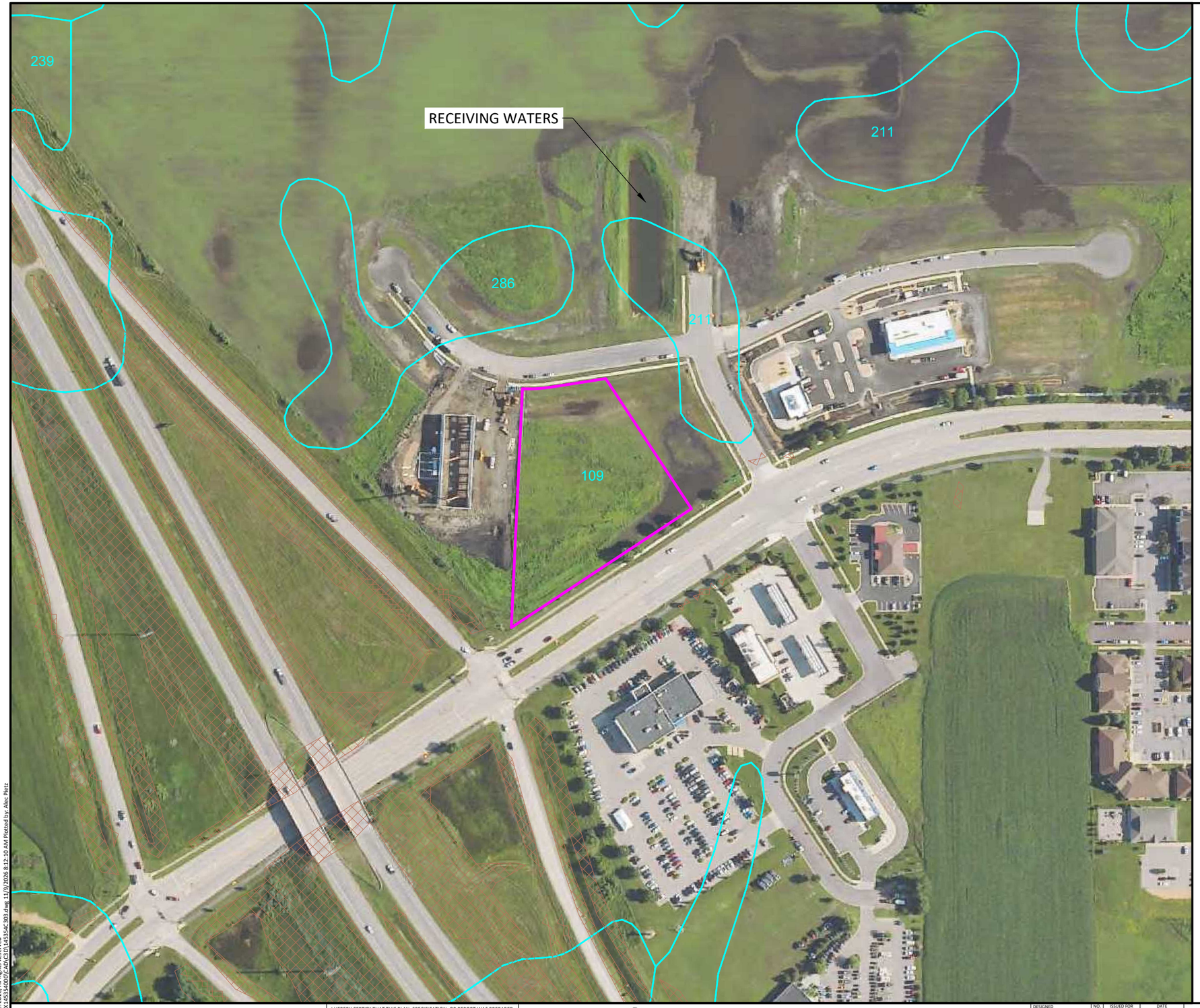
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TOLD DEVELOPMENT COMPANY
MANKATO TEXAS ROADHOUSE
STORMWATER POLLUTION PREVENTION PLAN
NARRATIVE

SHEET C3.02



LEGEND

- PROJECT BOUNDARY
- SOIL TYPE
- STEEP SLOPES (>33.3%)

N

0 100 200
SCALE FEET

SOIL TYPE SUMMARY

Map Unit Symbol	Soil Name	Hyd. Soil Group	Erodibility
109	CORDOVA CLAY LOAM	C/D	NHEL
211	LURA SILTY CLAY	C/D	NHEL
286	SHOREWOOD SILTY CLAY LOAM, 1 TO 6 PERCENT SLOPES	C/D	NHEL

NHEL - Not Highly Erodible Land

PHEL - Potentially Highly Erodible Land

HEL - Highly Erodible Land

LOCATION OF SWPPP REQUIREMENTS IN PROJECT PLAN

DESCRIPTION	SHEET NO.
SITE MAP	C3.01
NARRATIVE & NOTES	C3.01 - C3.02
SOILS	C3.03
EROSION & SEDIMENT CONTROL DETAILS	C3.04 - C3.05
DIRECTION OF FLOW	C3.06
FINAL STABILIZATION	C3.06

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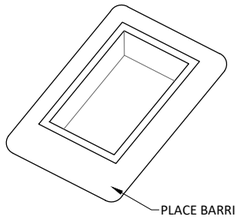
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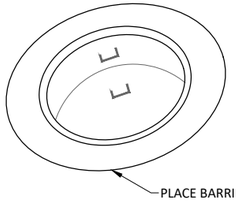
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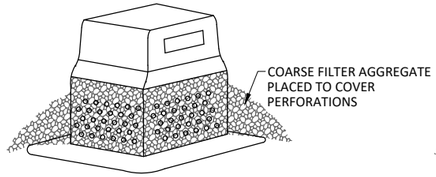
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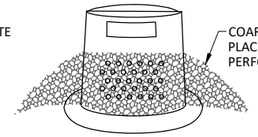
TOLD DEVELOPMENT COMPANY
MANKATO TEXAS ROADHOUSE
STORMWATER POLLUTION PREVENTION PLAN
SITE & SOILS MAP

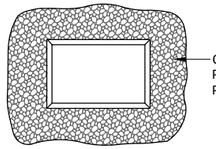
SHEET C3.03

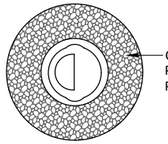






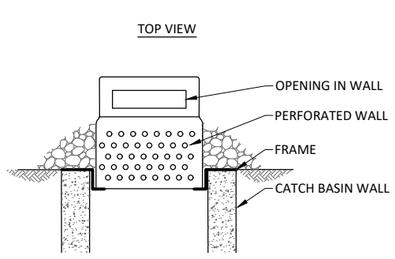


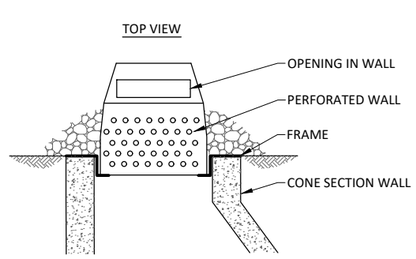




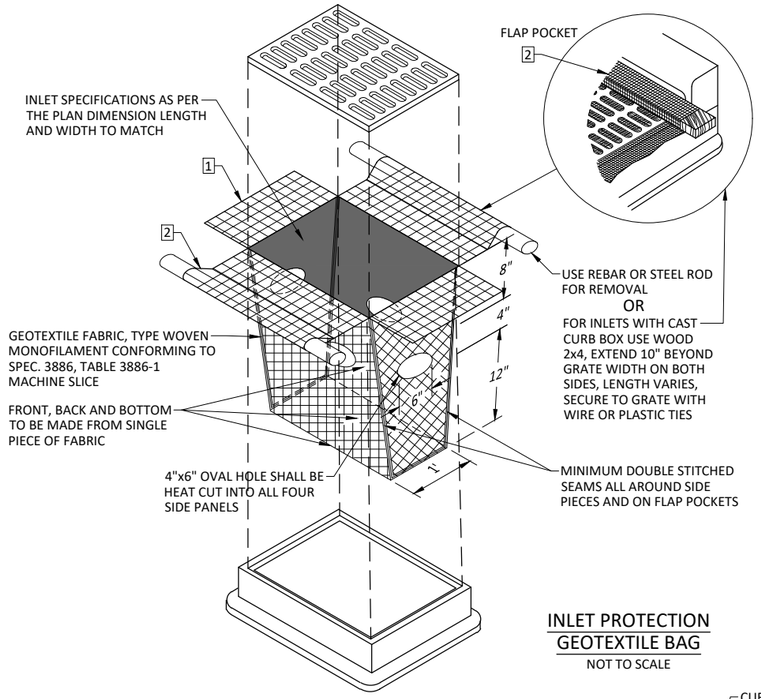
TOP VIEW

TOP VIEW





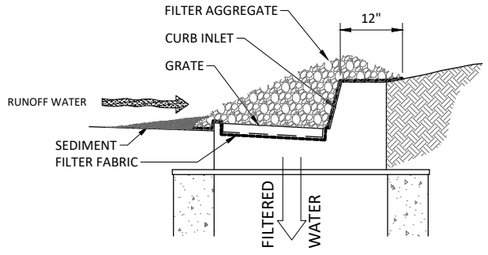
INLET PROTECTION
PERFORATED WALL
NOT TO SCALE



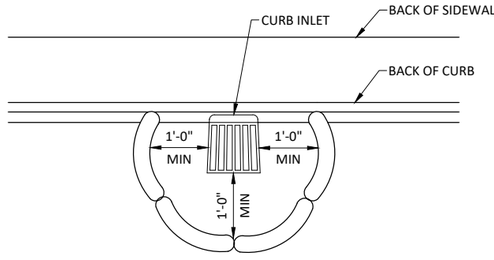
INLET PROTECTION
GEOTEXTILE BAG
NOT TO SCALE

NOTES:

1. FILTER AGGREGATE TO BE 1 TO 2 INCH CLEAN ROCK
2. FILTER FABRIC SHALL MEET MnDOT SPECIFICATION 3733 GEOTEXTILE FABRIC TYPE 3



INLET PROTECTION
FILTER AGGREGATE
NOT TO SCALE

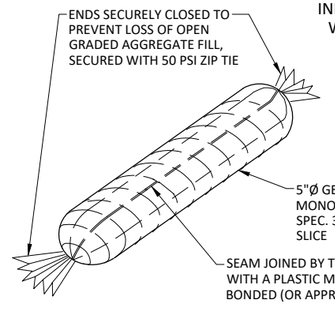


NOTE:
THIS INLET PROTECTION IS USED DURING ROUGH GRADING ONLY, USE BEFORE ROAD IS OPEN TO TRAFFIC OR IS PAVED

FILL ROCK LOG WITH 45 LBS. OF OPEN GRADED AGGREGATE CONSISTING OF SOUND, DURABLE PARTICLES OF CRUSHED QUARRY ROCK OR GRAVEL CONFORMING TO THE FOLLOWING GRADATION.

GRADATION	
SIEVE SIZE	PERCENT PASSING
1 1/2"	100
1"	95-100
3/4"	65-95
3/8"	30-65
NO 4	10-35
NO 10	3-20
NO 40	0-8
NO 200	0-3

NOTE:
CRUSHED CONCRETE OR BITUMINOUS SHALL NOT BE USED FOR OPEN GRADED AGGREGATE.



INLET PROTECTION
ROCK BAG
NOT TO SCALE

NOTES:

1 INLET PROTECTION DEVICES SHALL BE MAINTAINED OR REPLACED AT THE DIRECTION OF THE ENGINEER. MANUFACTURED ALTERNATIVES APPROVED AND LISTED ON THE DEPARTMENTS EROSION CONTROL PRODUCT ACCEPTABILITY LIST MAY BE SUBSTITUTED. WHEN REMOVING OR MAINTAINING INLET PROTECTION, CARE SHALL BE TAKEN SO THAT THE SEDIMENT TRAPPED ON THE GEOTEXTILE FABRIC DOES NOT FALL IN THE INLET. ANY MATERIAL FALLING INTO THE INLET SHALL BE REMOVED IMMEDIATELY.

2 FINISHED SIZE, INCLUDING POCKETS WHERE REQUIRED, SHALL EXTEND A MINIMUM OF 10" AROUND THE PERIMETER TO FACILITATE MAINTENANCE OR REMOVAL.

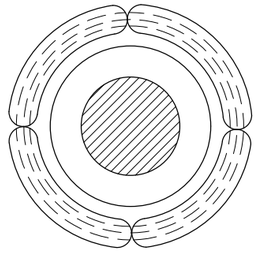
FLAP POCKETS SHALL BE LARGE ENOUGH TO ACCEPT WOOD 2x4.

INSTALLATION NOTES:
DO NOT INSTALL PROTECTION IN INLETS SHALLOWER THAN 30", MEASURED FROM THE BOTTOM OF THE INLET TO THE TOP OF THE GRATE.

TRIM EXCESS FABRIC IN THE FLOW LINE TO WITHIN 3" OF THE GRATE.

THE INSTALLED BAG SHALL HAVE A MINIMUM SIDE CLEARANCE, BETWEEN THE INLET AND THE BAG, MEASURED AT THE BOTTOM OF THE OVERFLOW HOLES, OF 3". WHERE NECESSARY THE CONTRACTOR SHALL CLINCH THE BAG, USING PLASTIC ZIP TIES, TO ACHIEVE THE 3" CLEARANCE. THE TIES SHALL BE PLACED AT A MAXIMUM OF 4" FROM THE BOTTOM OF THE BAG.

PAYMENT SHALL INCLUDE ALL MATERIALS, FILLING OF LOG, PLACEMENT, MAINTENANCE & REMOVAL;
80% OF BID PRICE SHALL BE PAID UPON PROPER PLACEMENT WITH THE FINAL 20% PAID UPON REMOVAL



INLET PROTECTION
WITH ROCK LOG

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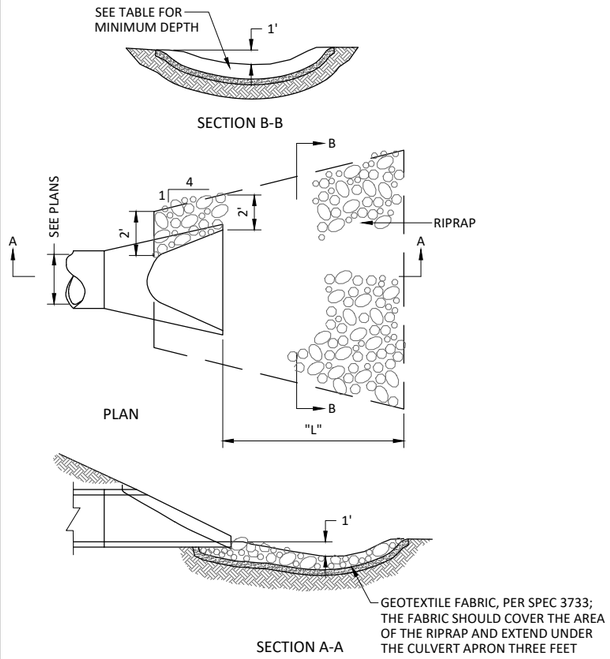
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STORMWATER POLLUTION PREVENTION PLAN
BEST MANAGEMENT PRACTICE DETAILS

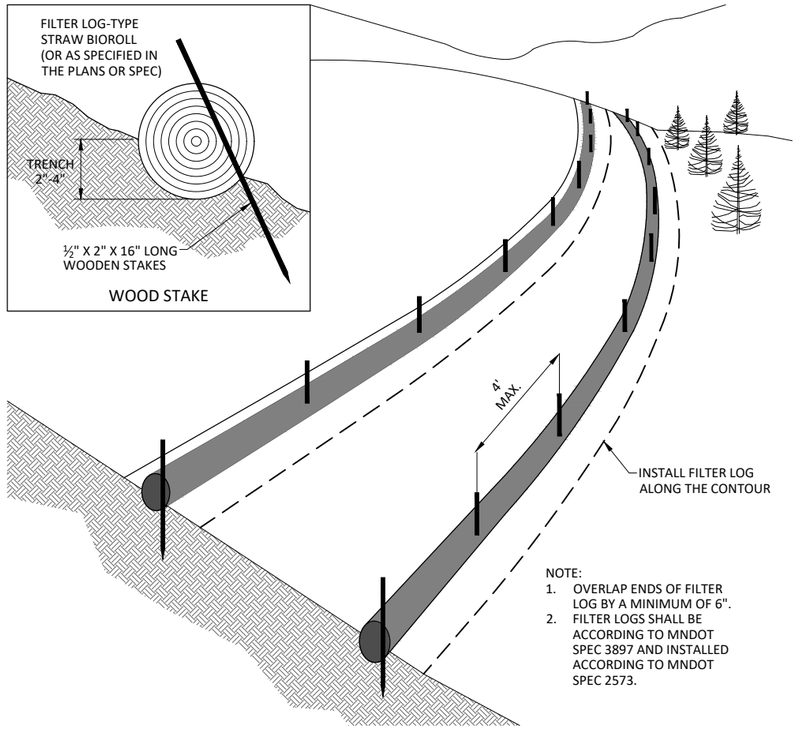
SHEET
C3.04



		CLASS II d50=6"	CLASS III d50=9"	CLASS IV d50=12"
ROUND PIPE DIA (IN)	L (FT)	12" DEPTH RIPRAP (CU YD)	18" DEPTH RIPRAP (CU YD)	24" DEPTH RIPRAP (CU YD)
12	8	5	8	10
15	8	5	8	10
18	10	6	10	15
21	10	8	15	15
24	12	10	15	20
27	12	10	15	20
30	14	15	20	25
36	16	18	25	30
42	18	20	30	40
48	20	20	40	50

RIPRAP AT RCP CULVERT END

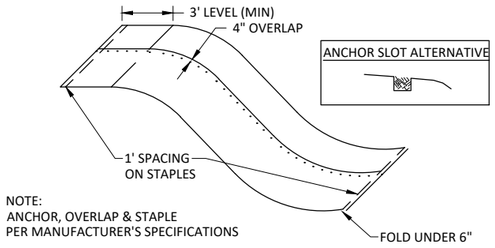
NOT TO SCALE



NOTE:
1. OVERLAP ENDS OF FILTER LOG BY A MINIMUM OF 6".
2. FILTER LOGS SHALL BE ACCORDING TO MNDOT SPEC 3897 AND INSTALLED ACCORDING TO MNDOT SPEC 2573.

PERIMETER PROTECTION-FILTER LOG

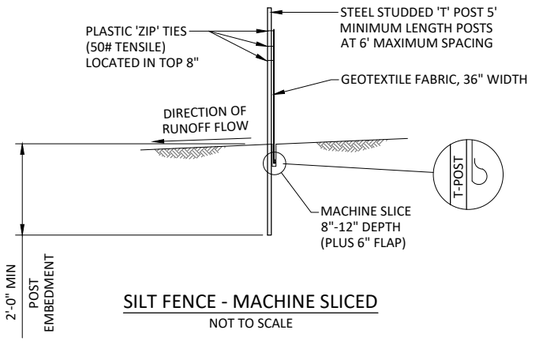
NOT TO SCALE



NOTE:
ANCHOR, OVERLAP & STAPLE PER MANUFACTURER'S SPECIFICATIONS

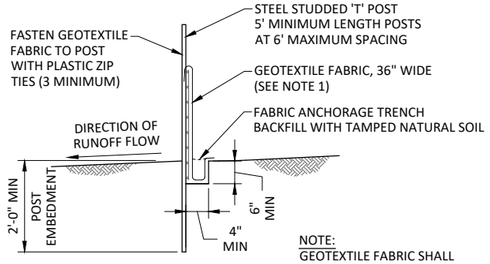
EROSION CONTROL BLANKET INSTALLATION

NOT TO SCALE



SILT FENCE - MACHINE SLICED

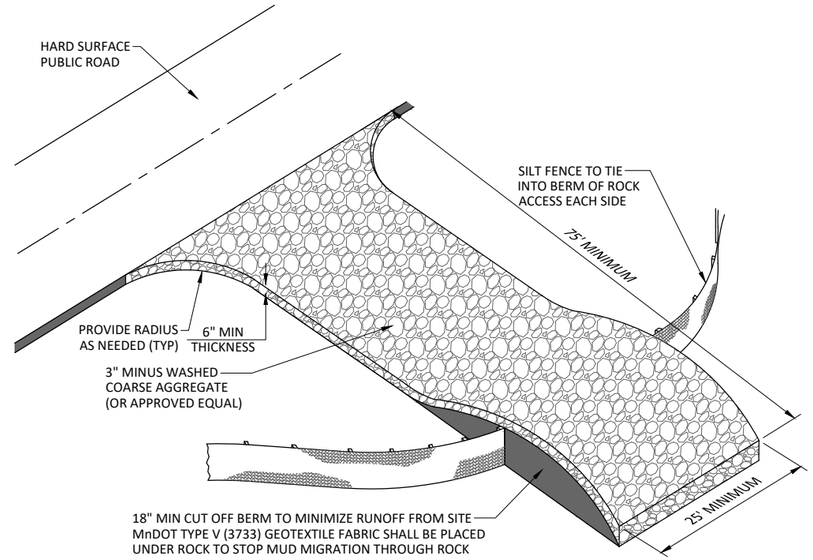
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NOTE:
GEOTEXTILE FABRIC SHALL BE PER MnDOT SPEC 3886

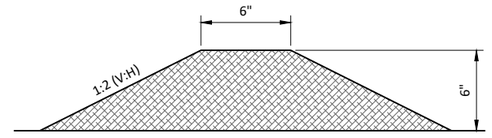
SILT FENCE - HEAVY DUTY

NOT TO SCALE

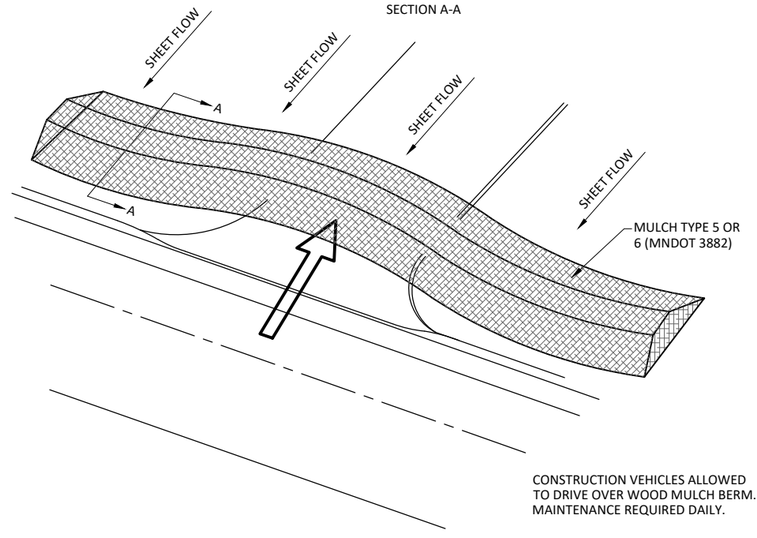


ROCK CONSTRUCTION ENTRANCE

NOT TO SCALE



SECTION A-A



PERIMETER PROTECTION-WOOD MULCH BERM

NOT TO SCALE

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MANKATO TEXAS ROADHOUSE
STORMWATER POLLUTION PREVENTION PLAN
BEST MANAGEMENT PRACTICE DETAILS

SHEET C3.05



NOTES:

1. ALL NECESSARY BMP'S SHALL BE IN PLACE PRIOR TO THE START OF CONSTRUCTION. ALL BMP'S SHALL BE INSPECTED EVERY 7 DAYS AND WITHIN 72 HOURS AFTER A RAINFALL EVENT GREATER THAN 0.5 INCHES IN A 24 HOUR PERIOD. ALL NON FUNCTIONING BMP'S SHALL BE REPAIRED OR REPLACED WITHIN 24 HOURS OF DISCOVERY.
2. ALL STORM SEWER INLETS SHALL HAVE INLET PROTECTION IN PLACE AS NEEDED UNTIL DISTURBED TURF IS STABILIZED.
3. ALL PERIMETER CONTROL IS TO BE REMOVED UPON ESTABLISHED TURF RESTORATION.
4. CONTRACTOR TO COORDINATE THE REMOVAL AND REPLACEMENT OF TEMPORARY ROCK CONSTRUCTION EXITS DURING CONSTRUCTION.

EROSION CONTROL LEGEND

- EXISTING/PROPOSED DRAINAGE FLOW
- PERIMETER CONTROL
- STORM DRAIN INLET PROTECTION
- STABILIZED CONSTRUCTION EXIT
- TURF GRASS MIX, FERTILIZER, AND MULCH

HORZ. SCALE 0 30 60 FEET

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MANKATO TEXAS ROADHOUSE
STORMWATER POLLUTION PREVENTION PLAN
EROSION & SEDIMENT CONTROL PLAN

SHEET C3.06

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Stormwater Management Memorandum

Date: October 15, 2026

To: Cory Bienfang, P.E. – City of Mankato

From: Alec Pietz, P.E. – Land Development Project Manager

Subject: Texas Roadhouse
BMI Project No.: 26X.145354

I. Project Introduction

This memorandum provides a summary and analysis of the existing and proposed hydrology for the proposed Mankato Texas Roadhouse within Victory Commercial Park in Mankato, Minnesota. The proposed project consists of a building, parking and pavement construction, site grading, utilities, and drainage improvements. The site is currently vacant and zoned for commercial use. A regional stormwater basin from the Victory Commercial Park – Phase 1 project will accommodate the impervious area of this project. The SCS TR-20 hydrology method was utilized in Autodesk Storm and Sanitary Analysis (SSA) for the project. NOAA Atlas 14 rainfalls for Blue Earth County, Minnesota and MSE 3 distribution curves were used to develop rainfall events. The 2-yr (2.87”), 10-yr (4.29”), and 100-yr (7.20”) events are reported for relevant data in this report.

II. Site Hydrology Design Criteria

The site, prior to establishment of the Victory Commercial Park Subdivision, existed as active farmland. The existing hydrology of the area can be reviewed in the Subdivision Drainage Report that was approved with the prior project. The Subdivision established stormwater management and storm sewer routing that applies to this property. Therefore, the existing basin north of the project accommodates the peak flow and water quality needs.

As shown on the Stormwater Management Plan Overview in the Victory Commercial Park Drainage Report, the site resides as a portion of Drainage Area E and has an assumed impervious area of 85%. Based on this, the development complies with the Subdivision drainage plan if proposed impervious area is at or under 85%.

III. Proposed Site Hydrology

The Proposed Drainage Area Map shows two catchments delineated by the corresponding drainage areas to the two storm sewer stubs for the properties. While the remaining parcel is currently shown to be empty, the curve number correlates to a similar impervious percentage of the Texas Roadhouse parcel (79.5%). The future development is anticipated to drain to a portion of the proposed catch basins of the “East Stub” storm sewer along with any necessary additional catch basins which also route to that stub.

Bolton & Menk is an equal opportunity employer.

Proposed peak flow rates of the two catchments for the design storms were determined in SSA to be:

Proposed Condition Peak Flow Rates (cfs)			
Location	**2-yr**	**10-yr**	**100-yr**
Western Stub	3.98	6.35	11.13
Eastern Stub	7.07	11.26	19.68
Total	**11.05**	**17.61**	**30.81**

As previously mentioned, the maximum impervious area for the parcels is 85% while the Texas Roadhouse project has 79.5% coverage. At the time of development, the remaining parcel will be required to show no more than 85% impervious area.

Please feel free to contact Alec Pietz, P.E. with any questions or comments at Alec.Pietz@bolton-menk.com or 507-766-3283.

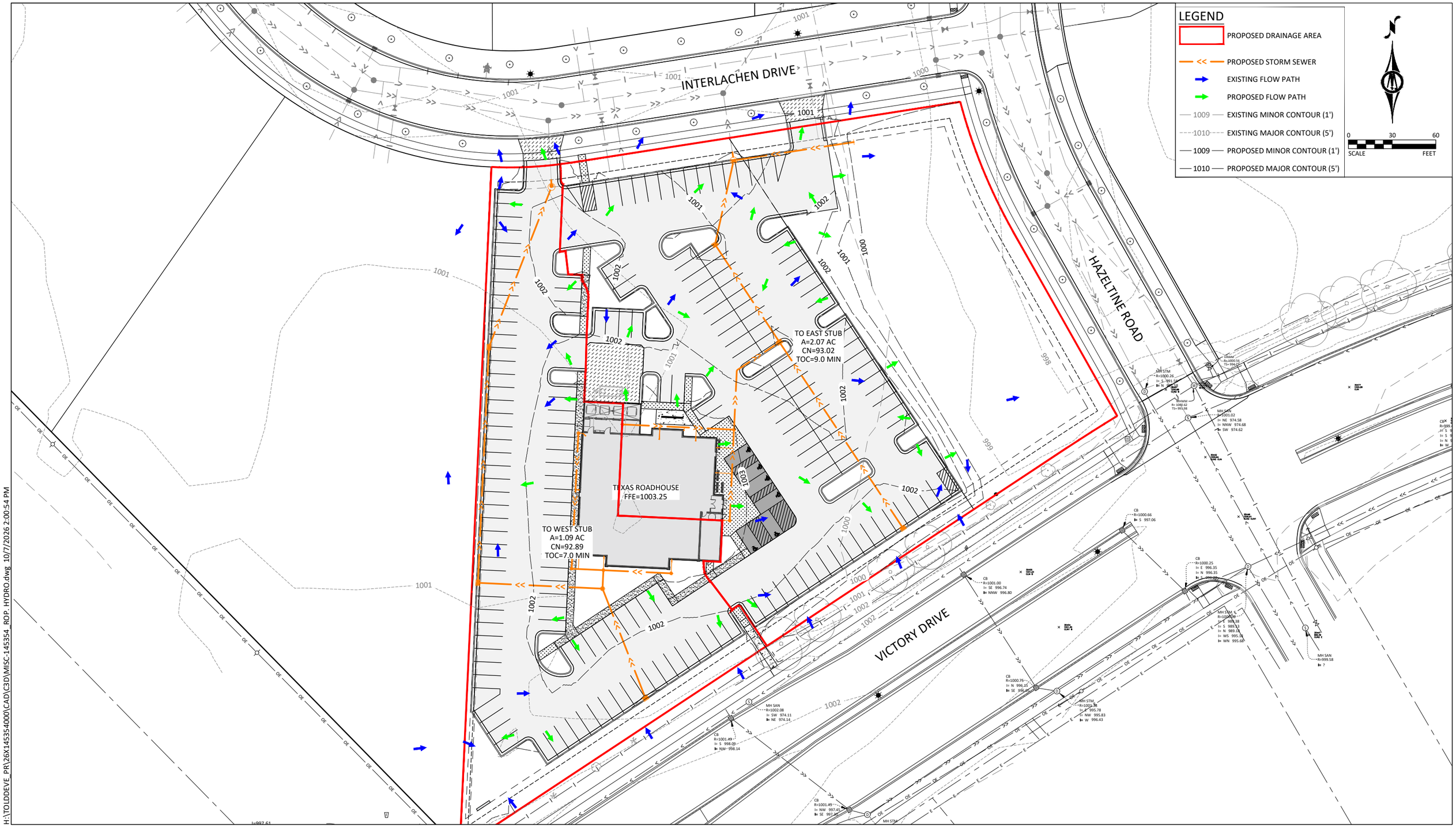
MANKATO TEXAS ROADHOUSE

TOLD DEVELOPMENT COMPANY

FIGURE 1: PROPOSED DRAINAGE AREA MAP

OCTOBER 2026

BOLTON & MENK



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Victory Commercial Park

Drainage Report

Victory Commercial Development, LLC

September 26, 2023

UPDATED 2-7-2024

Submitted by:
Bolton & Menk, Inc.
1960 Premier Drive
Mankato, MN 56001-5900
P: 507-625-4171
F: 507-625-4177

BOLTON & MENK

Real People. Real Solutions.

Certification

Drainage Report

For

Victory Commercial Park

Victory Commercial Development, LLC
Mankato, MN
0M1.127884

September 26, 2023

PROFESSIONAL ENGINEER
I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision, and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Signature: 
Typed or Printed Name: Alec Pietz, P.E.
Date: 09/26/2023 *License Number:* 59617

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I. INTRODUCTION

Victory Commercial Park consists of phased construction of public roadways providing access to a mix of commercial sites, multi-family housing, and single family residential. The first phase of construction includes the extension of Hazeltine Road and Birkdale Drive to their intersection point and approximately 600-feet of a new roadway named Interlachen Drive. This report is a comprehensive study of the whole subdivision.

The site is bounded by N Victory Drive to the south, MN State Highway 60/Interstate 14 to the west, existing housing along Torrey Pines Drive to the north, and existing commercial properties to the east. The purpose of this report is to describe in detail the proposed stormwater management design for the public improvements, which includes two stormwater ponds.

II. ANALYSIS

To understand the drainage conditions of the project area and guide the proposed stormwater management design, a hydrologic and hydraulic model was developed using Autodesk's Storm & Sanitary Analysis (SSA). SSA uses the Soil Conservation Service (SCS) Technical Release (TR-20) methodology to route watershed runoff through the system using a rainfall hydrograph. NOAA Atlas 14 rainfall depths were used along with the NRCS's MSE 3, 24-hour rainfall distribution. The rainfall depths used for the 2, 10, and 100-Year rainfall events were 2.87", 4.28" and 7.20", respectively. Time of concentrations were calculated using the NRCS's TR-55 methodology. Drainage areas were delineated using a combination of LiDAR data and survey data where available. Soil types within the project area are dominated by clay loams characterized by the hydrological soil group type D.

The Stormwater Study Area figure presented in Appendix A shows the full extent of the hydrologic and hydraulic model that was developed. This area has known stormwater design challenges due to flat topography and a large drainage area being served by a relatively small outlet pipe. Additionally, the area has very flat and submerged storm sewer mainlines that connect the stormwater ponds causing the ponds to rise and fall concurrently. These conditions mean that there is a tailwater effect which needs to be considered when the proposed design connects into the existing storm sewer stubs provided for the property. The sensitivity of the existing storm sewer system in this area necessitated a large study area to ensure that the proposed storm sewer and ponds are adequately sized and finished floor elevations are sufficiently high. See *Stormwater Study Area* figure in Appendix A for more detail.

III. EXISTING CONDITIONS

Currently, the project area consists entirely of straight-row cropland. Most of the runoff generated from the site sits in low points in the farmland and leaves via draintile or overland flow to the northeast towards Country Club Estates, south to N Victory Drive and Hazeltine Road, or west towards State Highway 60. Two storm sewer stubs exist along N Victory Drive that will be utilized in the project which ultimately outlet to the R & R Detention Basin. There is also one stub along Birkdale Drive that will be utilized and has an ultimate outlet to the ponds located in Country Club Park. When the existing storm sewer stubs were constructed, the parcels contained within the proposed project limits were assessed. The stubs were constructed for the purpose of serving future development of these parcels. See *Existing Site Drainage Area Map* in Appendix A for more detail.

IV. PROPOSED STORMWATER MANAGEMENT PLAN OVERVIEW

Appendix A also includes a summarized overview figure of the Stormwater Management Plan, illustrating the project's overall routing, major drainage areas, and two proposed public ponds. The figure highlights land use assumptions and calls out which lots will require their own separate stormwater best management practices (BMPs) to satisfy City and State stormwater treatment requirements. With the property having three separate owners, the overall stormwater management design represents an agreement of interests. See *Stormwater Management Plan Overview* figure in Appendix A for more detail.

V. PROPOSED DESIGN

The proposed stormwater management system has been designed to meet the MPCA's NPDES Construction Stormwater Permit requirements and the City of Mankato Grading Manual design standards. It utilizes existing storm sewer stubs on Victory Drive and Birkdale Drive as outlets and does not assume that existing downstream stormwater BMPs have additional water quality volume credit that can be taken advantage of. Along with the necessary catch basins and storm sewer, the proposed stormwater management system will consist of two wet sedimentation basins that will serve the public improvements which will also serve some of the private developments. The public system has two primary outfalls. The first is the existing 30" storm sewer located at the intersection of Hazeltine Road and N Victory Drive—and the second is the existing 42" storm sewer located along Birkdale Drive. See *Proposed Site Drainage Area Map* in Appendix A for more detail.

A. Water Quality Requirements

To fulfill the more stringent water quality requirements outlined in City of Mankato Grading Manual Sec. 3.2.4.2.b., the proposed project's permanent stormwater treatment basins have been designed to meet the requirement of 1.1" of runoff over the new impervious surfaces. This exceeds the 1" requirement of the MPCA NPDES Construction Stormwater Permit. The proposed public ponds have been designed to accommodate some private drainage as well. For the private areas accounted for in this design, a standard assumption of 85% impervious area was made for the commercially developed and multi-family lots, and 38% impervious for the planned 1/4-acre housing area.

B. Storm Sewer & Catch Basin Design

Storm sewer and catch basins were designed based on the guidance provided in the City of Mankato Grading Manual. Storm sewer has been sized to accommodate the 10-year rainfall event and flow from the storm sewer stubs provided for the private lots. All inlets have been designed per Grading Manual Sec. 3.2.3.2.a, in which a single 12-foot driving lane must be maintained free from inundation for every two driving lanes on a roadway for the 10-year rainfall event. Additionally, the 2-Year 24-hour storm with frozen ground was analyzed to be sure the design still provided adequate performance during spring snowmelt conditions.

C. Wet Sedimentation Basins

Two wet sedimentation basins have been designed as part of the project. The first, denoted as "Pond A" within the plans, serves drainage area A and is located in the northeast corner of the site. It serves a portion of the proposed and future roadway, residential development, two-thirds of the multi-family housing north of Birkdale Drive, as well as half of the proposed commercial area south of Birkdale and a portion of commercial development west of Interlachen Drive. Drainage area C will contain on-site stormwater management to account for water quality volume and to mitigate peak flows to the Birkdale Drive

connection point.

Denoted as "Pond B" within the plans, the second basin will serve drainage areas D and E. This area includes the commercial site immediately adjacent to the basin and situated between all three named roadways in the project, the southwestern lots on the site, along with the remaining public roads that are not served by Pond A. Both basins specified are designed per the MPCA NPDES Construction Stormwater Permit and the City of Mankato Grading Manual. The pond outlet control structures were designed to be skimming so that floatables such as oil and trash will be trapped within the pond. The existing downstream storm sewer system along Birkdale and St. Andrews Drive has a significant tailwater effect backing water up any storm sewer that would be connected into it. As a result of this, Pond A was designed with a 30" storm sewer outlet pipe designed to accommodate water backing up though it, thereby lowering the hydraulic grade line along Birkdale Drive. Modeling shows this 30" outlet pipe has a velocity of 3.5 feet per second during the 10-year rainfall event, which meets the MnDOT Drainage Manual recommendations for self-cleaning. The proposed stormwater ponds have been designed to provide enough storage to not cause an increase in high-water levels (HWLs) in the existing downstream stormwater ponds for the 100-Year rainfall event.

Drainage areas B and F will require on-site stormwater management and will connect to adjacent existing storm sewers. Area B will discharge west to Highways 14/60 with connection to a 48-inch storm sewer and area F will discharge south to Victory Drive with connection to a 30-inch storm sewer. These stormwater management for these areas will be required to accommodate all proposed impervious area and enough storage to mitigate peak flows to not exceed connected pipe capacities for their design storm event.

D. Water Quality Provided

The table below summarizes the water quality information for each stormwater pond for a full build-out condition. Detailed information for each can be found in Appendix B.

Table 1 – Water Quality Summary				
BASIN	**IMPERVIOUS AREA (AC)**	**NWL (ft)**	**WQ ELEVATION (ft)**	**WQ VOLUME (ac-ft)**
Pond A	23.4	991.0	992.5	2.15
Pond B	13.0	993.0	995.9	1.51
			TOTAL WQ Prov.	3.66
			TOTAL WQ Req.	3.35

VI. MODEL RESULTS

Table 2 summarizes the pre- and post-construction HWLs of the existing Country Club Park Pond that is downstream of the proposed Birkdale Drive storm sewer system.

Table 2 – HWL of Existing Country Club Park Basin			
	2-YEAR (2.81")	**10-YEAR (4.19")**	**100-YEAR (7.47")**
Existing (ft)	991.0	993.0	996.6
Proposed (ft)	991.3	993.3	996.6
Difference (ft)	+0.3	+0.3	+0.0

Table 3 below summarizes changes in the HWL of the existing R & R basin located south of the project area.

Table 3 – HWL of Existing R & R Basin			
	2-YEAR (2.81")	10-YEAR (4.19")	100-YEAR (7.47")
Existing	991.4	993.7	994.9
Proposed	991.5	993.7	994.5
Difference	+0.1	+0.0	-0.4

There are two proposed private developments that will require their own stormwater management ponds, but which designs have not been provided to Bolton & Menk. In the modeling, watersheds in these areas were connected directly into the proposed stubs for each lot. To simulate developed conditions for these lots including their ponds, the times of concentrations were increased to reduce peak flow rates to values that could pass through the stubs under surcharged conditions. Modeling this scenario was a conservative way to account for the storage not added in which would have lowered hydraulic grade lines and make sure pipes were not excessively oversized. When each of these private lots develop, they will have to model their sites to ensure their designs do not exceed what was planned here or cause a negative downstream effect.

Existing conditions modeling of the site represents row crop agricultural land with no water entering the 42" stub on Birkdale Drive and only a 12" farm tile connecting into the 30" stub on Victory Properties. The stubs and downstream storm sewer systems, including the existing ponds, would have been initially sized and designed to ensure that they could accommodate at least their full pipe capacity. Existing conditions model results presented in this report are with little to no flows from the stubs and are less than what the designed high-water levels would have been when the existing storm sewer systems were installed. Therefore, when connecting the proposed Victory Commercial Park development to the existing storm sewer system some increase in the existing high-water levels should be expected. The proposed stormwater ponds have been designed to mitigate any negative impacts to the downstream systems by matching or reducing high-water levels for large rainfall events. Model results show that the proposed design matches or reduces high-water levels in the existing downstream ponds for the 100-year rainfall event. While the modeling shows slight increases in these downstream ponds' elevations for the 2-year and 10-year events, these increases are well within the confidence interval of the models.

VII. SUMMARY

Victory Commercial Park is aimed at bringing multiple land uses to a previously undeveloped location in Mankato. The proposed storm system highlighted in this report has been designed to properly manage the stormwater runoff that the developed site will produce while minimizing any down-stream effects on the surrounding storm systems already in place. Its design meets MPCA NPDES Construction Stormwater Permit and the City of Mankato Grading Manual requirements.

This report is being provided along with the proposed construction plans for the project. Please refer to the plans for additional design details.

Please feel free to contact me with any questions or comments about this report at Alec.Pietz@Bolton-Menk.com or by phone at (507) 625-4171, x3310.

Appendix A: Figures

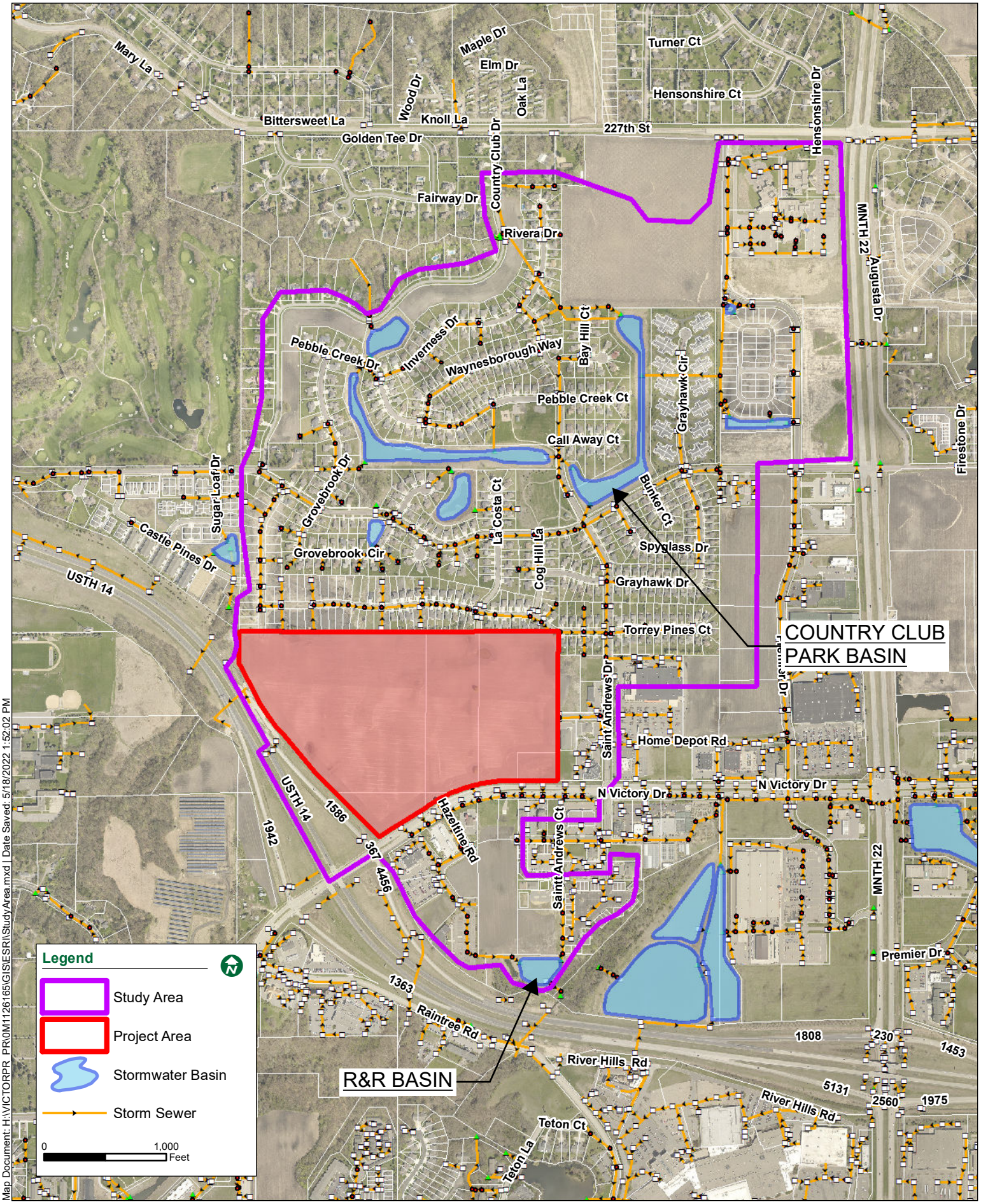
Victory Properties Development

Victory Properties

Stormwater Study Area

September 2023

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Map Document: H:\VICTORPR_PR\0M1126165\GIS\ESRI\StudyArea.mxd | Date Saved: 5/18/2022 1:52:02 PM

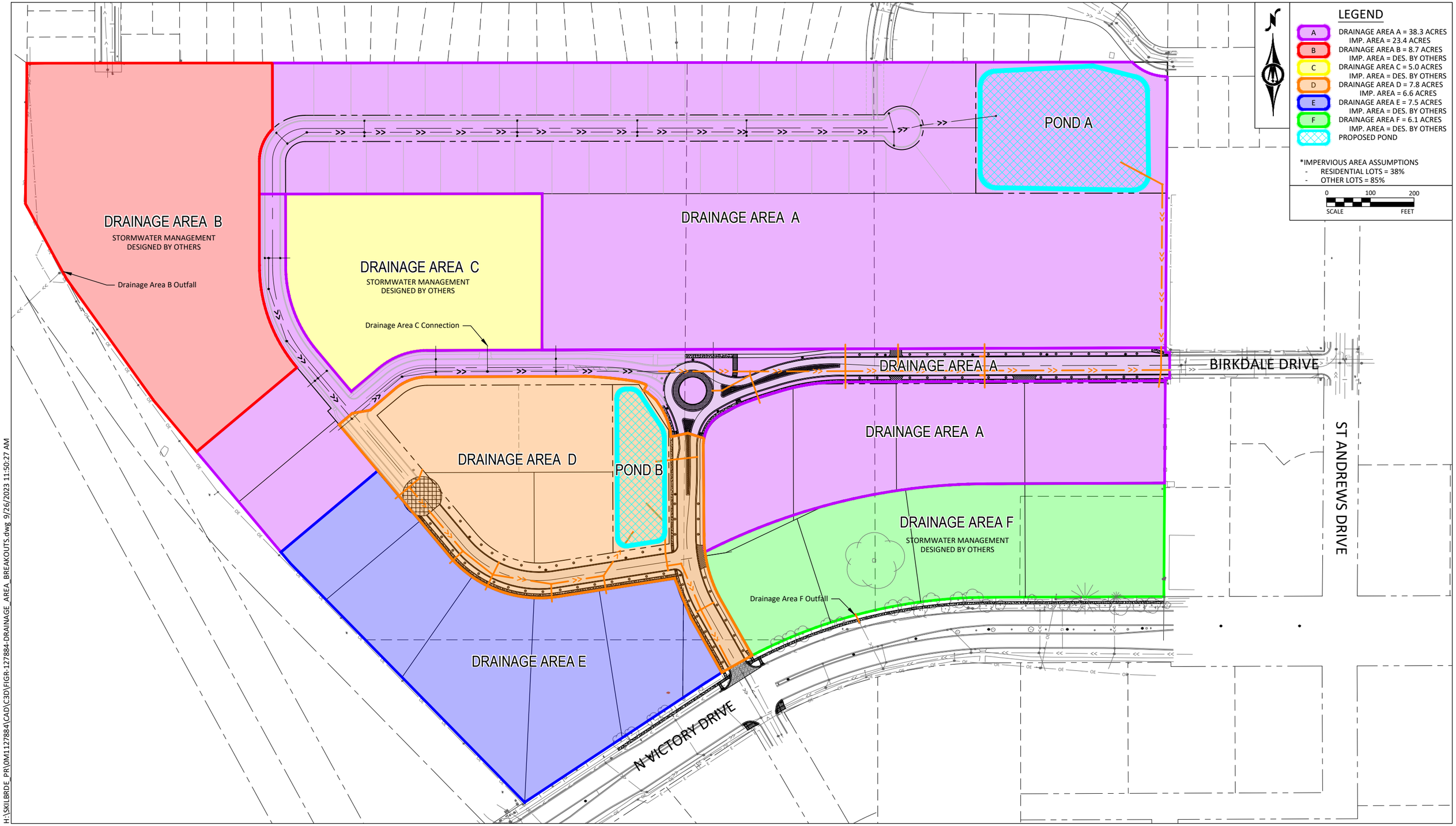
VICTORY COMMERCIAL PARK

MANKATO, MINNESOTA

STORMWATER MANAGEMENT PLAN OVERVIEW

September 2023

BOLTON & MENK



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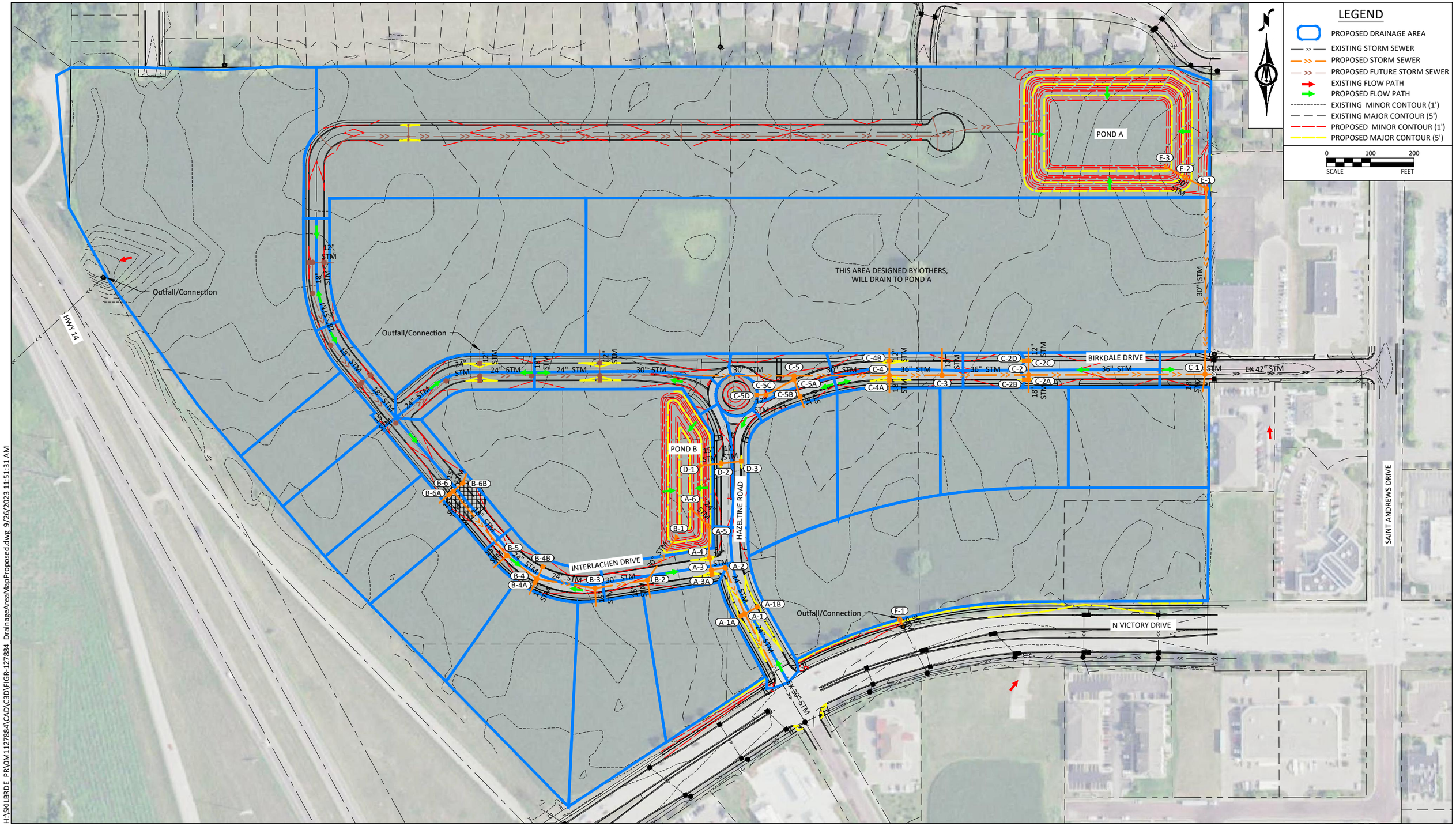
Victory Commercial Park

Mankato, MN

Proposed Site Drainage Area Map

September 2023

BOLTON & MENK

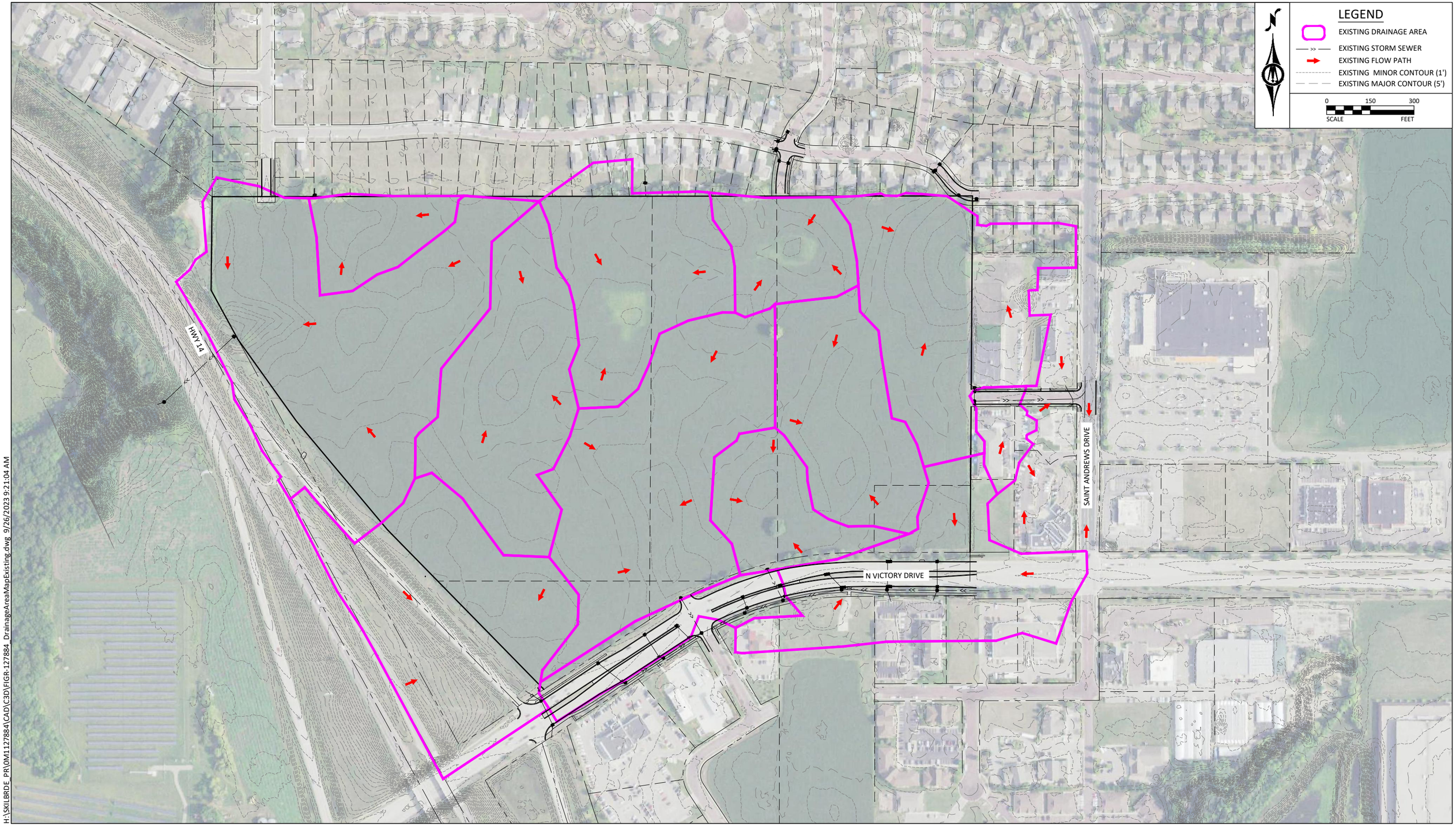


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Victory Commercial Park
Mankato, MN

Existing Site Drainage Area Map
September 2023

BOLTON & MENK



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Appendix B: Water Quality Spreadsheets & Subbasin Table

POND A - DESIGN

Area Flowing to Proposed Basin	38.40	acres
Newly constructed impervious area =	23.40	acres
Required Water Quality Volume (WQV)=	**2.15**	**ac-ft**
Designed WQV =	**2.15**	**ac-ft**
(See WQV Note at bottom)		
Water surface elevation at WQV bounce =	992.52	ft
Surface area at WQV bounce =	1.51	ac
Allowable Water Quality Release Rate =	**8.53**	cfs
Designed Water Quality Release Rate at elev 992.52	**8.53**	cfs
(From hydraulic modeling)		
Required Volume Below Outlet (dead storage) =	**1.59**	ac-ft
(1800 CF Per Acre of Drainage Area)		
Required Volume Below Outlet (dead storage) =	**2.15**	ac-ft
(1.1" Over New Impervious Area)		
Designed Volume Below Outlet (dead storage) =	**4.37**	ac-ft

Controls

	ELEV. (FT)	AREA (AC)	VOLUME (AC-FT)
	1000.0	2.31	20.75
	999.0	2.19	18.50
	998.0	2.08	16.36
	997.0	1.97	14.34
	996.0	1.86	12.42
	995.0	1.76	10.61
	994.0	1.66	8.90
	993.0	1.56	7.29
	992.0	1.46	5.78
NWL	991.00	1.37	4.37
SAFETY BENCH	990.0	1.16	3.10
	989.0	1.07	1.99
	988.0	0.99	0.96
	987.0	0.92	0.00

	2-year	10-year	100-year
HWL	**992.8**	**994.6**	**998.0**

WQV Note: The pond has additional WQV available than noted in the "Designed WQV". The 30-inch pipe release rate at varied elevations does not exceed the allowable release rate.

POND B - DESIGN

Area Flowing to Proposed Basin	15.30	acres
Newly constructed impervious area =	12.97	acres
Required Water Quality Volume (WQV)=	**1.19**	**ac-ft**
Designed WQV =	**1.51**	**ac-ft**
Water surface elevation at WQV bounce =	995.90	ft
Surface area at WQV bounce =	0.60	ac
Allowable Water Quality Release Rate =	**3.40**	cfs
Designed Water Quality Release Rate at elev 995.90 (From hydraulic modeling)	**3.14**	cfs
Required Volume Below Outlet (dead storage) = (1800 CF Per Acre of Drainage Area)	**0.63**	ac-ft
Required Volume Below Outlet (dead storage) = (1.1" Over New Impervious Area)	**1.19**	ac-ft
Designed Volume Below Outlet (dead storage) =	**1.25**	ac-ft

	ELEV. (FT)	AREA (AC)	VOLUME (AC-FT)
	1000.0	0.90	5.84
	999.0	0.81	4.98
	998.0	0.75	4.20
	997.0	0.70	3.48
	996.0	0.61	2.82
	995.0	0.55	2.24
	994.0	0.50	1.72
NWL	993.00	0.44	1.25
SAFETY BENCH	992.0	0.28	0.89
	991.0	0.23	0.63
	990.0	0.19	0.42
	989.0	0.16	0.25
	988.0	0.12	0.11
	987.0	0.09	0.00

Controls

	2-year	10-year	100-year
HWL	**995.6**	**996.6**	**999.4**

Skilbred Development, LLC Victory Commercial Park BMI Project No. 0M1.127884			
Subbasin Details			
INLET	**AREA (AC)**	**CURVE NUMBER**	**TIME OF CONCENTRATION (MIN.)**
A-1A	0.27	93.97	07
A-1B	0.33	95.31	07
A-3A	0.26	93.08	07
A-4	0.32	90.64	07
B-4A	0.27	92.67	07
B-4B	0.23	89.50	07
B-6A	0.33	92.61	07
B-6B	0.31	90.00	07
C-2A	0.29	94.89	07
C-2B	0.13	93.71	07
C-2C	0.29	94.23	07
C-2D	0.13	93.70	07
C-4A	0.28	94.13	07
C-4B	0.28	94.81	07
C-5A	0.36	89.06	07
C-5B	0.18	94.93	07
C-5C	0.03	98.00	07
C-5D	0.16	90.35	07
D-2	0.28	93.48	07
D-3	0.26	95.23	07
MH - 50	0.19	95.17	07
MH - 51	0.17	91.61	07
MH - 54	0.29	89.95	07
MH - 55	0.32	93.53	07
MH - 56	0.42	91.58	07
MH - 57	0.46	91.29	07
MH - 84	0.18	94.93	07
MH - 85	0.17	91.52	07
MH-272	1.17	96.46	25
MH-273	0.26	96.60	07

TOLD DEVELOPMENT CO

CONSTRUCTION PLANS FOR

MANKATO TEXAS ROADHOUSE

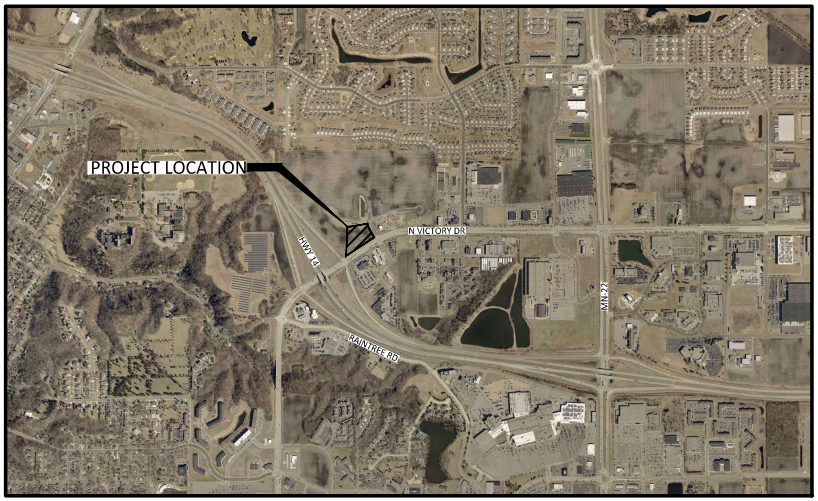
SITE GRADING, PAVEMENT AND SIDEWALK CONSTRUCTION,
WATERMAIN, SANITARY SEWER, AND STORM SEWER INSTALLATION

OCTOBER, 2026

NOTE: EXISTING UTILITY INFORMATION SHOWN ON THIS PLAN HAS BEEN PROVIDED BY THE UTILITY OWNER. THE CONTRACTOR SHALL FIELD VERIFY EXACT LOCATIONS PRIOR TO COMMENCING CONSTRUCTION AS REQUIRED BY STATE LAW. NOTIFY GOPHER STATE ONE CALL, 1-800-252-1166 OR 651-454-0002.

THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL "D". THIS UTILITY QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-22, ENTITLED "STANDARD GUIDELINES FOR INVESTIGATING AND DOCUMENTING EXISTING UTILITIES."

MAP OF THE
CITY OF MANKATO
BLUE EARTH COUNTY, MN



SCALE 0 1000 2000 FEET

SHEET NUMBER	SHEET TITLE
GENERAL	
G0.01	TITLE SHEET
G0.02	LEGEND
G1.01	PROJECT OVERVIEW
CIVIL	
C1.01	EXISTING CONDITIONS & REMOVALS PLAN
SITE PLAN	
C2.01	SITE PLAN
STORMWATER POLLUTION PREVENTION PLAN	
C3.01	PROJECT INFORMATION & LOCATION MAP
C3.02	NARRATIVE
C3.03	SITE & SOILS MAP
C3.04 - C3.05	BEST MANAGEMENT PRACTICE DETAILS
C3.06	EROSION & SEDIMENT CONTROL PLAN
GRADING & DRAINAGE PLAN	
C4.01 - C4.02	GRADING PLAN
C4.03	DRAINAGE PLAN
SANITARY SEWER & WATERMAIN	
C5.01	SANITARY SEWER & WATERMAIN SERVICE PLAN
CONSTRUCTION DETAILS	
C6.01 - C6.03	CONSTRUCTION DETAILS
LANDSCAPE	
L1.01	LANDSCAPE PLAN
L1.02	LANDSCAPE NOTES & DETAILS

THIS PLAN SET CONTAINS 20 SHEETS.

SPECIFICATION REFERENCES:
ALL WORK SHALL CONFORM TO THE LATEST EDITIONS OF THE FOLLOWING AS APPLICABLE:
MNDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION
CEAM CONSTRUCTION STANDARD SPECIFICATIONS

+ BM=1002.98
TOP NUT HYDRANT
NE QUADRANT OF VICTORY DRIVE & HAZELTINE ROAD

PROJECT DATUM: BLUE EARTH COUNTY
HORIZONTAL: 2011 COUNTY COORDINATES
VERTICAL: NAVD 1988

RECORD DRAWING INFORMATION
OBSERVER:
CONTRACTOR:
DATE:

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
NOT FOR CONSTRUCTION
ALEC W. PIETZ, P.E.
LIC. NO. 59617 DATE XX/XX/XXXX

BOLTON & MENK
1960 PREMIER DRIVE
MANKATO, MN 56001
Phone: (507) 625-4171
Email: Mankato@bolton-menk.com
www.bolton-menk.com

DESIGNED	AWP
DRAWN	AWP
CHECKED	AWP
CLIENT PROJ. NO.	26X.145354

NO.	ISSUED FOR	DATE

TOLD DEVELOPMENT COMPANY
MANKATO TEXAS ROADHOUSE
TITLE SHEET

SHEET G0.01

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EXISTING TOPOGRAPHIC SYMBOLS

- ACCESS GRATE
- AIR CONDITION UNIT
- ANTENNA
- AUTO SPRINKLER CONNECTION
- BARRICADE PERMANENT
- BASKETBALL POST
- BENCH
- BIRD FEEDER
- BOLLARD
- BUSH
- CATCH BASIN RECTANGULAR CASTING
- CATCH BASIN CIRCULAR CASTING
- CURB STOP
- CLEAN OUT
- CULVERT END
- DRINKING FOUNTAIN
- DOWN SPOUT
- ELECTRIC CAR CHARGE STATION
- FILL PIPE
- FIRE HYDRANT
- FLAG POLE
- FLARED END / APRON
- FUEL PUMP
- GRILL
- GUY WIRE ANCHOR
- HANDHOLE
- HANDICAP SPACE
- IRRIGATION SPRINKLER HEAD
- IRRIGATION VALVE BOX
- LIFT STATION CONTROL PANEL
- LIFT STATION
- LIGHT POLE
- MAILBOX
- MANHOLE-COMMUNICATION
- MANHOLE-ELECTRIC
- MANHOLE-GAS
- MANHOLE-HEAT
- MANHOLE-RECLAIMED WATER
- MANHOLE-SANITARY SEWER
- MANHOLE-STORM SEWER
- MANHOLE-UTILITY
- MANHOLE-WATER
- METER
- DRIVE-THRU MICROPHONE
- PARKING METER
- PAVEMENT MARKING
- PEDESTAL-COMMUNICATION
- PEDESTAL-ELECTRIC
- PEDESTRIAN PUSH BUTTON
- PICNIC TABLE
- POLE-UTILITY
- POST
- RAILROAD SIGNAL POLE
- REGULATION STATION GAS
- SATELLITE DISH
- SIGN TRAFFIC
- SIGNAL CONTROL CABINET
- SOIL BORING
- SIREN
- TELEPHONE BOOTH
- TILE INLET
- TILE OUTLET
- TILE RISER
- TRANSFORMER-ELECTRIC
- TREE-CONIFEROUS
- TREE-DEAD
- TREE-DECIDUOUS
- TREE STUMP
- TRAFFIC ARM BARRIER
- TRAFFIC SIGNAL
- TRASH CAN
- UTILITY MARKER
- VALVE
- VALVE POST INDICATOR
- VALVE VAULT
- VAULT
- VENT PIPE
- WATER SPIGOT
- WELL
- WETLAND DELINEATED MARKER
- WETLAND
- WET WELL
- YARD HYDRANT

PROPOSED TOPOGRAPHIC SYMBOLS

- CLEANOUT
- MANHOLE
- LIFT STATION
- STORM SEWER CIRCULAR CASTING
- STORM SEWER RECTANGULAR CASTING
- STORM SEWER FLARED END / APRON
- STORM SEWER OUTLET STRUCTURE
- STORM SEWER OVERFLOW STRUCTURE
- CURB BOX
- FIRE HYDRANT
- WATER VALVE
- WATER REDUCER
- WATER BEND
- WATER TEE
- WATER CROSS
- WATER SLEEVE
- WATER CAP / PLUG
- RIP RAP
- DRAINAGE FLOW
- TRAFFIC SIGNS

SURVEY SYMBOLS

- BENCHMARK LOCATION
- CONTROL POINT
- MONUMENT FOUND
- CAST IRON MONUMENT
- STONE MONUMENT

EXISTING TOPOGRAPHIC LINES

- RETAINING WALL
- FENCE
- FENCE-DECORATIVE
- GUARD RAIL
- TREE LINE
- BUSH LINE

SURVEY LINES

- CONTROLLED ACCESS
- BOUNDARY
- CENTERLINE
- EXISTING EASEMENT LINE
- PROPOSED EASEMENT LINE
- EXISTING LOT LINE
- PROPOSED LOT LINE
- EXISTING RIGHT-OF-WAY
- PROPOSED RIGHT-OF-WAY
- SETBACK LINE
- SECTION LINE
- QUARTER LINE
- SIXTEENTH LINE
- TEMPORARY EASEMENT

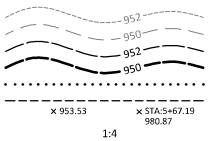
EXISTING UTILITY LINES

- FORCEMAIN
- SANITARY SEWER
- SANITARY SERVICE
- STORM SEWER
- STORM SEWER DRAIN TILE
- WATERMAIN
- WATER SERVICE
- RECLAIMED WATER

PROPOSED UTILITY LINES

- FORCEMAIN
- SANITARY SEWER
- SANITARY SERVICE
- STORM SEWER
- STORM SEWER DRAIN TILE
- WATERMAIN
- WATER SERVICE
- PIPE CASING
- TRENCHLESS PIPE (PLAN VIEW)
- TRENCHLESS PIPE (PROFILE VIEW)

GRADING INFORMATION



- EXISTING CONTOUR MINOR
- EXISTING CONTOUR MAJOR
- PROPOSED CONTOUR MINOR
- PROPOSED CONTOUR MAJOR
- PROPOSED GRADING LIMITS / SLOPE LIMITS
- PROJECT LIMITS
- PROPOSED SPOT ELEVATION
- RISE:RUN (SLOPE)

HATCH PATTERNS

- BITUMINOUS
- GRAVEL
- CONCRETE

EXISTING PRIVATE UTILITY LINES

NOTE:
EXISTING UTILITY INFORMATION SHOWN ON THIS PLAN HAS BEEN PROVIDED BY THE UTILITY OWNER. THE CONTRACTOR SHALL FIELD VERIFY EXACT LOCATIONS PRIOR TO COMMENCING CONSTRUCTION AS REQUIRED BY STATE LAW. NOTIFY GOPHER STATE ONE CALL, 1-800-252-1166 OR 651-454-0002.

THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D UNLESS OTHERWISE NOTED. THIS UTILITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-22, ENTITLED "STANDARD GUIDELINE FOR INVESTIGATING AND DOCUMENTING EXISTING UTILITIES".

- UNDERGROUND FIBER OPTIC
- UNDERGROUND ELECTRIC
- UNDERGROUND GAS
- UNDERGROUND COMMUNICATION
- OVERHEAD ELECTRIC
- OVERHEAD COMMUNICATION
- OVERHEAD UTILITY

UTILITIES IDENTIFIED WITH A QUALITY LEVEL :

LINE TYPES FOLLOW THE FORMAT: UTILITY TYPE - QUALITY LEVEL
EXAMPLE: G A UNDERGROUND GAS, QUALITY LEVEL A
UTILITY QUALITY LEVEL (A,B,C,D) DEFINITIONS CAN BE FOUND IN CI/ASCE 38-22.

UTILITY QUALITY LEVELS:

QUALITY LEVEL D: PROVIDES THE MOST BASIC LEVEL OF INFORMATION. IT INVOLVES COLLECTING DATA FROM EXISTING UTILITY RECORDS. RECORDS MAY INCLUDE AS-BUILT DRAWINGS, DISTRIBUTION AND SERVICES MAPS, EXISTING GEOGRAPHIC INFORMATION SYSTEM DATABASES, CONSTRUCTION PLANS, ETC.

QUALITY LEVEL C: INVOLVES SURVEYING VISIBLE SUBSURFACE UTILITY STRUCTURES SUCH AS MANHOLES, HAND-HOLES, UTILITY VALVES AND METERS, FIRE HYDRANTS, PEDESTALS AND UTILITY MARKERS, AND THEN CORRELATING THE INFORMATION WITH EXISTING UTILITY RECORDS TO CREATE COMPOSITE DRAWINGS. INCLUDES QUALITY LEVEL D ACTIVITIES.

QUALITY LEVEL B: INVOLVES DESIGNATING THE HORIZONTAL POSITION OF SUBSURFACE UTILITIES THROUGH SURFACE DETECTION METHODS AND COLLECTING THE INFORMATION THROUGH A SURVEY METHOD. INCLUDES QUALITY LEVEL C AND D TASKS.

QUALITY LEVEL A: PROVIDES THE HIGHEST LEVEL OF ACCURACY. IT INVOLVES LOCATING OR POTHOLING UTILITIES AS WELL AS ACTIVITIES IN QUALITY LEVELS B, C, AND D. THE LOCATED FACILITY INFORMATION IS SURVEYED AND MAPPED AND THE DATA PROVIDES PRECISE PLAN AND PROFILE INFORMATION.

ABBREVIATIONS

A	ALGEBRAIC DIFFERENCE	GRAV	GRAVEL	RSC	RIGID STEEL CONDUIT
ADJ	ADJUST	GU	GUTTER	RT	RIGHT
ALT	ALTERNATE	GV	GATE VALVE	SAN	SANITARY SEWER
B-B	BACK TO BACK	HDPE	HIGH DENSITY POLYETHYLENE	SCH	SCHEDULE
BIT	BITUMINOUS	HH	HANDHOLE	SERV	SERVICE
BLDG	BUILDING	HP	HIGH POINT	SHLD	SHOULDER
BMP	BEST MANAGEMENT PRACTICE	HWL	HIGH WATER LEVEL	STA	STATION
BR	BEGIN RADIUS	HYD	HYDRANT	STD	STANDARD
BV	BUTTERFLY VALVE	I	INVERT	STM	STORM SEWER
CB	CATCH BASIN	K	CURVE COEFFICIENT	TC	TOP OF CURB
C&G	CURB AND GUTTER	L	LENGTH	TE	TEMPORARY EASEMENT
CIP	CAST IRON PIPE	LO	LOWEST OPENING	TEMP	TEMPORARY
CIPP	CURED-IN-PLACE PIPE	LP	LOW POINT	TNH	TOP NUT HYDRANT
CL	CENTER LINE	LT	LEFT	TP	TOP OF PIPE
CL.	CLASS	MAX	MAXIMUM	TYP	TYPICAL
CLVT	CULVERT	MH	MANHOLE	VCP	VITRIFIED CLAY PIPE
CMP	CORRUGATED METAL PIPE	MIN	MINIMUM	VERT	VERTICAL
C.O.	CHANGE ORDER	MR	MID RADIUS	VPC	VERTICAL POINT OF CURVE
COMM	COMMUNICATION	NIC	NOT IN CONTRACT	VPI	VERTICAL POINT OF INTERSECTION
CON	CONCRETE	NMC	NON-METALLIC CONDUIT	VPT	VERTICAL POINT OF TANGENT
CSP	CORRUGATED STEEL PIPE	NTS	NOT TO SCALE	WM	WATERMAIN
DIA	DIAMETER	NWL	NORMAL WATER LEVEL		
DIP	DUCTILE IRON PIPE	OHW	ORDINARY HIGH WATER LEVEL		
DWY	DRIVEWAY	PC	POINT OF CURVE	AC	ACRES
E	EXTERNAL CURVE DISTANCE	PCC	POINT OF COMPOUND CURVE	CF	CUBIC FEET
ELEC	ELECTRIC	PE	PERMANENT EASEMENT	CV	COMPACTED VOLUME
ELEV	ELEVATION	PED	PEDESTRIAN, PEDESTAL	CY	CUBIC YARD
EOF	EMERGENCY OVERFLOW	PERF	PERFORATED PIPE	EA	EACH
ER	END RADIUS	PERM	PERMANENT	EV	EXCAVATED VOLUME
ESMT	EASEMENT	PI	POINT OF INTERSECTION	LB	POUND
EX	EXISTING	PL	PROPERTY LINE	LF	LINEAR FEET
FES	FLARED END SECTION	PRC	POINT OF REVERSE CURVE	LS	LUMP SUM
F-F	FACE TO FACE	PT	POINT OF TANGENT	LV	LOOSE VOLUME
FF	FINISHED FLOOR	PVC	POLYVINYL CHLORIDE PIPE	SF	SQUARE FEET
F&I	FURNISH AND INSTALL	PVMT	PAVEMENT	SV	STOCKPILE VOLUME
FM	FORCEMAIN	R	RADIUS	SY	SQUARE YARD
FO	FIBER OPTIC	R/W	RIGHT-OF-WAY		
F.O.	FIELD ORDER	RCP	REINFORCED CONCRETE PIPE		
GRAN	GRANULAR	RET	RETAINING		

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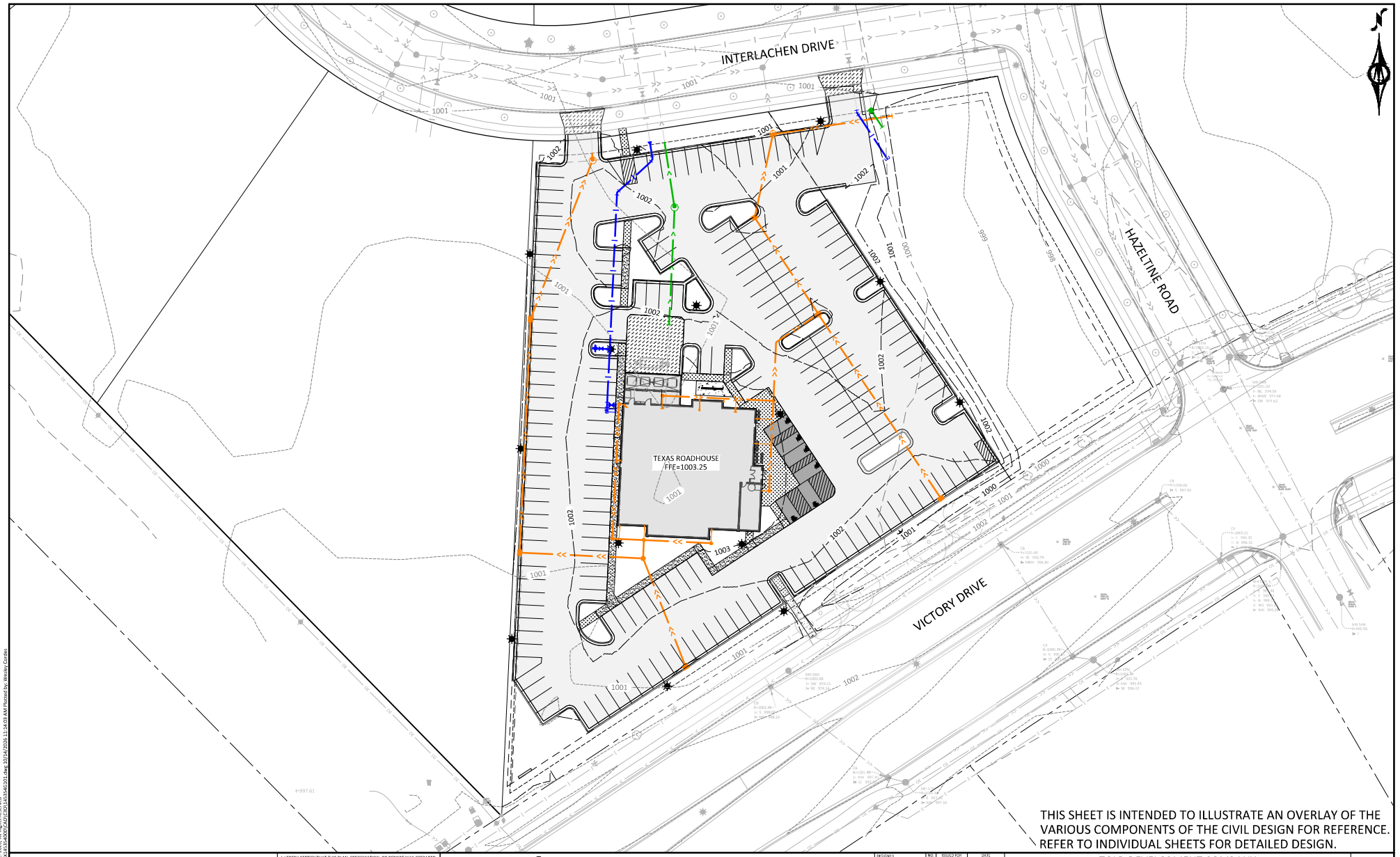
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TOLD DEVELOPMENT COMPANY
MANKATO TEXAS ROADHOUSE
LEGEND

SHEET G0.02



THIS SHEET IS INTENDED TO ILLUSTRATE AN OVERLAY OF THE VARIOUS COMPONENTS OF THE CIVIL DESIGN FOR REFERENCE. REFER TO INDIVIDUAL SHEETS FOR DETAILED DESIGN.

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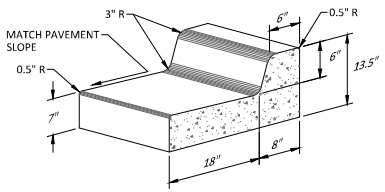
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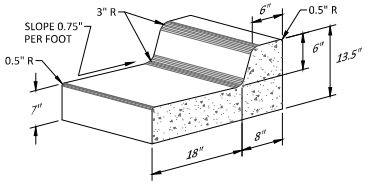
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TOLD DEVELOPMENT COMPANY
MANKATO TEXAS ROADHOUSE
PROJECT OVERVIEW

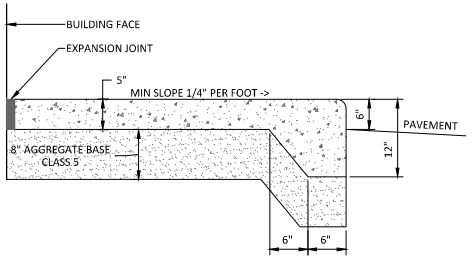
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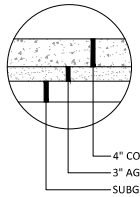
CONCRETE CURB & GUTTER
DESIGN B618, GUTTER OUT
NOT TO SCALE



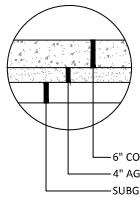
CONCRETE CURB & GUTTER
DESIGN B618
NOT TO SCALE



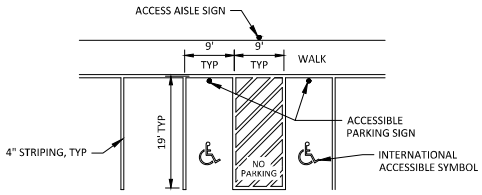
6" THICKENED EDGE
CONCRETE SIDEWALK
NOT TO SCALE



4" CONCRETE SIDEWALK
NOT TO SCALE

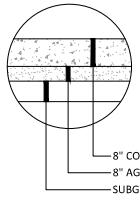


6" CONCRETE SIDEWALK
NOT TO SCALE

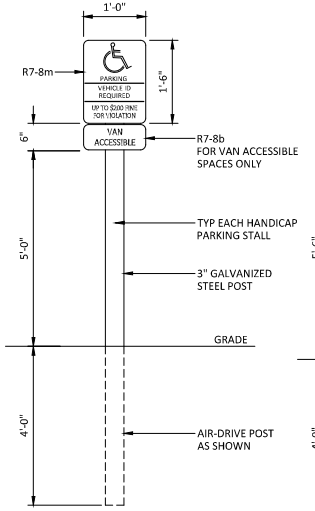


ADA STALL LAYOUT DETAIL (NOT TO SCALE)

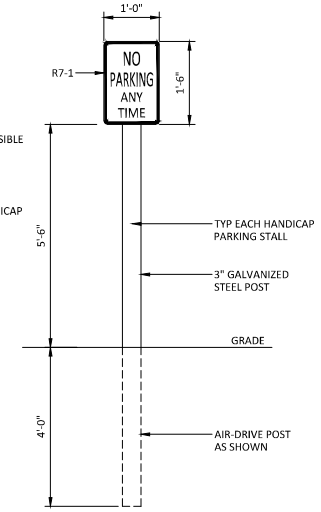
NOTE: THIS IS A TYPICAL DETAIL AS A GENERALIZED GUIDE FOR ADA STALLS.
REFER TO THE SITE PLAN FOR ACTUAL LAYOUT AND DEVIATIONS FROM THE DETAIL.



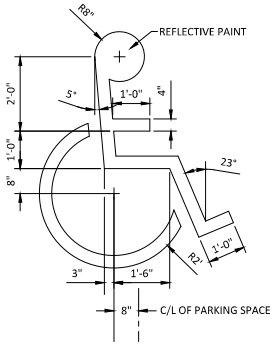
8" CONCRETE DRIVEWAY
NOT TO SCALE



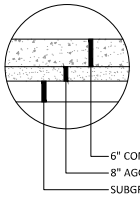
ACCESSIBLE PARKING SIGN
NOT TO SCALE



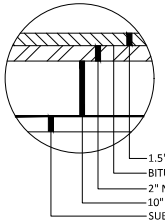
NO PARKING SIGN
NOT TO SCALE



INTERNATIONAL
HANDICAP SYMBOL
NOT TO SCALE



6" CONCRETE PAVEMENT
NOT TO SCALE



BITUMINOUS PAVEMENT SECTION
NOT TO SCALE

NOTE:
SIDEWALKS, DRIVEWAYS, AND PEDESTRIAN RAMPS SHALL BE INSTALLED IN ACCORDANCE WITH CURRENT MNDOT STANDARD PLANS 5-297.250 & 5-297.254.

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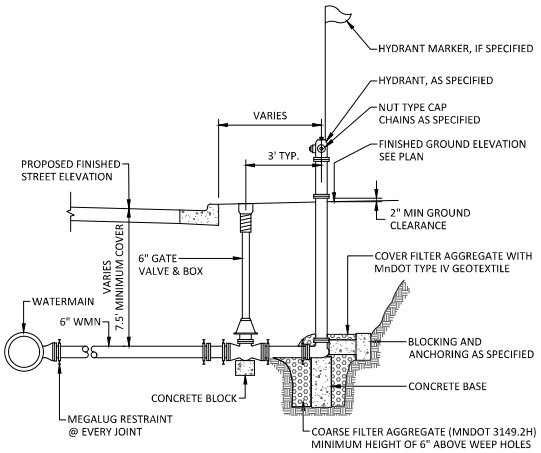
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TOLD DEVELOPMENT COMPANY
MANKATO TEXAS ROADHOUSE
CONSTRUCTION DETAILS
SURFACE

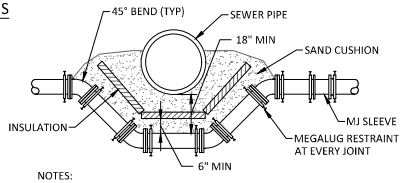
SHEET
C6.01



HYDRANTS LOCATED WHERE THE GROUNDWATER TABLE IS ABOVE THE DRAIN OUTLET SHALL HAVE THE OUTLET DRAIN PLUGGED AND SHALL BE EQUIPPED WITH A TAG STATING "PUMP AFTER USE"

HYDRANT INSTALLATION, MEGALUGS

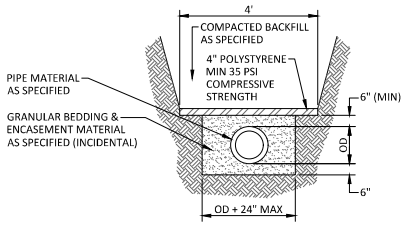
NOT TO SCALE



NOTES:
1. PROVIDE MEGALUG RESTRAINT AT JOINT ON BENDS AND AS SHOWN THIS DETAIL
2. COAT ALL ANCHORAGE AS PER SPECS
3. PROVIDE SAND CUSHION BETWEEN TOP OF WATERMAIN AND BOTTOM OF SEWER PIPE, MIN DIMENSIONS AS SHOWN THIS DETAIL (INCIDENTAL)
4. INSULATION TO BE 2" THICK POLYSTYRENE

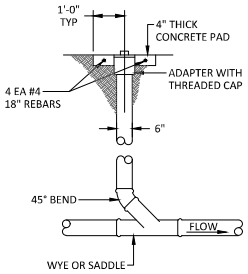
WATERMAIN OFFSET

NOT TO SCALE



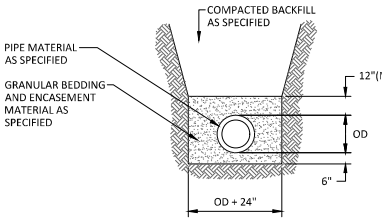
WATERMAIN INSULATION

NOT TO SCALE



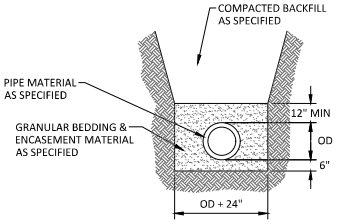
SANITARY SEWER CLEANOUT

NOT TO SCALE



NON-RIGID SANITARY SEWER TRENCH

NOT TO SCALE



PVC WATERMAIN TRENCH

NOT TO SCALE

TRACER WIRE NOTE:
REFER TO THE MINNESOTA RURAL WATER ASSOCIATION (MRWA) TRACER WIRE SPECIFICATION GUIDE & DETAILS TO PROPERLY INSTALL TRACER WIRE WITH WATERMAIN AND SANITARY SEWER. THE GUIDE CAN BE FOUND AT:
mrwa.com/tools.html - Tracer Wire Specification Guide & Details

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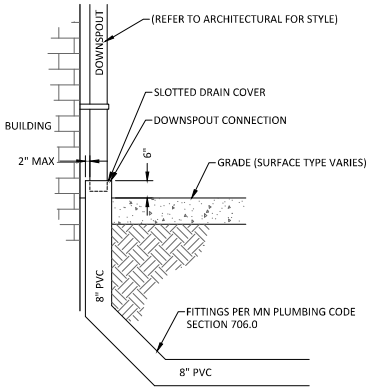
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CLIENT PROJ. NO.	26X.145354

NO.	ISSUED FOR	DATE

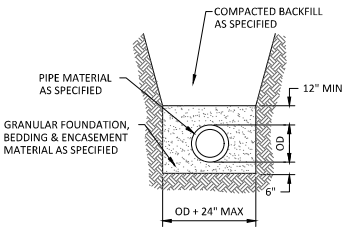
TOLD DEVELOPMENT COMPANY
MANKATO TEXAS ROADHOUSE
CONSTRUCTION DETAILS
WATERMAIN & SANITARY SEWER

SHEET C6.02



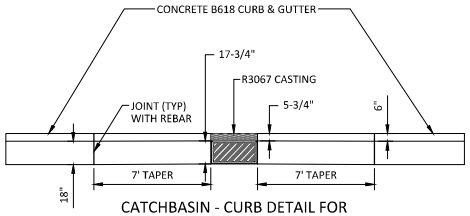
SUBSURFACE ROOF DRAIN CONNECTION

NOT TO SCALE



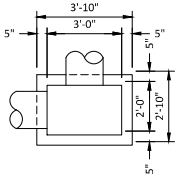
NON-RIGID STORM SEWER TRENCH

NOT TO SCALE

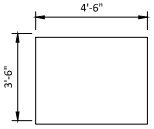


CATCHBASIN - CURB DETAIL FOR R-3067 IN "B" STYLE CURB

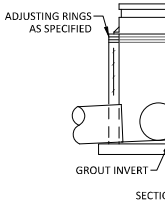
NOT TO SCALE



CATCH BASIN PLAN



BASE SLAB PLAN



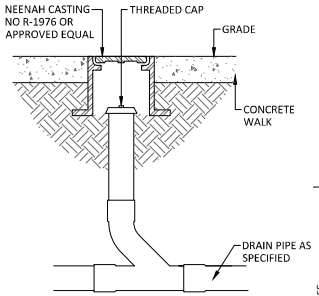
SECTION

NOTES:

1. CASTING PER CONSTRUCTION DOCUMENTS
2. PIPE CUT-OUTS PER CONSTRUCTION DOCUMENTS
3. ALTERNATE CAST-IN-PLACE BASE CAN BE USED
4. MIN REINFORCING SHALL BE WIRE FABRIC HAVING AN AREA OF NOT LESS THAN 0.12 SQ IN PER FOOT IN BOTH DIRECTIONS

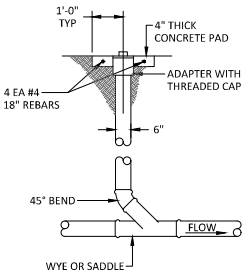
CATCH BASIN STRUCTURE DESIGN R-1 (2'Xx3')

NOT TO SCALE



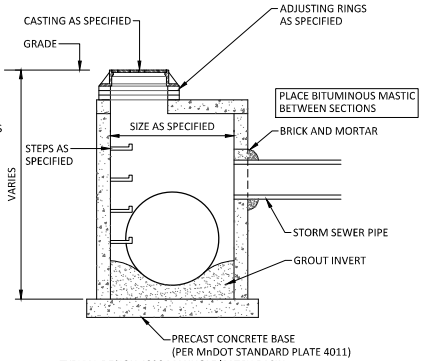
STORM SEWER CLEANOUT UNDER SIDEWALK

NOT TO SCALE



STORM SEWER CLEANOUT

NOT TO SCALE

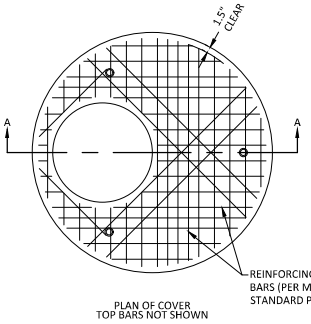


TYPICAL DESIGN 4020 MANHOLE/CATCH BASIN

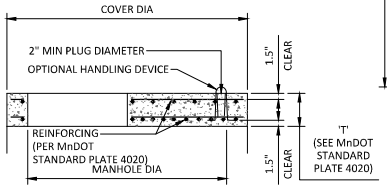
NOTES:

1. AASHTO HS 25 LOADING MAX FILL HEIGHT 15'
2. THE # 4020 SHALL BE PERMANENTLY MARKED ON THE TOP COVER
3. EQUIVALENT STEEL AREAS IN WIRE MESH MAY BE USED
4. REINFORCEMENT PER SPEC 3301, GRADE 60 A SINGLE HOOP OF 8ga STEEL WIRE

DESIGNATION:
DESIGN DIAMETER - STANDARD PLATE # DESIGN 48-4020



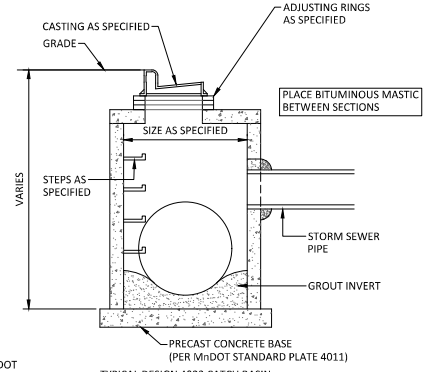
PLAN OF COVER
TOP BARS NOT SHOWN



SECTION A-A

STORM SEWER STRUCTURE DESIGN 4020

NOT TO SCALE

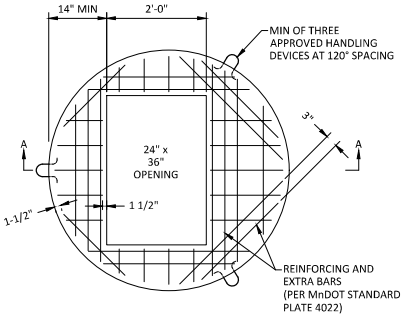


TYPICAL DESIGN 4022 CATCH BASIN

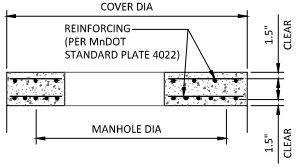
NOTES:

1. AASHTO HS 25 LOADING MAX FILL HEIGHT 15'
2. THE # 4022 SHALL BE PERMANENTLY MARKED ON THE TOP COVER
3. EQUIVALENT STEEL AREAS IN WIRE MESH MAY BE USED
4. REINFORCEMENT PER SPEC 3301, GRADE 60 A SINGLE HOOP OF 8ga STEEL WIRE

DESIGNATION:
DESIGN DIAMETER - STANDARD PLATE # DESIGN 48-4020



PLAN OF COVER
TOP BARS NOT SHOWN



SECTION A-A

STORM SEWER STRUCTURE DESIGN 4022

NOT TO SCALE

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H:\TECDOCS_PROJS\2439-4000\CAD\CED\C6359456D1.dwg 10/14/2026 11:16:51 AM Plotted by: Wesley Gordes

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

NOT FOR CONSTRUCTION

ALEC W. PIETZ, P.E.
LIC. NO. 59617 DATE XX/XX/XXXX

BOLTON & MENK

1960 PREMIER DRIVE
MANKATO, MN 56001
Phone: (507) 625-4171
Email: Mankato@bolton-menk.com
www.bolton-menk.com

DESIGNED	AWP
DRAWN	AWP
CHECKED	AWP
CLIENT PROJ. NO.	26X.145354

NO.	ISSUED FOR	DATE

TOLD DEVELOPMENT COMPANY
MANKATO TEXAS ROADHOUSE
CONSTRUCTION DETAILS
STORM SEWER

SHEET C6.03

BOLTON & MENK
Real People. Real Solutions.

1960 Premier Drive
Mankato, MN 56001-5900

Ph: (507) 625-4171
Fax: (507) 625-4177
Bolton-Menk.com

Anticipated Traffic Conformance

Date: October 15, 2026

To: Cory Bienfang, P.E. – City of Mankato

From: Alec Pietz, P.E. – Land Development Project Manager

Subject: Texas Roadhouse
BMI Project No.: 26X.145354

The intent of this memorandum is to show land use conformance in context to anticipated traffic and is being prepared by request of City staff. The property is zoned and land used for commercial activities which include users such as restaurants. Additionally, the Victory Commercial Park Subdivision traffic impact analysis dated September 18, 2022, prepared by SEH, Inc. notes that the study projected anticipated traffic based on the subject property being commercial land. Furthermore, the study specifically includes restaurants as a data input for "Multi-use Trip Percentages" in Table 2 on page 9. This further reinforces that the proposed Texas Roadhouse, a restaurant, conforms to a planned use and traffic generator in the subdivision.

Please reach out to Alec Pietz, P.E. at Alec.Pietz@bolton-menk.com or 507-766-3283 with any questions.

Bolton & Menk is an equal opportunity employer.

BOLTON & MENK
Real People. Real Solutions.

1960 Premier Drive
Mankato, MN 56001-5900

Ph: (507) 625-4171
Fax: (507) 625-4177
Bolton-Menk.com

Administrative Lot Split

Date: October 15, 2026

To: Mark Konz – City of Mankato

From: Alec Pietz, P.E. – Land Development Project Manager

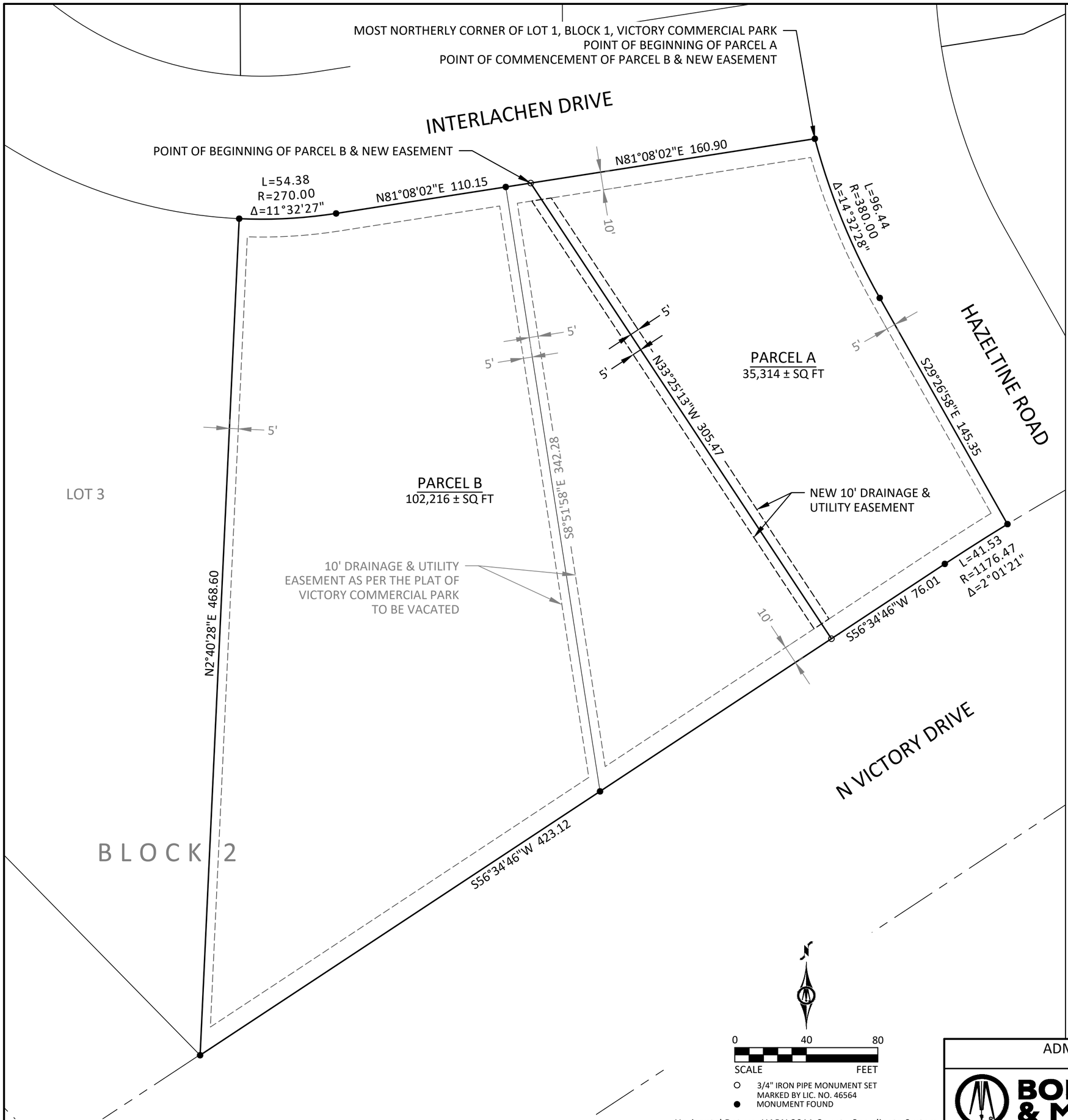
Subject: Texas Roadhouse
BMI Project No.: 26X.145354

The proposed Texas Roadhouse project is requesting an Administrative Lot Split to adjust the shared lot line of Lots 1 and 2 of Block 2 in the Victory Commercial Park Subdivision. Attached with this submittal are the following:

- Administrative Lot Split Figure
- Easement Vacation Figure
- Correspondence sent to the contacts listed in the Vacation Petition. Recipients were blank copied.
- Responses from participating utility companies. All correspondence that was received is attached, and not all companies responded.

Please reach out to Alec Pietz, P.E. at Alec.Pietz@bolton-menk.com or 507-766-3283 with any questions.

Bolton & Menk is an equal opportunity employer.



DESCRIPTION
Parcel A

Part of Lot 1, Block 2, Victory Commercial Park according to the plat thereof on file and of record with the Blue Earth County Recorder, more particularly described as follows:

Beginning at the most northerly corner of Lot 1, Block 1, Victory Commercial Park;
Thence southerly, along the easterly line of said Lot 1, a distance of 96.44 feet along a circular curve having a radius of 380.00 feet and a central angle of 14 degrees 32 minutes 28 seconds;
Thence South 29 degrees 26 minutes 58 seconds East, along the easterly line of Said Lot 1, a distance of 145.35 feet;
Thence westerly, along the southerly line of said Lot 1, a distance of 41.53 feet along a circular curve having a radius of 1176.47 feet and a central angle of 2 degrees 1 minute 21 seconds;
Thence South 56 degrees 34 minutes 46 seconds West, along the southerly line of Said Lot 1, a distance of 76.01 feet;
Thence North 33 degrees 25 minutes 13 seconds West, a distance of 305.47 feet;
Thence North 81 degrees 8 minutes 2 seconds East, along the northerly line of said Lot 1, a distance of 160.90 feet more or less to the Point of Beginning.

Parcel A contains 35,314 square feet more or less.

DESCRIPTION
Parcel B

Part of Lot 1 and all of Lot 2, Block 2, Victory Commercial Park according to the plat thereof on file and of record with the Blue Earth County Recorder, more particularly described as follows:

Commencing at the most northerly corner of Lot 1, Block 1, Victory Commercial Park;
Thence South 81 degrees 08 minutes 02 seconds West, along the northerly line of Said Lot 1, a distance of 160.09 feet to the Point Of Beginning;
Thence, South 33 degrees 25 minutes 13 seconds East, a distance of 305.47 feet;
Thence South 56 degrees 34 minutes 46 seconds West, a distance of 423.12 feet;
Thence North 2 degrees 40 minutes 28" East, a distance of 468.60 feet;
Thence easterly, a distance of 54.38 feet along a circular curve having a radius of 270.00 feet and a central angle of 11 degrees 32 minutes 27 seconds;
Thence North 81 degrees 8 minutes 2 seconds East, a distance of 110.15 feet more or less to the Point of Beginning.

Parcel B contains 102,216 square feet more or less.

NEW EASEMENT DESCRIPTION

An easement 10.00 feet in width lying over, under and across that part of Lot 1, Block 2, Victory Commercial Park, according to the plat thereof on file and of record with the Blue Earth County Recorder, the center line of which is described as follows:

Commencing at the most northerly corner of Lot 1, Block 1, Victory Commercial Park;
Thence South 33 degrees 25 minutes 13 seconds West, a distance of 305.47 feet to a point on the southerly line of said Lot 1 and there terminating.

EXCEPT the northwesterly 10.00 feet of said Lot 1 and EXCEPT the southeasterly 30.00 feet of said Lot 1.

CITY ACKNOWLEDGMENT

This Lot Split has been reviewed and approved pursuant to Section 11.14 of the Mankato City Code by the City Engineer and the Planning Director.

Signed this_____ day of _____ 20_____.

_____
Mankato City Engineer

Signed this_____ day of _____ 20_____.

_____
Mankato Planning Director

SURVEYOR'S CERTIFICATION

I hereby certify that this survey, plan, or report was prepared by me or under my direct supervision and that I am a duly Licensed Land Surveyor under the laws of the State of Minnesota.

FOR REVIEW

_____ XX/XX/20XX
Michael M. Eichers Date
License Number 46564

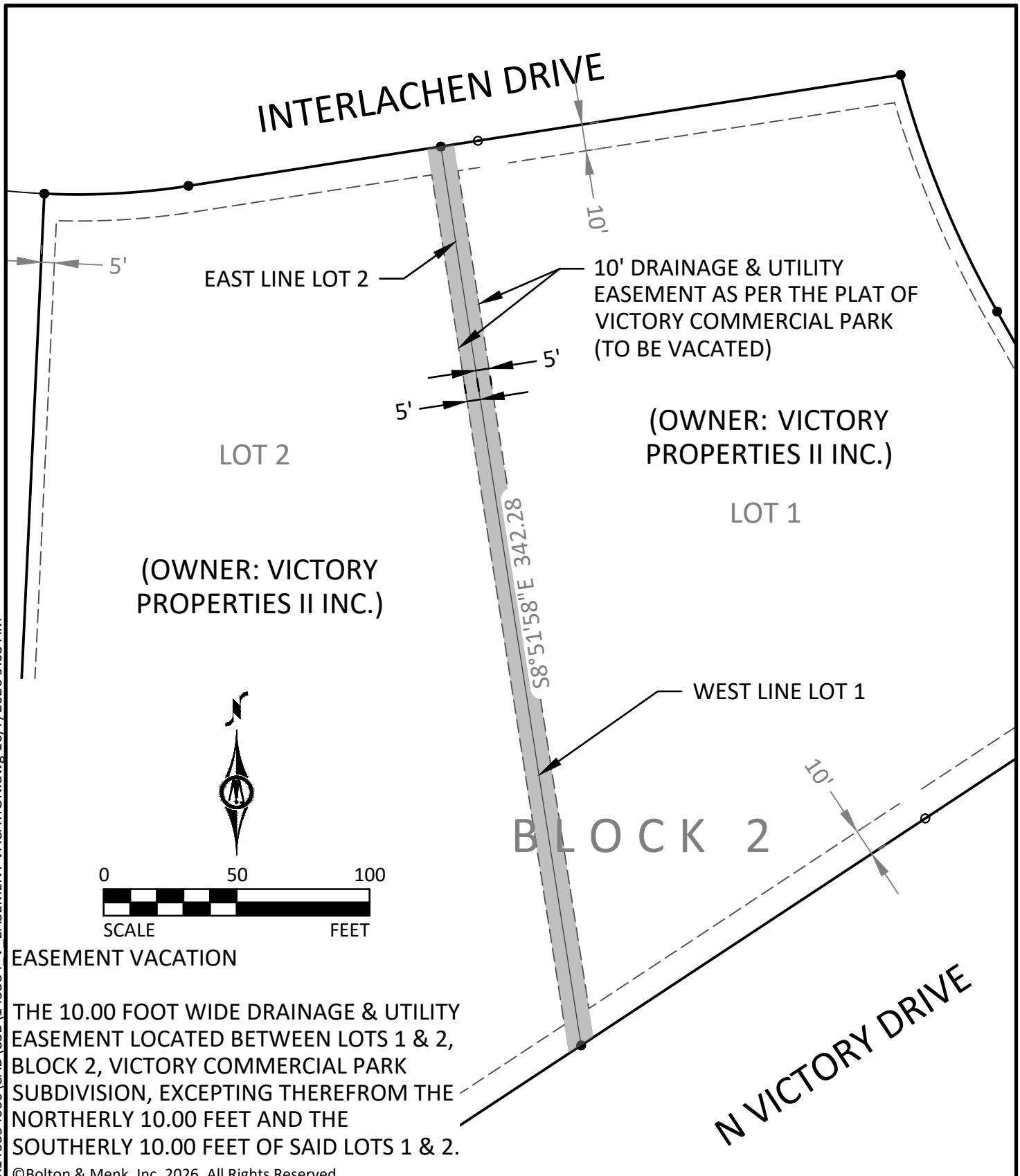
ADMINISTRATIVE LOT SPLIT
MANKATO, MINNESOTA

LOTS 1 & 2
BLOCK 2
VICTORY COMMERCIAL PARK

FOR: TOLD DEVELOPMENT COMPANY

BOLTON & MENK
1960 Premier Drive
Mankato, MN 56001
Phone: (507) 625-4171

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EASEMENT VACATION

THE 10.00 FOOT WIDE DRAINAGE & UTILITY EASEMENT LOCATED BETWEEN LOTS 1 & 2, BLOCK 2, VICTORY COMMERCIAL PARK SUBDIVISION, EXCEPTING THEREFROM THE NORTHERLY 10.00 FEET AND THE SOUTHERLY 10.00 FEET OF SAID LOTS 1 & 2.

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EASEMENT VACATION EXHIBIT

MANKATO, MINNESOTA

BOLTON & MENK

1960 Premier Drive
Mankato, MN 56001
Phone: (507) 625-4171

LOTS 1 & 2
BLOCK 2
VICTORY COMMERCIAL PARK

FOR: TOLD DEVELOPMENT COMPANY

JOB NUMBER: 26X.145354 FIELD BOOK: DRAWN BY: WSC

H:\TOLDDEVE_PR\26X145354000\CAD\C3D\145354_V_EASEMENT VACATION.dwg 10/7/2026 9:03 AM

Alec Pietz

From: Alec Pietz
Sent: Wednesday, October 7, 2026 4:49 PM
Subject: Lot 1 and Lot 2, Block 2 - Victory Commercial Park - Easement Vacation
Attachments: Lot 1 and 2 - Block 2 - Victory Commercial Park - Admin Lot Split.pdf; Lot 1 and 2 - Block 2 - Victory Commercial Park - Easement Vacation.pdf; Mankato Utility Contacts Easement Vacation petition 21020.pdf

Good Afternoon,
I am reaching out regarding an administrative lot split of Lots 1 and 2, Block 2 of Victory Commercial Park located off Victory Drive and east of Hwy 14 / 60. With this lot split comes a vacation of an existing utility easement on the shared lot line and establishment of a new easement on the new lot line.

Please let me know if there are any questions and respond to me via email or the petition regarding any facilities you may have. Sincerely,

BOLTON & MENK

Real People. Real Solutions.

Alec Pietz, PE (MN)
Land Development Project Manager | Associate
Bolton & Menk, Inc.
1960 Premier Drive, Mankato, Minnesota, 56001
(507) 902-2606
(507) 766-3283
alec.pietz@bolton-menk.com
www.Bolton-Menk.com

STREET/ALLEY VACATION REQUEST

City of Mankato
Intergovernmental Center
10 Civic Center Plaza
Mankato, MN 56001

Community Development
Phone: 507.387.8600
Fax: 507.388.7530
www.mankatomn.gov

Address/Location of Property:

Lot 1 and Lot 2, Block 2 - Victory Commercial Park

The City Council, with the assistance of the City Planning Commission, has the exclusive power to vacate or discontinue public streets, alleys, highways, or any portion thereof in the city, and public utility or access easements, but no such vacation or discontinuance shall be granted or ordered by the Council except upon the verified petition, in writing, of one or more of the owners of real property on that portion of such street, alley, or highway proposed to be vacated, or upon the verified petition of the city's Community Development Director. The petition shall state the reason for the vacation and briefly describe the street, alley, highway, or portion thereof, to be vacated.

The petition shall be delivered to the Community Development Director, who will forward it to the City Planning Commission, which will hold a hearing on the request and make a recommendation to the City Council.

It is the responsibility of the applicants to have all utility companies review the request for vacation to determine whether utilities are located in the right-of-way or easement to be vacated. The petition for right-of-way or easement vacation shall be accompanied by this form, along with a map of the proposed vacation, and brought to each utility listed below, to be signed and an indication made as to the presence of utilities. If easements must be retained for utilities or access, the applicant shall submit a drawing and a written description of the easements with this form.

Utility	By	Utilities present within vacation	Check box if easement needed
Alliance Pipeline		Yes____ No____	
Benco Electric		Yes____ No____	
CenterPoint Energy		Yes____ No____	
Charter Communication		Yes____ No____	
Consolidated Communications	Jason Fladland	Yes____ No_X_	
Enterprise Products (propane)		Yes____ No____	
Greater MN Gas		Yes____ No____	
Metronet		Yes____ No____	
Kinder Morgan Cochin Pipeline		Yes____ No____	
Magellan Pipeline		Yes____ No____	
Mankato Public Works		Yes____ No____	
Northern Natural Gas		Yes____ No____	
Sprint		Yes____ No____	
Verizon Wireless		Yes____ No____	
Xcel Energy		Yes____ No____	
Zayo Group		Yes____ No____	

Utility Company Comments: Jason Fladland
Outside Plant Engineer II

STREET/ALLEY VACATION REQUEST

City of Mankato
Intergovernmental Center
10 Civic Center Plaza
Mankato, MN 56001

Community Development
Phone: 507.387.8600
Fax: 507.388.7530
www.mankatomn.gov

Address/Location of Property:

LOTS 1 and 2 of VICTORY COMMERCIAL PARK

The City Council, with the assistance of the City Planning Commission, has the exclusive power to vacate or discontinue public streets, alleys, highways, or any portion thereof in the city, and public utility or access easements, but no such vacation or discontinuance shall be granted or ordered by the Council except upon the verified petition, in writing, of one or more of the owners of real property on that portion of such street, alley, or highway proposed to be vacated, or upon the verified petition of the city's Community Development Director. The petition shall state the reason for the vacation and briefly describe the street, alley, highway, or portion thereof, to be vacated.

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Utility	By	Utilities present within vacation	Check box if easement needed
Alliance Pipeline		Yes____ No____	
Benco Electric		Yes____ No____	
CenterPoint Energy		Yes____ No____	
Charter Communication	GSOC BRIANO/AT	Yes____ No X	
Consolidated Communications		Yes____ No____	
Enterprise Products (propane)		Yes____ No____	
Greater MN Gas		Yes____ No____	
Metronet		Yes____ No____	
Kinder Morgan Cochin Pipeline		Yes____ No____	
Magellan Pipeline		Yes____ No____	
Mankato Public Works		Yes____ No____	
Northern Natural Gas		Yes____ No____	
Sprint		Yes____ No____	
Verizon Wireless		Yes____ No____	
Xcel Energy		Yes____ No____	
Zayo Group		Yes____ No____	

Utility Company Comments: NO FACILITIES PRESENT

STREET/ALLEY VACATION REQUEST

City of Mankato
Intergovernmental Center
10 Civic Center Plaza
Mankato, MN 56001

Community Development
Phone: 507.387.8600
Fax: 507.388.7530
www.mankatomn.gov

Address/Location of Property:

Lot 1 & 2 - Block 2 - Victory Commercial Park - Lot Split - Easement Vacate

The City Council, with the assistance of the City Planning Commission, has the exclusive power to vacate or discontinue public streets, alleys, highways, or any portion thereof in the city, and public utility or access easements, but no such vacation or discontinuance shall be granted or ordered by the Council except upon the verified petition, in writing, of one or more of the owners of real property on that portion of such street, alley, or highway proposed to be vacated, or upon the verified petition of the city's Community Development Director. The petition shall state the reason for the vacation and briefly describe the street, alley, highway, or portion thereof, to be vacated.

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Utility	By	Utilities present within vacation	Check box if easement needed
Alliance Pipeline		Yes____ No____	
Benco Electric		Yes____ No____	
CenterPoint Energy		Yes____ No____	
Charter Communication		Yes____ No____	
Consolidated Communications		Yes____ No____	
Enterprise Products (propane)	D. Nicholson	Yes____ No X	
Greater MN Gas		Yes____ No____	
Metronet		Yes____ No____	
Kinder Morgan Cochin Pipeline		Yes____ No____	
Magellan Pipeline		Yes____ No____	
Mankato Public Works		Yes____ No____	
Northern Natural Gas		Yes____ No____	
Sprint		Yes____ No____	
Verizon Wireless		Yes____ No____	
Xcel Energy		Yes____ No____	
Zayo Group		Yes____ No____	

Utility Company Comments:

D. Nick Nicholson - Enterprise Products - 651-295-0960

BEACON
design . performance . technology

VIPER Area/Site

VIPER LUMINAIRE

DATE: | LOCATION:

TYPE: AA4 | PROJECT: Texas Roadhouse

CATALOG #: VP-1-160L-135-4K7-2-UNV-A-DBT

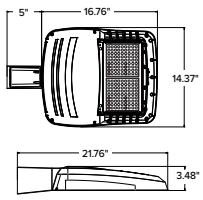
FEATURES

- Low profile LED area/site luminaire with a variety of IES distributions for lighting applications such as auto dealership, retail, commercial, and campus parking lots
- Featuring two different optical technologies, Strike and Micro Strike Optics, which provide the best distribution patterns for retrofit or new construction
- Rated for high vibration applications including bridges and overpasses. All sizes are rated for 1.5G
- Control options including photo control, occupancy sensing, NX Lighting Controls™, LightGRID+ and 7-Pin with networked controls
- New customizable lumen output feature allows for the wattage and lumen output to be customized in the factory to meet whatever specification requirements may entail
- Field interchangeable mounting provides additional flexibility after the fixture has shipped

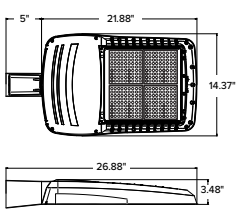
MICRO STRIKE | OPTICS STRIKE



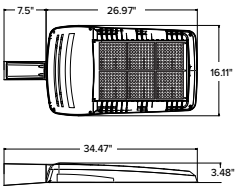
SIZE 1



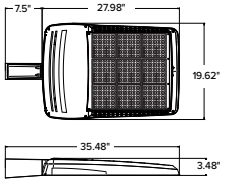
SIZE 2



SIZE 3



SIZE 4



CONTROL TECHNOLOGY

NX CONNECT | NX WIRED | NX WIRELESS | LIGHTGRID+

SERVICE PROGRAMS

STOCK | QS10

SPECIFICATIONS

CONSTRUCTION

- Die-cast housing with hidden vertical heat fins are optimal for heat dissipation while keeping a clean smooth outer surface
- Corrosion resistant, die-cast aluminum housing with 1000 hour powder coat paint finish
- External hardware is corrosion resistant

OPTICS

- Micro Strike Optics (160, 320, 480, or 720 LED counts) maximize uniformity in applications and come standard with mid-power LEDs which evenly illuminate the entire luminous surface area to provide a low glare appearance. Catalog logic found on page 2
- Strike Optics (36, 72, 108, or 162 LED counts) provide best in class distributions and maximum pole spacing in new applications with high powered LEDs. Strike optics are held in place with a polycarbonate bezel to mimic the appearance of the Micro Strike Optics so both solutions can be combined on the same application. Catalog logic found on page 3
- Both optics maximize target zone illumination with minimal losses at the house-side, reducing light trespass issues. Additional backlight control shields and house side shields can be added for further reduction of illumination behind the pole
- One-piece silicone gasket ensures a weatherproof seal
- Zero up-light at 0 degrees of tilt
- Field rotatable optics

INSTALLATION

- Mounting patterns for each arm can be found on page 11
- Optional universal mounting block for ease of installation during retrofit applications. Available as an option (ASQU) or accessory for square and round poles
- All mounting hardware included
- Knuckle arm fitter option available for 2-3/8" OD tenon
- For products with EPA less than 1 mounted to a pole greater that 20ft, a vibration damper is recommended

ELECTRICAL

- Universal 120-277 VAC or 347-480 VAC input voltage, 50/60 Hz
- Ambient operating temperature -40˚C to 40˚C
- Drivers have greater than 90% power factor and less than 20% THD
- LED drivers have output power over-voltage, over-current protection and short circuit protection with auto recovery
- Field replaceable surge protection device provides 20kA protection meeting ANSI/ IEEE C62.41.2 Category C High and Surge Location Category C3; Automatically takes fixture off-line for protection when device is compromised
- Dual Driver option provides 2 drivers within luminaire but only one set of leads exiting the luminaire, where Dual Power Feed provides two drivers which can be wired independently as two sets of leads are extended from the luminaire. Both options cannot be combined

CONTROLS

- Photo control, occupancy sensor programmable controls, and Zigbee wireless controls available for complete on/off and dimming control
- Please consult brand or sales representative when combining control and electrical options as some combinations may not operate as anticipated depending on your application
- 7-pin ANSI C136.41-2013 photocontrol receptacle option available for twist lock photocontrols or wireless control modules (control accessories sold separately)

CONTROLS (CONTINUED)

- 0- 10V Dimming Drivers are standard and dimming leads are extended out of the luminaire unless control options require connection to the dimming leads. Must specify if wiring leads are to be greater than the 6" standard
- NX Lighting Controls™ available with in fixture wireless control module, features dimming and occupancy sensor
- LightGRID+ available with in fixture wireless control module, features dimming and occupancy sensor. Also available in 7-pin configuration

	EPA				
	VP1 (Size 1)	VP2 (Size 2)	VP3 (Size 3)	VP4 (Size 4)	Config.
Single Fixture	0.454	0.555	0.655	0.698	
Two at 180	0.908	1.110	1.310	1.396	
Two at 90	0.583	0.711	0.857	0.948	
Three at 90	1.037	1.266	1.512	1.646	
Three at 120	0.943	1.155	1.392	1.680	
Four at 90	1.166	1.422	1.714	1.896	

CERTIFICATIONS

- DLC® (DesignLights Consortium Qualified), with some Premium Qualified configurations. Not all product variations listed in this document are DLC® qualified. Refer to http://www.designlights.org for the most up-to-date list.
- Listed to UL1598 and CSA C22.2#250.0-24 for wet locations and 40˚C ambient temperatures
- 1.5 G rated for ANSI C136.31 high vibration applications
- Fixture is IP65 rated
- Meets IDA recommendations using 3K CCT configuration at 0 degrees of tilt
- This product meets federal procurement law requirements under the Buy American Act (FAR 52.225-9) and Trade Agreements Act (FAR 52.225-11). See Buy America(n) Solutions (link to https://www.currentlighting.com/resources/america-solutions).

WARRANTY

- 5 year warranty

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DATE: | LOCATION:

TYPE: AA4 | PROJECT: Texas Roadhouse

CATALOG #: VP-1-160L-135-4K7-2-UNV-A-DBT

VIPER Area/Site

VIPER LUMINAIRE

MICROSTRIKE OPTICS – ORDERING GUIDE

Gray Shading = Service Program Limit of 15 luminaires

QS10

Example: VP–2–320L-145–3K7–2–R–UNV–A3–BLT

CATALOG #

VP –

Series	
VP	Viper

Optic Platform	
Micro Strike	

Size	
1	Size 1
2	Size 2
3	Size 3
4	Size 4

Light Engine	
160L-35 [6]	5500 lumens
160L-50 [6]	7500 lumens
160L-75	10000 lumens
160L-100	12500 lumens
160L-115	15000 lumens
160L-135	18000 lumens
160L-160	21000 lumens
320L-145	21000 lumens
320L-170	24000 lumens
320L-185	27000 lumens
320L-210	30000 lumens
320L-235	33000 lumens
320L-255	36000 lumens
320L-315 [6]	40000 lumens
480L-285	40000 lumens
480L-320	44000 lumens
480L-340	48000 lumens
480L-390	52000 lumens
480L-425	55000 lumens
480L-470	60000 lumens
720L-435	60000 lumens
720L-475	65000 lumens
720L-515	70000 lumens
720L-565 [6]	75000 lumens
720L-600 [6]	80000 lumens
CLO	Custom Lumen Output [1]

CCT/CRI	
AP	AP-Amber Phosphor Converted
27K8	2700K, 80 CRI
3K7	3000K, 70 CRI
3K8	3000K, 80 CRI
35K8	3500K, 80 CRI
3K9	3000K, 90 CRI
4K7	4000K, 70 CRI
4K8	4000K, 80 CRI
4K9	4000K, 90 CRI
5K7	5000K, 70 CRI
5K8	5000K, 80 CRI

Distribution	
2	Type 2
3	Type 3
4F	Type 4 Forward
4W	Type 4 Wide
5QW	Type 5 Square Wide

Optic Rotation	
BLANK	**No Rotation**
L	Optic rotation left
R	Optic rotation right

Voltage	
UNV	120-277V
120	120V
208	208V
240	240V
277	277V
347	347V
480	480V

Mounting	
A	Arm mount for square pole/flat surface (B3 Drill Pattern) (Does not include round pole adapter)
A_	Arm mount for round pole [2]
ASQU	Universal arm mount for square pole. Can be used with B3 or S2 Drill Pattern
A_U	Universal arm mount for round pole [2]
AAU	Adjustable arm for pole mounting (universal drill pattern)
AA_U	Adjustable arm mount for round pole [2]
ADU	Decorative upswept Arm (universal drill pattern)
AD_U	Decorative upswept arm mount for round pole [2]
MAF	Mast arm fitter for 2-3/8" OD horizontal arm
K	Knuckle
T	Trunnion
WB	Wall Bracket, horizontal tenon with MAF
WM	Wall mount bracket with decorative upswept arm
WA	Wall mount bracket with adjustable arm

Color	
BLT	Black Matte Textured
BLS	Black Gloss Smooth
DBT	Dark Bronze Matte Textured
DBS	Dark Bronze Gloss Smooth
GTT	Graphite Matte Textured
LGS	Light Grey Gloss Smooth
LGT	Light Grey Gloss Textured
PSS	Platinum Silver Smooth
WHT	White Matte Textured
WHS	White Gloss Smooth
VGT	Verde Green Textured

Color Option	
CC	Custom Color

Options	
F	Fusing
2PF	Dual Power Feed
2DR	Dual Driver
TE	Tooless Entry
BC	Backlight Control [8]
TB	Terminal Block

Network Control Options	
NXWS16F	NX Networked Wireless Enabled Integral NXSMP2-LMO PIR Occupancy Sensor with Automatic Dimming Photocell and Bluetooth Programming [1,3,4]
NXWS40F	NX Networked Wireless Enabled Integral NXSMP2-HMO PIR Occupancy Sensor with Automatic Dimming Photocell and Bluetooth Programming [1,3,4]
NXW	NX Networked Wireless Radio Module NXRM2 and Bluetooth Programming, without Sensor [3,4]
WIR	LightGRID+ In-Fixture Module [3,4]
WIRSC	LightGRID+ Module and Occupancy Sensor [3,4]
Stand Alone Sensors	
BTS-14F	Bluetooth® Programmable, BTSMP-LMO PIR Occupancy Sensor with Automatic Dimming Photocell and 360° Lens
BTS-40F	Bluetooth® Programmable, BTSMP-HMO PIR Occupancy Sensor with Automatic Dimming Photocell and 360° Lens
BTSO-12F	Bluetooth® Programmable, BTSMP-OMNI-O PIR Occupancy Sensor with Automatic Dimming Photocell and 360° Lens
7PR	7-Pin Receptacle [4]
7PR-SC	7-Pin Receptacle with shorting cap [4]
3PR	3-Pin twist lock [4]
3PR-SC	3-Pin receptacle with shorting cap [4]
3PR-TL	3-Pin PCR with photocontrol [4]
Programmed Controls	
SCP-_F	Sensor Control Programmable, 8F or 40F [9]
ADD	AutoDim Timer Based Dimming [4]
ADT	AutoDim Time of Day Dimming [4]
Photocontrols	
PC	Button Photocontrol [4,7]

1 – Items with a grey background can be done as a custom order. Contact brand representative for more information
2 – Replace "_" with "3" for 3.5"-4.13" OD pole, "4" for 4.18"-5.25" OD pole, "5" for 5.5"-6.5" OD pole
3 – Networked Controls cannot be combined with other control options
4 – Not available with 2PF option
5 – Not available with Dual Driver option
6 – Some voltage restrictions may apply when combined with controls
7 – Not available with 480V
8 – BC not available on 4F and type 5 distributions
9 – At least one SCPREMOTE required to program SCP motion sensor. Must select 8ft or 40ft.

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VIPER Area/Site

VIPER LUMINAIRE

DATE: | LOCATION:

TYPE: AA4 | PROJECT: Texas Roadhouse

CATALOG #: VP-1-160L-135-4K7-2-UNV-A-DBT

STRIKE OPTIC – ORDERING GUIDE

Example: VP–ST–1–36L-39–3K7–2–UNV–A–BLT

CATALOG #

VP –

Series		Optic Platform		Size		Light Engine		CCT/CRI		Distribution		Optic Rotation		Voltage	
VP	Viper	ST	Strike	1	Size 1	36L-39 [8]	5500 lumens	AM	monochromatic amber, 595nm	FR	Auto Front Row	BLANK	No Rotation	UNV	120-277V
						36L-55 [8]	7500 lumens			2	Type 2	L	Optic rotation left	120	120V
						36L-85	10000 lumens	27K8	2700K, 80 CRI	3	Type 3	R	Optic rotation right	208	208V
						36L-105	12500 lumens	3K7	3000K, 70 CRI	4F	Type 4 Forward			240	240V
						36L-120	14000 lumens	3K8	3000K, 80 CRI	4W	Type 4 Wide			277	277V
				2	Size 2	72L-115	15000 lumens	3K9	3000K, 90 CRI	5QN	Type 5 Square Narrow			347	347V
						72L-145	18000 lumens	35K8	3500K, 80 CRI					480	480V
						72L-180	21000 lumens	4K7	4000K, 70 CRI	5QW	Type 5 Square Wide				
						72L-210	24000 lumens	4K8	4000K, 80 CRI	5QM	Type 5 Square Medium				
						72L-240	27000 lumens	4K9	4000K, 90 CRI	5W	Type 5 Wide (Round)				
				3	Size 3	108L-215 [8]	27000 lumens	5K7	5000K, 70 CRI	5RW	Type 5 Rectangular				
						108L-250	30000 lumens	5K8	5000K, 80 CRI	C	Corner Optic				
						108L-280	33000 lumens			TC	Tennis Court Optic				
						108L-325	36000 lumens								
						108L-365	40000 lumens								
				4	Size 4	162L-320	40000 lumens								
						162L-365 [10]	44000 lumens								
						162L-405	48000 lumens								
						162L-445	52000 lumens								
						162L-485	55000 lumens								
						162L-545 [8]	60000 lumens								
						CLO	Custom Lumen Output [1]								

Mounting		Color		Options		Network Control Options	
A	Arm mount for square pole/flat surface	BLT	Black Matte Textured	F	Fusing	NXWS16F	NX Networked Wireless Enabled Integral NXSMP2-LMO PIR Occupancy Sensor with Automatic Dimming Photocell and Bluetooth Programming [1,4,5]
A_	Arm mount for round pole [3]	BLS	Black Gloss Smooth	E	Battery Backup [1,2,7,8,9]	NXWS40F	NX Networked Wireless Enabled Integral NXSMP2-HMO PIR Occupancy Sensor with Automatic Dimming Photocell and Bluetooth Programming [1,4,5]
ASQU	Universal arm mount for square pole	DBT	Dark Bronze Matte Textured	2PF	Dual Power Feed	NXW	NX Networked Wireless Radio Module NXRM2 and Bluetooth Programming, without Sensor [4,5]
A_U	Universal arm mount for round pole [3]	DBS	Dark Bronze Gloss Smooth	2DR	Dual Driver	WIR	LightGRID+ In-Fixture Module [4,5]
AAU	Adjustable arm for pole mounting (universal drill pattern)	GTT	Graphite Matte Textured	TE	Tooless Entry	WIRSC	LightGRID+ Module and Occupancy Sensor [4,5]
AA_U	Adjustable arm mount for round pole [3]	LGS	Light Grey Gloss Smooth	BC	Backlight Control	**Stand Alone Sensors**	
ADU	Decorative upswept Arm (universal drill pattern)	LGT	Light Grey Gloss Textured	TB	Terminal Block	BTS-14F	Bluetooth® Programmable, BTSMP-LMO PIR Occupancy Sensor with Automatic Dimming Photocell and 360° Lens
AD_U	Decorative upswept arm mount for round pole [3]	PSS	Platinum Silver Smooth			BTS-40F	Bluetooth® Programmable, BTSMP-HMO PIR Occupancy Sensor with Automatic Dimming® Photocell and 360° Lens
MAF	Mast arm fitter for 2-3/8" OD horizontal arm	WHT	White Matte Textured			BTSO-12F	Bluetooth® Programmable, BTSMP-OMNI-O PIR Occupancy Sensor with Automatic Dimming Photocell and 360° Lens
K	Knuckle	WHS	White Gloss Smooth			7PR	7-Pin Receptacle [4]
T	Trunnion	VGT	Verde Green Textured			7PR-SC	7-Pin Receptacle with shorting cap [4]
WB	Wall Bracket, horizontal tenon with MAF	**Color Option**				3PR	3-Pin twist lock [4]
WM	Wall mount bracket with decorative upswept arm	CC	Custom Color			3PR-SC	3-Pin receptacle with shorting cap [4]
WA	Wall mount bracket with adjustable arm					3PR-TL	3-Pin PCR with photocontrol [4]
						Programmed Controls	
						SCP-_F	Sensor Control Programmable, 8F or 40F [11]
						ADD	AutoDim Timer Based Dimming [4]
						ADT	AutoDim Time of Day Dimming [4]
						Photocontrols	
						PC	Button Photocontrol [4,7]

1 – Items with a grey background can be done as a custom order. Contact brand representative for more information
2 – Battery temperature rating -20C to 55C
3 – Replace "_" with "3" for 3.5"-4.13" OD pole, "4" for 4.18"-5.25" OD pole, "5" for 5.5"-6.5" OD pole
4 – Networked Controls cannot be combined with other control options
5 – Not available with 2PF option
6 – Not available with 480V
7 – Not available with 347 or 480V
8 – Not available with Dual Driver option
9 – Only available in Size 1 housing, up to 105 Watts
10 – Some voltage restrictions may apply when combined with controls
11 – At least one SCPREMOTE required to program SCP motion sensor. Must select 8ft or 40ft.

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VIPER Area/Site

VIPER LUMINAIRE

DATE: | LOCATION:

TYPE: AA4 | PROJECT: Texas Roadhouse

CATALOG #: VP-1-160L-135-4K7-2-UNV-A-DBT

ORDERING GUIDE (CONT'D)

CATALOG #

Accessory Type		Size		Option		Color	
SHD	Shield	1	Size 1	HSS-90-B	House Side Shield 90° Back	BLS	Black Gloss Smooth
		2	Size 2	HSS-90-F	House Side Shield 90° Front	BLT	Black Matte Textured
		3	Size 3	HSS-90-S	House Side Shield 90° Side	DBS	Dark Bronze Gloss Smooth
		4	Size 4	HSS-270-BSS	House Side Shield 270° Back/Side/Side	DBT	Dark Bronze Matte Textured
				HSS-270-FSS	House Side Shield 270° Front/Side/Side	GTT	Graphite Matte Textured
				HSS-270-FSB	House Side Shield 270° Front/Side/Back	LGS	Light Gray Gloss Smooth
				HSS-360	House Side Shield 360°	PSS	Platinum Silver Smooth
				BC	Back Light Control	WHS	White Gloss Smooth
MTG	Mounting			A	Arm Mount for square pole/flat surface	WHT	White Matte Textured
				ASQU	Universal Arm Mount for square pole	VGT	Green Landscape Decorative
				AAU	Adjustable Arm for pole mounting	LEG	Legacy Colors
				ADU	Decorative upswept Arm	**Color Option**	
				RPA	Round Pole Adapter	CC	Custom Color
				MAF	Mast Arm Fitter for 2-3/8" OD horizontal arm		
				K	Knuckle		
				T	Trunnion		
				WB	Wall Bracket (compatible with universal arm mounts)		

Accessory Type		Option	
MSC	Miscellaneous	BIRD SPK	Bird Spike

Current Control Solutions — Accessories (Sold Separately)

NX Lighting Controls

☐ **NXOFM-1R1D-UNV** — On-fixture Module (7-pin), On / Off / Dim, Daylight Sensor with NX Radio and Bluetooth® Radio, 120–480VAC

LightGRID+ Lighting Control

☐ **WIR-RME-L** — On-fixture Module (7-pin or 5-pin), On / Off / Dim, Daylight Sensor with LightGRID+ Radio, 110–480VAC

☐ **SCP-REMOTE** — Remote Control for SCP/_F option. Order at least one per project to program and control the occupancy sensor

For additional information related to these accessories please visit currentlighting.com/beacon. Options provided for use with integrated sensor, please view specification sheet ordering information table for details.

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DATE: LOCATION:

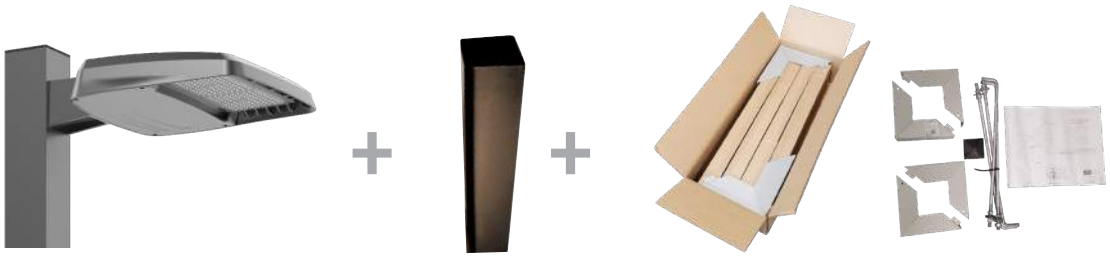
TYPE: PROJECT:

CATALOG #:

VIPER Area/Site

VIPER LUMINAIRE

VIPER POLE EXPRESS COMBO – ORDERING GUIDE



Catalog Number	Pole	Single or Double Head	Fixture	Lumens*	Wattage	Distribution	CCT/CRI	Mounting	Finish
VP-1-160-4K-3-LS-S20	**20' Square Straight Steel**	Single	**VP-1-160-4K-3-LS**	19584	158W	Type 3	4000K/70CRI	Universal Arm	Dark Bronze Textured
VP-1-160-4K-3-LS-S20-2X	**20' Square Straight Steel**	Double	**VP-1-160-4K-3-LS**	19584	158W	Type 3	4000K/70CRI	Universal Arm	Dark Bronze Textured
VP-1-160-4K-4F-LS-S20	**20' Square Straight Steel**	Single	**VP-1-160-4K-4F-LS**	19426	158W	Type 4F	4000K/70CRI	Universal Arm	Dark Bronze Textured
VP-1-160-4K-4F-LS-S20-2X	**20' Square Straight Steel**	Double	**VP-1-160-4K-4F-LS**	19426	158W	Type 4F	4000K/70CRI	Universal Arm	Dark Bronze Textured
VP-1-160-4K-3-LS-S25	**25' Square Straight Steel**	Single	**VP-1-160-4K-3-LS**	19584	158W	Type 3	4000K/70CRI	Universal Arm	Dark Bronze Textured
VP-1-160-4K-3-LS-S25-2X	**25' Square Straight Steel**	Double	**VP-1-160-4K-3-LS**	19584	158W	Type 3	4000K/70CRI	Universal Arm	Dark Bronze Textured
VP-1-160-4K-4F-LS-S25	**25' Square Straight Steel**	Single	**VP-1-160-4K-4F-LS**	19426	158W	Type 4F	4000K/70CRI	Universal Arm	Dark Bronze Textured
VP-1-160-4K-4F-LS-S25-2X	**25' Square Straight Steel**	Double	**VP-1-160-4K-4F-LS**	19426	158W	Type 4F	4000K/70CRI	Universal Arm	Dark Bronze Textured
VP-1-160-5K-3-LS-S20	**20' Square Straight Steel**	Single	**VP-1-160-5K-3-LS**	19499	158W	Type 3	5000K/70CRI	Universal Arm	Dark Bronze Textured
VP-1-160-5K-3-LS-S20-2X	**20' Square Straight Steel**	Double	**VP-1-160-5K-3-LS**	19499	158W	Type 3	5000K/70CRI	Universal Arm	Dark Bronze Textured
VP-1-160-5K-4F-LS-S20	**20' Square Straight Steel**	Single	**VP-1-160-5K-4F-LS**	19186	158W	Type 4F	5000K/70CRI	Universal Arm	Dark Bronze Textured
VP-1-160-5K-4F-LS-S20-2X	**20' Square Straight Steel**	Double	**VP-1-160-5K-4F-LS**	19186	158W	Type 4F	5000K/70CRI	Universal Arm	Dark Bronze Textured
VP-1-160-5K-3-LS-S25	**25' Square Straight Steel**	Single	**VP-1-160-5K-3-LS**	19499	158W	Type 3	5000K/70CRI	Universal Arm	Dark Bronze Textured
VP-1-160-5K-3-LS-S25-2X	**25' Square Straight Steel**	Double	**VP-1-160-5K-3-LS**	19499	158W	Type 3	5000K/70CRI	Universal Arm	Dark Bronze Textured
VP-1-160-5K-4F-LS-S25	**25' Square Straight Steel**	Single	**VP-1-160-5K-4F-LS**	19186	158W	Type 4F	5000K/70CRI	Universal Arm	Dark Bronze Textured
VP-1-160-5K-4F-LS-S25-2X	**25' Square Straight Steel**	Double	**VP-1-160-5K-4F-LS**	19186	158W	Type 4F	5000K/70CRI	Universal Arm	Dark Bronze Textured

VIPER POLE EXPRESS COMBO – STOCK LUMINAIRE SKUS

Catalog Number	Lumens	LPW	Distribution	Wattage	CCT/CRI	Voltage	Mounting	Finish
VP-1-160-4K-3-LS	19584	123.9	3	158W	4000K/70CRI	120-277V	Universal Arm with RPA (A3U)	Dark Bronze Textured
VP-1-160-4K-4F-LS	19426	122.9	4F	158W	4000K/70CRI	120-277V	Universal Arm with RPA (A3U)	Dark Bronze Textured
VP-1-160-5K-3-LS	19499	123.4	3	158W	5000K/70CRI	120-277V	Universal Arm with RPA (A3U)	Dark Bronze Textured
VP-1-160-5K-4F-LS	19186	121.4	4F	158W	5000K/70CRI	120-277V	Universal Arm with RPA (A3U)	Dark Bronze Textured

VIPER POLE EXPRESS COMBO – ACCESSORIES

Catalog Number	Description
VM14DB	Vibration Dampener, mounts to top of pole for reduced vibration



VM14DB

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VIPER Area/Site

VIPER LUMINAIRE

DATE: | LOCATION:

TYPE: AA4 | PROJECT: Texas Roadhouse

CATALOG #: VP-1-160L-135-4K7-2-UNV-A-DBT

OUTDOOR LIGHTING CONTROLS OPTIONS

CONTROLS FUNCTIONALITY

LIGHTGRID+

	Control Option Ordering Logic & Description		Control Option Functionality									Control Option Components	
			Networkable	Grouping	Scheduling	Occupancy/ Motion	Daylight Harvesting	0-10V Dimming	On/Off Control	Bluetooth App Programming	Sensor Height		
NX Wireless	NXOFM1R1D-UNV	NX 7-Pin Twist-Lock® with NX Networked Wireless Radio, Integral Automatic Dimming Photocell, Integral Single Pole Relay with Dimming, and Bluetooth Programming	✓	✓	✓	Paired with external control	✓	✓	✓	✓	–		NXOFM-1R1D-UV
NX Wireless	NXW	NX Networked Wireless Radio Module NXRM2 and Bluetooth Programming, without Sensor	✓	✓	✓	–	–	✓	✓	✓	–		NXRM2-H
NX Wireless	NXWS12F	NX Networked Wireless Enabled Integral NXSMP2-OMNI-O PIR Occupancy Sensor with Automatic Dimming Photocell and Bluetooth Programming	✓	✓	✓	✓	✓	✓	✓	✓	12ft		NXSMP2-OMNI-O
NX Wireless	NXWS16F	NX Networked Wireless Enabled Integral NXSMP2-LMO PIR Occupancy Sensor with Automatic Dimming Photocell and Bluetooth Programming	✓	✓	✓	✓	✓	✓	✓	✓	16ft		NXSMP2-LMO
NX Wireless	NXWS40F	NX Networked Wireless Enabled Integral NXSMP2-HMO PIR Occupancy Sensor with Automatic Dimming Photocell and Bluetooth Programming	✓	✓	✓	✓	✓	✓	✓	✓	40ft		NXSMP2-HMO
LightGRID+	WIR	LightGRID+ In-Fixture Module	✓	–	✓	–	–	✓	✓	Gateway	–		WIR
LightGRID+	WIR-RME-L	LightGRID+ On Fixture Module	✓	–	✓	–	–	✓	✓	Gateway	–		WIR-RME-L
LightGRID+	WIRSC	LightGRID+ Module and Occupancy Sensor	✓	✓	✓	✓	✓	✓	✓	Gateway	14ft - 40ft		BTMSP
Independent	BTSO-12F	Bluetooth® Programmable, BTSMP-OMNI-O PIR Occupancy Sensor with Automatic Dimming Photocell and 360° Lens	–	–	–	✓	✓	✓	✓	✓	12ft		BTSMP-OMNI-O
Independent	BTS-14F	Bluetooth® Programmable, BTSMP-LMO PIR Occupancy Sensor with Automatic Dimming Photocell and 360° Lens	–	–	–	✓	✓	✓	✓	✓	14ft		BTSMP-LMO
Independent	BTS-40F	Bluetooth® Programmable, BTSMP-HMO PIR Occupancy Sensor with Automatic Dimming Photocell and 360° Lens	–	–	–	✓	✓	✓	✓	✓	40ft		BTSMP-HMO

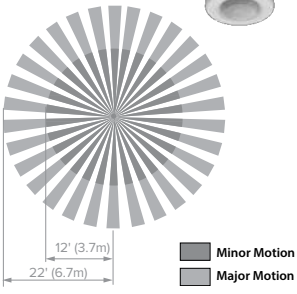
DEFAULT SETTINGS

NX Wireless	
Occupancy Sensor	Enabled
Occupancy Sensor Sensitivity	7
Occupancy Sensor Timeout	15 Minutes
Occupied Dim Level	100%
Unoccupied Dim Level	0%
Daylight Sensor	Disabled
Bluetooth	Enabled
2.4GHz Wireless Mesh	On
"Passcode Factory Passcode: HubbN3T!"	Enabled

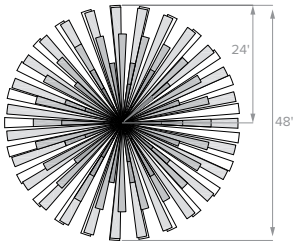
Stand Alone	
Occupancy Sensor	Enabled
Occupancy Sensor Sensitivity	7
Occupancy Sensor Timeout	8 Minutes
Occupied Dim Level	100%
Unoccupied Dim Level	50%
Daylight Sensor	Disabled

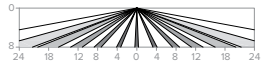
NX WIRELESS COVERAGE PATTERNS

NXSMP2-OMNI



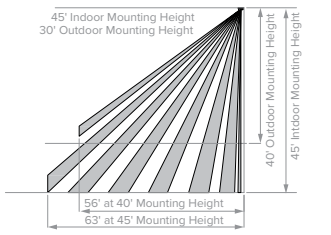
NXSMP2-LMO





Sensor Lens Coverage and Detection Patterns When Mounted at 8ft with Low Mount Lens

NXSMP2-HMO



Sensor Lens Coverage and Detection Patterns When Mounted at 40ft and 45ft with Standard Lens

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BEACON
design . performance . technology

VIPER Area/Site

VIPER LUMINAIRE

DATE: | LOCATION:

TYPE: AA4 | PROJECT: Texas Roadhouse

CATALOG #: VP-1-160L-135-4K7-2-UNV-A-DBT

NX LIGHTING CONTROLS FREE APP



The NX Lighting Controls App is free to use mobile application for programming both NX Lighting Controls System or Standalone Bluetooth Sensors. The mobile app allows you to configure devices, discover and setup wireless enable luminiares and program NX system settings.

Apple App: https://apps.apple.com/us/app/nx-lighting-controls/id962112904

Google Play: https://play.google.com/store/apps/details?id=io.cordova.NXBTR&hl=en_US&gl=US

Apple App

Google Play

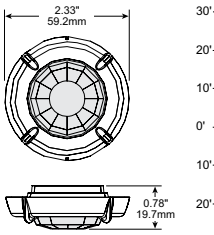
CONTROLS TECH SUPPORT 800-888-8006 (7:00 AM - 7:00 PM)

OUTDOOR LIGHTING CONTROLS OPTIONS

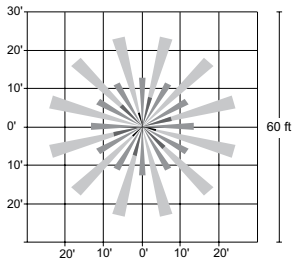
CONTROLS FUNCTIONALITY

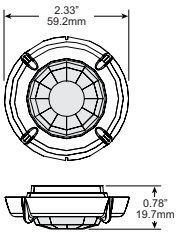
	Control Option Ordering Logic & Description		Control Option Functionality									Control Option Components
			Networkable	Grouping	Scheduling	Occupancy/ Motion	Daylight Harvesting	0-10V Dimming	On/Off Control	Bluetooth App Programming	Sensor Height	
Independent	SCP_F	Sensor Control Programmable, 8F or 40F	–	–	–	✓	✓	✓	✓	–	8ft or 40ft	SCP_F
	ADD	AutoDIM Timer Based Dimming	–	–	✓	–	–	–	✓	–	–	ADD
	ADT	AutoDIM Time of Day Dimming	–	–	✓	–	–	–	✓	–	–	ADT
	7PR	7-Pin Receptacle	–	–	Paired with external control	–	Paired with external control	–	Paired with external control	–	–	7PR
	7PR-SC	7-Pin Receptacle with shorting cap	–	–	–	–	–	–	–	–	–	7PR-SC
	3PR	3-Pin twist lock	–	–	–	–	–	–	Paired with external control	–	–	3PR
	3PR-SC	3-Pin Receptacle with shorting cap	–	–	–	–	–	–	–	–	–	3PR-SC
	3PR-TL	3-Pin with photocontrol	–	–	–	–	✓	–	✓	–	–	3PR-TL

COVERAGE PATTERNS FOR SCP_F

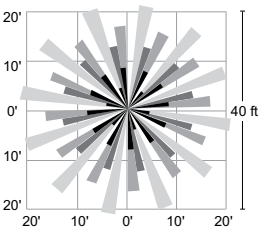


Coverage Top View @ 12ft.

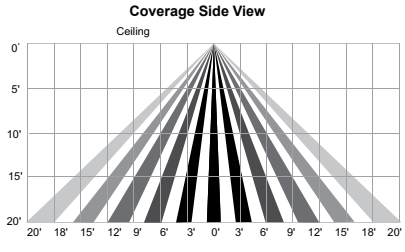




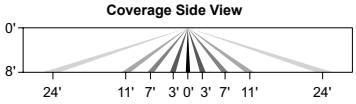
Coverage Top View @ 20 ft.

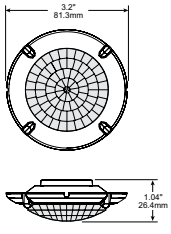


Coverage Side View

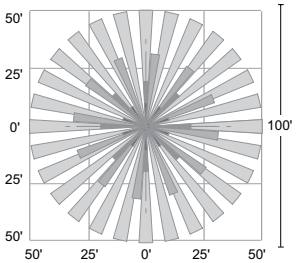


Coverage Side View

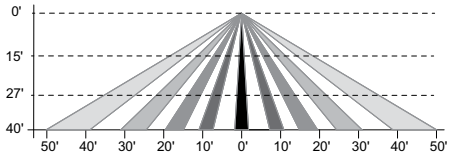




Coverage Top View @40ft



Coverage Side View



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DATE: | LOCATION:

TYPE: AA4 | PROJECT: Texas Roadhouse

CATALOG #: VP-1-160L-135-4K7-2-UNV-A-DBT

VIPER Area/Site

VIPER LUMINAIRE

PROGRAMMED CONTROLS

ADD-AutoDim Timer Based Options

- Light delay options from 1-9 hours after the light is turned on to dim the light by 10-100%. To return the luminaire to its original light level there are dim return options from 1-9 hours after the light has been dimmed previously.

EX: ADD-6-5-R6

ADD Control Options	Configurations Choices	Example Choice Picked
Auto-Dim Options	1-9 Hours	6 - Delay 6 hours
Auto-Dim Brightness	10-100% Brightness	5 - Dim to 50% brightness
Auto-Dim Return	Delay 0-9 Hours	R6 - Return to full output after 6 hours

ADT-AutoDim Time of Day Based Option

- Light delay options from 1AM-9PM after the light is turned on to dim the light by 10-100%. To return the luminaire to its original light level there are dim return options from 1AM-9PM after the light has been dimmed previously.

EX: ADT-6-5-R6

ADD Control Options	Configurations Choices	Example Choice Picked
Auto-Dim Options	12-3 AM and 6-11 PM	6 - Dim at 6PM
Auto-Dim Brightness	10-100% Brightness	5 - Dim to 50%
Auto-Dim Return	12-6 AM and 9-11P	R6 - Return to full output at 6AM

DELIVERED LUMENS

For delivered lumens, please see Lumens Data PDF on www.Currentlighting.com

PROJECTED LUMEN MAINTENANCE

Ambient Temp.	0	25,000	*TM-21-11 36,000	50,000	100,000	Calculated L_{70} (Hours)
25°C / 77°F	1.00	0.97	0.96	0.95	0.91	408,000
40°C / 104°F	0.99	0.96	0.95	0.94	0.89	356,000

LUMINAIRE AMBIENT TEMPERATURE FACTOR (LATF)

Ambient Temperature		Lumen Multiplier
0°C	32°F	1.03
10°C	50°F	1.01
20°C	68°F	1.00
25°C	77°F	1.00
30°C	86°F	0.99
40°C	104°F	0.98

Micro Strike Lumen Multiplier			
CCT	70 CRI	80 CRI	90 CRI
2700K	–	0.841	–
3000K	0.977	0.861	0.647
3500K	–	0.900	–
4000K	1	0.926	0.699
5000K	1	0.937	0.791
AP-Amber Phosphor Converted Multiplier			
Amber	0.710		

Strike Lumen Multiplier			
CCT	70 CRI	80 CRI	90 CRI
2700K	0.9	0.81	0.62
3000K	0.933	0.853	0.659
3500K	0.959	0.894	0.711
4000K	1	0.9	0.732
5000K	1	0.9	0.732
Monochromatic Amber Multiplier			
Amber	See Amber Spec Sheet		

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VIPER Area/Site

VIPER LUMINAIRE

DATE: | LOCATION:

TYPE: AA4 | PROJECT: Texas Roadhouse

CATALOG #: VP-1-160L-135-4K7-2-UNV-A-DBT

ELECTRICAL DATA: MICRO STRIKE

# OF LEDS	160						
NOMINAL WATTAGE	35	50	75	100	115	135	160
SYSTEM POWER (W)	34.9	50.5	72.1	97.2	111.9	132.2	157.8
INPUT VOLTAGE (V)	CURRENT (Amps)						
120	0.29	0.42	0.63	0.83	0.96	1.13	1.33
208	0.17	0.24	0.36	0.48	0.55	0.65	0.77
240	0.15	0.21	0.31	0.42	0.48	0.56	0.67
277	0.13	0.18	0.27	0.36	0.42	0.49	0.58
347	0.10	0.14	0.22	0.29	0.33	0.39	0.46
480	0.07	0.10	0.16	0.21	0.24	0.28	0.33

# OF LEDS	320						
NOMINAL WATTAGE	145	170	185	210	235	255	315
SYSTEM POWER (W)	150	166.8	185.7	216.2	240.9	261.5	312
INPUT VOLTAGE (V)	CURRENT (Amps)						
120	1.21	1.42	1.54	1.75	1.96	2.13	2.63
208	0.70	0.82	0.89	1.01	1.13	1.23	1.51
240	0.60	0.71	0.77	0.88	0.98	1.06	1.31
277	0.52	0.61	0.67	0.76	0.85	0.92	1.14
347	0.42	0.49	0.53	0.61	0.68	0.73	0.91
480	0.30	0.35	0.39	0.44	0.49	0.53	0.66

# OF LEDS	480					
NOMINAL WATTAGE	285	320	340	390	425	470
SYSTEM POWER (W)	286.2	316.7	338.4	392.2	423.2	468
INPUT VOLTAGE (V)	CURRENT (Amps)					
120	2.38	2.67	2.83	3.25	3.54	3.92
208	1.37	1.54	1.63	1.88	2.04	2.26
240	1.19	1.33	1.42	1.63	1.77	1.96
277	1.03	1.16	1.23	1.41	1.53	1.70
347	0.82	0.92	0.98	1.12	1.22	1.35
480	0.59	0.67	0.71	0.81	0.89	0.98

# OF LEDS	720				
NOMINAL WATTAGE	435	475	515	565	600
SYSTEM POWER (W)	429.3	475	519.1	565.2	599.9
INPUT VOLTAGE (V)	CURRENT (Amps)				
120	3.63	3.96	4.29	4.71	5.00
208	2.09	2.28	2.48	2.72	2.88
240	1.81	1.98	2.15	2.35	2.50
277	1.57	1.71	1.86	2.04	2.17
347	1.25	1.37	1.48	1.63	1.73
480	0.91	0.99	1.07	1.18	1.25

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DATE: | LOCATION:

TYPE: AA4 | PROJECT: Texas Roadhouse

CATALOG #:

VIPER Area/Site

VIPER LUMINAIRE

ELECTRICAL DATA: STRIKE

# OF LEDS	36				
NOMINAL WATTAGE	39	55	85	105	120
SYSTEM POWER (W)	39.6	56.8	83.6	108.2	120.9
INPUT VOLTAGE (V)	CURRENT (Amps)				
120	0.33	0.46	0.71	0.88	0.96
208	0.19	0.26	0.41	0.50	0.55
240	0.16	0.23	0.35	0.44	0.48
277	0.14	0.20	0.31	0.38	0.42
347	0.11	0.16	0.24	0.30	0.33
480	0.08	0.11	0.18	0.22	0.24

# OF LEDS	72				
NOMINAL WATTAGE	115	145	180	210	240
SYSTEM POWER (W)	113.7	143.2	179.4	210.2	241.7
INPUT VOLTAGE (V)	CURRENT (Amps)				
120	1.00	1.21	1.50	1.75	1.79
208	0.58	0.70	0.87	1.01	1.03
240	0.50	0.60	0.75	0.88	0.90
277	0.43	0.52	0.65	0.76	0.78
347	0.35	0.42	0.52	0.61	0.62
480	0.25	0.30	0.38	0.44	0.45

# OF LEDS	108				
NOMINAL WATTAGE	215	250	280	325	365
SYSTEM POWER (W)	214.8	250.8	278.3	324.7	362.6
INPUT VOLTAGE (V)	CURRENT (Amps)				
120	2.00	2.08	2.33	3.04	2.67
208	1.15	1.20	1.35	1.75	1.54
240	1.00	1.04	1.17	1.52	1.33
277	0.87	0.90	1.01	1.32	1.16
347	0.69	0.72	0.81	1.05	0.92
480	0.50	0.52	0.58	0.76	0.67

# OF LEDS		162				
NOMINAL WATTAGE	320	365	405	445	485	545
SYSTEM POWER (W)	322.1	362.6	403.6	445.1	487.1	543.9
INPUT VOLTAGE (V)		CURRENT (Amps)				
120	2.71	2.67	3.38	3.71	4.04	4.54
208	1.56	1.54	1.95	2.14	2.33	2.62
240	1.35	1.33	1.69	1.85	2.02	2.27
277	1.17	1.16	1.46	1.61	1.75	1.97
347	0.94	0.92	1.17	1.28	1.40	1.57
480	0.68	0.67	0.84	0.93	1.01	1.14

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VIPER Area/Site

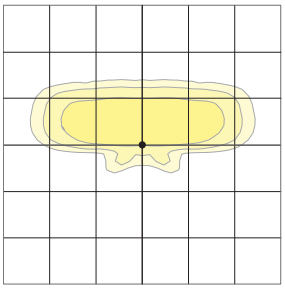
VIPER LUMINAIRE

DATE:	LOCATION:
TYPE: AA4	PROJECT: Texas Roadhouse
CATALOG #: VP-1-160L-135-4K7-2-UNV-A-DBT	

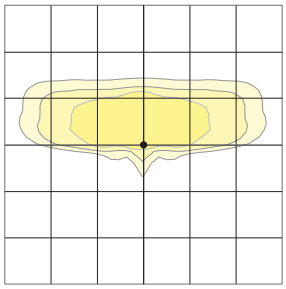
MICRO STRIKE PHOTOMETRY

The following diagrams represent the general distribution options offered for this product. For detailed information on specific product configurations, see website photometric test reports.

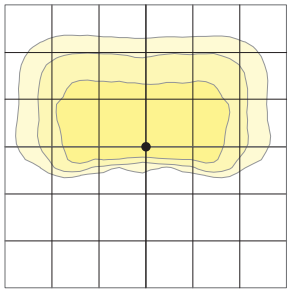
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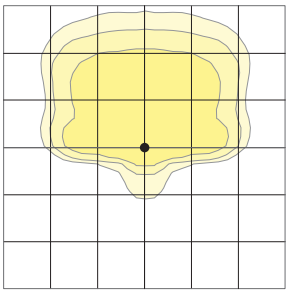
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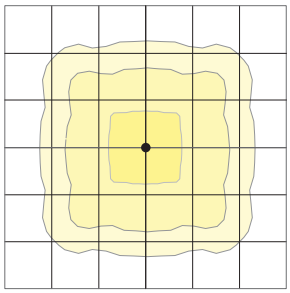
Type 4 Wide



Type 4F



Type 5QW



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VIPER Area/Site

VIPER LUMINAIRE

DATE: | LOCATION:

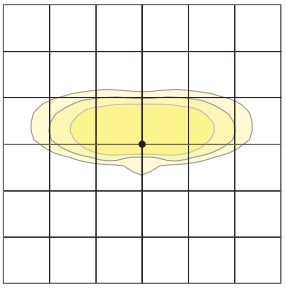
TYPE: AA4 | PROJECT: Texas Roadhouse

CATALOG #: VP-1-160L-135-4K7-2-UNV-A-DBT

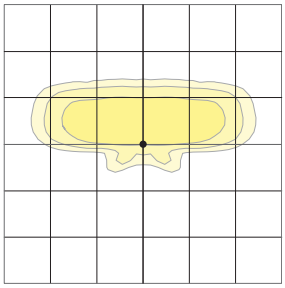
OPTIC STRIKE PHOTOMETRY

The following diagrams represent the general distribution options offered for this product. For detailed information on specific product configurations, see website photometric test reports.

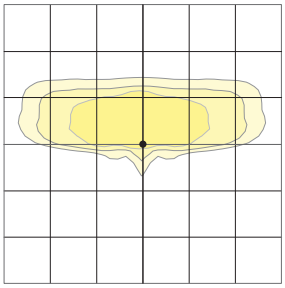
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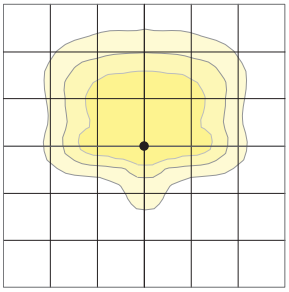
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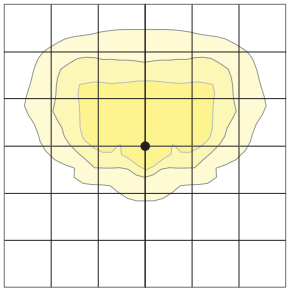
Type 3



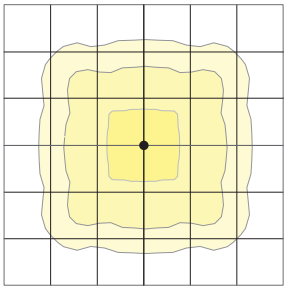
Type 4 Forward



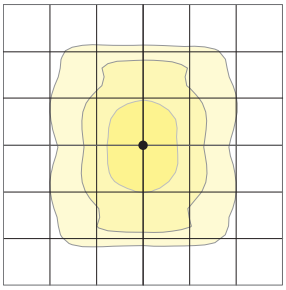
Type 4 Wide



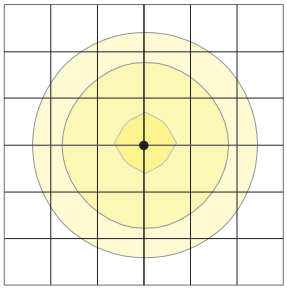
Type 5QM



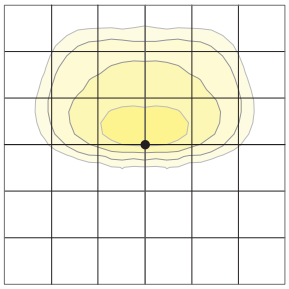
Type 5RW (rectangular)



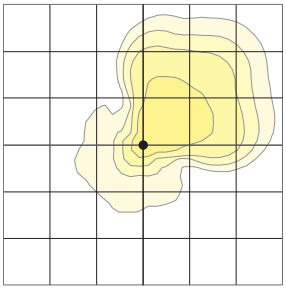
Type 5W (round wide)



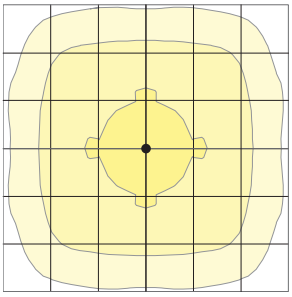
Type TC



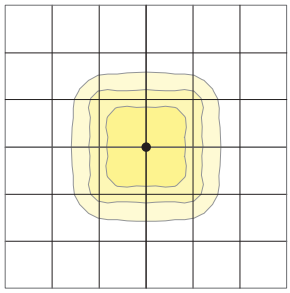
Type Corner



Type 5QW



Type 5QN



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BEACON
design . performance . technology

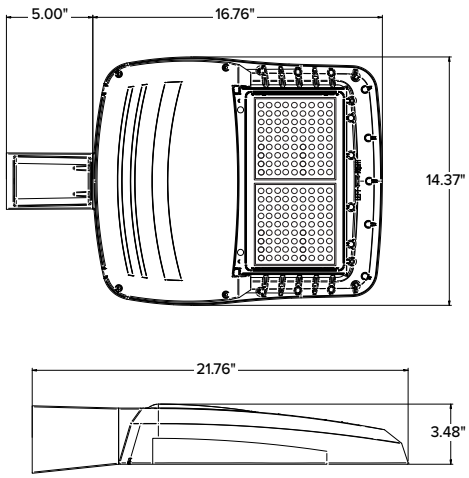
VIPER Area/Site

VIPER LUMINAIRE

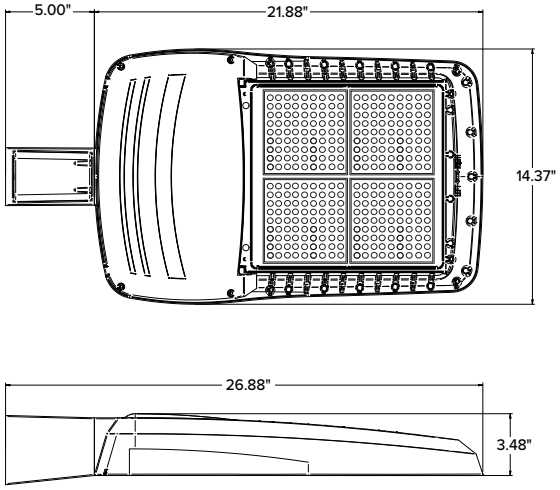
DATE:	LOCATION:
TYPE: AA4	PROJECT: Texas Roadhouse
CATALOG #: VP-1-160L-135-4K7-2-UNV-A-DBT	

DIMENSIONS

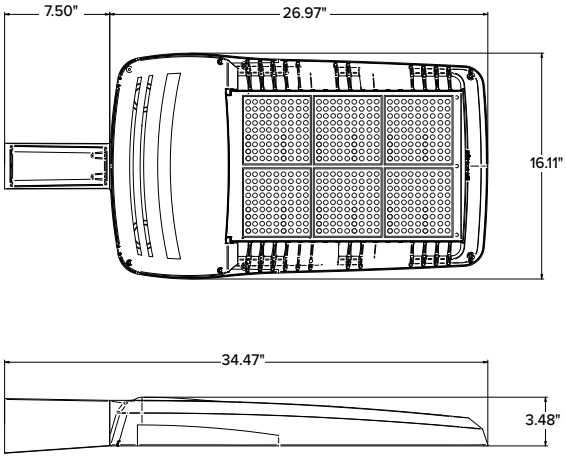
SIZE 1



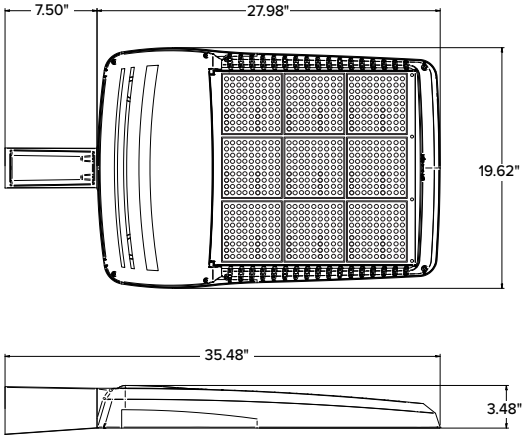
SIZE 2



SIZE 3



SIZE 4



	EPA				
	VP1 (Size 1)	VP2 (Size 2)	VP3 (Size 3)	VP4 (Size 4)	Config.
Single Fixture	0.454	0.555	0.655	0.698	
Two at 180	0.908	1.110	1.310	1.396	
Two at 90	0.583	0.711	0.857	0.948	
Three at 90	1.037	1.266	1.512	1.646	
Three at 120	0.943	1.155	1.392	1.680	
Four at 90	1.166	1.422	1.714	1.896	

	Weight	
	lbs	kgs
VP1 (Size 1)	13.7	6.2
VP2 (Size 2)	16.0	7.26
VP3 (Size 3)	25.9	11.7
VP4 (Size 4)	30.8	13.9

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VIPER Area/Site

VIPER LUMINAIRE

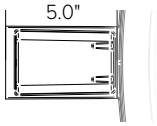
DATE:	LOCATION:
TYPE: AA4	PROJECT: Texas Roadhouse
CATALOG #: VP-1-160L-135-4K7-2-UNV-A-DBT	

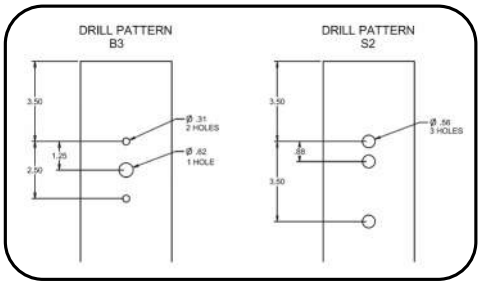
MOUNTING



A–STRAIGHT ARM MOUNT

Fixture ships with integral arm for ease of installation. Compatible with Current Outdoor B3 drill pattern for ease of installation on square poles. For round poles add applicable suffix (2/3/4/5)

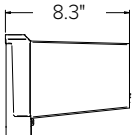


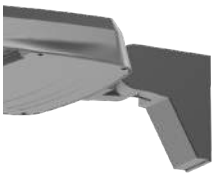




ASQU–UNIVERSAL ARM MOUNT

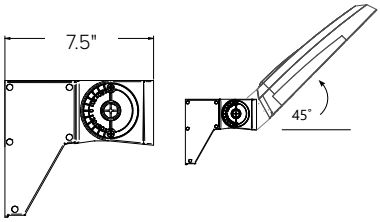
Universal mounting block for ease of installation. Compatible with drill patterns from 1.5" to 5.25" and Current drill pattern S2. For round poles add applicable suffix (2/3/4/5)





AAU–ADJUSTABLE ARM FOR POLE MOUNTING

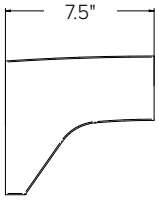
Rotatable arm mounts directly to pole. Compatible with drill patterns from 1.5" to 5.25" and Current drill pattern S2 and B3. For round poles add applicable suffix (2/3/4/5). Rotatable in 5˚ aiming angle increments. Micro Strike configurations have a 45° aiming limitation. Strike configurations have a 30° aiming limitation.





ADU–DECORATIVE UPSWEPT ARM

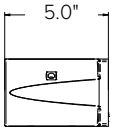
Upswept Arm compatible with drill patterns from 1.5" to 5.25" and Current drill pattern S2. For round poles add applicable suffix (2/3/4/5).

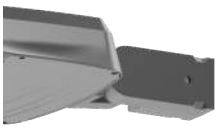




MAF–MAST ARM FITTER

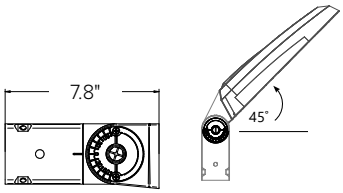
Fits 2-3/8" OD horizontal tenons.

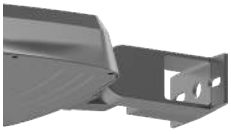




K–KNUCKLE

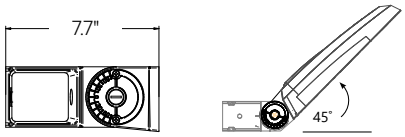
Rotatable in 5-degree aiming angle increments, fits 2-3/8" tenons or pipes. Micro Strike configurations have a 45° aiming limitation. Strike configurations have a 30° aiming limitation.





T–TRUNNION

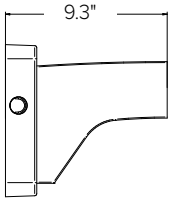
Trunnion for surface and crossarm mounting using (1) 3/4" or (2) 1/2" size through bolts. Micro Strike configurations have a 45° aiming limitation. Strike configurations have a 30° aiming limitation.





WM–WALL MOUNT

Compatible with universal arm mount, adjustable arm mount, and decorative arm mount. The WA option uses the same wall bracket but replaces the decorative arm with an adjustable arm.



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VIPER Area/Site

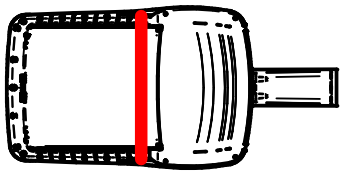
VIPER LUMINAIRE

ADDITIONAL INFORMATION (CONTINUED)

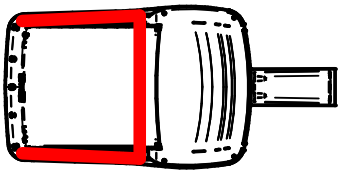
HOUSE SIDE SHIELD FIELD INSTALL ACCESSORIES

HSS has a depth of 5" for all Viper sizes
Not to be used with Occupancy Sensors as the shield may block the light to the sensor.

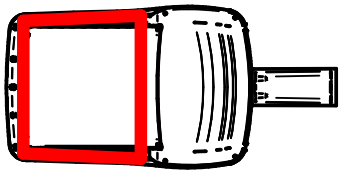
VPR2x HSS-90-B-xx



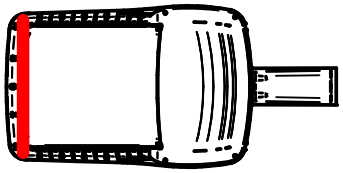
VPR2x HSS-270-BSS-xx



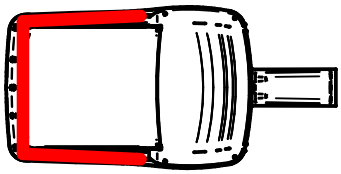
VPR2x HSS-360-xx



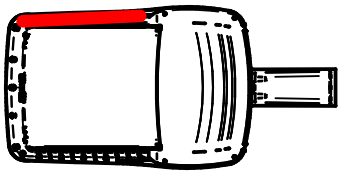
VPR2x HSS-90-F-xx



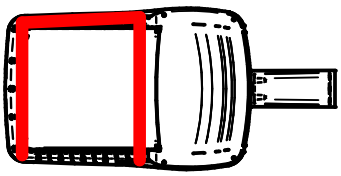
VPR2x HSS-270-FSS-xx



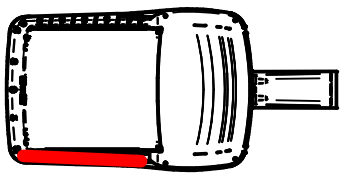
VPR2x HSS-90-S-xx



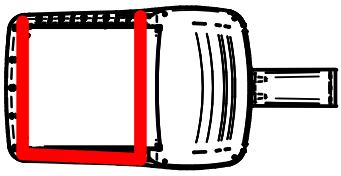
VPR2x HSS-270-FSB-xx



VPR2x HSS-90-S-xx



VPR2x HSS-270-FSB-xx



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SECURITY LIGHTING™

SES Poles

SQUARE STEEL STRAIGHT POLES (SES)

DATE: | LOCATION:

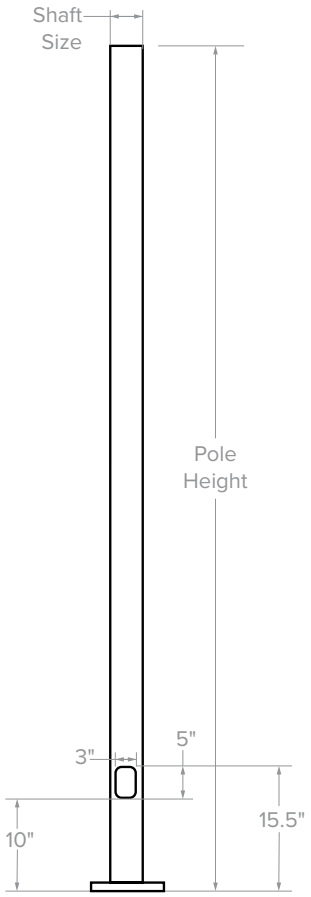
TYPE: AA4 - POLE | PROJECT: Texas Roadhouse

CATALOG #: SES-25-40-01-A-B3-DB

FEATURES

- Square Steel Straight Shaft
- One piece construction
- 2 3/8" OD tenon, Open Top or Factory drilled Side Mount Options available
- Steel Base Plate
- 3 size options for anchor bolts. All anchor bolts fully galvanized with 2 nuts and washer (bolts ordered as separate line item and paper template included as component of anchor bolts)
- Square base cover available (ordered as separate line item)
- Pole finished in weather proof powder coat paint in 4 standard colors
- 3" x 5" Gasketed hand hole standard

POLE DIMENSIONS







Tenon Top Pole

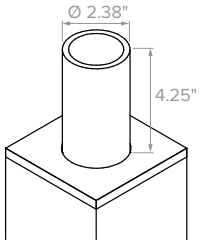


Open Top Pole

SPECIFICATIONS

The Square Steel Straight Pole has been successfully installed in projects of all types for over 30 years and has become the most popular and economical pole option for all site lighting applications including retail, commercial, industrial and residential projects.

The popularity of this series is due to its full offering of sizes, heights and standard colors with complete offering of mounting options, accessories and select styles/colors stocked for immediate shipping.



ORDERING GUIDE

Example: SES-XX-XX-X-XX-X-XX-XX

CATALOG #

SES	–		–		–		–		–		–		–	
Housing		**Height**		**Size**		**Guage**		**Mounting**		**Drilling**		**Coating**		**Color**
SES Square Steel Straight Pole		**18** 18 Feet **20** 20 Feet **22** 22 Feet **25** 25 Feet **28** 28 Feet **30** 30 Feet		**40** 4"x4" Shaft **50** 5"x5" Shaft		**01** 11 Guage .119" thick **07** 7 Guage .179" thick		**TA** 2⅜" OD Tenon[2] **TB** 2⅞" OD Tenon[2] **OT** Open Top Pole **A** Side-Single **B** Side-Double at 90° **C** Side-Double at 180° **D** Side-Triple at 90° **F** Side-Quad at 90°		**Blank** No Drilling **2** Drill Pattern 2 **6** Drill Pattern 6 **26** Drill Pattern 26 **C** Custom Drill Pattern[3] **B3** 2 bolt (2 ½" spacing) Ratio, Viper A arms		**Blank** None **GL** Galvanized[1]		**DB** Dark Bronze **WH** White **BL** Black **PS** Platinum Silver

Notes:

1 All Non-stocked galvanized poles have an 8-10 week lead time

2 Tenon 4.25" tall

Note: Anchor bolts, templates and bolt covers are ordered as separate line items and material part numbers are listed with the accessories.
Note: Custom Pole heights available, just note required height (pole will be cut down to required height from next tallest pole heights offered)

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SECURITY LIGHTING™

SES Poles

SQUARE STEEL STRAIGHT POLES (SES)

DATE: | LOCATION:

TYPE: AA4 - POLE | PROJECT: Texas Roadhouse

CATALOG #: SES-25-40-01-A-B3-DB

ORDERING INFORMATION CONTD.

Catalog Number	Pole Ht.		Nominal Shaft Dim.	Wind Load Rating- ASCE 7-05 wind map EPA Load Rating-(3 second gust wind speeds)										Wall Thick.	Bolt Circle (Sug.)	Bolt Circle	Bolt Sq.	Base Plate (sq.)	Anchor Bolt Size	Bolt Proj.	Pole Wt. (lbs.)
	ft	m		85 MPH	90 MPH	100 MPH	105 MPH	110 MPH	120 MPH	130 MPH	140 MPH	145 MPH	150 MPH								
SES-10-40-01-XX-XX	10	3.0	4"	25.0	25.0	25.0	22.8	20.6	17.0	14.2	11.9	11.0	10.1	0.125"	11"	8-11"	5.6-7.8"	10.25 x 0.75"	3/4 x 30 x 3"	4"	77
SES-10-50-01-XX-XX	10	3.0	5"	25.0	25.0	25.0	25.0	25.0	23.0	19.1	16.0	14.7	13.5	0.125"	11"	10-13.5"	7.1-9.5"	12" x 1"	1 x 36 x 4"	4"	
SES-12-40-01-XX-XX	12	3.7	4"	25.0	25.0	20.0	18.0	16.1	13.2	10.8	8.9	8.1	7.4	0.125"	11"	8-11"	5.6-7.8"	10.25 x 0.75"	3/4 x 30 x 3"	4"	90
SES-12-50-01-XX-XX	12	3.7	5"	25.0	25.0	25.0	24.0	21.8	17.8	14.5	12.1	11.0	10.0	0.125"	11"	10-13.5"	7.1-9.5"	12" x 1"	1 x 36 x 4"	4"	
SES-14-40-01-XX-XX	14	4.3	4"	23.1	20.4	16.1	14.3	12.8	10.2	8.2	6.6	5.9	5.3	0.125"	11"	8-11"	5.6-7.8"	10.25 x 0.75"	3/4 x 30 x 3"	4"	103
SES-16-40-01-XX-XX	16	4.9	4"	19.0	16.7	13.0	11.5	10.1	7.9	6.2	4.7	4.1	3.6	0.125"	11"	8-11"	5.6-7.8"	10.25 x 0.75"	3/4 x 30 x 3"	4"	116
SES-16-50-07-XX-XX	16	4.9	5"	25.0	25.0	26.0	25.0	24.8	20.1	16.5	13.6	12.3	11.2	0.188"	11"	10-13.5"	7.1-9.5"	12" x 1"	1 x 36 x 4"	4"	219
SES-18-40-01-XX-XX	18	5.5	4"	15.6	13.6	10.0	9.0	7.8	5.9	4.4	3.1	2.6	2.1	0.125"	11"	8-11"	5.6-7.8"	10.25 x 0.75"	3/4 x 30 x 3"	4"	129
SES-18-50-07-XX-XX	18	5.5	5"	25.0	25.0	25.0	22.9	20.4	16.4	13.2	10.7	9.6	8.6	0.188"	11"	10-13.5"	7.1-9.5"	12" x 1"	1 x 36 x 4"	4"	243
SES-20-40-01-XX-XX	20	6.1	4"	12.7	10.9	7.9	6.9	5.9	4.2	2.8	1.7	1.3	0.9	0.125"	11"	8-11"	5.6-7.8"	10.25 x 0.75"	3/4 x 30 x 3"	4"	142
SES-20-40-7-XX-XX	20	6.1	4"	13.6	11.6	8.5	7.2	6.1	4.4	3	1.9	1.4	1	0.188"	11"	8-11"	5.6-7.8"	11" x 1"	3/4 x 30 x 3"	4"	201
SES-20-50-07-XX-XX	20	6.1	5"	25.0	25.0	21.3	18.9	16.7	13.2	10.4	8.1	7.2	6.3	0.125"	11"	10-13.5"	7.1-9.5"	12" x 1"	1 x 36 x 4"	4"	267
SES-22-50-07-XX-XX	22	6.7	5"	25.0	23.0	17.7	15.5	13.5	10.5	8.0	6.0	5.2	4.4	0.125"	11"	10-13.5"	7.1-9.5"	12" x 1"	1 x 36 x 4"	4"	292
SES-25-40-01-XX-XX	25	7.6	4"	7.3	5.9	3.8	2.9	2.1	0.8	NR	NR	NR	NR	0.125"	11"	8-11"	5.6-7.8"	10.25 x 0.75"	3/4 x 30 x 3"	4"	175
SES-25-40-7-XX-XX	25	7.6	4"	12.8	11.0	7.9	6.7	5.5	3.7	2.3	1.2	0.7	NR	0.188"	11"	8-11"	5.6-7.8"	11" x 1"	3/4 x 30 x 3"	4"	257
SES-25-50-07-XX-XX	25	7.6	5"	20.7	17.8	13.3	11.5	9.8	7.2	5.0	3.3	2.6	1.9	0.125"	11"	10-13.5"	7.1-9.5"	12" x 1"	1 x 36 x 4"	4"	327
SES-28-50-07-XX-XX	27	8.1	5"	16.1	13.7	9.7	8.1	6.7	4.4	2.6	1.1	NR	NR	0.188"	11"	10-13.5"	7.1-9.5"	12" x 1"	1 x 36 x 4"	4"	335
SES-30-40-07-XX-XX	30	9.1	5"	13.5	11.3	7.7	6.2	4.9	2.8	1.1	NR	NR	NR	0.125"	11"	10-13.5"	7.1-9.5"	12" x 1"	1 x 36 x 4"	4"	367
SES-30-50-07-XX-XX	30	9.1	5"	13.5	11.3	7.7	6.2	4.9	2.8	1.1	NR	NR	NR	0.125"	11"	10-13.5"	7.1-9.5"	12" x 1"	1 x 36 x 4"	4"	367

Catalog Number	Florida Building Code 2010 EPA Load Rating (3 second gust wind speeds)									
	85 MPH	90 MPH	100 MPH	105 MPH	110 MPH	120 MPH	130 MPH	140 MPH	145 MPH	150 MPH
SES-10-40-01-XX-XX	25.0	25.0	25.0	25.0	23.5	20.5	17.8	15.5	11.0	10.1
SES-12-40-01-XX-XX	25.0	25.0	25.0	21.9	18.6	15.8	13.6	11.7	8.1	7.4
SES-14-40-01-XX-XX	25.0	25.0	21.1	17.5	14.7	12.3	10.4	8.8	5.9	5.3
SES-16-40-01-XX-XX	23.2	20.9	17.0	13.9	11.4	9.4	7.7	6.3	4.1	3.6
SES-16-50-07-XX-XX	25.0	25.0	25.0	25.0	24.9	21.0	17.9	15.2	12.3	11.2
SES-18-40-01-XX-XX	18.9	16.8	13.5	10.8	8.7	6.9	5.5	4.2	2.6	2.1
SES-18-50-07-XX-XX	25.0	25.0	25.0	24.1	20.0	16.7	13.9	11.6	9.6	8.6
SES-20-40-01-XX-XX	15.3	13.6	10.6	8.3	6.4	4.8	3.5	2.5	1.3	0.9
SES-20-40-07-XX-XX	25.0	24.0	19.6	16.1	13.2	10.8	8.9	7.2	4.3	3.7
SES-20-50-07-XX-XX	25.0	25.0	24.0	19.6	16.0	13.1	10.7	8.7	7.2	6.3
SES-22-50-07-XX-XX	25.0	24.8	19.8	15.9	12.7	10.1	8.0	6.2	5.2	4.4
SES-25-40-01-XX-XX	8.8	7.4	5.2	3.4	1.9	0.7	NR	NR	NR	NR
SES-25-40-7-XX-XX	7.7	6.4	4.3	2.8	1.3	NR	NR	NR		
SES-25-50-07-XX-XX	21.4	18.9	14.6	11.3	8.6	6.3	4.5	2.9	2.6	1.9
SES-28-50-07-XX-XX	18.7	16.4	12.4	9.3	6.8	4.7	3.0	1.5	NR	NR
SES-30-50-07-XX-XX	13.4	11.4	8.0	5.3	3.1	1.3	NR	NR	NR	NR
SES-30-40-07-XX-XX	13.4	11.4	8.0	5.3	3.1	1.3	NR	NR	NR	NR

Center of EPA is located at the pole top. If bullhorns or other methods are used that locate the EPA center above the poletop, EPA limits are reduced.
Calculations are based on each square foot of EPA being equal to 30 pounds.
The EPA limits are not applicable for poles attached to structures, such as parking garage decks.

QUICK SHIP

	Catalog Number	Description
☐	**SES18401TADB**	POLE-SES-18ftX4inSQ-11GA-TENON-DARK BRONZE
☐	**SES22507TABL**	POLE-SES-22ftX5inSQ-7GA-TENON-BLACK
☐	**SES22507TADB**	POLE-SES-22ftX5inSQ-7GA-TENON-DARK BRONZE
☐	**SES25507TABL**	POLE-SES-25ftX5inSQ-7GA-TENON-BLACK
☐	**SES25507TADB**	POLE-SES-25ftX5inSQ-7GA-TENON-DARK BRONZE

Consult factory for lead times on non-stocked poles

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SECURITY LIGHTING™

SES Poles

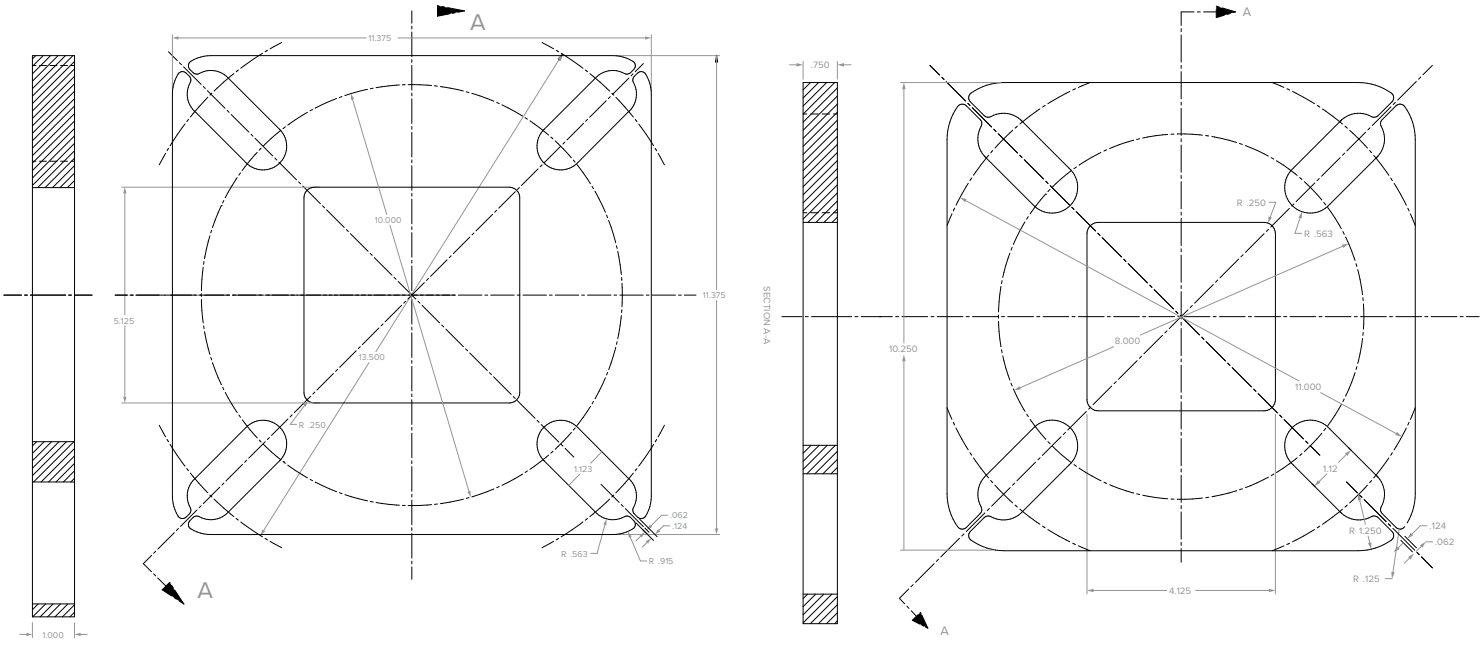
SQUARE STEEL STRAIGHT POLES (SES)

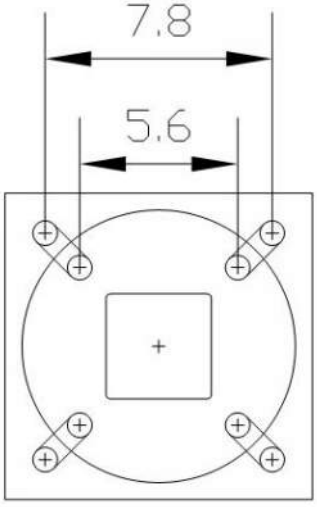
DATE: | LOCATION:

TYPE: AA4 - POLE | PROJECT: Texas Roadhouse

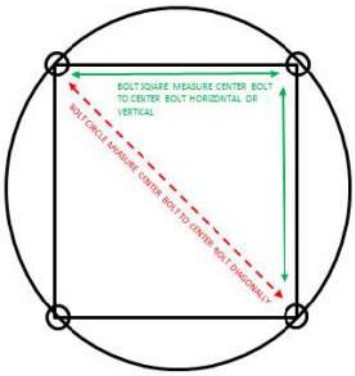
CATALOG #: SES-25-40-01-A-B3-DB

BOLT CIRCLE DIAGRAMS

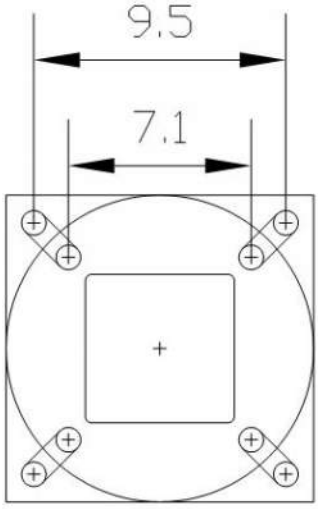




Bolt Square Measurement
Measurement vertical or horizontal from the center of the bolt to the center of the bolt.



Bolt Circle Measurement
Measure diagonal from the center of the bolt to the center of the bolt. Suggested bolt circle 10.5”



4” Square Pole

(10” Bolt Circle)
(Min. B.C. = 8”)
(MAX. B.C. - 11”)

5” Square Pole

(11” Bolt Circle)
(Min. B.C. = 10”)
(Max. B.C. = 13.5”)

All listed SES poles use 27701349904 paper template
It’s the contractors’ responsibilty to ensure that new poles will fit existing bases

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SES Poles

SQUARE STEEL STRAIGHT POLES (SES)

ACCESSORIES

POLE CAP



4" POLE CAP	20102389702
5" POLE CAP	20102389802
6" POLE CAP	20102389902

TENON



TA | (2 3/8" OD)

Note: TA Tenons are factory installed. For installation into open top poles, use TT1A tenon top adapter

HAND HOLE COVER



Note: Hand hole cover included with all new poles. Replacement parts:
22106400112 + (2)23115839901 + (1)26508469902(3"x5")

BASE COVER

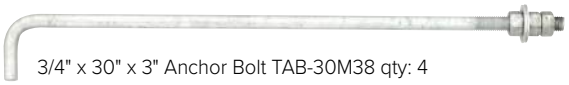
Order as a separate line item

Catalog Number	Description
Pole Base Covers for Square Poles	
SBC-4-XX[1]	10 1/2" Sq x 5" Deep (use on 4" sq poles)
SBC-4L-XX[1]	12 1/4" Sq x 5" Deep (use on 4" sq poles)
SBC-5-XX[1]	12 1/4" Sq x 5" Deep (use on 5" sq poles)
SBC-6-XX[1]	12 1/4" Sq x 5" Deep (use on 6" sq poles)

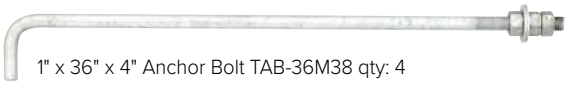
1. Replace XX with two letter color designation



ANCHORAGE | ORDER AS A SEPARATE LINE ITEM



3/4" x 30" x 3" Anchor Bolt TAB-30M38 qty: 4



1" x 36" x 4" Anchor Bolt TAB-36M38 qty: 4

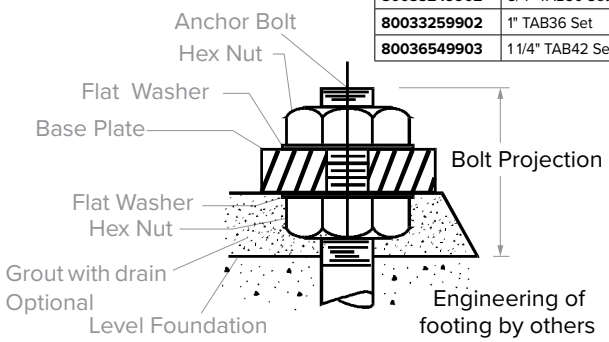


1" x 42" Anchor Bolt ABOLTS142 qty: 4

Note Fabricated from hight tensile steel, each anchor bolt has two nuts and two washers; Galvanized anchor bolts are hot dipped; (Galvanized includes threaded portion plus six inches minimum); Anchor Bolt template included with pole purchase.

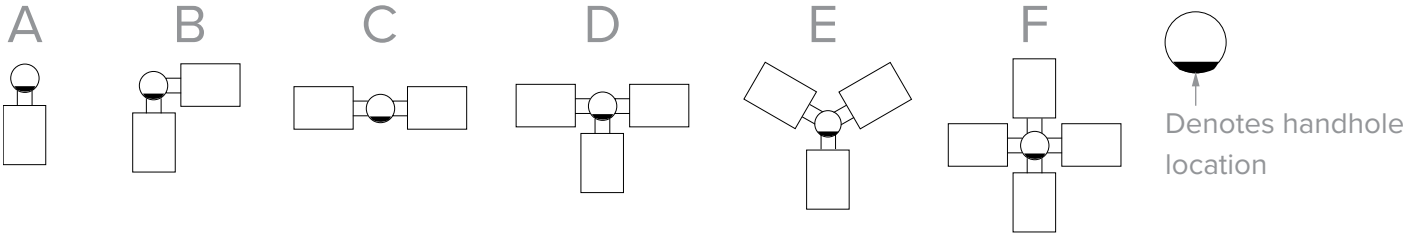
BASE DETAIL

Replacement Nut/Washer Kit	
80033249902	3/4" TAB30 Set
80033259902	1" TAB36 Set
80036549903	1 1/4" TAB42 Set

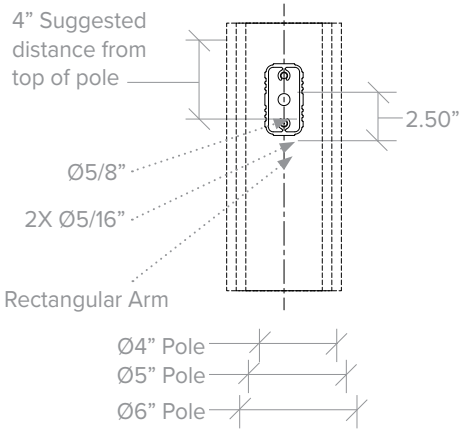


DRILL PATTERN | CONFIRM PROPER MOUNTING BEFORE ORDERING

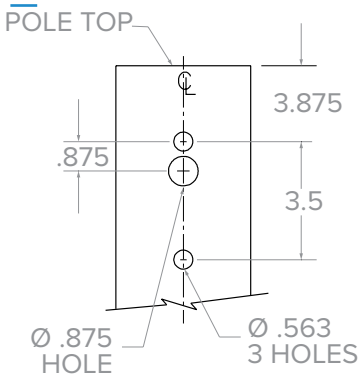
SIDE MOUNTING LOCATIONS Must use TETA fitter for 120° mounting



VIPER/RATIO (A ARMS) DRILL PATTERN B3, B4

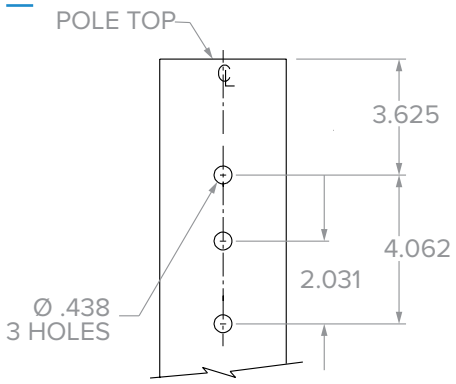


X2



#2 DRILL PATTERN

X6



#6 DRILL PATTERN

X26 drill pattern is a combination of both the X2 and X6 drill patterns

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SECURITY LIGHTING™

SES Poles

SQUARE STEEL STRAIGHT POLES (SES)

DATE: | LOCATION:

TYPE: AA4 - POLE | PROJECT: Texas Roadhouse

CATALOG #: SES-25-40-01-A-B3-DB

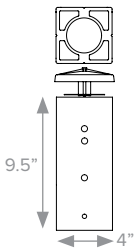
MOUNTING BRACKETS | ORDER AS ACCESSORIES

SIDE MOUNTING LOCATIONS

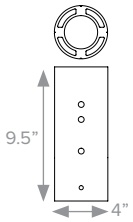
Catalog Number		Description	EPA	Weight
TTF-XX-XX[1,2]		4" Square pole top tenon adapter 2 3/8" OD slipfitter for max. four fixtures (90°)	0.4ft2 0.04m2	20lbs. 9kgs.
RETA-XX1,2 RETA-XX-Viper[1,2]		4" Round pole top tenon adapter 2 3/8" OD slipfitter for max. four fixtures (90°)	0.2ft2 0.02m2	20lbs. 9kgs.
TTF-VIPER-XX		4" Square pole top tenon adapter 2 3/8" OD slipfitter for max. fixture (90 0) Drilled 4 sides for Viper and plugged on two sides		

1 Replace X or XX with color designation
2 All fitters drilled with drill pattern 26 (except for fitters designed for Viper fixtures). Any other drill pattern must be designated at time of ordering.
3 Must use 10" arm on fixture for 120° mounting

TTF-10	Single
TTF-29	Twin 90°
TTF-28	Twin 180°
TTF-39	Triple 90°
TTF-49	Quad 90°
TTFViper	Quad 90° plugged on 3 sides



TTF-XX-XX
TTF-VIPER-XX
SETA-XX



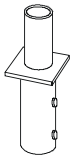
RETA-XX
RETA-XX-VIPER

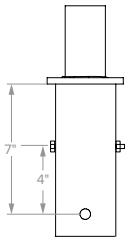
TENON INSERT FOR SINGLE FIXTURE MOUNTING OR TENON ADAPTERS

TT1A4-XX[1,2,3]	2 3/8" OD Tenon top adapter for 4" square open top poles, (slips 9" into pole aligns with #6 drill pattern)
TT1A5-XX[1,2,3]	2 3/8" OD Tenon top adapter for 5" square open top poles, (slips 9" into pole aligns with #6 drill pattern)

1 TT1A not required with tenon top pole. Use only for retrofit (specify 4" or 5" pole).
2 Replace XX with two letter color designation
3 Installed with one through bolt supplied with fitter. May require field drilling of pole for proper installation.


TT-1A*


SSP-TX



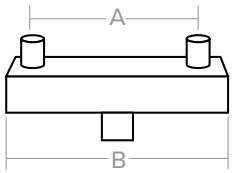
TWO FIXTURE MOUNTING BRACKET

Decorative steel floodlight brackets 4" square tubing with 2 1/3" O.D. fixture tenons. Square 4" bottom with 2 1/2" I.D. internet adapter for standard round tenons. Available in multiple finishes as shown. Use with SES series poles

Description	Maximum Weight Per Tenon		EPA		Weight	
	lbs	(kg)	Ft²	(m²)	lbs.	(kg)
Twin 180°	60	(27.2)	1.2	(0.1)	24	(10.9)

1 Replace XX with two letter color designation


TT2A-XX[1]



A	B
24"	30"
610mm	762mm

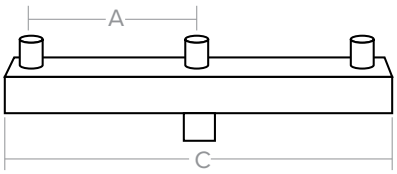
THREE FIXTURE MOUNTING BRACKET

Decorative steel floodlight brackets 4" square tubing with 2 1/3" O.D. fixture tenons. Square 4" bottom with 2 1/2" I.D. internet adapter for standard round tenons. Available in multiple finishes as shown. Use with SES series poles

Description	Maximum Weight Per Tenon		EPA		Weight	
	lbs	(kg)	Ft²	(m²)	lbs.	(kg)
Triple 180°	60	(27.2)	2.3	(0.2)	44	(19.9)

1 Replace XX with two letter color designation


TT3A-XX[1]



A	C
24"	54"
610mm	1372mm

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SECURITY LIGHTING™

SES Poles

SQUARE STEEL STRAIGHT POLES (SES)

DATE: | LOCATION:

TYPE: AA4 - POLE | PROJECT: Texas Roadhouse

CATALOG #: SES-25-40-01-A-B3-DB

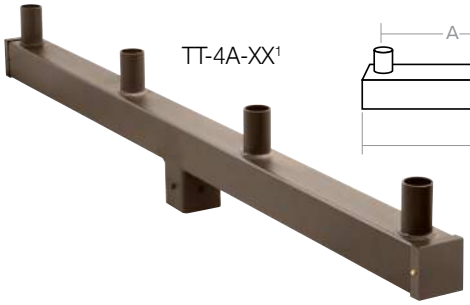
MOUNTING BRACKETS | ORDER AS ACCESSORIES

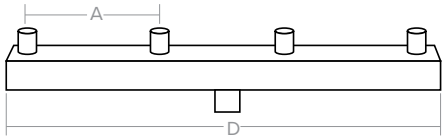
FOUR FIXTURE MOUNTING BRACKET

Decorative steel floodlight brackets 4" square tubing with 2 1/3" O.D. fixture tenons. Square 4" bottom with 2 1/2" I.D. internet adapter for standard round tenons. Available in multiple finishes as shown. Use with SES series poles

Description	Maximum Weight Per Tenon		EPA		Weight	
	lbs	(kg)	Ft²	(m²)	lbs.	(kg)
Quad 180°	60	(27.2)	3.4	(0.3)	64	(29)

1 Replace XX with two letter color designation





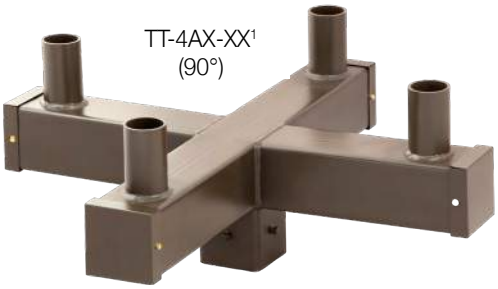
A	D
24"	78"
610mm	1981mm

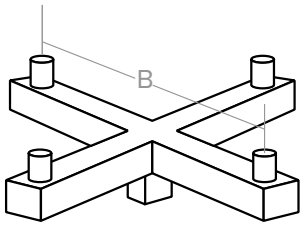
FOUR FIXTURE MOUNTING BRACKET (90°)

Decorative steel floodlight brackets 4" square tubing with 2 1/3" O.D. fixture tenons. Square 4" bottom with 2 1/2" I.D. internet adapter for standard round tenons. Available in multiple finishes as shown. Use with SES series poles

Description	Maximum Weight Per Tenon		EPA		Weight	
	lbs	(kg)	Ft²	(m²)	lbs.	(kg)
Quad 180°	60	(27.2)	2.8	(0.3)	46	(20.8)

1 Replace XX with two letter color designation





A	B
24"	30"
610mm	762mm

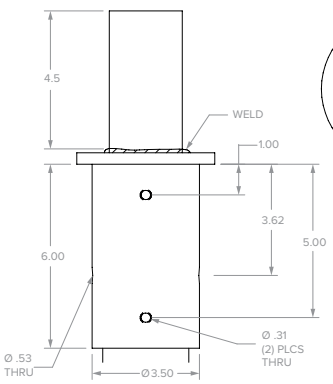
TPR SERIES

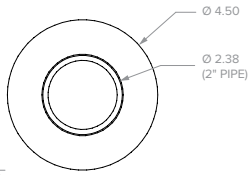
Decorative steel floodlight brackets 4" square tubing with 2 1/3" O.D. fixture tenons. Square 4" bottom with 2 1/2" I.D. internet adapter for standard round tenons. Available in multiple finishes as shown. Use with SES series poles

Catalog Number	Description	EPA	Weight
		ft²(m²)	lbs. (kg.)
TPR-2-XX[1,5]	2 1/2" to 2" pipe size tenon reducer	__	6 (2.7)
TPR-3-XX[2,5]	3" to 2" pipe size reducer	__	8 (3.6)
TPR-4-XX[3,5]	4" to 2" pipe size tenon reducer	__	9 (4.1)

1 Bracket slips over pole creating 2 3/8 OD Tenon (lower ID = 3 1/16")
2 Bracket slips over pole creating 2 3/8 OD Tenon (lower ID = ID = 3 1/2")
3 Bracket slips over pole creating 2 3/8 OD Tenon (lower ID = ID = 4 5/8")
4 Will not fit in 3 guage poles
5 Replace XX with two letter color designation







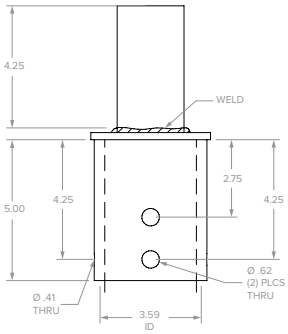
285-B SERIES

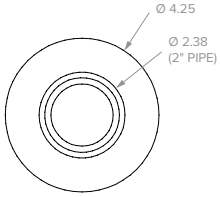
Decorative steel floodlight brackets 4" square tubing with 2 1/3" O.D. fixture tenons. Square 4" bottom with 2 1/2" I.D. internet adapter for standard round tenons. Available in multiple finishes as shown. Use with SES series poles

Catalog Number	Description
285-B-3-XX[1]	3 1/2" to 2 3/8" Reducer (OD for both dimensions)
285-B-4-XX[1]	4 1/2" to 2 3/8" Reducer (OD for both dimensions)

1 Replace XX with two letter color designation







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SECURITY LIGHTING™

SES Poles

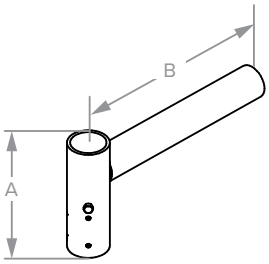
SQUARE STEEL STRAIGHT POLES (SES)

DATE: | LOCATION:

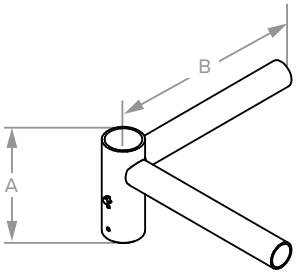
TYPE: AA4 - POLE | PROJECT: Texas Roadhouse

CATALOG #: SES-25-40-01-A-B3-DB

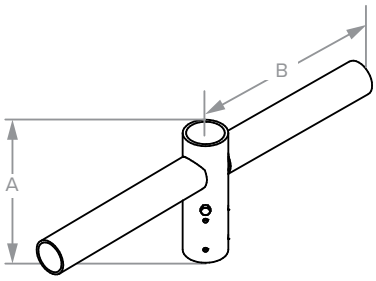
SPOKE MOUNTING BRACKETS[1]



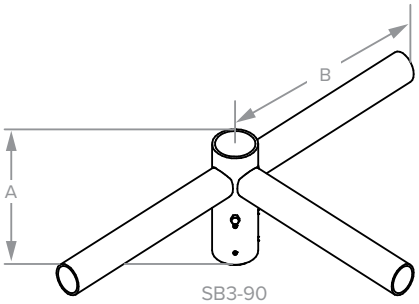
SB1



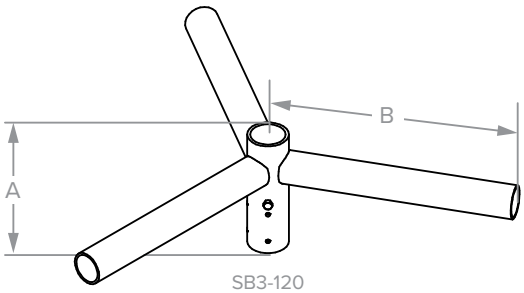
SB2-90



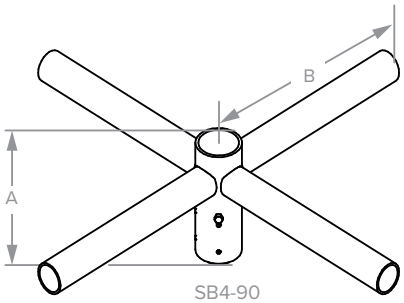
SB2-180



SB3-90



SB3-120



SB4-90

ORDERING GUIDE

Example: SB-X-XXX-XXXX-XXX

CATALOG #

SB –		–		–
Series	**Configuration**	**Length**	**Size**	**Color**
SB Spoke Bracket	**1**	**8"**	**PT20** 2" pipe tenon (2.38"OD)	**DB** Dark Bronze Textured
	2-180	**12"**		**BL** Black Textured
	2-90	**18"**	**PT25** 2.5" pipe tenon (2.88" OD)	**WH** White Textured
	3-120	**24"**		**GR** Gray Textured
	3-90	**30"**	**PT35** 3.5" pipe tenon (4.0" OD)	**PS** Platinum Silver Smooth
	4-90			**GYS** Light Gray Smooth
				BZT Bronze Textured
				BBT Basic Black Textured

Notes:

1 For Horizontal Slip Filter Mounting

ORDERING INFORMATION

(ORDER AS SEPARATE PART #, FIELD INSTALLED)

Catalog Number	Description	Max Allowable Load per Tenon	Bracket EPA MAX.	Bracket Weight, Max.
SB1	Single	60lbs (27.2kg)	0.6	18
SB2-180	Twin, 2@ 180°	60lbs (27.2kg)	1.0	27
SB2-90	Twin, 2@90°	60lbs (27.2kg)	0.8	27
SB3-120	3@120°	60lbs (27.2kg)	0.9	36
SB3-90	3@90°	60lbs (27.2kg)	1.0	36
SB4-90	4@90°	60lbs (27.2kg)	1.0	45

QUICK SHIP

Catalog Number	Description
SB2180PT20WHT	2@180°, 8"arms
SB2908PT20WHT	2@90°, 8" arms
SB312012PT20WHT	3@120°, 12" arms
SB3908PT20WHT	3@90°, 8" arms
SB4908PT20WHT	4@90°, 8" arms

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SECURITY LIGHTING™

SES Poles

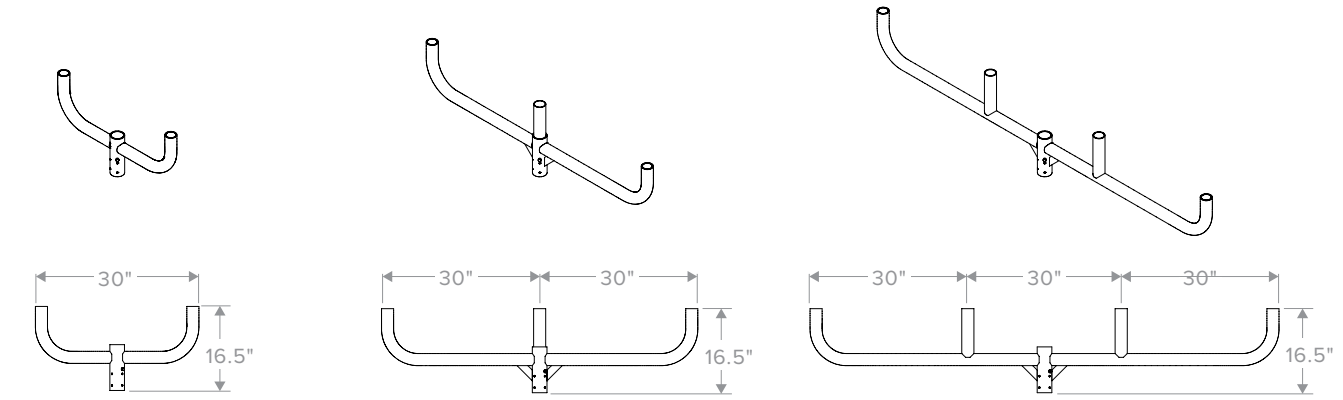
SQUARE STEEL STRAIGHT POLES (SES)

DATE: LOCATION:

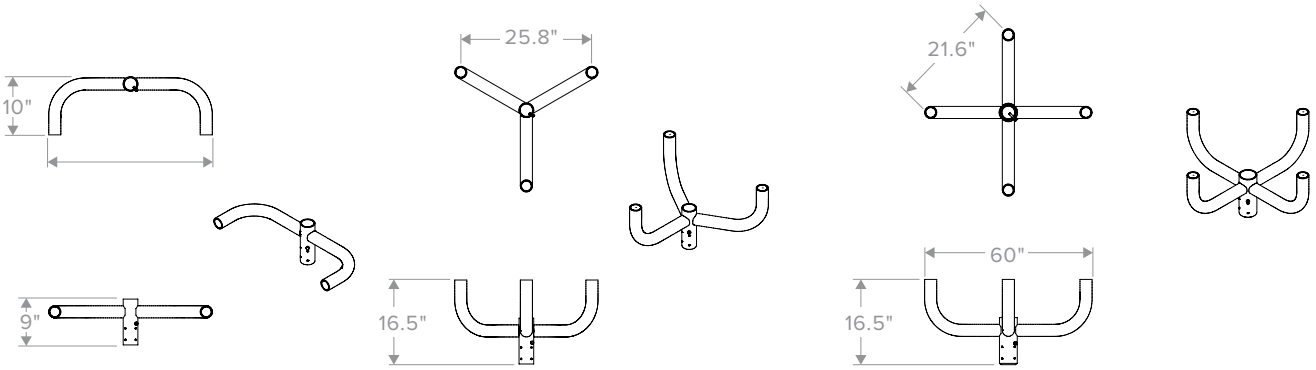
TYPE: PROJECT:

CATALOG #:

BULLHORN MOUNTING BRACKETS[1]



BHH–2–180 **BHH–3–180** **BHH–4–180**



BHH–2H–180 **BHH–3–120** **BHH–4–90**

ORDERING GUIDE

Example: BHH–X-XXX–XXXX–XX

CATALOG #

BHH –	–	–	–	–
Model	**Configurations**	**Pole Tenon Size**	**Color**	**Options**
BHH Bullhorn Bracket	**2–180** 2–180 **2H–180** 2H–180 **3–180** 3–180 **4–180** 4–180 **3–120** 3–120 **4–90** 4–90	**PT20** 2" pipe tenon (2.38" O.D.) **PT25** 2.5" pipe tenon (2.88" O.D.) **PT35** 3.5" pipe tenon (4.0" O.D.)	**DB** Dark bronze textured **BL** Black textured **WH** White textured **GR** Gray textured **PS** Platinum silver smooth	**BAS3** 3" SLEEVE (For luminaires requiring a 3" slipfit)

ORDERING INFORMATION

TENON TYPE BRACKETS (STEEL)

(order as separate part #, field installed)

Catalog Number	Description	Max allowable load per tenon	Bracket EPA, MAX.	Bracket weight, MAX
BHH-2-180	Twin	100 lbs (45.5 kg)	0.9 ft2 (.08 m2)	25 lbs (11.4 kg)
BHH-2H-180	Twin Horizontal	60 lbs (27.2 kg)	0.5 ft2 (.05 m2)	25 lbs (11.4 kg)
BHH-3-180	3-in-line	100 lbs (45.5 kg)	1.5 ft2 (.14 m2)	38 lbs (17.3 kg)
BHH-4-180	4-in-line	100 lbs (45.5 kg)	2.2 ft2 (.20 m2)	51 lbs (23.2 kg)
BHH-3-120	3 @ 120	100 lbs (45.5 kg)	1.2 ft2 (.11 m2)	40 lbs (18.2 kg)
BHH-4-90	4 @ 90	100 lbs (45.5 kg)	1.3 ft2 (.12 m2)	41 lbs (18.2 kg)

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SES Poles

SQUARE STEEL STRAIGHT POLES (SES)

DATE: | LOCATION:

TYPE: AA4 - POLE | PROJECT: Texas Roadhouse

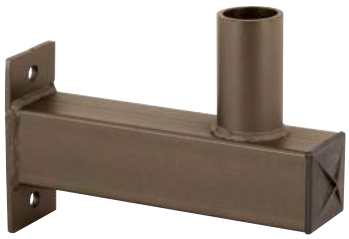
CATALOG #: SES-25-40-01-A-B3-DB

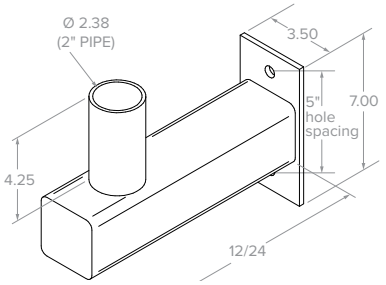
MID POLE BRACKET OPTIONS | ORDER AS ACCESSORIES

FLB-12/24

Catalog Number	Description
FLB-12-XX[1,2]	12" floodlight bracket for pole mounting (bracket requires internal pole access)
FLB-24-XX[1,2]	24" floodlight bracket for pole mounting (bracket requires internal pole access)

1 Replace XX with two letter color designation
2 Mounting Hardware by others



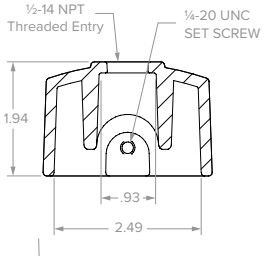


S-302

Catalog Number	Description	
S-302-XX[1]	Slipfits 1 1/2" or 2" pipe (1.9" OD or 2 3/8" OD) with 1/2" N.P.S.M. hub; Bronze	.6(0.3)

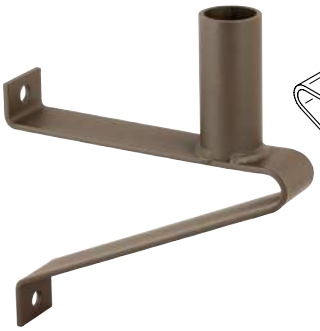
1 Replace XX with two letter color designation

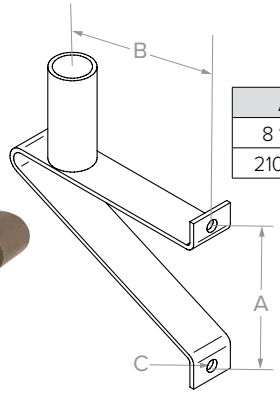




4041

Catalog Number	Description
4041	Heavy-duty steel wall/pole bracket 2" pipe (2 3/8" OD) tenon fitting for use with slipfitter units or 4024C; In dark bronze finish Mounting Hardware by Others



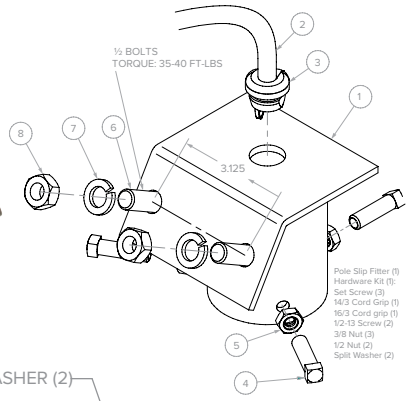


A	B	C
8 1/4"	9 1/2"	11"
210mm	241mm	279mm

4024C

Catalog Number	Description
4024C	Steel Slipfitter for 2" pipe, 2 3/8" OD yoke mount, bronze finish
4024CM53	Steel Slipfitter for 2" pipe, 2 3/8" OD yoke mount, gray finish
4024CM38	Steel Slipfitter for 2" pipe, 2 3/8" OD yoke mount, galvanized finish

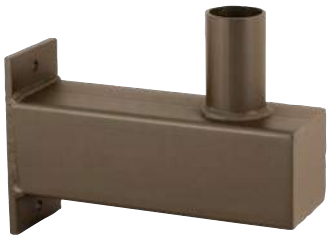


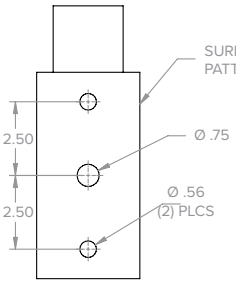


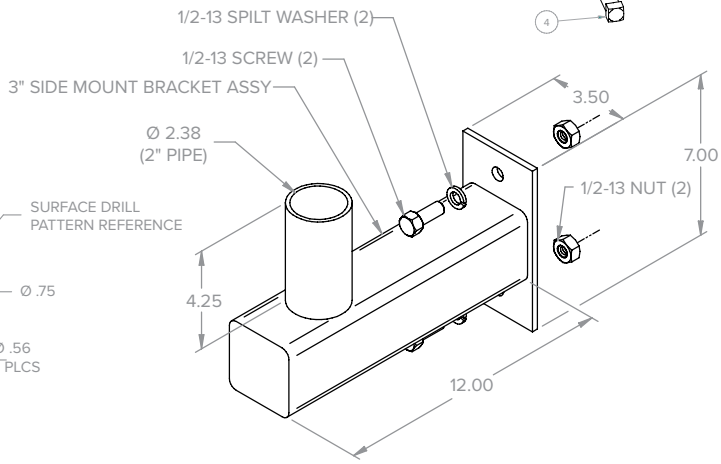
TTWM

Catalog Number	Description
TTWM-XX[1]	Wall Mount Bracket with 2 3/8" OD Tenon

1 Replace XX with two letter color designation
2 Mounting hardware by others







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POLE INTRODUCTION | POLE SELECTION GUIDE

Poles should initially be selected, according to lighting application needs, and second, but equally important, according to the structural requirements imposed on the pole by the lighting fixtures, bracketry and wind. Before attempting to make this selection, it would be helpful to have an understanding of the terminology, such as steady or sustained wind velocity, gust velocity, EPA, special wind region, and maximum weight. Then a step-by-step procedure can be followed to select the proper pole for your particular requirements.

STEADY WIND OR SUSTAINED WIND VELOCITY

This is the maximum steady wind velocity expressed in MPH likely to occur in a specific location. Refer to isotach wind map on the next page for the wind velocity in your location. Isotach maps are provided for reference only. Consult local authorities to determine the maximum velocities in your area.

GUST VELOCITY

Our isotach maps represent two different methods of addressing wind speed gusts. We have used the 'fastest-mile' wind speeds for years. These have a 1.3 gust factor in the calculations to account for gusting. As technology has improved the ability to accurately measure wind speeds for short durations, the gusts associated to a sustained wind speed have lessened. We are now moving toward '3-second-gust' wind speed maps. The results are typically higher steady/sustained wind speeds with lower factors for gusts. The gust factors are different depending on the wind speed map selected.

EFFECTIVE PROJECTED AREA

Effective Projected Area (EPA) is the exposed surface area of a fixture and bracket multiplied by a shape factor which varies depending on the shape of the fixture and bracket. For example, a large rectangular fixture will present more resistance to the wind than will a round or cylindrical shape.

SPECIAL WIND REGIONS

Many locations such as mountainous areas, coastal areas and areas surrounding the Great Lakes exhibit wind velocities considerably higher than the surrounding areas. Consult local authorities to determine maximum wind velocities and select equipment
accordingly.

MAXIMUM WEIGHT

This is the maximum allowable weight based on EPA loads. The weight is based on 30 pounds per square foot of EPA. Weight exceeding the 30 pound per foot of EPA may reduce the allowable EPA rating of the pole.

POLE SELECTION PROCEDURE

With an understanding of the parameters for pole selection, you can follow this simple step-by-step procedure and, with confidence, select a pole to meet your particular requirements.

1. Determine the site location and steady wind velocity by referring to the appropriate isotach map. If the steady wind exceeds those listed, consult factory. The isotach maps are provided for reference only. Consult local authorities to determine the maximum velocities in your area.

2. Total the EPA for the required luminaires and bracketry.

3. Total the weight of the luminaires and bracketry.

4. Compare steps 2 and 3 with the maximum allowable EPA and weight tables shown for the style, material, and height pole required. The maximum allowable must be equal to or exceed the totals from steps 2 and 3.

POLE SELECTION CONCERNS

Caution: These selection methods are guidelines only. Hubbell Lighting assumes no responsibility for selection and recommends you consult qualified professionals for verification of overall system design, site suitability, foundation considerations and applicable code and regulatory conformances.

Maintenance: The facility owner's/manager's regular scheduled maintenance program must include initial and regular follow-up inspections for structural damage, broken welds, tampering, nut loosening, missing wire covers, dangling electrical wiring, internal or external corrosion, foundation settlement, excessive shaft deflection and vibration for all lighting poles. Immediate repair or replacement may be necessary.

Overloading: Do not overload poles by attaching flags, banners, or any items that can add excessive wind or mechanical load to designed pole assemblies.

Observation: Installation and local area conditions can dramatically affect lighting pole performance. Excessive vibration may result from some wind and mounting conditions. Only individuals with local knowledge, who have observed or inspected the site can effectively evaluate site specific issues. Consult the factory for information on vibration dampers, special corrosion, foundation settlement, excessive shaft deflection and vibration for all lighting poles. Immediate repair or replacement may be necessary.

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SECURITY LIGHTING™

SES Poles

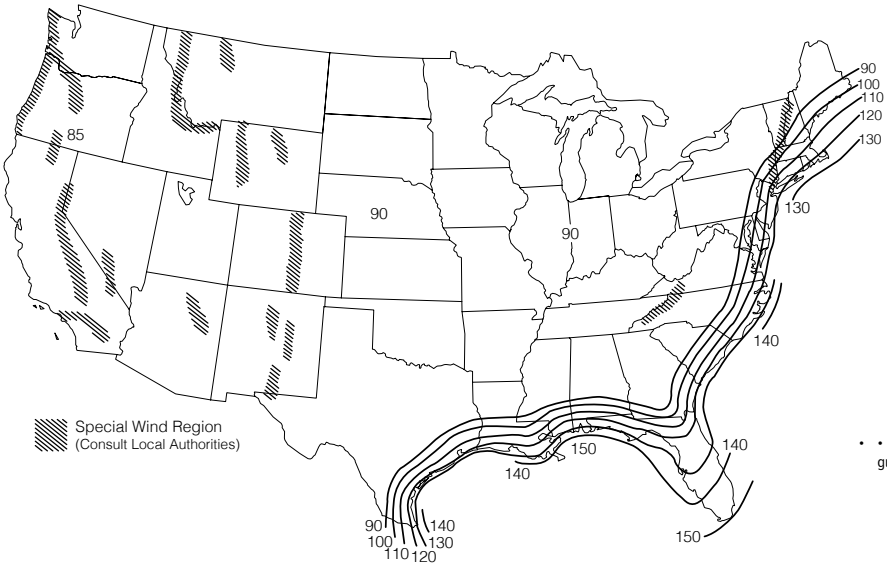
SQUARE STEEL STRAIGHT POLES (SES)

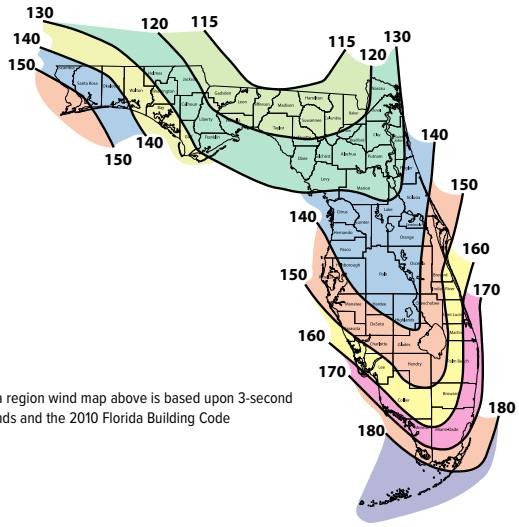
DATE: LOCATION:

TYPE: PROJECT:

CATALOG #:

WIND SPEED





• • Florida region wind map above is based upon 3-second gust winds and the 2010 Florida Building Code

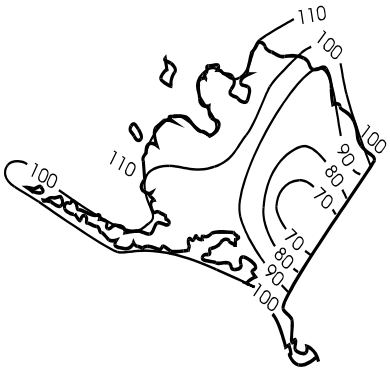
NOTES

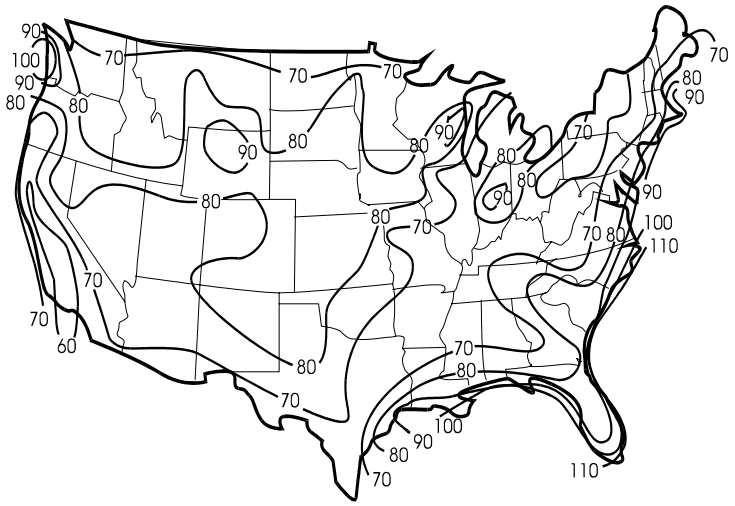
- Allowable EPA, to determine max pole loading weight, multiply allowable EPA by 30 lbs.
- The tables for allowable pole EPA are based on the ASCE 7-05 Wind Map or the Florida Region Wind Map for the 2010 Florida Building Code. The Wind Maps are intended only as a general guide and cannot be used in conjunction with other maps. Always consult local authorities to determine maximum wind velocities, gusting and unique wind conditions for each specific application
- Allowable pole EPA for jobsite wind conditions must be equal to or greater than the total EPA for fixtures, arms, and accessories to be assembled to the pole. Responsibility lies with the specifier for correct pole selection. Installation of poles without luminaires or attachment of any unauthorized accessories to poles is discouraged and shall void the manufacturer's warranty
- Wind speeds and listed EPAs are for ground mounted installations. Poles mounted on structures (such as bridges and buildings) must consider vibration and coefficient of height factors beyond this general guide; Consult local and federal standards
- Wind Induced Vibration brought on by steady, unidirectional winds and other unpredictable aerodynamic forces are not included in wind velocity ratings. Consult Hubbell Lighting's Pole Vibration Application Guide for environmental risk factors and design considerations. http://cdn.hubbelloutdoor.com/content/products/literature/literature_files/Pole_Wind_Induced_Flyer_HLOI0022.pdf
- Extreme Wind Events like, Hurricanes, Typhoons, Cyclones, or Tornadoes may expose poles to flying debris, wind shear or other detrimental effects not included in wind velocity ratings

STEADY/SUSTAINED WIND VELOCITY (Miles Per Hour, for KM/hr - multiply values by 1.61)

- Hawaii has an 80 MPH wind velocity
- Puerto Rico has a 95 MPH wind velocity
- Use caution in determining wind velocities in special wind areas such as mountainous areas, coastal areas and areas surrounding the Great Lakes
- Isotach map is provided for reference only. Consult local authorities to determine the maximum velocities in your area

Note The maximum allowable EPA and weights are listed for each pole; The EPA and weights are listed in this Selection Guide for each luminaire and bracket





For information on AASHTO Standards for Lighting Equipment contact:
American Association of State Highway and Transportation Officials
444 N. Capitol Street, NW, Suite 249
(202) 624-5800
www.aashto.org

AASHTO standards used are found in the following publications:
I-LTS-3 "*Standard Specification For Structural Support For Highway Signs, Luminaires And Traffic Signals*", (1994)
I-LPH "*A Guide for Standardizing Highway Lighting Pole Hardware*", (1980)
I-GL-5 "*An Informational Guide for Roadway Lighting*", (1984)

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BEACON
design . performance . technology

DATE: | LOCATION:

TYPE: A5 | PROJECT: Texas Roadhouse

CATALOG #: VP-1-160L-115-4K7-4W-HSS-90-B-UNV-A-DBT

VIPER Area/Site

VIPER LUMINAIRE

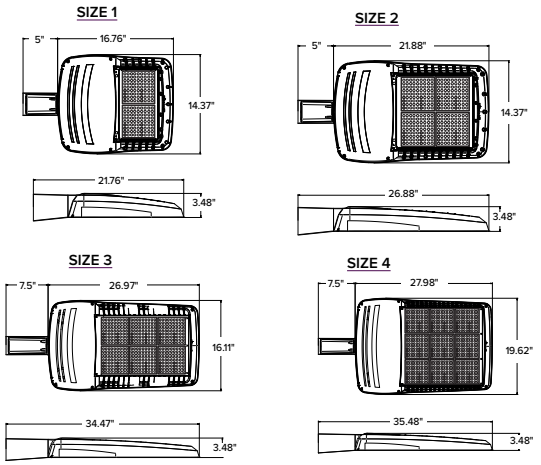
MICRO STRIKE | OPTICS STRIKE



FEATURES

- Low profile LED area/site luminaire with a variety of IES distributions for lighting applications such as auto dealership, retail, commercial, and campus parking lots
- Featuring two different optical technologies, Strike and Micro Strike Optics, which provide the best distribution patterns for retrofit or new construction
- Rated for high vibration applications including bridges and overpasses. All sizes are rated for 1.5G
- Control options including photo control, occupancy sensing, NX Lighting Controls™, LightGRID+ and 7-Pin with networked controls
- New customizable lumen output feature allows for the wattage and lumen output to be customized in the factory to meet whatever specification requirements may entail
- Field interchangeable mounting provides additional flexibility after the fixture has shipped

c UL us | IP65 | DLC LISTED | DLC LISTED PREMIUM | ida DARK SKY APPROVED 2016 | BAA | TAA



CONTROL TECHNOLOGY

NX CONNECT | NX WIRED | NX WIRELESS | LIGHTGRID+

SERVICE PROGRAMS

STOCK | QS10

SPECIFICATIONS

CONSTRUCTION

- Die-cast housing with hidden vertical heat fins are optimal for heat dissipation while keeping a clean smooth outer surface
- Corrosion resistant, die-cast aluminum housing with 1000 hour powder coat paint finish
- External hardware is corrosion resistant

OPTICS

- Micro Strike Optics (160, 320, 480, or 720 LED counts) maximize uniformity in applications and come standard with mid-power LEDs which evenly illuminate the entire luminous surface area to provide a low glare appearance. Catalog logic found on page 2
- Strike Optics (36, 72, 108, or 162 LED counts) provide best in class distributions and maximum pole spacing in new applications with high powered LEDs. Strike optics are held in place with a polycarbonate bezel to mimic the appearance of the Micro Strike Optics so both solutions can be combined on the same application. Catalog logic found on page 3
- Both optics maximize target zone illumination with minimal losses at the house-side, reducing light trespass issues. Additional backlight control shields and house side shields can be added for further reduction of illumination behind the pole
- One-piece silicone gasket ensures a weatherproof seal
- Zero up-light at 0 degrees of tilt
- Field rotatable optics

INSTALLATION

- Mounting patterns for each arm can be found on page 11
- Optional universal mounting block for ease of installation during retrofit applications. Available as an option (ASQU) or accessory for square and round poles
- All mounting hardware included
- Knuckle arm fitter option available for 2-3/8" OD tenon
- For products with EPA less than 1 mounted to a pole greater that 20ft, a vibration damper is recommended

ELECTRICAL

- Universal 120-277 VAC or 347-480 VAC input voltage, 50/60 Hz
- Ambient operating temperature -40˚C to 40˚C
- Drivers have greater than 90% power factor and less than 20% THD
- LED drivers have output power over-voltage, over-current protection and short circuit protection with auto recovery
- Field replaceable surge protection device provides 20kA protection meeting ANSI/ IEEE C62.41.2 Category C High and Surge Location Category C3; Automatically takes fixture off-line for protection when device is compromised
- Dual Driver option provides 2 drivers within luminaire but only one set of leads exiting the luminaire, where Dual Power Feed provides two drivers which can be wired independently as two sets of leads are extended from the luminaire. Both options cannot be combined

CONTROLS

- Photo control, occupancy sensor programmable controls, and Zigbee wireless controls available for complete on/off and dimming control
- Please consult brand or sales representative when combining control and electrical options as some combinations may not operate as anticipated depending on your application
- 7-pin ANSI C136.41-2013 photocontrol receptacle option available for twist lock photocontrols or wireless control modules (control accessories sold separately)

CONTROLS (CONTINUED)

- 0- 10V Dimming Drivers are standard and dimming leads are extended out of the luminaire unless control options require connection to the dimming leads. Must specify if wiring leads are to be greater than the 6" standard
- NX Lighting Controls™ available with in fixture wireless control module, features dimming and occupancy sensor
- LightGRID+ available with in fixture wireless control module, features dimming and occupancy sensor. Also available in 7-pin configuration

	EPA				
	VP1 (Size 1)	VP2 (Size 2)	VP3 (Size 3)	VP4 (Size 4)	Config.
Single Fixture	0.454	0.555	0.655	0.698	
Two at 180	0.908	1.110	1.310	1.396	
Two at 90	0.583	0.711	0.857	0.948	
Three at 90	1.037	1.266	1.512	1.646	
Three at 120	0.943	1.155	1.392	1.680	
Four at 90	1.166	1.422	1.714	1.896	

CERTIFICATIONS

- DLC® (DesignLights Consortium Qualified), with some Premium Qualified configurations. Not all product variations listed in this document are DLC® qualified. Refer to http://www.designlights.org for the most up-to-date list.
- Listed to UL1598 and CSA C22.2#250.0-24 for wet locations and 40˚C ambient temperatures
- 1.5 G rated for ANSI C136.31 high vibration applications
- Fixture is IP65 rated
- Meets IDA recommendations using 3K CCT configuration at 0 degrees of tilt
- This product meets federal procurement law requirements under the Buy American Act (FAR 52.225-9) and Trade Agreements Act (FAR 52.225-11). See Buy America(n) Solutions (link to https://www.currentlighting.com/resources/america-solutions).

WARRANTY

- 5 year warranty

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DATE: | LOCATION:

TYPE: A5 | PROJECT: Texas Roadhouse

CATALOG #: VP-1-160L-115-4K7-4W-HSS-90-B-UNV-A-DBT

VIPER Area/Site

VIPER LUMINAIRE

MICROSTRIKE OPTICS – ORDERING GUIDE

Gray Shading = Service Program Limit of 15 luminaires

QS10

Example: VP–2–320L-145–3K7–2–R–UNV–A3–BLT

CATALOG #

VP – | – | – | – | – | – | – | – | –

Series	Optic Platform	Size	Light Engine		CCT/CRI		Distribution		Optic Rotation		Voltage	
VP Viper	Micro Strike	1 Size 1	160L-35 [6]	5500 lumens	AP	AP-Amber Phosphor Converted	2	Type 2	BLANK	No Rotation	UNV	120-277V
			160L-50 [6]	7500 lumens	27K8	2700K, 80 CRI	3	Type 3	L	Optic rotation left	120	120V
			160L-75	10000 lumens	3K7	3000K, 70 CRI	4F	Type 4 Forward	R	Optic rotation right	208	208V
			160L-100	12500 lumens	3K8	3000K, 80 CRI	4W	Type 4 Wide			240	240V
			160L-115	15000 lumens	35K8	3500K, 80 CRI	5QW	Type 5 Square Wide			277	277V
			160L-135	18000 lumens	3K9	3000K, 90 CRI					347	347V
			160L-160	21000 lumens	4K7	4000K, 70 CRI					480	480V
		2 Size 2	320L-145	21000 lumens	4K8	4000K, 80 CRI						
			320L-170	24000 lumens	4K9	4000K, 90 CRI						
			320L-185	27000 lumens	5K7	5000K, 70 CRI						
			320L-210	30000 lumens	5K8	5000K, 80 CRI						
			320L-235	33000 lumens								
			320L-255	36000 lumens								
			320L-315 [6]	40000 lumens								
		3 Size 3	480L-285	40000 lumens								
			480L-320	44000 lumens								
			480L-340	48000 lumens								
			480L-390	52000 lumens								
			480L-425	55000 lumens								
			480L-470	60000 lumens								
		4 Size 4	720L-435	60000 lumens								
			720L-475	65000 lumens								
			720L-515	70000 lumens								
			720L-565 [6]	75000 lumens								
			720L-600 [6]	80000 lumens								
			CLO	Custom Lumen Output [1]								

– | – | – | –

Mounting		Color		Options		Network Control Options	
A	Arm mount for square pole/flat surface (B3 Drill Pattern) (Does not include round pole adapter)	BLT	Black Matte Textured	F	Fusing	NXWS16F	NX Networked Wireless Enabled Integral NXSMP2-LMO PIR Occupancy Sensor with Automatic Dimming Photocell and Bluetooth Programming [1,3,4]
A_	Arm mount for round pole [2]	BLS	Black Gloss Smooth	2PF	Dual Power Feed	NXWS40F	NX Networked Wireless Enabled Integral NXSMP2-HMO PIR Occupancy Sensor with Automatic Dimming Photocell and Bluetooth Programming [1,3,4]
ASQU	Universal arm mount for square pole. Can be used with B3 or S2 Drill Pattern	DBT	Dark Bronze Matte Textured	2DR	Dual Driver	NXW	NX Networked Wireless Radio Module NXRM2 and Bluetooth Programming, without Sensor [3,4]
A_U	Universal arm mount for round pole [2]	DBS	Dark Bronze Gloss Smooth	TE	Tooless Entry	WIR	LightGRID+ In-Fixture Module [3,4]
AAU	Adjustable arm for pole mounting (universal drill pattern)	GTT	Graphite Matte Textured	BC	Backlight Control [8]	WIRSC	LightGRID+ Module and Occupancy Sensor [3,4]
AA_U	Adjustable arm mount for round pole [2]	LGS	Light Grey Gloss Smooth	TB	Terminal Block	**Stand Alone Sensors**	
ADU	Decorative upswept Arm (universal drill pattern)	LGT	Light Grey Gloss Textured			BTS-14F	Bluetooth® Programmable, BTSMP-LMO PIR Occupancy Sensor with Automatic Dimming Photocell and 360° Lens
AD_U	Decorative upswept arm mount for round pole [2]	PSS	Platinum Silver Smooth			BTS-40F	Bluetooth® Programmable, BTSMP-HMO PIR Occupancy Sensor with Automatic Dimming Photocell and 360° Lens
MAF	Mast arm fitter for 2-3/8" OD horizontal arm	WHT	White Matte Textured			BTSO-12F	Bluetooth® Programmable, BTSMP-OMNI-O PIR Occupancy Sensor with Automatic Dimming Photocell and 360° Lens
K	Knuckle	WHS	White Gloss Smooth			7PR	7-Pin Receptacle [4]
T	Trunnion	VGT	Verde Green Textured			7PR-SC	7-Pin Receptacle with shorting cap [4]
WB	Wall Bracket, horizontal tenon with MAF	**Color Option**				3PR	3-Pin twist lock [4]
WM	Wall mount bracket with decorative upswept arm	CC	Custom Color			3PR-SC	3-Pin receptacle with shorting cap [4]
WA	Wall mount bracket with adjustable arm					3PR-TL	3-Pin PCR with photocontrol [4]
						Programmed Controls	
						SCP-_F	Sensor Control Programmable, 8F or 40F [9]
						ADD	AutoDim Timer Based Dimming [4]
						ADT	AutoDim Time of Day Dimming [4]
						Photocontrols	
						PC	Button Photocontrol [4,7]

1 – Items with a grey background can be done as a custom order. Contact brand representative for more information
2 – Replace "_" with "3" for 3.5"-4.13" OD pole, "4" for 4.18"-5.25" OD pole, "5" for 5.5"-6.5" OD pole
3 – Networked Controls cannot be combined with other control options
4 – Not available with 2PF option
5 – Not available with Dual Driver option
6 – Some voltage restrictions may apply when combined with controls
7 – Not available with 480V
8 – BC not available on 4F and type 5 distributions
9 – At least one SCPREMOTE required to program SCP motion sensor. Must select 8ft or 40ft.

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DATE: | LOCATION:

TYPE: A5 | PROJECT: Texas Roadhouse

CATALOG #: VP-1-160L-115-4K7-4W-HSS-90-B-UNV-A-DBT

VIPER Area/Site

VIPER LUMINAIRE

STRIKE OPTIC – ORDERING GUIDE

Example: VP–ST–1–36L-39–3K7–2–UNV–A–BLT

CATALOG #

VP –

Series	Optic Platform	Size	Light Engine		CCT/CRI		Distribution		Optic Rotation		Voltage	
VP Viper	ST Strike	1 Size 1	36L-39 [8]	5500 lumens	AM	monochromatic amber, 595nm	FR	Auto Front Row	BLANK No Rotation		UNV	120-277V
			36L-55 [8]	7500 lumens	27K8	2700K, 80 CRI	2	Type 2	L	Optic rotation left	120	120V
			36L-85	10000 lumens	3K7	3000K, 70 CRI	3	Type 3	R	Optic rotation right	208	208V
			36L-105	12500 lumens	3K8	3000K, 80 CRI	4F	Type 4 Forward			240	240V
			36L-120	14000 lumens	3K9	3000K, 90 CRI	4W	Type 4 Wide			277	277V
		2 Size 2	72L-115	15000 lumens	35K8	3500K, 80 CRI	5QN	Type 5 Square Narrow			347	347V
			72L-145	18000 lumens	4K7	4000K, 70 CRI	5QW	Type 5 Square Wide			480	480V
			72L-180	21000 lumens	4K8	4000K, 80 CRI	5QM	Type 5 Square Medium				
			72L-210	24000 lumens	4K9	4000K, 90 CRI	5W	Type 5 Wide (Round)				
			72L-240	27000 lumens	5K7	5000K, 70 CRI	5RW	Type 5 Rectangular				
		3 Size 3	108L-215 [8]	27000 lumens	5K8	5000K, 80 CRI	C	Corner Optic				
			108L-250	30000 lumens			TC	Tennis Court Optic				
			108L-280	33000 lumens								
			108L-325	36000 lumens								
			108L-365	40000 lumens								
		4 Size 4	162L-320	40000 lumens								
			162L-365 [10]	44000 lumens								
			162L-405	48000 lumens								
			162L-445	52000 lumens								
			162L-485	55000 lumens								
			162L-545 [8]	60000 lumens								
			CLO	Custom Lumen Output [1]								

– | – | – | – | – | – | – | –

Mounting	
A	Arm mount for square pole/flat surface
A_	Arm mount for round pole [3]
ASQU	Universal arm mount for square pole
A_U	Universal arm mount for round pole [3]
AAU	Adjustable arm for pole mounting (universal drill pattern)
AA_U	Adjustable arm mount for round pole [3]
ADU	Decorative upswept Arm (universal drill pattern)
AD_U	Decorative upswept arm mount for round pole [3]
MAF	Mast arm fitter for 2-3/8" OD horizontal arm
K	Knuckle
T	Trunnion
WB	Wall Bracket, horizontal tenon with MAF
WM	Wall mount bracket with decorative upswept arm
WA	Wall mount bracket with adjustable arm

Color	
BLT	Black Matte Textured
BLS	Black Gloss Smooth
DBT	Dark Bronze Matte Textured
DBS	Dark Bronze Gloss Smooth
GTT	Graphite Matte Textured
LGS	Light Grey Gloss Smooth
LGT	Light Grey Gloss Textured
PSS	Platinum Silver Smooth
WHT	White Matte Textured
WHS	White Gloss Smooth
VGT	Verde Green Textured

Color Option	
CC	Custom Color

Options	
F	Fusing
E	Battery Backup [1,2,7,8,9]
2PF	Dual Power Feed
2DR	Dual Driver
TE	Tooless Entry
BC	Backlight Control
TB	Terminal Block

Network Control Options	
NXWS16F	NX Networked Wireless Enabled Integral NXSMP2-LMO PIR Occupancy Sensor with Automatic Dimming Photocell and Bluetooth Programming [1,4,5]
NXWS40F	NX Networked Wireless Enabled Integral NXSMP2-HMO PIR Occupancy Sensor with Automatic Dimming Photocell and Bluetooth Programming [1,4,5]
NXW	NX Networked Wireless Radio Module NXRM2 and Bluetooth Programming, without Sensor [4,5]
WIR	LightGRID+ In-Fixture Module [4,5]
WIRSC	LightGRID+ Module and Occupancy Sensor [4,5]

Stand Alone Sensors	
BTS-14F	Bluetooth® Programmable, BTSMP-LMO PIR Occupancy Sensor with Automatic Dimming Photocell and 360° Lens
BTS-40F	Bluetooth® Programmable, BTSMP-HMO PIR Occupancy Sensor with Automatic Dimming® Photocell and 360° Lens
BTSO-12F	Bluetooth® Programmable, BTSMP-OMNI-O PIR Occupancy Sensor with Automatic Dimming Photocell and 360° Lens
7PR	7-Pin Receptacle [4]
7PR-SC	7-Pin Receptacle with shorting cap [4]
3PR	3-Pin twist lock [4]
3PR-SC	3-Pin receptacle with shorting cap [4]
3PR-TL	3-Pin PCR with photocontrol [4]

Programmed Controls	
SCP-_F	Sensor Control Programmable, 8F or 40F [11]
ADD	AutoDim Timer Based Dimming [4]
ADT	AutoDim Time of Day Dimming [4]

Photocontrols	
PC	Button Photocontrol [4,7]

1 – Items with a grey background can be done as a custom order. Contact brand representative for more information
2 – Battery temperature rating -20C to 55C
3 – Replace "_" with "3" for 3.5"-4.13" OD pole, "4" for 4.18"-5.25" OD pole, "5" for 5.5"-6.5" OD pole
4 – Networked Controls cannot be combined with other control options
5 – Not available with 2PF option
6 – Not available with 480V
7 – Not available with 347 or 480V
8 – Not available with Dual Driver option
9 – Only available in Size 1 housing, up to 105 Watts
10 – Some voltage restrictions may apply when combined with controls
11 – At least one SCPREMOTE required to program SCP motion sensor. Must select 8ft or 40ft.

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VIPER Area/Site

VIPER LUMINAIRE

DATE: | LOCATION:

TYPE: A5 | PROJECT: Texas Roadhouse

CATALOG #: VP-1-160L-115-4K7-4W-HSS-90-B-UNV-A-DBT

ORDERING GUIDE (CONT'D)

CATALOG #

Accessory Type		Size		Option		Color	
SHD	Shield	1	Size 1	HSS-90-B	House Side Shield 90° Back	BLS	Black Gloss Smooth
		2	Size 2	HSS-90-F	House Side Shield 90° Front	BLT	Black Matte Textured
		3	Size 3	HSS-90-S	House Side Shield 90° Side	DBS	Dark Bronze Gloss Smooth
		4	Size 4	HSS-270-BSS	House Side Shield 270° Back/Side/Side	DBT	Dark Bronze Matte Textured
				HSS-270-FSS	House Side Shield 270° Front/Side/Side	GTT	Graphite Matte Textured
				HSS-270-FSB	House Side Shield 270° Front/Side/Back	LGS	Light Gray Gloss Smooth
				HSS-360	House Side Shield 360°	PSS	Platinum Silver Smooth
				BC	Back Light Control	WHS	White Gloss Smooth
MTG	Mounting			A	Arm Mount for square pole/flat surface	WHT	White Matte Textured
				ASQU	Universal Arm Mount for square pole	VGT	Green Landscape Decorative
				AAU	Adjustable Arm for pole mounting	LEG	Legacy Colors
				ADU	Decorative upswept Arm	**Color Option**	
				RPA	Round Pole Adapter	CC	Custom Color
				MAF	Mast Arm Fitter for 2-3/8" OD horizontal arm		
				K	Knuckle		
				T	Trunnion		
				WB	Wall Bracket (compatible with universal arm mounts)		

Accessory Type		Option	
MSC	Miscellaneous	BIRD SPK	Bird Spike

Current Control Solutions — Accessories (Sold Separately)

NX Lighting Controls

- ☐ **NXOFM-1R1D-UNV** — On-fixture Module (7-pin), On / Off / Dim, Daylight Sensor with NX Radio and Bluetooth® Radio, 120–480VAC

LightGRID+ Lighting Control

- ☐ **WIR-RME-L** — On-fixture Module (7-pin or 5-pin), On / Off / Dim, Daylight Sensor with LightGRID+ Radio, 110–480VAC
- ☐ **SCP-REMOTE** — Remote Control for SCP/_F option. Order at least one per project to program and control the occupancy sensor

For additional information related to these accessories please visit currentlighting.com/beacon. Options provided for use with integrated sensor, please view specification sheet ordering information table for details.

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DATE: LOCATION:

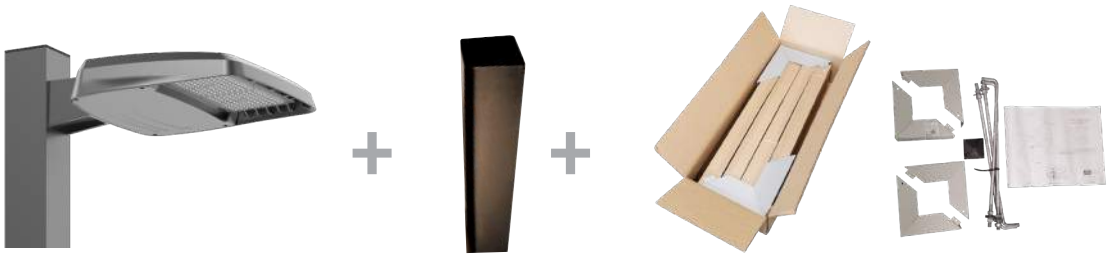
TYPE: PROJECT:

CATALOG #:

VIPER Area/Site

VIPER LUMINAIRE

VIPER POLE EXPRESS COMBO – ORDERING GUIDE



Catalog Number	Pole	Single or Double Head	Fixture	Lumens*	Wattage	Distribution	CCT/CRI	Mounting	Finish
VP-1-160-4K-3-LS-S20	**20' Square Straight Steel**	Single	**VP-1-160-4K-3-LS**	19584	158W	Type 3	4000K/70CRI	Universal Arm	Dark Bronze Textured
VP-1-160-4K-3-LS-S20-2X	**20' Square Straight Steel**	Double	**VP-1-160-4K-3-LS**	19584	158W	Type 3	4000K/70CRI	Universal Arm	Dark Bronze Textured
VP-1-160-4K-4F-LS-S20	**20' Square Straight Steel**	Single	**VP-1-160-4K-4F-LS**	19426	158W	Type 4F	4000K/70CRI	Universal Arm	Dark Bronze Textured
VP-1-160-4K-4F-LS-S20-2X	**20' Square Straight Steel**	Double	**VP-1-160-4K-4F-LS**	19426	158W	Type 4F	4000K/70CRI	Universal Arm	Dark Bronze Textured
VP-1-160-4K-3-LS-S25	**25' Square Straight Steel**	Single	**VP-1-160-4K-3-LS**	19584	158W	Type 3	4000K/70CRI	Universal Arm	Dark Bronze Textured
VP-1-160-4K-3-LS-S25-2X	**25' Square Straight Steel**	Double	**VP-1-160-4K-3-LS**	19584	158W	Type 3	4000K/70CRI	Universal Arm	Dark Bronze Textured
VP-1-160-4K-4F-LS-S25	**25' Square Straight Steel**	Single	**VP-1-160-4K-4F-LS**	19426	158W	Type 4F	4000K/70CRI	Universal Arm	Dark Bronze Textured
VP-1-160-4K-4F-LS-S25-2X	**25' Square Straight Steel**	Double	**VP-1-160-4K-4F-LS**	19426	158W	Type 4F	4000K/70CRI	Universal Arm	Dark Bronze Textured
VP-1-160-5K-3-LS-S20	**20' Square Straight Steel**	Single	**VP-1-160-5K-3-LS**	19499	158W	Type 3	5000K/70CRI	Universal Arm	Dark Bronze Textured
VP-1-160-5K-3-LS-S20-2X	**20' Square Straight Steel**	Double	**VP-1-160-5K-3-LS**	19499	158W	Type 3	5000K/70CRI	Universal Arm	Dark Bronze Textured
VP-1-160-5K-4F-LS-S20	**20' Square Straight Steel**	Single	**VP-1-160-5K-4F-LS**	19186	158W	Type 4F	5000K/70CRI	Universal Arm	Dark Bronze Textured
VP-1-160-5K-4F-LS-S20-2X	**20' Square Straight Steel**	Double	**VP-1-160-5K-4F-LS**	19186	158W	Type 4F	5000K/70CRI	Universal Arm	Dark Bronze Textured
VP-1-160-5K-3-LS-S25	**25' Square Straight Steel**	Single	**VP-1-160-5K-3-LS**	19499	158W	Type 3	5000K/70CRI	Universal Arm	Dark Bronze Textured
VP-1-160-5K-3-LS-S25-2X	**25' Square Straight Steel**	Double	**VP-1-160-5K-3-LS**	19499	158W	Type 3	5000K/70CRI	Universal Arm	Dark Bronze Textured
VP-1-160-5K-4F-LS-S25	**25' Square Straight Steel**	Single	**VP-1-160-5K-4F-LS**	19186	158W	Type 4F	5000K/70CRI	Universal Arm	Dark Bronze Textured
VP-1-160-5K-4F-LS-S25-2X	**25' Square Straight Steel**	Double	**VP-1-160-5K-4F-LS**	19186	158W	Type 4F	5000K/70CRI	Universal Arm	Dark Bronze Textured

VIPER POLE EXPRESS COMBO – STOCK LUMINAIRE SKUS

Catalog Number	Lumens	LPW	Distribution	Wattage	CCT/CRI	Voltage	Mounting	Finish
VP-1-160-4K-3-LS	19584	123.9	3	158W	4000K/70CRI	120-277V	Universal Arm with RPA (A3U)	Dark Bronze Textured
VP-1-160-4K-4F-LS	19426	122.9	4F	158W	4000K/70CRI	120-277V	Universal Arm with RPA (A3U)	Dark Bronze Textured
VP-1-160-5K-3-LS	19499	123.4	3	158W	5000K/70CRI	120-277V	Universal Arm with RPA (A3U)	Dark Bronze Textured
VP-1-160-5K-4F-LS	19186	121.4	4F	158W	5000K/70CRI	120-277V	Universal Arm with RPA (A3U)	Dark Bronze Textured

VIPER POLE EXPRESS COMBO – ACCESSORIES

Catalog Number	Description
VM14DB	Vibration Dampener, mounts to top of pole for reduced vibration



VM14DB

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VIPER Area/Site

VIPER LUMINAIRE

DATE: | LOCATION:

TYPE: A5 | PROJECT: Texas Roadhouse

CATALOG #: VP-1-160L-115-4K7-4W-HSS-90-B-UNV-A-DBT

OUTDOOR LIGHTING CONTROLS OPTIONS

CONTROLS FUNCTIONALITY

LIGHTGRID+

	Control Option Ordering Logic & Description		Control Option Functionality									Control Option Components	
			Networkable	Grouping	Scheduling	Occupancy/ Motion	Daylight Harvesting	0-10V Dimming	On/Off Control	Bluetooth App Programming	Sensor Height		
NX Wireless	NXOFM1R1D-UNV	NX 7-Pin Twist-Lock® with NX Networked Wireless Radio, Integral Automatic Dimming Photocell, Integral Single Pole Relay with Dimming, and Bluetooth Programming	✓	✓	✓	Paired with external control	✓	✓	✓	✓	–		NXOFM-1R1D-UV
NX Wireless	NXW	NX Networked Wireless Radio Module NXRM2 and Bluetooth Programming, without Sensor	✓	✓	✓	–	–	✓	✓	✓	–		NXRM2-H
NX Wireless	NXWS12F	NX Networked Wireless Enabled Integral NXSMP2-OMNI-O PIR Occupancy Sensor with Automatic Dimming Photocell and Bluetooth Programming	✓	✓	✓	✓	✓	✓	✓	✓	12ft		NXSMP2-OMNI-O
NX Wireless	NXWS16F	NX Networked Wireless Enabled Integral NXSMP2-LMO PIR Occupancy Sensor with Automatic Dimming Photocell and Bluetooth Programming	✓	✓	✓	✓	✓	✓	✓	✓	16ft		NXSMP2-LMO
NX Wireless	NXWS40F	NX Networked Wireless Enabled Integral NXSMP2-HMO PIR Occupancy Sensor with Automatic Dimming Photocell and Bluetooth Programming	✓	✓	✓	✓	✓	✓	✓	✓	40ft		NXSMP2-HMO
LightGRID+	WIR	LightGRID+ In-Fixture Module	✓	–	✓	–	–	✓	✓	Gateway	–		WIR
LightGRID+	WIR-RME-L	LightGRID+ On Fixture Module	✓	–	✓	–	–	✓	✓	Gateway	–		WIR-RME-L
LightGRID+	WIRSC	LightGRID+ Module and Occupancy Sensor	✓	✓	✓	✓	✓	✓	✓	Gateway	14ft - 40ft		BTMSP
Independent	BTSO-12F	Bluetooth® Programmable, BTSMP-OMNI-O PIR Occupancy Sensor with Automatic Dimming Photocell and 360° Lens	–	–	–	✓	✓	✓	✓	✓	12ft		BTSMP-OMNI-O
Independent	BTS-14F	Bluetooth® Programmable, BTSMP-LMO PIR Occupancy Sensor with Automatic Dimming Photocell and 360° Lens	–	–	–	✓	✓	✓	✓	✓	14ft		BTSMP-LMO
Independent	BTS-40F	Bluetooth® Programmable, BTSMP-HMO PIR Occupancy Sensor with Automatic Dimming Photocell and 360° Lens	–	–	–	✓	✓	✓	✓	✓	40ft		BTSMP-HMO

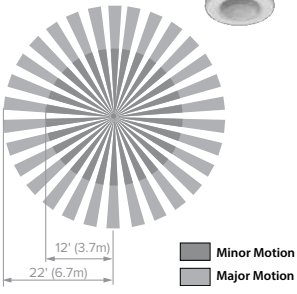
DEFAULT SETTINGS

NX Wireless	
Occupancy Sensor	Enabled
Occupancy Sensor Sensitivity	7
Occupancy Sensor Timeout	15 Minutes
Occupied Dim Level	100%
Unoccupied Dim Level	0%
Daylight Sensor	Disabled
Bluetooth	Enabled
2.4GHz Wireless Mesh	On
"Passcode Factory Passcode: HubbN3T!"	Enabled

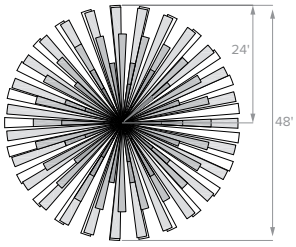
Stand Alone	
Occupancy Sensor	Enabled
Occupancy Sensor Sensitivity	7
Occupancy Sensor Timeout	8 Minutes
Occupied Dim Level	100%
Unoccupied Dim Level	50%
Daylight Sensor	Disabled

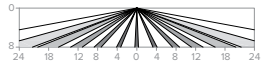
NX WIRELESS COVERAGE PATTERNS

NXSMP2-OMNI



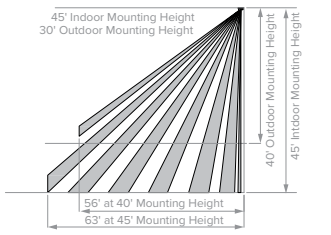
NXSMP2-LMO





Sensor Lens Coverage and Detection Patterns When Mounted at 8ft with Low Mount Lens

NXSMP2-HMO



Sensor Lens Coverage and Detection Patterns When Mounted at 40ft and 45ft with Standard Lens

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VIPER Area/Site

VIPER LUMINAIRE

DATE:	LOCATION:
TYPE: A5	PROJECT: Texas Roadhouse
CATALOG #: VP-1-160L-115-4K7-4W-HSS-90-B-UNV-A-DBT	

NX LIGHTING CONTROLS FREE APP



The NX Lighting Controls App is free to use mobile application for programming both NX Lighting Controls System or Standalone Bluetooth Sensors. The mobile app allows you to configure devices, discover and setup wireless enable luminiares and program NX system settings.

Apple App: https://apps.apple.com/us/app/nx-lighting-controls/id962112904

Google Play: https://play.google.com/store/apps/details?id=io.cordova.NXBTR&hl=en_US&gl=US

Apple App

Google Play

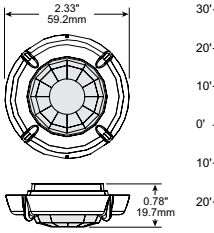
CONTROLS TECH SUPPORT 800-888-8006 (7:00 AM - 7:00 PM)

OUTDOOR LIGHTING CONTROLS OPTIONS

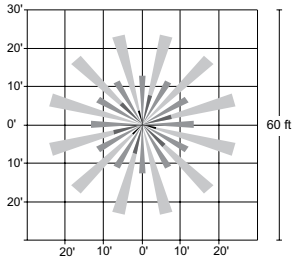
CONTROLS FUNCTIONALITY

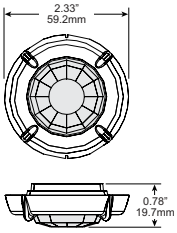
	Control Option Ordering Logic & Description		Control Option Functionality									Control Option Components
			Networkable	Grouping	Scheduling	Occupancy/ Motion	Daylight Harvesting	0-10V Dimming	On/Off Control	Bluetooth App Programming	Sensor Height	
Independent	SCP_F	Sensor Control Programmable, 8F or 40F	–	–	–	✓	✓	✓	✓	–	8ft or 40ft	SCP_F
	ADD	AutoDIM Timer Based Dimming	–	–	✓	–	–	–	✓	–	–	ADD
	ADT	AutoDIM Time of Day Dimming	–	–	✓	–	–	–	✓	–	–	ADT
	7PR	7-Pin Receptacle	–	–	Paired with external control	–	Paired with external control	–	Paired with external control	–	–	7PR
	7PR-SC	7-Pin Receptacle with shorting cap	–	–	–	–	–	–	–	–	–	7PR-SC
	3PR	3-Pin twist lock	–	–	–	–	–	–	Paired with external control	–	–	3PR
	3PR-SC	3-Pin Receptacle with shorting cap	–	–	–	–	–	–	–	–	–	3PR-SC
	3PR-TL	3-Pin with photocontrol	–	–	–	–	✓	–	✓	–	–	3PR-TL

COVERAGE PATTERNS FOR SCP_F

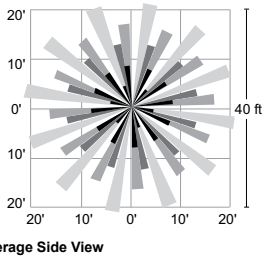


Coverage Top View @ 12ft.

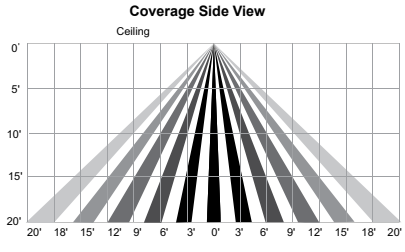




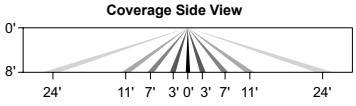
Coverage Top View @ 20 ft.

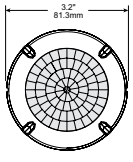


Coverage Side View

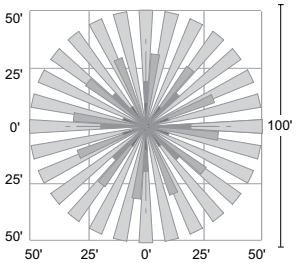


Coverage Side View

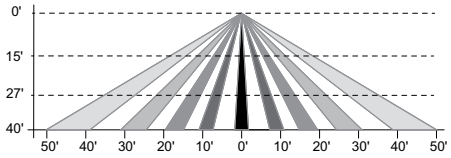




Coverage Top View @40ft



Coverage Side View



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VIPER Area/Site

VIPER LUMINAIRE

DATE: | LOCATION:

TYPE: A5 | PROJECT: Texas Roadhouse

CATALOG #: VP-1-160L-115-4K7-4W-HSS-90-B-UNV-A-DBT

PROGRAMMED CONTROLS

ADD-AutoDim Timer Based Options

- Light delay options from 1-9 hours after the light is turned on to dim the light by 10-100%. To return the luminaire to its original light level there are dim return options from 1-9 hours after the light has been dimmed previously.

EX: ADD-6-5-R6

ADD Control Options	Configurations Choices	Example Choice Picked
Auto-Dim Options	1-9 Hours	6 - Delay 6 hours
Auto-Dim Brightness	10-100% Brightness	5 - Dim to 50% brightness
Auto-Dim Return	Delay 0-9 Hours	R6 - Return to full output after 6 hours

ADT-AutoDim Time of Day Based Option

- Light delay options from 1AM-9PM after the light is turned on to dim the light by 10-100%. To return the luminaire to its original light level there are dim return options from 1AM-9PM after the light has been dimmed previously.

EX: ADT-6-5-R6

ADD Control Options	Configurations Choices	Example Choice Picked
Auto-Dim Options	12-3 AM and 6-11 PM	6 - Dim at 6PM
Auto-Dim Brightness	10-100% Brightness	5 - Dim to 50%
Auto-Dim Return	12-6 AM and 9-11P	R6 - Return to full output at 6AM

DELIVERED LUMENS

For delivered lumens, please see Lumens Data PDF on www.Currentlighting.com

PROJECTED LUMEN MAINTENANCE

Ambient Temp.	0	25,000	*TM-21-11 36,000	50,000	100,000	Calculated L_{70} (Hours)
25°C / 77°F	1.00	0.97	0.96	0.95	0.91	408,000
40°C / 104°F	0.99	0.96	0.95	0.94	0.89	356,000

LUMINAIRE AMBIENT TEMPERATURE FACTOR (LATF)

Ambient Temperature		Lumen Multiplier
0°C	32°F	1.03
10°C	50°F	1.01
20°C	68°F	1.00
25°C	77°F	1.00
30°C	86°F	0.99
40°C	104°F	0.98

Micro Strike Lumen Multiplier			
CCT	70 CRI	80 CRI	90 CRI
2700K	–	0.841	–
3000K	0.977	0.861	0.647
3500K	–	0.900	–
4000K	1	0.926	0.699
5000K	1	0.937	0.791
AP-Amber Phosphor Converted Multiplier			
Amber	0.710		

Strike Lumen Multiplier			
CCT	70 CRI	80 CRI	90 CRI
2700K	0.9	0.81	0.62
3000K	0.933	0.853	0.659
3500K	0.959	0.894	0.711
4000K	1	0.9	0.732
5000K	1	0.9	0.732
Monochromatic Amber Multiplier			
Amber	See Amber Spec Sheet		

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VIPER Area/Site

VIPER LUMINAIRE

DATE: | LOCATION:

TYPE: A5 | PROJECT: Texas Roadhouse

CATALOG #: VP-1-160L-115-4K7-4W-HSS-90-B-UNV-A-DBT

ELECTRICAL DATA: MICRO STRIKE

# OF LEDS	160						
NOMINAL WATTAGE	35	50	75	100	115	135	160
SYSTEM POWER (W)	34.9	50.5	72.1	97.2	111.9	132.2	157.8
INPUT VOLTAGE (V)	CURRENT (Amps)						
120	0.29	0.42	0.63	0.83	0.96	1.13	1.33
208	0.17	0.24	0.36	0.48	0.55	0.65	0.77
240	0.15	0.21	0.31	0.42	0.48	0.56	0.67
277	0.13	0.18	0.27	0.36	0.42	0.49	0.58
347	0.10	0.14	0.22	0.29	0.33	0.39	0.46
480	0.07	0.10	0.16	0.21	0.24	0.28	0.33

# OF LEDS	320						
NOMINAL WATTAGE	145	170	185	210	235	255	315
SYSTEM POWER (W)	150	166.8	185.7	216.2	240.9	261.5	312
INPUT VOLTAGE (V)	CURRENT (Amps)						
120	1.21	1.42	1.54	1.75	1.96	2.13	2.63
208	0.70	0.82	0.89	1.01	1.13	1.23	1.51
240	0.60	0.71	0.77	0.88	0.98	1.06	1.31
277	0.52	0.61	0.67	0.76	0.85	0.92	1.14
347	0.42	0.49	0.53	0.61	0.68	0.73	0.91
480	0.30	0.35	0.39	0.44	0.49	0.53	0.66

# OF LEDS	480					
NOMINAL WATTAGE	285	320	340	390	425	470
SYSTEM POWER (W)	286.2	316.7	338.4	392.2	423.2	468
INPUT VOLTAGE (V)	CURRENT (Amps)					
120	2.38	2.67	2.83	3.25	3.54	3.92
208	1.37	1.54	1.63	1.88	2.04	2.26
240	1.19	1.33	1.42	1.63	1.77	1.96
277	1.03	1.16	1.23	1.41	1.53	1.70
347	0.82	0.92	0.98	1.12	1.22	1.35
480	0.59	0.67	0.71	0.81	0.89	0.98

# OF LEDS	720				
NOMINAL WATTAGE	435	475	515	565	600
SYSTEM POWER (W)	429.3	475	519.1	565.2	599.9
INPUT VOLTAGE (V)	CURRENT (Amps)				
120	3.63	3.96	4.29	4.71	5.00
208	2.09	2.28	2.48	2.72	2.88
240	1.81	1.98	2.15	2.35	2.50
277	1.57	1.71	1.86	2.04	2.17
347	1.25	1.37	1.48	1.63	1.73
480	0.91	0.99	1.07	1.18	1.25

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DATE: | LOCATION:

TYPE: A5 | PROJECT: Texas Roadhouse

CATALOG #:

VIPER Area/Site

VIPER LUMINAIRE

ELECTRICAL DATA: STRIKE

# OF LEDS	36				
NOMINAL WATTAGE	39	55	85	105	120
SYSTEM POWER (W)	39.6	56.8	83.6	108.2	120.9
INPUT VOLTAGE (V)	CURRENT (Amps)				
120	0.33	0.46	0.71	0.88	0.96
208	0.19	0.26	0.41	0.50	0.55
240	0.16	0.23	0.35	0.44	0.48
277	0.14	0.20	0.31	0.38	0.42
347	0.11	0.16	0.24	0.30	0.33
480	0.08	0.11	0.18	0.22	0.24

# OF LEDS	72				
NOMINAL WATTAGE	115	145	180	210	240
SYSTEM POWER (W)	113.7	143.2	179.4	210.2	241.7
INPUT VOLTAGE (V)	CURRENT (Amps)				
120	1.00	1.21	1.50	1.75	1.79
208	0.58	0.70	0.87	1.01	1.03
240	0.50	0.60	0.75	0.88	0.90
277	0.43	0.52	0.65	0.76	0.78
347	0.35	0.42	0.52	0.61	0.62
480	0.25	0.30	0.38	0.44	0.45

# OF LEDS	108				
NOMINAL WATTAGE	215	250	280	325	365
SYSTEM POWER (W)	214.8	250.8	278.3	324.7	362.6
INPUT VOLTAGE (V)	CURRENT (Amps)				
120	2.00	2.08	2.33	3.04	2.67
208	1.15	1.20	1.35	1.75	1.54
240	1.00	1.04	1.17	1.52	1.33
277	0.87	0.90	1.01	1.32	1.16
347	0.69	0.72	0.81	1.05	0.92
480	0.50	0.52	0.58	0.76	0.67

# OF LEDS		162				
NOMINAL WATTAGE	320	365	405	445	485	545
SYSTEM POWER (W)	322.1	362.6	403.6	445.1	487.1	543.9
INPUT VOLTAGE (V)		CURRENT (Amps)				
120	2.71	2.67	3.38	3.71	4.04	4.54
208	1.56	1.54	1.95	2.14	2.33	2.62
240	1.35	1.33	1.69	1.85	2.02	2.27
277	1.17	1.16	1.46	1.61	1.75	1.97
347	0.94	0.92	1.17	1.28	1.40	1.57
480	0.68	0.67	0.84	0.93	1.01	1.14

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VIPER Area/Site

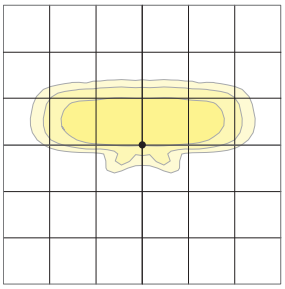
VIPER LUMINAIRE

DATE:	LOCATION:
TYPE: A5	PROJECT: Texas Roadhouse
CATALOG #: VP-1-160L-115-4K7-4W-HSS-90-B-UNV-A-DBT	

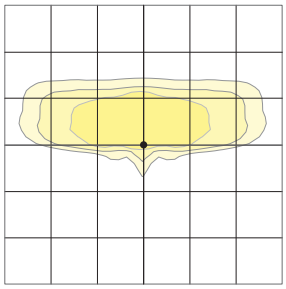
MICRO STRIKE PHOTOMETRY

The following diagrams represent the general distribution options offered for this product. For detailed information on specific product configurations, see website photometric test reports.

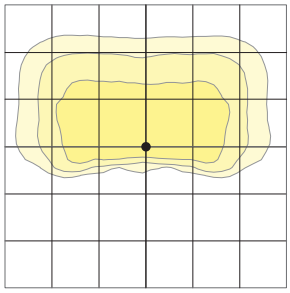
Type 2



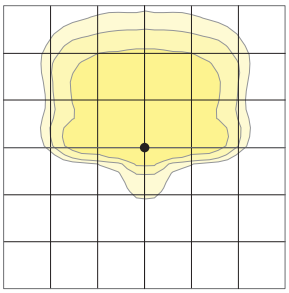
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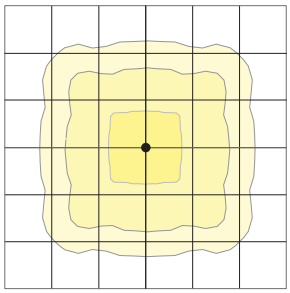
Type 4 Wide



Type 4F



Type 5QW



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VIPER Area/Site

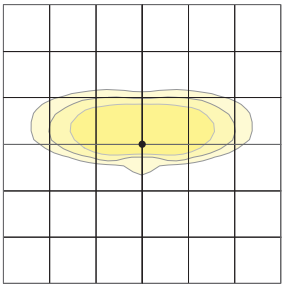
VIPER LUMINAIRE

DATE:	LOCATION:
TYPE: A5	PROJECT: Texas Roadhouse
CATALOG #: VP-1-160L-115-4K7-4W-HSS-90-B-UNV-A-DBT	

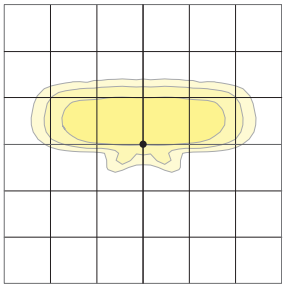
OPTIC STRIKE PHOTOMETRY

The following diagrams represent the general distribution options offered for this product. For detailed information on specific product configurations, see website photometric test reports.

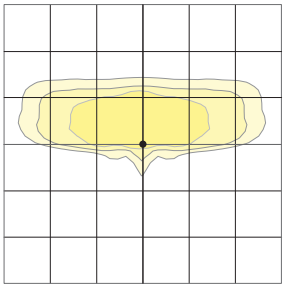
Type FR – Front Row/Auto Optic



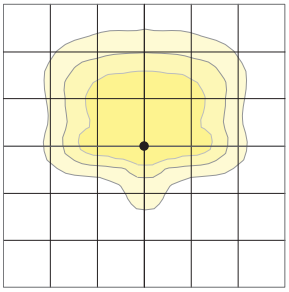
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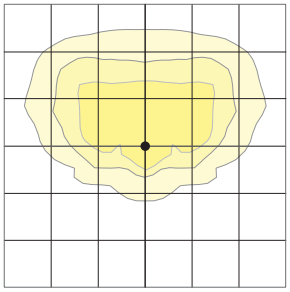
Type 3



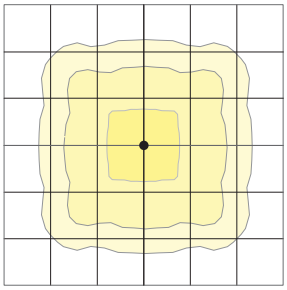
Type 4 Forward



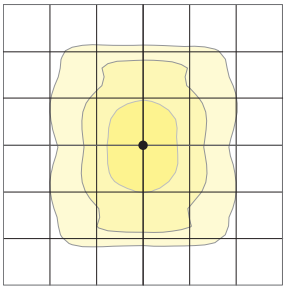
Type 4 Wide



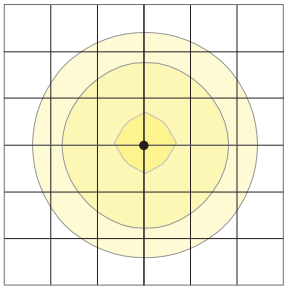
Type 5QM



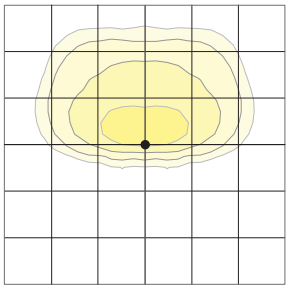
Type 5RW (rectangular)



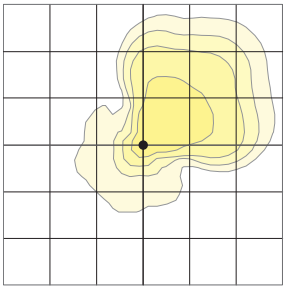
Type 5W (round wide)



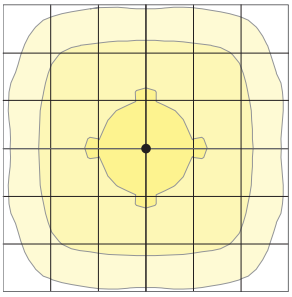
Type TC



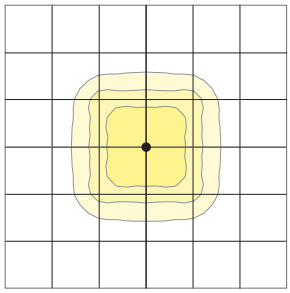
Type Corner



Type 5QW



Type 5QN



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BEACON
design . performance . technology

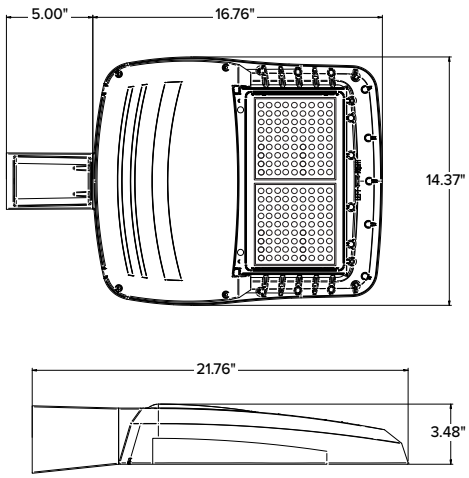
VIPER Area/Site

VIPER LUMINAIRE

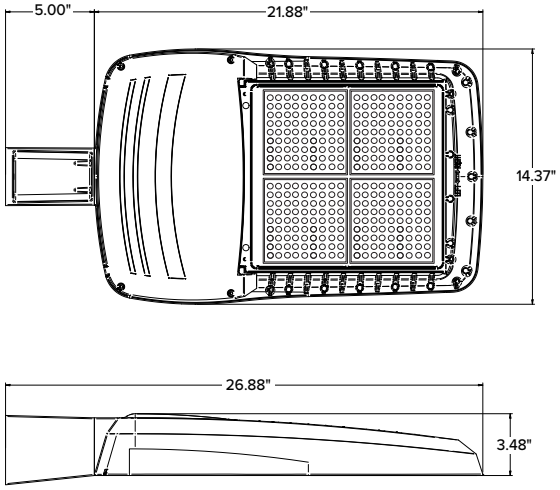
DATE:	LOCATION:
TYPE: A5	PROJECT: Texas Roadhouse
CATALOG #: VP-1-160L-115-4K7-4W-HSS-90-B-UNV-A-DBT	

DIMENSIONS

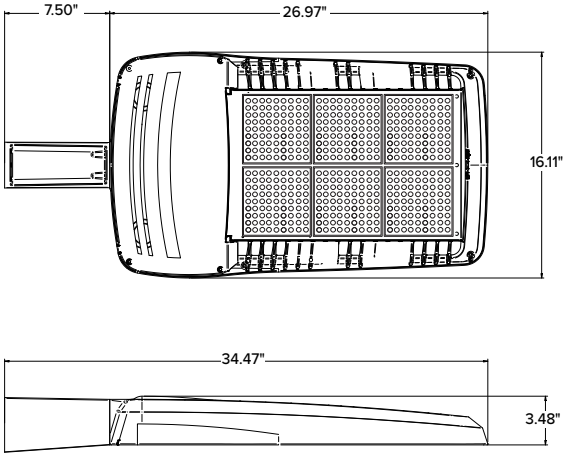
SIZE 1



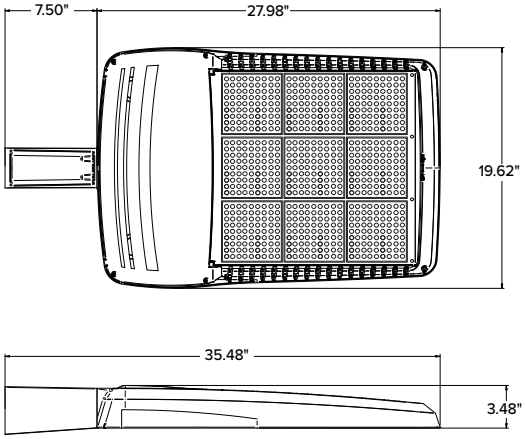
SIZE 2



SIZE 3



SIZE 4



	EPA				
	VP1 (Size 1)	VP2 (Size 2)	VP3 (Size 3)	VP4 (Size 4)	Config.
Single Fixture	0.454	0.555	0.655	0.698	
Two at 180	0.908	1.110	1.310	1.396	
Two at 90	0.583	0.711	0.857	0.948	
Three at 90	1.037	1.266	1.512	1.646	
Three at 120	0.943	1.155	1.392	1.680	
Four at 90	1.166	1.422	1.714	1.896	

	Weight	
	lbs	kgs
VP1 (Size 1)	13.7	6.2
VP2 (Size 2)	16.0	7.26
VP3 (Size 3)	25.9	11.7
VP4 (Size 4)	30.8	13.9

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VIPER Area/Site

VIPER LUMINAIRE

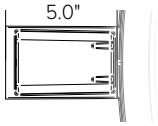
DATE:	LOCATION:
TYPE: A5	PROJECT: Texas Roadhouse
CATALOG #: VP-1-160L-115-4K7-4W-HSS-90-B-UNV-A-DBT	

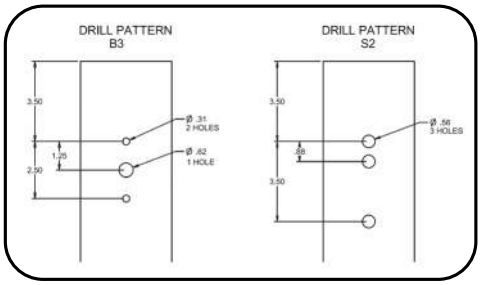
MOUNTING



A–STRAIGHT ARM MOUNT

Fixture ships with integral arm for ease of installation. Compatible with Current Outdoor B3 drill pattern for ease of installation on square poles. For round poles add applicable suffix (2/3/4/5)

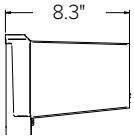


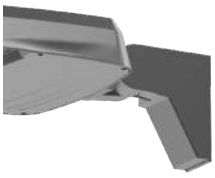




ASQU–UNIVERSAL ARM MOUNT

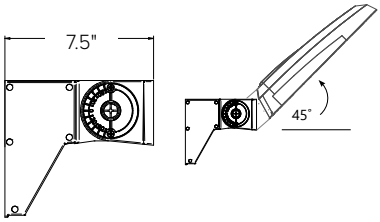
Universal mounting block for ease of installation. Compatible with drill patterns from 1.5" to 5.25" and Current drill pattern S2. For round poles add applicable suffix (2/3/4/5)





AAU–ADJUSTABLE ARM FOR POLE MOUNTING

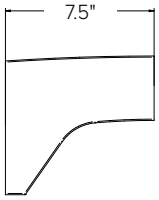
Rotatable arm mounts directly to pole. Compatible with drill patterns from 1.5" to 5.25" and Current drill pattern S2 and B3. For round poles add applicable suffix (2/3/4/5). Rotatable in 5˚ aiming angle increments. Micro Strike configurations have a 45° aiming limitation. Strike configurations have a 30° aiming limitation.





ADU–DECORATIVE UPSWEPT ARM

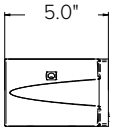
Upswept Arm compatible with drill patterns from 1.5" to 5.25" and Current drill pattern S2. For round poles add applicable suffix (2/3/4/5).

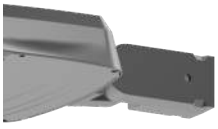




MAF–MAST ARM FITTER

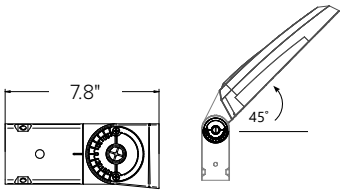
Fits 2-3/8" OD horizontal tenons.

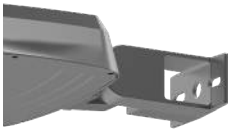




K–KNUCKLE

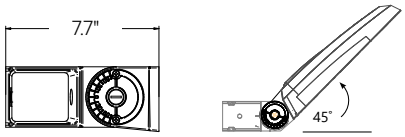
Rotatable in 5-degree aiming angle increments, fits 2-3/8" tenons or pipes. Micro Strike configurations have a 45° aiming limitation. Strike configurations have a 30° aiming limitation.





T–TRUNNION

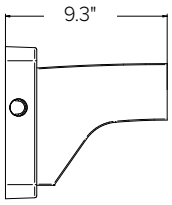
Trunnion for surface and crossarm mounting using (1) 3/4" or (2) 1/2" size through bolts. Micro Strike configurations have a 45° aiming limitation. Strike configurations have a 30° aiming limitation.





WM–WALL MOUNT

Compatible with universal arm mount, adjustable arm mount, and decorative arm mount. The WA option uses the same wall bracket but replaces the decorative arm with an adjustable arm.



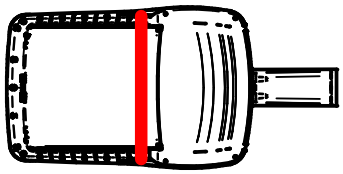
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ADDITIONAL INFORMATION (CONTINUED)

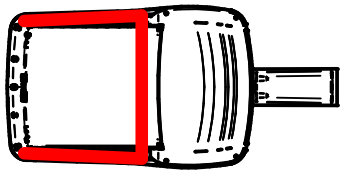
HOUSE SIDE SHIELD FIELD INSTALL ACCESSORIES

HSS has a depth of 5" for all Viper sizes
Not to be used with Occupancy Sensors as the shield may block the light to the sensor.

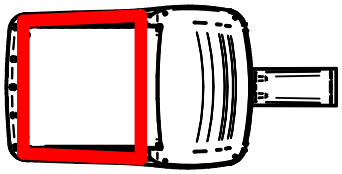
VPR2x HSS-90-B-xx



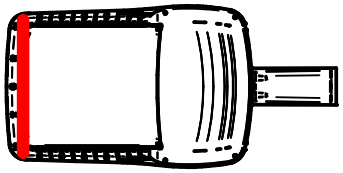
VPR2x HSS-270-BSS-xx



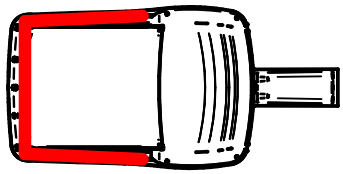
VPR2x HSS-360-xx



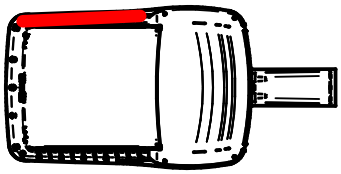
VPR2x HSS-90-F-xx



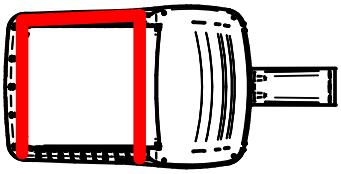
VPR2x HSS-270-FSS-xx



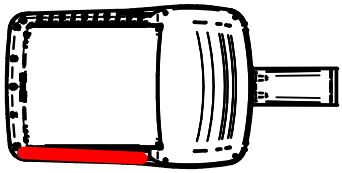
VPR2x HSS-90-S-xx



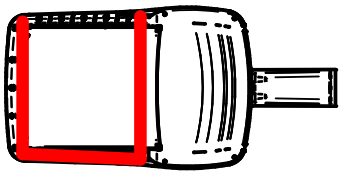
VPR2x HSS-270-FSB-xx



VPR2x HSS-90-S-xx



VPR2x HSS-270-FSB-xx



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SECURITY LIGHTING™

SES Poles

SQUARE STEEL STRAIGHT POLES (SES)

DATE: | LOCATION:

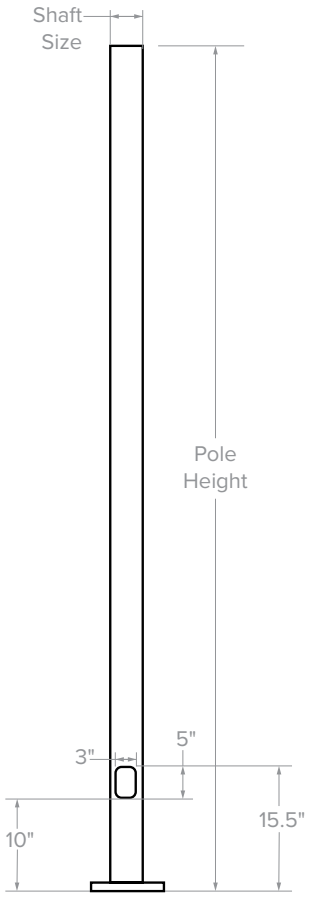
TYPE: AA5 - POLE | PROJECT: Texas Roadhouse

CATALOG #: SES-25-40-01-A-B3-DB

FEATURES

- Square Steel Straight Shaft
- One piece construction
- 2 3/8" OD tenon, Open Top or Factory drilled Side Mount Options available
- Steel Base Plate
- 3 size options for anchor bolts. All anchor bolts fully galvanized with 2 nuts and washer (bolts ordered as separate line item and paper template included as component of anchor bolts)
- Square base cover available (ordered as separate line item)
- Pole finished in weather proof powder coat paint in 4 standard colors
- 3" x 5" Gasketed hand hole standard

POLE DIMENSIONS





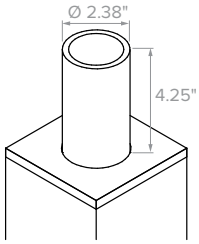
Tenon Top Pole

Open Top Pole

SPECIFICATIONS

The Square Steel Straight Pole has been successfully installed in projects of all types for over 30 years and has become the most popular and economical pole option for all site lighting applications including retail, commercial, industrial and residential projects.

The popularity of this series is due to its full offering of sizes, heights and standard colors with complete offering of mounting options, accessories and select styles/colors stocked for immediate shipping.



ORDERING GUIDE

Example: SES-XX-XX-X-XX-X-XX-XX

CATALOG #

SES	–		–		–		–		–		–		–	
Housing		**Height**		**Size**		**Guage**		**Mounting**		**Drilling**		**Coating**		**Color**
SES Square Steel Straight Pole		**18** 18 Feet **20** 20 Feet **22** 22 Feet **25** 25 Feet **28** 28 Feet **30** 30 Feet		**40** 4"x4" Shaft **50** 5"x5" Shaft		**01** 11 Guage .119" thick **07** 7 Guage .179" thick		**TA** 2⅜" OD Tenon[2] **TB** 2⅞" OD Tenon[2] **OT** Open Top Pole **A** Side-Single **B** Side-Double at 90° **C** Side-Double at 180° **D** Side-Triple at 90° **F** Side-Quad at 90°		**Blank** No Drilling **2** Drill Pattern 2 **6** Drill Pattern 6 **26** Drill Pattern 26 **C** Custom Drill Pattern[3] **B3** 2 bolt (2 ½" spacing) Ratio, Viper A arms		**Blank** None **GL** Galvanized[1]		**DB** Dark Bronze **WH** White **BL** Black **PS** Platinum Silver

Notes:

1 All Non-stocked galvanized poles have an 8-10 week lead time

2 Tenon 4.25" tall

Note: Anchor bolts, templates and bolt covers are ordered as separate line items and material part numbers are listed with the accessories.
Note: Custom Pole heights available, just note required height (pole will be cut down to required height from next tallest pole heights offered)

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SECURITY LIGHTING™

SES Poles

SQUARE STEEL STRAIGHT POLES (SES)

DATE: | LOCATION:

TYPE: AA5 - POLE | PROJECT: Texas Roadhouse

CATALOG #: SES-25-40-01-A-B3-DB

ORDERING INFORMATION CONTD.

Catalog Number	Pole Ht.		Nominal Shaft Dim.	Wind Load Rating- ASCE 7-05 wind map EPA Load Rating-(3 second gust wind speeds)										Wall Thick.	Bolt Circle (Sug.)	Bolt Circle	Bolt Sq.	Base Plate (sq.)	Anchor Bolt Size	Bolt Proj.	Pole Wt. (lbs.)
	ft	m		85 MPH	90 MPH	100 MPH	105 MPH	110 MPH	120 MPH	130 MPH	140 MPH	145 MPH	150 MPH								
SES-10-40-01-XX-XX	10	3.0	4"	25.0	25.0	25.0	22.8	20.6	17.0	14.2	11.9	11.0	10.1	0.125"	11"	8-11"	5.6-7.8"	10.25 x 0.75"	3/4 x 30 x 3"	4"	77
SES-10-50-01-XX-XX	10	3.0	5"	25.0	25.0	25.0	25.0	25.0	23.0	19.1	16.0	14.7	13.5	0.125"	11"	10-13.5"	7.1-9.5"	12" x 1"	1 x 36 x 4"	4"	
SES-12-40-01-XX-XX	12	3.7	4"	25.0	25.0	20.0	18.0	16.1	13.2	10.8	8.9	8.1	7.4	0.125"	11"	8-11"	5.6-7.8"	10.25 x 0.75"	3/4 x 30 x 3"	4"	90
SES-12-50-01-XX-XX	12	3.7	5"	25.0	25.0	25.0	24.0	21.8	17.8	14.5	12.1	11.0	10.0	0.125"	11"	10-13.5"	7.1-9.5"	12" x 1"	1 x 36 x 4"	4"	
SES-14-40-01-XX-XX	14	4.3	4"	23.1	20.4	16.1	14.3	12.8	10.2	8.2	6.6	5.9	5.3	0.125"	11"	8-11"	5.6-7.8"	10.25 x 0.75"	3/4 x 30 x 3"	4"	103
SES-16-40-01-XX-XX	16	4.9	4"	19.0	16.7	13.0	11.5	10.1	7.9	6.2	4.7	4.1	3.6	0.125"	11"	8-11"	5.6-7.8"	10.25 x 0.75"	3/4 x 30 x 3"	4"	116
SES-16-50-07-XX-XX	16	4.9	5"	25.0	25.0	26.0	25.0	24.8	20.1	16.5	13.6	12.3	11.2	0.188"	11"	10-13.5"	7.1-9.5"	12" x 1"	1 x 36 x 4"	4"	219
SES-18-40-01-XX-XX	18	5.5	4"	15.6	13.6	10.0	9.0	7.8	5.9	4.4	3.1	2.6	2.1	0.125"	11"	8-11"	5.6-7.8"	10.25 x 0.75"	3/4 x 30 x 3"	4"	129
SES-18-50-07-XX-XX	18	5.5	5"	25.0	25.0	25.0	22.9	20.4	16.4	13.2	10.7	9.6	8.6	0.188"	11"	10-13.5"	7.1-9.5"	12" x 1"	1 x 36 x 4"	4"	243
SES-20-40-01-XX-XX	20	6.1	4"	12.7	10.9	7.9	6.9	5.9	4.2	2.8	1.7	1.3	0.9	0.125"	11"	8-11"	5.6-7.8"	10.25 x 0.75"	3/4 x 30 x 3"	4"	142
SES-20-40-7-XX-XX	20	6.1	4"	13.6	11.6	8.5	7.2	6.1	4.4	3	1.9	1.4	1	0.188"	11"	8-11"	5.6-7.8"	11" x 1"	3/4 x 30 x 3"	4"	201
SES-20-50-07-XX-XX	20	6.1	5"	25.0	25.0	21.3	18.9	16.7	13.2	10.4	8.1	7.2	6.3	0.125"	11"	10-13.5"	7.1-9.5"	12" x 1"	1 x 36 x 4"	4"	267
SES-22-50-07-XX-XX	22	6.7	5"	25.0	23.0	17.7	15.5	13.5	10.5	8.0	6.0	5.2	4.4	0.125"	11"	10-13.5"	7.1-9.5"	12" x 1"	1 x 36 x 4"	4"	292
SES-25-40-01-XX-XX	25	7.6	4"	7.3	5.9	3.8	2.9	2.1	0.8	NR	NR	NR	NR	0.125"	11"	8-11"	5.6-7.8"	10.25 x 0.75"	3/4 x 30 x 3"	4"	175
SES-25-40-7-XX-XX	25	7.6	4"	12.8	11.0	7.9	6.7	5.5	3.7	2.3	1.2	0.7	NR	0.188"	11"	8-11"	5.6-7.8"	11" x 1"	3/4 x 30 x 3"	4"	257
SES-25-50-07-XX-XX	25	7.6	5"	20.7	17.8	13.3	11.5	9.8	7.2	5.0	3.3	2.6	1.9	0.125"	11"	10-13.5"	7.1-9.5"	12" x 1"	1 x 36 x 4"	4"	327
SES-28-50-07-XX-XX	27	8.1	5"	16.1	13.7	9.7	8.1	6.7	4.4	2.6	1.1	NR	NR	0.188"	11"	10-13.5"	7.1-9.5"	12" x 1"	1 x 36 x 4"	4"	335
SES-30-40-07-XX-XX	30	9.1	5"	13.5	11.3	7.7	6.2	4.9	2.8	1.1	NR	NR	NR	0.125"	11"	10-13.5"	7.1-9.5"	12" x 1"	1 x 36 x 4"	4"	367
SES-30-50-07-XX-XX	30	9.1	5"	13.5	11.3	7.7	6.2	4.9	2.8	1.1	NR	NR	NR	0.125"	11"	10-13.5"	7.1-9.5"	12" x 1"	1 x 36 x 4"	4"	367

Catalog Number	Florida Building Code 2010 EPA Load Rating (3 second gust wind speeds)									
	85 MPH	90 MPH	100 MPH	105 MPH	110 MPH	120 MPH	130 MPH	140 MPH	145 MPH	150 MPH
SES-10-40-01-XX-XX	25.0	25.0	25.0	25.0	23.5	20.5	17.8	15.5	11.0	10.1
SES-12-40-01-XX-XX	25.0	25.0	25.0	21.9	18.6	15.8	13.6	11.7	8.1	7.4
SES-14-40-01-XX-XX	25.0	25.0	21.1	17.5	14.7	12.3	10.4	8.8	5.9	5.3
SES-16-40-01-XX-XX	23.2	20.9	17.0	13.9	11.4	9.4	7.7	6.3	4.1	3.6
SES-16-50-07-XX-XX	25.0	25.0	25.0	25.0	24.9	21.0	17.9	15.2	12.3	11.2
SES-18-40-01-XX-XX	18.9	16.8	13.5	10.8	8.7	6.9	5.5	4.2	2.6	2.1
SES-18-50-07-XX-XX	25.0	25.0	25.0	24.1	20.0	16.7	13.9	11.6	9.6	8.6
SES-20-40-01-XX-XX	15.3	13.6	10.6	8.3	6.4	4.8	3.5	2.5	1.3	0.9
SES-20-40-07-XX-XX	25.0	24.0	19.6	16.1	13.2	10.8	8.9	7.2	4.3	3.7
SES-20-50-07-XX-XX	25.0	25.0	24.0	19.6	16.0	13.1	10.7	8.7	7.2	6.3
SES-22-50-07-XX-XX	25.0	24.8	19.8	15.9	12.7	10.1	8.0	6.2	5.2	4.4
SES-25-40-01-XX-XX	8.8	7.4	5.2	3.4	1.9	0.7	NR	NR	NR	NR
SES-25-40-7-XX-XX	7.7	6.4	4.3	2.8	1.3	NR	NR	NR		
SES-25-50-07-XX-XX	21.4	18.9	14.6	11.3	8.6	6.3	4.5	2.9	2.6	1.9
SES-28-50-07-XX-XX	18.7	16.4	12.4	9.3	6.8	4.7	3.0	1.5	NR	NR
SES-30-50-07-XX-XX	13.4	11.4	8.0	5.3	3.1	1.3	NR	NR	NR	NR
SES-30-40-07-XX-XX	13.4	11.4	8.0	5.3	3.1	1.3	NR	NR	NR	NR

Center of EPA is located at the pole top. If bullhorns or other methods are used that locate the EPA center above the poletop, EPA limits are reduced.
Calculations are based on each square foot of EPA being equal to 30 pounds.
The EPA limits are not applicable for poles attached to structures, such as parking garage decks.

QUICK SHIP

	Catalog Number	Description
☐	**SES18401TADB**	POLE-SES-18ftX4inSQ-11GA-TENON-DARK BRONZE
☐	**SES22507TABL**	POLE-SES-22ftX5inSQ-7GA-TENON-BLACK
☐	**SES22507TADB**	POLE-SES-22ftX5inSQ-7GA-TENON-DARK BRONZE
☐	**SES25507TABL**	POLE-SES-25ftX5inSQ-7GA-TENON-BLACK
☐	**SES25507TADB**	POLE-SES-25ftX5inSQ-7GA-TENON-DARK BRONZE

Consult factory for lead times on non-stocked poles

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SECURITY LIGHTING™

SES Poles

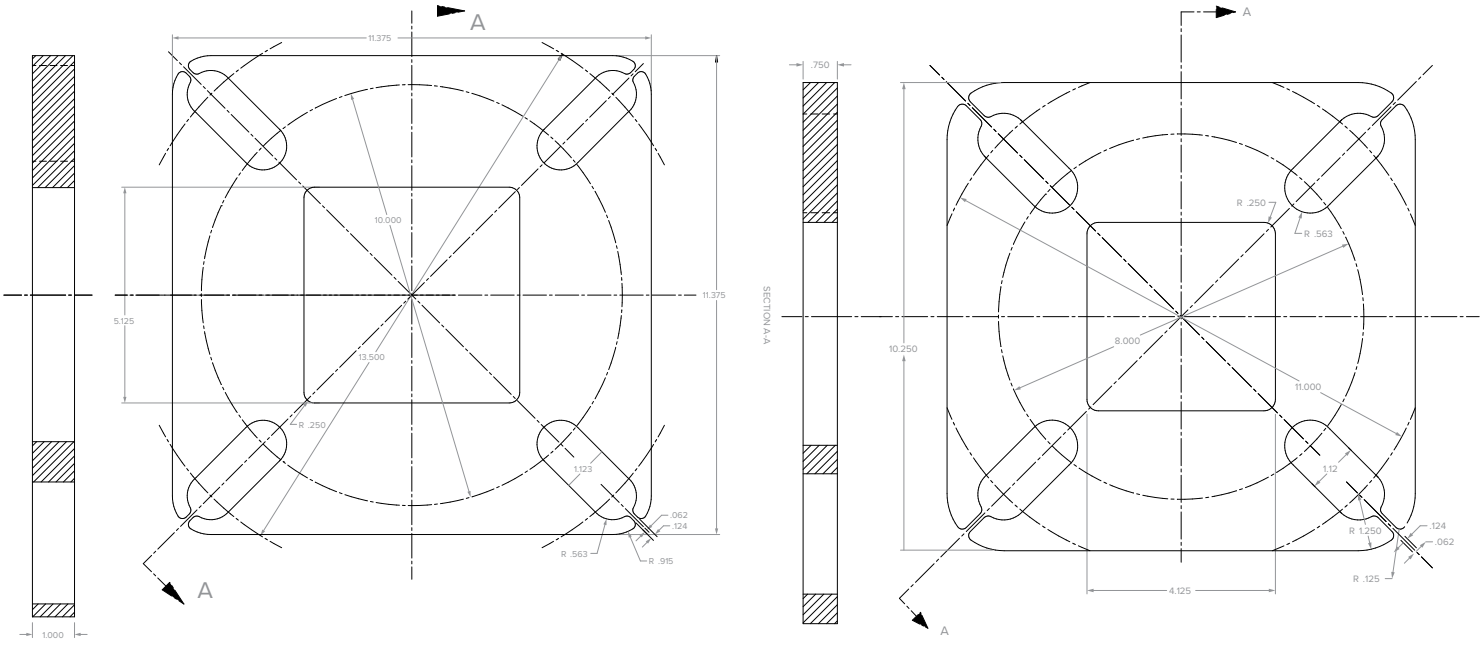
SQUARE STEEL STRAIGHT POLES (SES)

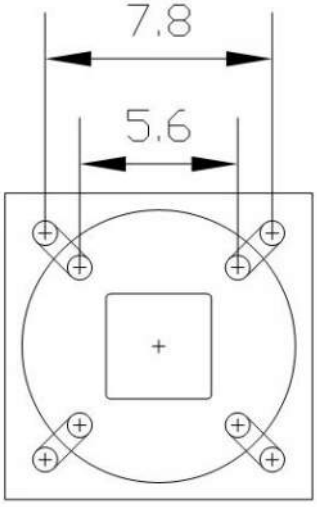
DATE: | LOCATION:

TYPE: AA5 - POLE | PROJECT: Texas Roadhouse

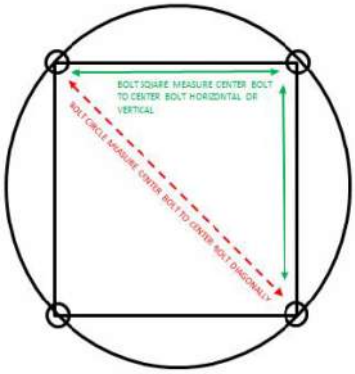
CATALOG #: SES-25-40-01-A-B3-DB

BOLT CIRCLE DIAGRAMS

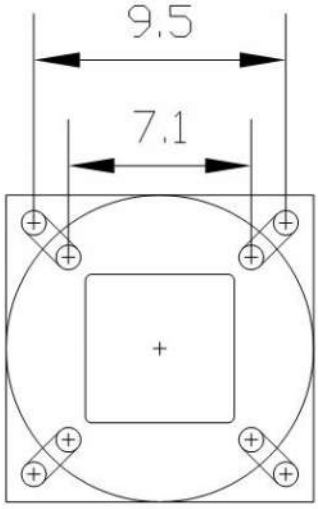




Bolt Square Measurement
Measurement vertical or horizontal from the center of the bolt to the center of the bolt.



Bolt Circle Measurement
Measure diagonal from the center of the bolt to the center of the bolt. Suggested bolt circle 10.5”



4” Square Pole

(10” Bolt Circle)
(Min. B.C. = 8”)
(MAX. B.C. - 11”)

5” Square Pole

(11” Bolt Circle)
(Min. B.C. = 10”)
(Max. B.C. = 13.5”)

All listed SES poles use 27701349904 paper template
It’s the contractors’ responsibilty to ensure that new poles will fit existing bases

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SES Poles

SQUARE STEEL STRAIGHT POLES (SES)

ACCESSORIES

POLE CAP



4" POLE CAP	20102389702
5" POLE CAP	20102389802
6" POLE CAP	20102389902

TENON



TA | (2 3/8" OD)

Note: TA Tenons are factory installed. For installation into open top poles, use TT1A tenon top adapter

HAND HOLE COVER



Note: Hand hole cover included with all new poles. Replacement parts:
22106400112 + (2)23115839901 + (1)26508469902(3"x5")

BASE COVER

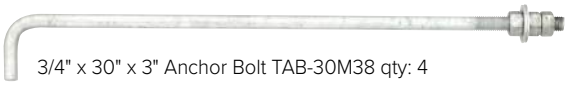
Order as a separate line item

Catalog Number	Description
Pole Base Covers for Square Poles	
SBC-4-XX[1]	10 1/2" Sq x 5" Deep (use on 4" sq poles)
SBC-4L-XX[1]	12 1/4" Sq x 5" Deep (use on 4" sq poles)
SBC-5-XX[1]	12 1/4" Sq x 5" Deep (use on 5" sq poles)
SBC-6-XX[1]	12 1/4" Sq x 5" Deep (use on 6" sq poles)

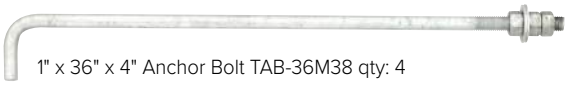
1. Replace XX with two letter color designation



ANCHORAGE | ORDER AS A SEPARATE LINE ITEM



3/4" x 30" x 3" Anchor Bolt TAB-30M38 qty: 4



1" x 36" x 4" Anchor Bolt TAB-36M38 qty: 4

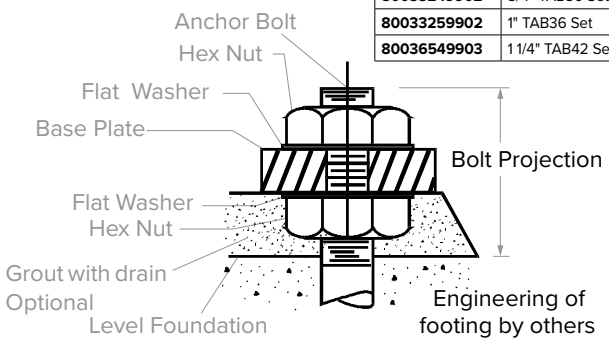


1" x 42" Anchor Bolt ABOLTS142 qty: 4

Note Fabricated from hight tensile steel, each anchor bolt has two nuts and two washers; Galvanized anchor bolts are hot dipped; (Galvanized includes threaded portion plus six inches minimum); Anchor Bolt template included with pole purchase.

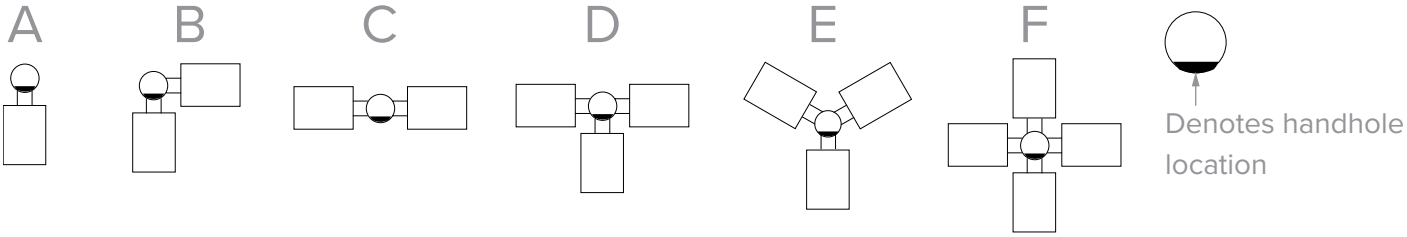
BASE DETAIL

Replacement Nut/Washer Kit	
80033249902	3/4" TAB30 Set
80033259902	1" TAB36 Set
80036549903	1 1/4" TAB42 Set

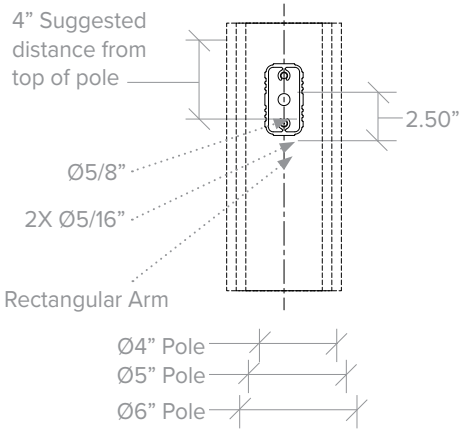


DRILL PATTERN | CONFIRM PROPER MOUNTING BEFORE ORDERING

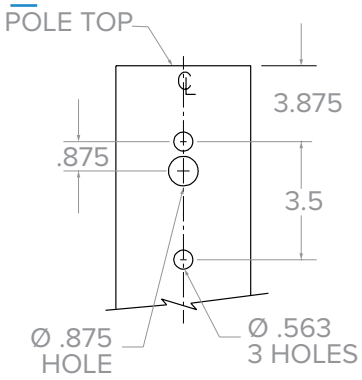
SIDE MOUNTING LOCATIONS Must use TETA fitter for 120° mounting



VIPER/RATIO (A ARMS) DRILL PATTERN B3, B4

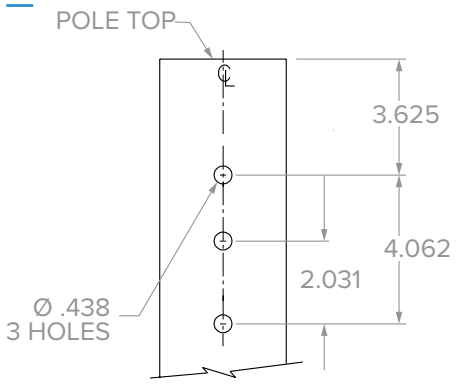


X2



#2 DRILL PATTERN

X6



#6 DRILL PATTERN

X26 drill pattern is a combination of both the X2 and X6 drill patterns

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SECURITY LIGHTING™

SES Poles

SQUARE STEEL STRAIGHT POLES (SES)

DATE: | LOCATION:

TYPE: AA5 - POLE | PROJECT: Texas Roadhouse

CATALOG #: SES-25-40-01-A-B3-DB

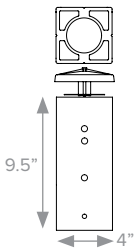
MOUNTING BRACKETS | ORDER AS ACCESSORIES

SIDE MOUNTING LOCATIONS

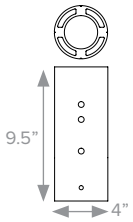
Catalog Number		Description	EPA	Weight
TTF-XX-XX[1,2]		4" Square pole top tenon adapter 2 3/8" OD slipfitter for max. four fixtures (90°)	0.4ft2 0.04m2	20lbs. 9kgs.
RETA-XX1,2 RETA-XX-Viper[1,2]		4" Round pole top tenon adapter 2 3/8" OD slipfitter for max. four fixtures (90°)	0.2ft2 0.02m2	20lbs. 9kgs.
TTF-VIPER-XX		4" Square pole top tenon adapter 2 3/8" OD slipfitter for max. fixture (90 0) Drilled 4 sides for Viper and plugged on two sides		

1 Replace X or XX with color designation
2 All fitters drilled with drill pattern 26 (except for fitters designed for Viper fixtures). Any other drill pattern must be designated at time of ordering.
3 Must use 10" arm on fixture for 120° mounting

TTF-10	Single
TTF-29	Twin 90°
TTF-28	Twin 180°
TTF-39	Triple 90°
TTF-49	Quad 90°
TTFViper	Quad 90° plugged on 3 sides



TTF-XX-XX
TTF-VIPER-XX
SETA-XX



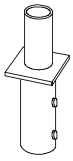
RETA-XX
RETA-XX-VIPER

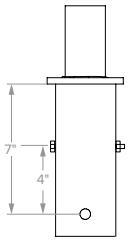
TENON INSERT FOR SINGLE FIXTURE MOUNTING OR TENON ADAPTERS

TT1A4-XX[1,2,3]	2 3/8" OD Tenon top adapter for 4" square open top poles, (slips 9" into pole aligns with #6 drill pattern)
TT1A5-XX[1,2,3]	2 3/8" OD Tenon top adapter for 5" square open top poles, (slips 9" into pole aligns with #6 drill pattern)

1 TT1A not required with tenon top pole. Use only for retrofit (specify 4" or 5" pole).
2 Replace XX with two letter color designation
3 Installed with one through bolt supplied with fitter. May require field drilling of pole for proper installation.


TT-1A*


SSP-TX



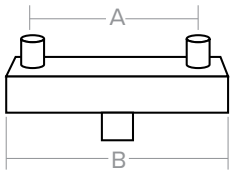
TWO FIXTURE MOUNTING BRACKET

Decorative steel floodlight brackets 4" square tubing with 2 1/3" O.D. fixture tenons. Square 4" bottom with 2 1/2" I.D. internet adapter for standard round tenons. Available in multiple finishes as shown. Use with SES series poles

Description	Maximum Weight Per Tenon		EPA		Weight	
	lbs	(kg)	Ft²	(m²)	lbs.	(kg)
Twin 180°	60	(27.2)	1.2	(0.1)	24	(10.9)

1 Replace XX with two letter color designation


TT2A-XX[1]



A	B
24"	30"
610mm	762mm

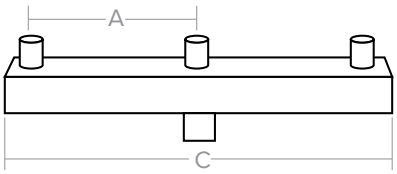
THREE FIXTURE MOUNTING BRACKET

Decorative steel floodlight brackets 4" square tubing with 2 1/3" O.D. fixture tenons. Square 4" bottom with 2 1/2" I.D. internet adapter for standard round tenons. Available in multiple finishes as shown. Use with SES series poles

Description	Maximum Weight Per Tenon		EPA		Weight	
	lbs	(kg)	Ft²	(m²)	lbs.	(kg)
Triple 180°	60	(27.2)	2.3	(0.2)	44	(19.9)

1 Replace XX with two letter color designation


TT3A-XX[1]



A	C
24"	54"
610mm	1372mm

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SECURITY LIGHTING™

SES Poles

SQUARE STEEL STRAIGHT POLES (SES)

DATE: | LOCATION:

TYPE: AA5 - POLE | PROJECT: Texas Roadhouse

CATALOG #: SES-25-40-01-A-B3-DB

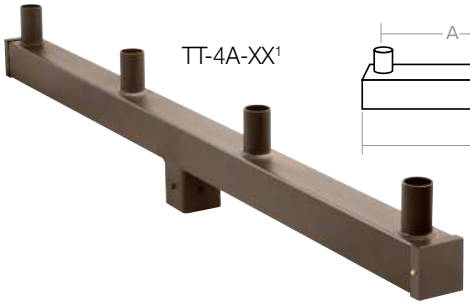
MOUNTING BRACKETS | ORDER AS ACCESSORIES

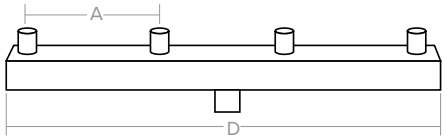
FOUR FIXTURE MOUNTING BRACKET

Decorative steel floodlight brackets 4" square tubing with 2 1/3" O.D. fixture tenons. Square 4" bottom with 2 1/2" I.D. internet adapter for standard round tenons. Available in multiple finishes as shown. Use with SES series poles

Description	Maximum Weight Per Tenon		EPA		Weight	
	lbs	(kg)	Ft^2	(m^2)	lbs.	(kg)
Quad 180°	60	(27.2)	3.4	(0.3)	64	(29)

1 Replace XX with two letter color designation





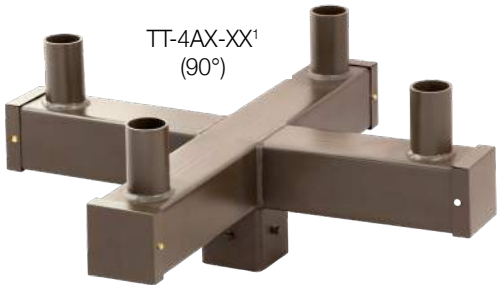
A	D
24"	78"
610mm	1981mm

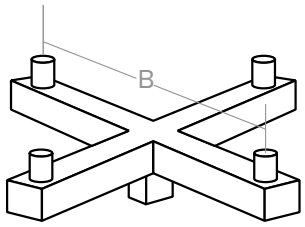
FOUR FIXTURE MOUNTING BRACKET (90°)

Decorative steel floodlight brackets 4" square tubing with 2 1/3" O.D. fixture tenons. Square 4" bottom with 2 1/2" I.D. internet adapter for standard round tenons. Available in multiple finishes as shown. Use with SES series poles

Description	Maximum Weight Per Tenon		EPA		Weight	
	lbs	(kg)	Ft^2	(m^2)	lbs.	(kg)
Quad 180°	60	(27.2)	2.8	(0.3)	46	(20.8)

1 Replace XX with two letter color designation





A	B
24"	30"
610mm	762mm

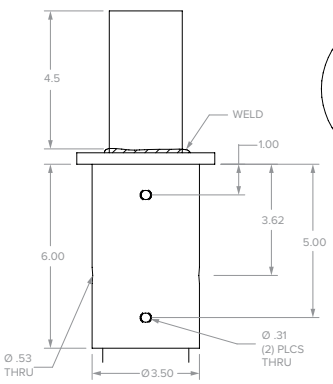
TPR SERIES

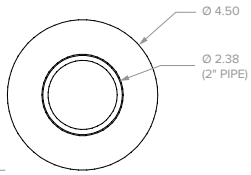
Decorative steel floodlight brackets 4" square tubing with 2 1/3" O.D. fixture tenons. Square 4" bottom with 2 1/2" I.D. internet adapter for standard round tenons. Available in multiple finishes as shown. Use with SES series poles

Catalog Number	Description	EPA	Weight
		$ft^2(m^2)$	lbs. (kg.)
TPR-2-XX[1,5]	2 1/2" to 2" pipe size tenon reducer	__	6 (2.7)
TPR-3-XX[2,5]	3" to 2" pipe size reducer	__	8 (3.6)
TPR-4-XX[3,5]	4" to 2" pipe size tenon reducer	__	9 (4.1)

1 Bracket slips over pole creating 2 3/8 OD Tenon (lower ID = 3 1/16")
2 Bracket slips over pole creating 2 3/8 OD Tenon (lower ID = ID = 3 1/2")
3 Bracket slips over pole creating 2 3/8 OD Tenon (lower ID = ID = 4 5/8")
4 Will not fit in 3 guage poles
5 Replace XX with two letter color designation







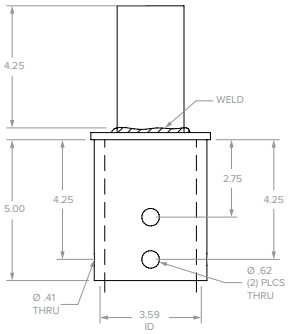
285-B SERIES

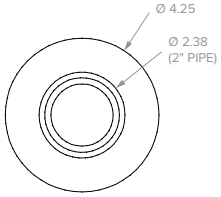
Decorative steel floodlight brackets 4" square tubing with 2 1/3" O.D. fixture tenons. Square 4" bottom with 2 1/2" I.D. internet adapter for standard round tenons. Available in multiple finishes as shown. Use with SES series poles

Catalog Number	Description
285-B-3-XX[1]	3 1/2" to 2 3/8" Reducer (OD for both dimensions)
285-B-4-XX[1]	4 1/2" to 2 3/8" Reducer (OD for both dimensions)

1 Replace XX with two letter color designation







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SECURITY LIGHTING™

SES Poles

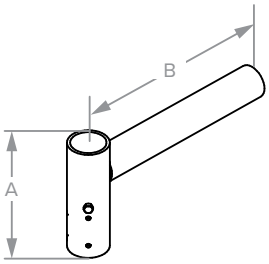
SQUARE STEEL STRAIGHT POLES (SES)

DATE: | LOCATION:

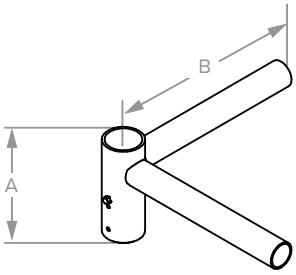
TYPE: AA5 - POLE | PROJECT: Texas Roadhouse

CATALOG #: SES-25-40-01-A-B3-DB

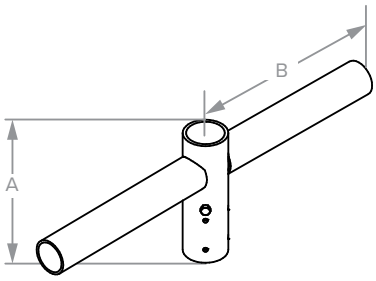
SPOKE MOUNTING BRACKETS[1]



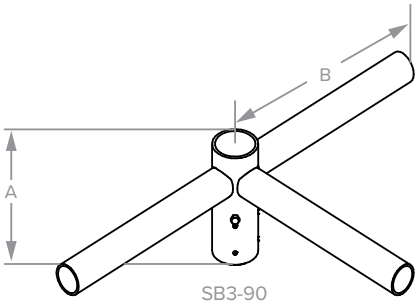
SB1



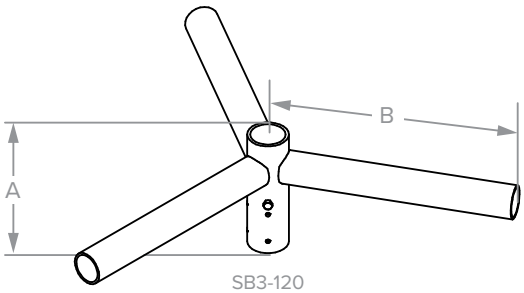
SB2-90



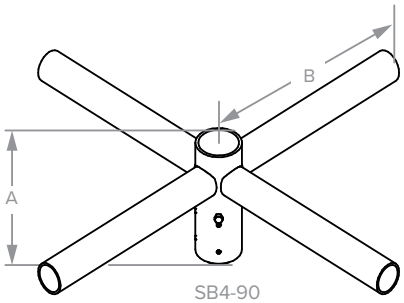
SB2-180



SB3-90



SB3-120



SB4-90

ORDERING GUIDE

Example: SB-X-XXX-XXXX-XXX

CATALOG #

SB –		–		–
Series	**Configuration**	**Length**	**Size**	**Color**
SB Spoke Bracket	**1**	**8"**	**PT20** 2" pipe tenon (2.38"OD)	**DB** Dark Bronze Textured
	2-180	**12"**		**BL** Black Textured
	2-90	**18"**	**PT25** 2.5" pipe tenon (2.88" OD)	**WH** White Textured
	3-120	**24"**		**GR** Gray Textured
	3-90	**30"**	**PT35** 3.5" pipe tenon (4.0" OD)	**PS** Platinum Silver Smooth
	4-90			**GYS** Light Gray Smooth
				BZT Bronze Textured
				BBT Basic Black Textured

Notes:

1 For Horizontal Slip Filter Mounting

ORDERING INFORMATION

(ORDER AS SEPARATE PART #, FIELD INSTALLED)

Catalog Number	Description	Max Allowable Load per Tenon	Bracket EPA MAX.	Bracket Weight, Max.
SB1	Single	60lbs (27.2kg)	0.6	18
SB2-180	Twin, 2@ 180°	60lbs (27.2kg)	1.0	27
SB2-90	Twin, 2@90°	60lbs (27.2kg)	0.8	27
SB3-120	3@120°	60lbs (27.2kg)	0.9	36
SB3-90	3@90°	60lbs (27.2kg)	1.0	36
SB4-90	4@90°	60lbs (27.2kg)	1.0	45

QUICK SHIP

Catalog Number	Description
SB2180PT20WHT	2@180°, 8"arms
SB2908PT20WHT	2@90°, 8" arms
SB312012PT20WHT	3@120°, 12" arms
SB3908PT20WHT	3@90°, 8" arms
SB4908PT20WHT	4@90°, 8" arms

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SECURITY LIGHTING™

SES Poles

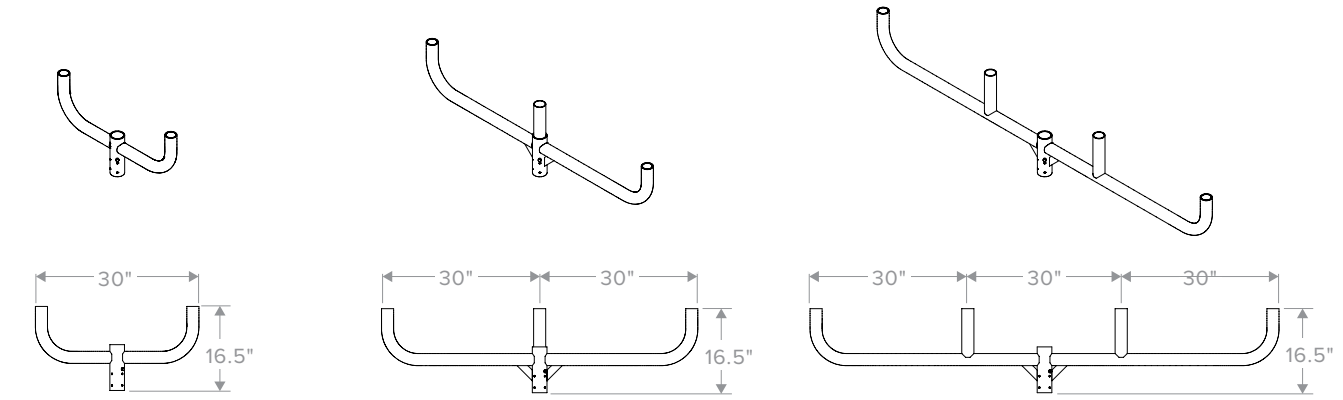
SQUARE STEEL STRAIGHT POLES (SES)

DATE: LOCATION:

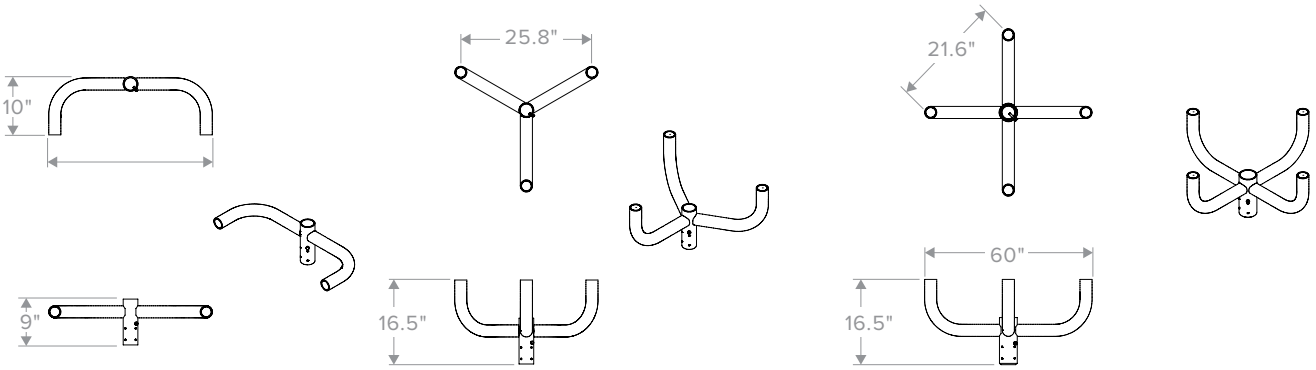
TYPE: PROJECT:

CATALOG #:

BULLHORN MOUNTING BRACKETS[1]



BHH–2–180 **BHH–3–180** **BHH–4–180**



BHH–2H–180 **BHH–3–120** **BHH–4–90**

ORDERING GUIDE

Example: BHH–X-XXX–XXXX–XX

CATALOG #

BHH –	–	–	–	–
Model	**Configurations**	**Pole Tenon Size**	**Color**	**Options**
BHH Bullhorn Bracket	**2–180** 2–180 **2H–180** 2H–180 **3–180** 3–180 **4–180** 4–180 **3–120** 3–120 **4–90** 4–90	**PT20** 2" pipe tenon (2.38" O.D.) **PT25** 2.5" pipe tenon (2.88" O.D.) **PT35** 3.5" pipe tenon (4.0" O.D.)	**DB** Dark bronze textured **BL** Black textured **WH** White textured **GR** Gray textured **PS** Platinum silver smooth	**BAS3** 3" SLEEVE (For luminaires requiring a 3" slipfit)

ORDERING INFORMATION

TENON TYPE BRACKETS (STEEL)

(order as separate part #, field installed)

Catalog Number	Description	Max allowable load per tenon	Bracket EPA, MAX.	Bracket weight, MAX
BHH-2-180	Twin	100 lbs (45.5 kg)	0.9 ft2 (.08 m2)	25 lbs (11.4 kg)
BHH-2H-180	Twin Horizontal	60 lbs (27.2 kg)	0.5 ft2 (.05 m2)	25 lbs (11.4 kg)
BHH-3-180	3-in-line	100 lbs (45.5 kg)	1.5 ft2 (.14 m2)	38 lbs (17.3 kg)
BHH-4-180	4-in-line	100 lbs (45.5 kg)	2.2 ft2 (.20 m2)	51 lbs (23.2 kg)
BHH-3-120	3 @ 120	100 lbs (45.5 kg)	1.2 ft2 (.11 m2)	40 lbs (18.2 kg)
BHH-4-90	4 @ 90	100 lbs (45.5 kg)	1.3 ft2 (.12 m2)	41 lbs (18.2 kg)

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SES Poles

SQUARE STEEL STRAIGHT POLES (SES)

DATE: | LOCATION:

TYPE: AA5 - POLE | PROJECT: Texas Roadhouse

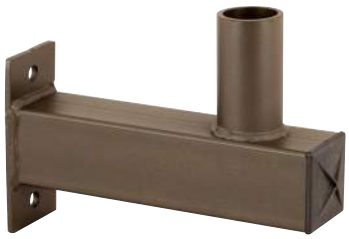
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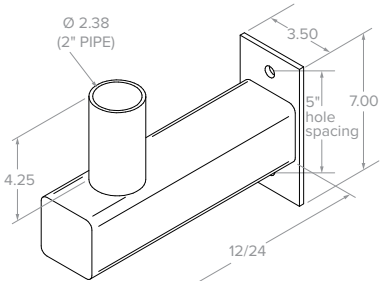
MID POLE BRACKET OPTIONS | ORDER AS ACCESSORIES

FLB-12/24

Catalog Number	Description
FLB-12-XX[1,2]	12" floodlight bracket for pole mounting (bracket requires internal pole access)
FLB-24-XX[1,2]	24" floodlight bracket for pole mounting (bracket requires internal pole access)

1 Replace XX with two letter color designation
2 Mounting Hardware by others



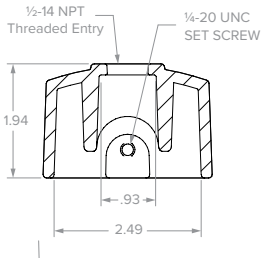


S-302

Catalog Number	Description	
S-302-XX[1]	Slipfits 1 1/2" or 2" pipe (1.9" OD or 2 3/8" OD) with 1/2" N.P.S.M. hub; Bronze	.6(0.3)

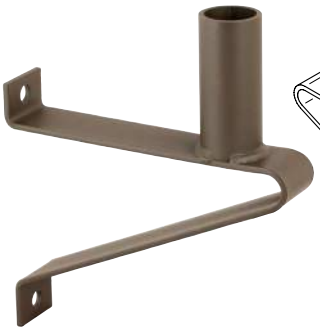
1 Replace XX with two letter color designation

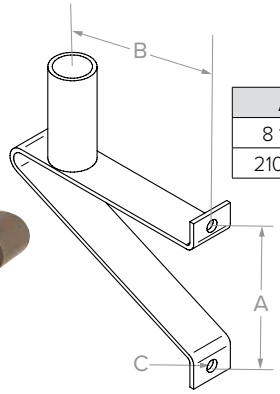




4041

Catalog Number	Description
4041	Heavy-duty steel wall/pole bracket 2" pipe (2 3/8" OD) tenon fitting for use with slipfitter units or 4024C; In dark bronze finish Mounting Hardware by Others



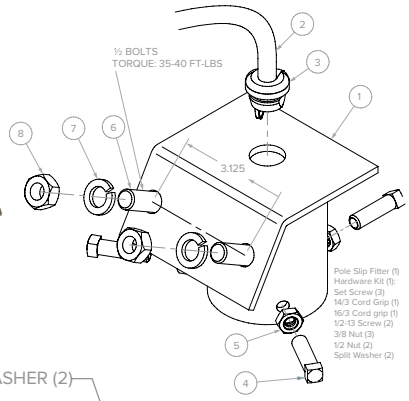


A	B	C
8 1/4"	9 1/2"	11"
210mm	241mm	279mm

4024C

Catalog Number	Description
4024C	Steel Slipfitter for 2" pipe, 2 3/8" OD yoke mount, bronze finish
4024CM53	Steel Slipfitter for 2" pipe, 2 3/8" OD yoke mount, gray finish
4024CM38	Steel Slipfitter for 2" pipe, 2 3/8" OD yoke mount, galvanized finish

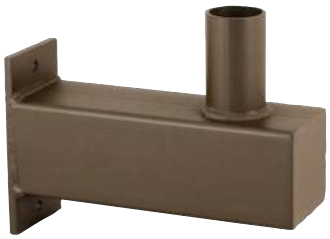


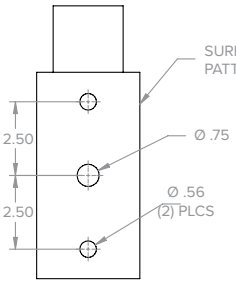


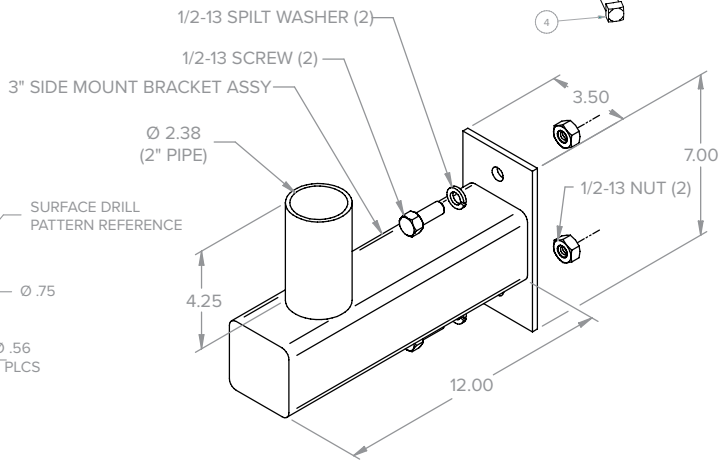
TTWM

Catalog Number	Description
TTWM-XX[1]	Wall Mount Bracket with 2 3/8" OD Tenon

1 Replace XX with two letter color designation
2 Mounting hardware by others







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POLE INTRODUCTION | POLE SELECTION GUIDE

Poles should initially be selected, according to lighting application needs, and second, but equally important, according to the structural requirements imposed on the pole by the lighting fixtures, bracketry and wind. Before attempting to make this selection, it would be helpful to have an understanding of the terminology, such as steady or sustained wind velocity, gust velocity, EPA, special wind region, and maximum weight. Then a step-by-step procedure can be followed to select the proper pole for your particular requirements.

STEADY WIND OR SUSTAINED WIND VELOCITY

This is the maximum steady wind velocity expressed in MPH likely to occur in a specific location. Refer to isotach wind map on the next page for the wind velocity in your location. Isotach maps are provided for reference only. Consult local authorities to determine the maximum velocities in your area.

GUST VELOCITY

Our isotach maps represent two different methods of addressing wind speed gusts. We have used the 'fastest-mile' wind speeds for years. These have a 1.3 gust factor in the calculations to account for gusting. As technology has improved the ability to accurately measure wind speeds for short durations, the gusts associated to a sustained wind speed have lessened. We are now moving toward '3-second-gust' wind speed maps. The results are typically higher steady/sustained wind speeds with lower factors for gusts. The gust factors are different depending on the wind speed map selected.

EFFECTIVE PROJECTED AREA

Effective Projected Area (EPA) is the exposed surface area of a fixture and bracket multiplied by a shape factor which varies depending on the shape of the fixture and bracket. For example, a large rectangular fixture will present more resistance to the wind than will a round or cylindrical shape.

SPECIAL WIND REGIONS

Many locations such as mountainous areas, coastal areas and areas surrounding the Great Lakes exhibit wind velocities considerably higher than the surrounding areas. Consult local authorities to determine maximum wind velocities and select equipment
accordingly.

MAXIMUM WEIGHT

This is the maximum allowable weight based on EPA loads. The weight is based on 30 pounds per square foot of EPA. Weight exceeding the 30 pound per foot of EPA may reduce the allowable EPA rating of the pole.

POLE SELECTION PROCEDURE

With an understanding of the parameters for pole selection, you can follow this simple step-by-step procedure and, with confidence, select a pole to meet your particular requirements.

1. Determine the site location and steady wind velocity by referring to the appropriate isotach map. If the steady wind exceeds those listed, consult factory. The isotach maps are provided for reference only. Consult local authorities to determine the maximum velocities in your area.

2. Total the EPA for the required luminaires and bracketry.

3. Total the weight of the luminaires and bracketry.

4. Compare steps 2 and 3 with the maximum allowable EPA and weight tables shown for the style, material, and height pole required. The maximum allowable must be equal to or exceed the totals from steps 2 and 3.

POLE SELECTION CONCERNS

Caution: These selection methods are guidelines only. Hubbell Lighting assumes no responsibility for selection and recommends you consult qualified professionals for verification of overall system design, site suitability, foundation considerations and applicable code and regulatory conformances.

Maintenance: The facility owner's/manager's regular scheduled maintenance program must include initial and regular follow-up inspections for structural damage, broken welds, tampering, nut loosening, missing wire covers, dangling electrical wiring, internal or external corrosion, foundation settlement, excessive shaft deflection and vibration for all lighting poles. Immediate repair or replacement may be necessary.

Overloading: Do not overload poles by attaching flags, banners, or any items that can add excessive wind or mechanical load to designed pole assemblies.

Observation: Installation and local area conditions can dramatically affect lighting pole performance. Excessive vibration may result from some wind and mounting conditions. Only individuals with local knowledge, who have observed or inspected the site can effectively evaluate site specific issues. Consult the factory for information on vibration dampers, special corrosion, foundation settlement, excessive shaft deflection and vibration for all lighting poles. Immediate repair or replacement may be necessary.

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SECURITY LIGHTING™

SES Poles

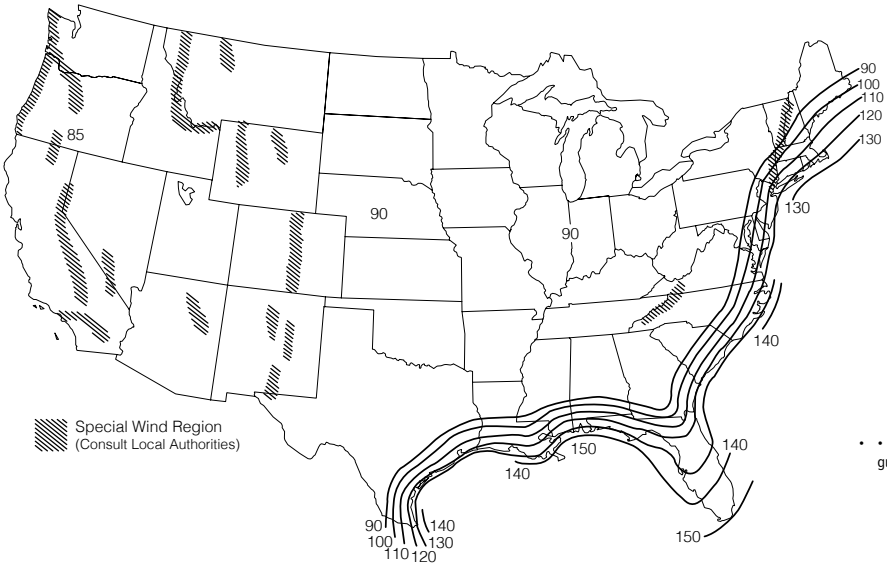
SQUARE STEEL STRAIGHT POLES (SES)

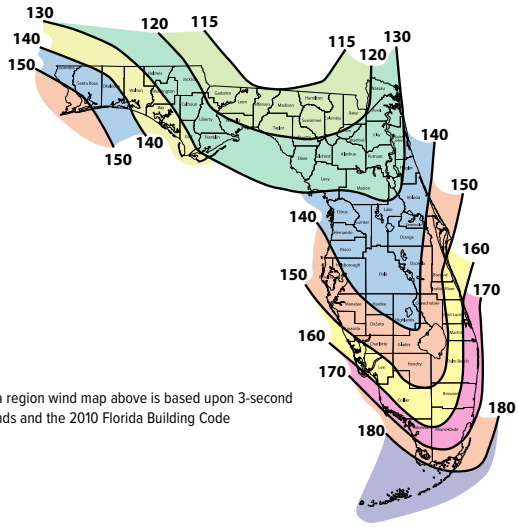
DATE: LOCATION:

TYPE: PROJECT:

CATALOG #:

WIND SPEED





• • Florida region wind map above is based upon 3-second gust winds and the 2010 Florida Building Code

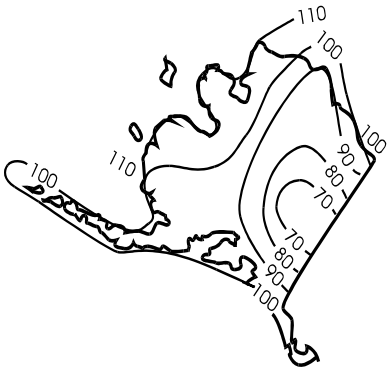
NOTES

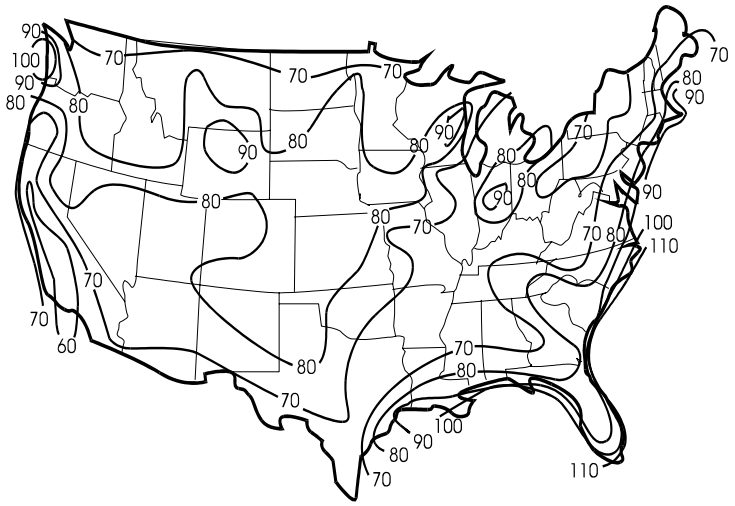
- Allowable EPA, to determine max pole loading weight, multiply allowable EPA by 30 lbs.
- The tables for allowable pole EPA are based on the ASCE 7-05 Wind Map or the Florida Region Wind Map for the 2010 Florida Building Code. The Wind Maps are intended only as a general guide and cannot be used in conjunction with other maps. Always consult local authorities to determine maximum wind velocities, gusting and unique wind conditions for each specific application
- Allowable pole EPA for jobsite wind conditions must be equal to or greater than the total EPA for fixtures, arms, and accessories to be assembled to the pole. Responsibility lies with the specifier for correct pole selection. Installation of poles without luminaires or attachment of any unauthorized accessories to poles is discouraged and shall void the manufacturer's warranty
- Wind speeds and listed EPAs are for ground mounted installations. Poles mounted on structures (such as bridges and buildings) must consider vibration and coefficient of height factors beyond this general guide; Consult local and federal standards
- Wind Induced Vibration brought on by steady, unidirectional winds and other unpredictable aerodynamic forces are not included in wind velocity ratings. Consult Hubbell Lighting's Pole Vibration Application Guide for environmental risk factors and design considerations. http://cdn.hubbelloutdoor.com/content/products/literature/literature_files/Pole_Wind_Induced_Flyer_HLOI0022.pdf
- Extreme Wind Events like, Hurricanes, Typhoons, Cyclones, or Tornadoes may expose poles to flying debris, wind shear or other detrimental effects not included in wind velocity ratings

STEADY/SUSTAINED WIND VELOCITY (Miles Per Hour, for KM/hr - multiply values by 1.61)

- Hawaii has an 80 MPH wind velocity
- Puerto Rico has a 95 MPH wind velocity
- Use caution in determining wind velocities in special wind areas such as mountainous areas, coastal areas and areas surrounding the Great Lakes
- Isotach map is provided for reference only. Consult local authorities to determine the maximum velocities in your area

Note The maximum allowable EPA and weights are listed for each pole; The EPA and weights are listed in this Selection Guide for each luminaire and bracket





For information on AASHTO Standards for Lighting Equipment contact:
American Association of State Highway and Transportation Officials
444 N. Capitol Street, NW, Suite 249
(202) 624-5800
www.aashto.org

AASHTO standards used are found in the following publications:
I-LTS-3 "*Standard Specification For Structural Support For Highway Signs, Luminaires And Traffic Signals*", (1994)
I-LPH "*A Guide for Standardizing Highway Lighting Pole Hardware*", (1980)
I-GL-5 "*An Informational Guide for Roadway Lighting*", (1984)

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BEACON
design . performance . technology

VIPER Area/Site

VIPER LUMINAIRE

DATE: | LOCATION:

TYPE: AA6 | PROJECT: Texas Roadhouse

CATALOG #: VP-1-160L-135-4K7-2-UNV-A-DBT

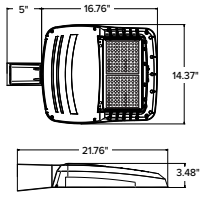
FEATURES

- Low profile LED area/site luminaire with a variety of IES distributions for lighting applications such as auto dealership, retail, commercial, and campus parking lots
- Featuring two different optical technologies, Strike and Micro Strike Optics, which provide the best distribution patterns for retrofit or new construction
- Rated for high vibration applications including bridges and overpasses. All sizes are rated for 1.5G
- Control options including photo control, occupancy sensing, NX Lighting Controls™, LightGRID+ and 7-Pin with networked controls
- New customizable lumen output feature allows for the wattage and lumen output to be customized in the factory to meet whatever specification requirements may entail
- Field interchangeable mounting provides additional flexibility after the fixture has shipped

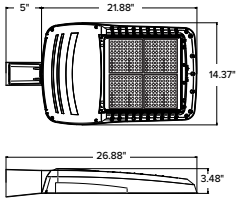
MICRO STRIKE | OPTICS STRIKE



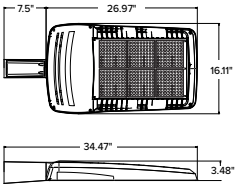
SIZE 1



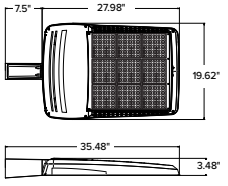
SIZE 2



SIZE 3



SIZE 4



CONTROL TECHNOLOGY

NX CONNECT | NX WIRED | NX WIRELESS | LIGHTGRID+

SERVICE PROGRAMS

STOCK | QS10

SPECIFICATIONS

CONSTRUCTION

- Die-cast housing with hidden vertical heat fins are optimal for heat dissipation while keeping a clean smooth outer surface
- Corrosion resistant, die-cast aluminum housing with 1000 hour powder coat paint finish
- External hardware is corrosion resistant

OPTICS

- Micro Strike Optics (160, 320, 480, or 720 LED counts) maximize uniformity in applications and come standard with mid-power LEDs which evenly illuminate the entire luminous surface area to provide a low glare appearance. Catalog logic found on page 2
- Strike Optics (36, 72, 108, or 162 LED counts) provide best in class distributions and maximum pole spacing in new applications with high powered LEDs. Strike optics are held in place with a polycarbonate bezel to mimic the appearance of the Micro Strike Optics so both solutions can be combined on the same application. Catalog logic found on page 3
- Both optics maximize target zone illumination with minimal losses at the house-side, reducing light trespass issues. Additional backlight control shields and house side shields can be added for further reduction of illumination behind the pole
- One-piece silicone gasket ensures a weatherproof seal
- Zero up-light at 0 degrees of tilt
- Field rotatable optics

INSTALLATION

- Mounting patterns for each arm can be found on page 11
- Optional universal mounting block for ease of installation during retrofit applications. Available as an option (ASQU) or accessory for square and round poles
- All mounting hardware included
- Knuckle arm fitter option available for 2-3/8" OD tenon
- For products with EPA less than 1 mounted to a pole greater that 20ft, a vibration damper is recommended

ELECTRICAL

- Universal 120-277 VAC or 347-480 VAC input voltage, 50/60 Hz
- Ambient operating temperature -40˚C to 40˚C
- Drivers have greater than 90% power factor and less than 20% THD
- LED drivers have output power over-voltage, over-current protection and short circuit protection with auto recovery
- Field replaceable surge protection device provides 20kA protection meeting ANSI/ IEEE C62.41.2 Category C High and Surge Location Category C3; Automatically takes fixture off-line for protection when device is compromised
- Dual Driver option provides 2 drivers within luminaire but only one set of leads exiting the luminaire, where Dual Power Feed provides two drivers which can be wired independently as two sets of leads are extended from the luminaire. Both options cannot be combined

CONTROLS

- Photo control, occupancy sensor programmable controls, and Zigbee wireless controls available for complete on/off and dimming control
- Please consult brand or sales representative when combining control and electrical options as some combinations may not operate as anticipated depending on your application
- 7-pin ANSI C136.41-2013 photocontrol receptacle option available for twist lock photocontrols or wireless control modules (control accessories sold separately)

CONTROLS (CONTINUED)

- 0- 10V Dimming Drivers are standard and dimming leads are extended out of the luminaire unless control options require connection to the dimming leads. Must specify if wiring leads are to be greater than the 6" standard
- NX Lighting Controls™ available with in fixture wireless control module, features dimming and occupancy sensor
- LightGRID+ available with in fixture wireless control module, features dimming and occupancy sensor. Also available in 7-pin configuration

	EPA				
	VP1 (Size 1)	VP2 (Size 2)	VP3 (Size 3)	VP4 (Size 4)	Config.
Single Fixture	0.454	0.555	0.655	0.698	
Two at 180	0.908	1.110	1.310	1.396	
Two at 90	0.583	0.711	0.857	0.948	
Three at 90	1.037	1.266	1.512	1.646	
Three at 120	0.943	1.155	1.392	1.680	
Four at 90	1.166	1.422	1.714	1.896	

CERTIFICATIONS

- DLC® (DesignLights Consortium Qualified), with some Premium Qualified configurations. Not all product variations listed in this document are DLC® qualified. Refer to http://www.designlights.org for the most up-to-date list.
- Listed to UL1598 and CSA C22.2#250.0-24 for wet locations and 40˚C ambient temperatures
- 1.5 G rated for ANSI C136.31 high vibration applications
- Fixture is IP65 rated
- Meets IDA recommendations using 3K CCT configuration at 0 degrees of tilt
- This product meets federal procurement law requirements under the Buy American Act (FAR 52.225-9) and Trade Agreements Act (FAR 52.225-11). See Buy America(n) Solutions (link to https://www.currentlighting.com/resources/america-solutions).

WARRANTY

- 5 year warranty

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DATE: | LOCATION:

TYPE: AA6 | PROJECT: Texas Roadhouse

CATALOG #: VP-1-160L-135-4K7-2-UNV-A-DBT

VIPER Area/Site

VIPER LUMINAIRE

MICROSTRIKE OPTICS – ORDERING GUIDE

Gray Shading = Service Program Limit of 15 luminaires

QS10

Example: VP–2–320L-145–3K7–2–R–UNV–A3–BLT

CATALOG #

VP –

Series	
VP	Viper

Optic Platform
Micro Strike

Size	
1	Size 1
2	Size 2
3	Size 3
4	Size 4

Light Engine	
160L-35 [6]	5500 lumens
160L-50 [6]	7500 lumens
160L-75	10000 lumens
160L-100	12500 lumens
160L-115	15000 lumens
160L-135	18000 lumens
160L-160	21000 lumens
320L-145	21000 lumens
320L-170	24000 lumens
320L-185	27000 lumens
320L-210	30000 lumens
320L-235	33000 lumens
320L-255	36000 lumens
320L-315 [6]	40000 lumens
480L-285	40000 lumens
480L-320	44000 lumens
480L-340	48000 lumens
480L-390	52000 lumens
480L-425	55000 lumens
480L-470	60000 lumens
720L-435	60000 lumens
720L-475	65000 lumens
720L-515	70000 lumens
720L-565 [6]	75000 lumens
720L-600 [6]	80000 lumens
CLO	Custom Lumen Output [1]

CCT/CRI	
AP	AP-Amber Phosphor Converted
27K8	2700K, 80 CRI
3K7	3000K, 70 CRI
3K8	3000K, 80 CRI
35K8	3500K, 80 CRI
3K9	3000K, 90 CRI
4K7	4000K, 70 CRI
4K8	4000K, 80 CRI
4K9	4000K, 90 CRI
5K7	5000K, 70 CRI
5K8	5000K, 80 CRI

Distribution	
2	Type 2
3	Type 3
4F	Type 4 Forward
4W	Type 4 Wide
5QW	Type 5 Square Wide

Optic Rotation	
BLANK	No Rotation
L	Optic rotation left
R	Optic rotation right

Voltage	
UNV	120-277V
120	120V
208	208V
240	240V
277	277V
347	347V
480	480V

Mounting	
A	Arm mount for square pole/flat surface (B3 Drill Pattern) (Does not include round pole adapter)
A_	Arm mount for round pole [2]
ASQU	Universal arm mount for square pole. Can be used with B3 or S2 Drill Pattern
A_U	Universal arm mount for round pole [2]
AAU	Adjustable arm for pole mounting (universal drill pattern)
AA_U	Adjustable arm mount for round pole [2]
ADU	Decorative upswept Arm (universal drill pattern)
AD_U	Decorative upswept arm mount for round pole [2]
MAF	Mast arm fitter for 2-3/8" OD horizontal arm
K	Knuckle
T	Trunnion
WB	Wall Bracket, horizontal tenon with MAF
WM	Wall mount bracket with decorative upswept arm
WA	Wall mount bracket with adjustable arm

Color	
BLT	Black Matte Textured
BLS	Black Gloss Smooth
DBT	Dark Bronze Matte Textured
DBS	Dark Bronze Gloss Smooth
GTT	Graphite Matte Textured
LGS	Light Grey Gloss Smooth
LGT	Light Grey Gloss Textured
PSS	Platinum Silver Smooth
WHT	White Matte Textured
WHS	White Gloss Smooth
VGT	Verde Green Textured

Color Option	
CC	Custom Color

Options	
F	Fusing
2PF	Dual Power Feed
2DR	Dual Driver
TE	Tooless Entry
BC	Backlight Control [8]
TB	Terminal Block

Network Control Options	
NXWS16F	NX Networked Wireless Enabled Integral NXSMP2-LMO PIR Occupancy Sensor with Automatic Dimming Photocell and Bluetooth Programming [1,3,4]
NXWS40F	NX Networked Wireless Enabled Integral NXSMP2-HMO PIR Occupancy Sensor with Automatic Dimming Photocell and Bluetooth Programming [1,3,4]
NXW	NX Networked Wireless Radio Module NXRM2 and Bluetooth Programming, without Sensor [3,4]
WIR	LightGRID+ In-Fixture Module [3,4]
WIRSC	LightGRID+ Module and Occupancy Sensor [3,4]
Stand Alone Sensors	
BTS-14F	Bluetooth® Programmable, BTSMP-LMO PIR Occupancy Sensor with Automatic Dimming Photocell and 360° Lens
BTS-40F	Bluetooth® Programmable, BTSMP-HMO PIR Occupancy Sensor with Automatic Dimming Photocell and 360° Lens
BTSO-12F	Bluetooth® Programmable, BTSMP-OMNI-O PIR Occupancy Sensor with Automatic Dimming Photocell and 360° Lens
7PR	7-Pin Receptacle [4]
7PR-SC	7-Pin Receptacle with shorting cap [4]
3PR	3-Pin twist lock [4]
3PR-SC	3-Pin receptacle with shorting cap [4]
3PR-TL	3-Pin PCR with photocontrol [4]
Programmed Controls	
SCP-_F	Sensor Control Programmable, 8F or 40F [9]
ADD	AutoDim Timer Based Dimming [4]
ADT	AutoDim Time of Day Dimming [4]
Photocontrols	
PC	Button Photocontrol [4,7]

1 – Items with a grey background can be done as a custom order. Contact brand representative for more information
2 – Replace "_" with "3" for 3.5"-4.13" OD pole, "4" for 4.18"-5.25" OD pole, "5" for 5.5"-6.5" OD pole
3 – Networked Controls cannot be combined with other control options
4 – Not available with 2PF option
5 – Not available with Dual Driver option
6 – Some voltage restrictions may apply when combined with controls
7 – Not available with 480V
8 – BC not available on 4F and type 5 distributions
9 – At least one SCPREMOTE required to program SCP motion sensor. Must select 8ft or 40ft.

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VIPER Area/Site

VIPER LUMINAIRE

DATE: | LOCATION:

TYPE: AA6 | PROJECT: Texas Roadhouse

CATALOG #: VP-1-160L-135-4K7-2-UNV-A-DBT

STRIKE OPTIC – ORDERING GUIDE

Example: VP–ST–1–36L-39–3K7–2–UNV–A–BLT

CATALOG # _____

VP – _____ – _____ – _____ – _____ – _____ – _____ – _____ – _____

Series	
VP	Viper

Optic Platform	
ST	Strike

Size	
1	Size 1
2	Size 2
3	Size 3
4	Size 4

Light Engine	
36L-39 [8]	5500 lumens
36L-55 [8]	7500 lumens
36L-85	10000 lumens
36L-105	12500 lumens
36L-120	14000 lumens
72L-115	15000 lumens
72L-145	18000 lumens
72L-180	21000 lumens
72L-210	24000 lumens
72L-240	27000 lumens
108L-215 [8]	27000 lumens
108L-250	30000 lumens
108L-280	33000 lumens
108L-325	36000 lumens
108L-365	40000 lumens
162L-320	40000 lumens
162L-365 [10]	44000 lumens
162L-405	48000 lumens
162L-445	52000 lumens
162L-485	55000 lumens
162L-545 [8]	60000 lumens
CLO	Custom Lumen Output [1]

CCT/CRI	
AM	monochromatic amber, 595nm
27K8	2700K, 80 CRI
3K7	3000K, 70 CRI
3K8	3000K, 80 CRI
3K9	3000K, 90 CRI
35K8	3500K, 80 CRI
4K7	4000K, 70 CRI
4K8	4000K, 80 CRI
4K9	4000K, 90 CRI
5K7	5000K, 70 CRI
5K8	5000K, 80 CRI

Distribution	
FR	Auto Front Row
2	Type 2
3	Type 3
4F	Type 4 Forward
4W	Type 4 Wide
5QN	Type 5 Square Narrow
5QW	Type 5 Square Wide
5QM	Type 5 Square Medium
5W	Type 5 Wide (Round)
5RW	Type 5 Rectangular
C	Corner Optic
TC	Tennis Court Optic

Optic Rotation	
BLANK	No Rotation
L	Optic rotation left
R	Optic rotation right

Voltage	
UNV	120-277V
120	120V
208	208V
240	240V
277	277V
347	347V
480	480V

Mounting	
A	Arm mount for square pole/flat surface
A_	Arm mount for round pole [3]
ASQU	Universal arm mount for square pole
A_U	Universal arm mount for round pole [3]
AAU	Adjustable arm for pole mounting (universal drill pattern)
AA_U	Adjustable arm mount for round pole [3]
ADU	Decorative upswept Arm (universal drill pattern)
AD_U	Decorative upswept arm mount for round pole [3]
MAF	Mast arm fitter for 2-3/8" OD horizontal arm
K	Knuckle
T	Trunnion
WB	Wall Bracket, horizontal tenon with MAF
WM	Wall mount bracket with decorative upswept arm
WA	Wall mount bracket with adjustable arm

Color	
BLT	Black Matte Textured
BLS	Black Gloss Smooth
DBT	Dark Bronze Matte Textured
DBS	Dark Bronze Gloss Smooth
GTT	Graphite Matte Textured
LGS	Light Grey Gloss Smooth
LGT	Light Grey Gloss Textured
PSS	Platinum Silver Smooth
WHT	White Matte Textured
WHS	White Gloss Smooth
VGT	Verde Green Textured

Color Option	
CC	Custom Color

Options	
F	Fusing
E	Battery Backup [1,2,7,8,9]
2PF	Dual Power Feed
2DR	Dual Driver
TE	Tooless Entry
BC	Backlight Control
TB	Terminal Block

Network Control Options	
NXWS16F	NX Networked Wireless Enabled Integral NXSMP2-LMO PIR Occupancy Sensor with Automatic Dimming Photocell and Bluetooth Programming [1,4,5]
NXWS40F	NX Networked Wireless Enabled Integral NXSMP2-HMO PIR Occupancy Sensor with Automatic Dimming Photocell and Bluetooth Programming [1,4,5]
NXW	NX Networked Wireless Radio Module NXRM2 and Bluetooth Programming, without Sensor [4,5]
WIR	LightGRID+ In-Fixture Module [4,5]
WIRSC	LightGRID+ Module and Occupancy Sensor [4,5]

Stand Alone Sensors	
BTS-14F	Bluetooth® Programmable, BTSMP-LMO PIR Occupancy Sensor with Automatic Dimming Photocell and 360° Lens
BTS-40F	Bluetooth® Programmable, BTSMP-HMO PIR Occupancy Sensor with Automatic Dimming® Photocell and 360° Lens
BTSO-12F	Bluetooth® Programmable, BTSMP-OMNI-O PIR Occupancy Sensor with Automatic Dimming Photocell and 360° Lens
7PR	7-Pin Receptacle [4]
7PR-SC	7-Pin Receptacle with shorting cap [4]
3PR	3-Pin twist lock [4]
3PR-SC	3-Pin receptacle with shorting cap [4]
3PR-TL	3-Pin PCR with photocontrol [4]

Programmed Controls	
SCP-_F	Sensor Control Programmable, 8F or 40F [11]
ADD	AutoDim Timer Based Dimming [4]
ADT	AutoDim Time of Day Dimming [4]

Photocontrols	
PC	Button Photocontrol [4,7]

1 – Items with a grey background can be done as a custom order. Contact brand representative for more information
2 – Battery temperature rating -20C to 55C
3 – Replace "_" with "3" for 3.5"-4.13" OD pole, "4" for 4.18"-5.25" OD pole, "5" for 5.5"-6.5" OD pole
4 – Networked Controls cannot be combined with other control options
5 – Not available with 2PF option
6 – Not available with 480V
7 – Not available with 347 or 480V
8 – Not available with Dual Driver option
9 – Only available in Size 1 housing, up to 105 Watts
10 – Some voltage restrictions may apply when combined with controls
11 – At least one SCPREMOTE required to program SCP motion sensor. Must select 8ft or 40ft.

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VIPER Area/Site

VIPER LUMINAIRE

DATE: | LOCATION:

TYPE: AA6 | PROJECT: Texas Roadhouse

CATALOG #: VP-1-160L-135-4K7-2-UNV-A-DBT

ORDERING GUIDE (CONT'D)

CATALOG #

Accessory Type		Size		Option		Color	
SHD	Shield	**1**	Size 1	**HSS-90-B**	House Side Shield 90° Back	**BLS**	Black Gloss Smooth
		2	Size 2	**HSS-90-F**	House Side Shield 90° Front	**BLT**	Black Matte Textured
		3	Size 3	**HSS-90-S**	House Side Shield 90° Side	**DBS**	Dark Bronze Gloss Smooth
		4	Size 4	**HSS-270-BSS**	House Side Shield 270° Back/Side/Side	**DBT**	Dark Bronze Matte Textured
				HSS-270-FSS	House Side Shield 270° Front/Side/Side	**GTT**	Graphite Matte Textured
				HSS-270-FSB	House Side Shield 270° Front/Side/Back	**LGS**	Light Gray Gloss Smooth
				HSS-360	House Side Shield 360°	**PSS**	Platinum Silver Smooth
				BC	Back Light Control	**WHS**	White Gloss Smooth
MTG	Mounting			**A**	Arm Mount for square pole/flat surface	**WHT**	White Matte Textured
				ASQU	Universal Arm Mount for square pole	**VGT**	Green Landscape Decorative
				AAU	Adjustable Arm for pole mounting	**LEG**	Legacy Colors
				ADU	Decorative upswept Arm	**Color Option**	
				RPA	Round Pole Adapter	**CC**	Custom Color
				MAF	Mast Arm Fitter for 2-3/8" OD horizontal arm		
				K	Knuckle		
				T	Trunnion		
				WB	Wall Bracket (compatible with universal arm mounts)		

Accessory Type		Option	
MSC	Miscellaneous	**BIRD SPK**	Bird Spike

Current Control Solutions — Accessories (Sold Separately)

NX Lighting Controls

☐ **NXOFM-1R1D-UNV** — On-fixture Module (7-pin), On / Off / Dim, Daylight Sensor with NX Radio and Bluetooth® Radio, 120–480VAC

LightGRID+ Lighting Control

☐ **WIR-RME-L** — On-fixture Module (7-pin or 5-pin), On / Off / Dim, Daylight Sensor with LightGRID+ Radio, 110–480VAC

☐ **SCP-REMOTE** — Remote Control for SCP/_F option. Order at least one per project to program and control the occupancy sensor

For additional information related to these accessories please visit currentlighting.com/beacon. Options provided for use with integrated sensor, please view specification sheet ordering information table for details.

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DATE: LOCATION:

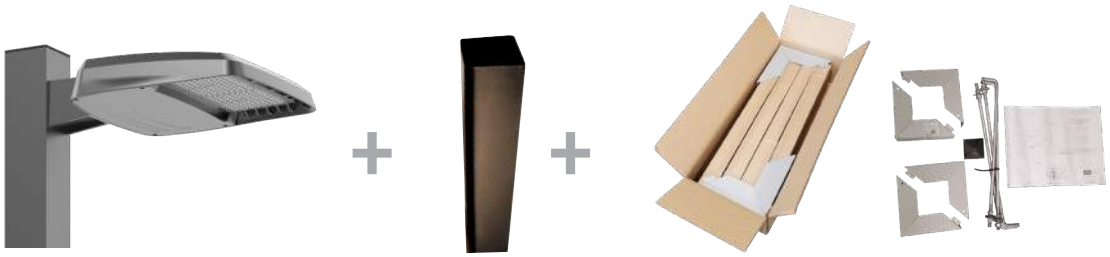
TYPE: PROJECT:

CATALOG #:

VIPER Area/Site

VIPER LUMINAIRE

VIPER POLE EXPRESS COMBO – ORDERING GUIDE



Catalog Number	Pole	Single or Double Head	Fixture	Lumens*	Wattage	Distribution	CCT/CRI	Mounting	Finish
VP-1-160-4K-3-LS-S20	**20' Square Straight Steel**	Single	**VP-1-160-4K-3-LS**	19584	158W	Type 3	4000K/70CRI	Universal Arm	Dark Bronze Textured
VP-1-160-4K-3-LS-S20-2X	**20' Square Straight Steel**	Double	**VP-1-160-4K-3-LS**	19584	158W	Type 3	4000K/70CRI	Universal Arm	Dark Bronze Textured
VP-1-160-4K-4F-LS-S20	**20' Square Straight Steel**	Single	**VP-1-160-4K-4F-LS**	19426	158W	Type 4F	4000K/70CRI	Universal Arm	Dark Bronze Textured
VP-1-160-4K-4F-LS-S20-2X	**20' Square Straight Steel**	Double	**VP-1-160-4K-4F-LS**	19426	158W	Type 4F	4000K/70CRI	Universal Arm	Dark Bronze Textured
VP-1-160-4K-3-LS-S25	**25' Square Straight Steel**	Single	**VP-1-160-4K-3-LS**	19584	158W	Type 3	4000K/70CRI	Universal Arm	Dark Bronze Textured
VP-1-160-4K-3-LS-S25-2X	**25' Square Straight Steel**	Double	**VP-1-160-4K-3-LS**	19584	158W	Type 3	4000K/70CRI	Universal Arm	Dark Bronze Textured
VP-1-160-4K-4F-LS-S25	**25' Square Straight Steel**	Single	**VP-1-160-4K-4F-LS**	19426	158W	Type 4F	4000K/70CRI	Universal Arm	Dark Bronze Textured
VP-1-160-4K-4F-LS-S25-2X	**25' Square Straight Steel**	Double	**VP-1-160-4K-4F-LS**	19426	158W	Type 4F	4000K/70CRI	Universal Arm	Dark Bronze Textured
VP-1-160-5K-3-LS-S20	**20' Square Straight Steel**	Single	**VP-1-160-5K-3-LS**	19499	158W	Type 3	5000K/70CRI	Universal Arm	Dark Bronze Textured
VP-1-160-5K-3-LS-S20-2X	**20' Square Straight Steel**	Double	**VP-1-160-5K-3-LS**	19499	158W	Type 3	5000K/70CRI	Universal Arm	Dark Bronze Textured
VP-1-160-5K-4F-LS-S20	**20' Square Straight Steel**	Single	**VP-1-160-5K-4F-LS**	19186	158W	Type 4F	5000K/70CRI	Universal Arm	Dark Bronze Textured
VP-1-160-5K-4F-LS-S20-2X	**20' Square Straight Steel**	Double	**VP-1-160-5K-4F-LS**	19186	158W	Type 4F	5000K/70CRI	Universal Arm	Dark Bronze Textured
VP-1-160-5K-3-LS-S25	**25' Square Straight Steel**	Single	**VP-1-160-5K-3-LS**	19499	158W	Type 3	5000K/70CRI	Universal Arm	Dark Bronze Textured
VP-1-160-5K-3-LS-S25-2X	**25' Square Straight Steel**	Double	**VP-1-160-5K-3-LS**	19499	158W	Type 3	5000K/70CRI	Universal Arm	Dark Bronze Textured
VP-1-160-5K-4F-LS-S25	**25' Square Straight Steel**	Single	**VP-1-160-5K-4F-LS**	19186	158W	Type 4F	5000K/70CRI	Universal Arm	Dark Bronze Textured
VP-1-160-5K-4F-LS-S25-2X	**25' Square Straight Steel**	Double	**VP-1-160-5K-4F-LS**	19186	158W	Type 4F	5000K/70CRI	Universal Arm	Dark Bronze Textured

VIPER POLE EXPRESS COMBO – STOCK LUMINAIRE SKUS

Catalog Number	Lumens	LPW	Distribution	Wattage	CCT/CRI	Voltage	Mounting	Finish
VP-1-160-4K-3-LS	19584	123.9	3	158W	4000K/70CRI	120-277V	Universal Arm with RPA (A3U)	Dark Bronze Textured
VP-1-160-4K-4F-LS	19426	122.9	4F	158W	4000K/70CRI	120-277V	Universal Arm with RPA (A3U)	Dark Bronze Textured
VP-1-160-5K-3-LS	19499	123.4	3	158W	5000K/70CRI	120-277V	Universal Arm with RPA (A3U)	Dark Bronze Textured
VP-1-160-5K-4F-LS	19186	121.4	4F	158W	5000K/70CRI	120-277V	Universal Arm with RPA (A3U)	Dark Bronze Textured

VIPER POLE EXPRESS COMBO – ACCESSORIES

Catalog Number	Description
VM14DB	Vibration Dampener, mounts to top of pole for reduced vibration



VM14DB

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VIPER Area/Site

VIPER LUMINAIRE

DATE: | LOCATION:

TYPE: AA6 | PROJECT: Texas Roadhouse

CATALOG #: VP-1-160L-135-4K7-2-UNV-A-DBT

OUTDOOR LIGHTING CONTROLS OPTIONS

CONTROLS FUNCTIONALITY

LIGHTGRID+

	Control Option Ordering Logic & Description		Control Option Functionality									Control Option Components	
			Networkable	Grouping	Scheduling	Occupancy/ Motion	Daylight Harvesting	0-10V Dimming	On/Off Control	Bluetooth App Programming	Sensor Height		
NX Wireless	NXOFM1R1D-UNV	NX 7-Pin Twist-Lock® with NX Networked Wireless Radio, Integral Automatic Dimming Photocell, Integral Single Pole Relay with Dimming, and Bluetooth Programming	✓	✓	✓	Paired with external control	✓	✓	✓	✓	–		NXOFM-1R1D-UV
NX Wireless	NXW	NX Networked Wireless Radio Module NXRM2 and Bluetooth Programming, without Sensor	✓	✓	✓	–	–	✓	✓	✓	–		NXRM2-H
NX Wireless	NXWS12F	NX Networked Wireless Enabled Integral NXSMP2-OMNI-O PIR Occupancy Sensor with Automatic Dimming Photocell and Bluetooth Programming	✓	✓	✓	✓	✓	✓	✓	✓	12ft		NXSMP2-OMNI-O
NX Wireless	NXWS16F	NX Networked Wireless Enabled Integral NXSMP2-LMO PIR Occupancy Sensor with Automatic Dimming Photocell and Bluetooth Programming	✓	✓	✓	✓	✓	✓	✓	✓	16ft		NXSMP2-LMO
NX Wireless	NXWS40F	NX Networked Wireless Enabled Integral NXSMP2-HMO PIR Occupancy Sensor with Automatic Dimming Photocell and Bluetooth Programming	✓	✓	✓	✓	✓	✓	✓	✓	40ft		NXSMP2-HMO
LightGRID+	WIR	LightGRID+ In-Fixture Module	✓	–	✓	–	–	✓	✓	Gateway	–		WIR
LightGRID+	WIR-RME-L	LightGRID+ On Fixture Module	✓	–	✓	–	–	✓	✓	Gateway	–		WIR-RME-L
LightGRID+	WIRSC	LightGRID+ Module and Occupancy Sensor	✓	✓	✓	✓	✓	✓	✓	Gateway	14ft - 40ft		BTMSP
Independent	BTSO-12F	Bluetooth® Programmable, BTSMP-OMNI-O PIR Occupancy Sensor with Automatic Dimming Photocell and 360° Lens	–	–	–	✓	✓	✓	✓	✓	12ft		BTSMP-OMNI-O
Independent	BTS-14F	Bluetooth® Programmable, BTSMP-LMO PIR Occupancy Sensor with Automatic Dimming Photocell and 360° Lens	–	–	–	✓	✓	✓	✓	✓	14ft		BTSMP-LMO
Independent	BTS-40F	Bluetooth® Programmable, BTSMP-HMO PIR Occupancy Sensor with Automatic Dimming Photocell and 360° Lens	–	–	–	✓	✓	✓	✓	✓	40ft		BTSMP-HMO

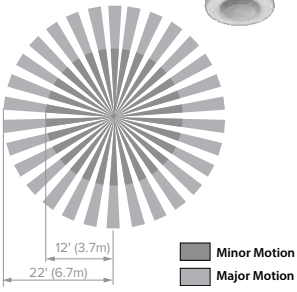
DEFAULT SETTINGS

NX Wireless	
Occupancy Sensor	Enabled
Occupancy Sensor Sensitivity	7
Occupancy Sensor Timeout	15 Minutes
Occupied Dim Level	100%
Unoccupied Dim Level	0%
Daylight Sensor	Disabled
Bluetooth	Enabled
2.4GHz Wireless Mesh	On
"Passcode Factory Passcode: HubbN3T!"	Enabled

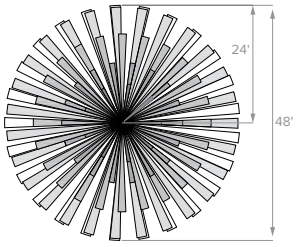
Stand Alone	
Occupancy Sensor	Enabled
Occupancy Sensor Sensitivity	7
Occupancy Sensor Timeout	8 Minutes
Occupied Dim Level	100%
Unoccupied Dim Level	50%
Daylight Sensor	Disabled

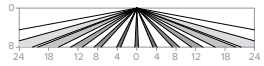
NX WIRELESS COVERAGE PATTERNS

NXSMP2-OMNI



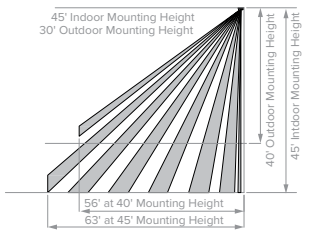
NXSMP2-LMO





Sensor Lens Coverage and Detection Patterns When Mounted at 8ft with Low Mount Lens

NXSMP2-HMO



Sensor Lens Coverage and Detection Patterns When Mounted at 40ft and 45ft with Standard Lens

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BEACON
design . performance . technology

VIPER Area/Site

VIPER LUMINAIRE

DATE: | LOCATION:

TYPE: AA6 | PROJECT: Texas Roadhouse

CATALOG #: VP-1-160L-135-4K7-2-UNV-A-DBT

NX LIGHTING CONTROLS FREE APP



The NX Lighting Controls App is free to use mobile application for programming both NX Lighting Controls System or Standalone Bluetooth Sensors. The mobile app allows you to configure devices, discover and setup wireless enable luminiares and program NX system settings.

Apple App: https://apps.apple.com/us/app/nx-lighting-controls/id962112904

Google Play: https://play.google.com/store/apps/details?id=io.cordova.NXBTR&hl=en_US&gl=US

Apple App

Google Play

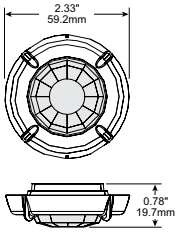
CONTROLS TECH SUPPORT 800-888-8006 (7:00 AM - 7:00 PM)

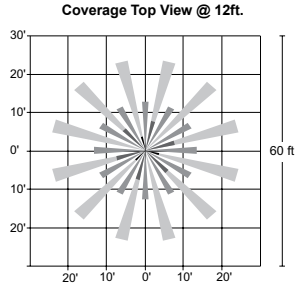
OUTDOOR LIGHTING CONTROLS OPTIONS

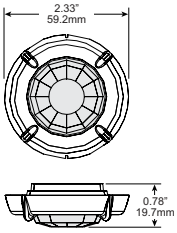
CONTROLS FUNCTIONALITY

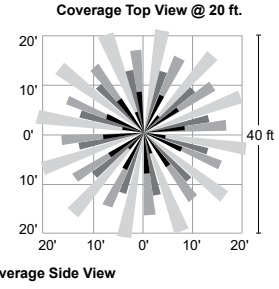
	Control Option Ordering Logic & Description		Control Option Functionality									Control Option Components	
			Networkable	Grouping	Scheduling	Occupancy/ Motion	Daylight Harvesting	0-10V Dimming	On/Off Control	Bluetooth App Programming	Sensor Height		
Independent	SCP_F	Sensor Control Programmable, 8F or 40F	–	–	–	✓	✓	✓	✓	–	8ft or 40ft		SCP_F
	ADD	AutoDIM Timer Based Dimming	–	–	✓	–	–	–	✓	–	–		ADD
	ADT	AutoDIM Time of Day Dimming	–	–	✓	–	–	–	✓	–	–		ADT
	7PR	7-Pin Receptacle	–	–	Paired with external control	–	Paired with external control	–	Paired with external control	–	–		7PR
	7PR-SC	7-Pin Receptacle with shorting cap	–	–	–	–	–	–	–	–	–		7PR-SC
	3PR	3-Pin twist lock	–	–	–	–	–	–	Paired with external control	–	–		3PR
	3PR-SC	3-Pin Receptacle with shorting cap	–	–	–	–	–	–	–	–	–		3PR-SC
	3PR-TL	3-Pin with photocontrol	–	–	–	–	✓	–	✓	–	–		3PR-TL

COVERAGE PATTERNS FOR SCP_F

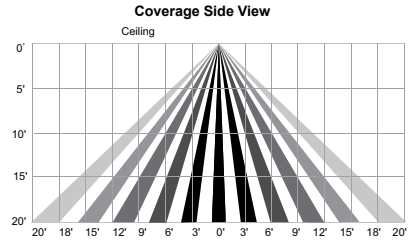


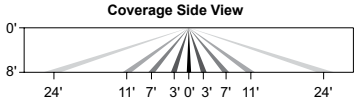


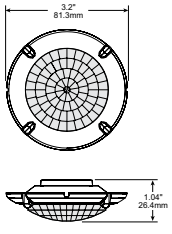


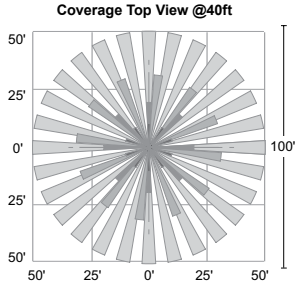


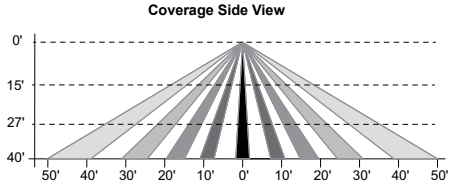
Coverage Side View











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DATE: | LOCATION:

TYPE: AA6 | PROJECT: Texas Roadhouse

CATALOG #: VP-1-160L-135-4K7-2-UNV-A-DBT

VIPER Area/Site

VIPER LUMINAIRE

PROGRAMMED CONTROLS

ADD-AutoDim Timer Based Options

- Light delay options from 1-9 hours after the light is turned on to dim the light by 10-100%. To return the luminaire to its original light level there are dim return options from 1-9 hours after the light has been dimmed previously.

EX: ADD-6-5-R6

ADD Control Options	Configurations Choices	Example Choice Picked
Auto-Dim Options	1-9 Hours	6 - Delay 6 hours
Auto-Dim Brightness	10-100% Brightness	5 - Dim to 50% brightness
Auto-Dim Return	Delay 0-9 Hours	R6 - Return to full output after 6 hours

ADT-AutoDim Time of Day Based Option

- Light delay options from 1AM-9PM after the light is turned on to dim the light by 10-100%. To return the luminaire to its original light level there are dim return options from 1AM-9PM after the light has been dimmed previously.

EX: ADT-6-5-R6

ADD Control Options	Configurations Choices	Example Choice Picked
Auto-Dim Options	12-3 AM and 6-11 PM	6 - Dim at 6PM
Auto-Dim Brightness	10-100% Brightness	5 - Dim to 50%
Auto-Dim Return	12-6 AM and 9-11P	R6 - Return to full output at 6AM

DELIVERED LUMENS

For delivered lumens, please see Lumens Data PDF on www.Currentlighting.com

PROJECTED LUMEN MAINTENANCE

Ambient Temp.	0	25,000	*TM-21-11 36,000	50,000	100,000	Calculated L_{70} (Hours)
25°C / 77°F	1.00	0.97	0.96	0.95	0.91	408,000
40°C / 104°F	0.99	0.96	0.95	0.94	0.89	356,000

LUMINAIRE AMBIENT TEMPERATURE FACTOR (LATF)

Ambient Temperature		Lumen Multiplier
0°C	32°F	1.03
10°C	50°F	1.01
20°C	68°F	1.00
25°C	77°F	1.00
30°C	86°F	0.99
40°C	104°F	0.98

Micro Strike Lumen Multiplier			
CCT	70 CRI	80 CRI	90 CRI
2700K	–	0.841	–
3000K	0.977	0.861	0.647
3500K	–	0.900	–
4000K	1	0.926	0.699
5000K	1	0.937	0.791
AP-Amber Phosphor Converted Multiplier			
Amber	0.710		

Strike Lumen Multiplier			
CCT	70 CRI	80 CRI	90 CRI
2700K	0.9	0.81	0.62
3000K	0.933	0.853	0.659
3500K	0.959	0.894	0.711
4000K	1	0.9	0.732
5000K	1	0.9	0.732
Monochromatic Amber Multiplier			
Amber	See Amber Spec Sheet		

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VIPER Area/Site

VIPER LUMINAIRE

DATE: | LOCATION:

TYPE: AA6 | PROJECT: Texas Roadhouse

CATALOG #: VP-1-160L-135-4K7-2-UNV-A-DBT

ELECTRICAL DATA: MICRO STRIKE

# OF LEDS	160						
NOMINAL WATTAGE	35	50	75	100	115	135	160
SYSTEM POWER (W)	34.9	50.5	72.1	97.2	111.9	132.2	157.8
INPUT VOLTAGE (V)	CURRENT (Amps)						
120	0.29	0.42	0.63	0.83	0.96	1.13	1.33
208	0.17	0.24	0.36	0.48	0.55	0.65	0.77
240	0.15	0.21	0.31	0.42	0.48	0.56	0.67
277	0.13	0.18	0.27	0.36	0.42	0.49	0.58
347	0.10	0.14	0.22	0.29	0.33	0.39	0.46
480	0.07	0.10	0.16	0.21	0.24	0.28	0.33

# OF LEDS	320						
NOMINAL WATTAGE	145	170	185	210	235	255	315
SYSTEM POWER (W)	150	166.8	185.7	216.2	240.9	261.5	312
INPUT VOLTAGE (V)	CURRENT (Amps)						
120	1.21	1.42	1.54	1.75	1.96	2.13	2.63
208	0.70	0.82	0.89	1.01	1.13	1.23	1.51
240	0.60	0.71	0.77	0.88	0.98	1.06	1.31
277	0.52	0.61	0.67	0.76	0.85	0.92	1.14
347	0.42	0.49	0.53	0.61	0.68	0.73	0.91
480	0.30	0.35	0.39	0.44	0.49	0.53	0.66

# OF LEDS	480					
NOMINAL WATTAGE	285	320	340	390	425	470
SYSTEM POWER (W)	286.2	316.7	338.4	392.2	423.2	468
INPUT VOLTAGE (V)	CURRENT (Amps)					
120	2.38	2.67	2.83	3.25	3.54	3.92
208	1.37	1.54	1.63	1.88	2.04	2.26
240	1.19	1.33	1.42	1.63	1.77	1.96
277	1.03	1.16	1.23	1.41	1.53	1.70
347	0.82	0.92	0.98	1.12	1.22	1.35
480	0.59	0.67	0.71	0.81	0.89	0.98

# OF LEDS	720				
NOMINAL WATTAGE	435	475	515	565	600
SYSTEM POWER (W)	429.3	475	519.1	565.2	599.9
INPUT VOLTAGE (V)	CURRENT (Amps)				
120	3.63	3.96	4.29	4.71	5.00
208	2.09	2.28	2.48	2.72	2.88
240	1.81	1.98	2.15	2.35	2.50
277	1.57	1.71	1.86	2.04	2.17
347	1.25	1.37	1.48	1.63	1.73
480	0.91	0.99	1.07	1.18	1.25

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DATE: | LOCATION:

TYPE: AA6 | PROJECT: Texas Roadhouse

CATALOG #:

VIPER Area/Site

VIPER LUMINAIRE

ELECTRICAL DATA: STRIKE

# OF LEDS	36				
NOMINAL WATTAGE	39	55	85	105	120
SYSTEM POWER (W)	39.6	56.8	83.6	108.2	120.9
INPUT VOLTAGE (V)	CURRENT (Amps)				
120	0.33	0.46	0.71	0.88	0.96
208	0.19	0.26	0.41	0.50	0.55
240	0.16	0.23	0.35	0.44	0.48
277	0.14	0.20	0.31	0.38	0.42
347	0.11	0.16	0.24	0.30	0.33
480	0.08	0.11	0.18	0.22	0.24

# OF LEDS	72				
NOMINAL WATTAGE	115	145	180	210	240
SYSTEM POWER (W)	113.7	143.2	179.4	210.2	241.7
INPUT VOLTAGE (V)	CURRENT (Amps)				
120	1.00	1.21	1.50	1.75	1.79
208	0.58	0.70	0.87	1.01	1.03
240	0.50	0.60	0.75	0.88	0.90
277	0.43	0.52	0.65	0.76	0.78
347	0.35	0.42	0.52	0.61	0.62
480	0.25	0.30	0.38	0.44	0.45

# OF LEDS	108				
NOMINAL WATTAGE	215	250	280	325	365
SYSTEM POWER (W)	214.8	250.8	278.3	324.7	362.6
INPUT VOLTAGE (V)	CURRENT (Amps)				
120	2.00	2.08	2.33	3.04	2.67
208	1.15	1.20	1.35	1.75	1.54
240	1.00	1.04	1.17	1.52	1.33
277	0.87	0.90	1.01	1.32	1.16
347	0.69	0.72	0.81	1.05	0.92
480	0.50	0.52	0.58	0.76	0.67

# OF LEDS		162				
NOMINAL WATTAGE	320	365	405	445	485	545
SYSTEM POWER (W)	322.1	362.6	403.6	445.1	487.1	543.9
INPUT VOLTAGE (V)		CURRENT (Amps)				
120	2.71	2.67	3.38	3.71	4.04	4.54
208	1.56	1.54	1.95	2.14	2.33	2.62
240	1.35	1.33	1.69	1.85	2.02	2.27
277	1.17	1.16	1.46	1.61	1.75	1.97
347	0.94	0.92	1.17	1.28	1.40	1.57
480	0.68	0.67	0.84	0.93	1.01	1.14

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VIPER Area/Site

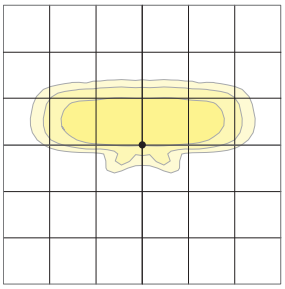
VIPER LUMINAIRE

DATE:	LOCATION:
TYPE: AA6	PROJECT: Texas Roadhouse
CATALOG #: VP-1-160L-135-4K7-2-UNV-A-DBT	

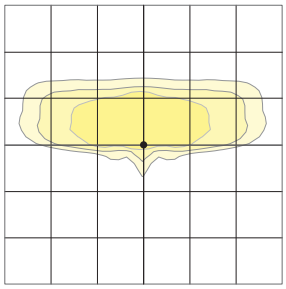
MICRO STRIKE PHOTOMETRY

The following diagrams represent the general distribution options offered for this product. For detailed information on specific product configurations, see website photometric test reports.

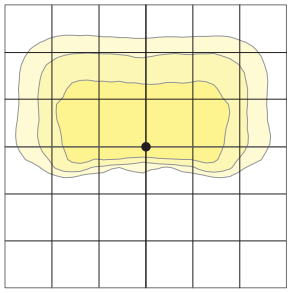
Type 2



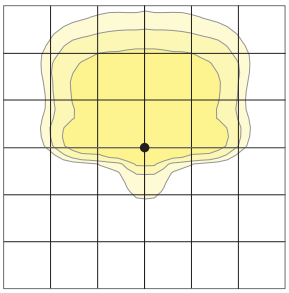
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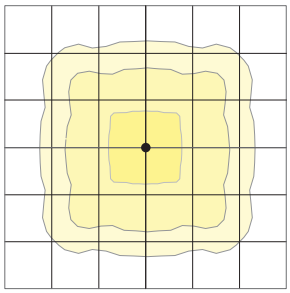
Type 4 Wide



Type 4F



Type 5QW



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VIPER Area/Site

VIPER LUMINAIRE

DATE: | LOCATION:

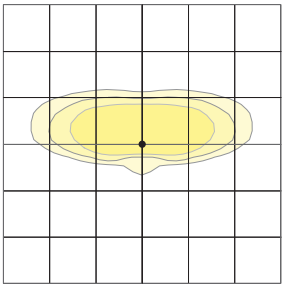
TYPE: AA6 | PROJECT: Texas Roadhouse

CATALOG #: VP-1-160L-135-4K7-2-UNV-A-DBT

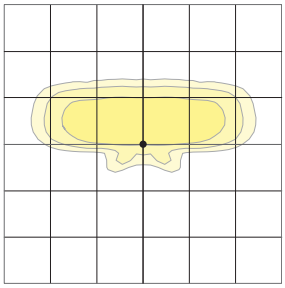
OPTIC STRIKE PHOTOMETRY

The following diagrams represent the general distribution options offered for this product. For detailed information on specific product configurations, see website photometric test reports.

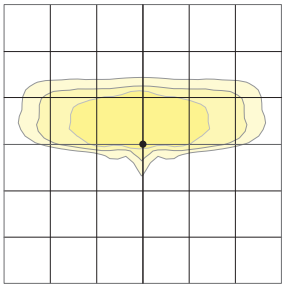
Type FR – Front Row/Auto Optic



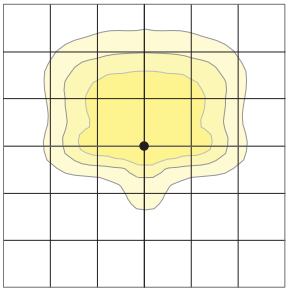
Type 2



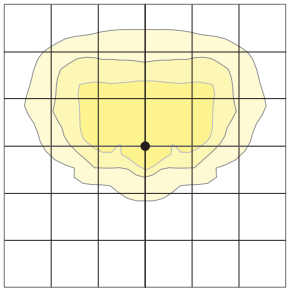
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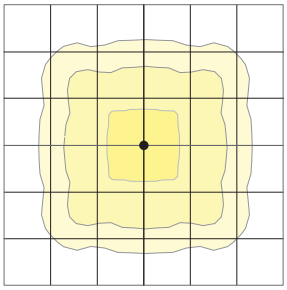
Type 4 Forward



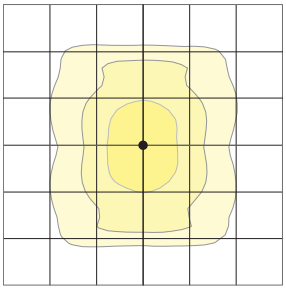
Type 4 Wide



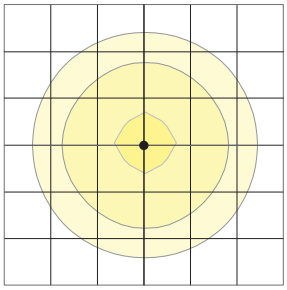
Type 5QM



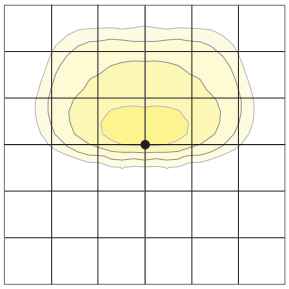
Type 5RW (rectangular)



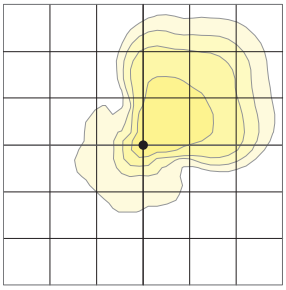
Type 5W (round wide)



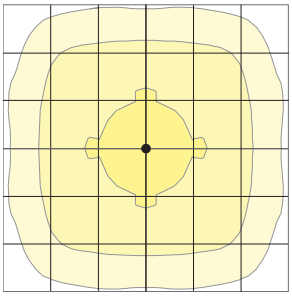
Type TC



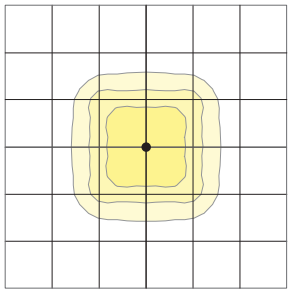
Type Corner



Type 5QW



Type 5QN



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BEACON
design . performance . technology

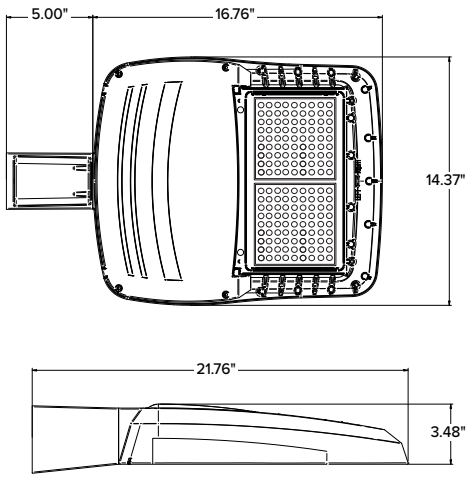
VIPER Area/Site

VIPER LUMINAIRE

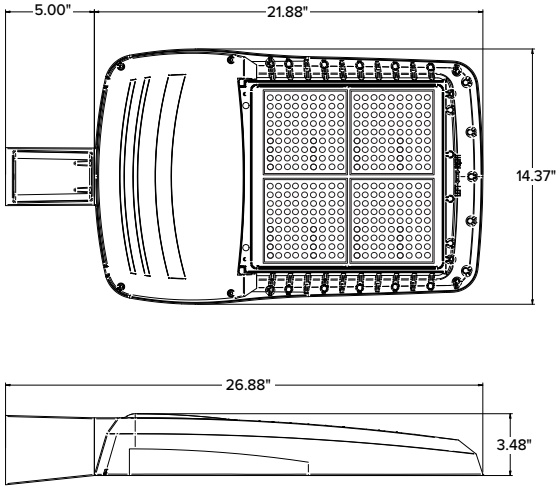
DATE:	LOCATION:
TYPE: AA6	PROJECT: Texas Roadhouse
CATALOG #: VP-1-160L-135-4K7-2-UNV-A-DBT	

DIMENSIONS

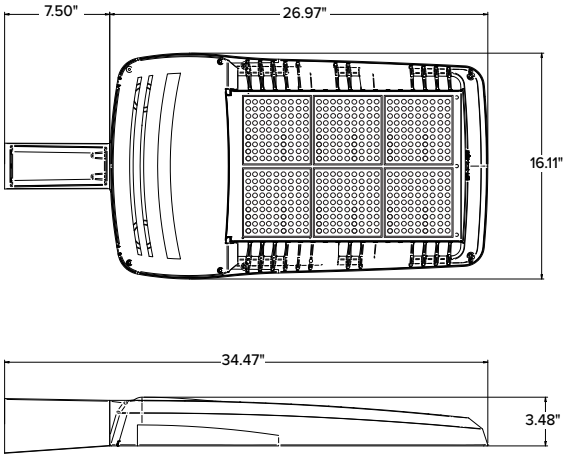
SIZE 1



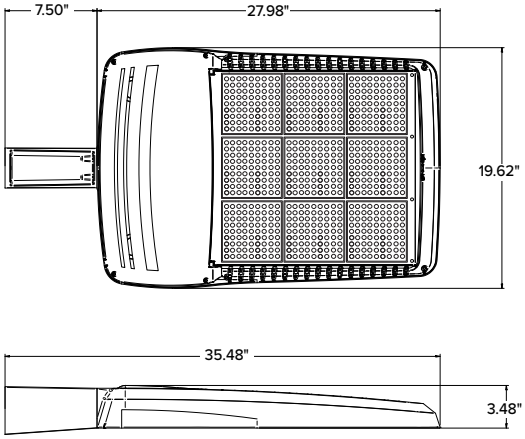
SIZE 2



SIZE 3



SIZE 4



	EPA				
	VP1 (Size 1)	VP2 (Size 2)	VP3 (Size 3)	VP4 (Size 4)	Config.
Single Fixture	0.454	0.555	0.655	0.698	
Two at 180	0.908	1.110	1.310	1.396	
Two at 90	0.583	0.711	0.857	0.948	
Three at 90	1.037	1.266	1.512	1.646	
Three at 120	0.943	1.155	1.392	1.680	
Four at 90	1.166	1.422	1.714	1.896	

	Weight	
	lbs	kgs
VP1 (Size 1)	13.7	6.2
VP2 (Size 2)	16.0	7.26
VP3 (Size 3)	25.9	11.7
VP4 (Size 4)	30.8	13.9

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VIPER Area/Site

VIPER LUMINAIRE

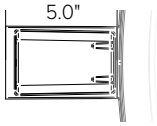
DATE:	LOCATION:
TYPE: AA6	PROJECT: Texas Roadhouse
CATALOG #: VP-1-160L-135-4K7-2-UNV-A-DBT	

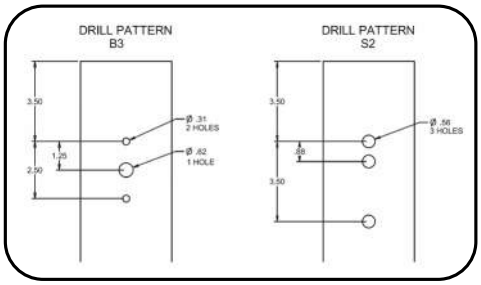
MOUNTING



A–STRAIGHT ARM MOUNT

Fixture ships with integral arm for ease of installation. Compatible with Current Outdoor B3 drill pattern for ease of installation on square poles. For round poles add applicable suffix (2/3/4/5)

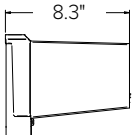


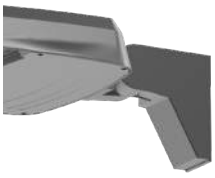




ASQU–UNIVERSAL ARM MOUNT

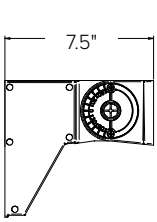
Universal mounting block for ease of installation. Compatible with drill patterns from 1.5" to 5.25" and Current drill pattern S2. For round poles add applicable suffix (2/3/4/5)

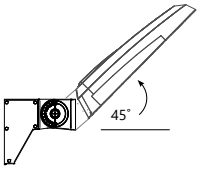




AAU–ADJUSTABLE ARM FOR POLE MOUNTING

Rotatable arm mounts directly to pole. Compatible with drill patterns from 1.5" to 5.25" and Current drill pattern S2 and B3. For round poles add applicable suffix (2/3/4/5). Rotatable in 5˚ aiming angle increments. Micro Strike configurations have a 45° aiming limitation. Strike configurations have a 30° aiming limitation.

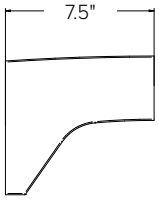






ADU–DECORATIVE UPSWEPT ARM

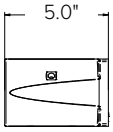
Upswept Arm compatible with drill patterns from 1.5" to 5.25" and Current drill pattern S2. For round poles add applicable suffix (2/3/4/5).

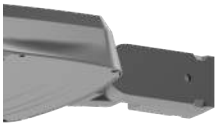




MAF–MAST ARM FITTER

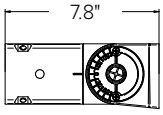
Fits 2-3/8" OD horizontal tenons.

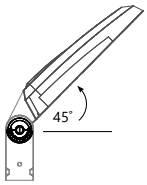


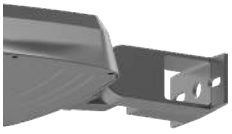


K–KNUCKLE

Rotatable in 5-degree aiming angle increments, fits 2-3/8" tenons or pipes. Micro Strike configurations have a 45° aiming limitation. Strike configurations have a 30° aiming limitation.

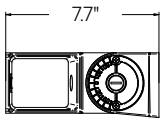


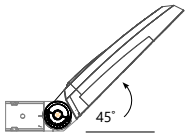




T–TRUNNION

Trunnion for surface and crossarm mounting using (1) 3/4" or (2) 1/2" size through bolts. Micro Strike configurations have a 45° aiming limitation. Strike configurations have a 30° aiming limitation.

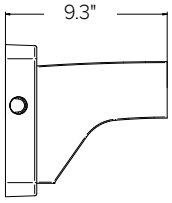






WM–WALL MOUNT

Compatible with universal arm mount, adjustable arm mount, and decorative arm mount. The WA option uses the same wall bracket but replaces the decorative arm with an adjustable arm.



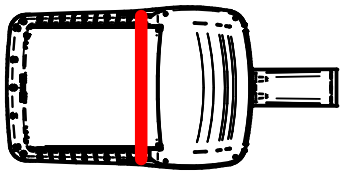
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ADDITIONAL INFORMATION (CONTINUED)

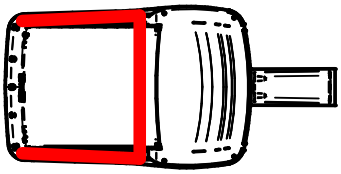
HOUSE SIDE SHIELD FIELD INSTALL ACCESSORIES

HSS has a depth of 5" for all Viper sizes
Not to be used with Occupancy Sensors as the shield may block the light to the sensor.

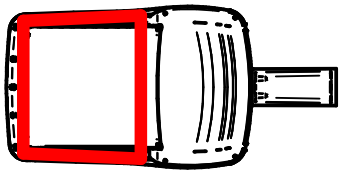
VPR2x HSS-90-B-xx



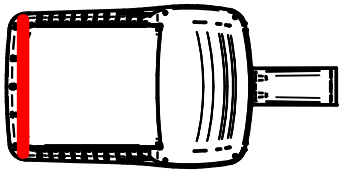
VPR2x HSS-270-BSS-xx



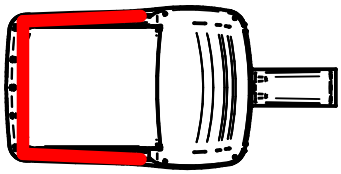
VPR2x HSS-360-xx



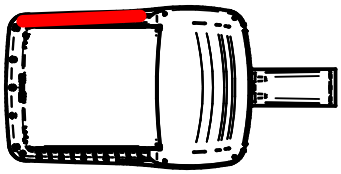
VPR2x HSS-90-F-xx



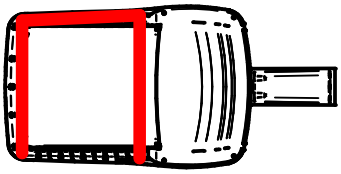
VPR2x HSS-270-FSS-xx



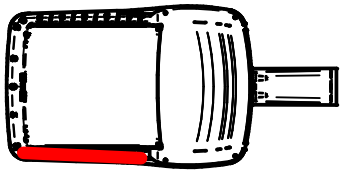
VPR2x HSS-90-S-xx



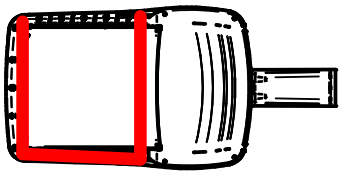
VPR2x HSS-270-FSB-xx



VPR2x HSS-90-S-xx



VPR2x HSS-270-FSB-xx



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SECURITY LIGHTING™

SES Poles

SQUARE STEEL STRAIGHT POLES (SES)

DATE: | LOCATION:

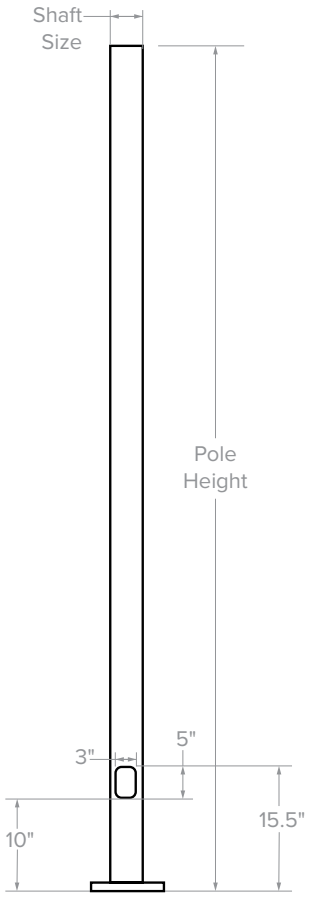
TYPE: AA4 - POLE | PROJECT: Texas Roadhouse

CATALOG #: SES-25-40-01-A-B3-DB

FEATURES

- Square Steel Straight Shaft
- One piece construction
- 2 3/8" OD tenon, Open Top or Factory drilled Side Mount Options available
- Steel Base Plate
- 3 size options for anchor bolts. All anchor bolts fully galvanized with 2 nuts and washer (bolts ordered as separate line item and paper template included as component of anchor bolts)
- Square base cover available (ordered as separate line item)
- Pole finished in weather proof powder coat paint in 4 standard colors
- 3" x 5" Gasketed hand hole standard

POLE DIMENSIONS







Tenon Top Pole

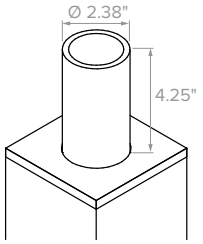


Open Top Pole

SPECIFICATIONS

The Square Steel Straight Pole has been successfully installed in projects of all types for over 30 years and has become the most popular and economical pole option for all site lighting applications including retail, commercial, industrial and residential projects.

The popularity of this series is due to its full offering of sizes, heights and standard colors with complete offering of mounting options, accessories and select styles/colors stocked for immediate shipping.



ORDERING GUIDE

Example: SES-XX-XX-X-XX-X-XX-XX

CATALOG #

SES	–		–		–		–		–		–		–	
Housing		**Height**		**Size**		**Guage**		**Mounting**		**Drilling**		**Coating**		**Color**
SES Square Steel Straight Pole		**18** 18 Feet **20** 20 Feet **22** 22 Feet **25** 25 Feet **28** 28 Feet **30** 30 Feet		**40** 4"x4" Shaft **50** 5"x5" Shaft		**01** 11 Guage .119" thick **07** 7 Guage .179" thick		**TA** 2⅜" OD Tenon[2] **TB** 2⅞" OD Tenon[2] **OT** Open Top Pole **A** Side-Single **B** Side-Double at 90° **C** Side-Double at 180° **D** Side-Triple at 90° **F** Side-Quad at 90°		**Blank** No Drilling **2** Drill Pattern 2 **6** Drill Pattern 6 **26** Drill Pattern 26 **C** Custom Drill Pattern[3] **B3** 2 bolt (2 ½" spacing) Ratio, Viper A arms		**Blank** None **GL** Galvanized[1]		**DB** Dark Bronze **WH** White **BL** Black **PS** Platinum Silver

Notes:

1 All Non-stocked galvanized poles have an 8-10 week lead time

2 Tenon 4.25" tall

Note: Anchor bolts, templates and bolt covers are ordered as separate line items and material part numbers are listed with the accessories.
Note: Custom Pole heights available, just note required height (pole will be cut down to required height from next tallest pole heights offered)

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SECURITY LIGHTING™

SES Poles

SQUARE STEEL STRAIGHT POLES (SES)

DATE: | LOCATION:

TYPE: AA4 - POLE | PROJECT: Texas Roadhouse

CATALOG #: SES-25-40-01-A-B3-DB

ORDERING INFORMATION CONTD.

Catalog Number	Pole Ht.		Nominal Shaft Dim.	Wind Load Rating- ASCE 7-05 wind map EPA Load Rating-(3 second gust wind speeds)										Wall Thick.	Bolt Circle (Sug.)	Bolt Circle	Bolt Sq.	Base Plate (sq.)	Anchor Bolt Size	Bolt Proj.	Pole Wt. (lbs.)
	ft	m		85 MPH	90 MPH	100 MPH	105 MPH	110 MPH	120 MPH	130 MPH	140 MPH	145 MPH	150 MPH								
SES-10-40-01-XX-XX	10	3.0	4"	25.0	25.0	25.0	22.8	20.6	17.0	14.2	11.9	11.0	10.1	0.125"	11"	8-11"	5.6-7.8"	10.25 x 0.75"	3/4 x 30 x 3"	4"	77
SES-10-50-01-XX-XX	10	3.0	5"	25.0	25.0	25.0	25.0	25.0	23.0	19.1	16.0	14.7	13.5	0.125"	11"	10-13.5"	7.1-9.5"	12" x 1"	1 x 36 x 4"	4"	
SES-12-40-01-XX-XX	12	3.7	4"	25.0	25.0	20.0	18.0	16.1	13.2	10.8	8.9	8.1	7.4	0.125"	11"	8-11"	5.6-7.8"	10.25 x 0.75"	3/4 x 30 x 3"	4"	90
SES-12-50-01-XX-XX	12	3.7	5"	25.0	25.0	25.0	24.0	21.8	17.8	14.5	12.1	11.0	10.0	0.125"	11"	10-13.5"	7.1-9.5"	12" x 1"	1 x 36 x 4"	4"	
SES-14-40-01-XX-XX	14	4.3	4"	23.1	20.4	16.1	14.3	12.8	10.2	8.2	6.6	5.9	5.3	0.125"	11"	8-11"	5.6-7.8"	10.25 x 0.75"	3/4 x 30 x 3"	4"	103
SES-16-40-01-XX-XX	16	4.9	4"	19.0	16.7	13.0	11.5	10.1	7.9	6.2	4.7	4.1	3.6	0.125"	11"	8-11"	5.6-7.8"	10.25 x 0.75"	3/4 x 30 x 3"	4"	116
SES-16-50-07-XX-XX	16	4.9	5"	25.0	25.0	26.0	25.0	24.8	20.1	16.5	13.6	12.3	11.2	0.188"	11"	10-13.5"	7.1-9.5"	12" x 1"	1 x 36 x 4"	4"	219
SES-18-40-01-XX-XX	18	5.5	4"	15.6	13.6	10.0	9.0	7.8	5.9	4.4	3.1	2.6	2.1	0.125"	11"	8-11"	5.6-7.8"	10.25 x 0.75"	3/4 x 30 x 3"	4"	129
SES-18-50-07-XX-XX	18	5.5	5"	25.0	25.0	25.0	22.9	20.4	16.4	13.2	10.7	9.6	8.6	0.188"	11"	10-13.5"	7.1-9.5"	12" x 1"	1 x 36 x 4"	4"	243
SES-20-40-01-XX-XX	20	6.1	4"	12.7	10.9	7.9	6.9	5.9	4.2	2.8	1.7	1.3	0.9	0.125"	11"	8-11"	5.6-7.8"	10.25 x 0.75"	3/4 x 30 x 3"	4"	142
SES-20-40-7-XX-XX	20	6.1	4"	13.6	11.6	8.5	7.2	6.1	4.4	3	1.9	1.4	1	0.188"	11"	8-11"	5.6-7.8"	11" x 1"	3/4 x 30 x 3"	4"	201
SES-20-50-07-XX-XX	20	6.1	5"	25.0	25.0	21.3	18.9	16.7	13.2	10.4	8.1	7.2	6.3	0.125"	11"	10-13.5"	7.1-9.5"	12" x 1"	1 x 36 x 4"	4"	267
SES-22-50-07-XX-XX	22	6.7	5"	25.0	23.0	17.7	15.5	13.5	10.5	8.0	6.0	5.2	4.4	0.125"	11"	10-13.5"	7.1-9.5"	12" x 1"	1 x 36 x 4"	4"	292
SES-25-40-01-XX-XX	25	7.6	4"	7.3	5.9	3.8	2.9	2.1	0.8	NR	NR	NR	NR	0.125"	11"	8-11"	5.6-7.8"	10.25 x 0.75"	3/4 x 30 x 3"	4"	175
SES-25-40-7-XX-XX	25	7.6	4"	12.8	11.0	7.9	6.7	5.5	3.7	2.3	1.2	0.7	NR	0.188"	11"	8-11"	5.6-7.8"	11" x 1"	3/4 x 30 x 3"	4"	257
SES-25-50-07-XX-XX	25	7.6	5"	20.7	17.8	13.3	11.5	9.8	7.2	5.0	3.3	2.6	1.9	0.125"	11"	10-13.5"	7.1-9.5"	12" x 1"	1 x 36 x 4"	4"	327
SES-28-50-07-XX-XX	27	8.1	5"	16.1	13.7	9.7	8.1	6.7	4.4	2.6	1.1	NR	NR	0.188"	11"	10-13.5"	7.1-9.5"	12" x 1"	1 x 36 x 4"	4"	335
SES-30-40-07-XX-XX	30	9.1	5"	13.5	11.3	7.7	6.2	4.9	2.8	1.1	NR	NR	NR	0.125"	11"	10-13.5"	7.1-9.5"	12" x 1"	1 x 36 x 4"	4"	367
SES-30-50-07-XX-XX	30	9.1	5"	13.5	11.3	7.7	6.2	4.9	2.8	1.1	NR	NR	NR	0.125"	11"	10-13.5"	7.1-9.5"	12" x 1"	1 x 36 x 4"	4"	367

Catalog Number	Florida Building Code 2010 EPA Load Rating (3 second gust wind speeds)									
	85 MPH	90 MPH	100 MPH	105 MPH	110 MPH	120 MPH	130 MPH	140 MPH	145 MPH	150 MPH
SES-10-40-01-XX-XX	25.0	25.0	25.0	25.0	23.5	20.5	17.8	15.5	11.0	10.1
SES-12-40-01-XX-XX	25.0	25.0	25.0	21.9	18.6	15.8	13.6	11.7	8.1	7.4
SES-14-40-01-XX-XX	25.0	25.0	21.1	17.5	14.7	12.3	10.4	8.8	5.9	5.3
SES-16-40-01-XX-XX	23.2	20.9	17.0	13.9	11.4	9.4	7.7	6.3	4.1	3.6
SES-16-50-07-XX-XX	25.0	25.0	25.0	25.0	24.9	21.0	17.9	15.2	12.3	11.2
SES-18-40-01-XX-XX	18.9	16.8	13.5	10.8	8.7	6.9	5.5	4.2	2.6	2.1
SES-18-50-07-XX-XX	25.0	25.0	25.0	24.1	20.0	16.7	13.9	11.6	9.6	8.6
SES-20-40-01-XX-XX	15.3	13.6	10.6	8.3	6.4	4.8	3.5	2.5	1.3	0.9
SES-20-40-07-XX-XX	25.0	24.0	19.6	16.1	13.2	10.8	8.9	7.2	4.3	3.7
SES-20-50-07-XX-XX	25.0	25.0	24.0	19.6	16.0	13.1	10.7	8.7	7.2	6.3
SES-22-50-07-XX-XX	25.0	24.8	19.8	15.9	12.7	10.1	8.0	6.2	5.2	4.4
SES-25-40-01-XX-XX	8.8	7.4	5.2	3.4	1.9	0.7	NR	NR	NR	NR
SES-25-40-7-XX-XX	7.7	6.4	4.3	2.8	1.3	NR	NR	NR		
SES-25-50-07-XX-XX	21.4	18.9	14.6	11.3	8.6	6.3	4.5	2.9	2.6	1.9
SES-28-50-07-XX-XX	18.7	16.4	12.4	9.3	6.8	4.7	3.0	1.5	NR	NR
SES-30-50-07-XX-XX	13.4	11.4	8.0	5.3	3.1	1.3	NR	NR	NR	NR
SES-30-40-07-XX-XX	13.4	11.4	8.0	5.3	3.1	1.3	NR	NR	NR	NR

Center of EPA is located at the pole top. If bullhorns or other methods are used that locate the EPA center above the poletop, EPA limits are reduced.
Calculations are based on each square foot of EPA being equal to 30 pounds.
The EPA limits are not applicable for poles attached to structures, such as parking garage decks.

QUICK SHIP

	Catalog Number	Description
☐	**SES18401TADB**	POLE-SES-18ftX4inSQ-11GA-TENON-DARK BRONZE
☐	**SES22507TABL**	POLE-SES-22ftX5inSQ-7GA-TENON-BLACK
☐	**SES22507TADB**	POLE-SES-22ftX5inSQ-7GA-TENON-DARK BRONZE
☐	**SES25507TABL**	POLE-SES-25ftX5inSQ-7GA-TENON-BLACK
☐	**SES25507TADB**	POLE-SES-25ftX5inSQ-7GA-TENON-DARK BRONZE

Consult factory for lead times on non-stocked poles

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SECURITY LIGHTING™

SES Poles

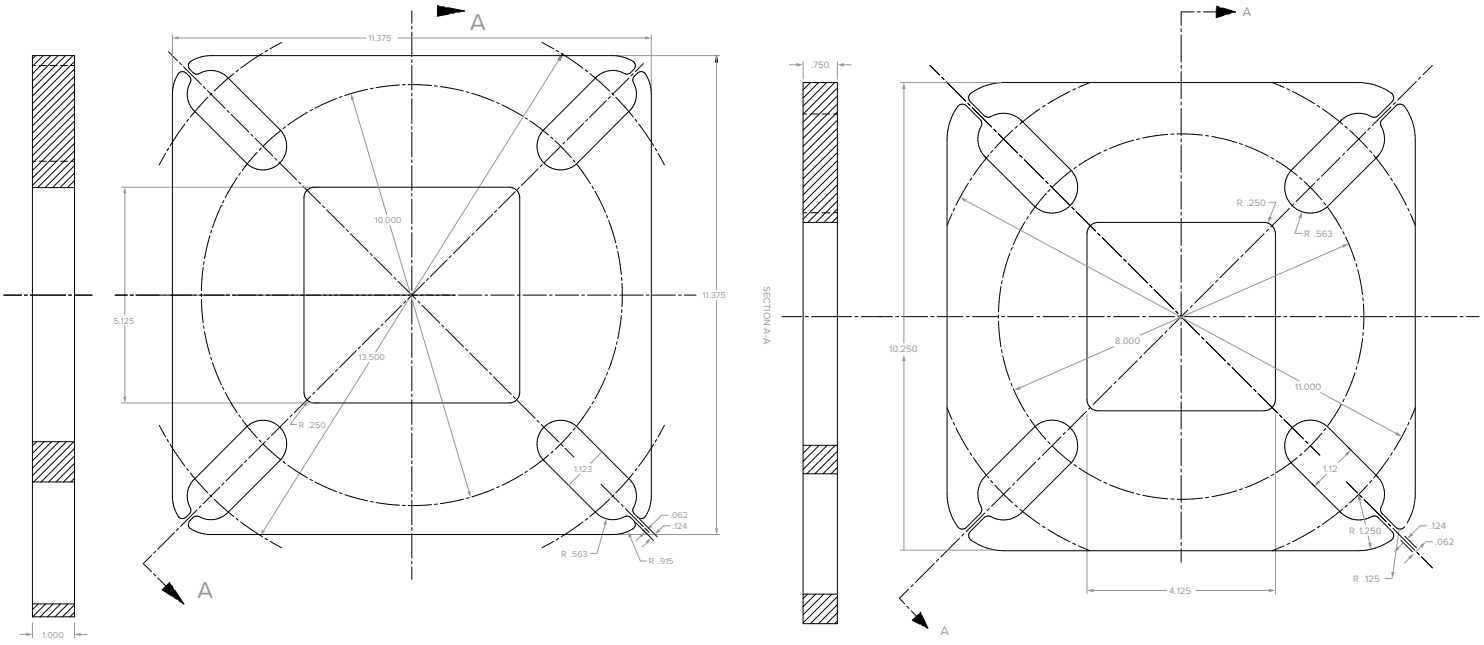
SQUARE STEEL STRAIGHT POLES (SES)

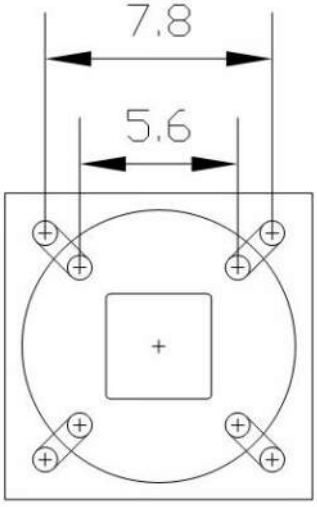
DATE: | LOCATION:

TYPE: AA4 - POLE | PROJECT: Texas Roadhouse

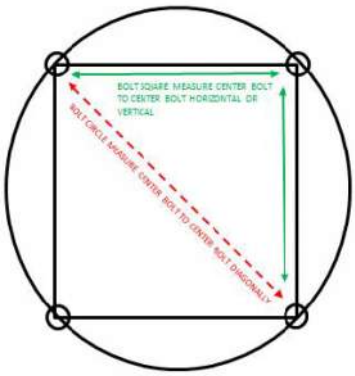
CATALOG #: SES-25-40-01-A-B3-DB

BOLT CIRCLE DIAGRAMS

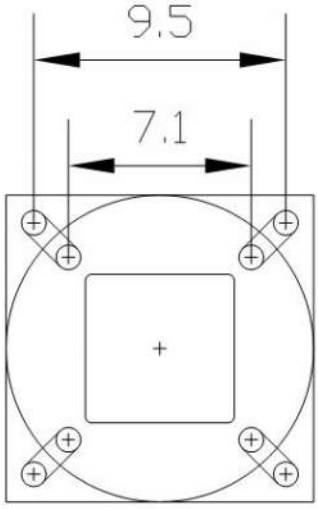




Bolt Square Measurement
Measurement vertical or horizontal from the center of the bolt to the center of the bolt.



Bolt Circle Measurement
Measure diagonal from the center of the bolt to the center of the bolt. Suggested bolt circle 10.5”



4” Square Pole

(10” Bolt Circle)
(Min. B.C. = 8”)
(MAX. B.C. - 11”)

5” Square Pole

(11” Bolt Circle)
(Min. B.C. = 10”)
(Max. B.C. = 13.5”)

All listed SES poles use 27701349904 paper template
It’s the contractors’ responsibilty to ensure that new poles will fit existing bases

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SES Poles

SQUARE STEEL STRAIGHT POLES (SES)

ACCESSORIES

POLE CAP



4" POLE CAP	20102389702
5" POLE CAP	20102389802
6" POLE CAP	20102389902

TENON



TA | (2 3/8" OD)

Note: TA Tenons are factory installed. For installation into open top poles, use TT1A tenon top adapter

HAND HOLE COVER



Note: Hand hole cover included with all new poles. Replacement parts:
22106400112 + (2)23115839901 + (1)26508469902(3"x5")

BASE COVER

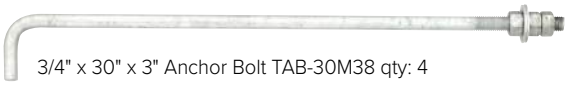
Order as a separate line item

Catalog Number	Description
Pole Base Covers for Square Poles	
SBC-4-XX[1]	10 1/2" Sq x 5" Deep (use on 4" sq poles)
SBC-4L-XX[1]	12 1/4" Sq x 5" Deep (use on 4" sq poles)
SBC-5-XX[1]	12 1/4" Sq x 5" Deep (use on 5" sq poles)
SBC-6-XX[1]	12 1/4" Sq x 5" Deep (use on 6" sq poles)

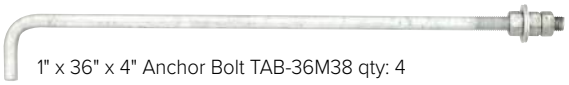
1. Replace XX with two letter color designation



ANCHORAGE | ORDER AS A SEPARATE LINE ITEM



3/4" x 30" x 3" Anchor Bolt TAB-30M38 qty: 4



1" x 36" x 4" Anchor Bolt TAB-36M38 qty: 4

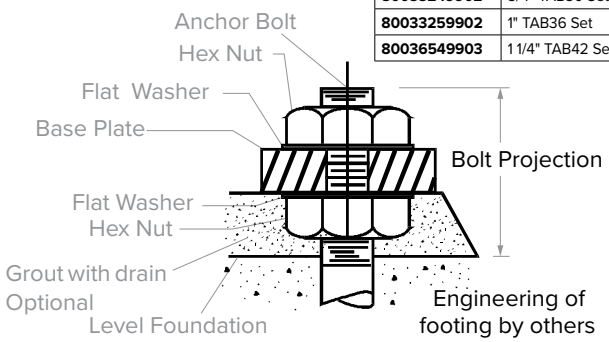


1" x 42" Anchor Bolt ABOLTS142 qty: 4

Note Fabricated from hight tensile steel, each anchor bolt has two nuts and two washers; Galvanized anchor bolts are hot dipped; (Galvanized includes threaded portion plus six inches minimum); Anchor Bolt template included with pole purchase.

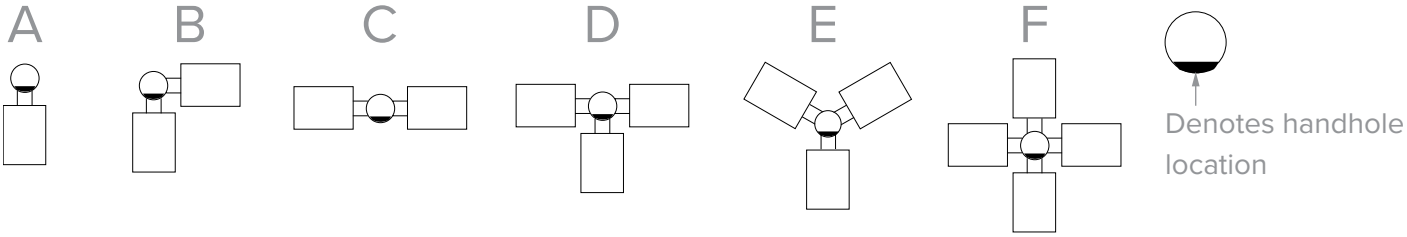
BASE DETAIL

Replacement Nut/Washer Kit	
80033249902	3/4" TAB30 Set
80033259902	1" TAB36 Set
80036549903	1 1/4" TAB42 Set

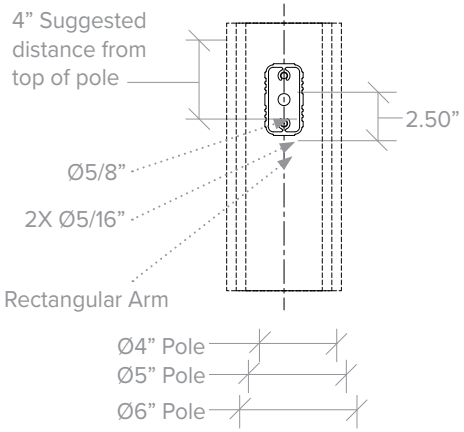


DRILL PATTERN | CONFIRM PROPER MOUNTING BEFORE ORDERING

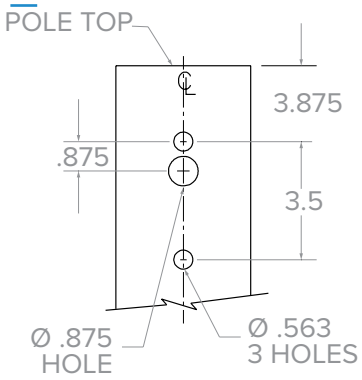
SIDE MOUNTING LOCATIONS Must use TETA fitter for 120° mounting



VIPER/RATIO (A ARMS) DRILL PATTERN B3, B4

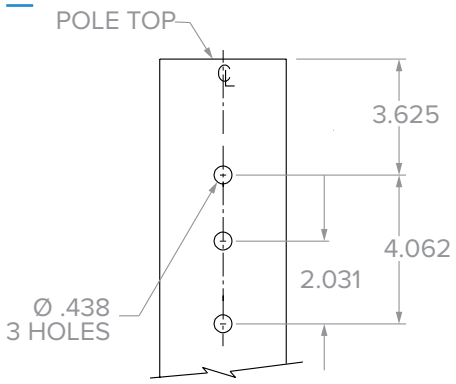


X2



#2 DRILL PATTERN

X6



#6 DRILL PATTERN

X26 drill pattern is a combination of both the X2 and X6 drill patterns

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SECURITY LIGHTING™

SES Poles

SQUARE STEEL STRAIGHT POLES (SES)

DATE: | LOCATION:

TYPE: AA4 - POLE | PROJECT: Texas Roadhouse

CATALOG #: SES-25-40-01-A-B3-DB

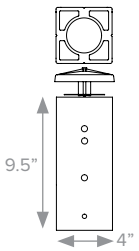
MOUNTING BRACKETS | ORDER AS ACCESSORIES

SIDE MOUNTING LOCATIONS

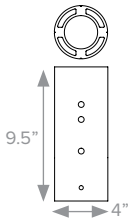
Catalog Number		Description	EPA	Weight
TTF-XX-XX[1,2]		4" Square pole top tenon adapter 2 3/8" OD slipfitter for max. four fixtures (90°)	0.4ft2 0.04m2	20lbs. 9kgs.
RETA-XX1,2 RETA-XX-Viper[1,2]		4" Round pole top tenon adapter 2 3/8" OD slipfitter for max. four fixtures (90°)	0.2ft2 0.02m2	20lbs. 9kgs.
TTF-VIPER-XX		4" Square pole top tenon adapter 2 3/8" OD slipfitter for max. fixture (90 0) Drilled 4 sides for Viper and plugged on two sides		

1 Replace X or XX with color designation
2 All fitters drilled with drill pattern 26 (except for fitters designed for Viper fixtures). Any other drill pattern must be designated at time of ordering.
3 Must use 10" arm on fixture for 120° mounting

TTF-10	Single
TTF-29	Twin 90°
TTF-28	Twin 180°
TTF-39	Triple 90°
TTF-49	Quad 90°
TTFViper	Quad 90° plugged on 3 sides



TTF-XX-XX
TTF-VIPER-XX
SETA-XX



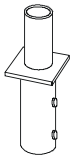
RETA-XX
RETA-XX-VIPER

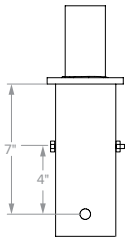
TENON INSERT FOR SINGLE FIXTURE MOUNTING OR TENON ADAPTERS

TT1A4-XX[1,2,3]	2 3/8" OD Tenon top adapter for 4" square open top poles, (slips 9" into pole aligns with #6 drill pattern)
TT1A5-XX[1,2,3]	2 3/8" OD Tenon top adapter for 5" square open top poles, (slips 9" into pole aligns with #6 drill pattern)

1 TT1A not required with tenon top pole. Use only for retrofit (specify 4" or 5" pole).
2 Replace XX with two letter color designation
3 Installed with one through bolt supplied with fitter. May require field drilling of pole for proper installation.


TT-1A*


SSP-TX



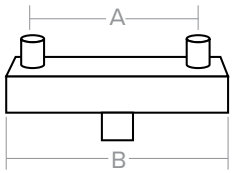
TWO FIXTURE MOUNTING BRACKET

Decorative steel floodlight brackets 4" square tubing with 2 1/3" O.D. fixture tenons. Square 4" bottom with 2 1/2" I.D. internet adapter for standard round tenons. Available in multiple finishes as shown. Use with SES series poles

Description	Maximum Weight Per Tenon		EPA		Weight	
	lbs	(kg)	Ft²	(m²)	lbs.	(kg)
Twin 180°	60	(27.2)	1.2	(0.1)	24	(10.9)

1 Replace XX with two letter color designation


TT2A-XX[1]



A	B
24"	30"
610mm	762mm

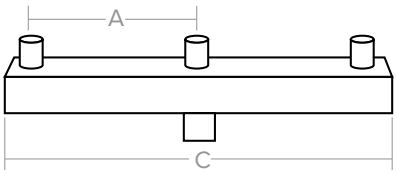
THREE FIXTURE MOUNTING BRACKET

Decorative steel floodlight brackets 4" square tubing with 2 1/3" O.D. fixture tenons. Square 4" bottom with 2 1/2" I.D. internet adapter for standard round tenons. Available in multiple finishes as shown. Use with SES series poles

Description	Maximum Weight Per Tenon		EPA		Weight	
	lbs	(kg)	Ft²	(m²)	lbs.	(kg)
Triple 180°	60	(27.2)	2.3	(0.2)	44	(19.9)

1 Replace XX with two letter color designation


TT3A-XX[1]



A	C
24"	54"
610mm	1372mm

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SECURITY LIGHTING™

SES Poles

SQUARE STEEL STRAIGHT POLES (SES)

DATE: | LOCATION:

TYPE: AA4 - POLE | PROJECT: Texas Roadhouse

CATALOG #: SES-25-40-01-A-B3-DB

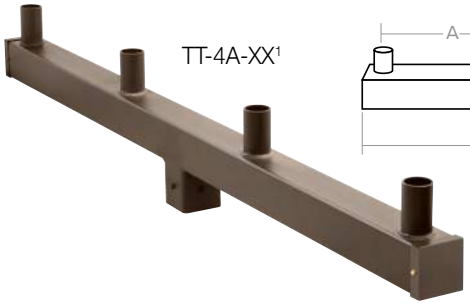
MOUNTING BRACKETS | ORDER AS ACCESSORIES

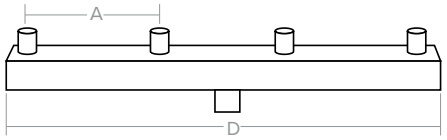
FOUR FIXTURE MOUNTING BRACKET

Decorative steel floodlight brackets 4" square tubing with 2 1/3" O.D. fixture tenons. Square 4" bottom with 2 1/2" I.D. internet adapter for standard round tenons. Available in multiple finishes as shown. Use with SES series poles

Description	Maximum Weight Per Tenon		EPA		Weight	
	lbs	(kg)	Ft²	(m²)	lbs.	(kg)
Quad 180°	60	(27.2)	3.4	(0.3)	64	(29)

1 Replace XX with two letter color designation





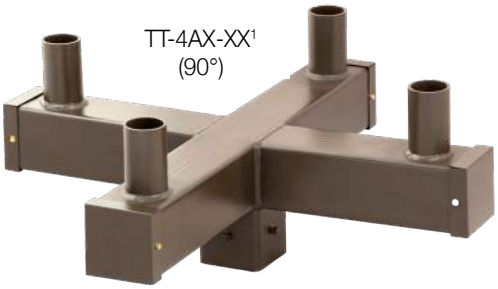
A	D
24"	78"
610mm	1981mm

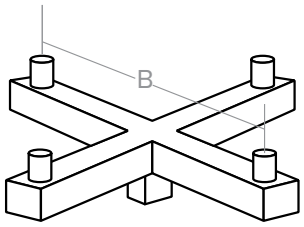
FOUR FIXTURE MOUNTING BRACKET (90°)

Decorative steel floodlight brackets 4" square tubing with 2 1/3" O.D. fixture tenons. Square 4" bottom with 2 1/2" I.D. internet adapter for standard round tenons. Available in multiple finishes as shown. Use with SES series poles

Description	Maximum Weight Per Tenon		EPA		Weight	
	lbs	(kg)	Ft²	(m²)	lbs.	(kg)
Quad 180°	60	(27.2)	2.8	(0.3)	46	(20.8)

1 Replace XX with two letter color designation





A	B
24"	30"
610mm	762mm

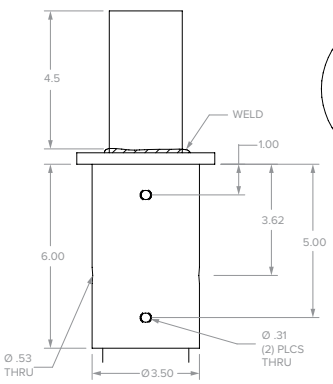
TPR SERIES

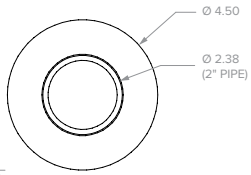
Decorative steel floodlight brackets 4" square tubing with 2 1/3" O.D. fixture tenons. Square 4" bottom with 2 1/2" I.D. internet adapter for standard round tenons. Available in multiple finishes as shown. Use with SES series poles

Catalog Number	Description	EPA	Weight
		ft²(m²)	lbs. (kg.)
TPR-2-XX[1,5]	2 1/2" to 2" pipe size tenon reducer	__	6 (2.7)
TPR-3-XX[2,5]	3" to 2" pipe size reducer	__	8 (3.6)
TPR-4-XX[3,5]	4" to 2" pipe size tenon reducer	__	9 (4.1)

1 Bracket slips over pole creating 2 3/8 OD Tenon (lower ID = 3 1/16")
2 Bracket slips over pole creating 2 3/8 OD Tenon (lower ID = ID = 3 1/2")
3 Bracket slips over pole creating 2 3/8 OD Tenon (lower ID = ID = 4 5/8")
4 Will not fit in 3 guage poles
5 Replace XX with two letter color designation







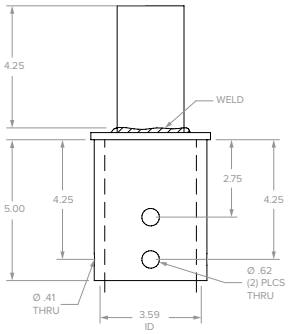
285-B SERIES

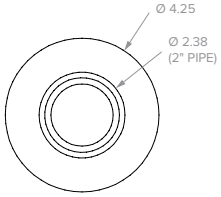
Decorative steel floodlight brackets 4" square tubing with 2 1/3" O.D. fixture tenons. Square 4" bottom with 2 1/2" I.D. internet adapter for standard round tenons. Available in multiple finishes as shown. Use with SES series poles

Catalog Number	Description
285-B-3-XX[1]	3 1/2" to 2 3/8" Reducer (OD for both dimensions)
285-B-4-XX[1]	4 1/2" to 2 3/8" Reducer (OD for both dimensions)

1 Replace XX with two letter color designation







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SECURITY LIGHTING™

SES Poles

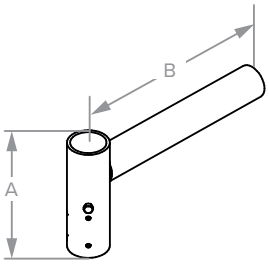
SQUARE STEEL STRAIGHT POLES (SES)

DATE: | LOCATION:

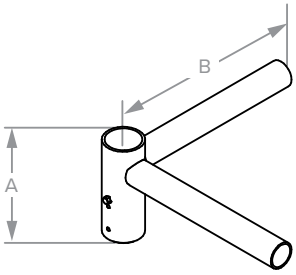
TYPE: AA4 - POLE | PROJECT: Texas Roadhouse

CATALOG #: SES-25-40-01-A-B3-DB

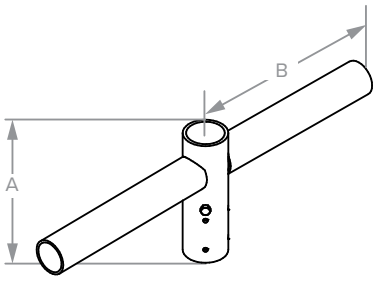
SPOKE MOUNTING BRACKETS[1]



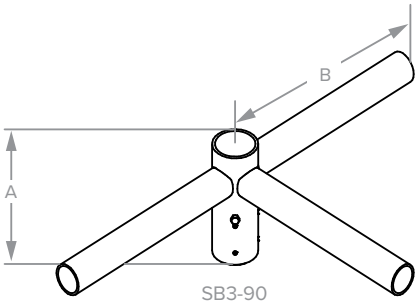
SB1



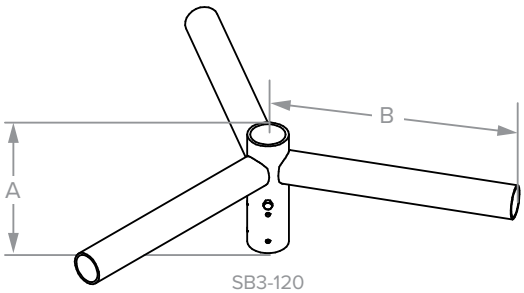
SB2-90



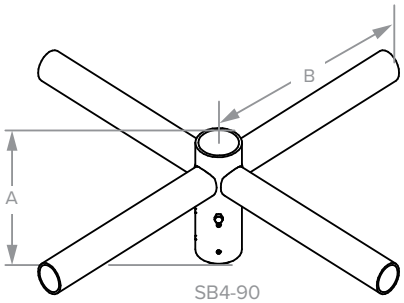
SB2-180



SB3-90



SB3-120



SB4-90

ORDERING GUIDE

Example: SB-X-XXX-XXXX-XXX

CATALOG #

SB –		–		–
Series	**Configuration**	**Length**	**Size**	**Color**
SB Spoke Bracket	**1**	**8"**	**PT20** 2" pipe tenon (2.38"OD)	**DB** Dark Bronze Textured
	2-180	**12"**		**BL** Black Textured
	2-90	**18"**	**PT25** 2.5" pipe tenon (2.88" OD)	**WH** White Textured
	3-120	**24"**		**GR** Gray Textured
	3-90	**30"**	**PT35** 3.5" pipe tenon (4.0" OD)	**PS** Platinum Silver Smooth
	4-90			**GYS** Light Gray Smooth
				BZT Bronze Textured
				BBT Basic Black Textured

Notes:

1 For Horizontal Slip Filter Mounting

ORDERING INFORMATION

(ORDER AS SEPARATE PART #, FIELD INSTALLED)

Catalog Number	Description	Max Allowable Load per Tenon	Bracket EPA MAX.	Bracket Weight, Max.
SB1	Single	60lbs (27.2kg)	0.6	18
SB2-180	Twin, 2@ 180°	60lbs (27.2kg)	1.0	27
SB2-90	Twin, 2@90°	60lbs (27.2kg)	0.8	27
SB3-120	3@120°	60lbs (27.2kg)	0.9	36
SB3-90	3@90°	60lbs (27.2kg)	1.0	36
SB4-90	4@90°	60lbs (27.2kg)	1.0	45

QUICK SHIP

Catalog Number	Description
SB2180PT20WHT	2@180°, 8"arms
SB2908PT20WHT	2@90°, 8" arms
SB312012PT20WHT	3@120°, 12" arms
SB3908PT20WHT	3@90°, 8" arms
SB4908PT20WHT	4@90°, 8" arms

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SECURITY LIGHTING™

SES Poles

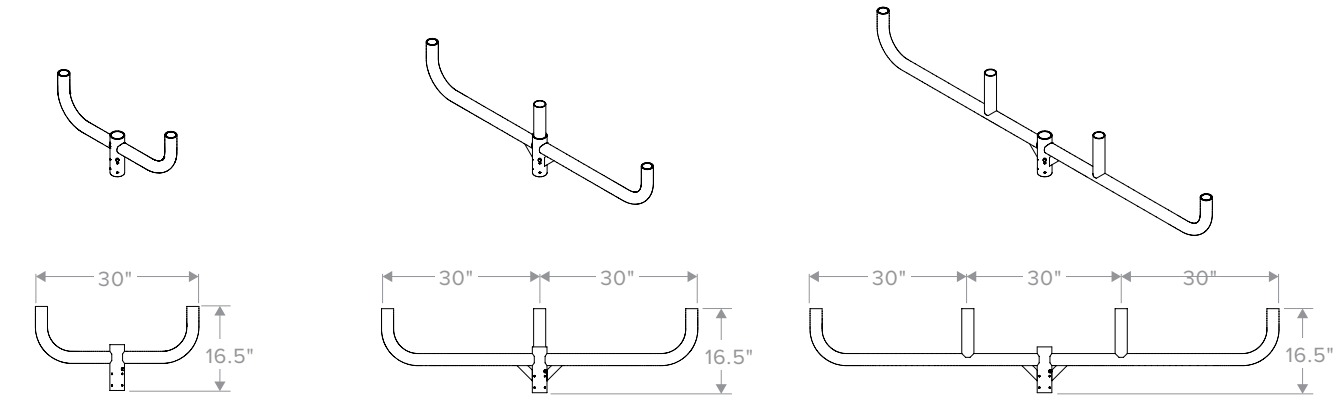
SQUARE STEEL STRAIGHT POLES (SES)

DATE: LOCATION:

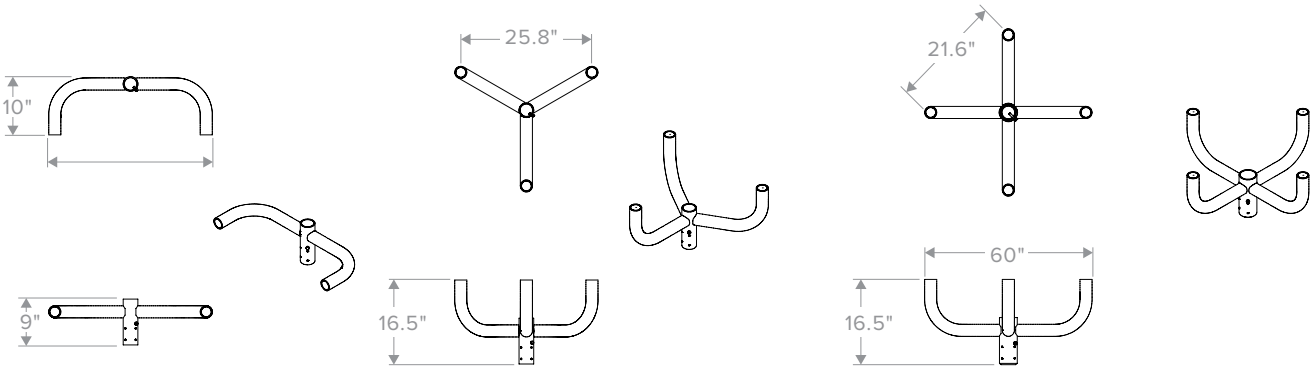
TYPE: PROJECT:

CATALOG #:

BULLHORN MOUNTING BRACKETS[1]



BHH–2–180 **BHH–3–180** **BHH–4–180**



BHH–2H–180 **BHH–3–120** **BHH–4–90**

ORDERING GUIDE

Example: BHH–X-XXX–XXXX–XX

CATALOG #

BHH –	–	–	–	–
Model	**Configurations**	**Pole Tenon Size**	**Color**	**Options**
BHH Bullhorn Bracket	**2–180** 2–180 **2H–180** 2H–180 **3–180** 3–180 **4–180** 4–180 **3–120** 3–120 **4–90** 4–90	**PT20** 2" pipe tenon (2.38" O.D.) **PT25** 2.5" pipe tenon (2.88" O.D.) **PT35** 3.5" pipe tenon (4.0" O.D.)	**DB** Dark bronze textured **BL** Black textured **WH** White textured **GR** Gray textured **PS** Platinum silver smooth	**BAS3** 3" SLEEVE (For luminaires requiring a 3" slipfit)

ORDERING INFORMATION

TENON TYPE BRACKETS (STEEL)

(order as separate part #, field installed)

Catalog Number	Description	Max allowable load per tenon	Bracket EPA, MAX.	Bracket weight, MAX
BHH-2-180	Twin	100 lbs (45.5 kg)	0.9 ft2 (.08 m2)	25 lbs (11.4 kg)
BHH-2H-180	Twin Horizontal	60 lbs (27.2 kg)	0.5 ft2 (.05 m2)	25 lbs (11.4 kg)
BHH-3-180	3-in-line	100 lbs (45.5 kg)	1.5 ft2 (.14 m2)	38 lbs (17.3 kg)
BHH-4-180	4-in-line	100 lbs (45.5 kg)	2.2 ft2 (.20 m2)	51 lbs (23.2 kg)
BHH-3-120	3 @ 120	100 lbs (45.5 kg)	1.2 ft2 (.11 m2)	40 lbs (18.2 kg)
BHH-4-90	4 @ 90	100 lbs (45.5 kg)	1.3 ft2 (.12 m2)	41 lbs (18.2 kg)

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SES Poles

SQUARE STEEL STRAIGHT POLES (SES)

DATE: | LOCATION:

TYPE: AA4 - POLE | PROJECT: Texas Roadhouse

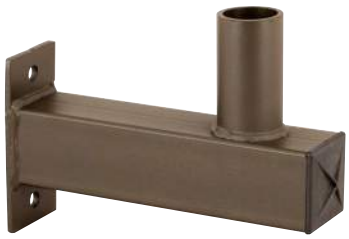
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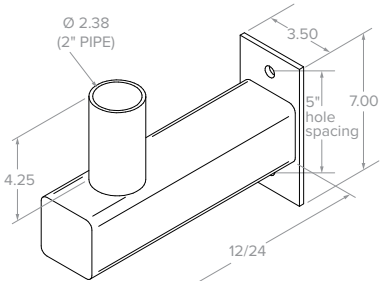
MID POLE BRACKET OPTIONS | ORDER AS ACCESSORIES

FLB-12/24

Catalog Number	Description
FLB-12-XX[1,2]	12" floodlight bracket for pole mounting (bracket requires internal pole access)
FLB-24-XX[1,2]	24" floodlight bracket for pole mounting (bracket requires internal pole access)

1 Replace XX with two letter color designation
2 Mounting Hardware by others



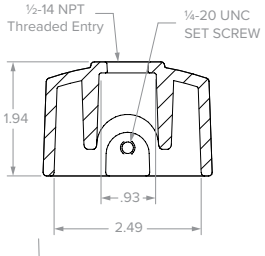


S-302

Catalog Number	Description	
S-302-XX[1]	Slipfits 1 1/2" or 2" pipe (1.9" OD or 2 3/8" OD) with 1/2" N.P.S.M. hub; Bronze	.6(0.3)

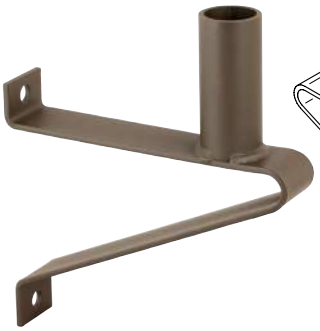
1 Replace XX with two letter color designation

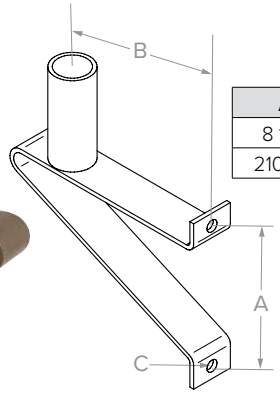




4041

Catalog Number	Description
4041	Heavy-duty steel wall/pole bracket 2" pipe (2 3/8" OD) tenon fitting for use with slipfitter units or 4024C; In dark bronze finish Mounting Hardware by Others



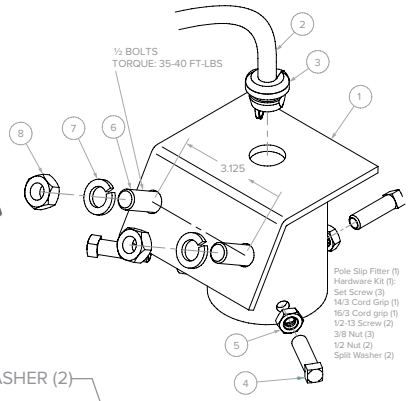


A	B	C
8 1/4"	9 1/2"	11"
210mm	241mm	279mm

4024C

Catalog Number	Description
4024C	Steel Slipfitter for 2" pipe, 2 3/8" OD yoke mount, bronze finish
4024CM53	Steel Slipfitter for 2" pipe, 2 3/8" OD yoke mount, gray finish
4024CM38	Steel Slipfitter for 2" pipe, 2 3/8" OD yoke mount, galvanized finish

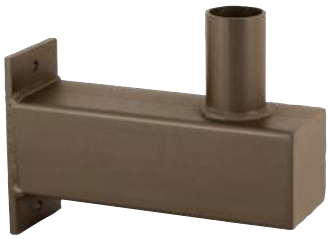


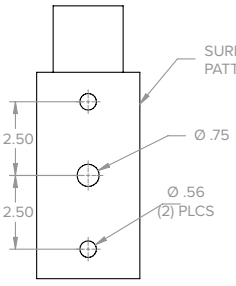


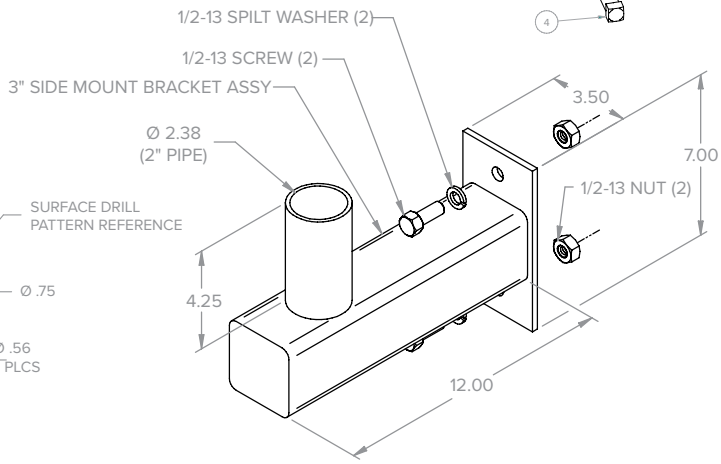
TTWM

Catalog Number	Description
TTWM-XX[1]	Wall Mount Bracket with 2 3/8" OD Tenon

1 Replace XX with two letter color designation
2 Mounting hardware by others







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POLE INTRODUCTION | POLE SELECTION GUIDE

Poles should initially be selected, according to lighting application needs, and second, but equally important, according to the structural requirements imposed on the pole by the lighting fixtures, bracketry and wind. Before attempting to make this selection, it would be helpful to have an understanding of the terminology, such as steady or sustained wind velocity, gust velocity, EPA, special wind region, and maximum weight. Then a step-by-step procedure can be followed to select the proper pole for your particular requirements.

STEADY WIND OR SUSTAINED WIND VELOCITY

This is the maximum steady wind velocity expressed in MPH likely to occur in a specific location. Refer to isotach wind map on the next page for the wind velocity in your location. Isotach maps are provided for reference only. Consult local authorities to determine the maximum velocities in your area.

GUST VELOCITY

Our isotach maps represent two different methods of addressing wind speed gusts. We have used the 'fastest-mile' wind speeds for years. These have a 1.3 gust factor in the calculations to account for gusting. As technology has improved the ability to accurately measure wind speeds for short durations, the gusts associated to a sustained wind speed have lessened. We are now moving toward '3-second-gust' wind speed maps. The results are typically higher steady/sustained wind speeds with lower factors for gusts. The gust factors are different depending on the wind speed map selected.

EFFECTIVE PROJECTED AREA

Effective Projected Area (EPA) is the exposed surface area of a fixture and bracket multiplied by a shape factor which varies depending on the shape of the fixture and bracket. For example, a large rectangular fixture will present more resistance to the wind than will a round or cylindrical shape.

SPECIAL WIND REGIONS

Many locations such as mountainous areas, coastal areas and areas surrounding the Great Lakes exhibit wind velocities considerably higher than the surrounding areas. Consult local authorities to determine maximum wind velocities and select equipment
accordingly.

MAXIMUM WEIGHT

This is the maximum allowable weight based on EPA loads. The weight is based on 30 pounds per square foot of EPA. Weight exceeding the 30 pound per foot of EPA may reduce the allowable EPA rating of the pole.

POLE SELECTION PROCEDURE

With an understanding of the parameters for pole selection, you can follow this simple step-by-step procedure and, with confidence, select a pole to meet your particular requirements.

1. Determine the site location and steady wind velocity by referring to the appropriate isotach map. If the steady wind exceeds those listed, consult factory. The isotach maps are provided for reference only. Consult local authorities to determine the maximum velocities in your area.

2. Total the EPA for the required luminaires and bracketry.

3. Total the weight of the luminaires and bracketry.

4. Compare steps 2 and 3 with the maximum allowable EPA and weight tables shown for the style, material, and height pole required. The maximum allowable must be equal to or exceed the totals from steps 2 and 3.

POLE SELECTION CONCERNS

Caution: These selection methods are guidelines only. Hubbell Lighting assumes no responsibility for selection and recommends you consult qualified professionals for verification of overall system design, site suitability, foundation considerations and applicable code and regulatory conformances.

Maintenance: The facility owner's/manager's regular scheduled maintenance program must include initial and regular follow-up inspections for structural damage, broken welds, tampering, nut loosening, missing wire covers, dangling electrical wiring, internal or external corrosion, foundation settlement, excessive shaft deflection and vibration for all lighting poles. Immediate repair or replacement may be necessary.

Overloading: Do not overload poles by attaching flags, banners, or any items that can add excessive wind or mechanical load to designed pole assemblies.

Observation: Installation and local area conditions can dramatically affect lighting pole performance. Excessive vibration may result from some wind and mounting conditions. Only individuals with local knowledge, who have observed or inspected the site can effectively evaluate site specific issues. Consult the factory for information on vibration dampers, special corrosion, foundation settlement, excessive shaft deflection and vibration for all lighting poles. Immediate repair or replacement may be necessary.

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SECURITY LIGHTING™

SES Poles

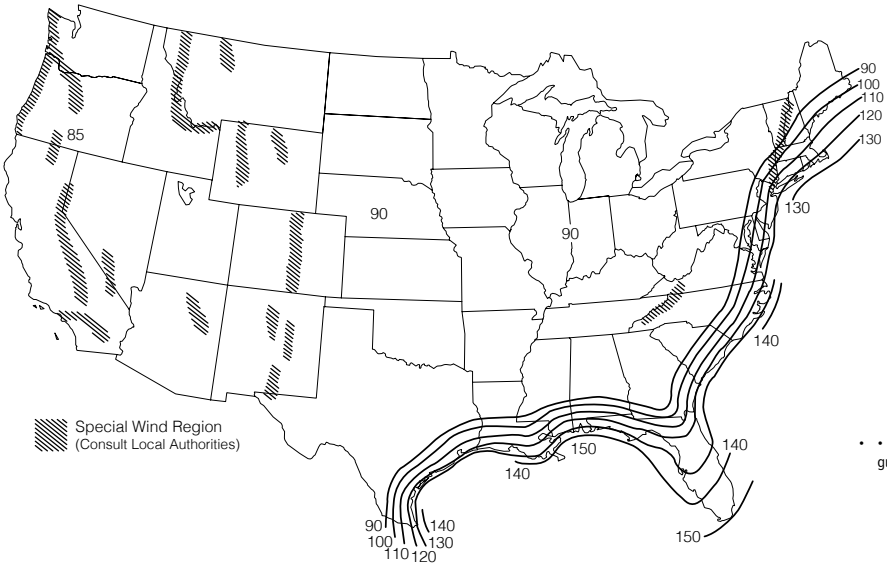
SQUARE STEEL STRAIGHT POLES (SES)

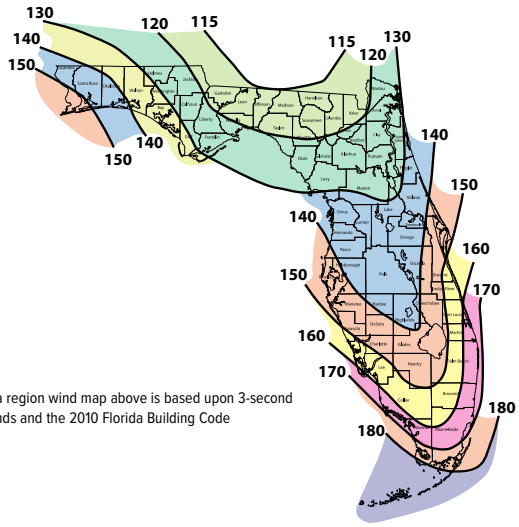
DATE: LOCATION:

TYPE: PROJECT:

CATALOG #:

WIND SPEED





• • Florida region wind map above is based upon 3-second gust winds and the 2010 Florida Building Code

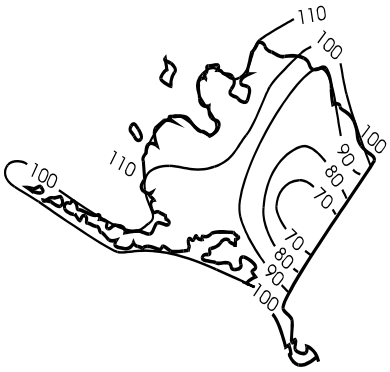
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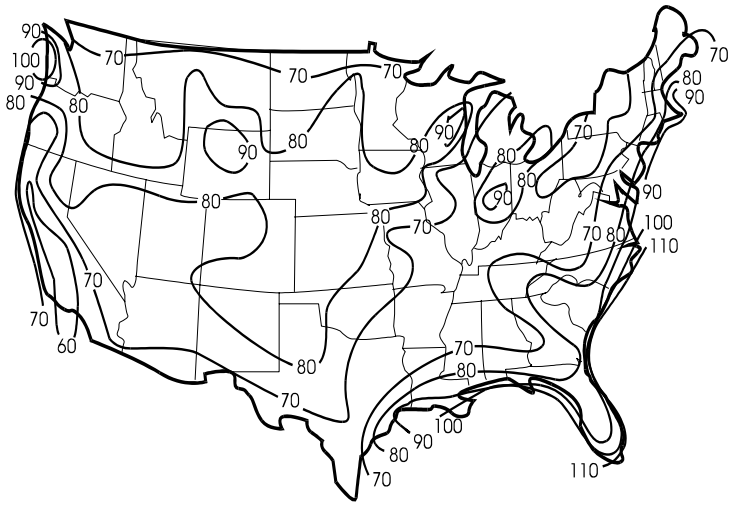
- Allowable EPA, to determine max pole loading weight, multiply allowable EPA by 30 lbs.
- The tables for allowable pole EPA are based on the ASCE 7-05 Wind Map or the Florida Region Wind Map for the 2010 Florida Building Code. The Wind Maps are intended only as a general guide and cannot be used in conjunction with other maps. Always consult local authorities to determine maximum wind velocities, gusting and unique wind conditions for each specific application
- Allowable pole EPA for jobsite wind conditions must be equal to or greater than the total EPA for fixtures, arms, and accessories to be assembled to the pole. Responsibility lies with the specifier for correct pole selection. Installation of poles without luminaires or attachment of any unauthorized accessories to poles is discouraged and shall void the manufacturer's warranty
- Wind speeds and listed EPAs are for ground mounted installations. Poles mounted on structures (such as bridges and buildings) must consider vibration and coefficient of height factors beyond this general guide; Consult local and federal standards
- Wind Induced Vibration brought on by steady, unidirectional winds and other unpredictable aerodynamic forces are not included in wind velocity ratings. Consult Hubbell Lighting's Pole Vibration Application Guide for environmental risk factors and design considerations. http://cdn.hubbelloutdoor.com/content/products/literature/literature_files/Pole_Wind_Induced_Flyer_HLOI0022.pdf
- Extreme Wind Events like, Hurricanes, Typhoons, Cyclones, or Tornadoes may expose poles to flying debris, wind shear or other detrimental effects not included in wind velocity ratings

STEADY/SUSTAINED WIND VELOCITY (Miles Per Hour, for KM/hr - multiply values by 1.61)

- Hawaii has an 80 MPH wind velocity
- Puerto Rico has a 95 MPH wind velocity
- Use caution in determining wind velocities in special wind areas such as mountainous areas, coastal areas and areas surrounding the Great Lakes
- Isotach map is provided for reference only. Consult local authorities to determine the maximum velocities in your area

Note The maximum allowable EPA and weights are listed for each pole; The EPA and weights are listed in this Selection Guide for each luminaire and bracket





For information on AASHTO Standards for Lighting Equipment contact:
American Association of State Highway and Transportation Officials
444 N. Capitol Street, NW, Suite 249
(202) 624-5800
www.aashto.org

AASHTO standards used are found in the following publications:
I-LTS-3 "*Standard Specification For Structural Support For Highway Signs, Luminaires And Traffic Signals*", (1994)
I-LPH "*A Guide for Standardizing Highway Lighting Pole Hardware*", (1980)
I-GL-5 "*An Informational Guide for Roadway Lighting*", (1984)

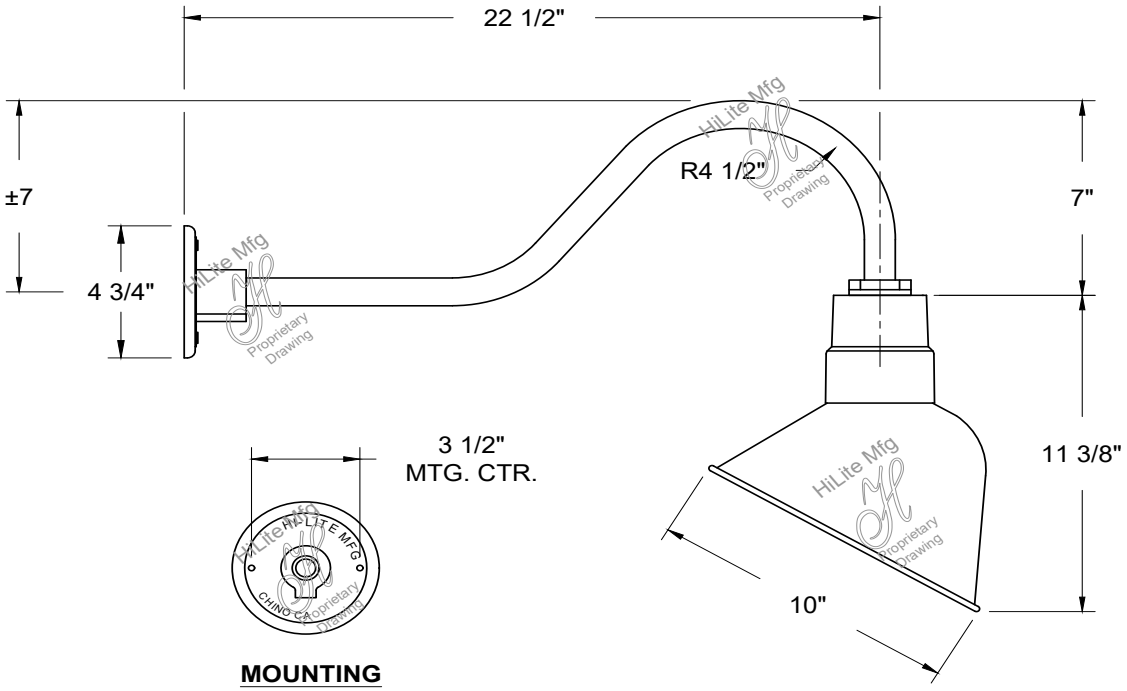
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Job Name : Texas Roadhouse Prototypical Lighting Spec Book
Manufacturer : HI-LITE
Model Number : H-18110-91/HL-A-91/INC
Notes : REQUIRES S28735 LAMP

Type : F16 - GOOSENECK

HI-LITE MFG. CO., INC.
13450 Monte Vista Avenue
Chino, California 91710
Telephone: (909) 465-1999
Toll Free: (800) 465-0211
Fax: (909) 465-0907
www.hilitemfg.com

JOB NAME:		
SCALE: N.T.S.	DATE: 08/11/2023	TYPE:
DRAWN BY: B.A.-W	QTY:	
SHEET:		REV:



MOUNTING PLATE



FULL CUTOFF FIXTURE

INC-Incandescent, CFL-Fluorescent
& MH & HPS-HID are UL Listed
LED is ETL Listed
Suitable for Wet Location

Item Number	Wattage	Voltage
H-18110-91/HL-A-91/INC	200W	120V

Finish
91-Black (Exterior of Fixture & Arm)
93-White (Interior of Fixture)

Mounting
Wall Mount

Lamp/Socket
1-Medium Base INC E26

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Manufacturer : SATCO
Model Number : S28735
Notes : Set CCT to 4000K

Type : BB

SATCO | NUVO

Project Name

Location | Prepared By



SATCO S28735
15WA21/LED/3CCT/120-277V

Notes

General	
Status	Active
Watts	15W
Incandescent Equivalent	125W
Volts	120V-277V
Shape	A21
Base	Medium
ANSI Base	E26
Finish	White
CCT (Kelvin)	2700K/4000K/5000K
Temperature	Warm White to Natural Light
CRI	90+
Lumens	1920L/2025L/1950L
Beam Spread	280
Dimmable	Yes-Dimmable
Hours Rated	50000
Product Category	Type A
Technology	LED
Min Compartment Size	Length: 6 in. Width: 6 in. Height: 8.5 in.
Ballasting Requirements	Ballast Bypass; Direct wire 120-277V line voltage; No ballast or external driver required

Electrical	
Operating Frequency	50/60Hz
Dimming Type	Forward Phase or Reverse Phase or Phase Selectable
Dimming Note	120V only
Power Factor	>0.9
Operating Temperature	-25C (-13F) to +45C (+113F)

Physical	
MOL	5.08
MOD	2.46
Lens Finish	Frosted
Lens Material	Polycarbonate (PC)
Housing Color	White
Weight (lb.)	0.44

Additional Information	
Rated For Enclosed Fixture	Yes
Warranty	5 Year Limited - Hi-Pro

Compliance	
Safety Listing	cULus - Certified; cULus - Listed
Location Rating	Damp
DLC Approved	No
California Status	Lawful for sale in California
Title 20 / 24 Status	Lawful for sale
RoHS Compliant	Yes
FCC Compliant	Yes
SDS Sheet	LED_Lamp

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For More Information Visit:
https://www.satco.com/

Job Name : Texas Roadhouse Prototypical Lighting Spec Book
Manufacturer : ELITE
Model Number : REL637-950L-DIMTR-120-27K/30K/35K/40K/50K-90-P-BK
Notes : Set CCT to 3000K

Type : CC

R6A

REL637

6" Economy LED Retrofit Lighting Module with CCT Selectable



TRIM INSERTS OPTIONS

BAFFLES


REL637-BT-SN-SN


REL637-BT-P-BK


REL637-BT-DBZ-DBZ

REFLECTORS


REL637-RT-CL-WH

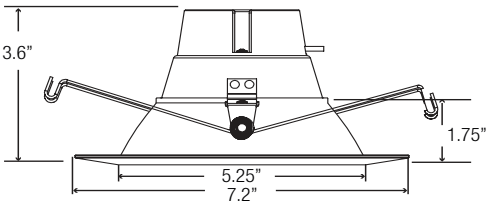

REL637-RT-DBZ-DBZ


REL637-RT-MB-BK


REL637-RT-SN-SN


REL-RT-SHZ-WH


REL637-RT-PW-PW



NOMINAL LUMENS	DELIVERED LUMENS	WATTAGE
950	1081	10W
1200	1211	16W

Based on 4000K, 90+ CRI. Actual wattage may vary +/- 5%



INSTALLATION

Elite LED Retrofits come standard with quick connectors ready for installation in Elite Lighting's LD series recessed housing that are Energy Star and Title 24 rated (LD5IC, LD6IC-AT).

You MUST seal all gaps between the ceiling and fixture with weatherproof silicone sealant. This deters moisture and water from damaging fixtures and other mechanical ceiling elements.

FEATURES

Elite REL Retrofits are ideal for new construction or remodel applications when paired with an Elite recessed housing. Engineered for quick and easy retrofitting into existing incandescent recessed housings. An easy 5-Color SeleCCTor switch allows the contractor to easily switch between 5 different color temperatures in the field. Multiple trim types, trim finishes, and apertures make the REL Retrofits perfect for hotels and restaurants, assisted living facilities, dormitories, and kitchens.

LUMENS	950, 1200
CCT	27K/30K/35K/40K/50K
CRI	90+
COLOR QUALITY	3 Step MacAdam Ellipses
TRIM	Baffle, Aluminum die-cast body and trim
REFLECTOR COLORS	WH (White), BK (Black)
FLANGE COLORS	W (White), P (Black)
DIMMING	DIMTR (Triac)
LIFETIME	50,000 Hours
EMERGENCY	16W high voltage inverter (Installed into the housing)*
PHOTOMETRIC TESTS	In Accordance with IES LM79-08, LM80 and TM-30, TM-21

** Consult Factory*

EASY 5-COLOR SELECCTOR SWITCH

Easy 5-Color SeleCCTor switch can be adjusted to a choice of 5 different Kelvin color temperatures in the field. Options include 27K/30K/35K/40K/50K. The SeleCCTor switch is located on the junction box for easy adjustment before and after installation. The SeleCCTor switch is easily accessible by lowering the luminaire from the opening.

elite LED LIGHTING

REL637 6"

6" Economy LED Retrofit Lighting Module with CCT Selectable

CONSTRUCTION
Die-cast aluminum body for maximum heat dissipation. Baffle and reflector trims are available.

OPTICS
A 55-degree cutoff angle delivers glare-free, even illumination.

COMPATIBLE WITH ELITE 6" HOUSINGS
The Elite REL637 series works in Elite housings (LD5IC, LD6IC-AT) and existing 6" incandescent housings. Elite LED Retrofits are shipped with a medium-based socket adapter to allow installation into housings with an E26 incandescent medium-based socket. Also suitable for use in most 6" and 5" incandescent recessed downlight housings.

QUICK AND EASY INSTALLATION
Quick connectors for use with 5" or 6" housing or Edison base adapter for retrofitting into existing 6" incandescent housings.

Torsion springs pre-installed onto both sides of fixture, installing easily in most 6" incandescent downlights.

Insert torsion springs into can and press trim to ceiling.

APPLICATIONS
Damp and wet-location-rated ideal for indoor and outdoor use, shower, and other wet-location applications. IC-Rated and Air Tight and may be installed in direct contact with insulation.

DRIVER ELECTRICAL INFORMATION
Driver is rated for 50 to 60Hz at 120V input, produces less than 20% THD, has a power factor between 90% and 100%, and is thermally protected for additional safety.

DIMMING & DRIVER INFORMATION
DIMTR - Triac & electronic low voltage (DIMTR-120) flicker-free dimming. Available in 120V. Dimmable down to 5% of initial lumens, standard.

WARRANTY
Five-year warranty for parts and components. (Labor not included)

LISTINGS
Energy Star
cETLus
Title 24
JA8E
RoHS
IECC
New York State

EXAMPLE: **REL637-950L-DIMTR-120-27K/30K/35K/40K/50K-90-W-WH**

TYPE	LUMEN	CCT	CRI	FINISH
REL637	❑ 950L-DIMTR-120 ❑ 1200L-DIMTR-120	❑ 27K/30K/35K/40K/50K	❑ 90+	❑ W-WH-White ❑ P-BK-Black

TRIM RING ACCESSORY: **REL637-BT-SN-SN**

BT - BAFFLE	RT - Reflecto	
❑ REL637-BT-SN-SN ❑ REL637-BT-P-BK ❑ REL637-BT-DBZ-DBZ	❑ REL637-RT-CL-WH ❑ REL637-RT-DBZ-DBZ ❑ REL637-RT-MB-BK ❑ REL637-RT-SN-SN	❑ REL637-RT-SHZ-WH ❑ REL637-RT-PW-PW

Trim accessories order separate

ACCESSORY: **GU24SA**

OPTIONS
 ❑ **GU24SA** - SOCKET FOR LED RETROFIT TO GU24

Accessories order separate

EXAMPLE: **HLD6IC-AT**

COMPATIBLE ELITE LIGHTING HOUSINGS							
 IC RATED				 IC RATED			
❑ LD6IC	❑ LD5IC	❑ LD6-AT		❑ LD6RIC-AT	❑ LD5RIC-AT	❑ LD6R-AT	❑ LD5R-AT
❑ HLD6IC-AT	❑ HLD5IC-AT	❑ HLD6-AT		❑ HLD6RIC-AT		❑ HLD6R-AT	❑ HLD5R-AT
❑ LD600IC-AT	❑ LD500IC-AT	❑ B6-AT		❑ EZ6IC-AT		❑ B6R-AT	❑ B5R-AT
❑ EZ6IC-AT	❑ EZ5IC-AT	❑ LD5-AT		❑ B6RIC-AT			
❑ B6IC-AT	❑ B5IC-AT	❑ HLD5-AT		❑ HLD5RIC-AT			
❑ B6IC-100-AT	❑ B5IC-100-AT	❑ B5-AT		❑ EZ5IC-AT			
❑ B600-IC	❑ B500-IC			❑ B5RIC-AT			

Housing order separate

Due to the changes of constant improvement in LED technology, all details are subject to change without notice. Consult factory for up to date information.

Job Name : Texas Roadhouse Prototypical Lighting Spec Book
Manufacturer : ELITE
Model Number : REL637-950L-DIMTR-120-27K/30K/35K/40K/50K-90-P-BK
Notes : Set CCT to 3000K

Type : F18 - DOWNLIGHT

elite LED LIGHTING

REL637

6" Economy LED Retrofit Lighting Module with CCT Selectable

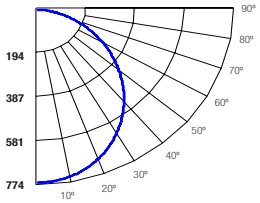
6"

REL637-950L-DIMTR-120-27K/30K/35K/40K/50K-90-W-WH

TEST NO.: **EL03272052**

INPUT WATTS: **10.8** LUMENS: **1081** CRI: **90** EFFICACY: **99** CCT: **4000K** SPACING CRITERIA: **1.08**

Candle Power Distribution (Candelas)



Cone of Light			
2	267	2.5	2.5
4	70.9	4.9	4.9
6	30.9	7.4	7.4
8	17.2	10.0	10.0
10	11.2	12.3	12.4
12	7.72	14.9	14.9
(FT.)Distance to Plane	(FC.) Initial Footcandle at Nadir	(FT.) Beam Vert. Spread	(FT.) Beam Horiz. Spread

BEAM DIA. MEASURED AT 50% OF NADIR F.C.

Zonal Lumens Summary

Zone	Lumens	%Lamp	%Fixt
0-20	269.48	24.9	24.9
0-30	539.77	49.9	49.9
0-40	800.79	74.1	74.1
0-60	1043.08	96.5	96.5
0-80	1080.55	99.9	99.9
0-90	1080.56	99.9	99.9

Luminance (Average candela/M²)

Angle in Degrees	Average 0°	Average 45°	Average 90°
45	95991	97458	104893
55	41035	42175	46365
65	21464	22136	24202
75	4801	7036	10184
85	0	59	0

Lumens Per Zone

Zone	Lumens
0-10	72.29
10-20	197.19
20-30	270.29
30-40	261.02
40-50	169.27
50-60	73.03
60-70	29.88
70-80	7.59
80-90	0.01

Candela Tabulation

	0
0	772.2
5	762.58
15	694.27
25	576.4
35	397.94
45	198.29
55	68.76
65	26.5
75	3.63
85	0
90	0

Coefficients of Utilization - Zonal Cavity Method
Effective Floor Cavity Reflectance 0.20

RC	80%				70%				50%			30%			10%			0%
RW	70%	50%	30%	10%	70%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0%
ROOM CAVITY RATIO 0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100
1	112	109	106	103	110	107	104	102	103	101	99	99	97	96	95	94	93	91
2	105	99	95	90	103	98	93	89	94	91	87	91	88	85	88	86	84	82
3	98	91	85	80	96	89	84	79	87	82	78	84	80	77	82	78	75	74
4	92	83	76	71	90	82	76	71	80	74	70	77	73	69	75	72	68	67
5	86	76	69	64	84	75	69	64	73	68	63	72	67	63	70	66	62	60
6	81	70	63	58	79	69	63	58	68	62	57	66	61	57	65	60	57	55
7	76	65	58	53	75	64	58	53	63	57	52	62	56	52	60	56	52	50
8	72	60	53	48	70	60	53	48	59	52	48	57	52	48	56	51	48	46
9	67	56	49	45	66	56	49	45	55	49	44	54	48	44	53	48	44	42
10	64	52	46	41	63	52	46	41	51	45	41	50	45	41	49	44	41	39

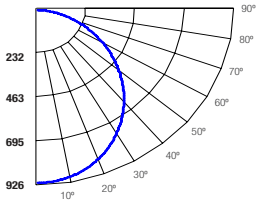
RC - Ceiling Cavity Reflectance *RW - Wall Reflectance*

REL637-1200L-DIMTR-120-27K/30K/35K/40K/50K-90-W-WH

TEST NO.: **EL011960**

INPUT WATTS: **16** LUMENS: **1211** CRI: **90** EFFICACY: **75** CCT: **3500K** SPACING CRITERIA: **1.04**

Candle Power Distribution (Candelas)



Cone of Light			
2	320	2.4	2.4
4	84.9	4.7	4.6
6	37.0	7.1	7.0
8	20.6	9.4	9.4
10	13.4	11.7	11.7
12	9.24	14.1	14.1
(FT.)Distance to Plane	(FC.) Initial Footcandle at Nadir	(FT.) Beam Vert. Spread	(FT.) Beam Horiz. Spread

BEAM DIA. MEASURED AT 50% OF NADIR F.C.

Zonal Lumens Summary

Zone	Lumens	%Lamp	%Fixt
0-20	321.55	26.5	26.5
0-30	639.2	52.8	52.8
0-40	928.79	76.7	76.7
0-60	1174.91	97	97
0-80	1210.3	99.9	99.9
0-90	1210.32	99.9	99.9

Luminance (Average candela/M²)

Angle in Degrees	Average 0°	Average 45°	Average 90°
45	5256	5573	6445
55	2200	2328	2696
65	1183	1251	1428
75	182	240	433
85	5	5	5

Lumens Per Zone

Zone	Lumens
0-10	86.41
10-20	235.14
20-30	317.65
30-40	289.59
40-50	174.33
50-60	71.79
60-70	29.17
70-80	6.22
80-90	0.02

Candela Tabulation

	0
0	924.45
5	910.06
15	822.3
25	667.74
35	420.36
45	186.91
55	63.46
65	25.15
75	2.37
85	0.02
90	0.02

Coefficients of Utilization - Zonal Cavity Method
Effective Floor Cavity Reflectance 0.20

RC	80%				70%				50%			30%			10%			0%
RW	70%	50%	30%	10%	70%	50%	30%	10%	50%	30%	10%	50%	30%	10%	50%	30%	10%	0%
ROOM CAVITY RATIO 0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100
1	112	109	106	104	110	107	104	102	103	101	99	99	98	96	96	94	93	91
2	106	100	95	91	103	98	94	90	95	91	88	92	89	86	89	87	84	83
3	99	91	86	81	97	90	85	80	87	83	79	85	81	78	82	79	76	75
4	93	84	78	73	91	83	77	72	81	75	71	78	74	70	76	73	69	68
5	87	77	71	66	85	76	70	65	74	69	65	73	68	64	71	67	63	62
6	82	71	65	60	80	71	64	59	69	63	59	68	62	58	66	62	58	56
7	77	66	59	54	76	66	59	54	64	58	54	63	58	54	62	57	53	52
8	73	62	55	50	71	61	54	50	60	54	50	59	53	49	58	53	49	48
9	69	57	51	46	67	57	50	46	56	50	46	55	50	46	54	49	46	44
10	65	54	47	43	64	53	47	43	52	47	43	52	46	42	51	46	42	41

RC - Ceiling Cavity Reflectance *RW - Wall Reflectance*

LD6IC-AT

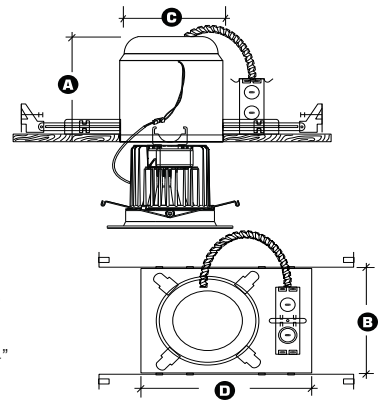
6" New Construction IC Housing for use with Triac and 0-10V Dimmable RL600 series LED Module lighting components



SAME DAY SHIPPING AVAILABLE

IC RATED

TO BE USED WITH LED MODULE LIGHTING COMPONENT ONLY



- **A** Height = 7-1/4"
- **B** Width = 7"
- **C** Cut-out = 6-3/4"
- **D** Length = 10"

DESCRIPTION - 6" IC housing for use with RL600 LED series LED Module trims. Designed for new construction installations and suitable for use in insulation covered or non-insulation covered ceilings. The LD6IC-AT housing is engineered with a unique 'EZ-connect' wiring system, that when used with the RL600 trim, with California Title-24. The unique EZ-connect system also meets other state and national regulatory mandates. LED Module connects effortlessly to housing, virtually eliminating mis-wiring and potential shock hazards.

NOTE** - **Complete system includes LD6IC-AT housing and LED Modules RL600 series trim. RL600 LED Modules trim must be ordered separately.

HOUSING - Die-formed aluminum and galvanized steel for maximum heat dissipation and rust protection. Housing adjusts vertically in plaster frame to accommodate 1/2" to 1-3/8" thick ceiling. Housing is IC rated for direct contact with insulation and can be used in IC and NON-IC applications. May be installed in 2" x 8" joist construction.

CONNECTION - Polarity-specific EZ-connect system engineered to match with Elite LED Module trims. Meets strict code requirements where Edison Base Sockets have been banned.

BAR HANGERS - Preinstalled bar hangers allow housing to be positioned and locked at any point within a 24" joist span. They can be positioned on either the long or short axis of the housing and can be shortened for 12" joists. They contain a double-headed real nail for secure attachment into the joist. Bar hanger nails are installed on a 20º downward angle for better contact, and the 90º pivoting mounting plate makes installation fast and accurate. Bar hangers can fit onto T-Bar spline with additional slots and holes for special mounting methods if necessary.

JUNCTION BOX - UL Listed for through-branch circuit wiring, provided with four ½" knockouts, one ¾" knockout and four Romex knockouts with true pry-out slots and strain clamps. Designed for straight through conduit runs.

THERMAL PROTECTION - Standard thermal protection device guards against improper installation and misuse of insulation material.

ELITE LED MODULE SOLD SEPARATELY - LD6IC-AT unique 'EZ-connect' wiring system is Title 24 compliant when used with the RL600 series module. RL600 series modules are rated to last up to 50,000hrs as tested in accordance with LM-80 standards. Driver and LED Engine are found on the module itself. The Elite **LED Module** system is fully dimmable down to 10% of initial light output with a 0-10 Volt dimmer when ordered with the following options (DIM10-MVOLT). Triac dimming driver also available when ordered with the following options (DIMTR-120). Consult Factory for details.

LISTING
c-UL-us - listed for Damp location
c-UL-us - listed for feed Through Wiring
c-UL-us - listed for Direct Contact with Insulation
LM79/LM80
Covered by U.S. Patent Number: 7717390B1

DIMMING INFORMATION
DIMTR (Triac Dimming)
DIM10 (Low Voltage 0-10 Volt Dimming)

c UL us LISTED

PROUDLY ASSEMBLED in AMERICA

Example: **LD6IC-AT-DIMTR-120**

HOUSING TYPE	
❑ **LD6IC-AT-DIMTR-120 -** Used For Triac Dimming Module	
❑ **LD6IC-AT-DIM10-MVOLT -** 0-10V dimming	
TRIM TYPE	**750L/900L SERIES**
❑ **RL630** (Baffle)	❑ 750L-DIMTR-120 ❑ 750L- DIM10-120-277 ❑ 900L-DIMTR-120 ❑ 900L- DIM10-120-277 ❑ 1200L-DIMTR-120 ❑ 1200L-- DIM10-120-277
❑ **RL611** (Baffle Wall Wash)	
❑ **RL607** (Reflector)	
❑ **RL622** (Reflector Wall Wash)	
TRIM TYPE	**1000L SERIES**
❑ **RL670**	❑ 1000L-DIMTR-120
TRIM TYPE	**SERIES**
❑ **RL631**	❑ 950/1200L-DIMTR-120

❑ **EMG -** Emegency

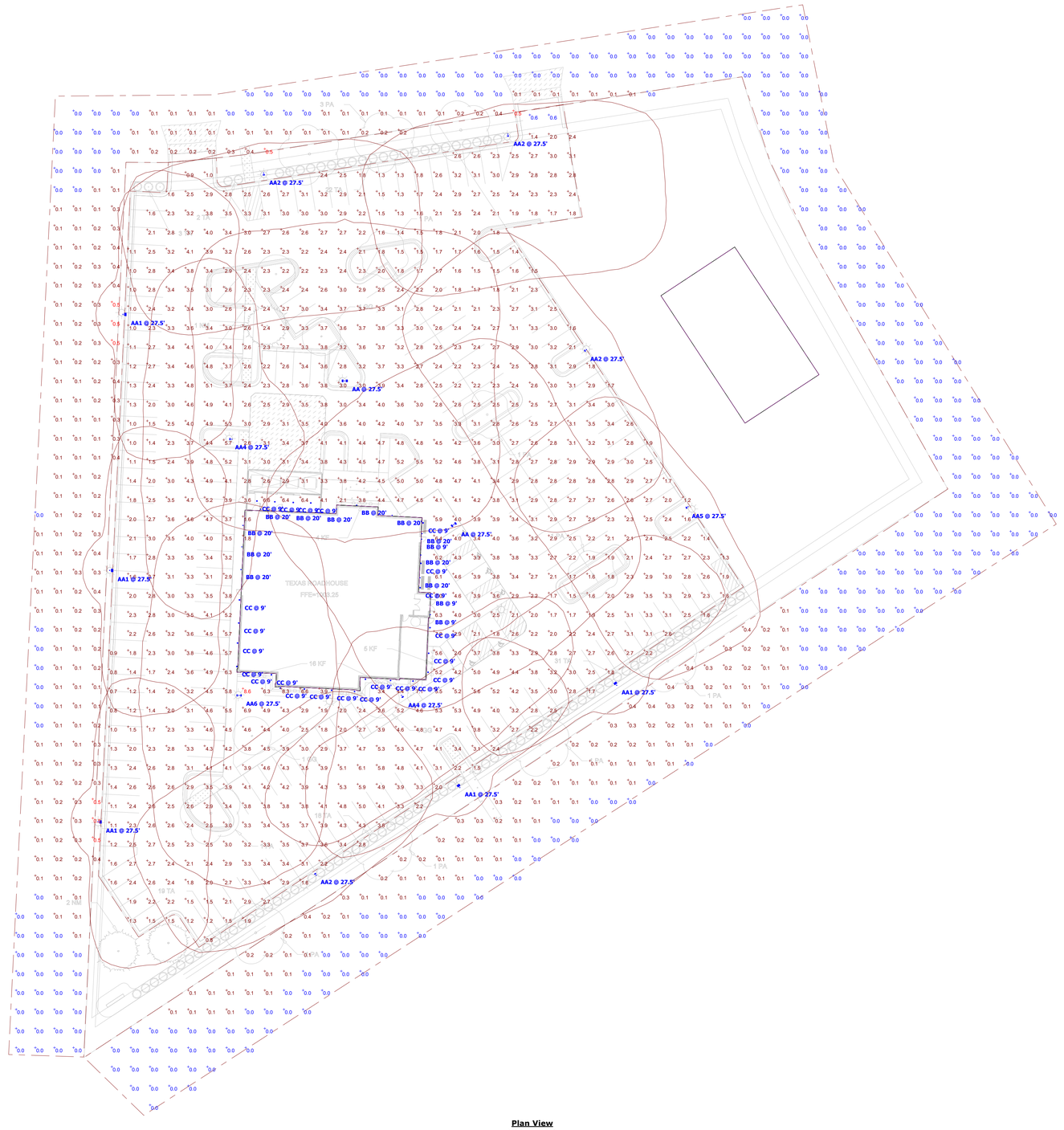
TRIM TYPE	**650L/900L SERIES**
❑ **RL660** (Baffle)	❑ 650L-DIMTR-120 ❑ 900L-DIMTR-120
❑ **RL661** (Reflector)	
TRIM TYPE	**750L SERIES**
❑ **RL625** (Baffle)	❑ 750L-DIMTR-120
❑ **RL663** (Adj. Baffle)	
TRIM TYPE	**950L SERIES**
❑ **RL628**	❑ 950L-DIMTR-120

Example: **LD6IC-AT-DIM10-MVOLT**

HOUSING TYPE	
❑ **LD6IC-AT-DIM10-120** Used For 0-10V Dimming Module. 120V input	
❑ **LD6IC-AT-DIM10-277** Used For 0-10V Dimming Module. 277V input	
TRIM TYPE	**900L SERIES**
❑ **RL630** (Baffle)	❑ 900L-DIM10-MVOLT
❑ **RL611** (Baffle Wall Wash)	
❑ **RL607** (Reflector)	
❑ **RL622** (Reflector Wall Wash)	

Schedule

Symbol	Label	QTY	Catalog Number	Description	Number Lamps	Lumens per Lamp	LLF	Wattage
	AA	2	VP-1-160L-160-4K7-4W	Viper w/ Type IV-W Polished 80L Lenses	1	19407	1	316
	AA1	5	VP-1-160L-160-4K7-4-BC	20 x 17 x 3.5 Dark Grey - RATIO Area w/ Acrylic Type 4 Refractor w/ Backlight Control Shields	1	10842	1	158
	AA2	4	VP-1-160L-160-4K7-4W-HSS-90-B	Size 1 Viper; Type IV-W with 90° Back-Shield (SHD-1-HSS-90B-DBT)	1	17831	1	158
	AA4	2	VP-1-160L-135-4K7-2	Viper Roadway w/ Polished 80L Type II Lens	1	17108	1	135
	AA5	1	VP-1-160L-115-4K7-4W-HSS-90-B	Size 1 Viper; Type IV-W with 90° Back-Shield (SHD-1-HSS-90B-DBT)	1	13294	1	110
	AA6	1	VP-1-160L-135-4K7-2	Viper Roadway w/ Polished 80L Type II Lens	1	17108	1	270
	BB	14	H-18110-91/HL-A-91/INC	S28735	1	2046	1	14.63
	CC	23	REL637-950L-DIMTR-120-27K-30K-35K-40K-50K-90-W-WH		1	1178	0.6	10.7

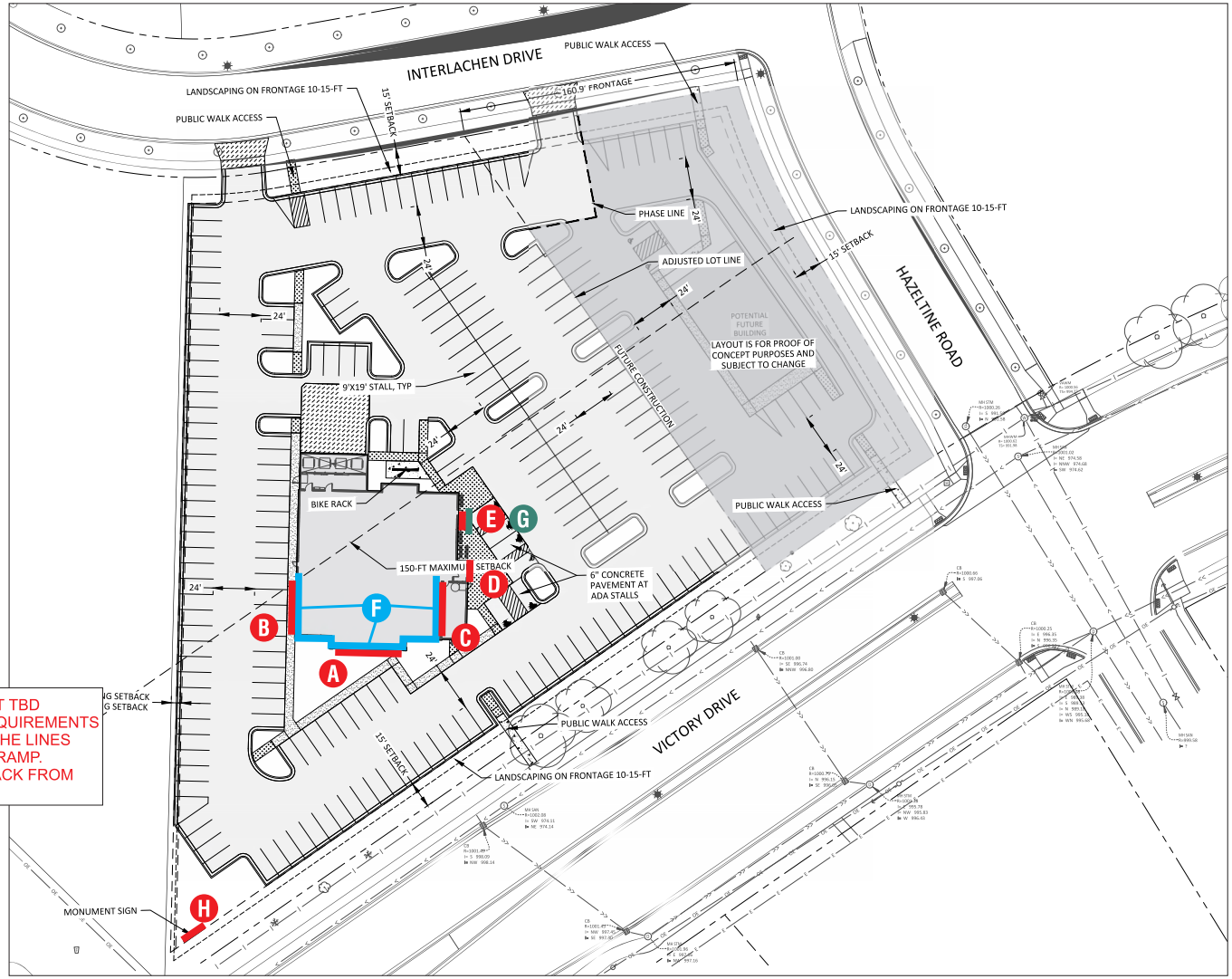


Plan View
Scale - 1" = 30ft

CITY VIEW ELECTRIC inc.

Texas Roadhouse
Mankato

Designer
Amber Forester
Date
09/28/2026
Scale
Not to Scale
Drawing No.
L0
Summary
Lighting Calculation



SIGN PLACEMENT TBD PER SETBACK REQUIREMENTS FROM EXISTING OHE LINES ALONG US-14 ON RAMP. MINIMUM 5' SETBACK FROM PROPERTY LINES.

SIGN TYPE A 3'0" Channel Letterset w/ 7' logo

SIGN TYPE B 2'8" Channel Letterset w/ 6' logo

SIGN TYPE C 2'8" Channel Letterset w/ 6' logo

SIGN TYPE D 3'3" x 5'7" LED Wall Sign

SIGN TYPE E 2'1" x 3'10" LED TO-GO Wall Sign

LED F Shielded White LED Border Lighting

AWNING G (1) 7'0" x 5'0" x 1'8" Fabric Awnings

SIGN TYPE H 10'6" x 18'0" x 30' OAH D/F LED Pylon Sign w/ 4'0" x 8'0" Future Tenant Panels.
See notes regarding height on Page 10 and options for larger sizes of cabinets Pages 11 & 12.

SIGN PLACEMENT

FEDERAL HEATH SIGN COMPANY
www.federalheath.com
1845 Precinct Line Road, Suite 100, Hurst, Texas 76054
T: 817.685.9075 F: 817.685.9103

Revisions:
R1-GW-10/14/26-Added options for larger pylon sign and tenant panel
R2-JK-10/14/26-Re-Insert Original Elevations w/o Flags.

Colors Depicted In This Rendering May Not Match Actual Finished Materials. Refer To Product Samples For Exact Color Match.

Client Approval/Date:

Landlord Approval/Date:

Account Rep: KELLY SINGLETON
Project Manager: M. KIRBY
Drawn By: K. SINGLETON

Underwriters Laboratories Inc. ELECTRICAL TO USE U.L. LISTED COMPONENTS AND SHALL MEET ALL N.E.C. STANDARDS

ALL ELECTRICAL SIGNS ARE TO COMPLY WITH U.L. 48 AND ARTICLE 600 OF THE N.E.C. STANDARDS, INCLUDING THE PROPER GROUNDING AND BONDING OF ALL SIGNS.

Project / Location:
TEXAS ROADHOUSE
Store #1039
North Victory Drive
Mankato, MN

Job Number: 66-10036-55
Date: July 28, 2026
Sheet Number: 1 Of 13
Design Number: 66-10036-55-R2

This original drawing is provided as part of a planned project and is not to be exhibited, copied or reproduced without the written permission of Federal Heath Sign Company, LLC or its authorized agent. ©FHSC

F1 WHITE LED BORDER ACCENT LIGHTING.
(SHOWN AS WHITE LINE)
APPROXIMATELY 160' ON THIS ELEVATION

NOTE: ALL LED BORDER ACCENT LIGHTING TO HAVE A LIGHT SHIELD ATTACHED, SO THEY ARE NOT VISIBLE DIRECTLY TO THE PUBLIC. (BOTTOM ROW OF LIGHT SHIELD TO HAVE WEEP HOLES AT 6' O.C.)

.063" ALUMINUM LIGHT SHIELD
(DARK GREEN ON OUTSIDE AND WHITE INSIDE)



FRONT ELEVATION

SCALE : 3/32" = 1'-0"

F2 WHITE LED BORDER ACCENT LIGHTING.
(SHOWN AS WHITE LINE)
APPROXIMATELY 160' ON THIS ELEVATION

NOTE: ALL LED BORDER ACCENT LIGHTING TO HAVE A LIGHT SHIELD ATTACHED, SO THEY ARE NOT VISIBLE DIRECTLY TO THE PUBLIC. (BOTTOM ROW OF LIGHT SHIELD TO HAVE WEEP HOLES AT 6' O.C.)

.063" ALUMINUM LIGHT SHIELD
(DARK GREEN ON OUTSIDE AND WHITE INSIDE)



RIGHT ELEVATION

SCALE : 3/32" = 1'-0"

FEDERAL HEATH SIGN COMPANY
www.federalheath.com
1845 Precinct Line Road, Suite 100, Hurst, Texas 76054
T: 817.685.9075 F: 817.685.9103

Revisions:
R1-CW-10/14/26-Added options for larger pylon sign and tenant panel
R2-JK-10/14/26-Re-Insert Original Elevations w/o Flags.

Colors Depicted In This Rendering May Not Match Actual Finished Materials. Refer To Product Samples For Exact Color Match.

Client Approval/Date:

Landlord Approval/Date:

Account Rep: KELLY SINGLETON
Project Manager: M. KIRBY
Drawn By: K. SINGLETON

Underwriters Laboratories Inc. ELECTRICAL TO USE U.L. LISTED COMPONENTS AND SHALL MEET ALL N.E.C. STANDARDS

ALL ELECTRICAL SIGNS ARE TO COMPLY WITH U.L. 48 AND ARTICLE 600 OF THE N.E.C. STANDARDS, INCLUDING THE PROPER GROUNDING AND BONDING OF ALL SIGNS.

Project / Location:
TEXAS ROADHOUSE
Store #1039
North Victory Drive
Mankato, MN

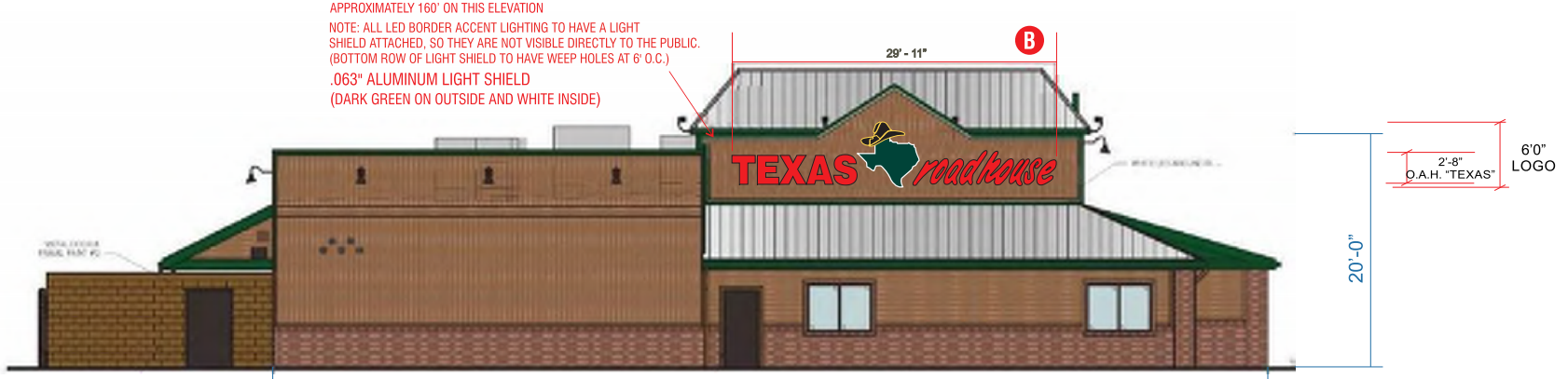
Job Number: 66-10036-55
Date: July 28, 2026
Sheet Number: 2 Of 13
Design Number: 66-10036-55-R2

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F 3 WHITE LED BORDER ACCENT LIGHTING.
(SHOWN AS WHITE LINE)
APPROXIMATELY 160' ON THIS ELEVATION

NOTE: ALL LED BORDER ACCENT LIGHTING TO HAVE A LIGHT SHIELD ATTACHED, SO THEY ARE NOT VISIBLE DIRECTLY TO THE PUBLIC. (BOTTOM ROW OF LIGHT SHIELD TO HAVE WEEP HOLES AT 6' O.C.)

.063" ALUMINUM LIGHT SHIELD
(DARK GREEN ON OUTSIDE AND WHITE INSIDE)



LEFT ELEVATION

SCALE : 3/32" = 1'-0"



REAR ELEVATION

SCALE : 3/32" = 1'-0"

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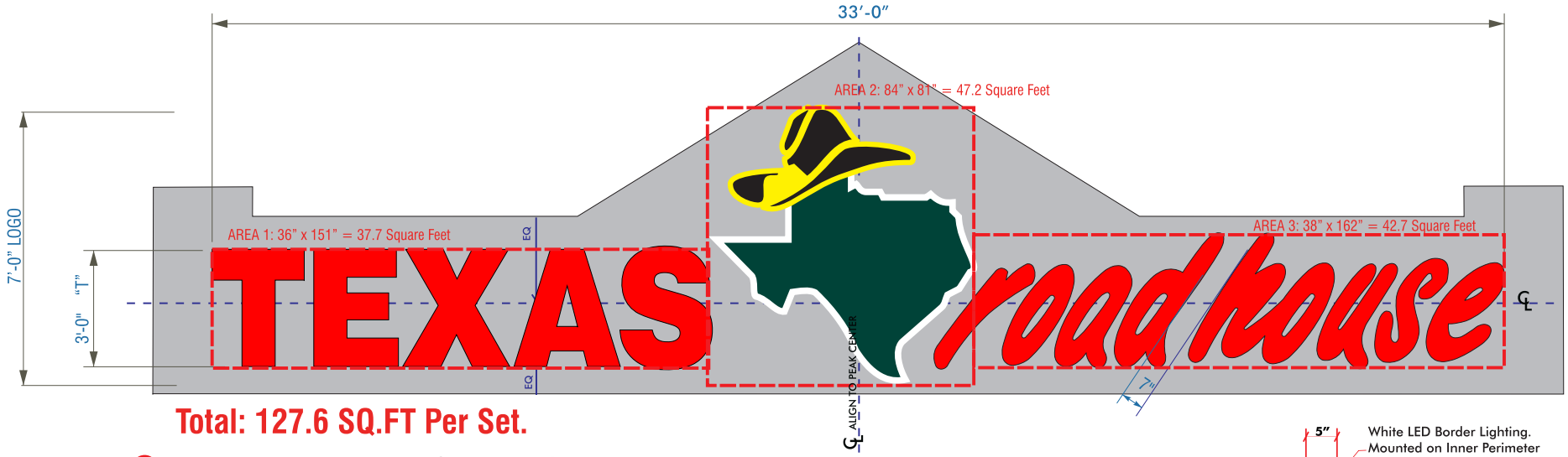
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Project / Location:
TEXAS ROADHOUSE
Store #1039
North Victory Drive
Mankato, MN

Job Number: 66-10036-55
Date: July 28, 2026
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Total: 127.6 SQ.FT Per Set.

SIGN TYPE **A** **Individual Plex Faced LED Illuminated Channel Letters | One (1) Set Required**

Scale: 3/8" = 1'-0"

Scope of Work:
Manufacture and install Plex Faced, LED Illuminated channel letters having remote power supplies located in accessible area behind wall.

INSTALLER IS RESPONSIBLE FOR:

PROVIDING AND INSTALLING ALL COMPONENTS REQUIRED TO RUN SECONDARY WIRING (CONNECTORS, GTO CONDUIT, ETC.) TO BE DETERMINED BY LOCAL CODE AND SITE CONDITIONS.

PROVIDING ALL NEEDED INSTALLATION HARDWARE AS DETERMINED BY LOCAL CODE AND SITE CONDITIONS.

ELECTRICAL REQUIREMENTS

Total: 6 Amps per set

(1) 120V 20A Circuit Required.

ALL BRANCH CIRCUITS SHALL BE DEDICATED TO SIGNS (INCLUDING GROUND AND NEUTRAL) AND SHALL NOT BE SHARED WITH OTHER LOADS.

MATERIAL FINISH COLORS

Letter Returns	Letter Face	Letter Trim Cap	Logo: Face	Logo: "State" Return. & Retainer.	Logo: "State"	Logo: "Hat" Return & Retainer	Logo: "Hat"	Logo: "Hat"
Pre-painted Hunter Red Coil	#2283 Red Acrylic	Red	#7328 White Acrylic "Hat & State"	AKZO Gloss White	3M 3630-76 Vinyl Applied to White Acrylic Face Leaving White Outline.	Match PMS-122	3M 3630-15 Yellow Vinyl Applied to White Acrylic.	3M 3630-22 Black Vinyl Applied to Yellow Vinyl Leaving "Hat" Detail.

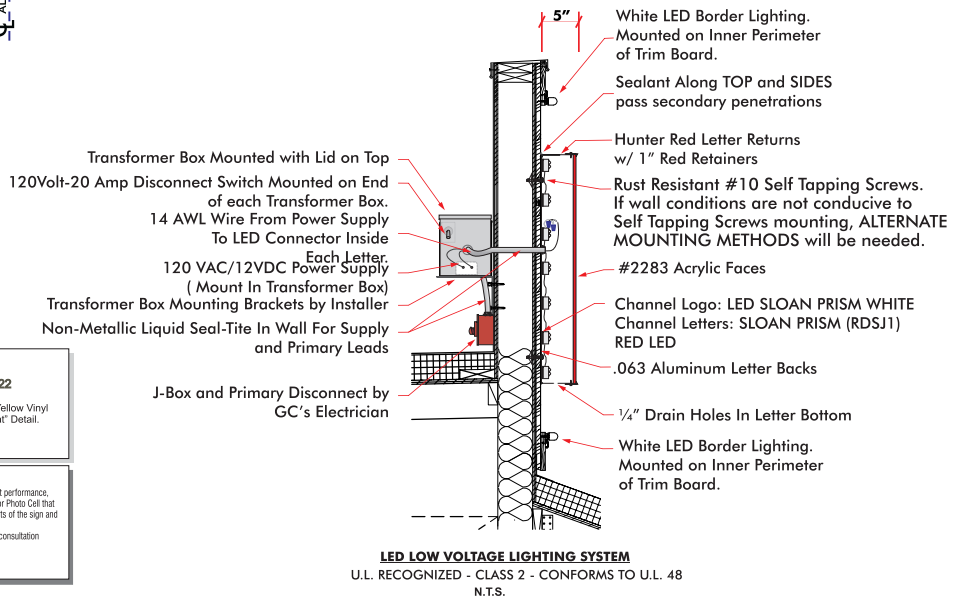
CUSTOMER TO PROVIDE:

ALL BRANCH (PRIMARY ELECTRICAL SERVICE) CIRCUITS & FINAL CONNECTION TO EACH SIGN (WITHIN 5 FT.) TO BE BY CERTIFIED ELECTRICIAN:

A. All branch circuits for signs must be totally dedicated to signs (including dedicated ground and dedicated neutral per circuit).
B. Sign circuits must not be shared with other loads such as lighting, air conditioning, and other equipment.
C. Properly sized ground wire that can be traced back to the breaker panel must be provided.
D. Number and size of circuits for each sign to meet Federal Heath Sign's requirement.

Any deviation from the above recommendations may result in:
1. Damage to or improper operation of the sign(s).
2. Delays and additional costs.

Notes:
- Certain electrical components of signs will fail prematurely if signs are not shut-off for a period of time, once, each day. For best performance, we recommend signs to be connected to an automatic controlling device such as an Energy Management System, Time Clock or Photo Cell that will automatically shut-off the sign for a period of time, each day. Failure to do so will cause damage to the electrical components of the sign and will void the warranty.
- Some dimming devices will also adversely affect sign electrical components, causing failure. Any dimming of the sign without consultation with Federal Heath Sign Co. will void the warranty.



LED LOW VOLTAGE LIGHTING SYSTEM
U.L. RECOGNIZED - CLASS 2 - CONFORMS TO U.L. 48
N.T.S.

FEDERAL HEATH SIGN COMPANY
www.federalheath.com
1845 Precinct Line Road, Suite 100, Hurst, Texas 76054
T: 817.685.9075 F: 817.685.9103

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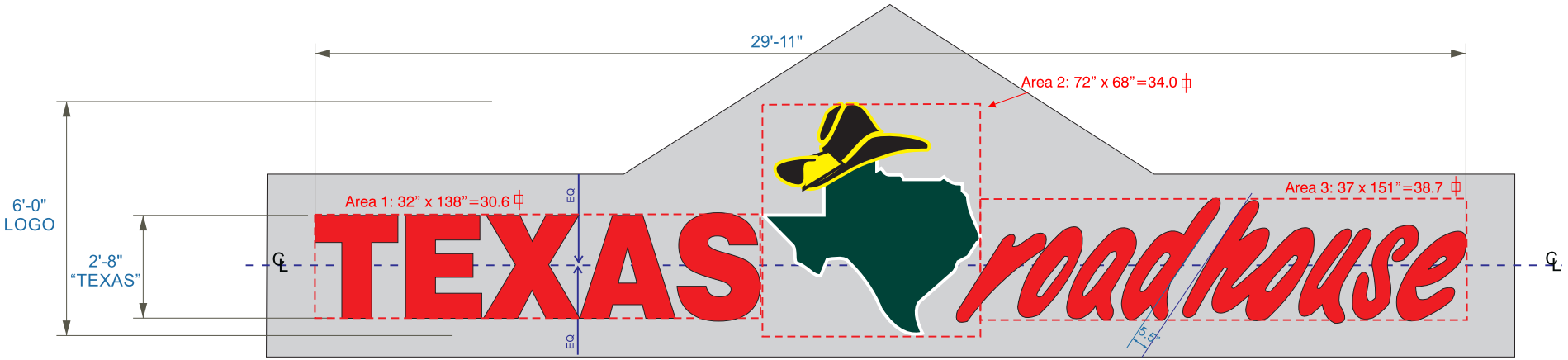
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Project / Location:
TEXAS ROADHOUSE
Store #1039
North Victory Drive
Mankato, MN

Job Number: 66-10036-55
Date: July 28, 2026
Sheet Number: 4 Of 13
Design Number: 66-10036-55-R2

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Total: 103.3 SQ.FT. Per Set.

SIGN TYPES B & C

Individual Plex Faced LED Illuminated Channel Letters- Two (2) Sets Req'd.

SCALE : 3/8" = 1'-0"

SCOPE OF WORK:

Manufacture and install Plex Faced, LED Illuminated channel letters having remote power supplies located in accessible area behind wall.

INSTALLER IS RESPONSIBLE FOR:

PROVIDING AND INSTALLING ALL COMPONENTS REQUIRED TO RUN SECONDARY WIRING (CONNECTORS, GTO CONDUIT, ETC.) TO BE DETERMINED BY LOCAL CODE AND SITE CONDITIONS.

PROVIDING ALL NEEDED INSTALLATION HARDWARE AS DETERMINED BY LOCAL CODE AND SITE CONDITIONS.

ELECTRICAL REQUIREMENTS

Total: 6 Amps per set

(1) 120V 20A Circuit Required.

ALL BRANCH CIRCUITS SHALL BE DEDICATED TO SIGNS (INCLUDING GROUND AND NEUTRAL) AND SHALL NOT BE SHARED WITH OTHER LOADS.

MATERIAL FINISH COLORS

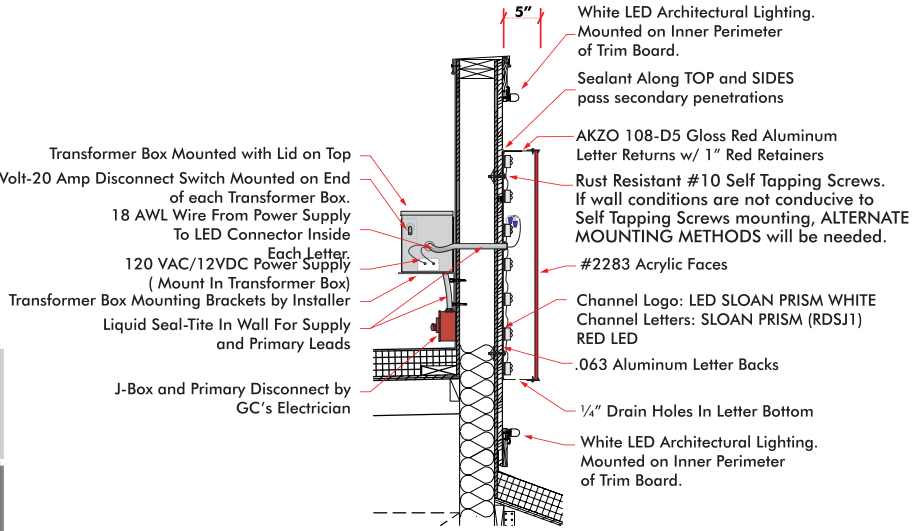
Letter Returns	Letter Face	Letter Trim Cap	Logo: Face	Logo: "State" Return. & Retainer.	Logo: "State"	Logo: "Hat" Return & Retainer	Logo: "Hat"	Logo: "Hat"
AKZO 108-D5 Gloss Red	#2283 Red Acrylic	Red	#7328 White Acrylic "Hat & State"	AKZO Gloss White	2500-76 Holly Green Vinyl Applied to White Acrylic Face Leaving White Outline.	Match PMS-122	2500-15 Yellow Vinyl Applied to White Acrylic.	2500-22 Black Vinyl Applied to Yellow Vinyl Leaving "Hat" Detail.

CUSTOMER TO PROVIDE:

ALL BRANCH (PRIMARY ELECTRICAL SERVICE) CIRCUITS & FINAL CONNECTION TO EACH SIGN (WITHIN 5 FT.) TO BE BY CERTIFIED ELECTRICIAN:
- A. All branch circuits for signs must be totally dedicated to signs (including dedicated ground and dedicated neutral per circuit).
- B. Sign circuits must not be shared with other loads such as lighting, air conditioning, and other equipment.
- C. Properly sized ground wire that can be traced back to the breaker panel must be provided.
- D. Number and size of circuits for each sign to meet Federal Heath Sign's requirement.

Any deviation from the above recommendations may result in:
1. Damage to or improper operation of the sign(s).
2. Delays and additional costs.

Notes:
- Certain electrical components of signs will fail prematurely if signs are not shut-off for a period of time, once, each day. For best performance, we recommend signs to be connected to an automatic controlling device such as an Energy Management System, Time Clock or Photo Cell that will automatically shut-off the sign for a period of time, each day. Failure to do so will cause damage to the electrical components of the sign and will void the warranty.
- Some dimming devices will also adversely affect sign electrical components, causing failure. Any dimming of the sign without consultation with Federal Heath Sign Co. will void the warranty.



LED LOW VOLTAGE LIGHTING SYSTEM

U.L. RECOGNIZED - CLASS 2 - CONFORMS TO U.L. 48

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Project Manager: M. KIRBY
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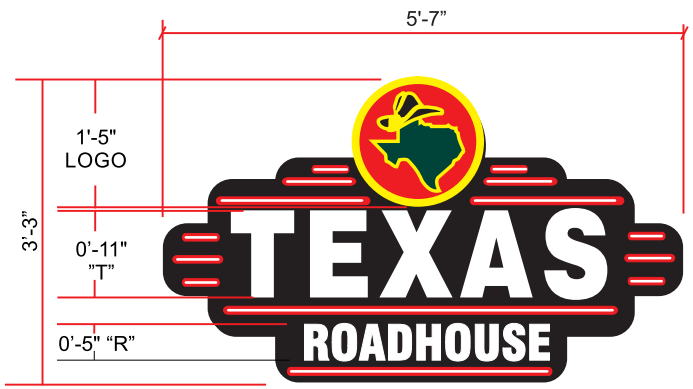
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Project / Location:
TEXAS ROADHOUSE
Store #1039
North Victory Drive
Mankato, MN

Job Number: 66-10036-55
Date: July 28, 2026
Sheet Number: 5 Of 13
Design Number: 66-10036-55-R2

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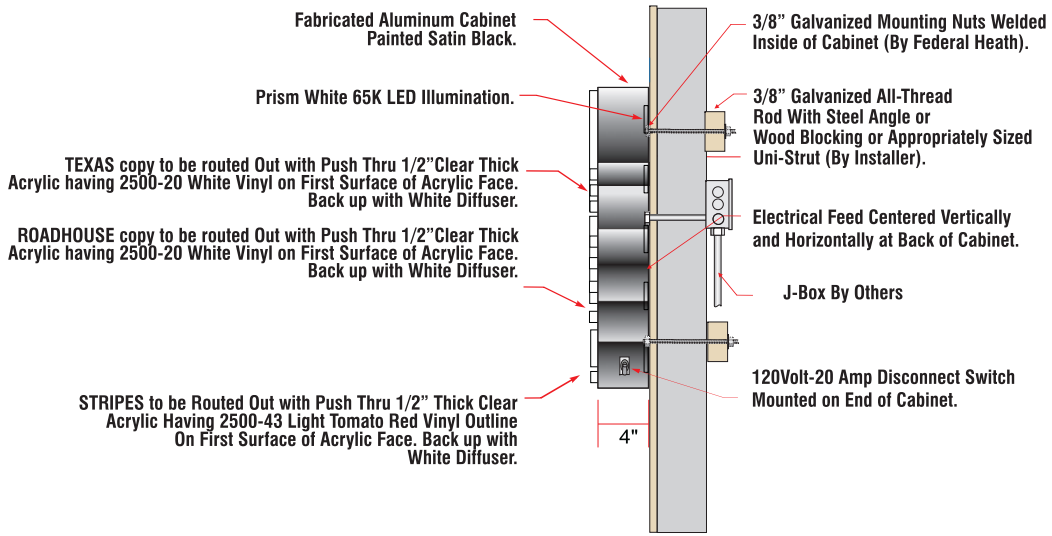
SIGN TYPE D

Single Face Illuminated Wall Sign One (1) Req'd

SCOPE OF WORK:
Manufacture and install S/F Internally illuminated wall sign.

Scale: 3/4"= 1'-0"

18.1 SQ.FT.



Typical Cabinet End View

MATERIAL FINISH COLORS

AKZO Satin Black — **Cabinet and Face Bkgd**	#7328 White Acrylic — **Copy, Logo and Stripes Bkgd**	2500-43 Light Tomato Red Vinyl — **Logo Circle and Stripe Bkgd.**
2500-76 Holly Green Vinyl — **Logo: "State"**	2500-15 Yellow Vinyl — **Logo: Circle, Hat and State Border.**	2500-22 Black Vinyl elements Applied to Yellow Bkgd. — **Logo: "Hat"**

CUSTOMER TO PROVIDE:

(For New / Remodel Construction) ADEQUATE BEHIND THE WALL BACKING AND ACCESS AS REQUIRED TO INSTALL SIGNAGE. CUSTOMER TO FORWARD COPY OF FINAL APPROVED SIGNAGE DRAWINGS TO BUILDING SITE CONTACT SO THAT THESE PROVISIONS CAN BE MADE DURING CONSTRUCTION AND PRIOR TO SIGN INSTALLATION.

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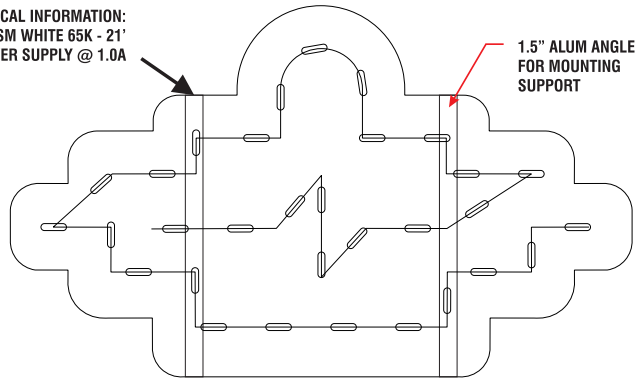
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ELECTRICAL INFORMATION
(31) SLOAN PRISM WHITE 65K - 21'
(1) 60w POWER SUPPLY @ 1.0A
TOTAL AMP LOAD = 1.0
(1) 120v / 20A CIRCUIT REQUIRED

ELECTRICAL INFORMATION:
(31) SLOAN PRISM WHITE 65K - 21'
(1) 60w POWER SUPPLY @ 1.0A

1.5" ALUM ANGLE FOR MOUNTING SUPPORT



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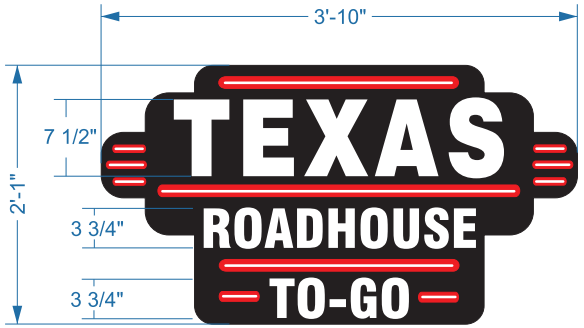
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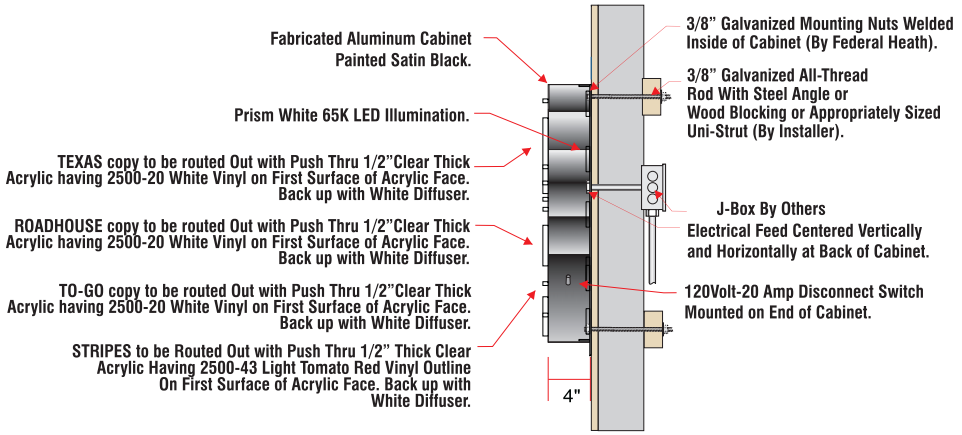
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Project / Location:
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Typical Cabinet End View

SIGN TYPE **E**

Single Face Illuminated Wall Sign One (1) Req'd | 7.98 SQ.FT.

SCOPE OF WORK: Scale: 1"= 1'-0"

Manufacture and install S/F Internally illuminated wall sign.

CUSTOMER TO PROVIDE:

(For New / Remodel Construction) ADEQUATE BEHIND THE WALL BACKING AND ACCESS AS REQUIRED TO INSTALL SIGNAGE. CUSTOMER TO FORWARD COPY OF FINAL APPROVED SIGNAGE DRAWINGS TO BUILDING SITE CONTACT SO THAT THESE PROVISIONS CAN BE MADE DURING CONSTRUCTION AND PRIOR TO SIGN INSTALLATION.

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INSTALLER IS RESPONSIBLE FOR:

PROVIDING AND INSTALLING ALL COMPONENTS REQUIRED TO RUN SECONDARY WIRING (CONNECTORS, GTO CONDUIT, ETC.) TO BE DETERMINED BY LOCAL CODE AND SITE CONDITIONS.

PROVIDING ALL NEEDED INSTALLATION HARDWARE AS DETERMINED BY LOCAL CODE AND SITE CONDITIONS.

SEALING BUILDING PENETRATIONS WITH SILICONE TO PREVENT MOISTURE PENETRATION @ EXTERIOR LOCATIONS..

ELECTRICAL REQUIREMENTS	
Total: 1.2 Amps	ALL BRANCH CIRCUITS SHALL BE DEDICATED TO SIGNS (INCLUDING GROUND AND NEUTRAL) AND SHALL
(1) 120V 20A Circuit Required.	

MATERIAL FINISH COLORS

- AKZO Satin Black — **Cabinet and Face Bkgd**
- #7328 White Acrylic — **Copy, Logo and Stripes Bkgd**
- 2150-43 Light Tomato Red Vinyl — **Stripe Bkgd.**

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Project / Location:

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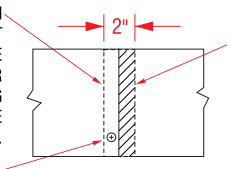




SHIELDING APPLICATION PHOTOS

FH TO PROVIDE FORTY (44) .040" ALUMINUM SEAM TABS FOR INSIDE OF LIGHT SHIELDS FOR ALIGNMENT OF SEAMS & TO ELIMINATE LIGHT LEAKS. FH TO PROVIDE TABS WITH VHB TAPE ON ONE SIDE OF SEAMS ONLY. INSTALLER WILL ATTACH TAB TO OTHER SIDE OF SEAM WITH SELF-TAPPING SCREWS PAINTED TO MATCH LIGHT SHIELD. FH TO PROVIDE PRE PAINTED SCREWS.

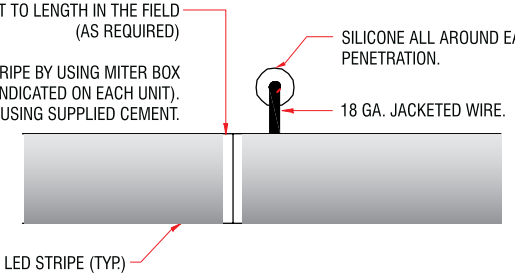
INSTALLER TO ATTACH ALUMINUM SEAM TAB FOR SHIELD ALIGNMENT TO INSIDE OF SHIELD WITH FH PROVIDED PRE-PAINTED, SELF-TAPPING SCREWS



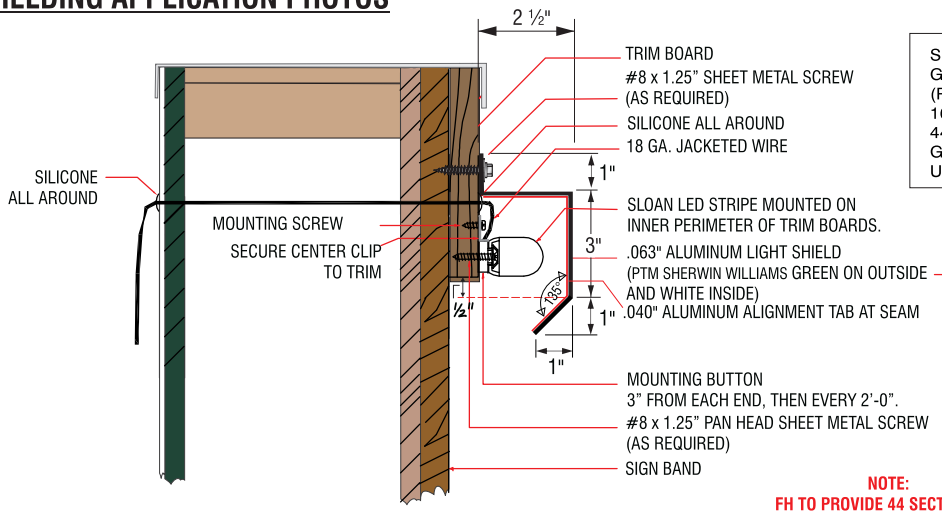
SEAM TAB DETAIL

ENDS CUT TO LENGTH IN THE FIELD (AS REQUIRED)

1. CUT LEDSTRIPE BY USING MITER BOX (CUT END MARKED AS INDICATED ON EACH UNIT).
2. APPLY ACRYLIC END CAP USING SUPPLIED CEMENT.



CUTTING DETAIL

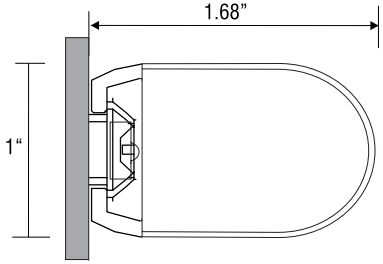


CROSS SECTION-MOUNTING DETAIL (TYP.)

SHERWINWILLIAMSPAINTS 2 COATS GREEN ENAMEL OIL OR ACRYLIC BASE (R2 MAROON 1/32, N1 RAW UMBER 16/32, W1 WITE 22/32, B1 BLACK 44/32, Y3 DEEP GOLD 2 OZ & 5/32, G2 NEW GREEN 4 OZ & 54/32. (DTM UD SEMI)

NOTE:
FH TO PROVIDE 44 SECTIONS OF .063" ALUMINUM LIGHT SHIELD, EACH 10' IN LENGTH. INSTALLER TO CUT TO FIT IN FIELD.

ELECTRICAL REQUIREMENTS
Total: 6.0 Amps
(1) 120V 20A Circuit Required.
ALL BRANCH CIRCUITS SHALL BE DEDICATED TO SIGNS (INCLUDING GROUND AND NEUTRAL) AND SHALL NOT BE SHARED WITH OTHER LOADS.



CROSS SECTION (TYP.)

LED ACCENT LIGHTING F 1-3

LEDSTRIPE & LIGHT SHIELD DETAIL

SCOPE OF WORK:
Manufacture and install LED accent lighting on three elevation having remote transformers located in accessible area behind wall. (Transformers shall be mounted in Transformer Box if mounted outside of shelter.)

SCALE : NTS

FEDERAL HEATH SIGN COMPANY
www.federalheath.com
1845 Precinct Line Road, Suite 100, Hurst, Texas 76054
T: 817.685.9075 F: 817.685.9103

Revisions:
R1-CW-10/14/26-Added options for larger pylon sign and tenant panel
R2-JK-10/14/26-Re-Insert Original Elevations w/o Flags.

Colors Depicted In This Rendering May Not Match Actual Finished Materials. Refer To Product Samples For Exact Color Match.

Client Approval/Date:

Landlord Approval/Date:

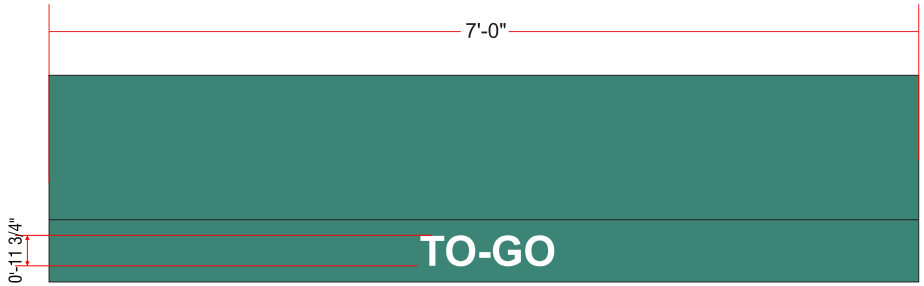
Account Rep: KELLY SINGLETON
Project Manager: M. KIRBY
Drawn By: K. SINGLETON

Underwriters Laboratories Inc. ELECTRICAL TO USE U.L. LISTED COMPONENTS AND SHALL MEET ALL N.E.C. STANDARDS
ALL ELECTRICAL SIGNS ARE TO COMPLY WITH U.L. 48 AND ARTICLE 600 OF THE N.E.C. STANDARDS, INCLUDING THE PROPER GROUNDING AND BONDING OF ALL SIGNS.

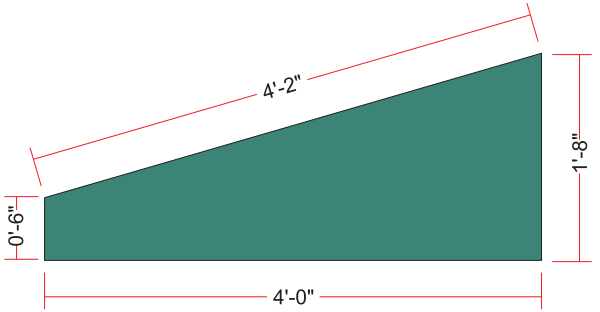
Project / Location:
TEXAS ROADHOUSE
Store #1039
North Victory Drive
Mankato, MN

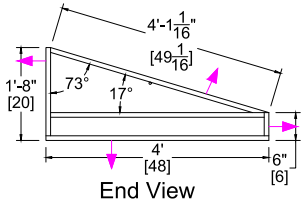
Job Number: 66-10036-55
Date: July 28, 2026
Sheet Number: 8 Of 13
Design Number: 66-10036-55-R2

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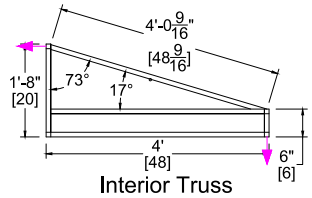


White “TO-GO”

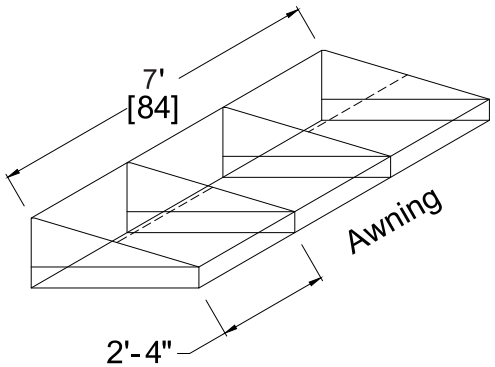




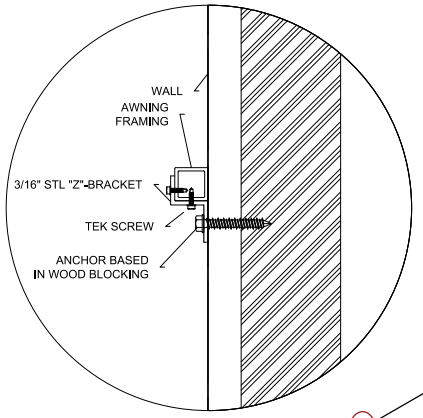
End View



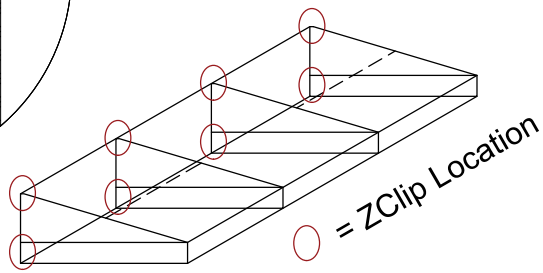
Interior Truss



TYPICAL MOUNTING



PROVIDED
(8) Z Clips
(8) Tek Screws



AWNING G

SHED FABRIC AWNING WITH ALUMINUM FRAME One (1) Req’d

Scale: 1”= 1’-0”

SCOPE OF WORK:

MANUFACTURE AND INSTALL NON-ILLUMINATED SHED W/PANEL STYLE AWNING FOR OVER PICK-UP WINDOW.
MATERIALS: SUNBRELLA WATERPROOF AWNING FABRIC, FOREST GREEN COLOR

FEDERAL HEATH SIGN COMPANY
www.federalheath.com
1845 Precinct Line Road, Suite 100, Hurst, Texas 76054
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Revisions:
R1-GW-10/14/26-Added options for larger pylon sign and tenant panel
R2-JK-10/14/26-Re-Insert Original Elevations w/o Flags.

Colors Depicted In This Rendering May Not Match Actual Finished Materials. Refer To Product Samples For Exact Color Match.

Client Approval/Date:

Landlord Approval/Date:

Account Rep: KELLY SINGLETON
Project Manager: M. KIRBY
Drawn By: K. SINGLETON

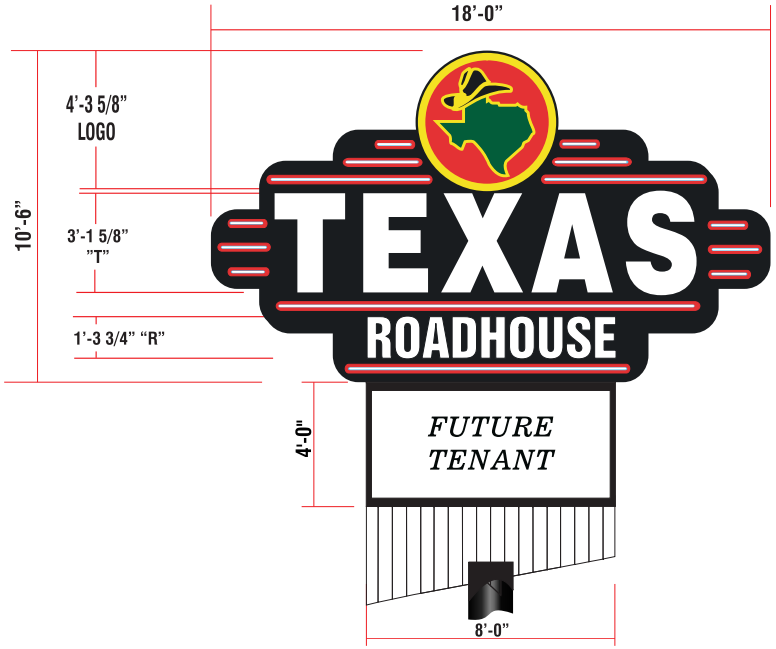
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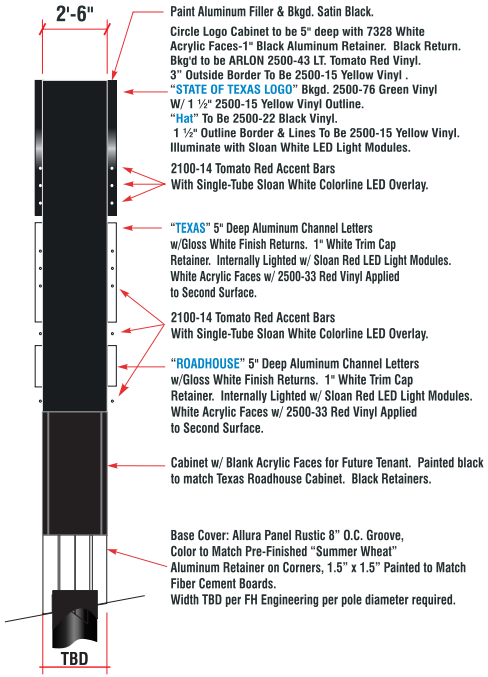
ALL ELECTRICAL SIGNS ARE TO COMPLY WITH U.L. 48 AND ARTICLE 600 OF THE N.E.C. STANDARDS, INCLUDING THE PROPER GROUNDING AND BONDING OF ALL SIGNS.

Project / Location:
TEXAS ROADHOUSE
Store #1039
North Victory Drive
Mankato, MN

Job Number: 66-10036-55
Date: July 28, 2026
Sheet Number: 9 Of 13
Design Number: 66-10036-55-R2

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Paint Aluminum Filler & Bkgd. Satin Black.

Circle Logo Cabinet to be 5" deep with 7328 White Acrylic Faces-1" Black Aluminum Retainer. Black Return. Bkg'd to be ARLON 2500-43 LT. Tomato Red Vinyl. 3" Outside Border To Be 2500-15 Yellow Vinyl .

"STATE OF TEXAS LOGO" Bkgd. 2500-76 Green Vinyl W/ 1 ½" 2500-15 Yellow Vinyl Outline.

"Hat" To Be 2500-22 Black Vinyl. 1 ½" Outline Border & Lines To Be 2500-15 Yellow Vinyl. Illuminate with Sloan White LED Light Modules.

2100-14 Tomato Red Accent Bars With Single-Tube Sloan White Colorline LED Overlay.

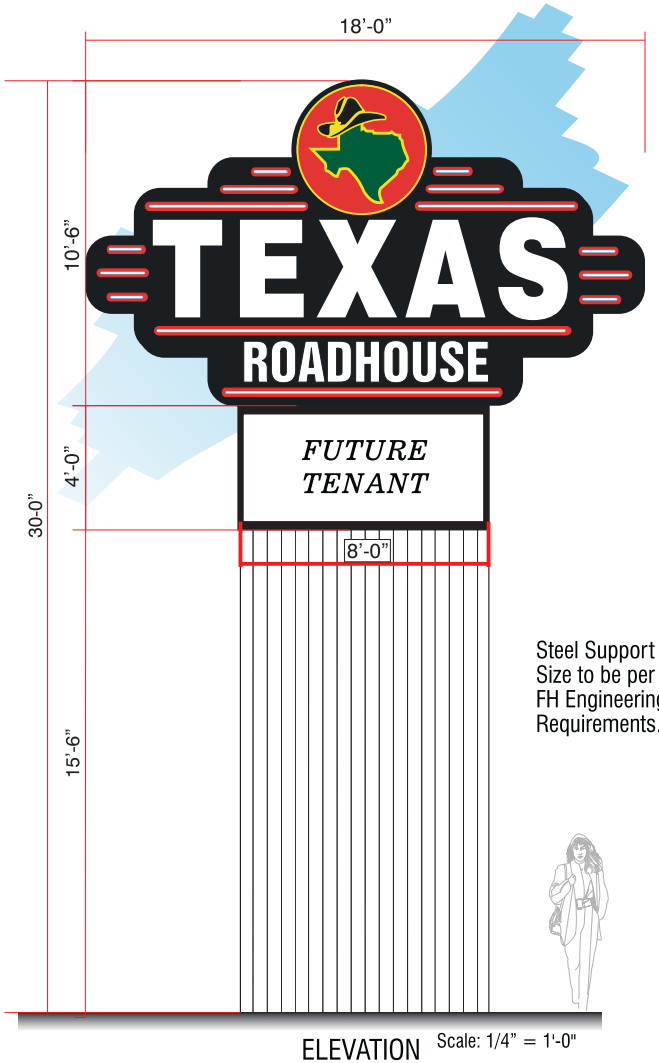
"TEXAS" 5" Deep Aluminum Channel Letters w/Gloss White Finish Returns. 1" White Trim Cap Retainer. Internally Lighted w/ Sloan Red LED Light Modules. White Acrylic Faces w/ 2500-33 Red Vinyl Applied to Second Surface.

2100-14 Tomato Red Accent Bars With Single-Tube Sloan White Colorline LED Overlay.

"ROADHOUSE" 5" Deep Aluminum Channel Letters w/Gloss White Finish Returns. 1" White Trim Cap Retainer. Internally Lighted w/ Sloan Red LED Light Modules. White Acrylic Faces w/ 2500-33 Red Vinyl Applied to Second Surface.

Cabinet w/ Blank Acrylic Faces for Future Tenant. Painted black to match Texas Roadhouse Cabinet. Black Retainers.

Base Cover: Allura Panel Rustic 8" O.C. Groove, Color to Match Pre-Finished "Summer Wheat" Aluminum Retainer on Corners, 1.5" x 1.5" Painted to Match Fiber Cement Boards. Width TBD per FH Engineering per pole diameter required.



Steel Support Size to be per FH Engineering Requirements.

ELEVATION Scale: 1/4" = 1'-0"

SIGN TYPE H1 **D/F PYLON SIGN W/ PLEX FACE CHANNEL LETTERS - WHITE DAY & RED NIGHT | ONE (1) REQUIRED | 189.0 SQ.FT. (TRH) + 32.0 SQ. FT. (Panels)**

SCALE: 1/4" = 1'-0"

MANUFACTURING TO PROVIDE A SLEEVE WITHIN SIGN CABINET TO ACCEPT STEEL PIPE AS PER ENGINEERING.

STANDARD INSTALL IS TO BE DIRECT PIPE EMBEDMENT INTO CONCRETE FOOTING PER FH ENGINEERING SPECS.

ELECTRICAL REQUIREMENTS	
Total: 6 Amps	TEXAS ROADHOUSE CABINET
(1) 120V 20A Circuit Required.	

NOTE:
PYLON SIGN HEIGHT MAY INCREASE ONCE THE NEARBY OVERPASS ELEVATION IS CONFIRMED. CODE ALLOWS FREESTANDING SIGNAGE TO BE 15' ABOVE THE ELEVATION OF THE ADJACENT HIGHWAY (US-14).

MATERIAL FINISH COLORS

AKZO Satin Black	AKZO Gloss White	White Acrylic Faces	White Colorline LED	2100-14 Tomato Red Vinyl	2500-43 Light Tomato Red Vinyl	2500-33 Red Vinyl	2500-76 Holly Green Vinyl	2500-15 Yellow	2500-22 Black Vinyl elements Applied to Yellow Bkgd.
Cabinet, Face Bkgd & Circle logo retainers	"TEXAS" & "ROADHOUSE" Letters inside and outside.	"TEXAS" & "ROADHOUSE" Letters	Stripes	Stripes Bkgd.	Logo Bkgd.	"TEXAS" & "ROADHOUSE" Letters - 2nd Surface	Logo: "State"	Logo: Circle, Hat and State Border.	Logo: "Hat"

CUSTOMER TO PROVIDE:

ALL BRANCH (PRIMARY ELECTRICAL SERVICE) CIRCUITS & FINAL CONNECTION TO EACH SIGN (WITHIN 5 FT.) TO BE BY CERTIFIED ELECTRICIAN:
A. All branch circuits for signs must be totally dedicated to signs (including dedicated ground and dedicated neutral per circuit).
B. Sign circuits must not be shared with other loads such as lighting, air conditioning, and other equipment.
D. Properly sized ground wire that can be traced back to the breaker panel must be provided.
D. Number and size of circuits for each sign to meet Federal Heath Sign's requirement.

Any deviation from the above recommendations may result in:
1. Damage to or improper operation of the sign(s).
2. Delays and additional costs.

Notes: ○ Certain electrical components of signs will fail prematurely if signs are not shut-off for a period of time, once, each day. For best performance, we recommend signs to be connected to an automatic controlling device such as an Energy Management System, Time Clock or Photo Cell that will automatically shut-off the sign for a period of time, each day. Failure to do so will cause damage to the electrical components of the sign and will void the warranty.
○ Some dimming devices will also adversely affect sign electrical components, causing failure. Any dimming of the sign without consultation with Federal Heath Sign Co. will void the warranty.

INSTALLATION OF THIS SIGN SHALL CONFORM TO ARTICLE 600 OF THE NEC, UL 48 AND OR OTHER APPLICABLE LOCAL CODES, INCLUDING THE PROPER GROUNDING AND BONDING OF THE SIGN.

THE LOCATION OF THE DISCONNECT SWITCH, AFTER INSTALLATION SHALL COMPLY WITH ARTICLE 600.6(A) OF THE NEC.

FEDERAL HEATH SIGN COMPANY
www.federalheath.com
1845 Precinct Line Road, Suite 100, Hurst, Texas 76054
T: 817.685.9075 F: 817.685.9103

Revisions:
R1-CW-10/14/26-Added options for larger pylon sign and tenant panel
R2-JK-10/14/26-Re-Insert Original Elevations w/o Flags.

Colors Depicted In This Rendering May Not Match Actual Finished Materials. Refer To Product Samples For Exact Color Match.

Client Approval/Date:

Landlord Approval/Date:

Account Rep: KELLY SINGLETON
Project Manager: M. KIRBY
Drawn By: K. SINGLETON

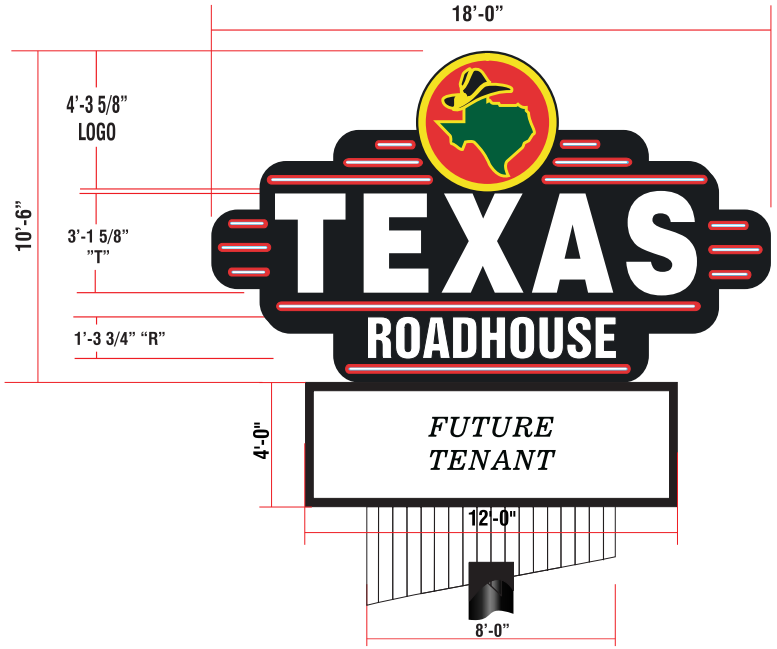
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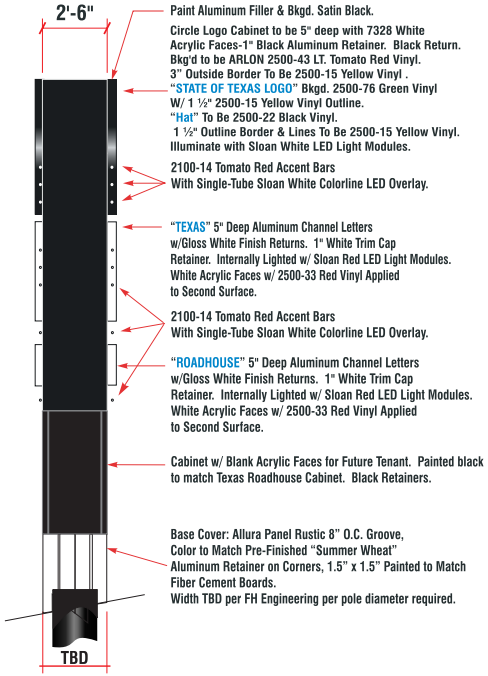
ALL ELECTRICAL SIGNS ARE TO COMPLY WITH U.L. 48 AND ARTICLE 600 OF THE N.E.C. STANDARDS, INCLUDING THE PROPER GROUNDING AND BONDING OF ALL SIGNS.

Project / Location:
Store #1039
North Victory Drive
Mankato, MN

Job Number: 66-10036-55
Date: July 28, 2026
Sheet Number: 10 Of 13
Design Number: 66-10036-55-R2

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Paint Aluminum Filler & Bkgd. Satin Black.

Circle Logo Cabinet to be 5" deep with 7328 White Acrylic Faces-1" Black Aluminum Retainer. Black Return. Bkg'd to be ARLON 2500-43 LT. Tomato Red Vinyl. 3" Outside Border To Be 2500-15 Yellow Vinyl .

"STATE OF TEXAS LOGO" Bkgd. 2500-76 Green Vinyl W/ 1 ½" 2500-15 Yellow Vinyl Outline.

"Hat" To Be 2500-22 Black Vinyl. 1 ½" Outline Border & Lines To Be 2500-15 Yellow Vinyl. Illuminate with Sloan White LED Light Modules.

2100-14 Tomato Red Accent Bars With Single-Tube Sloan White Colorline LED Overlay.

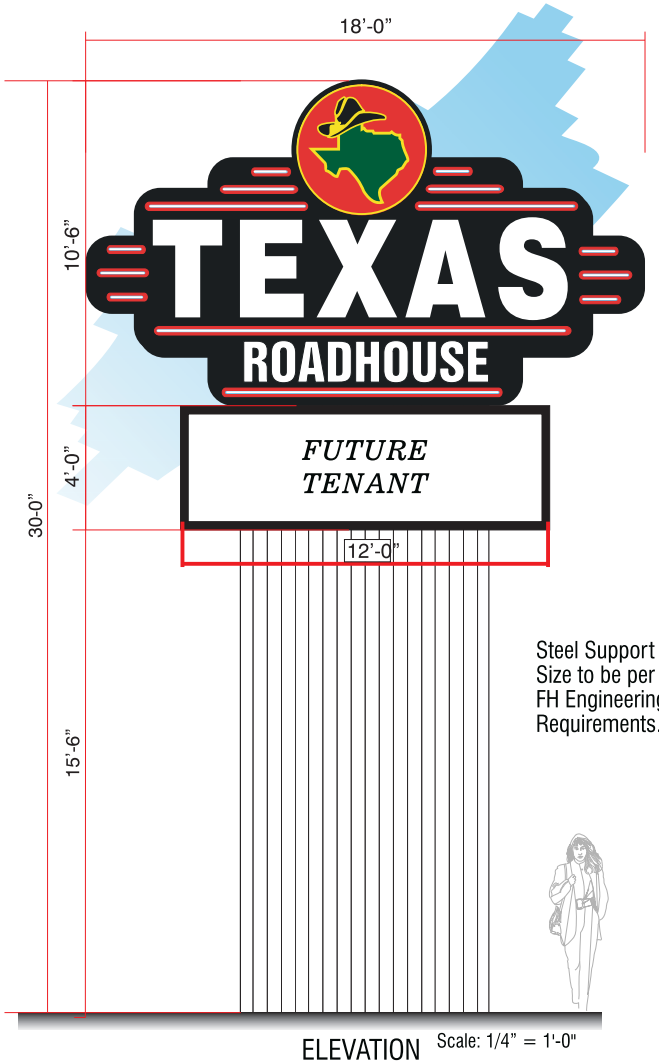
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Cabinet w/ Blank Acrylic Faces for Future Tenant. Painted black to match Texas Roadhouse Cabinet. Black Retainers.

Base Cover: Allura Panel Rustic 8" O.C. Groove, Color to Match Pre-Finished "Summer Wheat" Aluminum Retainer on Corners, 1.5" x 1.5" Painted to Match Fiber Cement Boards. Width TBD per FH Engineering per pole diameter required.



Steel Support Size to be per FH Engineering Requirements.

ELEVATION Scale: 1/4" = 1'-0"

SIGN TYPE H2 **D/F PYLON SIGN W/ PLEX FACE CHANNEL LETTERS - WHITE DAY & RED NIGHT | ONE (1) REQUIRED | 189.0 SQ.FT. (TRH) + 48.0 SQ. FT. (Panels)**

SCALE: 1/4" = 1'-0"

MANUFACTURING TO PROVIDE A SLEEVE WITHIN SIGN CABINET TO ACCEPT STEEL PIPE AS PER ENGINEERING.

STANDARD INSTALL IS TO BE DIRECT PIPE EMBEDMENT INTO CONCRETE FOOTING PER FH ENGINEERING SPECS.

ELECTRICAL REQUIREMENTS	
Total: 6 Amps	TEXAS ROADHOUSE CABINET
(1) 120V 20A Circuit Required.	

NOTE:
PYLON SIGN HEIGHT MAY INCREASE ONCE THE NEARBY OVERPASS ELEVATION IS CONFIRMED. CODE ALLOWS FREESTANDING SIGNAGE TO BE 15' ABOVE THE ELEVATION OF THE ADJACENT HIGHWAY (US-14).

MATERIAL FINISH COLORS

AKZO Satin Black	AKZO Gloss White	White Acrylic Faces	White Colorline LED	2100-14 Tomato Red Vinyl	2500-43 Light Tomato Red Vinyl	2500-33 Red Vinyl	2500-76 Holly Green Vinyl	2500-15 Yellow	2500-22 Black Vinyl elements Applied to Yellow Bkgd.
Cabinet, Face Bkgd & Circle logo retainers	"TEXAS" & "ROADHOUSE" Letters inside and outside.	"TEXAS" & "ROADHOUSE" Letters	Stripes	Stripes Bkgd.	Logo Bkgd.	"TEXAS" & "ROADHOUSE" Letters - 2nd Surface	Logo: "State"	Logo: Circle, Hat and State Border.	Logo: "Hat"

CUSTOMER TO PROVIDE:

ALL BRANCH (PRIMARY ELECTRICAL SERVICE) CIRCUITS & FINAL CONNECTION TO EACH SIGN (WITHIN 5 FT.) TO BE BY CERTIFIED ELECTRICIAN:
A. All branch circuits for signs must be totally dedicated to signs (including dedicated ground and dedicated neutral per circuit).
B. Sign circuits must not be shared with other loads such as lighting, air conditioning, and other equipment.
C. Properly sized ground wire that can be traced back to the breaker panel must be provided.
D. Number and size of circuits for each sign to meet Federal Heath Sign's requirement.

Any deviation from the above recommendations may result in:
1. Damage to or improper operation of the sign(s).
2. Delays and additional costs.

Notes:
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INSTALLATION OF THIS SIGN SHALL CONFORM TO ARTICLE 600 OF THE NEC, UL 48 AND OR OTHER APPLICABLE LOCAL CODES, INCLUDING THE PROPER GROUNDING AND BONDING OF THE SIGN.

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R2-JK-10/14/26-Re-Insert Original Elevations w/o Flags.

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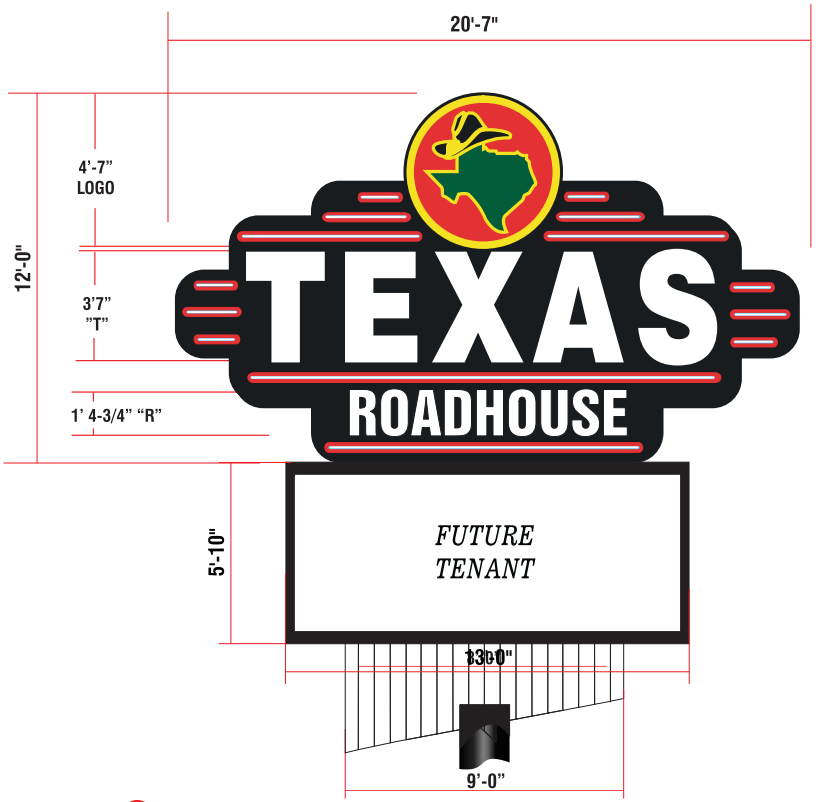
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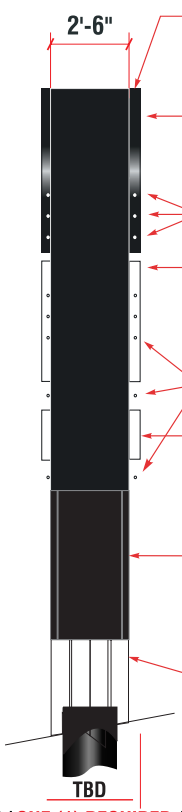
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Project / Location:
Store #1039
North Victory Drive
Mankato, MN

Job Number: 66-10036-55
Date: July 28, 2026
Sheet Number: 11 Of 13
Design Number: 66-10036-55-R2

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Paint Aluminum Filler & Bkgd. Satin Black.

Circle Logo Cabinet to be 5" deep with 7328 White Acrylic Faces-1" Black Aluminum Retainer. Black Return. Bkg'd to be ARLON 2500-43 LT. Tomato Red Vinyl. 3" Outside Border To Be 2500-15 Yellow Vinyl . "STATE OF TEXAS LOGO" Bkgd. 2500-76 Green Vinyl W/ 1 ½" 2500-15 Yellow Vinyl Outline. "Hat" To Be 2500-22 Black Vinyl. 1 ½" Outline Border & Lines To Be 2500-15 Yellow Vinyl. Illuminate with Sloan White LED Light Modules.

2100-14 Tomato Red Accent Bars With Single-Tube Sloan White Colorline LED Overlay.

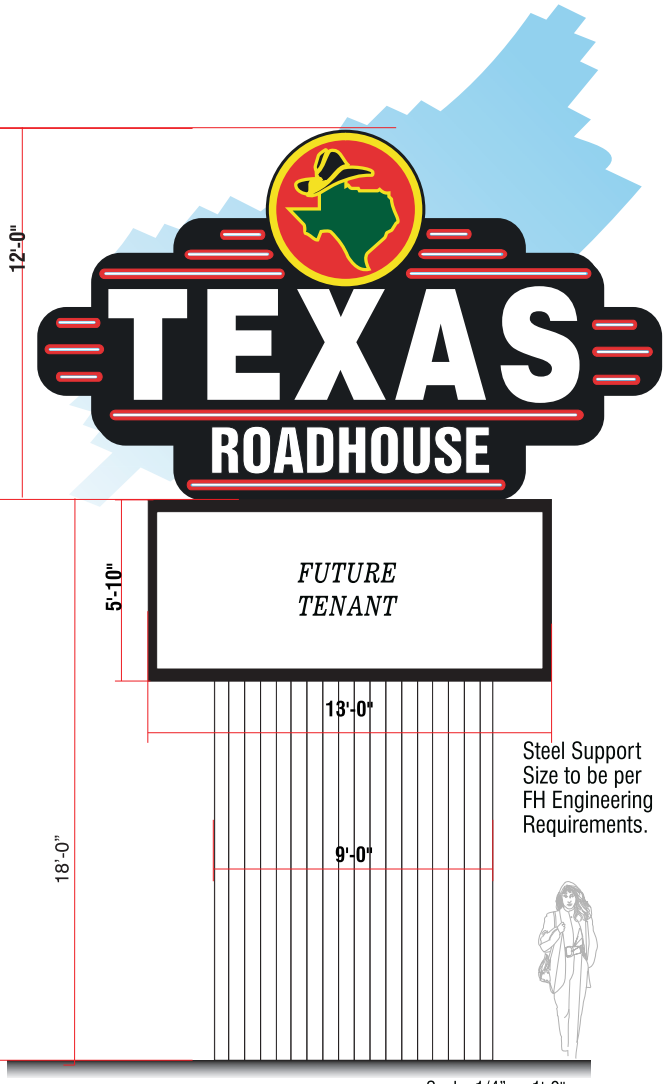
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2100-14 Tomato Red Accent Bars With Single-Tube Sloan White Colorline LED Overlay.

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Cabinet w/ Blank Acrylic Faces for Future Tenant. Painted black to match Texas Roadhouse Cabinet. Black Retainers.

Base Cover: Allura Panel Rustic 8" O.C. Groove, Color to Match Pre-Finished "Summer Wheat" Aluminum Retainer on Corners, 1.5" x 1.5" Painted to Match Fiber Cement Boards. Width TBD per FH Engineering per pole diameter required.



Steel Support Size to be per FH Engineering Requirements.

ELEVATION Scale: 1/4" = 1'-0"

SIGN TYPE H2 **D/F PYLON SIGN W/ PLEX FACE CHANNEL LETTERS - WHITE DAY & RED NIGHT | ONE (1) REQUIRED | 247.0 SQ.FT. (TRH) + 78.8.0 SQ. FT. (Panels)**

SCALE: 1/4" = 1'-0"

MANUFACTURING TO PROVIDE A SLEEVE WITHIN SIGN CABINET TO ACCEPT STEEL PIPE AS PER ENGINEERING.

STANDARD INSTALL IS TO BE DIRECT PIPE EMBEDMENT INTO CONCRETE FOOTING PER FH ENGINEERING SPECS.

ELECTRICAL REQUIREMENTS

Total: 6 Amps

(1) 120V 20A Circuit Required.

TEXAS ROADHOUSE CABINET

NOTE:
PYLON SIGN HEIGHT MAY INCREASE ONCE THE NEARBY OVERPASS ELEVATION IS CONFIRMED. CODE ALLOWS FREESTANDING SIGNAGE TO BE 15' ABOVE THE ELEVATION OF THE ADJACENT HIGHWAY (US-14).

MATERIAL FINISH COLORS

AKZO Satin Black	AKZO Gloss White	White Acrylic Faces	White Colorline LED	2100-14 Tomato Red Vinyl	2500-43 Light Tomato Red Vinyl	2500-33 Red Vinyl	2500-76 Holly Green Vinyl	2500-15 Yellow	2500-22 Black Vinyl elements Applied to Yellow Bkgd.
Cabinet, Face Bkgd & Circle logo retainers	"TEXAS" & "ROADHOUSE" Letters inside and outside.	"TEXAS" & "ROADHOUSE" Letters	Stripes	Stripes Bkgd.	Logo Bkgd.	"TEXAS" & "ROADHOUSE" Letters - 2nd Surface	Logo: "State"	Logo: Circle, Hat and State Border.	Logo: "Hat"

CUSTOMER TO PROVIDE:

ALL BRANCH (PRIMARY ELECTRICAL SERVICE) CIRCUITS & FINAL CONNECTION TO EACH SIGN (WITHIN 5 FT.) TO BE BY CERTIFIED ELECTRICIAN:
A. All branch circuits for signs must be totally dedicated to signs (including dedicated ground and dedicated neutral per circuit).
B. Sign circuits must not be shared with other loads such as lighting, air conditioning, and other equipment.
C. Properly sized ground wire that can be traced back to the breaker panel must be provided.
D. Number and size of circuits for each sign to meet Federal Heath Sign's requirement.

Any deviation from the above recommendations may result in:
1. Damage to or improper operation of the sign(s).
2. Delays and additional costs.

Notes:
- Certain electrical components of signs will fail prematurely if signs are not shut-off for a period of time, once, each day. For best performance, we recommend signs to be connected to an automatic controlling device such as an Energy Management System, Time Clock or Photo Cell that will automatically shut-off the sign for a period of time, each day. Failure to do so will cause damage to the electrical components of the sign and will void the warranty.
- Some dimming devices will also adversely affect sign electrical components, causing failure. Any dimming of the sign without consultation with Federal Heath Sign Co. will void the warranty.

INSTALLATION OF THIS SIGN SHALL CONFORM TO ARTICLE 600 OF THE NEC, UL 48 AND OR OTHER APPLICABLE LOCAL CODES, INCLUDING THE PROPER GROUNDING AND BONDING OF THE SIGN.

THE LOCATION OF THE DISCONNECT SWITCH, AFTER INSTALLATION SHALL COMPLY WITH ARTICLE 600.6(A) OF THE NEC.

FEDERAL HEATH SIGN COMPANY
www.federalheath.com
1845 Precinct Line Road, Suite 100, Hurst, Texas 76054
T: 817.685.9075 F: 817.685.9103

Revisions:
R1-CW-10/14/26-Added options for larger pylon sign and tenant panel
R2-JK-10/14/26-Re-Insert Original Elevations w/o Flags.

Colors Depicted In This Rendering May Not Match Actual Finished Materials. Refer To Product Samples For Exact Color Match.

Client Approval/Date:

Landlord Approval/Date:

Account Rep: KELLY SINGLETON
Project Manager: M. KIRBY
Drawn By: K. SINGLETON

Underwriters Laboratories Inc. ELECTRICAL TO USE U.L. LISTED COMPONENTS AND SHALL MEET ALL N.E.C. STANDARDS

ALL ELECTRICAL SIGNS ARE TO COMPLY WITH U.L. 48 AND ARTICLE 600 OF THE N.E.C. STANDARDS, INCLUDING THE PROPER GROUNDING AND BONDING OF ALL SIGNS.

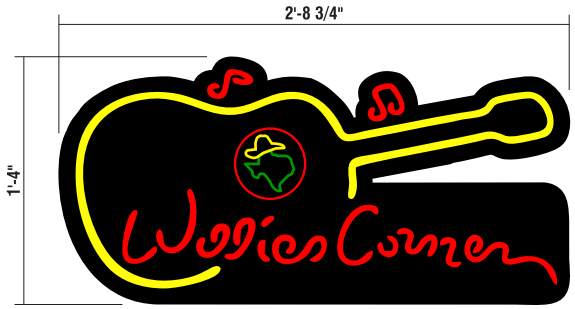
Project / Location:
Store #1039
North Victory Drive
Mankato, MN

Job Number: 66-10036-55
Date: July 28, 2026
Sheet Number: 12 Of 13
Design Number: 66-10036-55-R2

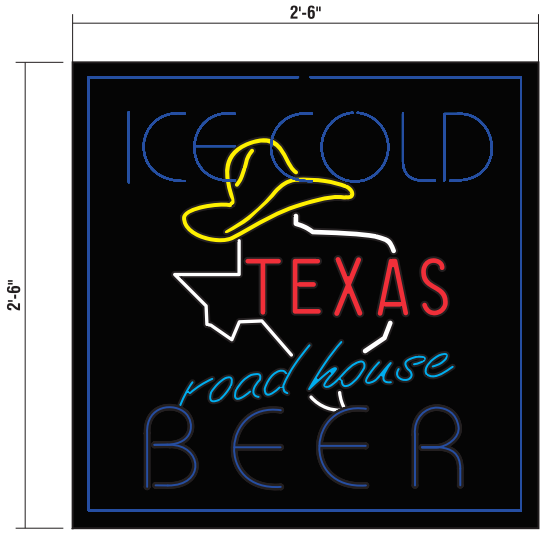
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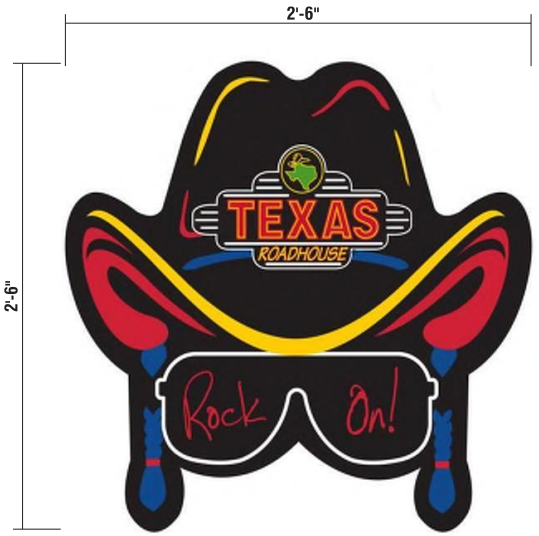
I 7" Outhouse Display — PART # TR7300UTL



J 16" Willies Corner Display — PART # TR16WCL



K 30" Ice Cold Beer Display — PART #TR3030ICBL



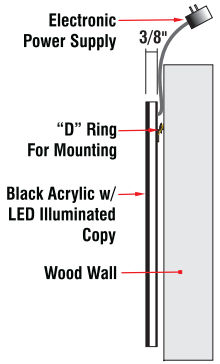
L 30" Texas Roadhouse Rock On Display — PART #TR3030ROL

Single Face Illuminated LEDeon Wall Sign | Interior Application

Scale: 1 1/2" = 1'-0"

Specifications:

- S/F LEDeon black acrylic face w/ LED illuminated copy/graphics.
- Sign mounts flush to wall.
- Electronic power supply plugs into standard wall outlet.



Typical Section

Not to Scale

INSTALLATION OF THIS SIGN SHALL CONFORM TO ARTICLE 600 OF THE NEC, UL48, AND OR OTHER APPLICABLE LOCAL CODES, INCLUDING PROPER GROUNDING AND BONDING OF SIGN.

LOCATION OF DISCONNECT SWITCH AFTER INSTALLATION SHALL COMPLY WITH ARTICLE 600.6(A) OF THE NEC.

FEDERAL HEATH SIGN COMPANY
www.federalheath.com
1845 Precinct Line Road, Suite 100, Hurst, Texas 76054
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Colors Depicted In This Rendering May Not Match Actual Finished Materials. Refer To Product Samples For Exact Color Match.

Client Approval/Date:

Landlord Approval/Date:

Account Rep: KELLY SINGLETON
Project Manager: M. KIRBY
Drawn By: K. SINGLETON

Underwriters Laboratories Inc. ELECTRICAL TO USE U.L. LISTED COMPONENTS AND SHALL MEET ALL N.E.C. STANDARDS

ALL ELECTRICAL SIGNS ARE TO COMPLY WITH U.L. 48 AND ARTICLE 600 OF THE N.E.C. STANDARDS, INCLUDING THE PROPER GROUNDING AND BONDING OF ALL SIGNS.

Project / Location:
TEXAS ROADHOUSE
Store #1039
North Victory Drive
Mankato, MN

Job Number: 66-10036-55
Date: July 28, 2026
Sheet Number: 13 Of 13
Design Number: 66-10036-55-R2

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Real People. Real Solutions.

MEMORANDUM

Date: November 9, 2026

To: City of Mankato Site Plan & Traffic Advisory Committee

From: Alec Pietz, PE – Bolton & Menk, Inc

Cc: Molly Westman – City of Mankato Planning Coordinator
Wesley Cordes, PE – Bolton & Menk, Inc

Subject: Mankato Texas Roadhouse
BMI Project No. 26X.145354

We appreciate receiving the Site Plan & Traffic Advisory Committee comments on 11/04/2026. We offer the following responses to the comments.

a. If not already complete, applicant shall log in to the online portal and make notification fee payment.
Acknowledged.

b. The proposed exterior material, "fiber cement board siding and trim" is not listed as an allowable material in the gateway overlay district. The code allowable materials can be found here and are as follows:

1) *Exterior wall finish.*
2) *All exterior wall finishes on any building structure shall be of the following materials, or a combination of the following materials:*
3) *Face brick.*
4) *Natural stone.*
5) *Precast concrete panels, provided the material has been integrally treated with a color, or if the surfaces have a texture or pattern that gives the panel the appearance of natural stone or brick.*
6) *Concrete block not to exceed 20 percent of a wall areas, provided the surfaces have a texture or pattern discernibly different from flat smooth concrete, and if the material is either integrally colored or treated with a long-lasting durable decorative finish.*
7) *Glass.*
8) *Stucco, or similar durable cement-based material, not to exceed 20 percent of a wall area.*
9) *Accent or framing materials of metal or wood, but only if they form a minor part of the overall façade treatment.*
10) *Other materials of similar quality and durability as approved by the city council.*

On behalf of Texas Roadhouse, we respectfully request the City Council's consideration and approval of an alternative exterior material composition that exceeds the currently permitted percentage of fiber cement board. Our proposed building design incorporates a substantial amount of masonry, including brick pilasters with brick base and brick rowlock provided

throughout the perimeter of the building, consistent with the architectural character and quality expectations of the community. While the development code limits fiber cement board to 20% of the exterior façade, our proposal includes approximately 60% fiber cement board as part of the prototypical Texas Roadhouse design that has been successfully implemented throughout the United States.

Fiber cement board is a highly durable, long-lasting exterior cladding material that has demonstrated excellent performance in a wide range of climates, including harsh northern environments with extreme freeze-thaw cycles. The material is resistant to moisture, rot, warping, insects, and fire, making it a low-maintenance and resilient building product. As a result, it provides a level of quality and longevity comparable to many traditional building materials, including natural stone and masonry accents. The proposed fiber cement board is not being utilized as a cost-saving substitute for inferior materials, but rather as an integral component of the established architectural design that has become synonymous with the Texas Roadhouse brand nationwide. This material has been successfully used on hundreds of restaurant locations across the country, including in cold-weather states where durability and long-term performance are critical considerations.

Approving this request would allow the project to maintain the architectural consistency of the nationally recognized restaurant brand while still providing a high-quality building that incorporates significant masonry elements and contributes positively to the visual character of the community. The combination of brick and fiber cement board creates an attractive, durable, and well-maintained appearance that will continue to serve the City well for many years. We respectfully ask that the City Council consider fiber cement board as a material of similar quality, durability, and aesthetic value to the materials suggested by the code and approve the proposed exterior material distribution as presented.

c. Applicant shall clarify the setback of the parking lot on the eastern side (the proposed new split). If the setback is not achieved, how will ownership of the two separate parcels be maintained in the future?
   Reciprocal access and parking agreement(s) prepared by an attorney.
d. In conjunction with consideration for the lot split, the applicant shall present, at a minimum, the access easement, and the new drainage and utility easement documentation for recording with the proposed lot split.
   The access easement will be prepared by an attorney. The drainage and utility easement along the shared lot line is included with the Lot Split figure included with this response.
e. Landscaping shall be provided in conformance with Mankato City Code. As discussed during preliminary meeting, the landscaping screening can be provided around the entirety of the lots (extended around the currently vacant lot on Hazeltine). Applicant shall clarify how the easterly side of the subject lot will be screened to achieve Mankato City Code.
   The easterly lot line will be screened with plantings meeting City Code. Further discussion on the remaining parcel is desired with Staff.
f. Applicant shall clarify the interior landscaping calculations and the proposed ground coverage for the interior landscaping islands.
   Calculation provided in the Site Plan as updated with this response.
g. Lighting photometric levels shall be extended to the property line area. In particular on the western side, and the northern side to ensure the ½ foot candle is achieved.
   The original submittal showed the western and northern sides. However, and updated

photometric plan is also included with this response.

h. Lighting submission does not appear to include the fixtures proposed for the building. All lighting, including building lighting, shall achieve Mankato City Code standards. Lighting shown on the roof in the rendering images of the structure does not appear to conform to Mankato City Code.
   Uplights at the towers will be removed.

i. Applicant shall clarify how the outdoor waiting patio will be utilized. Will guests be allowed to eat/drink at this area while waiting?
   The patio will be for customers to wait, and the assumption is if the liquor license allows the restaurant to include the outdoor patio, customers could purchase a beverage and come outside to the waiting area (accessed from the lobby) while waiting for their table. This outdoor patio will have a rail to keep the customers from exiting to the parking lot.

j. Applicant shall provide the number of proposed seats in the restaurant, the number of employees, proposed food pick-up parking stalls and if there will be a delivery vehicle(s).
   The Site Plan has been updated with additional stall requirement information. No food delivery vehicles are anticipated.

k. A separate sign permit review and approval will be required in the future prior to signage fabrication and installation. Proposed pylon sign does not achieve the standards for a pylon sign on the proposed subject lot. A monument sign would achieve the signage standards. Options may exist if the two lots are combined into one zoning lot and not further separated in the future.
   Per the pre-application meeting discussion, staff indicated that if both tenants utilize a shared multi-tenant pole sign, the allowable sign height may be calculated based on the combined linear frontage of both lots. Under this approach, a pole sign height of up to 30-feet could be permitted. The sign package has been provided for the City's review and consideration. Link below:
   https://atwell-group.sharefile.com/public/share/web-sb1562ffe71ab4f5589cea5825aba60d2

l. General note: all rooftop mechanical exceeding 6' shall be fully screening in conformance with Mankato City Code.
   Acknowledged.

m. General note: all exterior mechanical equipment shall be fully screened in conformance with Mankato City Code.
   Acknowledged.

n. The applicant shall provide off-street loading in conformance with Mankato City Code, and shall clarify how loading and unloading maneuvers will occur on the site.
   Texas Roadhouse restaurants do not typically utilize a designated loading space, as deliveries are scheduled during the early morning hours prior to the restaurant opening for business. During these times, the parking lot is largely unoccupied and ample parking spaces are available to accommodate delivery vehicles without impacting customer parking or on-site circulation. Delivery trucks will temporarily park adjacent to the designated service entrance at the side of the building while loading and unloading activities occur. This operational model has been successfully implemented at numerous Texas Roadhouse locations nationwide and minimizes the need for a dedicated loading space that would otherwise remain unused for the vast majority of the day.

o. General note: noise generated at the site shall conform with Minnesota Rule 7030.
   Acknowledged.

p. The applicant shall be advised that the address assigned to this property will be 1550 Interlachen Drive.

Acknowledged.

q. Applicant shall provide an impervious coverage map and tabulation to properly vet stormwater compliance. Reviewing the turf plan and landscaping plan, the islands are not identified to be pervious, suggesting that the site exceeds 85% impervious threshold allowed by code and the rea stormwater BMP. A figure is provided with clarification on the impervious/pervious areas.

r. Applicant shall be required to construct permanent perimeter curb and gutter for driveway located on Lot 1/Parcel A if no development is in process by end of 2031.
Acknowledged.

s. Applicant shall clearly demonstrate that the new sanitary sewer and water service stubs are within the respective lot post administrative lot split.
Refer to Sheet C5.01, which shows the sanitary and water stubs extending beyond proposed surface improvements in the undeveloped lot. The adjusted property line is on the easternmost proposed stalls, so the stubs are well into the undeveloped lot.

t. The applicant shall be aware of and acknowledge the following comments for any future zoning or building permit requests associated with the subject property. Acknowledged. Plans will be updated prior to permitting.

    i. Sheet C1.01 – Sidewalk removals shall be noted and both driveway apron locations.
    Sidewalk removals have been noted on the plans at both driveway apron locations.

    ii. Sheet C1.01- Contractor shall coordinate with City Forester to salvage and relocate boulevard trees. Relocation of trees is the responsibility of the Contractor.
    A note has been added to this sheet.

    iii. Sheet C2.01 – Note that City right of way permit shall be secured prior to driveway work in the right of way. Traffic Control plan shall be submitted at time of permit application.
    This has been noted on the plans. A Traffic Control plan will be submitted at time of permit application.

    iv. Sheet C2.01 – Note that Driveway and sidewalk construction in the right of way shall be in conformance with Mn/DOT Standard Plans 5-297.250 & 5-297.254.
    This has been noted on the plans.

    v. Sheet C2.01 – Shift curb returns back to the property line on both driveway entrances.
    Curb returns have been pulled back to the property line on both driveway entrances.

    vi. Sheet C2.01 – Connections to existing sidewalk and curb and gutter shall be tied with rebar.
    This has been noted on the plans.

    vii. Sheet C2.01 – Parking stall dimensions shall be labeled.
    A parking stall dimension was included in the original submittal. Additional dimensions have been added for clarity.

    viii. Sheet C3.06 – Restoration limits shall be expanded to include work in the right of way.
    Restoration limits have been expanded to include work in the right of way.

    ix. Sheet C4.04 – Connection to Ex. 15” storm stubs shall be of like pipe. The closest bell shall be found to connect. Construction joint will not be allowed at connection point.

A note has been added to the plans.

x. Sheet C5.01 – West sanitary connection shall be made with gasketed PVC coupler.
A callout has been added to the west sanitary connection.

xi. Sheet C5.01 – East sanitary connection shall be made with new sanitary manhole. The bend depicted in the sanitary line will be a long-term maintenance issue.
A sanitary manhole is not warranted by plumbing code. A cleanout is not even warranted at this point as there is less than 100-ft of pipe run and no bend greater than 45° (or 135°) (Reference – Section 719.1 of Plumbing Code). The proposed cleanout, however, is provided for future field verification purposes. Additionally, cleanouts are acceptable within plumbing code at bends greater than 45°.

Section 719.6 of Plumbing Code also notes "Approved manholes shall be permitted to be installed in lieu of cleanouts, where first approved by the Authority Having Jurisdiction". This suggests that cleanouts are the default and manholes the exception requiring applicant request, not dictation from the Authority Having Jurisdiction.

xii. Sheet C5.01 – 2" blow off shall be installed at the end of east watermain connection to conduct pressure and bacteria testing.
A 2" blow-off is shown and called out at the end of the east watermain.

Meeting Date: 11/18/2026

Title

CY51-26

Request of ISG on behalf of the property owner, Front Street Plaza, LLC, for a final plat review of Front Street Place. The subject properties are described as Parcel 1: Lots 1, 2, 3, 13, 14 and 15 of Auditor's Plat No. 5 Mankato with exceptions; AND, Parcel 2: Easterly 157 feet of the northerly 22 feet of Lot 4 and also the easterly 143 feet of the middle 22 feet of said Lot 4 in Block 1, Warren's Addition to Mankato; otherwise also described as Lot 4 of Auditor's Plat No. 17 and light well on Lot 5 of said Auditor's Plat No. 17; AND, Parcel 3: Outlot B, Pike Street Subdivision No. 3, City of Mankato, Blue Earth County, Minnesota; AND, Parcel 4: Lots 5 and 6, and the vacated alley adjacent thereto, of Auditor's Plat No. 17, Rearrangement of part of Auditor's Plat No. 5, City of Mankato; AND, Parcel 5: Lot Twelve (12), Auditor's Plat #17, Re-Arrangement of part of Auditor's Plat #5, except: All that part of Lot No. 12 lying East of Southerly extension of Westerly line of Lot No. 8, both of said lots being in the City of Mankato and according to Auditor's Plat #17; AND, Parcel 6: That part of Lot Sixteen (16), Auditor's Plat #17, Rearrangement of Auditor's Plat #5, and Lot Twenty-one (21), Auditor's Plat #17, Re-Arrangement of Part of Auditor's Plat #5, according to the Plat thereof; AND, Parcel 7: the Westerly 48 feet of the following described parcel: The Easterly 140 feet of Lots 9 and 10 of Auditor's Plat No. 5, Mankato, of Block 84, Bruner's Plat of Mankato, Lot 1 and part of Lot 2 of Van Brunt's North Row, Block 2 of Oakwood Addition to Mankato, and Block 1 Warrens Addition to Mankato, said tract of land fronting on Front Street in said City 38 feet and extending along Liberty Street a distance of 140 feet and being rectangular in form; AND, Parcel 8: Lot 7, Auditor's Plat No.17, Rearrangement of Part of Auditor's Plat No. 5; AND, Parcel 9: Lot Eight (8), Auditor's Plat No.17, Rearrangement of Part of Auditor's Plat No. 5 and Part of Lots Nine (9) and Ten (10) Auditor's Plat No. 5 and a part of Lot Twelve (12) Auditor's Plat No.17 and All that part of Lot 9 according to Auditor's Plat No. 5 lying West of the southerly extension of the westerly line of Lot No. 8, according to Auditor's Plat No. 17; AND, Parcel 10: The Easterly 92 feet of the following described parcel: The Easterly 140 feet of Lots 9 and 10 of Auditor's Plat No. 5, Mankato, of Block 84, Bruner's Plat of Mankato, Lot 1 and part of Lot 2 of Van Brunt's North Row, Block 2 of Oakwood Addition to Mankato, and Block 1 Warrens Addition to Mankato, said tract of land fronting on Front Street in said City 38 feet and extending along Liberty Street a distance of 140 feet and being rectangular in form; AND, Parcel 11: Outlot A, Warren Street Subdivision; AND, Parcel 12: Outlot A, Pike Street Subdivision No. 3, City of Mankato; AND, Parcel 13: part of Lot 14, Auditor's Plat No. 5, on file and of record with the Blue Earth County Recorder, described as: Commencing at the southeasterly corner of Lot 5, Block 9, City of Mankato by E.D. Bruner, according to the plat thereof on file and of record with the Blue Earth County Recorder, all being in City of Mankato, Blue Earth County, Minnesota (All those lands lying between Warren Street, South Front Street, Liberty Street and Riverfront Drive).

The anticipated date of City Council action is December 14, 2026.

Applicant

The applicant is ISG on behalf of the owner, Front Street Plaza, LLC.

Request

The applicant is seeking a final plat review of Front Street Place subdivision.

The preliminary plat was reviewed and approved at the March 9, 2026, City Council meeting.

Location

The development is proposed to occur on the city block between Riverfront Dr. and Front St. and Warrent St. and Liberty St.

Existing Land Use

The property currently has a mix of commercial, retail, and residential units.

Zoning

The property is zoned CBD-F, Central Business District-Fringe.

Environmentally Sensitive Areas

The site falls within FEMA's "Catastrophic Levee Failure" ESA Zone.

Public Utilities

The property is currently served by public utilities.

City Code

The City Code pertaining to the CBD-F, Central Business District-Fringe may be viewed at the following link:

https://library.municode.com/mn/mankato/codes/code_of_ordinances?nodeId=PTIICOOR_CH10LAUSDE_ARTVCODI_DIV5CCEBUDIIN

Site Plan Review Comments

The Site Plan and Traffic Advisory Committee reviewed the proposal at their November 3, 2026, meeting and provided the following comments:

1. The applicant shall be advised that the City of Mankato has an interest in establishing a dedicated public transit stop somewhere on the property. The City's preference would be for the stop to be located along either Front Street or Warren Street. *Applicant Response: Fees have been paid.*
2. The applicant shall be aware that there are seven utility accounts throughout this block. Only one account, associated with 112 W. Liberty Street, has not yet been transferred to the new owners. This account should be transferred to the new owners as soon as possible.*Applicant Response: The location and feasibility of a public transit stop on the property will be coordinated with City Staff.*
3. The applicant shall be aware that, when demolition of the existing buildings begins, the City of Mankato requests that all water meters be returned to the City. *Applicant Response: Acknowledged.*
4. The applicant shall be aware that any proposed road work in the immediate vicinity of the Public Safety Center that may result in the closure of Liberty Street should be coordinated with the City of Mankato in advance. *Applicant Response: Acknowledged.*
5. The applicant will be required to pay SAC & WAC connection charges based on the City of Mankato assessment policy and fee schedule. Applicant*Response: Acknowledged.*
6. Applicant shall be aware of and acknowledge previously provided Site Plan comments associated with the request for a Conditional Use Permit and Certificate of Design Compliance. *Applicant Response: Acknowledged.*
7. Applicant shall provide a figure demonstrating that the proposed sidewalk is fully contained within the South Riverfront Drive right-of-way. *Applicant Response: See Plan Sheet C3-00 Site Code Plan depicting the proposed right-of-way line in red.*
8. Applicant shall provide water quality computations for each of the stormwater chambers, supporting statements made in the drainage report memorandum. *Applicant Response: As stated in the ADS Isolator Row Plus product sheet, the device "is designed to capture the "first flush" runoff and offers the versatility to be sized on a volume or a flow basis." Given the site's limited storage capacity allowance, the devices were designed for treatment on a flow basis. The ADS MC-3500 Isolator Row Plus can treat 0.4 CFS per unit. 30 Isolator Flow Plus units will be installed on the north system and 20 will be installed on the south system. This sums to two rows in each system. This allows for 12 CFS to be treated within the north system and 8 CFS to be treated within the south system. Given a 100-yr flow rate of 8.95 CFS on the north system and 4.31 CFS on the south system, all the flows collected by the systems will be treated. Attached is the Isolator Row Plus product sheet defining the treatment capabilities and limitations of the device.*
9. Applicant shall provide details for the layout of stormwater chambers and outlet control structures. *Applicant Response: Details will be provided in final construction documents.*
10. Applicant shall be aware that the City of Mankato may require a separate maintenance agreement for the underground treatment mechanisms. *Applicant Response: Acknowledged*
11. Applicant shall verify that the existing storm sewer infrastructure on the site will be removed, with upstream and downstream points of removal capped or bulkheaded. Any remaining portion within the city right of way not proposed for removal shall be abandoned by sand/grout fill and bulkheaded. The applicant shall clearly label removal and/or abandonment with callout notes and plan sheet legend the 127", 72", 48", and 15" storm lines running through the site on the removal plans.*Applicant Response: Acknowledge*
12. Applicant shall provide justification for the 5% pass-by trip reduction applied to the multifamily residential land use (ITE LUC 221). Pass-by trip reductions are typically associated with commercial land uses that attract trips already traveling on the adjacent roadway system. Residential trips would generally be considered primary trips to or from the development.*Applicant Response: Acknowledged*
13. Applicant shall provide a transparent reconciliation of gross, internal-capture, pass-by, existing-site-credit, and net-new trips in a single table. The purpose would be to clearly depict how AM and PM trips were arrived at.*Applicant Response: This has been updated in the Traffic Impact Study.*
14. The applicant shall be aware of and acknowledge the following comments for any future zoning or building permit requests associated with the subject property.
    - It shall be noted in the plans that City Right of Way permit shall be obtained prior to any work being performed in the City's Right of Way.*Applicant Response: Acknowledged*
    - Full depth sawcuts shall be noted on removal plan sheets. *Applicant Response: Acknowledged*
    - Remainder of curb (80'-100') shall be removed on westerly side of S. Front Street; this will provide flexibility in construction of new sidewalk that is adjacent. *Applicant Response: Acknowledged*
    - All sanitary, water, and storm services that are not being utilized by the new development shall be identified by the design team and depicted on the removals plan. Those services shall be abandoned to the respective main line.*Applicant Response: All services to the best of our knowledge are shown as being abandoned to the mainline.*
    - Sewer and Water Services – Larger water services shall be wet-tapped if the condition of the pipe will permit. When the Public Safety Center was remodeled, they could not wet tap due to the condition on the outside of the pipe. Sizes of sewer and water services are not noted on the utility plan; due to that the recommended types of connection would be prescribed at a later date. Proposed sanitary services on S. Front Street will require a connection to clay pipe (N. Service) and a connection to truss pipe (S. Service); the design team to specify viable connections to those pipes. Coordinate with the City*Applicant Response: Acknowledged*
    - Proposed pipe sizes and materials need to be noted in the utility plan for storm, sanitary services, and water services. *Applicant Response: Information will be provided in final construction documents.*
    - Storm drain leads that connect to structures in the right of way shall be RCP. *Applicant Response: Acknowledged.*
    - Note that tracer wires shall be installed per Minnesota Rural Water Association current specification on water services. *Applicant Response: Acknowledged*
    - There are precast sanitary manholes adjacent to the two proposed services on Warren Street and service connections shall be made at adjacent precast sanitary manholes via an outside drop and modification to the bottom of the structure to add a dedicated invert for the new service. Connections to the manholes shall be cored and booted*Applicant Response: Acknowledged.*
    - Traffic Control Plan shall be incorporated into Civil Plans. Impacts to the right of way shall be phased and included in the traffic control plans. *Applicant Response: Traffic Control Plan will be submitted with the building permit.*
    - The applicant shall protect City Fiber optic conduits adjacent to the project. Any adjustment to handholes or conduits is the responsibility of the contractor. *Applicant Response: Acknowledged*
    - Applicant shall forward R/W tree planting plan to City Forester for review. *Applicant Response: Acknowledged*
    - Boulevard trees shall be replaced at a 2:1 ratio. *Applicant Response: Acknowledged*
    - Sidewalk tree planting detail shall match City specifications and coordinate with the City. *Applicant Response: Acknowledged*
    - Traffic signal systems adjacent to the site shall be protected during construction. Any adjustment to in-place handholes/conduits/wiring and protection of the signal system is the responsibility of the contractor.*Applicant Response: Acknowledged*
    - City Street Light Poles adjacent to the site shall be taken down during construction and salvaged to the City and reinstalled after sidewalk work is complete. Any needed replacement of street light pole bases/wiring/conduit is the responsibility of the contractor. Removal and replacement of street light pole bases adjacent to the improvement shall be required and noted in the plans.*Applicant Response: Acknowledged*
    - Any impacts on existing street striping, including parking stalls on S. Front Street and Warren Street, shall be included in the construction plans. *Applicant Response: Acknowledged*
    - Pavement (concrete and bituminous) section details shall be included in the plans. Street cuts shall match the existing pavement section.*Applicant Response: Acknowledged*
    - Applicable city standard plates shall be included in the plan set for right of way civil work. *Applicant Response: Acknowledged*
    - Note that driveway and sidewalk construction in the right of way shall be in conformance with Mn/DOT Standard Plans 5-297.250 &

5-297.254. *Applicant Response: Acknowledged*

Review

The applicant, ISG, on behalf of Front Street Plaza, LLC, is seeking a final plat review of Front Street Place subdivision. The purpose of the plat is to combine thirteen existing parcels into one block, totaling 2.5 acres.

The new Block 1 has two lots, 1B, which is .15 acres and Lot 1A, which is 2.35 acres. Also included in the plat are 3 areas proposed for right-of-way totaling 11 acres.

The property is currently served by public infrastructure. The applicant will need to cap/abandon any unused utility water and sanitary sewer services at the main and will be required to pay SAC and WAC connection fees. Connections fees will be based on uses within the building. Residential units will be required to pay 1 Residential Equivalent Unit for each dwelling unit. The applicant acknowledged these required fees. Additionally, the applicant will provide a plan to abandon the 127 inch, 72 inch and 48 inch storm lines running through the site within their development plans.

The plans for redevelopment propose a new mixed-use building to include a mix of residential units, offices, and commercial retail. A stand-alone office building is planned at the corner of Riverfront Dr. and Warren St. A three-story parking ramp is proposed along Riverfront Dr.

Access to the site will be provided from Warren Street and Liberty Street. The applicant has agreed to be a willing petitioner when any intersection improvements are proposed on adjacent roads.

The applicant has provided an updated stormwater report and a Traffic Impact Study.

The Planning Commission met on February 25, 2026, to review the preliminary plat. The conditions of approval have been addressed with this submission. Previous approvals can be viewed at the following links: preliminary plat, a conditional use permit, and certificate of design compliance.

Findings

Staff respectfully submits the following findings of fact:

1. General Requirements
    1. The site is designed in conformance with the existing location and width of streets, the general drainage situation, lot sizes and arrangement.
    2. An updated stormwater report has been submitted and will be reviewed for compliance with the City drainage/stormwater requirements.
    3. The applicant shall continue working with City Staff on a future bus stop location.
2. Streets
    1. The street right-of-way widths conform to the standards listed in Chapter 10 of the Mankato City Code.
    2. The applicant shall be a willing petitioner when any intersection improvements are proposed on adjacent roads.
3. Easements
    1. The final plat provides standard easements required in Chapter 10 of the Mankato City Code.
4. Block Standards
    1. The blocks within the subdivision were designed around the existing corridors.
5. Lot Standards
    1. The lots are designed in conformance with the standards set forth in Chapter 10.
6. Public Sites and Open Spaces
    1. The property was previously platted. Therefore, no parkland dedication or payment-in-lieu of parkland dedication is required.

Recommendation

Based on conformance with the conditions of the preliminary plat, staff recommends approval of the final plat.

Attachments

General Location Map

Aerial

Preliminary Plat

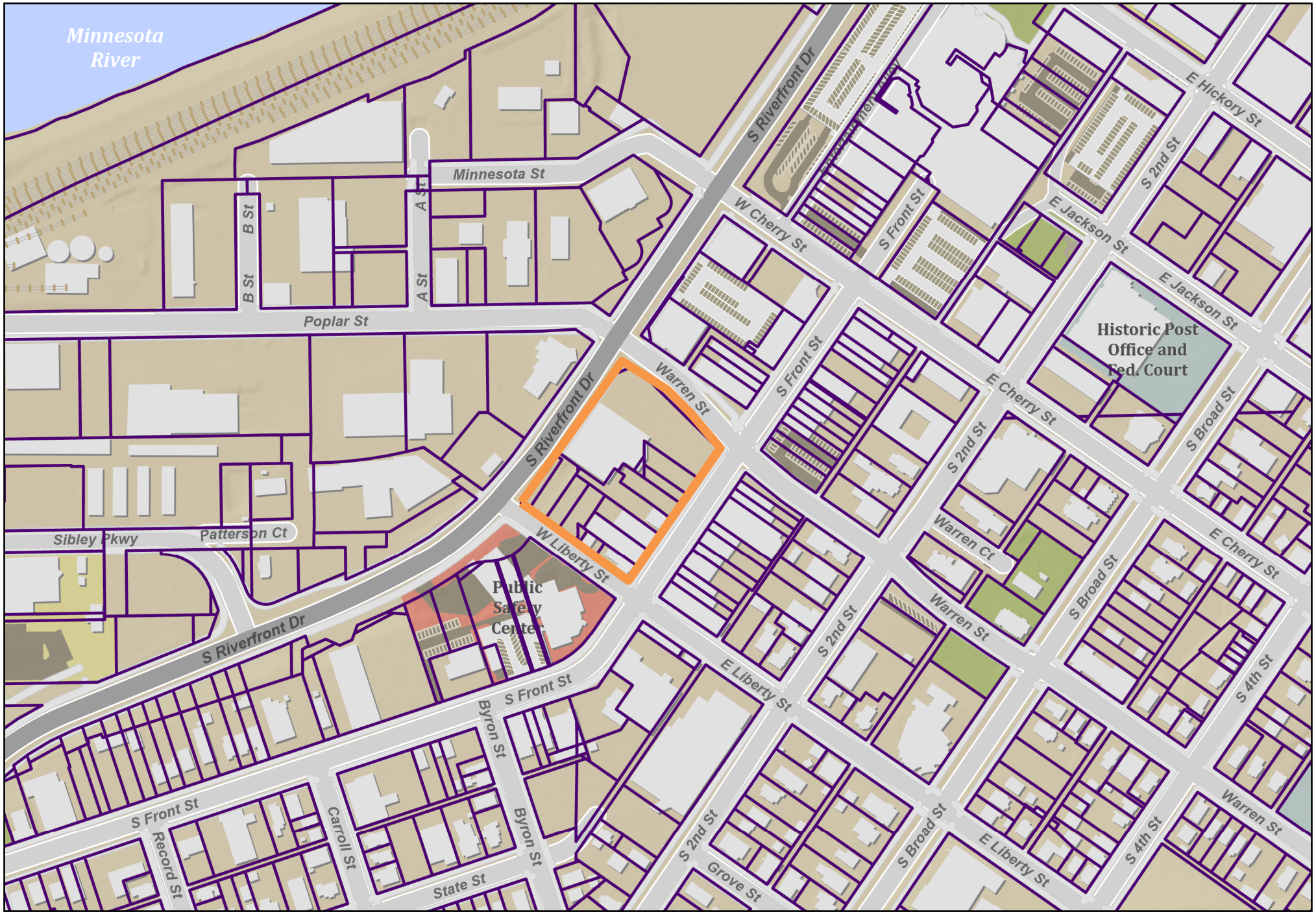
Final Plat

Site Plan

Stormwater & GeoTech Report

Traffic Study

General Location Map



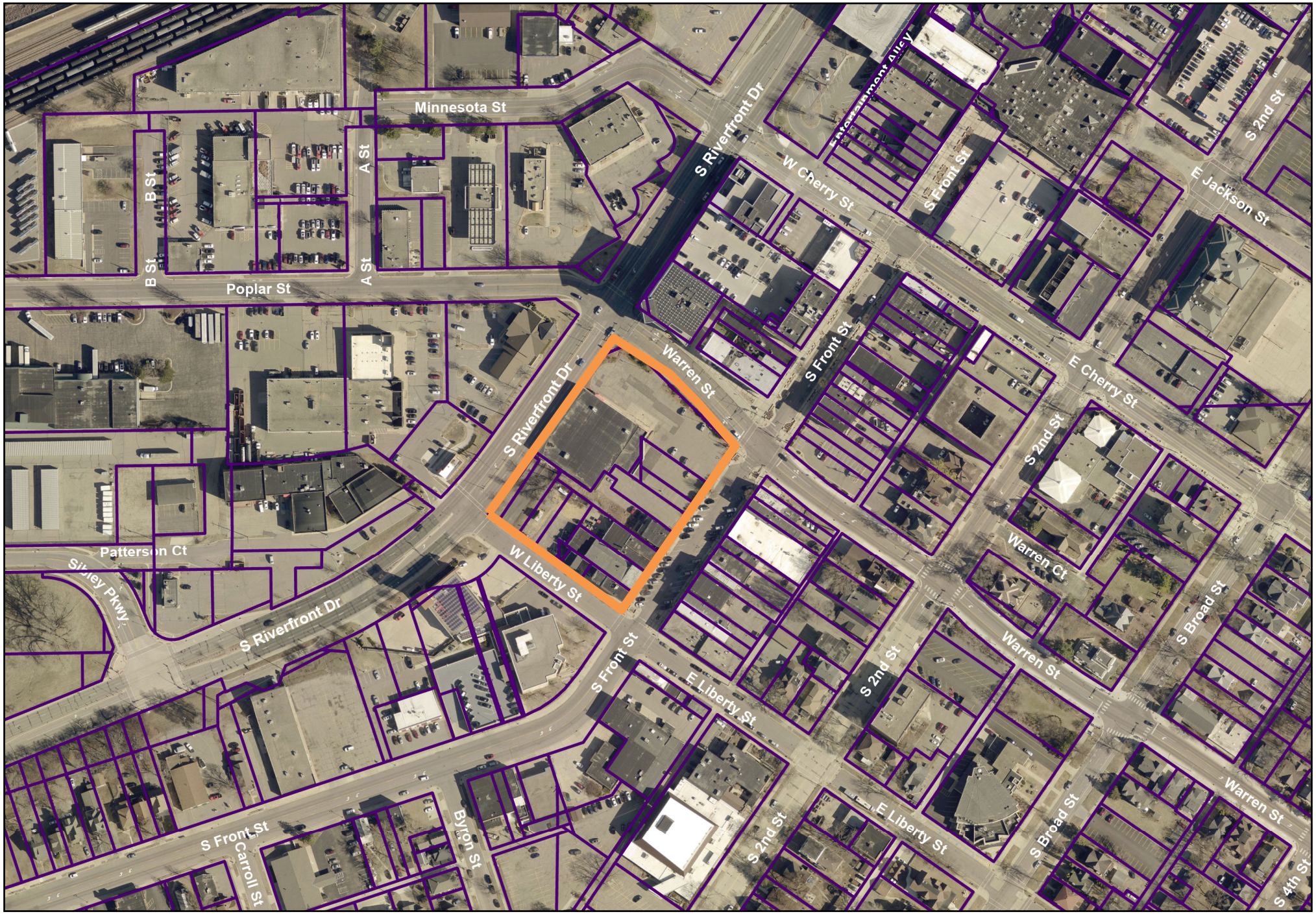
N W E S

0 0.08 0.2 0.3 mi

This information is to be used for reference purposes only. The City of Mankato does not guarantee accuracy of the material contained herein and is not responsible for misuse or misinterpretation.

Produced by: City of Mankato GIS
Published: October 26, 2026

Aerial Map



N W E S

0 0.07 0.1 0.3 mi

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Produced by: City of Mankato GIS
Published: October 26, 2026

Mankato — Leading the way...

FRONT STREET PLACE

EXISTING DESCRIPTION:

Parcel 1:

Lots 1, 2, 3, 13, 14 and 15 of Auditor's Plat No. 5 Mankato, Blue Earth County, Minnesota, excepting therefrom any portion thereof included within the following described land:

Exception No. 1:

Warren Street Subdivision, Blue Earth County, Minnesota.

Exception No. 2:

Pike Street Subdivision No. 2, City of Mankato, Blue Earth County, Minnesota.

Exception No. 3:

That part of Lot 14, Auditor's Plat No. 5, on file and of record with the Blue Earth County Recorder, described as: Commencing at the southeasterly corner of Lot 5, Block 9, City of Mankato by E.D. Bruner, according to the plat thereof on file and of record with the Blue Earth County Recorder; thence North 55°34'07" West, (assumed bearing), along the southwesterly line of said Lot 5, a distance of 94.84 feet; thence South 34°10'49" West, 70.00 feet to a point on the northeasterly line of said Lot 14, said point being the point of beginning; thence North 55°34'07" West, along said northeasterly line, 23.00 feet to a point on the easterly right of way line of South Riverfront Drive, (formerly Pike Street), according to the plat of Pike Street Subdivision No. 2, on file and of record with the Blue Earth County Recorder; thence South 35°28'28" West, along said easterly right of way line, 37.50 feet; thence North 66°42'42" East, 44.35 feet to the point of beginning.

(Abstract Property)

Parcel 2:

Easterly 157 feet of the northerly 22 feet of Lot 4 and also the easterly 143 feet of the middle 22 feet of said Lot 4 in Block 1, Warren's Addition to Mankato; otherwise also described as Lot 4 of Auditor's Plat No. 17 and light well on Lot 5 of said Auditor's Plat No. 17; also described as follows, viz:

Commencing at the northeast corner of Lot 4 of Auditor's Plat No. 5 in Block 1 of Warren's Addition to Mankato, being on the westerly line of Front Street in said City of Mankato, running thence westerly along the northerly line of said Lot 4, 157 feet, thence southerly on a line parallel with said westerly line of Front Street 22 feet, thence easterly on a line parallel with the northerly line of said Lot 4, 14 feet, thence southerly on a line parallel with the said westerly line of Front Street 22 feet, thence easterly along the southerly line of said Lot 4, 143 feet to the westerly line of Front Street, thence northerly along the westerly line of Front Street, 44 feet to the place of beginning.

(Torrens Property - Certificate of Title No. 15256)

Parcel 3:

Outlot B, Pike Street Subdivision No. 3, City of Mankato, Blue Earth County, Minnesota.

(Abstract Property)

Parcel 4:

Lots 5 and 6, and the vacated alley adjacent thereto, of Auditor's Plat No. 17, Rearrangement of part of Auditor's Plat No. 5, City of Mankato.

(Abstract Property)

Parcel 5:

Lot Twelve (12), Auditor's Plat #17, Re-Arrangement of part of Auditor's Plat #5, except: All that part of Lot No. 12 lying East of Southerly extension of Westerly line of Lot No. 8, both of said lots being in the City of Mankato and according to Auditor's Plat #17.

PID: R01.09.18.151.009

Parcel 6:

That part of Lot Sixteen (16), Auditor's Plat #17, Rearrangement of Auditor's Plat #5, described as follows: Commencing at the Northwest corner of Lot Six (6), Auditor's Plat #17, Rearrangement of Auditor's Plat #5, thence Southerly along the Westerly line of said Lot Six (6), a distance of 37 feet, thence Westerly to the Southeast corner of Lot Twenty-one (21), Auditor's Plat #17, Rearrangement of Auditor's Plat #5, thence Northerly 37 feet along the Easterly line of said Lot Twenty-one (21), thence Easterly to the point of beginning, according to the plat thereof on file and of record in the office of the Register of Deeds, Blue Earth County, Minnesota;

AND

Lot Twenty-one (21), Auditor's Plat #17, Re-Arrangement of Part of Auditor's Plat #5, according to the Plat thereof on file and of record In the office of the Register of Deeds in and for the County of Blue Earth, Stale of Minnesota.

Parcel 7

Westerly 48 feet of the following described parcel: The Easterly 140 feet of Lots 9 and 10 of Auditior's Plat No. 5, Mankato, of Block 84, Bruners Plat of Mankato, Lot 1 and part of Lot 2 of Van Brunt's North Row, Block 2 of Oakwood Addition to Mankato, and Block 1 Warrens Addition to Mankato, said tract of land fronting on Front Street in said City 38 feet and extending along Liberty Street a distance of 140 feet and being rectangular in form; and being otherwise described as: Commencing at the intersection of the westerly line of Front Street with the northerly line of Liberty Street; running thence northerly along said westerly line of Front Street a distance of 38 feet; thence running westerly along the northerly line of said Lot 9, parallel with Liberty Street, a distance of 140 feet; running thence southerly parallel with Front Street a distance of 38 feet to said northerly line of Liberty Street; running thence easterly along said northerly line of Liberty Street a distance of 140 feet to the place of beginning.

Parcel 8

Lot 7, Auditor's Plat No.17, Rearrangement of Part of Auditor's Plat No. 5, Mankato, Blue Earth County, Minnesota.

Parcel 9

Lot Eight (8), Auditor's Plat No.17, Rearrangement of Part of Auditor's Plat No. 5, Mankato, Blue Earth County, Minnesota

and

A) Part of Lots Nine (9) and Ten (10) Auditor's Plat No. 5 and a part of Lot Twelve (12) Auditor's Plat No.17, Mankato, Minnesota legally described as follows: Commencing at the southwesterly corner of Lot 8, Auditor's Plat No. 17, thence southwesterly along an extension of the westerly boundary line of Lot 8, extended to the northeasterly boundary line of Liberty Street, Mankato, thence southeasterly along the northeasterly boundary line of Liberty Street 10 feet, thence at right angles northeasterly 38 feet to the southwesterly line of Lot 8, thence at right angles along the southwesterly line of said Lot 8, Ten (10) feet to the place of beginning.

B) All that part of Lot 9 according to Auditor's Plat No. 5 lying West of the southerly extension of the westerly line of Lot No. 8, according to Auditor's Plat No. 17, both of said Lots being in the City of Mankato, also being described as all the the northwesterly part of Lot Nine (9) according to Auditor's Plat No. 5, lying northwesterly of the northwesterly line of Lots Seven (7) & Eight (8) according to Auditor's Plat No. 17, if extended to Liberty Street.

Parcel 10

The Easterly 92 feet of the following described parcel: The Easterly 140 feet of Lots 9 and 10 of Auditior's Plat No. 5, Mankato, of Block 84, Bruners Plat of Mankato, Lot 1 and part of Lot 2 of Van Brunt's North Row, Block 2 of Oakwood Addition to Mankato, and Block 1 Warrens Addition to Mankato, said tract of land fronting on Front Street in said City 38 feet and extending along Liberty Street a distance of 140 feet and being rectangular in form; and being otherwise described as: Commencing at the intersection of the westerly line of Front Street with the northerly line of Liberty Street; running thence northerly along said westerly line of Front Street a distance of 38 feet; thence running westerly along the northerly line of said Lot 9, parallel with Liberty Street, a distance of 140 feet; running thence southerly parallel with Front Street a distance of 38 feet to said northerly line of Liberty Street; running thence easterly along said northerly line of Liberty Street a distance of 140 feet to the place of beginning. Together with a license to encroach on the Easterly 12 feet of the property adjacent to the West of the described property.

Parcel 11

Real property in the City of Mankato, County of Blue Earth, State of Minnesota described as follows:

Commencing at the northeast corner (the same being the most easterly corner) of Lot Sixteen (16) of Auditor's Plat No. 17, which said plat is a rearrangement of a part of Auditor's Plat No. 5 of Blue Earth County, Minnesota, Thence westerly along the most northerly line of said Lot Sixteen (16), to a point where said line intersects the town line between Section Eighteen (18) in Township One Hundred Eight (108) North of Range Twenty-Six West, and Section Thirteen (13) in Township One Hundred Eight (108) North of Range Twenty-Seven (27) West, thence southerly on said town line to a point where said town line intersects the easterly line of said Lot Sixteen (16) and thence in a straight line along the most easterly side of said Lot Sixteen (16) to the point of commencement.

EXISTING DESCRIPTION con't.:

Parcel 12:

Outlot A, Warren Street Subdivision, Blue Earth County, Minnesota.

Parcel 13:

Outlot A, Pike Street Subdivision No. 3, City of Mankato, Blue Earth County, Minnesota.

Parcel 14:

That part of Lot 14, Auditor's Plat No. 5, on file and of record with the Blue Earth County Recorder, described as: Commencing at the southeasterly corner of Lot 5, Block 9, City of Mankato by E.D. Bruner, according to the plat thereof on file and of record with the Blue Earth County Recorder; thence North 55°34'07" West, (assumed bearing), along the southwesterly line of said Lot 5, a distance of 94.84 feet; thence South 34°10'49" West, 70.00 feet to a point on the northeasterly line of said Lot 14, said point being the point of beginning; thence North 55°34'07" West, along said northeasterly line, 23.00 feet to a point on the easterly right of way line of South Riverfront Drive, (formerly Pike Street), according to the plat of Pike Street Subdivision No. 2, on file and of record with the Blue Earth County Recorder; thence South 35°28'28" West, along said easterly right of way line, 37.50 feet; thence North 66°42'42" East, 44.35 feet to the point of beginning.

OWNERS / DEVELOPERS:
Front Street Plaza, LLC
100 Warren Street Suite 317
Mankato, MN 56001

SURVEYOR:
ISG
115 E. Hickory Street Suite 300
Mankato, MN 56001
(507)-387-6651

AREA TABLE:
Lot 1A Block 1 = 102,446 sq. ft. - 2.35 acres
Lot 1B Block 1 = 6,590 sq. ft. - 0.15 acres
Right of Way = 4,788 sq. ft. - 0.11 acres
Total = 113,824 sq. ft. - 2.61 acres

EXISTING PROPERTY:
ZONED: CBD - F (Central Business District - Fringe) (Per City of Mankato website)

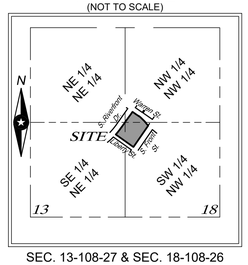
Setbacks - none

BENCHMARK:
Top nut fire hydrant located at northeast corner of South Riverfront Drive and Warren Street.
Elev=779.68 (NAVD88)

FLOOD ZONE:
Part of the surveyed premises shown on this survey map is in Flood Zone X (areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less that 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood)), according to Flood Insurance Rate Map Community Panel No. 27013C0092F, published by the Federal Emergency Management Agency, effective date February 22, 2024.

BEARING NOTE:
Bearings shown hereon are based upon westerly line of South Front Street. Said line bears South 34 degrees 24 minutes 35 seconds West.

VICINITY MAP
(NOT TO SCALE)



SEC. 13-108-27 & SEC. 18-108-26
Blue Earth County, Minnesota

ISG

I HEREBY CERTIFY THAT THIS SURVEY, PLAN, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED LAND SURVEYOR UNDER THE LAWS OF THE STATE OF MINNESOTA.

RYAN E. KOTTHOFF

DATE 10/14/26 LIC. NO. 61565

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PROJECT

FRONT STREET PLAZA MIXED-USE DEVELOPMENT

MANKATO MINNESOTA

REVISION SCHEDULE

DATE	DESCRIPTION	BY
1/26/26	Added City Parcels	KH
10/14/26	Added Additional R/W S. Riverfront Drive	KH

PROJECT NO.	25-33587
FILE NAME	33587 PPLAT
DRAWN BY	KH
DESIGNED BY	---
REVIEWED BY	---
ORIGINAL ISSUE DATE	1/22/26
CLIENT PROJECT NO.	-

TITLE

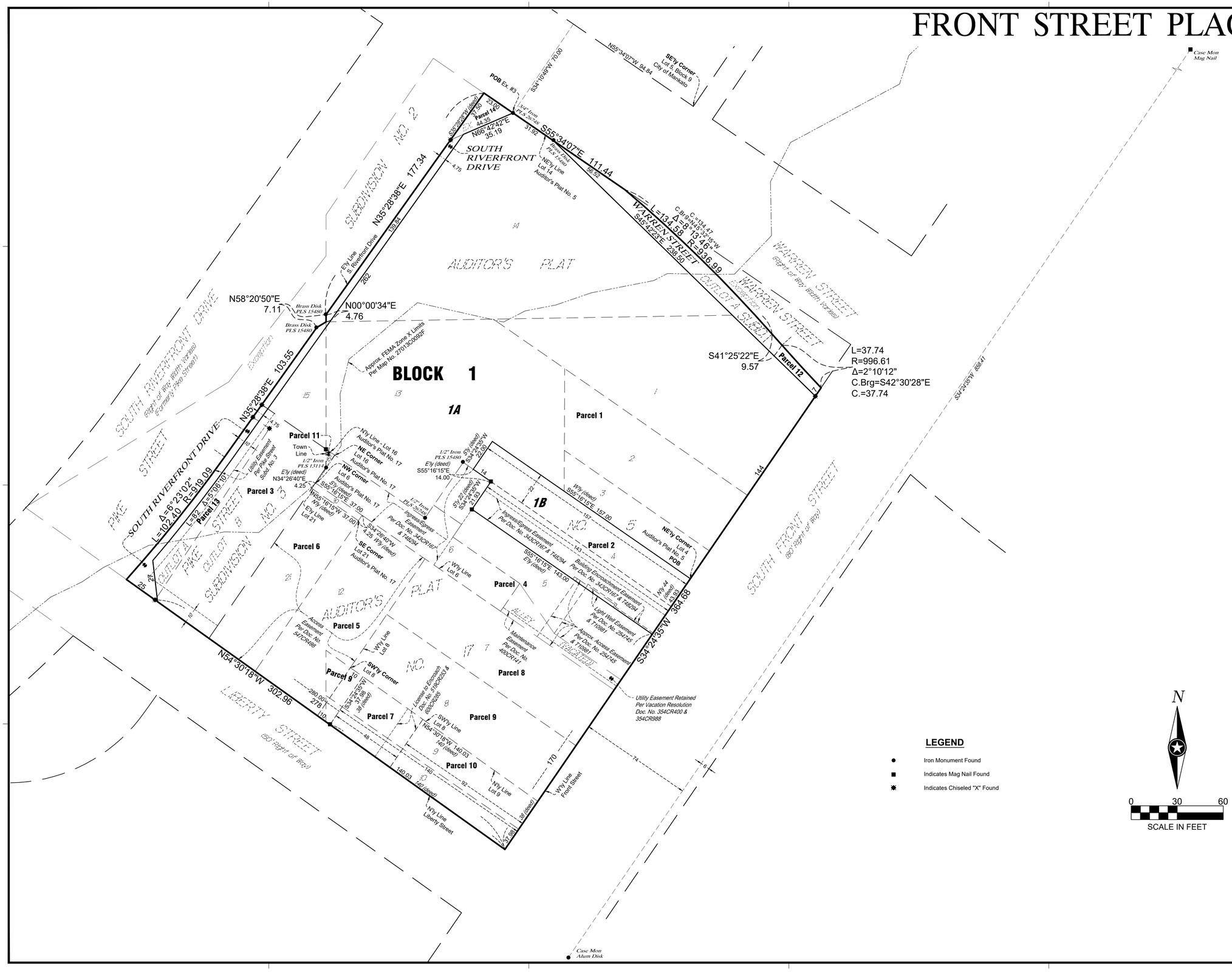
PRELIMINARY PLAT

SHEET

1

OF 3

FRONT STREET PLACE



LEGEND

- ● Iron Monument Found
- ■ Indicates Mag Nail Found
- ✱ Indicates Chiseled "X" Found

N

0 30 60

SCALE IN FEET

ISG

I HEREBY CERTIFY THAT THIS SURVEY, PLAN, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED LAND SURVEYOR UNDER THE LAWS OF THE STATE OF MINNESOTA.

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PROJECT

FRONT STREET PLAZA MIXED-USE DEVELOPMENT

MANKATO MINNESOTA

REVISION SCHEDULE

DATE	DESCRIPTION	BY
1/26/26	Added City Parcels	KH
10/16/26	Added Additional R/W S. Riverfront Drive	KH

PROJECT NO.	25-33587
FILE NAME	33587 PPLAT
DRAWN BY	KH
DESIGNED BY	---
REVIEWED BY	---
ORIGINAL ISSUE DATE	1/22/26
CLIENT PROJECT NO.	-

TITLE

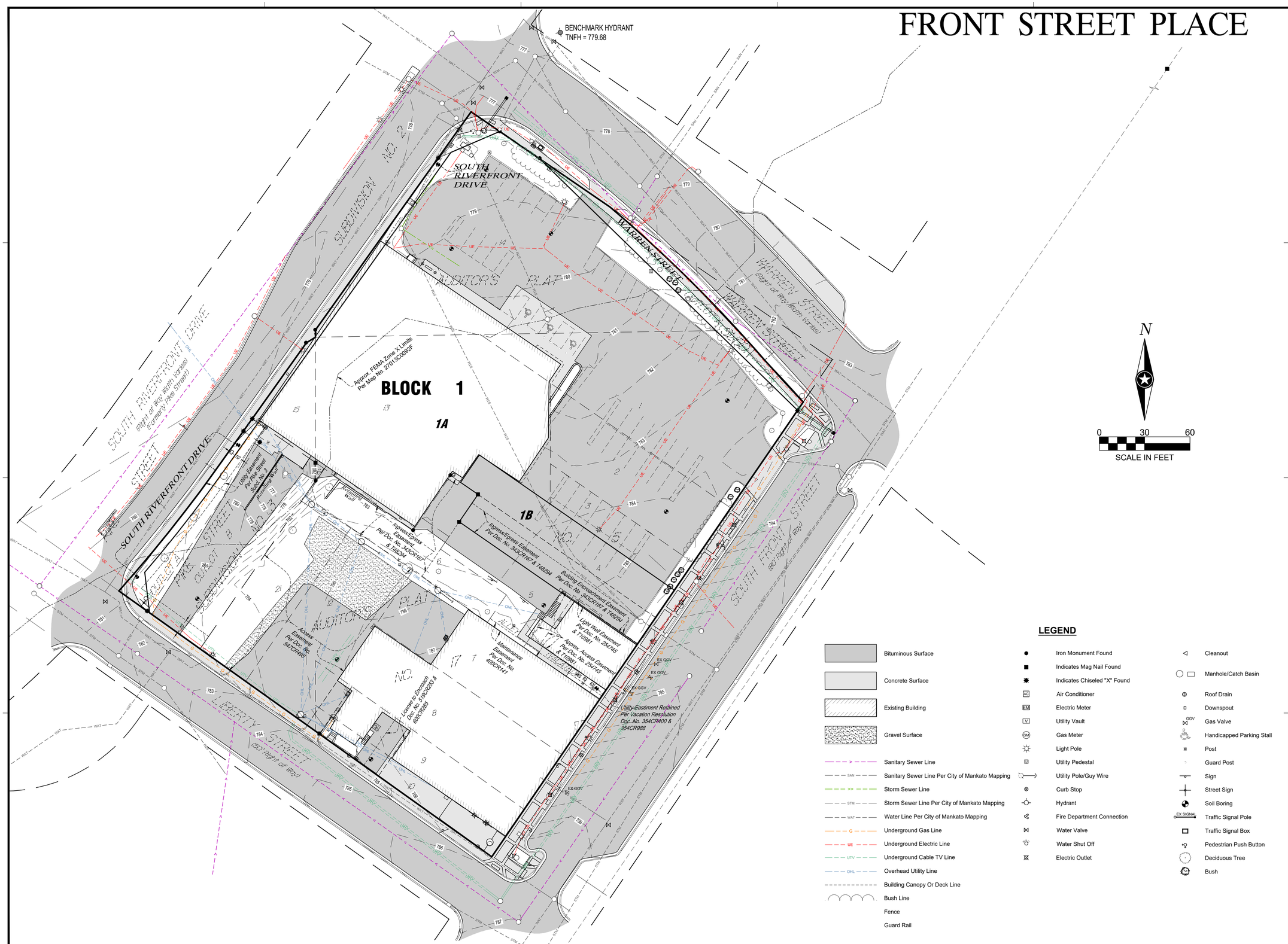
PRELIMINARY PLAT

SHEET

2

OF 3

FRONT STREET PLACE



N

0 30 60

SCALE IN FEET

LEGEND

- Bituminous Surface
- Concrete Surface
- Existing Building
- Gravel Surface
- Sanitary Sewer Line
- Sanitary Sewer Line Per City of Mankato Mapping
- Storm Sewer Line
- Storm Sewer Line Per City of Mankato Mapping
- Water Line Per City of Mankato Mapping
- Underground Gas Line
- Underground Electric Line
- Underground Cable TV Line
- Overhead Utility Line
- Building Canopy Or Deck Line
- Bush Line
- Fence
- Guard Rail
- Iron Monument Found
- Indicates Mag Nail Found
- Indicates Chiseled "X" Found
- Air Conditioner
- Electric Meter
- Utility Vault
- Gas Meter
- Light Pole
- Utility Pedestal
- Utility Pole/Guy Wire
- Curb Stop
- Hydrant
- Fire Department Connection
- Water Valve
- Water Shut Off
- Electric Outlet
- Cleanout
- Manhole/Catch Basin
- Roof Drain
- Downspout
- Gas Valve
- Handicapped Parking Stall
- Post
- Guard Post
- Sign
- Street Sign
- Soil Boring
- Traffic Signal Pole
- Traffic Signal Box
- Pedestrian Push Button
- Deciduous Tree
- Bush

ISG

I HEREBY CERTIFY THAT THIS SURVEY, PLAN, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED LAND SURVEYOR UNDER THE LAWS OF THE STATE OF MINNESOTA.

RYAN E. KOTTHOFF

DATE 10/14/26 LIC. NO. 61565

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PROJECT

FRONT STREET PLAZA MIXED-USE DEVELOPMENT

MANKATO MINNESOTA

REVISION SCHEDULE

DATE	DESCRIPTION	BY
1/26/26	Added City Parcels	KH
10/14/26	Added Additional R/W S. Riverfront Drive	KH

PROJECT NO.	25-33587
FILE NAME	33587 PPLAT
DRAWN BY	KH
DESIGNED BY	---
REVIEWED BY	---
ORIGINAL ISSUE DATE	--/--/--
CLIENT PROJECT NO.	-

TITLE

PRELIMINARY PLAT

SHEET

3

OF 3

FINAL PLAT FOR REVIEW

FRONT STREET PLACE

INSTRUMENT OF DEDICATION

KNOW ALL PERSONS BY THESE PRESENTS: That Front Street Plaza, LLC, a Minnesota limited liability company, owner of the following described property:

Lots 1, 2, 3, 13, 14 and 15 of Auditor's Plat No. 5 Mankato, Blue Earth County, Minnesota, excepting therefrom any portion thereof included within the following described land:

Exception No. 1:

Warren Street Subdivision, Blue Earth County, Minnesota.

Exception No. 2:

Pike Street Subdivision No. 2, City of Mankato, Blue Earth County, Minnesota.

Exception No. 3:

That part of Lot 14, Auditor's Plat No. 5, on file and of record with the Blue Earth County Recorder, described as: Commencing at the southeasterly corner of Lot 5, Block 9, City of Mankato by E.D. Bruner, according to the plat thereof on file and of record with the Blue Earth County Recorder; thence North 55°34'07" West, (assumed bearing), along the southwesterly line of said Lot 5, a distance of 94.84 feet; thence South 34°10'49" West, 70.00 feet to a point on the northeasterly line of said Lot 14, said point being the point of beginning; thence North 55°34'07" West, along said northeasterly line, 23.00 feet to a point on the easterly right of way line of South Riverfront Drive, (formerly Pike Street), according to the plat of Pike Street Subdivision No. 2, on file and of record with the Blue Earth County Recorder; thence South 35°28'28" West, along said easterly right of way line, 37.50 feet; thence North 66°42'42" East, 44.35 feet to the point of beginning.

(Abstract Property)

AND

Easterly 157 feet of the northerly 22 feet of Lot 4 and also the easterly 143 feet of the middle 22 feet of said Lot 4 in Block 1, Warren's Addition to Mankato; otherwise also described as Lot 4 of Auditor's Plat No. 17 and light well on Lot 5 of said Auditor's Plat No. 17; also described as follows, viz:

Commencing at the northeast corner of Lot 4 of Auditor's Plat No. 5 in Block 1 of Warren's Addition to Mankato, being on the westerly line of Front Street in said City of Mankato, running thence westerly along the northerly line of said Lot 4, 157 feet, thence southerly on a line parallel with said westerly line of Front Street 22 feet, thence easterly on a line parallel with the northerly line of said Lot 4, 14 feet, thence southerly on a line parallel with the said westerly line of Front Street 22 feet, thence easterly along the southerly line of said Lot 4, 143 feet to the westerly line of Front Street, thence northerly along the westerly line of Front Street, 44 feet to the place of beginning.

(Torrens Property - Certificate of Title No. 15256)

AND

Outlot B, Pike Street Subdivision No. 3, City of Mankato, Blue Earth County, Minnesota.

(Abstract Property)

AND

Lots 5 and 6, and the vacated alley adjacent thereto, of Auditor's Plat No. 17, Rearrangement of part of Auditor's Plat No. 5, City of Mankato.

(Abstract Property)

AND

Lot Twelve (12), Auditor's Plat #17, Re-Arrangement of part of Auditor's Plat #5, except: All that part of Lot No. 12 lying East of Southerly extension of Westerly line of Lot No. 8, both of said lots being in the City of Mankato and according to Auditor's Plat #17.

and

That part of Lot Sixteen (16), Auditor's Plat #17, Rearrangement of Auditor's Plat #5, described as follows: Commencing at the Northwest corner of Lot Six (6), Auditor's Plat #17, Rearrangement of Auditor's Plat #5, thence Southerly along the Westerly line of said Lot Six (6), a distance of 37 feet, thence Westerly to the Southeast corner of Lot Twenty-one (21), Auditor's Plat #17, Rearrangement of Auditor's Plat #5, thence Northerly 37 feet along the Easterly line of said Lot Twenty-one (21), thence Easterly to the point of beginning, according to the plat thereof on file and of record in the office of the Register of Deeds, Blue Earth County, Minnesota;

and

Lot Twenty-one (21), Auditor's Plat #17, Re-Arrangement of Part of Auditor's Plat #5, according to the Plat thereof on file and of record In the office of the Register of Deeds in and for the County of Blue Earth, Stale of Minnesota.

AND

Westerly 48 feet of the following described parcel: The Easterly 140 feet of Lots 9 and 10 of Auditior's Plat No. 5, Mankato, of Block 84, Bruners Plat of Mankato, Lot 1 and part of Lot 2 of Van Brunt's North Row, Block 2 of Oakwood Addition to Mankato, and Block 1 Warrens Addition to Mankato, said tract of land fronting on Front Street in said City 38 feet and extending along Liberty Street a distance of 140 feet and being rectangular in form; and being otherwise described as: Commencing at the intersection of the westerly line of Front Street with the northerly line of Liberty Street; running thence northerly along said westerly line of Front Street a distance of 38 feet; thence running westerly along the northerly line of said Lot 9, parallel with Liberty Street, a distance of 140 feet; running thence southerly parallel with Front Street a distance of 38 feet to said northerly line of Liberty Street; running thence easterly along said northerly line of Liberty Street a distance of 140 feet to the place of beginning.

AND

Lot 7, Auditor's Plat No.17, Rearrangement of Part of Auditor's Plat No. 5, Mankato, Blue Earth County, Minnesota.

AND

Lot Eight (8), Auditor's Plat No.17, Rearrangement of Part of Auditor's Plat No. 5, Mankato, Blue Earth County, Minnesota

and

A) Part of Lots Nine (9) and Ten (10) Auditor's Plat No. 5 and a part of Lot Twelve (12) Auditor's Plat No.17, Mankato, Minnesota legally described as follows: Commencing at the southwesterly corner of Lot 8, Auditor's Plat No. 17, thence southwesterly along an extension of the westerly boundary line of Lot 8, extended to the northeasterly boundary line of Liberty Street, Mankato, thence southeasterly along the northeasterly boundary line of Liberty Street 10 feet, thence at right angles northeasterly 38 feet to the southwesterly line of Lot 8, thence at right angles along the southwesterly line of said Lot 8, Ten (10) feet to the place of beginning.

B) All that part of Lot 9 according to Auditor's Plat No. 5 lying West of the southerly extension of the westerly line of Lot No. 8, according to Auditor's Plat No. 17, both of said Lots being in the City of Mankato, also being described as all the the northwesterly part of Lot Nine (9) according to Auditor's Plat No. 5, lying northwesterly of the northwesterly line of Lots Seven (7) & Eight (8) according to Auditor's Plat No. 17, if extended to Liberty Street.

AND

The Easterly 92 feet of the following described parcel: The Easterly 140 feet of Lots 9 and 10 of Auditior's Plat No. 5, Mankato, of Block 84, Bruners Plat of Mankato, Lot 1 and part of Lot 2 of Van Brunt's North Row, Block 2 of Oakwood Addition to Mankato, and Block 1 Warrens Addition to Mankato, said tract of land fronting on Front Street in said City 38 feet and extending along Liberty Street a distance of 140 feet and being rectangular in form; and being otherwise described as: Commencing at the intersection of the westerly line of Front Street with the northerly line of Liberty Street; running thence northerly along said westerly line of Front Street a distance of 38 feet; thence running westerly along the northerly line of said Lot 9, parallel with Liberty Street, a distance of 140 feet; running thence southerly parallel with Front Street a distance of 38 feet to said northerly line of Liberty Street; running thence easterly along said northerly line of Liberty Street a distance of 140 feet to the place of beginning. Together with a license to encroach on the Easterly 12 feet of the property adjacent to the West of the described property.

AND

Real property in the City of Mankato, County of Blue Earth, State of Minnesota described as follows:

Commencing at the northeast corner (the same being the most easterly corner) of Lot Sixteen (16) of Auditor's Plat No. 17, which said plat is a rearrangement of a part of Auditor's Plat No. 5 of Blue Earth County, Minnesota, Thence westerly along the most northerly line of said Lot Sixteen (16), to a point where said line intersects the town line between Section Eighteen (18) in Township One Hundred Eight (108) North of Range Twenty-Six West, and Section Thirteen (13) in Township One Hundred Eight (108) North of Range Twenty-Seven (27) West, thence southerly on said town line to a point where said town line intersects the easterly line of said Lot Sixteen (16) and thence in a straight line along the most easterly side of said Lot Sixteen (16) to the point of commencement.

Has caused the same to be surveyed and platted as **FRONT STREET PLACE** and does hereby dedicate to the public, for public use, the public ways as created by this plat.

In witness whereof said Front Street Plaza, LLC, a Minnesota limited liability company, has caused these presents to be signed by its proper officer this _____ day of _____, 20_____.

Signed: Front Street Plaza, LLC

_____
Bryan Sowers, President
State of _____
County of _____

This instrument was acknowledged before me on _____, 20_____ by Bryan Sowers, President, of Front Street Plaza, LLC, a Minnesota limited liability company.

_____(sign)

_____(print)
Notary Public _____
My Commission Expires _____

AND

KNOW ALL PERSONS BY THESE PRESENTS: That the City of Mankato, a Minnesota municipal corporation, owner of the following described property:

Outlot A, Warren Street Subdivision, Blue Earth County, Minnesota.

AND

Outlot A, Pike Street Subdivision No. 3, City of Mankato, Blue Earth County, Minnesota.

AND

That part of Lot 14, Auditor's Plat No. 5, on file and of record with the Blue Earth County Recorder, described as: Commencing at the southeasterly corner of Lot 5, Block 9, City of Mankato by E.D. Bruner, according to the plat thereof on file and of record with the Blue Earth County Recorder; thence North 55°34'07" West, (assumed bearing), along the southwesterly line of said Lot 5, a distance of 94.84 feet; thence South 34°10'49" West, 70.00 feet to a point on the northeasterly line of said Lot 14, said point being the point of beginning; thence North 55°34'07" West, along said northeasterly line, 23.00 feet to a point on the easterly right of way line of South Riverfront Drive, (formerly Pike Street), according to the plat of Pike Street Subdivision No. 2, on file and of record with the Blue Earth County Recorder; thence South 35°28'28" West, along said easterly right of way line, 37.50 feet; thence North 66°42'42" East, 44.35 feet to the point of beginning.

Has caused the same to be surveyed and platted as **FRONT STREET PLACE** and does hereby dedicate to the public, for public use, the public ways as created by this plat.

In witness whereof said City of Mankato, a Minnesota municipal corporation, has caused these presents to be signed by its proper officer this _____ day of _____, 20_____.

_____ _____
Mayor City Manager

State of _____
County of _____

This instrument was acknowledged before me on _____, 20_____ by _____, Mayor of the City of Mankato, and by _____, City Manager, of City of Mankato, a Minnesota municipal corporation.

_____(sign)

_____(print)
Notary Public _____
My Commission Expires _____

SURVEYOR'S CERTIFICATE

I, Ryan E. Kotthoff, do hereby certify that this plat was prepared by me or under my direct supervision; that I am a duly Licensed Land Surveyor in the State of Minnesota; that this plat is a correct representation of the boundary survey; that all mathematical data and labels are correctly designated on this plat; that all monuments depicted on this plat have been or, will be correctly set within one year; that all water boundaries and wet lands, as defined in Minnesota Statutes, Section 505.01, Subd. 3, as of the date of this certificate are shown and labeled on this plat; and all public ways are shown and labeled on this plat.

Dated this _____ day of _____, 20_____.

_____
Ryan E. Kotthoff, Licensed Land Surveyor
Minnesota License No. 61565

State of Minnesota
County of Blue Earth

This instrument was acknowledged before me on _____, 20_____ by Ryan E. Kotthoff, Licensed Land Surveyor.

_____
Kent A. Hays
Notary Public, Minnesota
My Commission Expires Jan. 31, 2030

MANKATO PLANNING COMMISSION

Be it known that on this _____ day of _____, 20_____, the Planning Commission of the City of Mankato did duly review this plat of **FRONT STREET PLACE** .

_____ _____
Chair Person Secretary

CITY COUNCIL, CITY OF MANKATO, MINNESOTA

This plat of **FRONT STREET PLACE** , was approved and accepted by the City Council of the City of Mankato, Minnesota at a regular meeting thereof held this _____ day of _____, 20_____, and said plat is in compliance with the provisions of Minnesota Statutes, Section 505.03, Subd. 2.

_____ _____
Mayor Clerk

TITLE OPINION

I, Abbie, S. Olson, Licensed Attorney, State of Minnesota, do hereby certify that the owners as indicated hereon represent all ownership interest in the land encompassed by this plat.

_____
Abbie, S. Olson, Licensed Attorney

BLUE EARTH COUNTY PROPERTY AND ENVIRONMENTAL RESOURCES

I hereby certify that there are no delinquent taxes and/or delinquent special assessments, that the current taxes have ben paid and that the transfer has been entered on the land described herein on the _____ day of _____, 20_____.

_____
Blue Earth County Property and Environmental Resources Director

COUNTY RECORDER, BLUE EARTH COUNTY, MINNESOTA

I hereby certify that this plat of **FRONT STREET PLACE** was filed in the office of the County Recorder for public record on this _____ day of _____, 20_____, at _____ o'clock _____.M. and was duly filed in Book _____ of Plats, page _____, as Document No. _____.

_____
Blue Earth County, County Recorder

REGISTRAR OF TITLES, BLUE EARTH COUNTY, MINNESOTA

I hereby certify that this plat of **FRONT STREET PLACE** was filed in the office of the Registrar of Titles for public record on this _____ day of _____, 20_____, at _____ o'clock _____.M. and was duly filed in Book _____ of Plats, page _____, as Document No: _____.

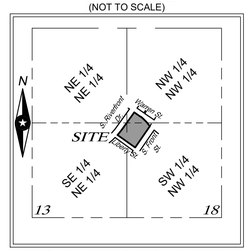
_____
Blue Earth County, Registrar of Titles

ISG

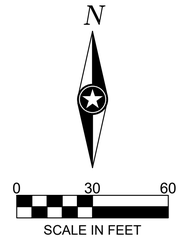
JOB # 33587 DATE: 10/14/26

FRONT STREET PLACE

VICINITY MAP
(NOT TO SCALE)



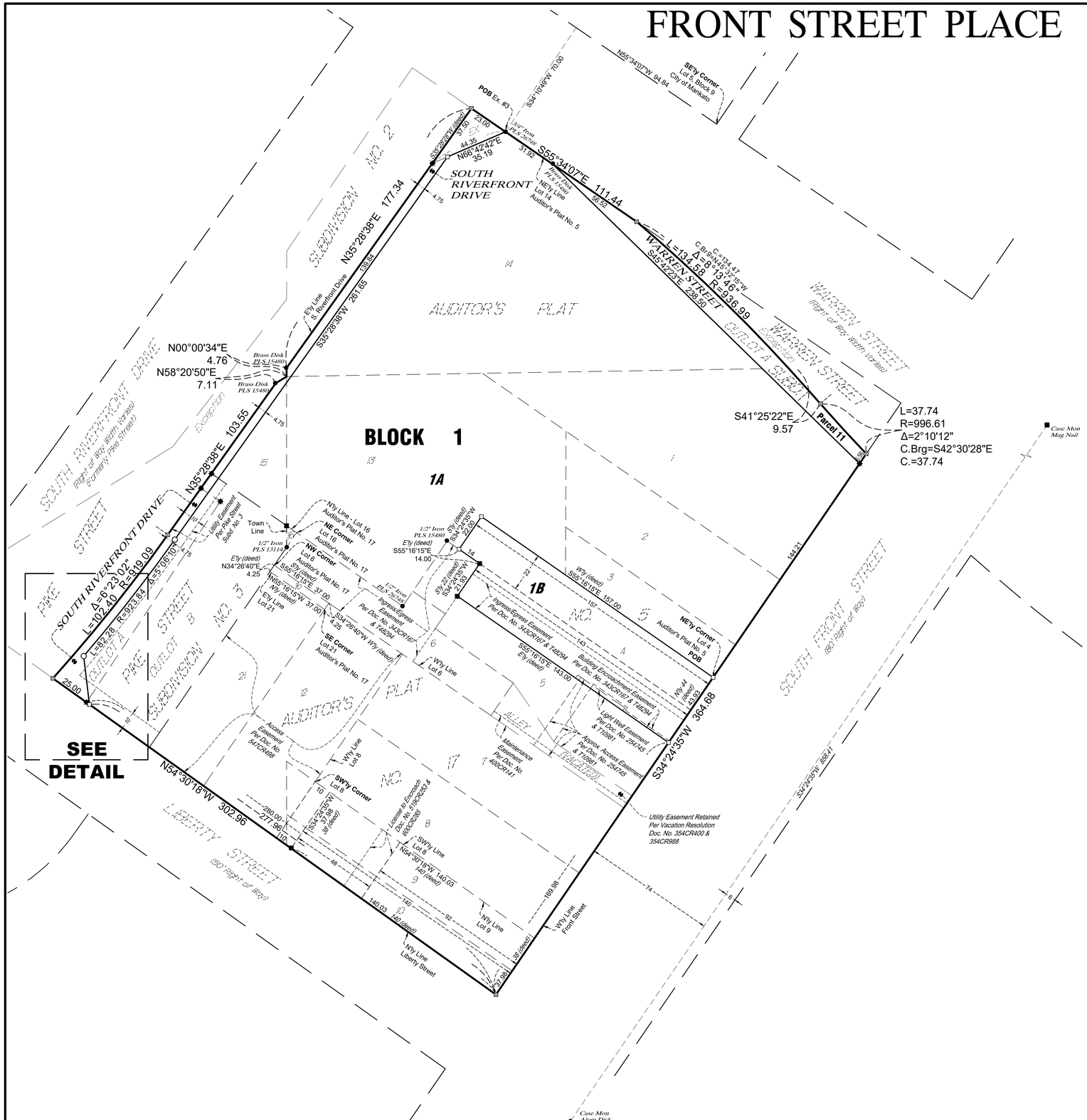
SEC. 13-108-27 & SEC. 18-108-26
Blue Earth County, Minnesota



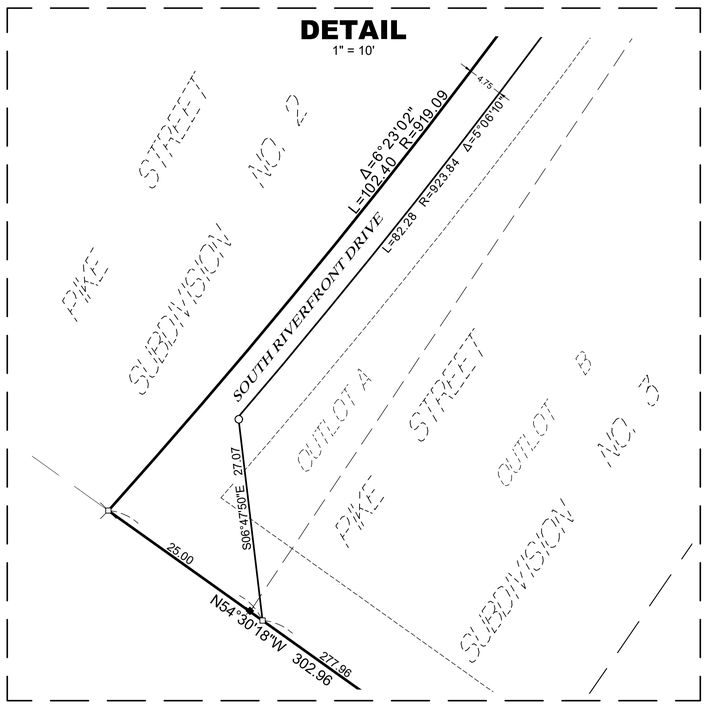
BEARING NOTE:
The orientation of this bearing system is based on the westerly line of South Front Street. Said line bears South 34 degrees 24 minutes 35 seconds West.

LEGEND

- ● Iron Monument Found
- ■ Indicates Mag Nail Found
- ✸ Indicates Chiseled "X" Found
- ⊗ Indicates 1/2" Dia. Iron Monument Set With Plastic Cap Marked By ISG, PLS No. 61565 to be set before time of recording
- ○ Indicates 1/2" Dia. Iron Monument Set With Plastic Cap Marked By ISG, PLS No. 61565
- ⊠ Indicates Mag Nail to be set before time of recording
- □ Indicates Mag Nail Set



DETAIL
1" = 10'



ISG

JOB # 33587 DATE: 10/14/26

PAVEMENT LEGEND

SYMBOL	DESCRIPTION
	BITUMINOUS PAVEMENT
	CONCRETE PAVEMENT
	PARKING STRUCTURE (REFER TO STRUCTURAL)
	CONCRETE WALK

S RIVERFRONT DRIVE

W LIBERTY STREET

S FRONT STREET

WARREN STREET

B618 CURB AND GUTTER (TYP)

30'x90'
UNDER GROUND STORMWATER
TREATMENT SYSTEM

30'x111'
UNDER GROUND STORMWATER
TREATMENT SYSTEM

PROPOSED PARKING STRUCTURE
(REFER TO STRUCTURE)

BIKE RACKS
(6 BIKES)

TRASH ROOM

LOADING DOCK

COVERED SURFACE PARKING
(REFER TO OFFICE ARCHITECTURAL)

BIKE RACKS
(2 BIKES)

PROPOSED
OFFICE
FFE = 778.00

ABOVE GRADE BUILDING OVERHANG (TYP)

BENCHMARK HYDRANT
TNFH = 779.68

PROPOSED
GROCERY
FFE = 784.70

PROPOSED
LOBBY
FFE = 784.70

PROPOSED
CAFE
FFE = 784.25

PROPOSED
UTILITY ROOM
FFE = 782.25

PRIVATE PATIO

15' MAX BUILDING SETBACK

BENCHMARK HYDRANT
TNFH = 785.78

0 20 40
SCALE IN FEET

PRELIMINARY NOT FOR CONSTRUCTION

ISG

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

DATE _____ LIC. NO. _____

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED LANDSCAPE ARCHITECT UNDER THE LAWS OF THE STATE OF MINNESOTA.

DATE _____ LIC. NO. _____

SHEET NOT VALID UNLESS THIS TEXT IS COLOR.

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PROJECT

FRONT STREET PLACE

MIXED USE DEVELOPMENT

MANKATO MINNESOTA

REVISION SCHEDULE

DATE	DESCRIPTION	BY

PROJECT NO.	25-33587
FILE NAME	33587-C3-SITE
DRAWN BY	SMW
DESIGNED BY	SMW, NJH
REVIEWED BY	NJH
ORIGINAL ISSUE DATE	--/--/--
CLIENT PROJECT NO.	-

TITLE

SITE PLAN

SHEET

C3-10

Stormwater Management Report

Front Street Place
Mankato, Minnesota

October 13th, 2026

Project No. 25-33587

ISG
Architecture
Engineering
Environmental
Planning
ISGInc.com

REPORT FOR:
City of Mankato
Cory Bienfang, City Engineer
10 Civic Center Plaza
Mankato, MN 56001
507.387.8643
cbienfang@mankatomn.gov

FROM:
ISG
Nathan Hermer, **P.E.**
115 East Hickory Street + Suite 300
Mankato, Minnesota 56001
507.387.6651
Nathan.Hermer@ISGInc.com

SIGNATURE SHEET

I HEREBY CERTIFY THAT THESE CALCULATIONS WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.



Nathan J. Hermer, **P.E.**
Project Engineer
Reg. No. 54848

ISG
115 East Hickory Street + Suite 300
Mankato, MN 56001

Front Street Place
Mankato, MN

Engineer's Project Number: 25-33587

Dated this 13th day of October 2026

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INTRODUCTION

This stormwater management report was prepared for the redevelopment of the city block contained within South Front Street, Warren Street, West Liberty Street, and South Riverfront Drive in Mankato, MN. The property area is 2.61 acres. The proposed development will contain a mixed-use development including apartments, office space, restaurants, retail and a parking garage. The improvements will include grading, underground utility installation, curb and gutter, underground stormwater management, and pavement surfacing.

In concurrence with the production of site plans, hydrologic and hydraulic models were developed to generate the data presented within this report. Given that the project will disturb more than one acre of land, an NPDES Construction Stormwater Permit will be required. This project is also subject to the City of Mankato's stormwater rate control and water quality requirements.

DRAINAGE CONDITIONS

Existing Site

The project property has historically been the site of local businesses, Walgreens, and one residential house. The site drains separately to the north and to the west. Water draining to the west flows towards the corner of West Liberty Street and South Riverfront Drive. The west drainage area (DA1) is approximately 1.08 acres in size and accepts water from the local businesses, the residential house, and the final portions of the Walgreens. Flows from DA1 are collected via parking lot sump grates and curb inlets and ultimately drain into the existing 18" RCP pipe located along West Liberty Street. Water draining to the north flows towards the corner of Riverfront Drive and Warren Street. The North drainage areas (DA2 and DA3) combine to approximately 1.53 acres in size and accept water from portions of the Walgreens and the parking lot associated with it. Flows from DA2 and DA3 are collected via parking lot sump grates and curb inlets and ultimately drain into the existing 108" RCP pipe located along Warren Street. Flows that fail to be collected by storm inlets will sheet flow across South Riverfront Drive. More information on the existing drainage areas can be found on the Existing Conditions Drainage Map in Appendix A.

Table 1. Existing Drainage Areas

Drainage Area	Total Area [ac]	Impervious Area [ac]	Pervious Area [ac]	Discharge Point
West (DA1)	1.086	0.807	0.279	S Riverfront Dr & W Liberty St Corner
North (DA2)	0.746	0.731	0.015	S Riverfront Dr & Warren St Corner
North (DA3)	0.781	0.781	0	S Riverfront Dr & Warren St Corner
Total	**2.613**	**2.319**	**0.294**	-

Proposed Site

The proposed project site will consist of primarily impervious cover with the mixed-use development offering a multitude of different spaces for offices, residential, and businesses. The developed site will slightly increase the impervious cover on site from the existing value of 2.319 acres to the proposed value of 2.520 acres. Additionally, there are no wetlands on site, and the proposed project will not have any increased impact on any downstream waters.

Flows captured on site will ultimately be distributed to the existing West Liberty Street and Warren Street storm sewer systems. The proposed site consists of five drainage areas and two underground detention systems. Underground detention systems will capture flows generated from 2.31 acres (DA1 through DA4) of the 2.61 acre site and will be utilized to reduce pollutants and control flows into existing storm sewer systems. Flows from the remaining 0.3 acres (DA5) will be captured via existing curb inlets on S Riverfront Dr and Warren St and will be directed north. The south underground detention system has a capacity of 0.108

acre-feet and will capture the remainder of flows from DA1. This system will outlet into the existing 18" RCP pipe located along West Liberty Street. An outlet control structure with a weir and orifice will be utilized to control flows leaving the south underground detention system. The north underground detention system has a capacity of 0.201 acre-feet and will capture partial flows from DA1 as well as full flows from DA2, DA3 and DA4. This system will outlet into the existing 108" RCP pipe located along Warren Street. More information on the proposed drainage areas can be found on the Proposed Conditions Drainage Map in Appendix A.

Table 2. Proposed Drainage Areas

Drainage Area	Total Area [ac]	Impervious Area [ac]	Pervious Area [ac]	Discharge Point
DA1	1.280	1.268	0.012	S Riverfront Dr & Warren St Corner / S Riverfront Dr & W Liberty St Corner
DA2	0.058	0.058	0	S Riverfront Dr & Warren St Corner
DA3	0.668	0.668	0	S Riverfront Dr & Warren St Corner
DA4	0.307	0.297	0.010	S Riverfront Dr & Warren St Corner
DA5	0.300	0.229	0.071	S Riverfront Dr & Warren St Corner
Total	**2.61**	**2.52**	**0.09**	-

Soil Conditions

Both the USDA's Web Soil Survey (WSS) and the geotechnical report were used to review the existing soils. Based on the findings, the soil type on site is to be modeled using Hydraulic Soil Group (HSG) D soils with soils consisting mostly of clays and clayey sand. The geotechnical report can be found below in Appendix B.

STORMWATER MANAGEMENT

Stormwater Regulations

The location of the project involves two agencies with stormwater management requirements: the Minnesota Pollution Control Agency (MPCA NPDES Construction Stormwater Permit) and the City of Mankato. The project exceeds all agencies' disturbance thresholds, and as such, must meet all applicable stormwater rate control and water quality requirements. The City of Mankato standards are more stringent than the MPCA requirements; thus, meeting the City of Mankato's requirements indicates that the site inherently complies with MPCA regulations.

Stormwater System Overview

Hydrologic and hydraulic calculations were performed for the existing and proposed drainage conditions using the rainfalls depths obtained for the City of Mankato and the MSE-3 24-hour rainfall distribution curve. The existing and proposed site conditions were modeled in HydroCAD to ensure the proposed site meets rate control and water quality standards. Both the existing and proposed HydroCAD reports can be found below in Appendix C and Appendix D accordingly. Given the poor soils, infiltration was deemed infeasible for the site. Given the limitation on drained soils and lack of available space, the Engineer opted to pursue underground detention systems. The product being used for underground detention is the StormTech ADS MC-3500. The south underground detention system will be 4 rows with an effective length of 75 feet, summing to 40 MC-3500 units (excluding caps). The north underground detention system will be 5 rows with an effective length of 112.5 feet, summing to 75 MC-3500 units (excluding caps).

The north and south system discharge points are shown on the Proposed Drainage Map in Appendix A. Final design elevations and discharge rates for each storm event will be provided with the final design.

Stormwater Rate Control

The City of Mankato requires that the proposed peak discharge rate does not exceed the existing peak discharge rates for the 2-, 10-, and 100-year 24-hour storm events as well as the two back-to-back 10-year 24-hour storm event. An overall summary of the existing and proposed peak discharge rates is available in Table 3. The peak discharge rates defined in table 3 are the sums of the flows entering existing storm systems from both site outlets. Peak discharge rates decrease from existing conditions to proposed conditions for each storm event. Rate control was accomplished by utilizing the detention time provided by the MC-3500 systems and the outlet control structure attached to the south underground detention system outlet.

Table 3. Peak Discharge Rates

Storm Event	Existing [cfs]	Proposed [cfs]
2-year	7.99	6.23
10-year	11.17	9.79
10-year Back-to-Back	11.50	9.92
100-year	17.10	15.21

Water Quality

WATER QUALITY VOLUME

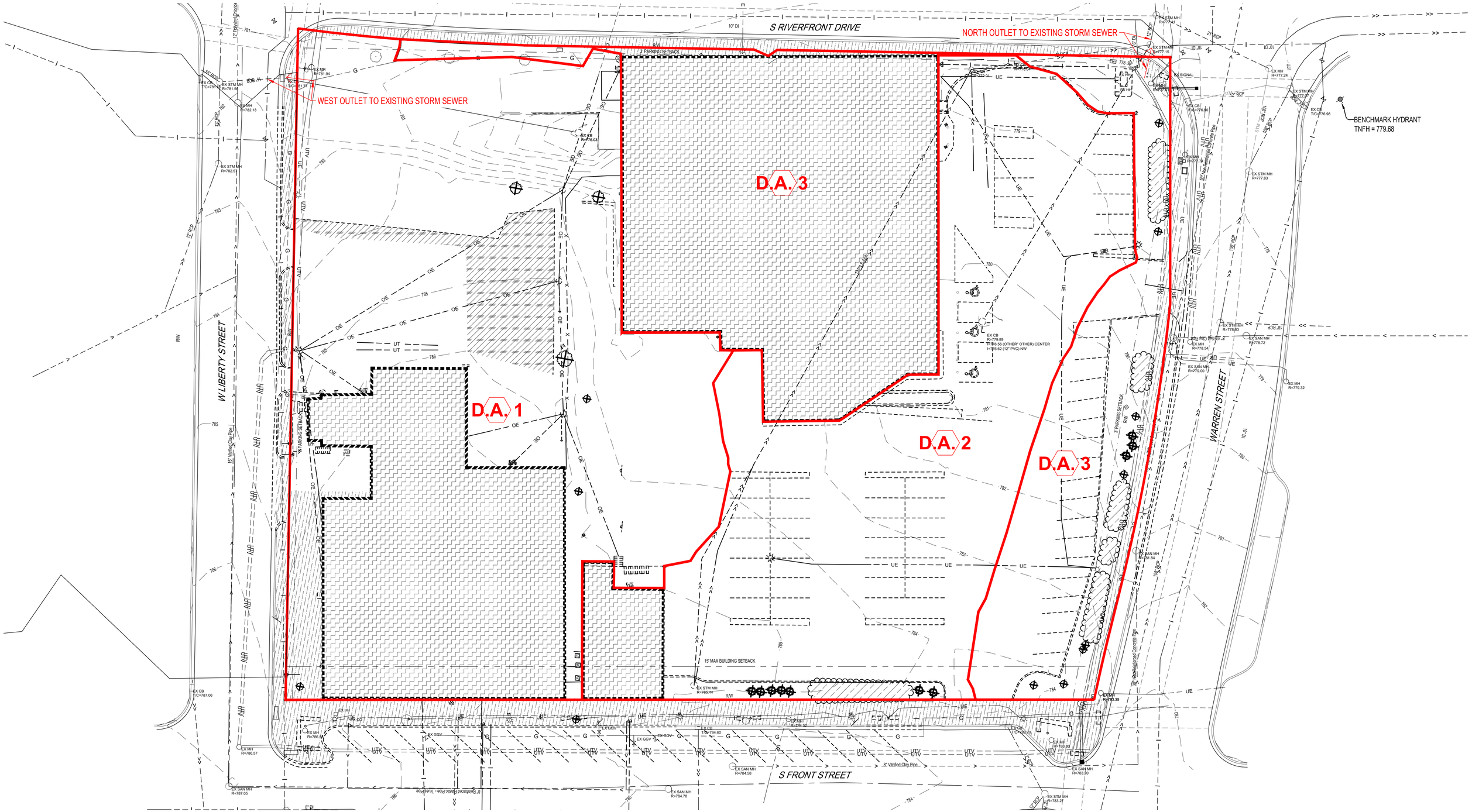
The City of Mankato requires that 1.1 inches of runoff across new and reconstructed impervious surfaces be retained as the water quality volume. Alternatively, if 100% of the runoff from impervious surfaces is routed through a filtration practice, the WQV requirement will be considered met. If either of these requirements are met, then Total Suspended Solids (TSS) and Total Phosphorus (TP) requirements shall be considered met as well.

Due to the predominately clay soil and lack of space on the site, underground detention systems utilizing the 100% routed impervious flow filtration method are proposed to meet the water quality requirements. To accomplish this, each of the two underground detention systems will contain two rows of StormTech Isolator Row Plus MC-3500 units. These rows allow sediment to settle before entering the rest of the system and have inspection ports for easy maintenance. Additionally, StormTech Flexstorm inserts will be installed on all curb inlets collecting water on site as well as one existing curb inlet on the south corner of Warren Street and South Riverfront Drive to ensure all water generated on site is filtered. 91% of flows generated from pervious surfaces across the proposed site will be routed directly through the underground detention systems. The remaining 9% will sheet flow to the north and be collected via existing storm infrastructure located on the south corner of Warren Street and South Riverfront Drive.

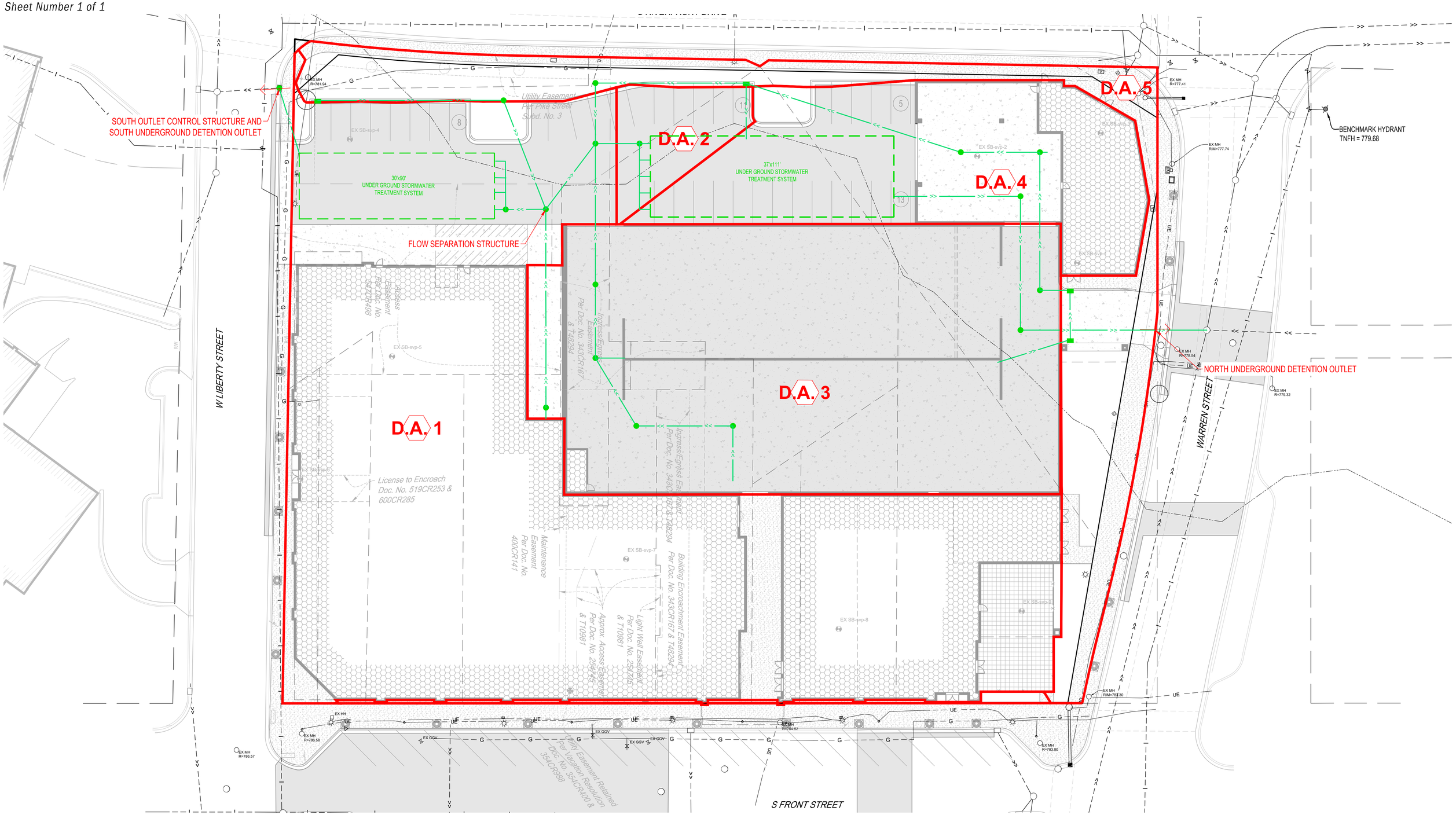
CONCLUSION

The proposed project provides a stormwater management system that meets all MPCA NPDES and City of Mankato requirements. The NPDES Construction Stormwater Permit will be applied for prior to construction and available as soon as the permit is obtained. The proposed project as designed meets rate control and water quality requirements.

Appendix A: Existing + Proposed Condition Drainage Maps



EXISTING DRAINAGE MAP



PROPOSED DRAINAGE MAP

SCALE IN FEET: 0 20 40

Appendix B: Geotechnical Evaluation Report

BRAUN INTERTEC

the science you build on

Geotechnical Evaluation Report

Front Street Plaza

602 South Front Street
Mankato, Minnesota

Prepared for

Front Street Plaza, LLC

Professional Certification:
I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.





Matthew A. Kluthe, PE
Project Engineer
License Number: 64753
May 1, 2026

Braun Intertec Corporation

Project 10005196_001

May 1, 2026

Project 10005196_001

Bryan Sowers
Front Street Plaza, LLC
100 Warren Street, Suite 317
Mankato, MN 56001

Re: Geotechnical Evaluation
Front Street Plaza
602 South Front Street
Mankato, Minnesota

Dear Mr. Sowers:

We are pleased to present this geotechnical evaluation report for the proposed Front Street Plaza project.

Thank you for making Braun Intertec Corporation (Braun Intertec) your geotechnical consultant for this project. If you have questions about this report, or if there are other services that we can provide in support of our work to date, please contact Matt Kluthe at 218.255.2609 (MKluthe@braunintertec.com) or Philip Bailey at 507.995.2788 (PBailey@braunintertec.com).

Sincerely,
Braun Intertec Corporation

Matthew A. Kluthe, PE
Project Engineer

Philip E. Bailey, PE
Associate Director, Senior Engineer

c: Ryan Evenson, APX Construction Group
Shawn Meschke, APX Construction Group
Courtney Kramlinger, City of Mankato

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1.0 Introduction

1.1 Project Description

This geotechnical evaluation report addresses the proposed design and construction of the proposed Front Street Plaza project, located at 602 South Front Street in Mankato, Minnesota. The proposed development will include a six-story multi-family building on the east side of the site. The ground floor of the building will consist of retail and amenity space, while floors two through six will contain housing units. Additionally, a six-story office building will be constructed near the northwest corner of the site. A two-story parking ramp containing approximately 250 spaces will be constructed between the two structures. Table 1-1 summarizes the provided and assumed project details used to prepare this report.

Table 1-1. Building Description

Aspect	Descriptions
Below grade levels	None (Provided)
Above grade levels	Six (Provided)
Multi-family/Retail Building finished floor elevations	784.81-785.57 feet (Provided)
Office Building finished floor elevation	781.32 feet (Provided)
Parking Structure finished grade elevation	781 to 785 feet for lowest level and 786 to 796 feet for ramp
Column loads (kips)	500 (Provided)
Wall loads (kips per lineal foot)	5 to 10 (Provided)
Nature of construction	▪ 1 level of precast concrete for first floor framing and 2nd floor deck. ▪ 5 levels of wood framing above precast concrete podium for residential portion ▪ 5 levels of structural steel above precast concrete podium for office building. (Provided)
Cuts or fills for structures	Cuts and fills generally less than 2 feet, Fill of 1 to 16 feet for ramp (Assumed)
Tolerable building settlements	1 inch total and 1/2 inch differential (Provided)

The figure that follows shows an illustration of the proposed site layout.

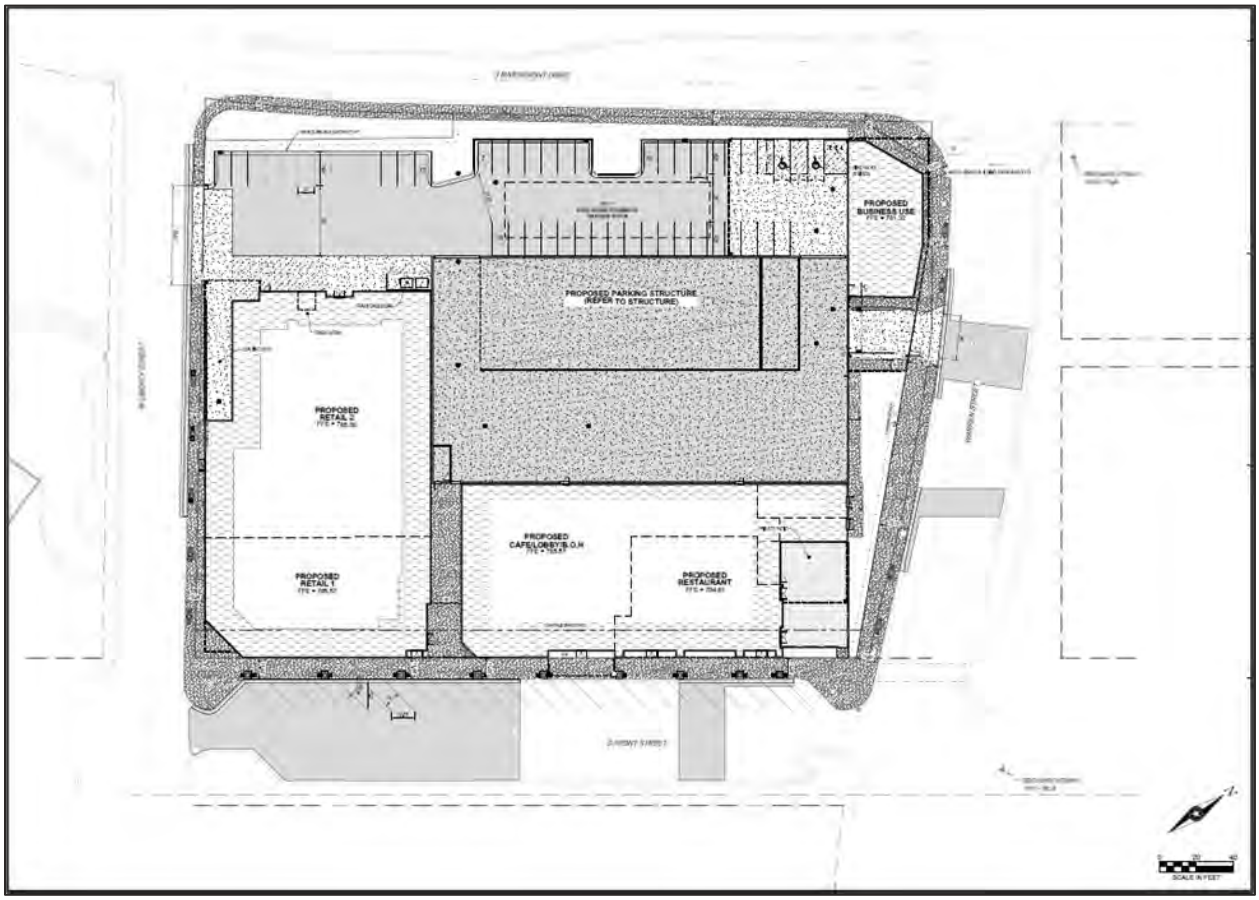


Figure 1-1. Site Layout
Figure provided by ISG, Inc. on April 20, 2026.

1.2 Site Conditions and History

Currently, the site is occupied by multiple structures. The northeast half of the site contains an old pharmacy building and associated bituminous surfaced parking lot. The southeast quadrant of the site contains multiple commercial buildings with at least a portion of these buildings having full or partial below-grade levels. The southwest quadrant of the site contains multiple bituminous surfaced parking lots/drive lanes and grass covered landscaping areas.

Current grades range from approximately 778 to 786 feet. Generally, the site is gently sloping downward, from southeast to northwest.

An aerial image of the site is shown in Figure 1-2 below.



Figure 1-2. Aerial Photograph of the Site in 2025
Figure obtained from Google Earth™.

1.3 Purpose

The purpose of our geotechnical evaluation was to characterize subsurface geologic conditions at selected exploration locations, evaluate their impact on the project, and provide geotechnical recommendations for the design and construction of the multi-family building, retail building, office building, and parking ramp.

1.4 Background Information and Reference Documents

We reviewed the following information:

- Surficial Geology Map of Blue Earth County, prepared by the University of Minnesota, Minnesota Geological Survey. The map is denoted as Atlas C-26, Part A, Plate 3, and dated 2012.
- Site topographic data from MnTOPO™, accessed February 25, 2026.

- Grading plan and site plan provided by ISG on April 20, 2026.
- Several previous geotechnical reports for surrounding properties prepared by Braun Intertec and dated 2011 through 2021.
- Communications with both ISG, Inc. and you regarding project design details.
- Phase I Environmental Site Assessment prepared by Braun Intertec and dated January 29, 2026.

We have described our understanding of the proposed construction and site to the extent others reported it to us. Depending on the extent of available information, we may have made assumptions based on our experience with similar projects. If we have not correctly recorded or interpreted the project details, the project team should notify us. New or changed information could require additional evaluation, analyses, and/or recommendations.

1.5 Scope of Services

We performed our scope of services for the project in accordance with our Proposal 10005196_001 to you, dated December 22, 2025, and authorized on December 23, 2025. The following list describes the geotechnical tasks completed in accordance with our authorized scope of services.

- Reviewing the background information and reference documents previously cited.
- Staking and clearing the exploration location of underground utilities. We selected and staked the new exploration locations. We acquired the surface elevations and locations with GPS technology. The Soil Boring Location Sketch included in the Appendix shows the approximate locations of the borings.
- Performing eight standard penetration test (SPT) borings, denoted as ST-1 to ST-8, to nominal depths of 20 to 55 feet below grade across the site. We originally proposed to drill nine borings. However, Boring ST-9 could not be advanced through the concrete surface due to an underground bomb shelter or vault in the area of the boring.
- Performing laboratory testing on select samples to aid in soil classification and engineering analysis.
- Preparing this report containing a boring location sketch, logs of soil borings, a summary of the soils encountered, results of laboratory tests, and recommendations for structure subgrade preparation and:
    - Recommendations for the design and construction of spread footing foundations, potential ground improvement techniques, potential deep foundation, and grade-supported slabs.
    - Providing recommended pavement design section thicknesses for bituminous pavements based on assumed subgrade strength values.

We performed this geotechnical evaluation concurrently with a Phase II Environmental Assessment (ESA) which we will submit separately. The project team should review the Phase II ESA report in conjunction with this geotechnical evaluation report to understand both the geotechnical and environmental aspects of the site and how they may impact one another.

2.0 Results

2.1 Geologic Overview

We based the geologic origins used in this report on the soil types, in-situ and laboratory testing, and available common knowledge of the geological history of the site. Because of the complex depositional history, geologic origins can be difficult to ascertain. We did not perform a detailed investigation of the geologic history for the site.

2.2 Boring Results

Table 2-1 provides a summary of the soil boring results, in the general order we encountered the strata. Please refer to the Log of Boring sheets in the Appendix for additional details. The Descriptive Terminology sheet in the Appendix includes definitions of abbreviations used in the table below.

Table 2-1. Subsurface Profile Summary*

Strata	Soil Type – ASTM Classification	Range of Penetration Resistances	Commentary and Details
Pavement Section	---	---	▪ Overall thickness ranges from 1 to 13 inches. ▪ Bituminous thickness 1 to 6 inches. ▪ Apparent aggregate base is 0 to 8 inches.
Fill	SM, CL, SP-SM, SC, SP, GP, OL	3 to 29 blows per foot (BPF)	▪ Encountered in all borings to depths of 4 to 12 feet. ▪ Generally consisted of clayey sand, silty sand, poorly graded sand with silt, poorly graded sand, and lean clay with varying sand and gravel contents. ▪ Varying amounts of bituminous, brick, and glass debris. ▪ Highly variable, soils intermixed. ▪ Locally slightly organic to organic. ▪ Dark brown, brown, reddish brown, and light brown in color. ▪ Moisture condition generally moist. ▪ General penetration resistance of 5 to 15 BPF.
Alluvium/ Terrace Deposits	SP, SP-SM, SM, ML, SC, CL, CH, OL	WOH to 50 blows for 0 inches of penetration	▪ Generally consisted of poorly graded sand, poorly graded sand with silt, silty sand, clayey sand, and lean clay with varying sand and gravel contents. ▪ Variable amounts of gravel, may contain cobbles and boulders. ▪ Fat clay layer present in Boring ST-1. ▪ Organic clay layer present in Boring ST-2. ▪ Light brown, brown, reddish brown, dark brown, gray, and black in color. ▪ Moisture condition generally moist to wet. ▪ General penetration resistance of 2 to 6 BPF in the upper 30 feet and 11 BPF to 50 blows for no penetration at depth.

Strata	Soil Type – ASTM Classification	Range of Penetration Resistances	Commentary and Details
Glacial deposits	SP-SM, SM, CL	24 to 30 BPF	▪ Encountered in Boring ST-3 from 18 to 56 feet. ▪ Intermixed layers of glacial outwash and till. ▪ Consisted of poorly graded sand with silt, silty sand, and lean clay with varying gravel contents. ▪ Variable amounts of gravel; may contain cobbles and boulders. ▪ Light brown, reddish brown, and gray in color. ▪ Moisture condition generally moist to wet. ▪ General penetration resistance of 24 to 30 BPF.

*Abbreviations are defined in the attached Descriptive Terminology sheets.

We did not perform gradation analysis on the apparent aggregate base material encountered as part of the pavement section, in accordance with our scope of work. Therefore, we cannot conclusively determine if the encountered material satisfies a particular specification, and it should not be assumed it is suitable for reuse.

For simplicity in this report, we define existing fill to mean existing, uncontrolled, or undocumented fill.

2.3 Groundwater

Table 2-2 summarizes the depths where we observed groundwater; the attached Log of Boring sheets in the Appendix also include this information and additional details.

Table 2-2. Groundwater Summary

Locations	Surface Elevation (ft)	Measured or Estimated Depth to Groundwater (ft)	Corresponding Groundwater Elevation (ft)
ST-1	778.8	13	766
ST-2	780.2	10	770 1/2
ST-3	784.0	Not Observed	Not Observed
ST-4	779.6	13	767
ST-5	783.5	13	770 1/2
ST-6	785.4	13	772 1/2
ST-7	781.6	10	772
ST-8	783.9	9	775

Note, mud rotary drilling techniques were utilized while drilling Borings ST-1 and ST-3. This would make groundwater observations difficult after switching to mud rotary drilling as water is introduced to the soil during drilling.

At the time of our observation, the groundwater surface elevation appeared to vary from about elevation 766 to 775 feet and that in general, the groundwater surface appears to slope downward to the northwest towards the Minnesota River. The soil borings also indicate a layered soil profile that is conducive for encountering perched water conditions. Project planning should expect groundwater will fluctuate in relation to the surface elevation of the Minnesota River and general precipitation.

2.4 Laboratory Test Results

The boring logs show the results of laboratory testing we performed, next to the tested sample depth.

The moisture content of the soils varied from approximately 4 to 71 percent, indicating that the materials were well below to well above their probable optimum moisture contents.

Our mechanical analyses indicated that the soils contained 3 to 87 percent silt and clay by weight.

Organic contents determined for selected samples ranged from 4 to 11 percent, indicating slightly organic to organic soils.

3.0 Recommendations

3.1 Design and Construction Discussion

Based on the results of our field exploration, laboratory testing, and our understanding of the proposed project, it is our opinion the site is suitable for the proposed project, provided measures are taken to mitigate risks associated with certain soft unsuitable soils underlying the site.

The existing fill soils contain some organics and debris, have variable strengths, and were likely not placed with the intention of supporting a structure. The near surface alluvial soils, particularly the clays and silts, are considered compressible and will consolidate beyond typical settlement tolerances if foundations and slabs are supported directly on them. The typical approach to mitigating risks of differential settlement below this type of structure is excavation of the existing fill soils and any soft or unsuitable soils, and replacement with engineered fill. However, this approach will likely be infeasible due to the significant excavation depth, excavation below the groundwater table, and the need for temporary excavation retention systems to facilitate the deep excavations. In circumstances where a soil correction is not feasible, alternatives such as ground improvement are often considered. We recommend the structure foundations be supported on soils improved with aggregate piers or rigid inclusions.

Depending upon the sensitivity of at-grade slabs to settlement and the proposed finishes of the slabs, consideration could be given to allowing a portion of the existing fill and alluvium to remain below the slabs to reduce costs associated with full removal and replacement of unsuitable soils or constructing structural slabs supported on deep foundations. If the owner is willing to accept some risk of settlement and distress of grade-supported slabs, we recommend at a minimum, subexcavating at least 4 feet below the proposed slab subgrade elevation, surface compacting the excavation bottom and placing structural fill below the slabs. This will provide some level of uniformity for slab support and reduce the amount of differential cracking and settlement of the slabs. Placement of additional reinforcement in the slab should also be considered to reduce the amount of differential cracking of the slabs.

Ground improvement techniques such as aggregate piers or rigid inclusions are used to improve the existing soils in lieu of performing deep soil corrections or supporting the structure on deep foundations such as driven pile. Both methods or ground improvement are designed to limit settlement and increase allowable bearing pressures for spread footings. Further discussion for aggregate piers and rigid inclusions is provided in Section 3.4 and Section 0, respectively.

Regardless of the foundation system selected, a specialty design contractor should be consulted for final design, configuration, and placement of the foundation elements.

The design and construction teams should also be aware of the following geotechnical design and construction considerations:

- A conventional soil correction will likely be infeasible for this site due to the required excavation depth ranging from 4 to 33 feet below existing grade, excavation below the groundwater table, and the need for temporary excavation retention systems to facilitate the deep excavations. However, we have still provided required excavation depths in Table 3-1. We recommend surface compacting the bottom of excavations prior to the placement of additional engineered fill or foundations.
- Grades within the ramp from the lowest level to upper level of the parking structure will be raised by up to 16 feet. Settlement induced by the grade raise is anticipated to be 1 to 5 inches (depending upon the location on the ramp) and will be realized by the ramp itself as well as surrounding foundations, structures, or slabs. If subgrade improvements are not made prior to raising grade, the ramp foundations, walls, and slabs will experience this settlement differentially. We recommend completing soil corrections or performing ground improvement beneath the entire parking structure grade-supported ramp. Alternatively, the ramp could be constructed as a structural ramp in lieu of a grade-supported ramp to reduce the need for significant grade raises and the associated settlement.
- The existing site features will need to be removed to facilitate the construction of the new structures. These features include, but are not limited to, buildings and associated foundations, pavements, sidewalks, curbs, trees, and utilities.
- Excavations on site may extend into debris laden or contaminated soils. We recommend handling or disposing of soils and groundwater onsite in accordance with the recommendations of our Response Action Plan (RAP).

- The soils at anticipated pavement and exterior slab subgrades are considered to be moderately to highly frost susceptible. If heaving of exterior slabs and sidewalks is unacceptable, consideration should be given to incorporating a granular subbase into these sections. A granular subbase enhances subgrade drainage, reduces the potential for subgrades to become saturated and heave upon freezing, and reduces the effects of subgrade strength loss upon thawing.
- The contractor should note the on-site clayey and silty soils are highly susceptible to disturbance, due to repeated construction traffic. Disturbance of these soils may cause areas that were previously prepared, or that were suitable for pavement or structure support, to become unstable and require moisture conditioning and compaction. Subcutting and replacing the disturbed material with crushed, coarse gravel, free of fines is also an alternative. The contractor should use means and methods to limit disturbance of these soils.
- If significant rainfall is anticipated during construction, the site should be graded to intercept surface water flow into the area and drain water from the area to an appropriate collection point. After grading, the soil surface should be compacted with a smooth drum roller to attempt to lower infiltration. After the rain, construction traffic should be limited until the surface has dried somewhat, to prevent traffic from mixing water that has accumulated at the surface into lower portions of the soil.

3.2 Site Grading and Subgrade Preparation

We are providing several alternatives for preparing the proposed structure areas. We are providing recommendations for soil correction of unsuitable soils below the structures. However, as mentioned previously, this approach will likely be infeasible due to the significant excavation depth, excavation below the groundwater table, and the need for temporary excavation retention systems to facilitate the deep excavations. Alternatively, we are also providing recommendations for limited subgrade preparation for all structures with foundations supported on soils improved with aggregate piers or rigid inclusions.

3.2.1 Building Subgrade Excavations

Where ground improvement is not performed, we recommend removing unsuitable materials from beneath the proposed structures and their oversize area. We define unsuitable materials as existing fill, frozen materials, slightly organic and organic soils, existing structures, existing utilities, vegetation, and soft/loose alluvial soils. Table 3-1 shows the anticipated excavation depths and bottom elevations for each of the borings.

Table 3-1. Structure Excavation Depths

Location	Approximate Surface Elevation (ft)	Anticipated Excavation Depth (ft)	Anticipated Bottom Elevation (ft)
ST-1	778.8	33	745 1/2
ST-2	780.2	23	757
ST-3	784.0	18	766

Location	Approximate Surface Elevation (ft)	Anticipated Excavation Depth (ft)	Anticipated Bottom Elevation (ft)
ST-4	779.6	28	751 1/2
ST-5	783.5	6	777 1/2
ST-6	785.4	17	768
ST-7	781.6	8	773 1/2
ST-8	783.9	4	779 1/2

Excavation depths will vary between the borings. Portions of the excavations may also extend deeper than indicated by the borings. A geotechnical representative should observe the excavations to make the necessary field judgments regarding the suitability of the exposed soils.

The contractor should use equipment and techniques to minimize soil disturbance. If soils become disturbed or are wet, we recommend excavation and replacement of disturbed soils.

3.2.2 Alternative Shallow Soil Correction with Ground Improvement

As an alternative to the deep soil correction depths provided above, where ground improvement is implemented, consideration should be given to performing a shallow soil correction of 4 feet within the structure footprint and its oversize area. This would involve partial subexcavation of the debris-laden fill and replacement with engineered fill. This will provide for a more uniform subgrade for construction support and installation of shallow utilities.

Excavation spoils for foundations and utilities are expected to be of a mixed nature, containing debris and in many locations unsuitable for reuse as backfill. We anticipate that imported sands will be necessary to replace soils excavated on the site. Some disposal of unsuitable soils on the site containing debris or contamination should be expected in accordance with our RAP.

3.2.3 Excavation Oversizing

When removing unsuitable materials below structures or pavements, we recommend the excavation extend outward and downward at a slope of 1H:1V (horizontal:vertical) or flatter. See Figure 3-1 for an illustration of excavation oversizing.

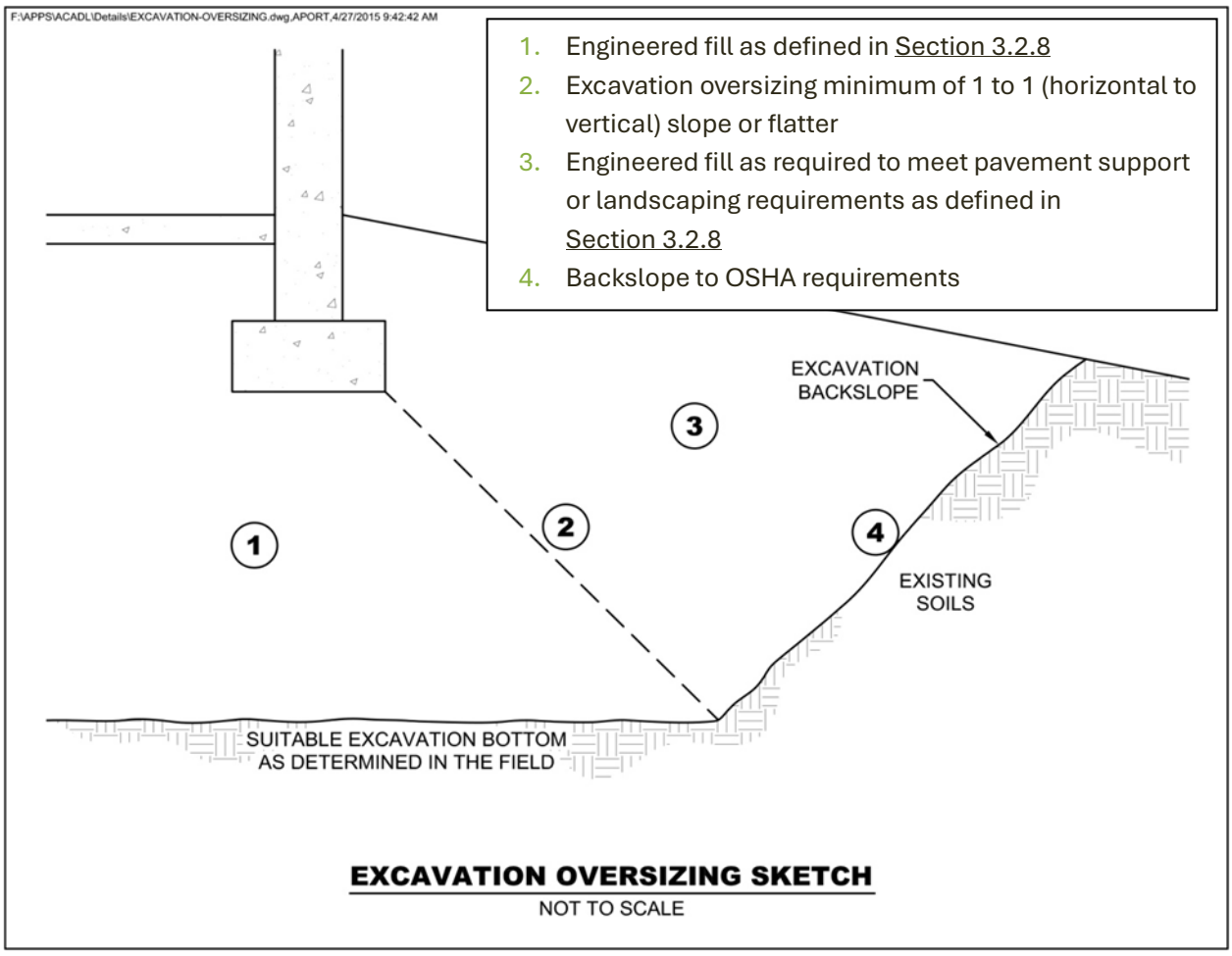


Figure 3-1. Generalized Illustration of Oversizing

3.2.4 Excavated Slopes

Based on the borings, we anticipate on-site soils in excavations will consist of mixed existing fill soils and soft/loose alluvial soils. These soils are typically considered Type C Soil under OSHA (Occupational Safety and Health Administration) guidelines. OSHA guidelines indicate unsupported excavations in Type C soils should have a gradient no steeper than 1 1/2H:1V. Slopes constructed in this manner may still exhibit surface sloughing. OSHA requires an engineer to evaluate slopes or excavations over 20 feet in depth.

An OSHA-approved qualified person should review the soil classification in the field. Excavations must comply with the requirements of OSHA 29 CFR, Part 1926, Subpart P, "Excavations and Trenches." This document states that excavation safety is the responsibility of the contractor. The project specifications should reference these OSHA requirements.

3.2.5 Excavation Dewatering

We recommend removing groundwater from the excavations. Project planning should include temporary sumps and pumps for excavations in low-permeability soils, such as clays. Dewatering of high-permeability soils (e.g., sands) from within the excavation with conventional pumps has the potential to loosen the soils, due to upward flow. A well contractor should develop a dewatering plan; the design team should review this plan.

3.2.6 Vibration Monitoring and Condition Surveys

Structures located near the project site may experience vibrations during construction activities. Excessive ground vibration levels can damage structures, e.g., cracked walls and foundations. Although vibration levels during construction may not necessarily cause damage, our experience is that vibration-related complaints and damage claims tend to increase when vibration levels become noticeable or are annoying. For this reason, we recommend recording vibration levels during construction. We also recommend performing pre-construction surveys on structures within the affected area to document existing conditions. The owner or contractor can then perform a comparative post-construction survey in response to any vibration-related damage claims.

3.2.7 Pavement Subgrade Proofroll

After preparing the pavement subgrade and prior to the placement of the aggregate base, we recommend proofrolling the subgrade soils with a fully loaded tandem-axle truck. We also recommend having a geotechnical representative observe the proofroll. Areas that fail the proofroll likely indicate soft or weak areas that will require additional soil correction work to support pavements.

The contractor should correct areas that display excessive yielding or rutting during the proofroll, as determined by the geotechnical representative. Possible options for subgrade correction include moisture conditioning and recompaction, subcutting and replacement with soil or crushed aggregate, chemical stabilization, and/or geotextiles. We recommend performing a second proofroll after the aggregate base material is in place, and prior to placing bituminous or concrete pavement.

3.2.8 Engineered Fill Materials and Compaction

Table 3-2 below contains our recommendations for engineered fill materials.

Table 3-2. Engineered Fill Materials*

Locations To Be Used	Engineered Fill Classification	Possible Soil Type Descriptions	Gradation	Additional Requirements
▪ Below foundations ▪ Below interior slabs	Structural fill	SP, SW, SP-SM, SW-SM	100% passing 2-inch sieve ≤12% passing #200 sieve	< 2% Organic Content (OC)
▪ Drainage layer ▪ Non-frost-susceptible	▪ Free draining ▪ Non-frost-susceptible fill	GP, GW, SP, SW	100% passing 1-inch sieve < 50% passing #40 sieve < 5% passing #200 sieve	< 2% OC
Behind below-grade walls, beyond drainage layer	Retained fill	SP, SP-SM, SM	100% passing 3-inch sieve < 20% passing #200 sieve	< 2% OC Plasticity Index (PI) < 4%
Pavements	Pavement fill	SP, SP-SM, SM, SC, CL	100% passing 3-inch sieve	< 2% OC PI < 20%
Below landscaped surfaces, where subsidence is not a concern	Non-structural fill	---	100% passing 6-inch sieve	< 10% OC

* Engineered fill materials should satisfy the approved Response Action Plan (RAP) or applicable environmental regulations.
* More select soils comprised of coarse sands with < 5% passing #200 sieve may be needed to accommodate work occurring in periods of wet or freezing weather.

We recommend spreading engineered fill in loose lifts of approximately 8 to 10 inches thick. We recommend compacting engineered fill in accordance with the criteria presented below in Table 3-3. The project documents should specify relative compaction of engineered fill, based on the structure located above the engineered fill, and vertical proximity to that structure.

Table 3-3. Compaction Recommendations Summary

Reference	Relative Compaction, percent (ASTM D698 – Standard Proctor)	Moisture Content Variance from Optimum, percentage points	
		< 12% Passing #200 Sieve (typically SP, SP-SM)	> 12% Passing #200 Sieve (typically CL, SC, ML, SM)
Below foundations and oversizing zones	100	±3	N/A
Below interior slabs	95	±3	N/A
Within 3 feet of pavement subgrade	100	±3	-2 to +1
More than 3 feet below pavement subgrade	95	±3	±3
Below sidewalks	95	±3	-1 to +3
Adjacent to below grade wall	95*	±3	-1 to +3
Below landscaped surfaces	90	±5	±5

Increase compaction requirement to meet compaction required for structure supported by this engineered fill.

The project documents should not allow the contractor to use frozen material as engineered fill or to place engineered fill on frozen material. Frost should not penetrate under foundations during construction.

We recommend performing density tests in engineered fill to evaluate if the contractors are effectively compacting the soil and meeting project requirements.

3.2.9 Special Inspections of Soils

We recommend including the site grading and placement of engineered fill within the building pad under the requirements of Special Inspections, as provided in Chapter 17 of the International Building Code, which is part of the Minnesota State Building Code. Special Inspection requires observation of soil conditions below engineered fill or footings, evaluations to determine if excavations extend to the anticipated soils, and if engineered fill materials meet requirements for engineered fill and compaction condition of engineered fill. A licensed geotechnical engineer should direct the Special Inspections of site grading and engineered fill placement. The purpose of these Special Inspections is to evaluate whether the work is in accordance with the approved geotechnical report for the project. Special Inspections should include evaluation of the subgrade, observing preparation of the subgrade (surface compaction or dewatering, excavation oversizing, placement procedures, and materials used for engineered fill, etc.) and compaction testing of the engineered fill.

3.3 Spread Footings

Table 3-4 below contains our recommended parameters for foundation design assuming soil corrections are utilized.

Table 3-4. Recommended Spread Footing Design Parameters – With Deep Soil Correction

Item	Description
Maximum net allowable bearing pressure (psf)	5,000 psf
Minimum factor of safety for bearing capacity failure	3.0
Minimum embedment below final exterior grade for heated structures (inches)	42
Minimum embedment below final exterior grade for unheated structures or for footings not protected from freezing temperatures during construction (inches)	60
Total estimated settlement (inches)	1
Differential settlement	Typically about 1/2 of total settlement*

* Actual differential settlement amounts will depend on final loads and foundation layout. We can evaluate differential settlement based on final foundation plans and loadings.

3.4 Aggregate Piers or Stone Columns

As an option for support of foundations, ramps and slabs for the structures, consideration could be given to performing ground improvements with aggregate piers or stone columns, commonly known by trade names such as: Geopier, Vibro Piers, Vibro Stone Columns, etc.

A subgrade improved with aggregate piers or stone columns will reduce the potential for detrimental settlement associated with the existing fill to occur, provide increased bearing capacity, eliminate the need for deep excavations, reduce impacts to adjacent site features, and reduce the volume of subgrade soils disturbed at this site.

We recommend installing aggregate piers under all foundations and the ramp. The aggregate piers should extend through the existing fill and soft and loose alluvial soils to bear in the relatively clean terrace deposit sands or glacial till/outwash deposits. Additionally, we recommend installing aggregate piers under slabs that have lower settlement and differential movement tolerances (such as polished concrete floors). For slabs that can tolerate higher settlement and differential movement (such as the parking ramp), aggregate piers may not be necessary and a partial subexcavation could be considered if the owner is willing to accept some risk of slab distress.

Different contractors use varying techniques to construct aggregate piers but generally consist of excavating soil from a hole with an auger or vibrating a mandrel into the ground, and then building a column of clean, open-graded aggregate. The contractor constructs the pier by placing the aggregate in lifts from the bottom of the pier and compacting each lift before placing aggregate for the subsequent lift. The vibratory energy, and sometimes ramming action, causes the aggregate to interlock, forming a stiff pier that provides soil reinforcement and increases shear resistance. Due to the many variations in techniques, we recommend using performance-based specifications with design-build contracting. Given the soft and loose alluvial soils and waterbearing sand soils present on the site would cave under a traditional drill and fill approach, we anticipate a technique such as Geopier's "Impact" system or other mandrel equipped system would be required.

We recommend requiring the contractor to have at least five years of experience in performing this work, and to demonstrate performing the proposed protection system(s) on at least three previous projects of similar size and scope. The specifications should require the design engineer be licensed in the project state. We can assist you with developing a list of pre-qualified contractors prior to bidding or with reviewing contractor experience as part of the bidding process.

Aggregate piers are a Special Inspection item in accordance with Chapter 17 of the IBC. The observations should include installed length, consistency of soil profile with the geotechnical evaluation confirmation of the materials, and confirmation of installation techniques.

3.4.1 Net Allowable Bearing Pressure

The aggregate pier designer will determine the allowable soil bearing capacity of footings bearing upon rammed aggregate piers. We estimate that a net allowable soil bearing capacity of 4,000 to 7,000 pounds per square foot (PSF) could likely be utilized for design. This value includes a safety factor of at least 3.0 with regards to bearing capacity failure.

3.4.2 Uplift Resistance

We anticipate that aggregate piers could be designed to provide uplift resistance. Uplift resistance would likely be provided by an uplift harness installed at the bottom of the aggregate piers. We recommend consulting with the aggregate pier design engineer for estimates on uplift capacity.

3.4.3 Settlement

The aggregate pier designer will determine the settlement of footings bearing upon aggregate piers. However, aggregate piers typically limit total and differential settlement of spread footing foundations to less than 1 inch and 1/2 inch, respectively.

3.5 Rigid Inclusions

3.5.1 Design and Construction Considerations

Once a rigid inclusion ground improvement system has been installed under the structure footprint, the structure can be supported on conventional spread footings. Rough finished building pad grades should be achieved, and sub-slab aggregate should be installed prior to rigid inclusion installation.

Rigid inclusions provide an intermediate support option that is typically more robust than aggregate piers and better able to transfer load through organic deposit soils that provide limited confinement support to the ground improvement piers. Rigid inclusions are designed to limit settlement and increase allowable bearing pressures estimated to be on the magnitude of 4,000 to 7,000 pounds per square foot (psf) for this site.

Varying methods exist to construct rigid inclusions, but the process generally consists of drilling, pressing, or vibrating a specialty grout/concrete delivery system to the proposed design depth. Ready-mix or mixed on-site grout/concrete is then injected through an annulus in the auger or probe as the tooling is withdrawn to build a rigid column to the surface. Rigid inclusions are typically unreinforced but are occasionally modified with reinforcing cages or bars to add additional capacity.

The rigid inclusion installation process anticipated to be appropriate for this site may look similar to auger cast-in-place pile, but design and follow-on construction methods differ, as rigid inclusions are typically not structurally connected to supported footings or floor slabs. A Load Transfer Platform (LTP) is generally placed between the top of the columns and the supported footings or floor slabs. The LTP typically consists of a layer of compacted angular stone which serves to arch structure loads into the grid of rigid inclusions below. LTP thickness typically vary from 1/2 to 2 feet, but the thickness will be calculated by the design-build contractor. We anticipate that the sub-slab aggregate would be incorporated into the LTP. In some cases, a layer of geotextile may be specified to improve the performance of the LTP.

3.5.2 Design

The rigid inclusion designer will determine the number of piers required to support the proposed structures including, the installation depth, spacing between piers, and the diameter.

3.5.3 Quality Control

The quality control observations should include installed length, installed diameter, consistency of soil profile with the geotechnical evaluation, confirmation of the materials, and confirmation of installation techniques. Grout cylinders or cubes should be taken at regular intervals to verify material compressive strengths.

3.6 Below-Grade Walls

3.6.1 Drainage Control

We recommend installing drain tile to remove water behind the below-grade walls or at steps in slab elevation, at the location shown in Figure 3-2. The below-grade wall drainage system should also incorporate free-draining, engineered fill or a drainage board placed against the wall and connected to the drain tile.

Even with the use of free-draining, engineered fill, we recommend general waterproofing of below-grade walls that surround occupied or potentially occupied areas because of the potential cost impacts related to seepage after construction is complete.

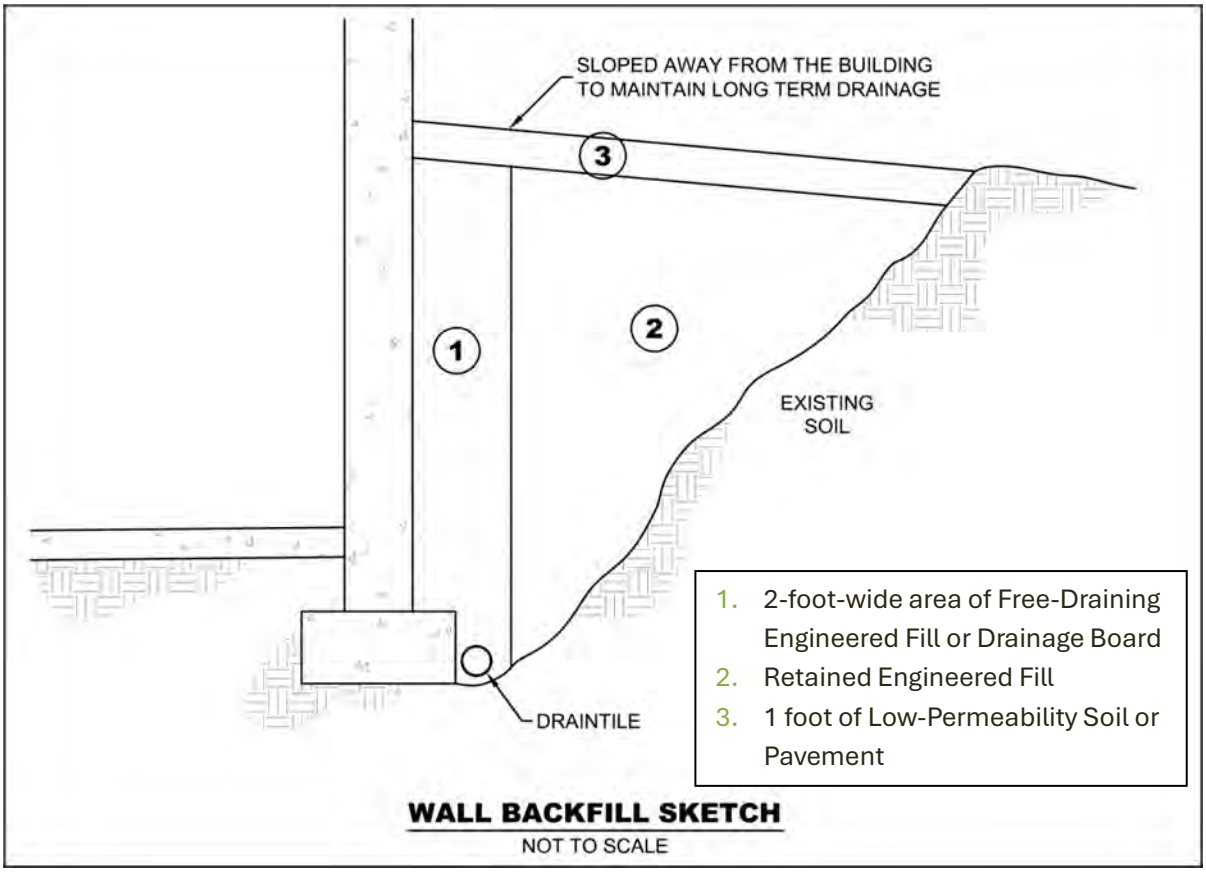


Figure 3-2. Generalized Illustration of Wall Engineered Fill

The materials listed in the sketch should meet the definitions in Section 0. Low-permeability material is capable of directing water away from the wall, like clay, topsoil, or pavement. The project documents should indicate if the contractor should brace the walls prior to filling and allow unbalanced fill heights.

As shown in Figure 3-2, we recommend Zone 2 consist of retained, engineered fill, and this material will control lateral pressures on the wall.

3.6.2 Configuring and Resisting Lateral Loads

Below-grade wall design can use active earth pressure conditions if the walls can rotate slightly. If the wall design cannot tolerate rotation, then design should use at-rest earth pressure conditions. Rotation up to 0.002 times the wall height is generally required for walls supporting sand.

Table 3-5 presents our recommended lateral coefficients and equivalent fluid pressures for wall design of active, at-rest and passive earth pressure conditions. The table also provides recommended wet unit weights and internal friction angles. Designs should also consider the slope of any engineered fill, and dead or live loads placed behind the walls within a horizontal distance that is equal to the height of the walls. Our recommended values assume the wall design provides drainage so water cannot accumulate behind the walls. The construction documents should clearly identify what soils the contractor should use for engineered fill of walls.

Table 3-5. Recommended Below-Grade/Ramp Wall Design Parameters – Drained Conditions

Retained Soil	Wet Unit Weight (pcf)	Friction Angle (degrees)	Active Lateral Coefficient* (pcf)	At-Rest Lateral Coefficient* (pcf)	Passive Lateral Coefficient* (pcf)
Retained Fill	115	30	0.33	0.50	3.00

* Based on Rankine model for soils in a region behind the wall extending at least 2 horizontal feet beyond the bottom outer edges of the wall footings and then rising up and away from the wall at an angle no steeper than 60 degrees from horizontal.

Sliding resistance between the bottom of the footing and the soil can also resist lateral pressures. We recommend assuming a sliding coefficient equal to 0.35 between the concrete and soil.

The values presented in this section are un-factored.

3.7 Interior Slabs

3.7.1 Subgrade Modulus

The anticipated floor subgrade is mixed fill soils. We recommend using a modulus of subgrade reaction, k, of 125 pounds per square inch per inch of deflection (pci) to design the slabs. If the slab design requires placing 6 inches of compacted crushed aggregate base immediately below the slab, the slab design may increase the k-value by 50 pci. We recommend that the aggregate base materials be free of bituminous. In addition to improving the modulus of subgrade reaction, an aggregate base facilitates construction activities and is less weather sensitive.

3.7.2 Moisture Vapor Protection

Excess transmission of water vapor could cause floor dampness, certain types of floor bonding agents to separate, or mold to form under floor coverings. If project planning includes using floor coverings or coatings, we recommend placing a vapor retarder or vapor barrier immediately beneath the slab. We also recommend consulting with floor covering manufacturers regarding the appropriate type, use and installation of the vapor retarder or barrier to preserve warranty assurances.

3.8 Frost Protection

3.8.1 General

Silty and clayey soils will underlie some exterior slabs, as well as pavements. We consider silty and clayey soil to be moderately to highly frost susceptible. Soils of this type can retain moisture and heave upon freezing. In general, this characteristic is not an issue unless these soils become saturated, due to surface runoff or infiltration, or are excessively wet in-situ. Once frozen, unfavorable amounts of general and isolated heaving of the soils and the surface structures supported on them could develop. This type of heaving could affect design drainage patterns and the performance of exterior slabs and pavements, as well as any isolated exterior footings and piers.

Note that general runoff and infiltration from precipitation are not the only sources of water that can saturate subgrade soils and contribute to frost heave. Roof drainage and irrigation of landscaped areas in close proximity to exterior slabs, pavements, and isolated footings and piers, contribute as well.

3.8.2 Frost Heave Mitigation

To address most of the heave related issues, we recommend setting general site grades and grades for exterior surface features to direct surface drainage away from buildings, across large, paved areas and away from walkways. Such grading will limit the potential for saturation of the subgrade and subsequent heaving. General grades should also have enough “slope” to tolerate potential larger areas of heave, which may not fully settle after thawing.

Even small amounts of frost-related differential movement at walkway joints or cracks can create tripping hazards. Project planning can explore several subgrade improvement options to address this condition.

One of the more conservative subgrade improvement options to mitigate potential heave is removing any frost-susceptible soils present below the exterior slab areas down to a minimum depth of 4 feet below subgrade elevations. We recommend filling the resulting excavation with non-frost-susceptible fill. We recommend providing drainage at the base of the subcut, as well as gradual transitions from this subcut (3H:1V or flatter gradient). We also recommend sloping the bottom of the excavation toward one or more collection points to remove any water entering the engineered fill. This approach will not be effective in controlling frost heave without removing the water.

An important geometric aspect of the excavation and replacement approach described above is sloping the banks of the excavations to create a more gradual transition between the unexcavated soils considered frost susceptible and the engineered fill in the excavated area, which is not frost susceptible. The slope allows attenuation of differential movement that may occur along the excavation boundary. We recommend slopes that are 3H:1V, or flatter, along transitions between frost-susceptible and non-frost-susceptible soils.

Figure 3-3 shows an illustration summarizing some of the recommendations.

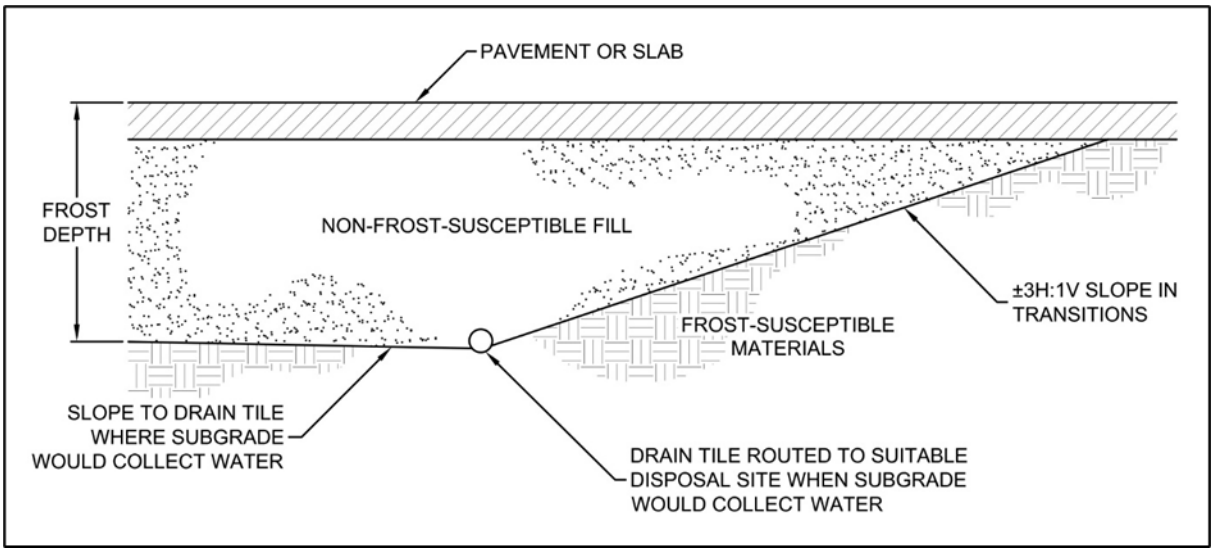


Figure 3-3. Frost Protection Geometry Illustration

Another option is to limit frost heave in critical areas, such as doorways and entrances, via frost-depth footings or localized excavations with sloped transitions between frost-susceptible and non-frost-susceptible soils, as described above.

Over the life of slabs and pavements, cracks will develop, and joints will open up, which will expose the subgrade and allow water to enter from the surface and either saturate or perch atop the subgrade soils. This water intrusion increases the potential for frost heave or moisture-related distress near the crack or joint. Therefore, we recommend implementing a detailed maintenance program to seal and/or fill any cracks and joints. The maintenance program should give special attention to areas where dissimilar materials abut one another, where construction joints occur and where shrinkage cracks develop.

3.9 Pavements and Exterior Slabs

3.9.1 Design Sections

Our scope of services for this project did not include laboratory tests on subgrade soils to determine an R-value for pavement design. Based on our experience with similar mixed fill soils anticipated at the pavement subgrade elevation, we recommend pavement design assume an R-value of 15. Note the contractor may need to perform limited removal of unsuitable or less suitable soils to achieve this value.

Table 3-6 provides recommended pavement sections, based on the soils support and traffic loads.

We based the concrete pavement designs on a modulus of subgrade reaction (k) of 125 pci.

Table 3-6. Recommended Bituminous Pavement Sections

Use	Light Duty (50,000 ESAL's)	Heavy Duty (100,000 ESAL's)
Minimum bituminous thickness (inches)	3 1/2	4 1/2
Minimum aggregate base thickness (inches)	8	10

Table 3-7. Recommended Concrete Pavement Sections

Use	Light Duty/Medium Duty (50,000 ESAL's)	Heavy Duty (100,000 ESAL's)
Minimum concrete thickness (inches)	5 1/2	6
Minimum aggregate base thickness (inches)	6	8

3.9.2 Concrete Pavements

We assumed the concrete pavement sections in Table 3-7 will have edge support. We recommend placing an aggregate base below the pavement to provide a suitable subgrade for concrete placement, reduce faulting and help dissipate loads. Appropriate mix designs, panel sizing, jointing, doweling and edge reinforcement are critical to performance of rigid pavements. We recommend you contact your civil engineer to determine the final design or consult with us for guidance on these items.

3.9.3 Bituminous Pavement Materials

Appropriate mix designs are critical to the performance of flexible pavements. We can provide recommendations for pavement material selection during final pavement design.

3.9.4 Subgrade Drainage

We recommend installing perforated drainpipes throughout pavement areas at low points, around catch basins, and behind curb in landscaped areas. We also recommend installing drainpipes along pavement and exterior slab edges where exterior grades promote drainage toward those edge areas. The contractor should place drainpipes in small trenches, extended at least 8 inches below the granular subbase layer, or below the aggregate base material where no subbase is present.

3.9.5 Performance and Maintenance

We based the above pavement designs on a 20-year performance life for both bituminous and concrete. This is the amount of time before we anticipate the pavement will require reconstruction. This performance assumes routine maintenance, such as seal coating and crack sealing. The actual pavement life will vary depending on variations in weather, traffic conditions, and maintenance.

It is common to place the non-wear course of bituminous and then delay placement of wear course. For this situation, we recommend evaluating if the reduced pavement section will have sufficient structure to support construction traffic.

Many conditions affect the overall performance of the exterior slabs and pavements. Some of these conditions include the environment, loading conditions and the level of ongoing maintenance. With regards to bituminous pavements in particular, it is common to have thermal cracking develop within the first few years of placement and continue throughout the life of the pavement. We recommend developing a regular maintenance plan for filling cracks in exterior slabs and pavements to lessen the potential impacts for cold weather distress due to frost heave or warm weather distress due to wetting and softening of the subgrade.

3.10 Utilities

3.10.1 Subgrade Stabilization

Earthwork activities associated with utility installations located inside the building area should adhere to the recommendations in Section 3.2.

For exterior utilities, we anticipate the soils at typical invert elevations will be suitable for utility support. However, if construction encounters unfavorable conditions such as soft clay, organic soils or perched water at invert grades, the unsuitable soils may require some additional subcutting and replacement with sand or crushed rock to prepare a proper subgrade for pipe support. Project design and construction should not place utilities within the 1H:1V oversizing of foundations.

3.10.2 Corrosion Potential

Based on our experience, the soils encountered in the borings are moderately corrosive to metallic conduits, but only marginally corrosive to concrete. We recommend specifying non-corrosive materials or providing corrosion protection, unless project planning chooses to perform additional tests to demonstrate the soils are not corrosive.

3.11 Equipment Support

The recommendations included in the report may not be applicable to equipment used for the construction and maintenance of this project. We recommend evaluating subgrade conditions in areas of shoring, scaffolding, cranes, pumps, lifts, and other construction equipment prior to mobilization to determine if the exposed materials are suitable for equipment support or require some form of subgrade improvement. We also recommend project planning consider the effect that loads applied by such equipment may have on structures they bear on or surcharge – including pavements, buried utilities, below-grade walls, etc. We can assist you in this evaluation.

4.0 Procedures

4.1 Penetration Test Borings

We drilled the penetration test borings with a truck-mounted core and auger drill equipped with hollow-stem auger. We performed the borings in general accordance with ASTM D6151 taking penetration test samples at continuously in the upper 15 feet and at 5-foot intervals at greater depths, in general accordance with ASTM D1586. The boring logs show the actual sample intervals and corresponding depths.

We sealed penetration test boreholes meeting the Minnesota Department of Health (MDH) Environmental Borehole criteria with an MDH-approved grout.

4.2 Exploration Logs

4.2.1 Log of Boring Sheets

The Appendix includes Log of Boring sheets for our penetration test borings. The logs identify and describe the penetrated geologic materials and present the results of penetration resistance tests performed. The logs also present the results of organic vapor screening, laboratory tests performed on penetration test samples, and groundwater measurements.

We inferred strata boundaries from changes in the penetration test samples and the auger cuttings. Because we did not perform continuous sampling the entire depth of the borings, the strata boundary depths are only approximate. The boundary depths likely vary away from the boring locations, and the boundaries themselves may occur as gradual rather than abrupt transitions.

4.2.2 Organic Vapor Screening

We conducted the geotechnical evaluation concurrently with a Phase II ESA and will provide the results of the ESA under separate cover. The project team should review the Phase II ESA report in conjunction with this geotechnical evaluation report to understand both the geotechnical and environmental aspects of the site and how they may impact one another.

An environmental technician examined soil samples from the borings for staining, odors, and other apparent signs of contamination. In addition, the environmental technician screened the soil samples for the presence of organic vapors using a photoionization detector (PID). The boring logs in the Appendix include the PID results, which we discuss further in the companion Phase II ESA.

4.2.3 Geologic Origins

We assigned geologic origins to the materials shown on the logs and referenced within this report, based on: (1) a review of the background information and reference documents cited above, (2) visual classification of the various geologic material samples retrieved during the course of our subsurface exploration, (3) penetration resistance and other in-situ testing performed for the project, (4) laboratory test results, and (5) available common knowledge of the geologic processes and environments that have impacted the site and surrounding area in the past.

4.3 Material Classification and Testing

4.3.1 Visual and Manual Classification

We visually and manually classified the geologic materials encountered based on ASTM D2488. When we performed laboratory classification tests, we used the results to classify the geologic materials in accordance with ASTM D2487. The Appendix includes a chart explaining the classification system we used.

4.3.2 Laboratory Testing

The exploration logs in the Appendix note most of the results of the laboratory tests performed on geologic material samples. We performed the tests in general accordance with ASTM procedures.

4.4 Groundwater Measurements

The drillers checked for groundwater while advancing the penetration test borings, and again after auger withdrawal. We then filled the boreholes, as noted on the boring logs.

5.0 Qualifications

5.1 Variations in Subsurface Conditions

5.1.1 Material Strata

We developed our evaluation, analyses, and recommendations from a limited amount of site and subsurface information. It is not standard engineering practice to retrieve material samples from exploration locations continuously with depth. Therefore, we must infer strata boundaries and thicknesses to some extent. Strata boundaries may also be gradual transitions, and project planning should expect the strata to vary in depth, elevation, and thickness, away from the exploration locations.

Variations in subsurface conditions present between exploration locations may not be revealed until performing additional exploration work or starting construction. If future activity for this project reveals any such variations, you should notify us so that we may reevaluate our recommendations. Such variations could increase construction costs, and we recommend including a contingency to accommodate them.

5.1.2 Groundwater Levels

We made groundwater measurements under the conditions reported herein and shown on the exploration logs and interpreted in the text of this report. Note that the observation periods were relatively short, and project planning can expect groundwater levels to fluctuate in response to rainfall, flooding, irrigation, seasonal freezing and thawing, surface drainage modifications, and other seasonal and annual factors.

5.2 Continuity of Professional Responsibility

5.2.1 Plan Review

We based this report on a limited amount of information, and we made a number of assumptions to help us develop our recommendations. We should be retained to review the geotechnical aspects of the designs and specifications. This review will allow us to evaluate whether we anticipated the design correctly, if any design changes affect the validity of our recommendations, and if the design and specifications correctly interpret and implement our recommendations.

5.2.2 Construction Observations and Testing

We recommend retaining us to perform the required observations and testing during construction as part of the ongoing geotechnical evaluation. This will allow us to correlate the subsurface conditions exposed during construction with those encountered by the borings and provide professional continuity from the design phase to the construction phase. If we do not perform observations and testing during construction, it becomes the responsibility of others to validate the assumption made during the preparation of this report and to accept the construction-related geotechnical engineer-of-record responsibilities.

5.3 Use of Report

This report is for the exclusive use of the addressed parties. Without written approval, we assume no responsibility to other parties regarding this report. Our evaluation, analyses and recommendations may not be appropriate for other parties or projects.

5.4 Standard of Care

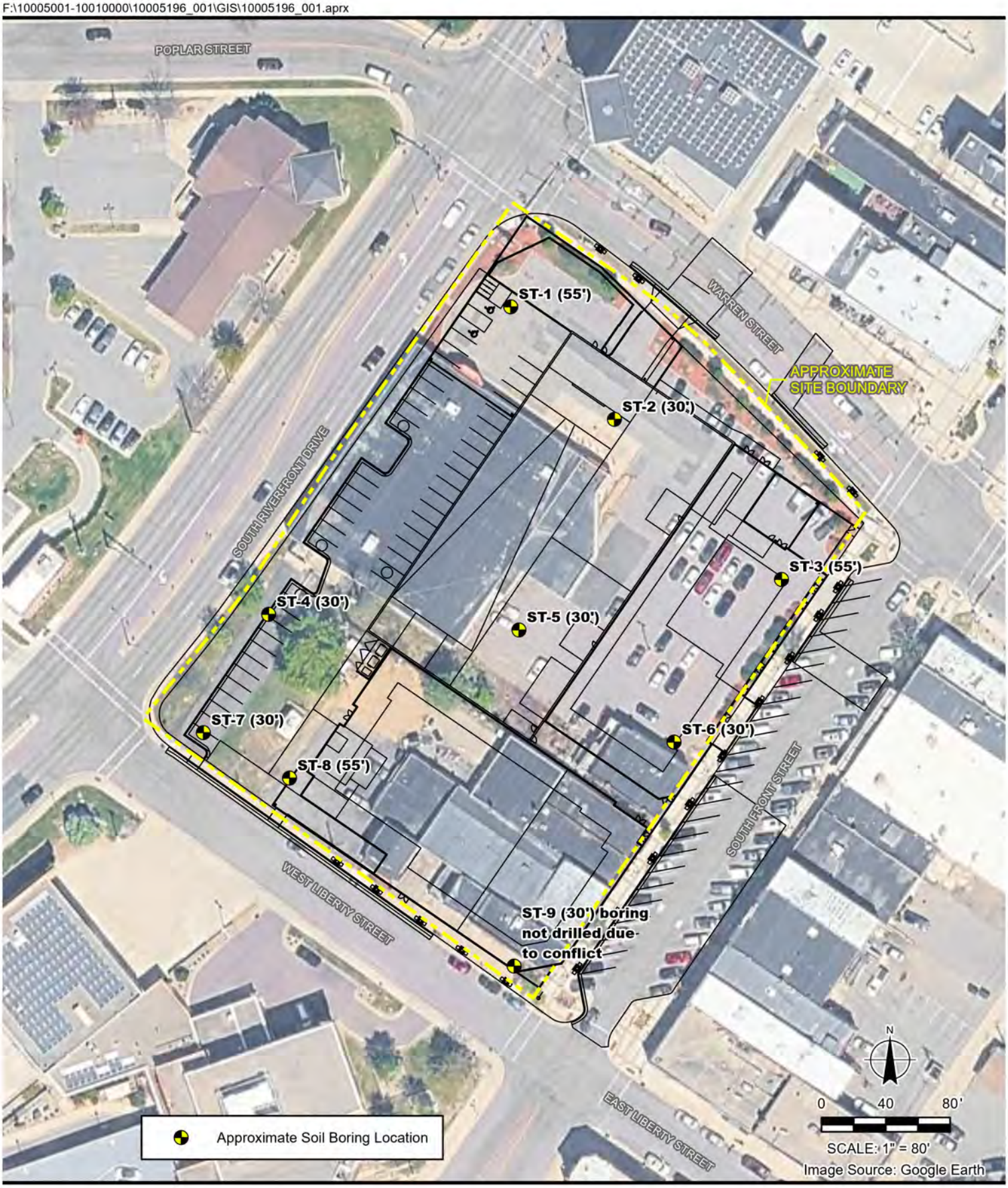
In performing its services, Braun Intertec used that degree of care and skill ordinarily exercised under similar circumstances by reputable members of its profession currently practicing in the same locality. No warranty, express or implied, is made.

Appendix

Soil Boring Location Sketch
Fence Diagram
Log of Boring Sheets ST-1 to ST-8
Descriptive Terminology of Soil

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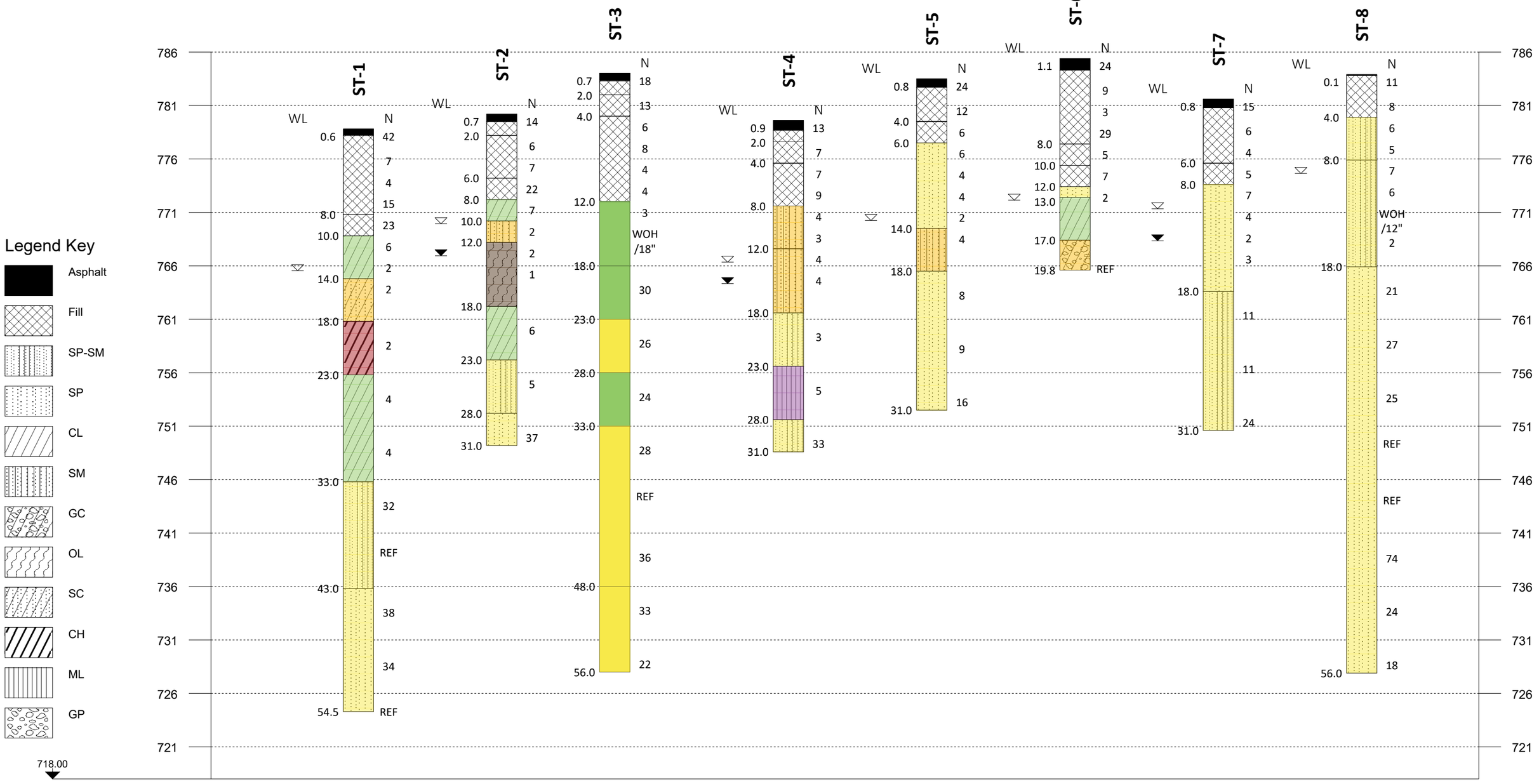
Project No:	10005196_001
Drawing No:	BoringLocs
Drawn By:	SL
Date Drawn:	2/25/2026
Checked By:	MK
Last Modified:	4/22/2026

Front Street Plaza

602 S Front Street

Mankato, Minnesota

Soil Boring Location Sketch



Project ID:	10005196_001
Vert. Scale:	1"= 9'
Hor. Scale:	NTS
Date:	03/31/2026

Fence Diagram
Geotechnical & Environmental Evaluation
Front Street Plaza
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Mankato, Minnesota

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LOG OF BORING

See Descriptive Terminology sheet for explanation of abbreviations

Project Number 10005196_001
Geotechnical & Environmental Evaluation
Front Street Plaza
602 South Front Street
Mankato, Minnesota

BORING: **ST-1**
LOCATION: See attached sketch.
DATUM: NAD 1983 HARN Adj MN Blue Earth (US Feet)
NORTHING: 214953 EASTING: 567812
DRILLER: S. Kerrigan LOGGED BY: M. Kluthe START DATE: 02/16/26 END DATE: 02/16/26
SURFACE ELEVATION: 778.8 ft RIG: 7519 METHOD: 3 1/4" HSA SURFACING: Bituminous WEATHER: 55°, Clear

Elev./ Depth ft	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	PID ppm	MC %	Tests or Remarks
778.2						
0.6	BITUMINOUS, 4 inches of bituminous over 8 inches of apparent aggregate base		3-22-20-17 (42) 16"	0.4		Soil sample ST-1 (2-4') @ 08:50 collected for analytical testing
	FILL: SANDY ORGANIC CLAY (OL), with Gravel, trace bituminous, dark brown to brown, moist		8-4-3-3 (7) 17"	2.0	33	OC=11%
		5	2-2-2-2 (4) 12"	4.9		Soil sample ST-1 (4-6') @ 09:00 collected for analytical testing
770.8			5-7-8-12 (15) 18"	0.2		
8.0	FILL: POORLY GRADED SAND with SILT (SP-SM), fine to coarse-grained, with Gravel, reddish brown to brown, moist	10	11-12-11-8 (23) 17"	0.7		
768.8						
10.0	LEAN CLAY (CL), trace Sand, slightly organic, trace fibers, gray to dark brown, moist, medium to soft (ALLUVIUM)		4-4-2-2 (6) 17"	0.0	39	
764.8			1-1-1-2 (2) 15"	0.0		
14.0	CLAYEY SAND (SC), fine to medium-grained, trace Gravel, gray, wet, very loose (ALLUVIUM)	15	2-1-1-2 (2) 25"	0.0	30	P200=31% End of environmental observation Drilling method switched to mud rotary at 16 feet
760.8						
18.0	FAT CLAY (CH), trace Sand, gray, moist, soft (ALLUVIUM)	20	1-1-1 (2) 17"		49	LL=51, PL=27, PI=24
755.8						
23.0	LEAN CLAY (CL), trace Sand, gray, moist, soft (ALLUVIUM)	25	2-2-2 (4) 16"			
		30	3-2-2 (4) 18"			
745.8						
33.0	POORLY GRADED SAND with SILT (SP-SM), fine to coarse-grained, with Gravel, occasional Silt seams, possible Cobbles and Boulders, brown, wet, dense to very dense (TERRACE DEPOSIT)	35	14-16-16 (32) 11"			Auger chatter from 33-35 feet

Continued on next page

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Project Number 10005196_001
Geotechnical & Environmental Evaluation
Front Street Plaza
602 South Front Street
Mankato, Minnesota

BORING: **ST-1**
LOCATION: See attached sketch.
DATUM: NAD 1983 HARN Adj MN Blue Earth (US Feet)
NORTHING: 214953 EASTING: 567812
START DATE: 02/16/26 END DATE: 02/16/26
DRILLER: S. Kerrigan LOGGED BY: M. Kluthe
SURFACE ELEVATION: 778.8 ft RIG: 7519 METHOD: 3 1/4" HSA
SURFACING: Bituminous WEATHER: 55°, Clear

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	PID ppm	MC %	Tests or Remarks
		POORLY GRADED SAND with SILT (SP-SM), fine to coarse-grained, with Gravel, occasional Silt seams, possible Cobbles and Boulders, brown, wet, dense to very dense (TERRACE DEPOSIT)		50/2" (REF) 8"			
735.8							
43.0		POORLY GRADED SAND (SP), medium to coarse-grained, with Gravel, brown, wet, dense to very dense (TERRACE DEPOSIT)		16-22-16 (38) 10"			
				16-16-18 (34) 12"			
724.3							Rock in tip of sampler at 54.5 feet
54.5		END OF BORING Boring immediately backfilled with bentonite grout		50/0" (REF) 1"			Water observed at 13.0 feet with 14.0 feet of tooling in the ground while drilling.

40 45 50 55 60 65 70

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BORING: **ST-2**
LOCATION: See attached sketch.
DATUM: NAD 1983 HARN Adj MN Blue Earth (US Feet)
NORTHING: 214883 EASTING: 567877
DRILLER: S. Kerrigan LOGGED BY: M. Kluthe START DATE: 02/16/26 END DATE: 02/16/26
SURFACE ELEVATION: 780.2 ft RIG: 7519 METHOD: 3 1/4" HSA SURFACING: Bituminous WEATHER: 55°, Clear

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	PID ppm	MC %	Tests or Remarks
779.5		BITUMINOUS, 2 1/2 inches of bituminous over		4-6-8-7			
0.7		6 inches of apparent aggregate base		(14)	2.5		
778.2		FILL: LEAN CLAY (CL), trace bituminous, trace		22"			
2.0		Sand, dark brown, moist		3-3-3-3			Soil sample ST-2 (2-4') @ 15:00 collected for analytical testing
		FILL: SILTY SAND (SM), fine to medium-grained, trace Gravel, slightly organic, dark brown to brown, moist		(6)	2.9		
				18"			
			5	2-2-5-5	1.9	19	
774.2				(7)			Temporary well installed with screen set from 10 to 15 feet
6.0		POORLY GRADED SAND (SP), fine to coarse-grained, with Gravel, light brown, moist		17"			
772.2		(POSSIBLE FILL)		8-10-12-16	3.5		
8.0		SANDY LEAN CLAY (CL), trace Gravel, gray,		(22)			
770.2		moist, medium (ALLUVIUM)		20"			
				9-5-2-2	3.0	22	Water sample ST-2 @ 15:30 collected for analytical testing
			10	(7)			
10.0	▽	SILTY SAND (SM), fine to medium-grained,		19"			
768.2		trace Gravel, gray, wet, very loose (ALLUVIUM)		1-1-1-1	2.0	25	P200=27%
12.0	▼	ORGANIC CLAY (OL), trace Marl, black, moist		(2)			
		(ALLUVIUM)		18"	2.5	71	OC=10%
				1-1-1-1			
				(2)	1.7		
			15	19"			End of environmental observations
				0-0-1-1			
762.2				(1)			
				21"			
18.0		LEAN CLAY (CL), trace Sand, slightly organic,					
		dark brown to gray, moist, medium		2-3-3			
		(ALLUVIUM)	20	(6)			
				18"			
757.2							
23.0		POORLY GRADED SAND with SILT (SP-SM),					
		fine to medium-grained, gray, wet, loose		2-2-3			
		(ALLUVIUM)	25	(5)			
				17"			
752.2							
28.0		POORLY GRADED SAND (SP), medium to					
		coarse-grained, with Gravel, brown, wet, dense		9-20-17			
		(TERRACE DEPOSIT)	30	(37)			
749.2				17"			
31.0		END OF BORING					Water observed at 10.0 feet with 12.0 feet of tooling in the ground while drilling.
		Boring immediately backfilled with bentonite grout					Water observed at 13.0 feet immediately after withdrawal of auger.
			35				

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BORING: **ST-3**
LOCATION: See attached sketch.
DATUM: NAD 1983 HARN Adj MN Blue Earth (US Feet)
NORTHING: 214784 EASTING: 567981
DRILLER: S. Kerrigan LOGGED BY: M. Kluthe START DATE: 02/16/26 END DATE: 02/16/26
SURFACE ELEVATION: 784.0 ft RIG: 7519 METHOD: 3 1/4" HSA SURFACING: Bituminous WEATHER: 55°, Clear

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	PID ppm	MC %	Tests or Remarks
783.3		BITUMINOUS, 4 inches of bituminous over 4 inches of apparent aggregate base		8-8-10-12 (18) 22"	2.5		Soil sample ST-3 (2-4') @ 11:50 collected for analytical testing
0.7 782.0		FILL: LEAN CLAY (CL), trace Sand, trace Gravel, slightly organic, dark brown, moist		10-8-5-3 (13) 15"	104.6		Soil sample ST-3 (4-6') @ 12:00 collected for analytical testing
2.0 780.0		FILL: CLAYEY SAND (SC), fine to coarse-grained, with Gravel, brick debris, dark brown, moist		2-3-3-3 (6) 16"	21.4	22	OC=4%
4.0		FILL: LEAN CLAY (CL), with Sand, trace Gravel, organic to slightly organic, trace brick and bituminous debris, dark brown to dark gray, moist	5	4-4-4-4 (8) 17"	7.0	27	
				2-2-2-3 (4) 20"	15.4		
			10	2-2-2-2 (4) 16"	12.8		
772.0 12.0		LEAN CLAY (CL), trace Sand, trace Gravel, occasional Silt seams, occasional Sand layers, dark gray, moist, soft to very soft (ALLUVIUM)		1-2-1-2 (3) 24"	2.0	30	
			15	0-0-0-3 WOH/18" 18"	2.3		End of environmental observation Drilling method switched to mud rotary at 16 feet
766.0 18.0		LEAN CLAY (CL), little Sand, with Silt lenses, gray, moist, very stiff (GLACIAL TILL)	20	10-15-15 (30) 17"		23	P200=87%
761.0 23.0		POORLY GRADED SAND with SILT (SP-SM), fine to coarse-grained, trace Gravel, light brown to reddish brown, wet, medium dense (GLACIAL OUTWASH)	25	11-11-15 (26) 13"			
756.0 28.0		SANDY LEAN CLAY (CL), gray, moist, very stiff (GLACIAL TILL)	30	9-12-12 (24) 16"			
751.0 33.0		POORLY GRADED SAND (SP), medium to coarse-grained, trace Gravel, possible Cobbles and Boulders, light reddish brown to brown, wet, medium dense to very dense (TERRACE DEPOSIT)	35	10-14-14 (28) 14"			Auger chatter from 35-45 feet

Continued on next page

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Mankato, Minnesota

BORING: **ST-3**
LOCATION: See attached sketch.
DATUM: NAD 1983 HARN Adj MN Blue Earth (US Feet)
NORTHING: 214784 EASTING: 567981
START DATE: 02/16/26 END DATE: 02/16/26
SURFACE ELEVATION: 784.0 ft RIG: 7519 METHOD: 3 1/4" HSA
SURFACING: Bituminous WEATHER: 55°, Clear
DRILLER: S. Kerrigan LOGGED BY: M. Kluthe

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	PID ppm	MC %	Tests or Remarks
		POORLY GRADED SAND (SP), medium to coarse-grained, trace Gravel, possible Cobbles and Boulders, light reddish brown to brown, wet, medium dense to very dense (TERRACE DEPOSIT)		50/1" (REF) 2"			
40							
				15-18-18 (36) 16"			
45							
736.0							
48.0		POORLY GRADED GRAVEL (GP), with coarse Sand, brown, wet, dense to medium dense (TERRACE DEPOSIT)		12-15-18 (33) 17"			
50							
				5-10-12 (22) 13"			
55							
728.0							
56.0		END OF BORING Boring immediately backfilled with bentonite grout					Water not observed while drilling.
60							
65							
70							

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Project Number 10005196_001
Geotechnical & Environmental Evaluation
Front Street Plaza
602 South Front Street
Mankato, Minnesota

BORING: **ST-4**
LOCATION: See attached sketch.
DATUM: NAD 1983 HARN Adj MN Blue Earth (US Feet)
NORTHING: 214762 EASTING: 567662
DRILLER: S. Kerrigan LOGGED BY: M. Kluthe START DATE: 02/17/26 END DATE: 02/17/26
SURFACE ELEVATION: 779.6 ft RIG: 7519 METHOD: 3 1/4" HSA SURFACING: Bituminous WEATHER: 52°, Clear

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	PID ppm	MC %	Tests or Remarks
778.7		BITUMINOUS, 5 inches of bituminous over 6 inches of apparent aggregate base		8-7-6-6 (13) 15"	1.0	15	Soil sample ST-4 (0-2') @ 10:40 collected for analytical testing
0.9 777.6		FILL: LEAN CLAY (CL), trace Gravel, trace Sand, brown, moist		4-4-3-4 (7) 16"	0.2	17	
2.0 775.6		FILL: SILTY SAND (SM), fine to medium-grained, trace roots, brown to dark brown, moist	5	2-3-4-4 (7) 13"	3.2		
4.0 771.6		FILL: POORLY GRADED SAND with SILT (SP-SM), fine to medium-grained, trace Gravel, brown to dark brown, moist		5-5-4-3 (9) 14"	1.0		
8.0 767.6		SILTY SAND (SM), fine to medium-grained, trace Gravel, organic, black, moist, very loose (ALLUVIUM)	10	2-2-2-2 (4) 16"	0.9	28	P200=22%
12.0 761.6	▽ ▼	SILTY SAND (SM), fine to medium-grained, trace Gravel, dark gray, moist, very loose (ALLUVIUM)	15	1-1-2-2 (3) 20"	3.3	36	OC=6%
18.0 756.6		POORLY GRADED SAND with SILT (SP-SM), fine to medium-grained, trace Gravel, brown, wet, very loose (ALLUVIUM)	20	1-2-2-2 (4) 19"	0.0		
23.0 751.6		SANDY SILT (ML), brown, wet, loose (ALLUVIUM)	25	1-2-2-3 (4) 14"	0.0		End of environmental observation
28.0 748.6		POORLY GRADED SAND with SILT (SP-SM), fine to coarse-grained, with Gravel, brown, wet, dense (TERRACE DEPOSIT)	30	1-1-2 (3) 18"			
31.0		END OF BORING Boring immediately backfilled with bentonite grout	35	1-2-3 (5) 13"			Water observed at 13.0 feet with 16.0 feet of tooling in the ground while drilling. Water observed at 15.0 feet immediately after withdrawal of auger.
				2-16-17 (33) 10"			

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Front Street Plaza
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Mankato, Minnesota

BORING: **ST-5**
LOCATION: See attached sketch.
DATUM: NAD 1983 HARN Adj MN Blue Earth (US Feet)
NORTHING: 214752 EASTING: 567817
DRILLER: S. Kerrigan LOGGED BY: M. Kluthe START DATE: 02/17/26 END DATE: 02/17/26
SURFACE ELEVATION: 783.5 ft RIG: 7519 METHOD: 3 1/4" HSA SURFACING: Bituminous WEATHER: 52°, Clear

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	PID ppm	MC %	Tests or Remarks
782.7		BITUMINOUS, 1 inches of bituminous over 8 inches of apparent aggregate base		7-11-13 (24) 19"	0.9		Soil sample ST-5 (0-2') @ 17:10 collected for analytical testing
0.8		FILL: SILTY SAND (SM), fine to medium-grained, with Gravel, trace bituminous, and brick debris, dark brown, moist		6-7-5-7 (12) 18"	0.8	6	
779.5							
4.0		FILL: POORLY GRADED SAND with SILT (SP-SM), fine to medium-grained, brown and dark brown, moist	5	3-3-3-3 (6) 20"	0.0		
777.5							
6.0		POORLY GRADED SAND (SP), fine-grained, light brown to brown, moist, very loose to loose (ALLUVIUM)		4-3-3-3 (6) 19"	0.8	6	P200=3%
				4-2-2-2 (4) 16"	0.0		
			10	2-2-2-2 (4) 18"	0.3	26	
769.5	▽			1-1-1-2 (2) 19"	0.2		
14.0		SILTY SAND (SM), fine to medium-grained, light brown, wet, very loose (ALLUVIUM)	15	1-2-2-1 (4) 17"	0.0		End of environmental observation
765.5							
18.0		POORLY GRADED SAND (SP), fine to coarse-grained, trace Gravel, brown, wet, loose to medium dense (TERRACE DEPOSIT)	20	4-2-6 (8) 0"			Rock in tip of sampler at 19.5 feet
			25	3-4-5 (9) 24"			
			30	11-10-6 (16) 23"			
752.5							
31.0		END OF BORING Boring immediately backfilled with bentonite grout	35				Water observed at 13.0 feet with 14.0 feet of tooling in the ground while drilling.

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Mankato, Minnesota

BORING: **ST-6**
LOCATION: See attached sketch.
DATUM: NAD 1983 HARN Adj MN Blue Earth (US Feet)
NORTHING: 214683 EASTING: 567914
START DATE: 02/17/26 END DATE: 02/17/26
DRILLER: S. Kerrigan LOGGED BY: M. Kluthe
SURFACE ELEVATION: 785.4 ft RIG: 7519 METHOD: 3 1/4" HSA
SURFACING: Bituminous WEATHER: 52°, Clear

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	PID ppm	MC %	Tests or Remarks
784.3		BITUMINOUS, 6 inches of bituminous over 7 inches of apparent aggregate base		8-11-13-12 (24) 15"	0.0		
1.1		FILL: POORLY GRADED SAND with SILT (SP-SM), fine to coarse-grained, with Gravel, trace bituminous, light brown to brown, moist		8-6-3-3 (9) 14"	0.4		Soil sample ST-6 (2-4') @ 07:30 collected for analytical testing
			5	2-2-1-1 (3) 17"	0.0	5	P200=5%
777.4				5-9-20-26 (29) 18"	0.0		
8.0		FILL: POORLY GRADED GRAVEL (GP), with Sand, brown, moist		4-3-2-2 (5) 19"	0.0		
775.4			10				
10.0		FILL: POORLY GRADED SAND with SILT (SP-SM), fine to coarse-grained, with Gravel, trace brick debris, brown, moist		4-5-2-1 (7) 20"	0.0	10	
773.4							
12.0		POORLY GRADED SAND (SP), medium to coarse-grained, trace Gravel, brown, moist, loose (ALLUVIUM)		1-1-1-1 (2) 17"	0.0		End of environmental observation
772.4	▽						
13.0		LEAN CLAY (CL), trace Sand, gray, moist, soft (ALLUVIUM)	15		0.0		Temporary well installed with screen set from 15 to 20 feet
768.4							
17.0		CLAYEY GRAVEL (GC), with Sand, reddish brown to gray, wet, very dense (TERRACE DEPOSIT)					Water sample ST-6 @ 09:30 collected for analytical testing
765.6			W	50/3" (REF) 12"			
19.8		END OF BORING	20				Water observed at 13.0 feet with 16.0 feet of tooling in the ground while drilling.
		Boring immediately backfilled with bentonite grout					Auger met refusal at 19.8 feet
			25				
			30				
			35				

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Project Number 10005196_001
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Front Street Plaza
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Mankato, Minnesota

BORING: **ST-7**
LOCATION: See attached sketch.
DATUM: NAD 1983 HARN Adj MN Blue Earth (US Feet)
NORTHING: 214688 EASTING: 567621
START DATE: 02/17/26 END DATE: 02/17/26
DRILLER: S. Kerrigan LOGGED BY: M. Kluthe
SURFACE ELEVATION: 781.6 ft RIG: 7519 METHOD: 3 1/4" HSA
SURFACING: Bituminous WEATHER: 52°, Clear

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	PID ppm	MC %	Tests or Remarks
780.8		BITUMINOUS, 4 inches of bituminous over 5 inches of apparent aggregate base		9-8-7-7 (15) 14"	0.0	9	
0.8		FILL: SILTY SAND (SM), fine to medium-grained, trace Gravel, trace bituminous, and glass debris, dark brown, moist		4-3-3-2 (6) 12"	0.0		Soil sample ST-7 (2-4') @ 11:50 collected for analytical testing
775.6			5	3-3-1-2 (4) 13"	0.0	7	
6.0		POORLY GRADED SAND with SILT (SP-SM), fine to coarse-grained, trace Gravel, dark brown, moist (POSSIBLE FILL)		2-2-3-2 (5) 15"	0.0		
773.6				5-4-3-3 (7) 17"	0.0		
8.0	▽	POORLY GRADED SAND (SP), fine to medium-grained, gray, moist to wet, loose to very loose (ALLUVIUM)	10	1-2-2-1 (4) 16"	0.0		Temporary well installed with screen set from 10 to 15 feet
	▼			1-1-1-2 (2) 10"	0.0		Water sample ST-7 @ 13:00 collected for analytical testing
			15	1-1-2-2 (3) 12"			End of environmental testing
763.6							
18.0		POORLY GRADED SAND with SILT (SP-SM), fine to coarse-grained, with Gravel, reddish brown to brown, wet, medium dense (TERRACE DEPOSIT)	20	4-6-5 (11) 14"			
			25	5-5-6 (11) 16"			
			30	5-12-12 (24) 24"			
750.6							
31.0		END OF BORING Boring immediately backfilled with bentonite grout	35				Water observed at 10.0 feet with 10.0 feet of tooling in the ground while drilling. Water observed at 13.0 feet immediately after withdrawal of auger.

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Mankato, Minnesota

BORING: **ST-8**
LOCATION: See attached sketch.
DATUM: NAD 1983 HARN Adj MN Blue Earth (US Feet)
NORTHING: 214660 EASTING: 567675
START DATE: 02/18/26 END DATE: 02/18/26
DRILLER: S. Kerrigan LOGGED BY: M. Kluthe
SURFACE ELEVATION: 783.9 ft RIG: 7519 METHOD: 3 1/4" HSA
SURFACING: Bituminous WEATHER: 32°, Light Snow

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	PID ppm	MC %	Tests or Remarks
783.8		BITUMINOUS, 1 inch		4-5-6-6			
0.1		FILL: POORLY GRADED SAND (SP), fine to medium-grained, trace Gravel, light brown to brown, moist		(11) 14"	0.1		Soil sample ST-8 (0-2') @ 16:20 collected for analytical testing
				4-4-4-4 (8) 15"	0.2	4	P200=6%
779.9							
4.0		POORLY GRADED SAND with SILT (SP-SM), fine to medium-grained, trace Gravel, light brown, moist, loose (ALLUVIUM)	5	3-3-3-3 (6) 13"	0.2		Soil sample ST-8 (2-4') @ 1630 collected for analytical testing
775.9				4-3-2-2 (5) 16"	0.2		
8.0	▽	POORLY GRADED SAND with SILT (SP-SM), fine to medium-grained, trace Gravel, brown, moist to wet, loose to very loose (ALLUVIUM)	10	4-4-3-3 (7) 17"	0.0		
				6-4-2-2 (6) 8"	0.0	19	
			15	1-0-0-1 WOH/12" 15"	0.0		End of environmental observation
				1-1-1-3 (2) 19"			Auger chatter from 17-20 feet
765.9							
18.0		POORLY GRADED SAND (SP), fine to coarse-grained, with Gravel, possible Cobbles and Boulders, reddish brown to light gray, wet, medium dense to very dense (TERRACE DEPOSIT)	20	8-9-12 (21) 23"			
			25	8-12-15 (27) 8"			Jetted with water at 25 feet
			30	11-10-15 (25) 14"			
			35	50/1" (REF) 12"			

Continued on next page

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See Descriptive Terminology sheet for explanation of abbreviations

Project Number 10005196_001
Geotechnical & Environmental Evaluation
Front Street Plaza
602 South Front Street
Mankato, Minnesota

BORING: **ST-8**
LOCATION: See attached sketch.
DATUM: NAD 1983 HARN Adj MN Blue Earth (US Feet)
NORTHING: 214660 EASTING: 567675
START DATE: 02/18/26 END DATE: 02/18/26
DRILLER: S. Kerrigan LOGGED BY: M. Kluthe
SURFACE ELEVATION: 783.9 ft RIG: 7519 METHOD: 3 1/4" HSA
SURFACING: Bituminous WEATHER: 32°, Light Snow

Elev./ Depth ft	Water Level	Description of Materials (Soil-ASTM D2488 or 2487; Rock-USACE EM 1110-1-2908)	Sample	Blows (N-Value) Recovery	PID ppm	MC %	Tests or Remarks
		POORLY GRADED SAND (SP), fine to coarse-grained, with Gravel, possible Cobbles and Boulders, reddish brown to light gray, wet, medium dense to very dense (TERRACE DEPOSIT)					
40				32-50/2" (REF) 9"			
45				33-46-28 (74) 13"			
50				8-10-14 (24) 20"			
55				8-8-10 (18) 22"			
727.9							
56.0		END OF BORING Boring immediately backfilled with bentonite grout					Water observed at 9.0 feet with 10.0 feet of tooling in the ground while drilling.
60							
65							
70							

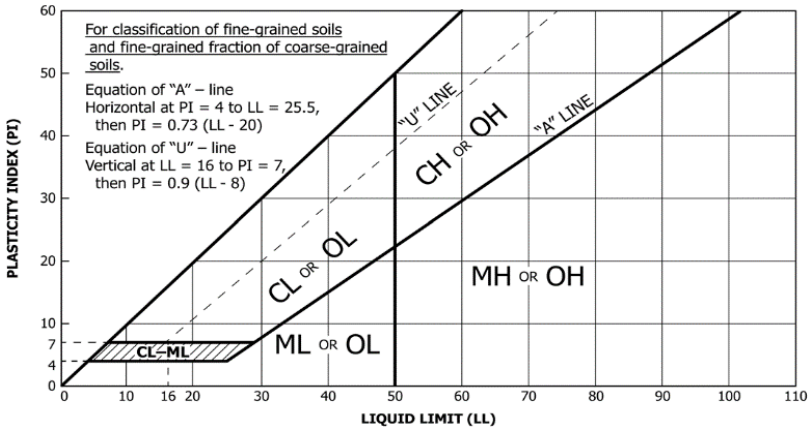
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Descriptive Terminology of Soil

Based on Standards ASTM D2487/2488
(Unified Soil Classification System)

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests[A]				Soil Classification	
				Group Symbol	Group Name[B]
Coarse-grained Soils (more than 50% retained on No. 200 sieve)	Gravels (More than 50% of coarse fraction retained on No. 4 sieve)	Clean Gravels (Less than 5% fines[C])	$C_u \geq 4$ and $1 \leq C_c \leq 3^D$	GW	Well-graded gravel[E]
			$C_u < 4$ and/or ($C_c < 1$ or $C_c > 3$)[D]	GP	Poorly graded gravel[E]
		Gravels with Fines (More than 12% fines[C])	Fines classify as ML or MH	GM	Silty gravel[E F G]
			Fines Classify as CL or CH	GC	Clayey gravel[E F G]
	Sands (50% or more coarse fraction passes No. 4 sieve)	Clean Sands (Less than 5% fines[H])	$C_u \geq 6$ and $1 \leq C_c \leq 3^D$	SW	Well-graded sand[I]
			$C_u < 6$ and/or ($C_c < 1$ or $C_c > 3$)[D]	SP	Poorly graded sand[I]
		Sands with Fines (More than 12% fines[H])	Fines classify as ML or MH	SM	Silty sand[F G I]
			Fines classify as CL or CH	SC	Clayey sand[F G I]
Fine-grained Soils (50% or more passes the No. 200 sieve)	Silts and Clays (Liquid limit less than 50)	Inorganic	PI > 7 and plots on or above "A" line[J]	CL	Lean clay[K L M]
			PI < 4 or plots below "A" line[J]	ML	Silt[K L M]
		Organic	Liquid Limit – oven dried / Liquid Limit – not dried <0.75	OL	Organic clay[K L M N] / Organic silt[K L M O]
	Silts and Clays (Liquid limit 50 or more)	Inorganic	PI plots on or above "A" line	CH	Fat clay[K L M]
			PI plots below "A" line	MH	Elastic silt[K L M]
		Organic	Liquid Limit – oven dried / Liquid Limit – not dried <0.75	OH	Organic clay[K L M P] / Organic silt[K L M Q]
Highly Organic Soils		Primarily organic matter, dark in color, and organic odor		PT	Peat

A. Based on the material passing the 3-inch (75-mm) sieve.
B. If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.
C. Gravels with 5 to 12% fines require dual symbols:
   GW-GM well-graded gravel with silt
   GW-GC well-graded gravel with clay
   GP-GM poorly graded gravel with silt
   GP-GC poorly graded gravel with clay
D. $C_u = D_{60} / D_{10}$ $C_c = (D_{30})^2 / (D_{10} \times D_{60})$
E. If soil contains ≥ 15% sand, add "with sand" to group name.
F. If fines classify as CL-ML, use dual symbol GC-GM or SC-SM.
G. If fines are organic, add "with organic fines" to group name.
H. Sands with 5 to 12% fines require dual symbols:
   SW-SM well-graded sand with silt
   SW-SC well-graded sand with clay
   SP-SM poorly graded sand with silt
   SP-SC poorly graded sand with clay
I. If soil contains ≥ 15% gravel, add "with gravel" to group name.
J. If Atterberg limits plot in hatched area, soil is CL-ML, silty clay.
K. If soil contains 15 to < 30% plus No. 200, add "with sand" or "with gravel", whichever is predominant.
L. If soil contains ≥ 30% plus No. 200, predominantly sand, add "sandy" to group name.
M. If soil contains ≥ 30% plus No. 200 predominantly gravel, add "gravelly" to group name.
N. PI ≥ 4 and plots on or above "A" line.
O. PI < 4 or plots below "A" line.
P. PI plots on or above "A" line.
Q. PI plots below "A" line.



Laboratory Tests

DD	Dry density, pcf	**q_p**	Pocket penetrometer strength, tsf
WD	Wet density, pcf	**q_u**	Unconfined compression test, tsf
P200	% Passing #200 sieve	**LL**	Liquid limit
MC	Moisture content, %	**PL**	Plastic limit
OC	Organic content, %	**PI**	Plasticity index

Particle Size Identification

Boulders	over 12"
Cobbles	3" to 12"
Gravel	
Coarse	3/4" to 3" (19.00 mm to 75.00 mm)
Fine	No. 4 to 3/4" (4.75 mm to 19.00 mm)
Sand	
Coarse	No. 10 to No. 4 (2.00 mm to 4.75 mm)
Medium	No. 40 to No. 10 (0.425 mm to 2.00 mm)
Fine	No. 200 to No. 40 (0.075 mm to 0.425 mm)
Silt	No. 200 (0.075 mm) to .005 mm
Clay	< .005 mm

Relative Proportions[L, M]

trace	0 to 5%
little	6 to 14%
with	≥ 15%

Inclusion Thicknesses

lens	0 to 1/8"
seam	1/8" to 1"
layer	over 1"

Apparent Relative Density of Cohesionless Soils

Very loose	0 to 4 BPF
Loose	5 to 10 BPF
Medium dense	11 to 30 BPF
Dense	31 to 50 BPF
Very dense	over 50 BPF

Consistency of Cohesive Soils	Blows Per Foot	Approximate Unconfined Compressive Strength
Very soft	0 to 1 BPF	< 0.25 tsf
Soft	2 to 4 BPF	0.25 to 0.5 tsf
Medium	5 to 8 BPF	0.5 to 1 tsf
Stiff	9 to 15 BPF	1 to 2 tsf
Very Stiff	16 to 30 BPF	2 to 4 tsf
Hard	over 30 BPF	> 4 tsf

Moisture Content:

Dry: Absence of moisture, dusty, dry to the touch.
Moist: Damp but no visible water.
Wet: Visible free water, usually soil is below water table.

Drilling Notes:

Blows/N-value: Blows indicate the driving resistance recorded for each 6-inch interval. The reported N-value is the blows per foot recorded by summing the second and third interval in accordance with the Standard Penetration Test, ASTM D1586.

Partial Penetration: If the sampler could not be driven through a full 6-inch interval, the number of blows for that partial penetration is shown as #/x" (i.e. 50/2"). The N-value is reported as "REF" indicating refusal.

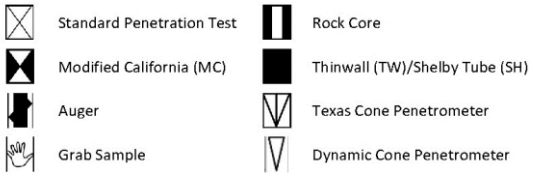
Recovery: Indicates the inches of sample recovered from the sampled interval. For a standard penetration test, full recovery is 18", and is 24" for a thinwall/shelby tube sample.

WOH: Indicates the sampler penetrated soil under weight of hammer and rods alone; driving not required.

WOR: Indicates the sampler penetrated soil under weight of rods alone; hammer weight and driving not required.

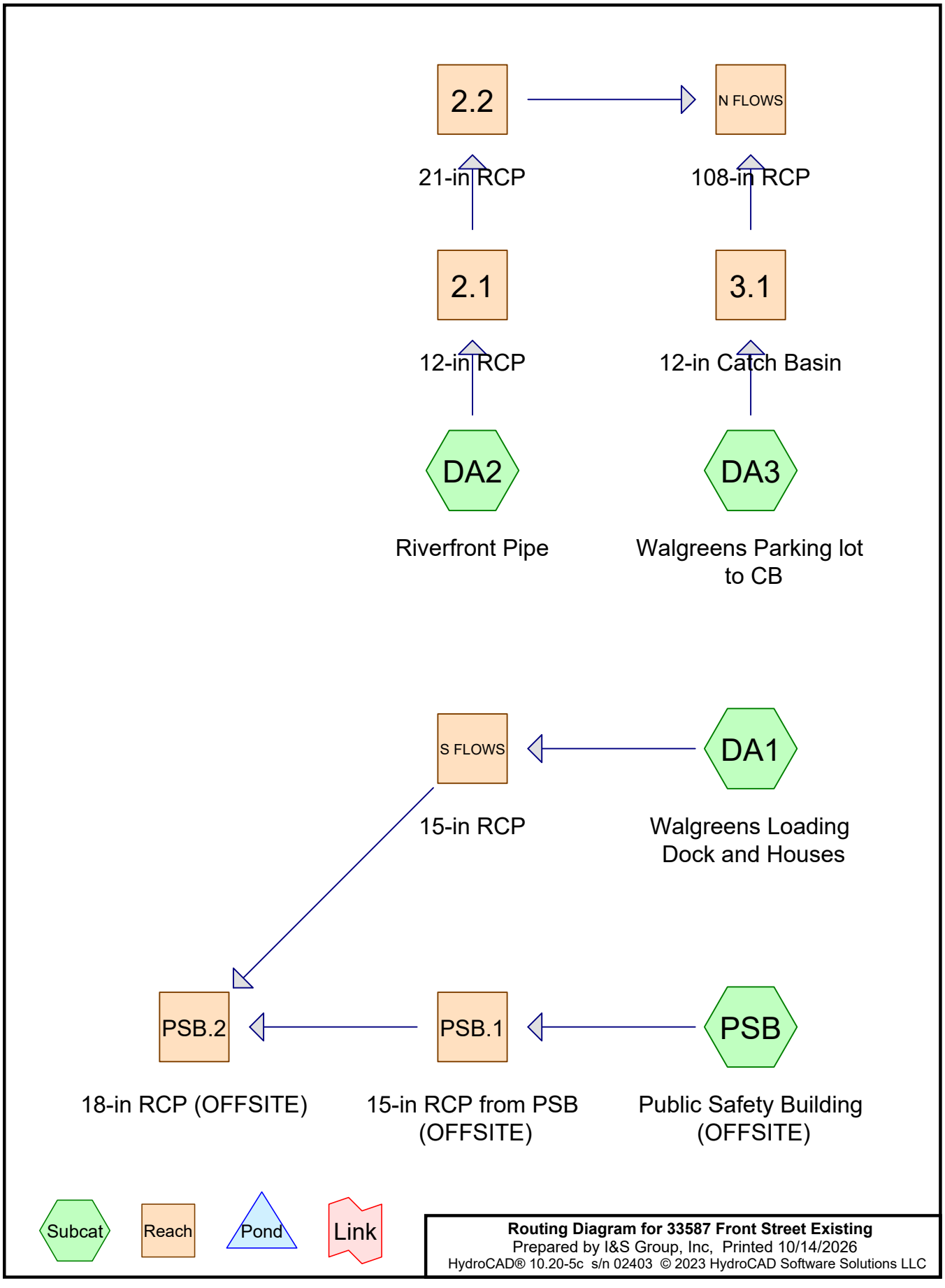
Water Level: Indicates the water level measured by the drillers either while drilling (▽), at the end of drilling (▼), or at some time after drilling (⧨).

Sample Symbols



5/2021

Appendix C: Existing HydroCAD Report



Routing Diagram for 33587 Front Street Existing
Prepared by I&S Group, Inc, Printed 10/14/2026
HydroCAD® 10.20-5c s/n 02403 © 2023 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-yr	MSE 24-hr	3	Default	24.00	1	2.87	2
2	10-yr	MSE 24-hr	3	Default	24.00	1	4.28	2
3	10-yrb2b	MSE 24-hr	3	Default	24.00	2	4.28	2
4	100-yr	MSE 24-hr	3	Default	24.00	1	7.19	2

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment DA1: Walgreens Loading Runoff Area=1.086 ac 74.31% Impervious Runoff Depth=2.13"
Flow Length=256' Slope=0.0320 '/' Tc=18.2 min CN=93 Runoff=2.64 cfs 0.193 af

Subcatchment DA2: Riverfront Pipe Runoff Area=0.746 ac 97.99% Impervious Runoff Depth=2.64"
Tc=10.0 min CN=98 Runoff=2.64 cfs 0.164 af

Subcatchment DA3: Walgreens Parking Runoff Area=0.781 ac 100.00% Impervious Runoff Depth=2.64"
Tc=10.0 min CN=98 Runoff=2.77 cfs 0.172 af

Subcatchment PSB: Public Safety Building Runoff Area=2.011 ac 94.88% Impervious Runoff Depth=2.53"
Tc=10.0 min CN=97 Runoff=7.00 cfs 0.424 af

Reach 2.1: 12-in RCP Avg. Flow Depth=0.35' Max Vel=10.65 fps Inflow=2.64 cfs 0.164 af
12.0" Round Pipe n=0.013 L=14.5' S=0.0779 '/' Capacity=9.95 cfs Outflow=2.64 cfs 0.164 af

Reach 2.2: 21-in RCP Avg. Flow Depth=0.66' Max Vel=3.17 fps Inflow=2.64 cfs 0.164 af
21.0" Round Pipe n=0.015 L=56.2' S=0.0041 '/' Capacity=8.78 cfs Outflow=2.61 cfs 0.164 af

Reach 3.1: 12-in Catch Basin Avg. Flow Depth=0.75' Max Vel=4.34 fps Inflow=2.77 cfs 0.172 af
12.0" Round Pipe n=0.015 L=46.1' S=0.0095 '/' Capacity=3.02 cfs Outflow=2.74 cfs 0.172 af

Reach N FLOWS: 108-in RCP Avg. Flow Depth=1.56' Max Vel=0.42 fps Inflow=5.35 cfs 0.336 af
108.0" Round Pipe n=0.015 L=512.0' S=0.0000 '/' Capacity=47.83 cfs Outflow=3.10 cfs 0.336 af

Reach PSB.1: 15-in RCP from PSB Avg. Flow Depth=1.25' Max Vel=3.32 fps Inflow=7.00 cfs 0.424 af
15.0" Round Pipe n=0.015 L=9.7' S=0.0041 '/' Capacity=3.60 cfs Outflow=3.60 cfs 0.424 af

Reach PSB.2: 18-in RCP (OFFSITE) Avg. Flow Depth=1.17' Max Vel=4.21 fps Inflow=6.23 cfs 0.617 af
18.0" Round Pipe n=0.013 L=69.5' S=0.0039 '/' Capacity=6.55 cfs Outflow=6.21 cfs 0.617 af

Reach S FLOWS: 15-in RCP Avg. Flow Depth=0.80' Max Vel=3.16 fps Inflow=2.64 cfs 0.193 af
15.0" Round Pipe n=0.015 L=27.5' S=0.0040 '/' Capacity=3.54 cfs Outflow=2.63 cfs 0.193 af

Summary for Subcatchment DA1: Walgreens Loading Dock and Houses

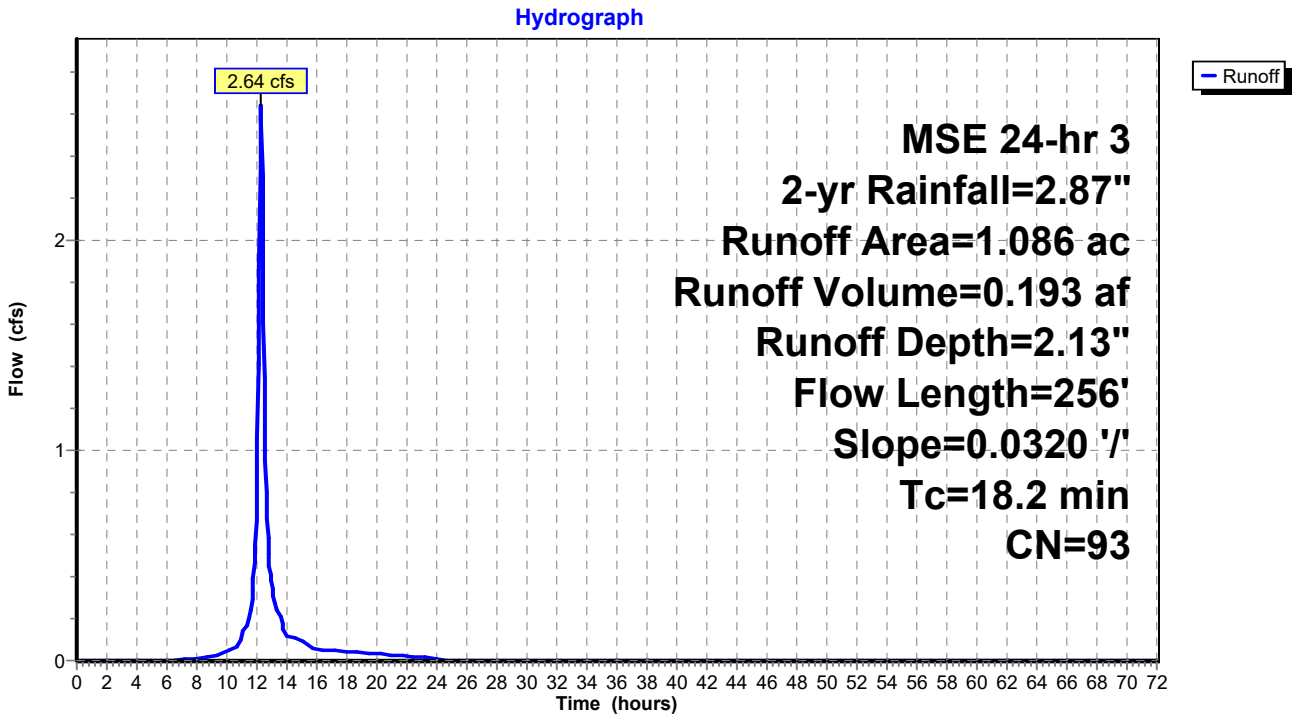
Runoff = 2.64 cfs @ 12.27 hrs, Volume= 0.193 af, Depth= 2.13"
Routed to Reach S FLOWS : 15-in RCP

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-yr Rainfall=2.87"

Area (ac)	CN	Description
0.807	98	Paved parking, HSG D
0.279	80	>75% Grass cover, Good, HSG D
1.086	93	Weighted Average
0.279		25.69% Pervious Area
0.807		74.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.2	256	0.0320	0.23		**Sheet Flow, Grass Sheet Flow to intake** Grass: Short n= 0.150 P2= 2.87"

Subcatchment DA1: Walgreens Loading Dock and Houses



Hydrograph for Subcatchment DA1: Walgreens Loading Dock and Houses

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.01	0.00	0.00
2.00	0.03	0.00	0.00
3.00	0.05	0.00	0.00
4.00	0.07	0.00	0.00
5.00	0.11	0.00	0.00
6.00	0.15	0.00	0.00
7.00	0.19	0.00	0.00
8.00	0.24	0.01	0.01
9.00	0.30	0.02	0.02
10.00	0.39	0.06	0.04
11.00	0.55	0.14	0.12
12.00	1.33	0.72	**0.82**
13.00	2.32	1.61	**0.35**
14.00	2.48	1.76	0.12
15.00	2.57	1.85	0.10
16.00	2.63	1.90	0.06
17.00	2.68	1.95	0.05
18.00	2.72	1.99	0.04
19.00	2.76	2.03	0.04
20.00	2.80	2.06	0.03
21.00	2.82	2.08	0.03
22.00	2.84	2.11	0.02
23.00	2.86	2.12	0.02
24.00	**2.87**	**2.13**	0.01
25.00	2.87	2.13	0.00
26.00	2.87	2.13	0.00
27.00	2.87	2.13	0.00
28.00	2.87	2.13	0.00
29.00	2.87	2.13	0.00
30.00	2.87	2.13	0.00
31.00	2.87	2.13	0.00
32.00	2.87	2.13	0.00
33.00	2.87	2.13	0.00
34.00	2.87	2.13	0.00
35.00	2.87	2.13	0.00
36.00	2.87	2.13	0.00
37.00	2.87	2.13	0.00
38.00	2.87	2.13	0.00
39.00	2.87	2.13	0.00
40.00	2.87	2.13	0.00
41.00	2.87	2.13	0.00
42.00	2.87	2.13	0.00
43.00	2.87	2.13	0.00
44.00	2.87	2.13	0.00
45.00	2.87	2.13	0.00
46.00	2.87	2.13	0.00
47.00	2.87	2.13	0.00
48.00	2.87	2.13	0.00
49.00	2.87	2.13	0.00
50.00	2.87	2.13	0.00
51.00	2.87	2.13	0.00
52.00	2.87	2.13	0.00
53.00	2.87	2.13	0.00
54.00	2.87	2.13	0.00
55.00	2.87	2.13	0.00
56.00	2.87	2.13	0.00
57.00	2.87	2.13	0.00
58.00	2.87	2.13	0.00
59.00	2.87	2.13	0.00
60.00	2.87	2.13	0.00
61.00	2.87	2.13	0.00
62.00	2.87	2.13	0.00
63.00	2.87	2.13	0.00
64.00	2.87	2.13	0.00
65.00	2.87	2.13	0.00
66.00	2.87	2.13	0.00
67.00	2.87	2.13	0.00
68.00	2.87	2.13	0.00
69.00	2.87	2.13	0.00
70.00	2.87	2.13	0.00
71.00	2.87	2.13	0.00
72.00	2.87	2.13	0.00

Summary for Subcatchment DA2: Riverfront Pipe

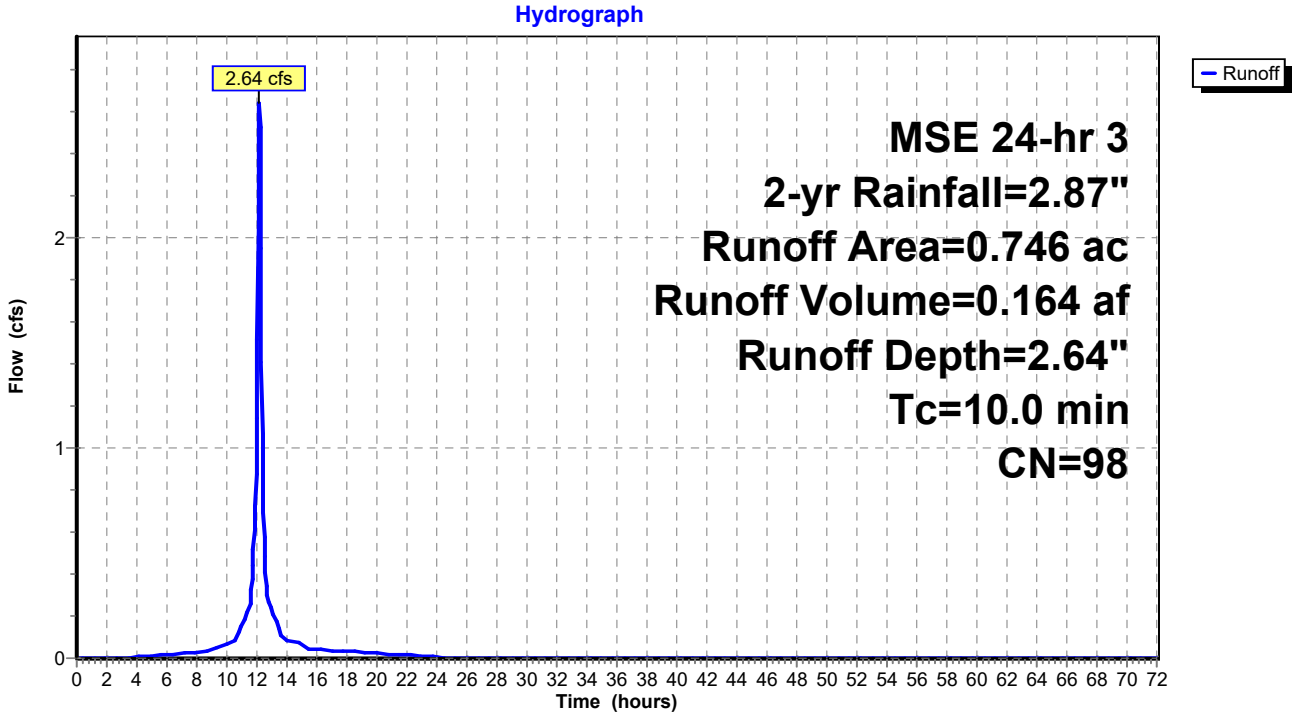
Runoff = 2.64 cfs @ 12.17 hrs, Volume= 0.164 af, Depth= 2.64"
Routed to Reach 2.1 : 12-in RCP

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-yr Rainfall=2.87"

Area (ac)	CN	Description
0.731	98	Paved parking, HSG D
0.015	80	>75% Grass cover, Good, HSG D
0.746	98	Weighted Average
0.015		2.01% Pervious Area
0.731		97.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, Minimum**

Subcatchment DA2: Riverfront Pipe



Hydrograph for Subcatchment DA2: Riverfront Pipe

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.01	0.00	0.00
2.00	0.03	0.00	0.00
3.00	0.05	0.00	0.00
4.00	0.07	0.00	0.01
5.00	0.11	0.02	0.01
6.00	0.15	0.04	0.02
7.00	0.19	0.06	0.02
8.00	0.24	0.10	0.03
9.00	0.30	0.14	0.03
10.00	0.39	0.22	0.07
11.00	0.55	0.37	0.16
12.00	1.33	1.11	**1.14**
13.00	2.32	2.09	**0.22**
14.00	2.48	2.25	0.08
15.00	2.57	2.34	0.07
16.00	2.63	2.40	0.04
17.00	2.68	2.45	0.04
18.00	2.72	2.49	0.03
19.00	2.76	2.53	0.03
20.00	2.80	2.56	0.02
21.00	2.82	2.59	0.02
22.00	2.84	2.61	0.01
23.00	2.86	2.63	0.01
24.00	**2.87**	**2.64**	0.01
25.00	2.87	2.64	0.00
26.00	2.87	2.64	0.00
27.00	2.87	2.64	0.00
28.00	2.87	2.64	0.00
29.00	2.87	2.64	0.00
30.00	2.87	2.64	0.00
31.00	2.87	2.64	0.00
32.00	2.87	2.64	0.00
33.00	2.87	2.64	0.00
34.00	2.87	2.64	0.00
35.00	2.87	2.64	0.00
36.00	2.87	2.64	0.00
37.00	2.87	2.64	0.00
38.00	2.87	2.64	0.00
39.00	2.87	2.64	0.00
40.00	2.87	2.64	0.00
41.00	2.87	2.64	0.00
42.00	2.87	2.64	0.00
43.00	2.87	2.64	0.00
44.00	2.87	2.64	0.00
45.00	2.87	2.64	0.00
46.00	2.87	2.64	0.00
47.00	2.87	2.64	0.00
48.00	2.87	2.64	0.00
49.00	2.87	2.64	0.00
50.00	2.87	2.64	0.00
51.00	2.87	2.64	0.00
52.00	2.87	2.64	0.00
53.00	2.87	2.64	0.00
54.00	2.87	2.64	0.00
55.00	2.87	2.64	0.00
56.00	2.87	2.64	0.00
57.00	2.87	2.64	0.00
58.00	2.87	2.64	0.00
59.00	2.87	2.64	0.00
60.00	2.87	2.64	0.00
61.00	2.87	2.64	0.00
62.00	2.87	2.64	0.00
63.00	2.87	2.64	0.00
64.00	2.87	2.64	0.00
65.00	2.87	2.64	0.00
66.00	2.87	2.64	0.00
67.00	2.87	2.64	0.00
68.00	2.87	2.64	0.00
69.00	2.87	2.64	0.00
70.00	2.87	2.64	0.00
71.00	2.87	2.64	0.00
72.00	2.87	2.64	0.00

Summary for Subcatchment DA3: Walgreens Parking lot to CB

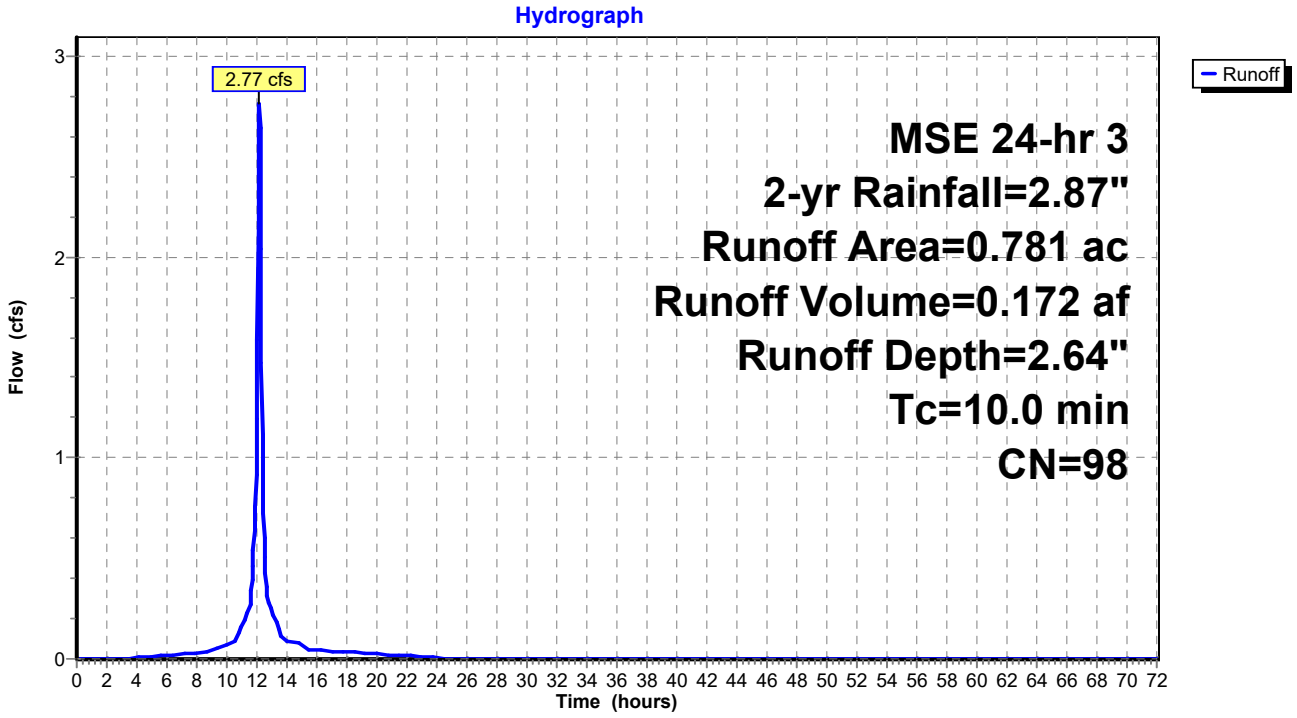
Runoff = 2.77 cfs @ 12.17 hrs, Volume= 0.172 af, Depth= 2.64"
Routed to Reach 3.1 : 12-in Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-yr Rainfall=2.87"

Area (ac)	CN	Description
0.781	98	Paved parking, HSG D
0.781		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, Minimum Entry**

Subcatchment DA3: Walgreens Parking lot to CB



Hydrograph for Subcatchment DA3: Walgreens Parking lot to CB

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.01	0.00	0.00
2.00	0.03	0.00	0.00
3.00	0.05	0.00	0.00
4.00	0.07	0.00	0.01
5.00	0.11	0.02	0.01
6.00	0.15	0.04	0.02
7.00	0.19	0.06	0.02
8.00	0.24	0.10	0.03
9.00	0.30	0.14	0.04
10.00	0.39	0.22	0.07
11.00	0.55	0.37	0.16
12.00	1.33	1.11	**1.19**
13.00	2.32	2.09	**0.23**
14.00	2.48	2.25	0.08
15.00	2.57	2.34	0.07
16.00	2.63	2.40	0.04
17.00	2.68	2.45	0.04
18.00	2.72	2.49	0.03
19.00	2.76	2.53	0.03
20.00	2.80	2.56	0.02
21.00	2.82	2.59	0.02
22.00	2.84	2.61	0.02
23.00	2.86	2.63	0.01
24.00	**2.87**	**2.64**	0.01
25.00	2.87	2.64	0.00
26.00	2.87	2.64	0.00
27.00	2.87	2.64	0.00
28.00	2.87	2.64	0.00
29.00	2.87	2.64	0.00
30.00	2.87	2.64	0.00
31.00	2.87	2.64	0.00
32.00	2.87	2.64	0.00
33.00	2.87	2.64	0.00
34.00	2.87	2.64	0.00
35.00	2.87	2.64	0.00
36.00	2.87	2.64	0.00
37.00	2.87	2.64	0.00
38.00	2.87	2.64	0.00
39.00	2.87	2.64	0.00
40.00	2.87	2.64	0.00
41.00	2.87	2.64	0.00
42.00	2.87	2.64	0.00
43.00	2.87	2.64	0.00
44.00	2.87	2.64	0.00
45.00	2.87	2.64	0.00
46.00	2.87	2.64	0.00
47.00	2.87	2.64	0.00
48.00	2.87	2.64	0.00
49.00	2.87	2.64	0.00
50.00	2.87	2.64	0.00
51.00	2.87	2.64	0.00
52.00	2.87	2.64	0.00
53.00	2.87	2.64	0.00
54.00	2.87	2.64	0.00
55.00	2.87	2.64	0.00
56.00	2.87	2.64	0.00
57.00	2.87	2.64	0.00
58.00	2.87	2.64	0.00
59.00	2.87	2.64	0.00
60.00	2.87	2.64	0.00
61.00	2.87	2.64	0.00
62.00	2.87	2.64	0.00
63.00	2.87	2.64	0.00
64.00	2.87	2.64	0.00
65.00	2.87	2.64	0.00
66.00	2.87	2.64	0.00
67.00	2.87	2.64	0.00
68.00	2.87	2.64	0.00
69.00	2.87	2.64	0.00
70.00	2.87	2.64	0.00
71.00	2.87	2.64	0.00
72.00	2.87	2.64	0.00

Summary for Subcatchment PSB: Public Safety Building (OFFSITE)

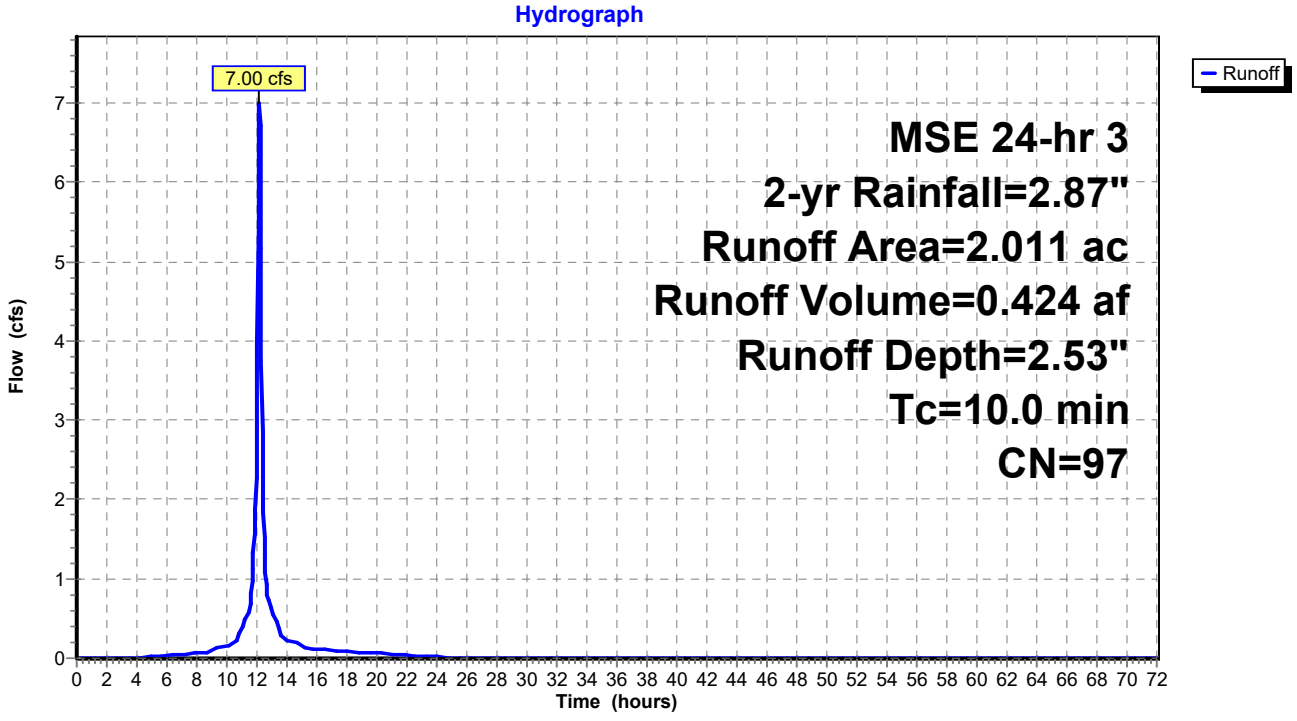
Runoff = 7.00 cfs @ 12.17 hrs, Volume= 0.424 af, Depth= 2.53"
Routed to Reach PSB.1 : 15-in RCP from PSB (OFFSITE)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-yr Rainfall=2.87"

Area (ac)	CN	Description
1.908	98	Roofs, HSG D
0.103	82	Woods/grass comb., Fair, HSG D
2.011	97	Weighted Average
0.103		5.12% Pervious Area
1.908		94.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, Minimum Entry**

Subcatchment PSB: Public Safety Building (OFFSITE)



Hydrograph for Subcatchment PSB: Public Safety Building (OFFSITE)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.01	0.00	0.00
2.00	0.03	0.00	0.00
3.00	0.05	0.00	0.00
4.00	0.07	0.00	0.00
5.00	0.11	0.01	0.02
6.00	0.15	0.02	0.03
7.00	0.19	0.04	0.05
8.00	0.24	0.07	0.06
9.00	0.30	0.10	0.08
10.00	0.39	0.17	0.16
11.00	0.55	0.30	0.39
12.00	1.33	1.02	**2.98**
13.00	2.32	1.98	**0.59**
14.00	2.48	2.14	0.22
15.00	2.57	2.24	0.19
16.00	2.63	2.29	0.11
17.00	2.68	2.34	0.10
18.00	2.72	2.38	0.08
19.00	2.76	2.42	0.07
20.00	2.80	2.46	0.06
21.00	2.82	2.48	0.05
22.00	2.84	2.50	0.04
23.00	2.86	2.52	0.03
24.00	**2.87**	**2.53**	0.02
25.00	2.87	2.53	0.00
26.00	2.87	2.53	0.00
27.00	2.87	2.53	0.00
28.00	2.87	2.53	0.00
29.00	2.87	2.53	0.00
30.00	2.87	2.53	0.00
31.00	2.87	2.53	0.00
32.00	2.87	2.53	0.00
33.00	2.87	2.53	0.00
34.00	2.87	2.53	0.00
35.00	2.87	2.53	0.00
36.00	2.87	2.53	0.00
37.00	2.87	2.53	0.00
38.00	2.87	2.53	0.00
39.00	2.87	2.53	0.00
40.00	2.87	2.53	0.00
41.00	2.87	2.53	0.00
42.00	2.87	2.53	0.00
43.00	2.87	2.53	0.00
44.00	2.87	2.53	0.00
45.00	2.87	2.53	0.00
46.00	2.87	2.53	0.00
47.00	2.87	2.53	0.00
48.00	2.87	2.53	0.00
49.00	2.87	2.53	0.00
50.00	2.87	2.53	0.00
51.00	2.87	2.53	0.00
52.00	2.87	2.53	0.00
53.00	2.87	2.53	0.00
54.00	2.87	2.53	0.00
55.00	2.87	2.53	0.00
56.00	2.87	2.53	0.00
57.00	2.87	2.53	0.00
58.00	2.87	2.53	0.00
59.00	2.87	2.53	0.00
60.00	2.87	2.53	0.00
61.00	2.87	2.53	0.00
62.00	2.87	2.53	0.00
63.00	2.87	2.53	0.00
64.00	2.87	2.53	0.00
65.00	2.87	2.53	0.00
66.00	2.87	2.53	0.00
67.00	2.87	2.53	0.00
68.00	2.87	2.53	0.00
69.00	2.87	2.53	0.00
70.00	2.87	2.53	0.00
71.00	2.87	2.53	0.00
72.00	2.87	2.53	0.00

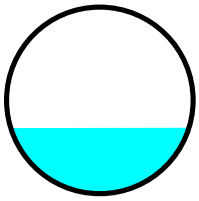
Summary for Reach 2.1: 12-in RCP

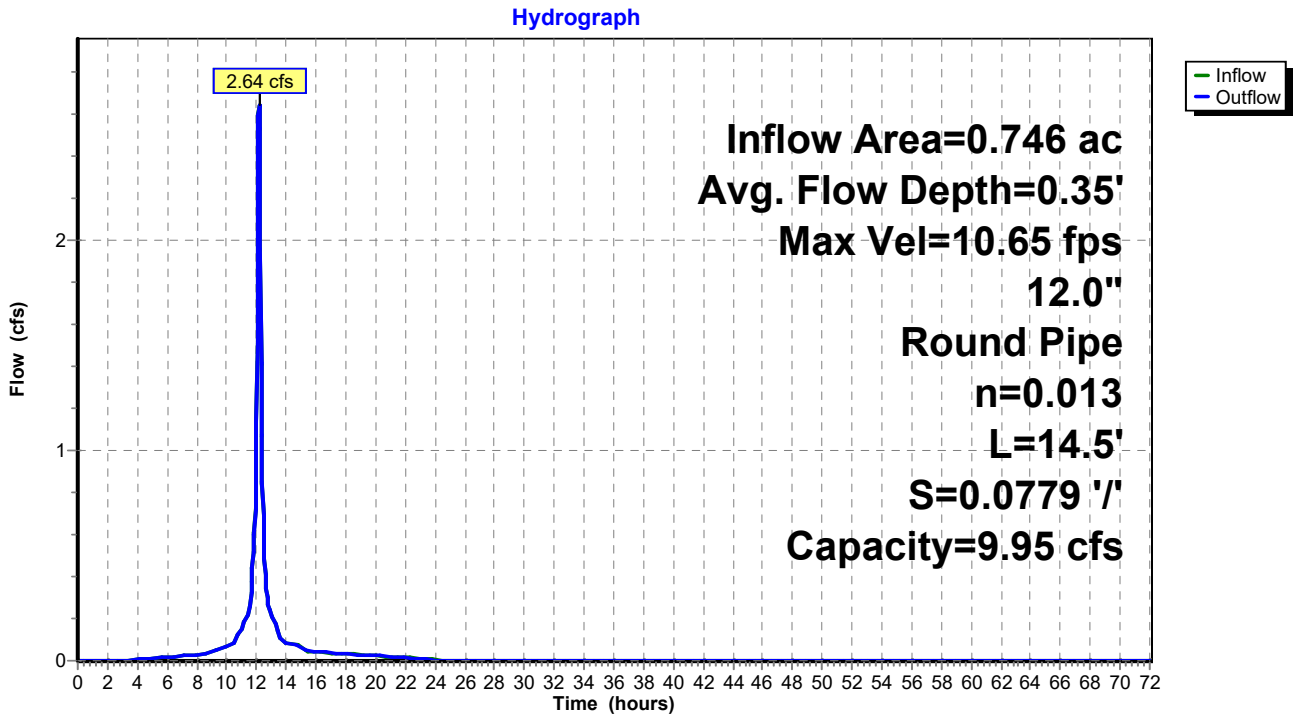
Inflow Area = 0.746 ac, 97.99% Impervious, Inflow Depth = 2.64" for 2-yr event
Inflow = 2.64 cfs @ 12.17 hrs, Volume= 0.164 af
Outflow = 2.64 cfs @ 12.17 hrs, Volume= 0.164 af, Atten= 0%, Lag= 0.0 min
Routed to Reach 2.2 : 21-in RCP

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 10.65 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.10 fps, Avg. Travel Time= 0.1 min

Peak Storage= 4 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.35' , Surface Width= 0.96'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 9.95 cfs

12.0" Round Pipe
n= 0.013 Concrete pipe, bends & connections
Length= 14.5' Slope= 0.0779 '/'
Inlet Invert= 773.11', Outlet Invert= 771.98'





Hydrograph for Reach 2.1: 12-in RCP

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	773.11	0.00
2.50	0.00	0	773.11	0.00
5.00	0.01	0	773.13	0.01
7.50	0.03	0	773.15	0.03
10.00	**0.07**	**0**	**773.17**	**0.07**
12.50	**0.57**	**1**	**773.27**	**0.58**
15.00	0.07	0	773.17	0.07
17.50	0.03	0	773.15	0.03
20.00	0.02	0	773.15	0.02
22.50	0.01	0	773.14	0.01
25.00	0.00	0	773.11	0.00
27.50	0.00	0	773.11	0.00
30.00	0.00	0	773.11	0.00
32.50	0.00	0	773.11	0.00
35.00	0.00	0	773.11	0.00
37.50	0.00	0	773.11	0.00
40.00	0.00	0	773.11	0.00
42.50	0.00	0	773.11	0.00
45.00	0.00	0	773.11	0.00
47.50	0.00	0	773.11	0.00
50.00	0.00	0	773.11	0.00
52.50	0.00	0	773.11	0.00
55.00	0.00	0	773.11	0.00
57.50	0.00	0	773.11	0.00
60.00	0.00	0	773.11	0.00
62.50	0.00	0	773.11	0.00
65.00	0.00	0	773.11	0.00
67.50	0.00	0	773.11	0.00
70.00	0.00	0	773.11	0.00

Stage-Discharge for Reach 2.1: 12-in RCP

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
773.11	0.00	0.00
773.12	1.13	0.00
773.13	1.78	0.01
773.14	2.33	0.02
773.15	2.81	0.03
773.16	3.25	0.05
773.17	3.66	0.07
773.18	4.04	0.10
773.19	4.41	0.13
773.20	4.75	0.17
773.21	5.08	0.21
773.22	5.40	0.25
773.23	5.70	0.30
773.24	5.99	0.36
773.25	6.27	0.42
773.26	6.54	0.48
773.27	6.81	0.55
773.28	7.06	0.63
773.29	7.31	0.70
773.30	7.55	0.78
773.31	7.79	0.87
773.32	8.02	0.96
773.33	8.24	1.06
773.34	8.46	1.15
773.35	8.67	1.26
773.36	8.87	1.36
773.37	9.07	1.47
773.38	9.27	1.59
773.39	9.46	1.70
773.40	9.65	1.82
773.41	9.83	1.95
773.42	10.01	2.08
773.43	10.18	2.21
773.44	10.35	2.34
773.45	10.51	2.48
773.46	10.68	2.62
773.47	10.83	2.76
773.48	10.99	2.90
773.49	11.14	3.05
773.50	11.28	3.20
773.51	11.42	3.35
773.52	11.56	3.51
773.53	11.70	3.66
773.54	11.83	3.82
773.55	11.96	3.98
773.56	12.09	4.14
773.57	12.21	4.31
773.58	12.33	4.47
773.59	12.44	4.64
773.60	12.55	4.80
773.61	12.66	4.97
773.62	12.77	5.14
773.63	12.87	5.31
773.64	12.97	5.48
773.65	13.07	5.65
773.66	13.16	5.83
773.67	13.25	6.00
773.68	13.34	6.17
773.69	13.42	6.34
773.70	13.50	6.51
773.71	13.58	6.68
773.72	13.66	6.85
773.73	13.73	7.02
773.74	13.79	7.19
773.75	13.86	7.36
773.76	13.92	7.52
773.77	13.98	7.69
773.78	14.03	7.85
773.79	14.09	8.01
773.80	14.14	8.17
773.81	14.18	8.33
773.82	14.22	8.48
773.83	14.26	8.63
773.84	14.30	8.78
773.85	14.33	8.93
773.86	14.35	9.07
773.87	14.38	9.21
773.88	14.40	9.34
773.89	14.41	9.47
773.90	14.43	9.60
773.91	14.43	9.72
773.92	**14.44**	9.84
773.93	14.44	9.95
773.94	14.43	10.06
773.95	14.42	10.16
773.96	14.40	10.25
773.97	14.38	10.34
773.98	14.36	10.41
773.99	14.32	10.48
774.00	14.28	10.55
774.01	14.24	10.60
774.02	14.18	10.64
774.03	14.12	10.67
774.04	14.05	10.69
774.05	13.96	**10.70**
774.06	13.87	10.69
774.07	13.75	10.66
774.08	13.62	10.60
774.09	13.45	10.51
774.10	13.22	10.36
774.11	12.66	9.95

Stage-Area-Storage for Reach 2.1: 12-in RCP

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
773.11	0.0	0
773.12	0.0	0
773.13	0.0	0
773.14	0.0	0
773.15	0.0	0
773.16	0.0	0
773.17	0.0	0
773.18	0.0	0
773.19	0.0	0
773.20	0.0	1
773.21	0.0	1
773.22	0.0	1
773.23	0.1	1
773.24	0.1	1
773.25	0.1	1
773.26	0.1	1
773.27	0.1	1
773.28	0.1	1
773.29	0.1	1
773.30	0.1	2
773.31	0.1	2
773.32	0.1	2
773.33	0.1	2
773.34	0.1	2
773.35	0.1	2
773.36	0.2	2
773.37	0.2	2
773.38	0.2	2
773.39	0.2	3
773.40	0.2	3
773.41	0.2	3
773.42	0.2	3
773.43	0.2	3
773.44	0.2	3
773.45	0.2	3
773.46	0.2	4
773.47	0.3	4
773.48	0.3	4
773.49	0.3	4
773.50	0.3	4
773.51	0.3	4
773.52	0.3	4
773.53	0.3	5
773.54	0.3	5
773.55	0.3	5
773.56	0.3	5
773.57	0.4	5
773.58	0.4	5
773.59	0.4	5
773.60	0.4	6
773.61	0.4	6
773.62	0.4	6
773.63	0.4	6
773.64	0.4	6
773.65	0.4	6
773.66	0.4	6
773.67	0.5	7
773.68	0.5	7
773.69	0.5	7
773.70	0.5	7
773.71	0.5	7
773.72	0.5	7
773.73	0.5	7
773.74	0.5	8
773.75	0.5	8
773.76	0.5	8
773.77	0.5	8
773.78	0.6	8
773.79	0.6	8
773.80	0.6	8
773.81	0.6	9
773.82	0.6	9
773.83	0.6	9
773.84	0.6	9
773.85	0.6	9
773.86	0.6	9
773.87	0.6	9
773.88	0.6	9
773.89	0.7	10
773.90	0.7	10
773.91	0.7	10
773.92	0.7	10
773.93	0.7	10
773.94	0.7	10
773.95	0.7	10
773.96	0.7	10
773.97	0.7	10
773.98	0.7	11
773.99	0.7	11
774.00	0.7	11
774.01	0.7	11
774.02	0.8	11
774.03	0.8	11
774.04	0.8	11
774.05	0.8	11
774.06	0.8	11
774.07	0.8	11
774.08	0.8	11
774.09	0.8	11
774.10	0.8	11
774.11	**0.8**	**11**

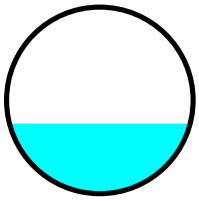
Summary for Reach 2.2: 21-in RCP

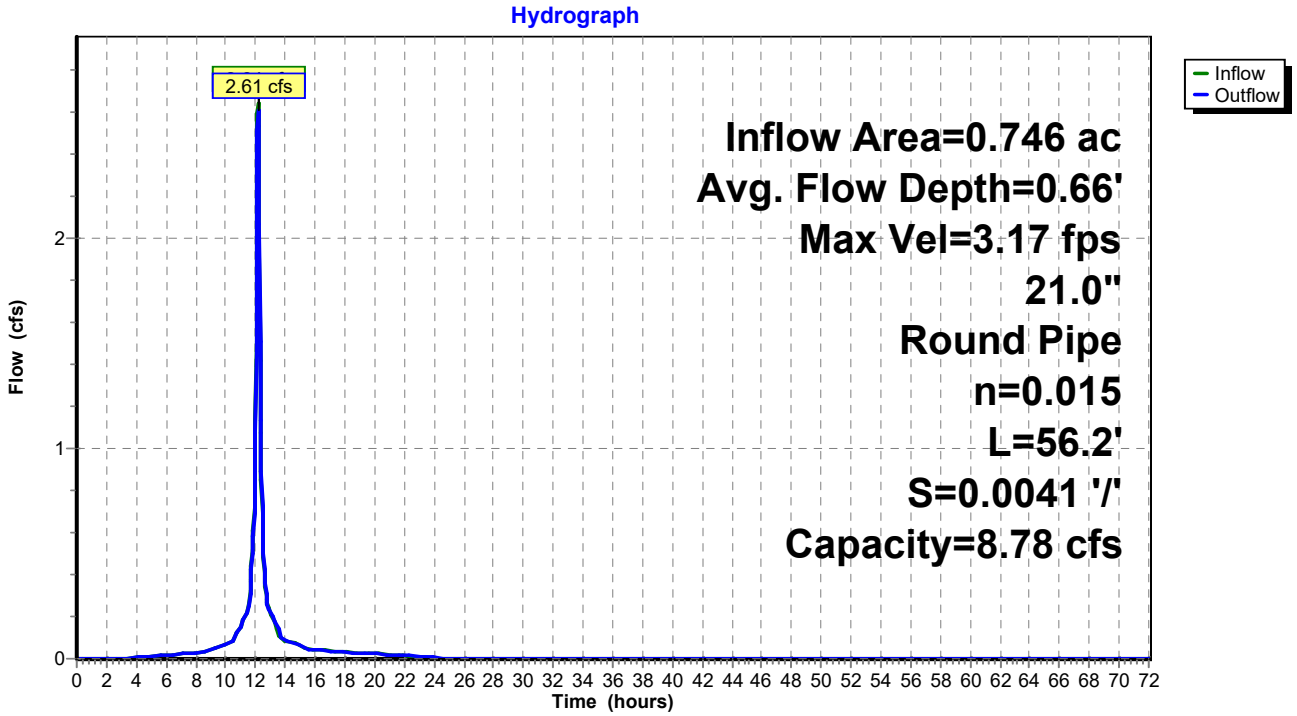
Inflow Area = 0.746 ac, 97.99% Impervious, Inflow Depth = 2.64" for 2-yr event
Inflow = 2.64 cfs @ 12.17 hrs, Volume= 0.164 af
Outflow = 2.61 cfs @ 12.18 hrs, Volume= 0.164 af, Atten= 1%, Lag= 0.6 min
Routed to Reach N FLOWS : 108-in RCP

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.17 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 0.92 fps, Avg. Travel Time= 1.0 min

Peak Storage= 46 cf @ 12.18 hrs
Average Depth at Peak Storage= 0.66' , Surface Width= 1.69'
Bank-Full Depth= 1.75' Flow Area= 2.4 sf, Capacity= 8.78 cfs

21.0" Round Pipe
n= 0.015 Concrete sewer w/manholes & inlets
Length= 56.2' Slope= 0.0041 '/'
Inlet Invert= 771.98', Outlet Invert= 771.75'





Hydrograph for Reach 2.2: 21-in RCP

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	771.98	0.00
2.50	0.00	0	771.98	0.00
5.00	0.01	1	772.03	0.01
7.50	0.03	2	772.05	0.03
10.00	**0.07**	**3**	**772.09**	**0.07**
12.50	**0.58**	**16**	**772.29**	**0.60**
15.00	0.07	4	772.09	0.07
17.50	0.03	2	772.06	0.03
20.00	0.02	2	772.05	0.02
22.50	0.01	1	772.03	0.01
25.00	0.00	0	771.98	0.00
27.50	0.00	0	771.98	0.00
30.00	0.00	0	771.98	0.00
32.50	0.00	0	771.98	0.00
35.00	0.00	0	771.98	0.00
37.50	0.00	0	771.98	0.00
40.00	0.00	0	771.98	0.00
42.50	0.00	0	771.98	0.00
45.00	0.00	0	771.98	0.00
47.50	0.00	0	771.98	0.00
50.00	0.00	0	771.98	0.00
52.50	0.00	0	771.98	0.00
55.00	0.00	0	771.98	0.00
57.50	0.00	0	771.98	0.00
60.00	0.00	0	771.98	0.00
62.50	0.00	0	771.98	0.00
65.00	0.00	0	771.98	0.00
67.50	0.00	0	771.98	0.00
70.00	0.00	0	771.98	0.00

Stage-Discharge for Reach 2.2: 21-in RCP

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
771.98	0.00	0.00
772.00	0.35	0.00
772.02	0.56	0.01
772.04	0.73	0.02
772.06	0.88	0.04
772.08	1.02	0.06
772.10	1.15	0.08
772.12	1.27	0.11
772.14	1.38	0.15
772.16	1.49	0.20
772.18	1.59	0.24
772.20	1.69	0.30
772.22	1.79	0.36
772.24	1.88	0.42
772.26	1.96	0.49
772.28	2.05	0.56
772.30	2.13	0.64
772.32	2.21	0.73
772.34	2.28	0.81
772.36	2.36	0.91
772.38	2.43	1.01
772.40	2.50	1.11
772.42	2.57	1.22
772.44	2.63	1.33
772.46	2.70	1.45
772.48	2.76	1.57
772.50	2.82	1.69
772.52	2.88	1.82
772.54	2.94	1.95
772.56	2.99	2.08
772.58	3.05	2.22
772.60	3.10	2.36
772.62	3.15	2.51
772.64	3.20	2.66
772.66	3.25	2.81
772.68	3.30	2.96
772.70	3.34	3.12
772.72	3.39	3.27
772.74	3.43	3.44
772.76	3.47	3.60
772.78	3.51	3.76
772.80	3.55	3.93
772.82	3.59	4.10
772.84	3.63	4.27
772.86	3.66	4.44
772.88	3.70	4.61
772.90	3.73	4.78
772.92	3.76	4.95
772.94	3.79	5.12
772.96	3.82	5.30
772.98	3.85	5.47
773.00	3.88	5.64
773.02	3.90	5.82
773.04	3.93	5.99
773.06	3.95	6.16
773.08	3.98	6.33
773.10	4.00	6.50
773.12	4.02	6.67
773.14	4.04	6.83
773.16	4.05	7.00
773.18	4.07	7.16
773.20	4.09	7.32
773.22	4.10	7.47
773.24	4.11	7.63
773.26	4.12	7.77
773.28	4.13	7.92
773.30	4.14	8.06
773.32	4.15	8.20
773.34	4.16	8.33
773.36	4.16	8.46
773.38	4.16	8.59
773.40	**4.16**	8.70
773.42	4.16	8.82
773.44	4.16	8.92
773.46	4.16	9.02
773.48	4.15	9.11
773.50	4.14	9.19
773.52	4.13	9.26
773.54	4.12	9.32
773.56	4.10	9.37
773.58	4.08	9.41
773.60	4.06	9.44
773.62	4.03	**9.45**
773.64	4.00	9.44
773.66	3.97	9.41
773.68	3.92	9.35
773.70	3.86	9.25
773.72	3.74	9.00

Stage-Area-Storage for Reach 2.2: 21-in RCP

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
771.98	0.0	0
772.00	0.0	0
772.02	0.0	1
772.04	0.0	1
772.06	0.0	2
772.08	0.1	3
772.10	0.1	4
772.12	0.1	5
772.14	0.1	6
772.16	0.1	7
772.18	0.2	9
772.20	0.2	10
772.22	0.2	11
772.24	0.2	13
772.26	0.2	14
772.28	0.3	15
772.30	0.3	17
772.32	0.3	18
772.34	0.4	20
772.36	0.4	22
772.38	0.4	23
772.40	0.4	25
772.42	0.5	27
772.44	0.5	28
772.46	0.5	30
772.48	0.6	32
772.50	0.6	34
772.52	0.6	35
772.54	0.7	37
772.56	0.7	39
772.58	0.7	41
772.60	0.8	43
772.62	0.8	45
772.64	0.8	47
772.66	0.9	49
772.68	0.9	50
772.70	0.9	52
772.72	1.0	54
772.74	1.0	56
772.76	1.0	58
772.78	1.1	60
772.80	1.1	62
772.82	1.1	64
772.84	1.2	66
772.86	1.2	68
772.88	1.2	70
772.90	1.3	72
772.92	1.3	74
772.94	1.4	76
772.96	1.4	78
772.98	1.4	80
773.00	1.5	82
773.02	1.5	84
773.04	1.5	86
773.06	1.6	88
773.08	1.6	89
773.10	1.6	91
773.12	1.7	93
773.14	1.7	95
773.16	1.7	97
773.18	1.8	99
773.20	1.8	101
773.22	1.8	102
773.24	1.9	104
773.26	1.9	106
773.28	1.9	108
773.30	1.9	109
773.32	2.0	111
773.34	2.0	113
773.36	2.0	114
773.38	2.1	116
773.40	2.1	117
773.42	2.1	119
773.44	2.1	120
773.46	2.2	122
773.48	2.2	123
773.50	2.2	125
773.52	2.2	126
773.54	2.3	127
773.56	2.3	128
773.58	2.3	130
773.60	2.3	131
773.62	2.3	132
773.64	2.4	133
773.66	2.4	133
773.68	2.4	134
773.70	2.4	135
773.72	**2.4**	**135**

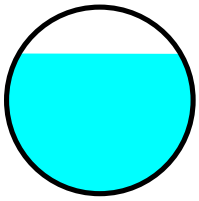
Summary for Reach 3.1: 12-in Catch Basin

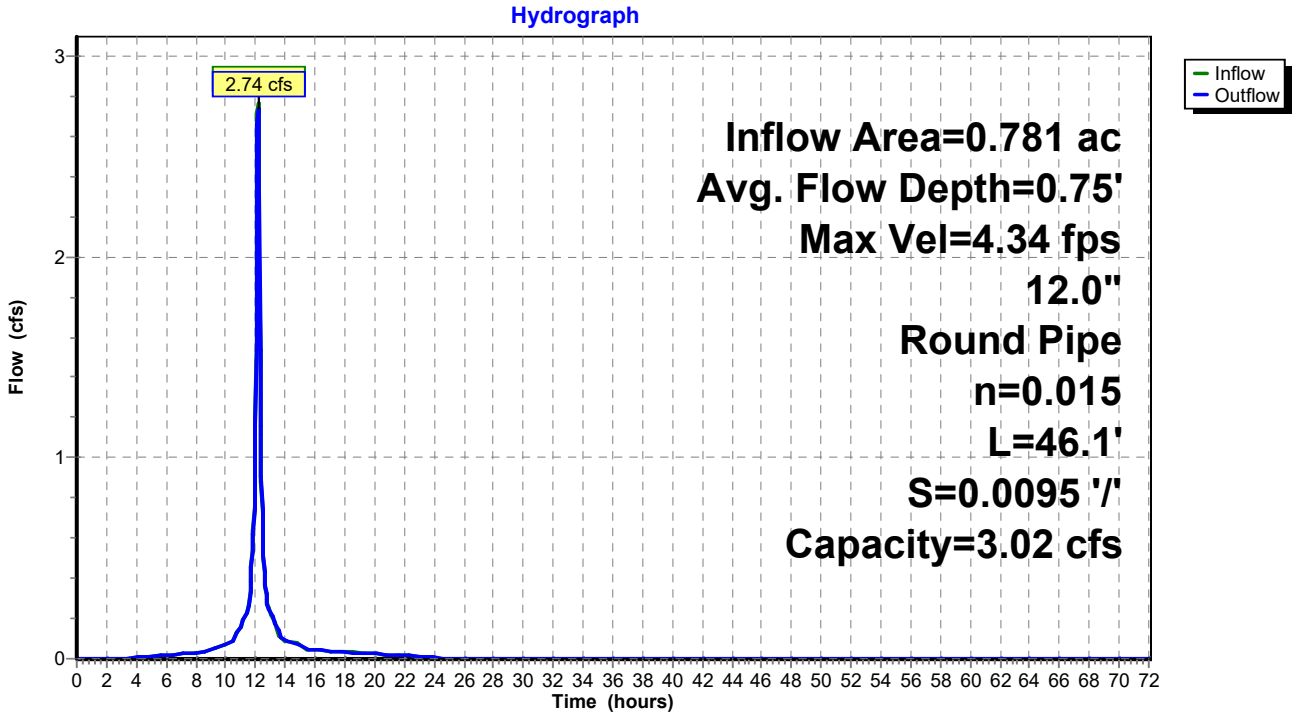
Inflow Area = 0.781 ac,100.00% Impervious, Inflow Depth = 2.64" for 2-yr event
Inflow = 2.77 cfs @ 12.17 hrs, Volume= 0.172 af
Outflow = 2.74 cfs @ 12.18 hrs, Volume= 0.172 af, Atten= 1%, Lag= 0.4 min
Routed to Reach N FLOWS : 108-in RCP

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.34 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.35 fps, Avg. Travel Time= 0.6 min

Peak Storage= 29 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.75' , Surface Width= 0.87'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.02 cfs

12.0" Round Pipe
n= 0.015 Concrete sewer w/manholes & inlets
Length= 46.1' Slope= 0.0095 '/'
Inlet Invert= 772.55', Outlet Invert= 772.11'





Hydrograph for Reach 3.1: 12-in Catch Basin

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	772.55	0.00
2.50	0.00	0	772.55	0.00
5.00	0.01	1	772.59	0.01
7.50	0.03	1	772.62	0.03
10.00	**0.07**	**2**	**772.65**	**0.07**
12.50	**0.60**	**9**	**772.85**	**0.61**
15.00	0.07	2	772.66	0.07
17.50	0.04	1	772.63	0.04
20.00	0.02	1	772.61	0.02
22.50	0.01	1	772.60	0.01
25.00	0.00	0	772.55	0.00
27.50	0.00	0	772.55	0.00
30.00	0.00	0	772.55	0.00
32.50	0.00	0	772.55	0.00
35.00	0.00	0	772.55	0.00
37.50	0.00	0	772.55	0.00
40.00	0.00	0	772.55	0.00
42.50	0.00	0	772.55	0.00
45.00	0.00	0	772.55	0.00
47.50	0.00	0	772.55	0.00
50.00	0.00	0	772.55	0.00
52.50	0.00	0	772.55	0.00
55.00	0.00	0	772.55	0.00
57.50	0.00	0	772.55	0.00
60.00	0.00	0	772.55	0.00
62.50	0.00	0	772.55	0.00
65.00	0.00	0	772.55	0.00
67.50	0.00	0	772.55	0.00
70.00	0.00	0	772.55	0.00

Stage-Discharge for Reach 3.1: 12-in Catch Basin

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
772.55	0.00	0.00
772.56	0.34	0.00
772.57	0.54	0.00
772.58	0.71	0.00
772.59	0.85	0.01
772.60	0.99	0.01
772.61	1.11	0.02
772.62	1.23	0.03
772.63	1.34	0.04
772.64	1.44	0.05
772.65	1.54	0.06
772.66	1.64	0.08
772.67	1.73	0.09
772.68	1.82	0.11
772.69	1.90	0.13
772.70	1.98	0.15
772.71	2.06	0.17
772.72	2.14	0.19
772.73	2.22	0.21
772.74	2.29	0.24
772.75	2.36	0.26
772.76	2.43	0.29
772.77	2.50	0.32
772.78	2.56	0.35
772.79	2.63	0.38
772.80	2.69	0.41
772.81	2.75	0.45
772.82	2.81	0.48
772.83	2.87	0.52
772.84	2.93	0.55
772.85	2.98	0.59
772.86	3.03	0.63
772.87	3.09	0.67
772.88	3.14	0.71
772.89	3.19	0.75
772.90	3.24	0.79
772.91	3.29	0.84
772.92	3.33	0.88
772.93	3.38	0.92
772.94	3.42	0.97
772.95	3.47	1.02
772.96	3.51	1.06
772.97	3.55	1.11
772.98	3.59	1.16
772.99	3.63	1.21
773.00	3.67	1.26
773.01	3.70	1.31
773.02	3.74	1.36
773.03	3.77	1.41
773.04	3.81	1.46
773.05	3.84	1.51
773.06	3.87	1.56
773.07	3.90	1.61
773.08	3.93	1.66
773.09	3.96	1.71
773.10	3.99	1.77
773.11	4.02	1.82
773.12	4.05	1.87
773.13	4.07	1.92
773.14	4.10	1.97
773.15	4.12	2.03
773.16	4.14	2.08
773.17	4.16	2.13
773.18	4.18	2.18
773.19	4.20	2.23
773.20	4.22	2.28
773.21	4.24	2.33
773.22	4.26	2.38
773.23	4.27	2.43
773.24	4.29	2.48
773.25	4.30	2.53
773.26	4.31	2.57
773.27	4.33	2.62
773.28	4.34	2.66
773.29	4.35	2.71
773.30	4.35	2.75
773.31	4.36	2.79
773.32	4.37	2.83
773.33	4.37	2.87
773.34	4.38	2.91
773.35	4.38	2.95
773.36	**4.38**	2.98
773.37	4.38	3.02
773.38	4.38	3.05
773.39	4.37	3.08
773.40	4.37	3.11
773.41	4.36	3.13
773.42	4.35	3.16
773.43	4.34	3.18
773.44	4.33	3.20
773.45	4.32	3.22
773.46	4.30	3.23
773.47	4.28	3.24
773.48	4.26	3.24
773.49	4.24	**3.24**
773.50	4.21	3.24
773.51	4.17	3.23
773.52	4.13	3.21
773.53	4.08	3.19
773.54	4.01	3.14
773.55	3.84	3.02

Stage-Area-Storage for Reach 3.1: 12-in Catch Basin

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
772.55	0.0	0
772.56	0.0	0
772.57	0.0	0
772.58	0.0	0
772.59	0.0	0
772.60	0.0	1
772.61	0.0	1
772.62	0.0	1
772.63	0.0	1
772.64	0.0	2
772.65	0.0	2
772.66	0.0	2
772.67	0.1	2
772.68	0.1	3
772.69	0.1	3
772.70	0.1	3
772.71	0.1	4
772.72	0.1	4
772.73	0.1	4
772.74	0.1	5
772.75	0.1	5
772.76	0.1	6
772.77	0.1	6
772.78	0.1	6
772.79	0.1	7
772.80	0.2	7
772.81	0.2	7
772.82	0.2	8
772.83	0.2	8
772.84	0.2	9
772.85	0.2	9
772.86	0.2	10
772.87	0.2	10
772.88	0.2	10
772.89	0.2	11
772.90	0.2	11
772.91	0.3	12
772.92	0.3	12
772.93	0.3	13
772.94	0.3	13
772.95	0.3	14
772.96	0.3	14
772.97	0.3	14
772.98	0.3	15
772.99	0.3	15
773.00	0.3	16
773.01	0.4	16
773.02	0.4	17
773.03	0.4	17
773.04	0.4	18
773.05	0.4	18
773.06	0.4	19
773.07	0.4	19
773.08	0.4	19
773.09	0.4	20
773.10	0.4	20
773.11	0.5	21
773.12	0.5	21
773.13	0.5	22
773.14	0.5	22
773.15	0.5	23
773.16	0.5	23
773.17	0.5	24
773.18	0.5	24
773.19	0.5	24
773.20	0.5	25
773.21	0.5	25
773.22	0.6	26
773.23	0.6	26
773.24	0.6	27
773.25	0.6	27
773.26	0.6	27
773.27	0.6	28
773.28	0.6	28
773.29	0.6	29
773.30	0.6	29
773.31	0.6	30
773.32	0.6	30
773.33	0.7	30
773.34	0.7	31
773.35	0.7	31
773.36	0.7	31
773.37	0.7	32
773.38	0.7	32
773.39	0.7	32
773.40	0.7	33
773.41	0.7	33
773.42	0.7	33
773.43	0.7	34
773.44	0.7	34
773.45	0.7	34
773.46	0.8	35
773.47	0.8	35
773.48	0.8	35
773.49	0.8	35
773.50	0.8	36
773.51	0.8	36
773.52	0.8	36
773.53	0.8	36
773.54	0.8	36
773.55	**0.8**	**36**

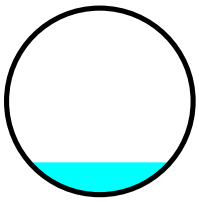
Summary for Reach N FLOWS: 108-in RCP

Inflow Area = 1.527 ac, 99.02% Impervious, Inflow Depth = 2.64" for 2-yr event
Inflow = 5.35 cfs @ 12.18 hrs, Volume= 0.336 af
Outflow = 3.10 cfs @ 12.64 hrs, Volume= 0.336 af, Atten= 42%, Lag= 27.8 min

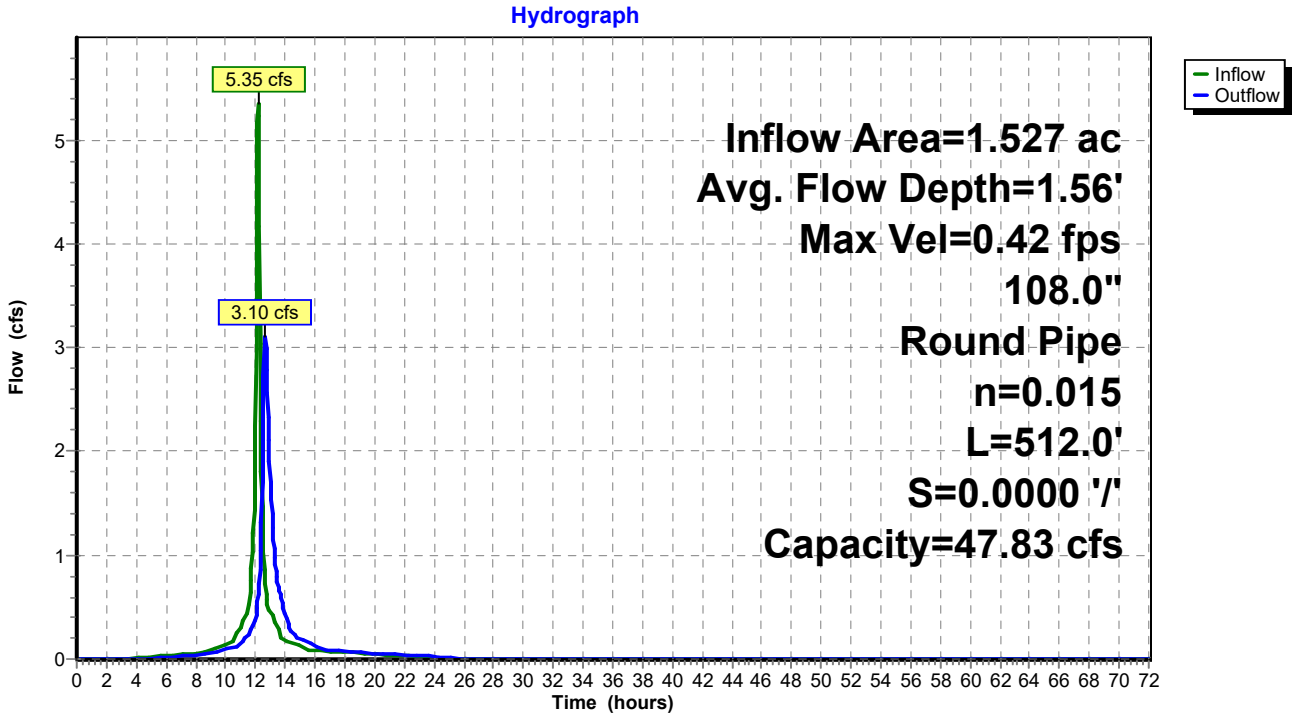
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.42 fps, Min. Travel Time= 20.1 min
Avg. Velocity = 0.11 fps, Avg. Travel Time= 76.3 min

Peak Storage= 3,770 cf @ 12.30 hrs
Average Depth at Peak Storage= 1.56' , Surface Width= 6.81'
Bank-Full Depth= 9.00' Flow Area= 63.6 sf, Capacity= 47.83 cfs

108.0" Round Pipe
n= 0.015 Concrete sewer w/manholes & inlets
Length= 512.0' Slope= 0.0000 '/'
Inlet Invert= 761.00', Outlet Invert= 760.99'



Reach N FLOWS: 108-in RCP



Hydrograph for Reach N FLOWS: 108-in RCP

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	761.00	0.00
2.50	0.00	0	761.00	0.00
5.00	0.02	58	761.09	0.01
7.50	0.05	179	761.20	0.04
10.00	**0.14**	**358**	**761.31**	0.09
12.50	**1.21**	**3,124**	**762.37**	**2.23**
15.00	0.14	496	761.39	**0.19**
17.50	0.07	284	761.27	0.08
20.00	0.05	220	761.22	0.06
22.50	0.03	157	761.18	0.04
25.00	0.00	66	761.10	0.01
27.50	0.00	20	761.03	0.00
30.00	0.00	6	761.01	0.00
32.50	0.00	2	761.00	0.00
35.00	0.00	1	761.00	0.00
37.50	0.00	0	761.00	0.00
40.00	0.00	0	761.00	0.00
42.50	0.00	0	761.00	0.00
45.00	0.00	0	761.00	0.00
47.50	0.00	0	761.00	0.00
50.00	0.00	0	761.00	0.00
52.50	0.00	0	761.00	0.00
55.00	0.00	0	761.00	0.00
57.50	0.00	0	761.00	0.00
60.00	0.00	0	761.00	0.00
62.50	0.00	0	761.00	0.00
65.00	0.00	0	761.00	0.00
67.50	0.00	0	761.00	0.00
70.00	0.00	0	761.00	0.00

Stage-Discharge for Reach N FLOWS: 108-in RCP

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
761.00	0.00	0.00
761.10	0.07	0.01
761.20	0.11	0.04
761.30	0.15	0.10
761.40	0.18	0.18
761.50	0.21	0.29
761.60	0.23	0.43
761.70	0.26	0.59
761.80	0.28	0.78
761.90	0.30	1.00
762.00	0.32	1.25
762.10	0.34	1.52
762.20	0.36	1.82
762.30	0.38	2.15
762.40	0.40	2.51
762.50	0.41	2.89
762.60	0.43	3.30
762.70	0.45	3.73
762.80	0.46	4.19
762.90	0.48	4.67
763.00	0.49	5.18
763.10	0.51	5.71
763.20	0.52	6.27
763.30	0.53	6.84
763.40	0.55	7.44
763.50	0.56	8.06
763.60	0.57	8.70
763.70	0.58	9.37
763.80	0.60	10.05
763.90	0.61	10.75
764.00	0.62	11.47
764.10	0.63	12.20
764.20	0.64	12.96
764.30	0.65	13.72
764.40	0.66	14.51
764.50	0.67	15.30
764.60	0.68	16.12
764.70	0.69	16.94
764.80	0.70	17.78
764.90	0.70	18.63
765.00	0.71	19.49
765.10	0.72	20.36
765.20	0.73	21.23
765.30	0.74	22.12
765.40	0.74	23.01
765.50	0.75	23.91
765.60	0.76	24.82
765.70	0.77	25.73
765.80	0.77	26.64
765.90	0.78	27.55
766.00	0.78	28.47
766.10	0.79	29.39
766.20	0.80	30.30
766.30	0.80	31.22
766.40	0.81	32.13
766.50	0.81	33.04
766.60	0.82	33.94
766.70	0.82	34.84
766.80	0.82	35.73
766.90	0.83	36.61
767.00	0.83	37.49
767.10	0.84	38.35
767.20	0.84	39.20
767.30	0.84	40.04
767.40	0.84	40.86
767.50	0.85	41.67
767.60	0.85	42.46
767.70	0.85	43.23
767.80	0.85	43.98
767.90	0.85	44.71
768.00	0.86	45.41
768.10	0.86	46.09
768.20	**0.86**	46.75
768.30	**0.86**	47.37
768.40	0.86	47.96
768.50	0.86	48.51
768.60	0.86	49.03
768.70	0.85	49.51
768.80	0.85	49.95
768.90	0.85	50.34
769.00	0.85	50.68
769.10	0.85	50.97
769.20	0.84	51.19
769.30	0.84	51.35
769.40	0.83	**51.43**
769.50	0.83	**51.42**
769.60	0.82	51.31
769.70	0.81	51.06
769.80	0.80	50.63
769.90	0.79	49.91
770.00	0.75	47.83

Stage-Area-Storage for Reach N FLOWS: 108-in RCP

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
761.00	0.0	0
761.10	0.1	66
761.20	0.4	184
761.30	0.7	335
761.40	1.0	513
761.50	1.4	714
761.60	1.8	934
761.70	2.3	1,172
761.80	2.8	1,426
761.90	3.3	1,695
762.00	3.9	1,979
762.10	4.4	2,275
762.20	5.0	2,583
762.30	5.7	2,901
762.40	6.3	3,230
762.50	7.0	3,569
762.60	7.7	3,917
762.70	8.3	4,273
762.80	9.1	4,638
762.90	9.8	5,010
763.00	10.5	5,390
763.10	11.3	5,777
763.20	12.1	6,170
763.30	12.8	6,569
763.40	13.6	6,973
763.50	14.4	7,383
763.60	15.2	7,799
763.70	16.1	8,218
763.80	16.9	8,643
763.90	17.7	9,072
764.00	18.6	9,505
764.10	19.4	9,941
764.20	20.3	10,380
764.30	21.1	10,823
764.40	22.0	11,268
764.50	22.9	11,716
764.60	23.8	12,167
764.70	24.6	12,619
764.80	25.5	13,074
764.90	26.4	13,530
765.00	27.3	13,987
765.10	28.2	14,445
765.20	29.1	14,905
765.30	30.0	15,365
765.40	30.9	15,825
765.50	31.8	16,286
765.60	32.7	16,747
765.70	33.6	17,207
765.80	34.5	17,667
765.90	35.4	18,127
766.00	36.3	18,585
766.10	37.2	19,042
766.20	38.1	19,498
766.30	39.0	19,953
766.40	39.9	20,405
766.50	40.7	20,856
766.60	41.6	21,304
766.70	42.5	21,749
766.80	43.3	22,192
766.90	44.2	22,631
767.00	45.1	23,067
767.10	45.9	23,500
767.20	46.7	23,929
767.30	47.6	24,354
767.40	48.4	24,773
767.50	49.2	25,189
767.60	50.0	25,599
767.70	50.8	26,003
767.80	51.6	26,402
767.90	52.3	26,795
768.00	53.1	27,182
768.10	53.8	27,562
768.20	54.6	27,934
768.30	55.3	28,299
768.40	56.0	28,655
768.50	56.6	29,003
768.60	57.3	29,342
768.70	58.0	29,671
768.80	58.6	29,989
768.90	59.2	30,297
769.00	59.8	30,593
769.10	60.3	30,877
769.20	60.8	31,146
769.30	61.3	31,400
769.40	61.8	31,638
769.50	62.2	31,858
769.60	62.6	32,059
769.70	63.0	32,237
769.80	63.3	32,388
769.90	63.5	32,506
770.00	**63.6**	**32,572**

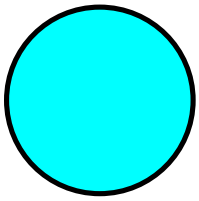
Summary for Reach PSB.1: 15-in RCP from PSB (OFFSITE)

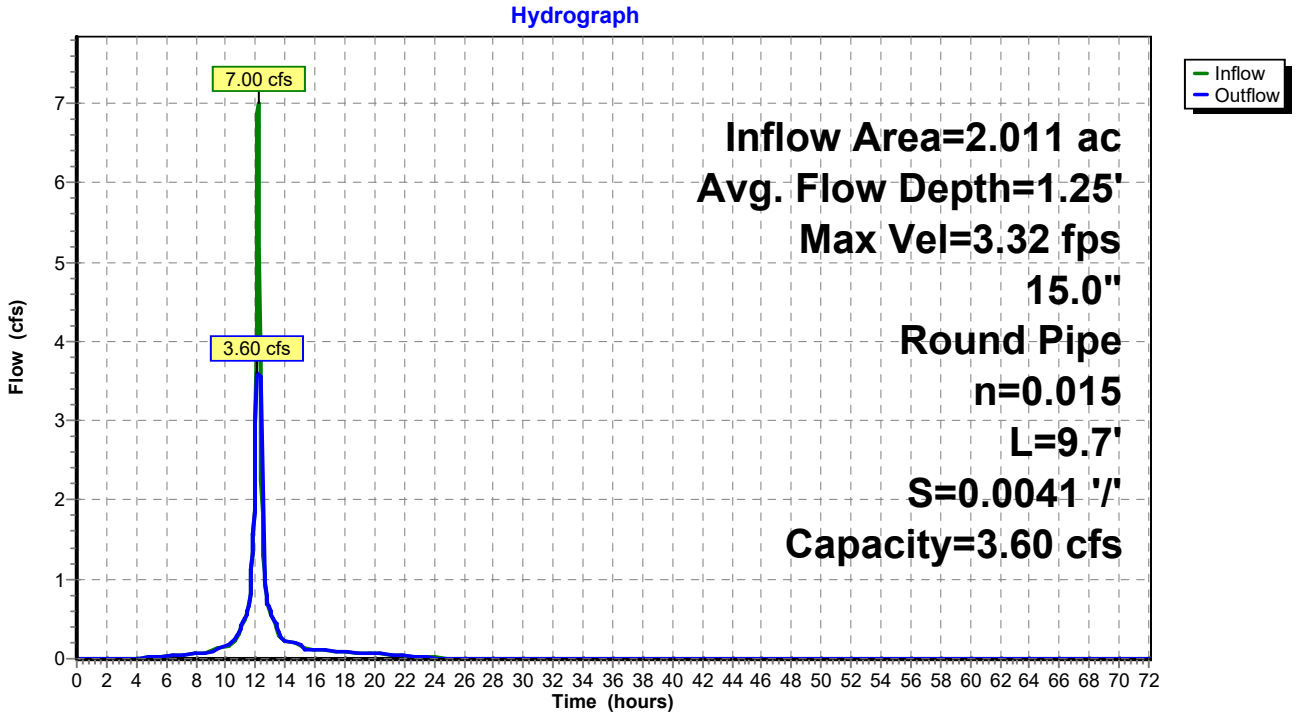
Inflow Area = 2.011 ac, 94.88% Impervious, Inflow Depth = 2.53" for 2-yr event
Inflow = 7.00 cfs @ 12.17 hrs, Volume= 0.424 af
Outflow = 3.60 cfs @ 12.10 hrs, Volume= 0.424 af, Atten= 49%, Lag= 0.0 min
Routed to Reach PSB.2 : 18-in RCP (OFFSITE)

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.32 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.27 fps, Avg. Travel Time= 0.1 min

Peak Storage= 12 cf @ 12.05 hrs
Average Depth at Peak Storage= 1.25'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 3.60 cfs

15.0" Round Pipe
n= 0.015 Concrete sewer w/manholes & inlets
Length= 9.7' Slope= 0.0041 '/'
Inlet Invert= 776.20', Outlet Invert= 776.16'





Hydrograph for Reach PSB.1: 15-in RCP from PSB (OFFSITE)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	776.20	0.00
2.50	0.00	0	776.20	0.00
5.00	0.02	0	776.26	0.02
7.50	0.05	0	776.31	0.05
10.00	**0.16**	**1**	**776.38**	**0.16**
12.50	**1.53**	**12**	**777.45**	**3.60**
15.00	0.19	1	776.39	0.19
17.50	0.09	1	776.34	0.09
20.00	0.06	1	776.31	0.06
22.50	0.03	0	776.29	0.03
25.00	0.00	0	776.20	0.00
27.50	0.00	0	776.20	0.00
30.00	0.00	0	776.20	0.00
32.50	0.00	0	776.20	0.00
35.00	0.00	0	776.20	0.00
37.50	0.00	0	776.20	0.00
40.00	0.00	0	776.20	0.00
42.50	0.00	0	776.20	0.00
45.00	0.00	0	776.20	0.00
47.50	0.00	0	776.20	0.00
50.00	0.00	0	776.20	0.00
52.50	0.00	0	776.20	0.00
55.00	0.00	0	776.20	0.00
57.50	0.00	0	776.20	0.00
60.00	0.00	0	776.20	0.00
62.50	0.00	0	776.20	0.00
65.00	0.00	0	776.20	0.00
67.50	0.00	0	776.20	0.00
70.00	0.00	0	776.20	0.00

Stage-Discharge for Reach PSB.1: 15-in RCP from PSB (OFFSITE)

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
776.20	0.00	0.00
776.21	0.21	0.00
776.22	0.35	0.00
776.23	0.46	0.00
776.24	0.56	0.01
776.25	0.65	0.01
776.26	0.73	0.02
776.27	0.81	0.02
776.28	0.88	0.03
776.29	0.95	0.04
776.30	1.02	0.05
776.31	1.08	0.06
776.32	1.14	0.07
776.33	1.20	0.08
776.34	1.26	0.10
776.35	1.32	0.11
776.36	1.37	0.13
776.37	1.42	0.14
776.38	1.48	0.16
776.39	1.53	0.18
776.40	1.58	0.20
776.41	1.62	0.22
776.42	1.67	0.24
776.43	1.71	0.27
776.44	1.76	0.29
776.45	1.80	0.31
776.46	1.84	0.34
776.47	1.89	0.37
776.48	1.93	0.40
776.49	1.97	0.42
776.50	2.01	0.45
776.51	2.04	0.48
776.52	2.08	0.52
776.53	2.12	0.55
776.54	2.15	0.58
776.55	2.19	0.62
776.56	2.22	0.65
776.57	2.26	0.69
776.58	2.29	0.72
776.59	2.32	0.76
776.60	2.35	0.80
776.61	2.39	0.84
776.62	2.42	0.88
776.63	2.45	0.92
776.64	2.48	0.96
776.65	2.51	1.00
776.66	2.53	1.04
776.67	2.56	1.08
776.68	2.59	1.12
776.69	2.62	1.17
776.70	2.64	1.21
776.71	2.67	1.26
776.72	2.69	1.30
776.73	2.72	1.35
776.74	2.74	1.39
776.75	2.77	1.44
776.76	2.79	1.49
776.77	2.81	1.53
776.78	2.84	1.58
776.79	2.86	1.63
776.80	2.88	1.68
776.81	2.90	1.72
776.82	2.92	1.77
776.83	2.94	1.82
776.84	2.96	1.87
776.85	2.98	1.92
776.86	3.00	1.97
776.87	3.01	2.02
776.88	3.03	2.07
776.89	3.05	2.12
776.90	3.07	2.17
776.91	3.08	2.22
776.92	3.10	2.27
776.93	3.11	2.32
776.94	3.13	2.37
776.95	3.14	2.42
776.96	3.16	2.46
776.97	3.17	2.51
776.98	3.18	2.56
776.99	3.19	2.61
777.00	3.21	2.66
777.01	3.22	2.71
777.02	3.23	2.76
777.03	3.24	2.80
777.04	3.25	2.85
777.05	3.26	2.90
777.06	3.27	2.94
777.07	3.28	2.99
777.08	3.28	3.03
777.09	3.29	3.08
777.10	3.30	3.12
777.11	3.31	3.16
777.12	3.31	3.21
777.13	3.32	3.25
777.14	3.32	3.29
777.15	3.33	3.33
777.16	3.33	3.37
777.17	3.33	3.41
777.18	3.34	3.44
777.19	3.34	3.48
777.20	3.34	3.51
777.21	3.34	3.55
777.22	**3.34**	3.58
777.23	3.34	3.61
777.24	3.34	3.64
777.25	3.34	3.67
777.26	3.33	3.70
777.27	3.33	3.72
777.28	3.32	3.75
777.29	3.32	3.77
777.30	3.31	3.79
777.31	3.31	3.81
777.32	3.30	3.82
777.33	3.29	3.84
777.34	3.28	3.85
777.35	3.27	3.86
777.36	3.25	3.86
777.37	3.24	**3.87**
777.38	3.22	3.87
777.39	3.20	3.86
777.40	3.18	3.85
777.41	3.16	3.84
777.42	3.13	3.81
777.43	3.09	3.78
777.44	3.03	3.72
777.45	2.93	3.60

Stage-Area-Storage for Reach PSB.1: 15-in RCP from PSB (OFFSITE)

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
776.20	0.0	0
776.22	0.0	0
776.24	0.0	0
776.26	0.0	0
776.28	0.0	0
776.30	0.0	0
776.32	0.1	1
776.34	0.1	1
776.36	0.1	1
776.38	0.1	1
776.40	0.1	1
776.42	0.1	1
776.44	0.2	2
776.46	0.2	2
776.48	0.2	2
776.50	0.2	2
776.52	0.2	2
776.54	0.3	3
776.56	0.3	3
776.58	0.3	3
776.60	0.3	3
776.62	0.4	4
776.64	0.4	4
776.66	0.4	4
776.68	0.4	4
776.70	0.5	4
776.72	0.5	5
776.74	0.5	5
776.76	0.5	5
776.78	0.6	5
776.80	0.6	6
776.82	0.6	6
776.84	0.6	6
776.86	0.7	6
776.88	0.7	7
776.90	0.7	7
776.92	0.7	7
776.94	0.8	7
776.96	0.8	8
776.98	0.8	8
777.00	0.8	8
777.02	0.9	8
777.04	0.9	9
777.06	0.9	9
777.08	0.9	9
777.10	0.9	9
777.12	1.0	9
777.14	1.0	10
777.16	1.0	10
777.18	1.0	10
777.20	1.1	10
777.22	1.1	10
777.24	1.1	11
777.26	1.1	11
777.28	1.1	11
777.30	1.1	11
777.32	1.2	11
777.34	1.2	11
777.36	1.2	12
777.38	1.2	12
777.40	1.2	12
777.42	1.2	12
777.44	**1.2**	**12**

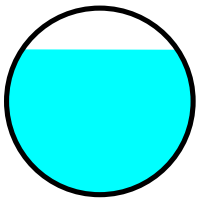
Summary for Reach PSB.2: 18-in RCP (OFFSITE)

Inflow Area = 3.097 ac, 87.67% Impervious, Inflow Depth = 2.39" for 2-yr event
Inflow = 6.23 cfs @ 12.27 hrs, Volume= 0.617 af
Outflow = 6.21 cfs @ 12.28 hrs, Volume= 0.617 af, Atten= 0%, Lag= 0.7 min

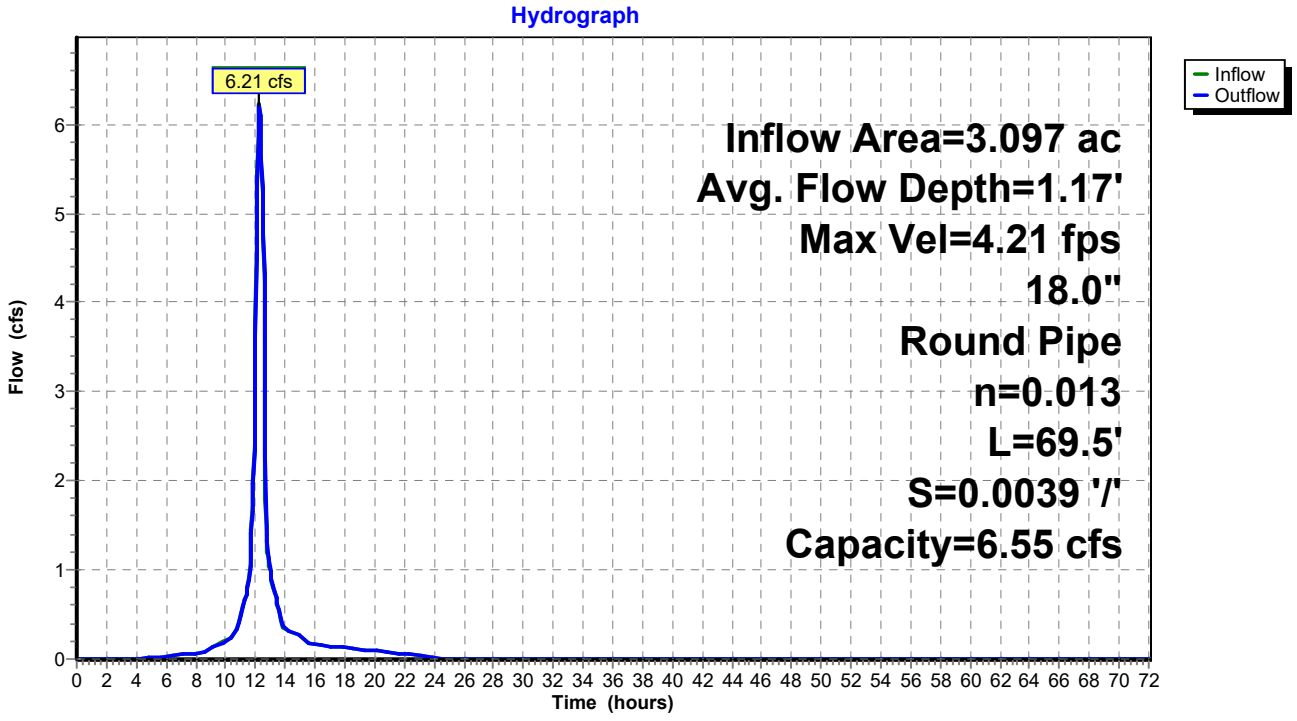
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.21 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.48 fps, Avg. Travel Time= 0.8 min

Peak Storage= 103 cf @ 12.28 hrs
Average Depth at Peak Storage= 1.17' , Surface Width= 1.25'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 6.55 cfs

18.0" Round Pipe
n= 0.013 Concrete pipe, bends & connections
Length= 69.5' Slope= 0.0039 '/'
Inlet Invert= 772.10', Outlet Invert= 771.83'



Reach PSB.2: 18-in RCP (OFFSITE)



Hydrograph for Reach PSB.2: 18-in RCP (OFFSITE)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	772.10	0.00
2.50	0.00	0	772.10	0.00
5.00	0.02	1	772.15	0.02
7.50	0.06	4	772.20	0.06
10.00	**0.20**	**8**	**772.28**	**0.20**
12.50	**4.96**	**85**	**773.08**	**5.01**
15.00	0.29	11	772.31	0.29
17.50	0.14	6	772.25	0.14
20.00	0.09	5	772.23	0.10
22.50	0.05	3	772.19	0.05
25.00	0.00	0	772.10	0.00
27.50	0.00	0	772.10	0.00
30.00	0.00	0	772.10	0.00
32.50	0.00	0	772.10	0.00
35.00	0.00	0	772.10	0.00
37.50	0.00	0	772.10	0.00
40.00	0.00	0	772.10	0.00
42.50	0.00	0	772.10	0.00
45.00	0.00	0	772.10	0.00
47.50	0.00	0	772.10	0.00
50.00	0.00	0	772.10	0.00
52.50	0.00	0	772.10	0.00
55.00	0.00	0	772.10	0.00
57.50	0.00	0	772.10	0.00
60.00	0.00	0	772.10	0.00
62.50	0.00	0	772.10	0.00
65.00	0.00	0	772.10	0.00
67.50	0.00	0	772.10	0.00
70.00	0.00	0	772.10	0.00

Stage-Discharge for Reach PSB.2: 18-in RCP (OFFSITE)

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
772.10	0.00	0.00
772.11	0.22	0.00
772.12	0.39	0.00
772.13	0.52	0.00
772.14	0.63	0.01
772.15	0.73	0.01
772.16	0.82	0.02
772.17	0.91	0.03
772.18	0.99	0.04
772.19	1.07	0.05
772.20	1.15	0.06
772.21	1.22	0.07
772.22	1.29	0.09
772.23	1.36	0.10
772.24	1.42	0.12
772.25	1.49	0.14
772.26	1.55	0.16
772.27	1.61	0.18
772.28	1.67	0.20
772.29	1.72	0.22
772.30	1.78	0.25
772.31	1.83	0.28
772.32	1.89	0.30
772.33	1.94	0.33
772.34	1.99	0.36
772.35	2.04	0.40
772.36	2.09	0.43
772.37	2.14	0.46
772.38	2.19	0.50
772.39	2.23	0.54
772.40	2.28	0.57
772.41	2.32	0.61
772.42	2.37	0.65
772.43	2.41	0.69
772.44	2.45	0.74
772.45	2.49	0.78
772.46	2.54	0.83
772.47	2.58	0.87
772.48	2.62	0.92
772.49	2.65	0.97
772.50	2.69	1.02
772.51	2.73	1.07
772.52	2.77	1.12
772.53	2.80	1.17
772.54	2.84	1.23
772.55	2.88	1.28
772.56	2.91	1.34
772.57	2.94	1.39
772.58	2.98	1.45
772.59	3.01	1.51
772.60	3.04	1.57
772.61	3.08	1.63
772.62	3.11	1.69
772.63	3.14	1.75
772.64	3.17	1.82
772.65	3.20	1.88
772.66	3.23	1.94
772.67	3.26	2.01
772.68	3.29	2.07
772.69	3.31	2.14
772.70	3.34	2.21
772.71	3.37	2.27
772.72	3.40	2.34
772.73	3.42	2.41
772.74	3.45	2.48
772.75	3.47	2.55
772.76	3.50	2.62
772.77	3.52	2.69
772.78	3.55	2.76
772.79	3.57	2.83
772.80	3.59	2.91
772.81	3.62	2.98
772.82	3.64	3.05
772.83	3.66	3.13
772.84	3.68	3.20
772.85	3.70	3.27
772.86	3.73	3.35
772.87	3.75	3.42
772.88	3.77	3.50
772.89	3.79	3.57
772.90	3.80	3.65
772.91	3.82	3.72
772.92	3.84	3.80
772.93	3.86	3.87
772.94	3.88	3.95
772.95	3.89	4.02
772.96	3.91	4.10
772.97	3.93	4.17
772.98	3.94	4.25
772.99	3.96	4.32
773.00	3.97	4.40
773.01	3.99	4.47
773.02	4.00	4.55
773.03	4.02	4.62
773.04	4.03	4.70
773.05	4.04	4.77
773.06	4.05	4.84
773.07	4.07	4.92
773.08	4.08	4.99
773.09	4.09	5.06
773.10	4.10	5.13
773.11	4.11	5.20
773.12	4.12	5.27
773.13	4.13	5.34
773.14	4.14	5.41
773.15	4.15	5.48
773.16	4.16	5.55
773.17	4.16	5.62
773.18	4.17	5.68
773.19	4.18	5.75
773.20	4.19	5.81
773.21	4.19	5.88
773.22	4.20	5.94
773.23	4.20	6.00
773.24	4.21	6.06
773.25	4.21	6.12
773.26	4.21	6.18
773.27	4.22	6.24
773.28	4.22	6.29
773.29	4.22	6.35
773.30	4.22	6.40
773.31	4.22	6.45
773.32	**4.22**	6.50
773.33	4.22	6.55
773.34	4.22	6.60
773.35	4.22	6.64
773.36	4.22	6.69
773.37	4.22	6.73
773.38	4.21	6.77
773.39	4.21	6.80
773.40	4.20	6.84
773.41	4.20	6.87
773.42	4.19	6.90
773.43	4.18	6.93
773.44	4.17	6.95
773.45	4.17	6.98
773.46	4.15	7.00
773.47	4.14	7.01
773.48	4.13	7.03
773.49	4.12	7.04
773.50	4.10	7.04
773.51	4.09	**7.04**
773.52	4.07	7.04
773.53	4.05	7.03
773.54	4.02	7.01
773.55	4.00	6.99
773.56	3.97	6.96
773.57	3.93	6.92
773.58	3.89	6.85
773.59	3.81	6.73
773.60	3.70	6.55

Stage-Area-Storage for Reach PSB.2: 18-in RCP (OFFSITE)

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
772.10	0.0	0
772.12	0.0	0
772.14	0.0	1
772.16	0.0	2
772.18	0.0	3
772.20	0.1	4
772.22	0.1	5
772.24	0.1	6
772.26	0.1	7
772.28	0.1	8
772.30	0.1	10
772.32	0.2	11
772.34	0.2	13
772.36	0.2	14
772.38	0.2	16
772.40	0.3	17
772.42	0.3	19
772.44	0.3	21
772.46	0.3	23
772.48	0.4	24
772.50	0.4	26
772.52	0.4	28
772.54	0.4	30
772.56	0.5	32
772.58	0.5	34
772.60	0.5	36
772.62	0.5	38
772.64	0.6	40
772.66	0.6	42
772.68	0.6	44
772.70	0.7	46
772.72	0.7	48
772.74	0.7	50
772.76	0.7	52
772.78	0.8	54
772.80	0.8	56
772.82	0.8	58
772.84	0.9	60
772.86	0.9	62
772.88	0.9	65
772.90	1.0	67
772.92	1.0	69
772.94	1.0	71
772.96	1.0	73
772.98	1.1	75
773.00	1.1	77
773.02	1.1	79
773.04	1.2	81
773.06	1.2	83
773.08	1.2	85
773.10	1.3	87
773.12	1.3	89
773.14	1.3	91
773.16	1.3	93
773.18	1.4	95
773.20	1.4	97
773.22	1.4	98
773.24	1.4	100
773.26	1.5	102
773.28	1.5	104
773.30	1.5	105
773.32	1.5	107
773.34	1.6	109
773.36	1.6	110
773.38	1.6	112
773.40	1.6	113
773.42	1.6	114
773.44	1.7	116
773.46	1.7	117
773.48	1.7	118
773.50	1.7	119
773.52	1.7	120
773.54	1.7	121
773.56	1.8	122
773.58	1.8	122
773.60	**1.8**	**123**

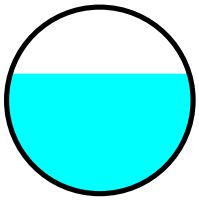
Summary for Reach S FLOWS: 15-in RCP

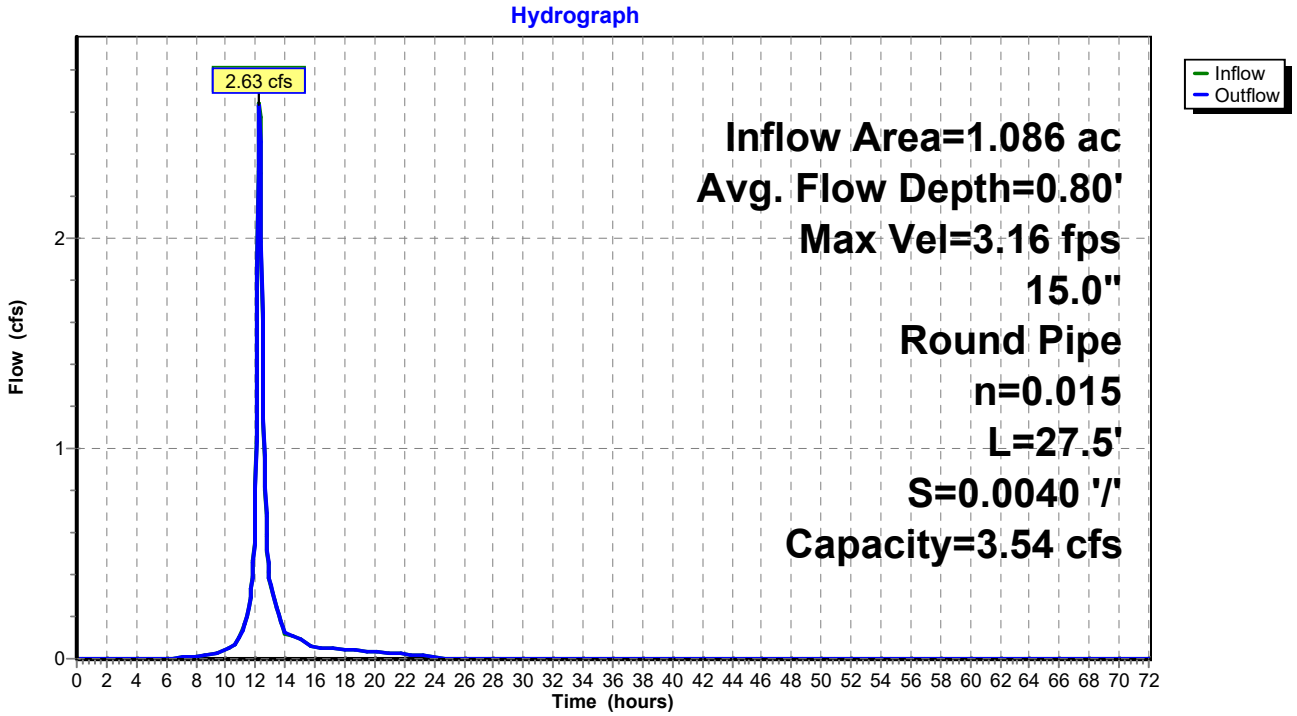
Inflow Area = 1.086 ac, 74.31% Impervious, Inflow Depth = 2.13" for 2-yr event
Inflow = 2.64 cfs @ 12.27 hrs, Volume= 0.193 af
Outflow = 2.63 cfs @ 12.27 hrs, Volume= 0.193 af, Atten= 0%, Lag= 0.3 min
Routed to Reach PSB.2 : 18-in RCP (OFFSITE)

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.16 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.03 fps, Avg. Travel Time= 0.4 min

Peak Storage= 23 cf @ 12.27 hrs
Average Depth at Peak Storage= 0.80' , Surface Width= 1.20'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 3.54 cfs

15.0" Round Pipe
n= 0.015 Concrete sewer w/manholes & inlets
Length= 27.5' Slope= 0.0040 '/'
Inlet Invert= 772.21', Outlet Invert= 772.10'





Hydrograph for Reach S FLOWS: 15-in RCP

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	772.21	0.00
2.50	0.00	0	772.21	0.00
5.00	0.00	0	772.21	0.00
7.50	0.01	0	772.25	0.01
10.00	**0.04**	**1**	**772.31**	**0.04**
12.50	**1.34**	**14**	**772.75**	**1.36**
15.00	0.10	2	772.35	0.10
17.50	0.05	1	772.31	0.05
20.00	0.03	1	772.30	0.03
22.50	0.02	1	772.27	0.02
25.00	0.00	0	772.21	0.00
27.50	0.00	0	772.21	0.00
30.00	0.00	0	772.21	0.00
32.50	0.00	0	772.21	0.00
35.00	0.00	0	772.21	0.00
37.50	0.00	0	772.21	0.00
40.00	0.00	0	772.21	0.00
42.50	0.00	0	772.21	0.00
45.00	0.00	0	772.21	0.00
47.50	0.00	0	772.21	0.00
50.00	0.00	0	772.21	0.00
52.50	0.00	0	772.21	0.00
55.00	0.00	0	772.21	0.00
57.50	0.00	0	772.21	0.00
60.00	0.00	0	772.21	0.00
62.50	0.00	0	772.21	0.00
65.00	0.00	0	772.21	0.00
67.50	0.00	0	772.21	0.00
70.00	0.00	0	772.21	0.00

Stage-Discharge for Reach S FLOWS: 15-in RCP

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
772.21	0.00	0.00
772.22	0.21	0.00
772.23	0.35	0.00
772.24	0.46	0.00
772.25	0.55	0.01
772.26	0.64	0.01
772.27	0.72	0.02
772.28	0.80	0.02
772.29	0.87	0.03
772.30	0.94	0.04
772.31	1.00	0.05
772.32	1.07	0.06
772.33	1.13	0.07
772.34	1.19	0.08
772.35	1.24	0.09
772.36	1.30	0.11
772.37	1.35	0.12
772.38	1.40	0.14
772.39	1.45	0.16
772.40	1.50	0.18
772.41	1.55	0.20
772.42	1.60	0.22
772.43	1.64	0.24
772.44	1.69	0.26
772.45	1.73	0.29
772.46	1.77	0.31
772.47	1.82	0.34
772.48	1.86	0.36
772.49	1.90	0.39
772.50	1.94	0.42
772.51	1.97	0.45
772.52	2.01	0.48
772.53	2.05	0.51
772.54	2.09	0.54
772.55	2.12	0.57
772.56	2.16	0.61
772.57	2.19	0.64
772.58	2.22	0.68
772.59	2.26	0.71
772.60	2.29	0.75
772.61	2.32	0.79
772.62	2.35	0.82
772.63	2.38	0.86
772.64	2.41	0.90
772.65	2.44	0.94
772.66	2.47	0.98
772.67	2.50	1.02
772.68	2.52	1.06
772.69	2.55	1.11
772.70	2.58	1.15
772.71	2.60	1.19
772.72	2.63	1.24
772.73	2.65	1.28
772.74	2.68	1.33
772.75	2.70	1.37
772.76	2.73	1.42
772.77	2.75	1.46
772.78	2.77	1.51
772.79	2.79	1.56
772.80	2.81	1.60
772.81	2.83	1.65
772.82	2.86	1.70
772.83	2.88	1.75
772.84	2.89	1.79
772.85	2.91	1.84
772.86	2.93	1.89
772.87	2.95	1.94
772.88	2.97	1.99
772.89	2.99	2.04
772.90	3.00	2.09
772.91	3.02	2.13
772.92	3.04	2.18
772.93	3.05	2.23
772.94	3.07	2.28
772.95	3.08	2.33
772.96	3.09	2.38
772.97	3.11	2.43
772.98	3.12	2.48
772.99	3.13	2.52
773.00	3.15	2.57
773.01	3.16	2.62
773.02	3.17	2.67
773.03	3.18	2.71
773.04	3.19	2.76
773.05	3.20	2.81
773.06	3.21	2.85
773.07	3.22	2.90
773.08	3.23	2.94
773.09	3.23	2.99
773.10	3.24	3.03
773.11	3.25	3.07
773.12	3.26	3.12
773.13	3.26	3.16
773.14	3.27	3.20
773.15	3.27	3.24
773.16	3.28	3.28
773.17	3.28	3.32
773.18	3.28	3.35
773.19	3.29	3.39
773.20	3.29	3.43
773.21	3.29	3.46
773.22	3.29	3.49
773.23	**3.29**	3.53
773.24	3.29	3.56
773.25	3.29	3.59
773.26	3.29	3.62
773.27	3.28	3.64
773.28	3.28	3.67
773.29	3.27	3.69
773.30	3.27	3.71
773.31	3.26	3.73
773.32	3.26	3.75
773.33	3.25	3.77
773.34	3.24	3.78
773.35	3.23	3.79
773.36	3.22	3.80
773.37	3.20	3.81
773.38	3.19	**3.81**
773.39	3.17	3.81
773.40	3.15	3.80
773.41	3.13	3.79
773.42	3.11	3.78
773.43	3.08	3.75
773.44	3.04	3.72
773.45	2.99	3.66
773.46	2.89	3.54

Stage-Area-Storage for Reach S FLOWS: 15-in RCP

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
772.21	0.0	0
772.23	0.0	0
772.25	0.0	0
772.27	0.0	1
772.29	0.0	1
772.31	0.0	1
772.33	0.1	2
772.35	0.1	2
772.37	0.1	3
772.39	0.1	3
772.41	0.1	3
772.43	0.1	4
772.45	0.2	5
772.47	0.2	5
772.49	0.2	6
772.51	0.2	6
772.53	0.2	7
772.55	0.3	7
772.57	0.3	8
772.59	0.3	9
772.61	0.3	9
772.63	0.4	10
772.65	0.4	11
772.67	0.4	11
772.69	0.4	12
772.71	0.5	13
772.73	0.5	13
772.75	0.5	14
772.77	0.5	15
772.79	0.6	15
772.81	0.6	16
772.83	0.6	17
772.85	0.6	17
772.87	0.7	18
772.89	0.7	19
772.91	0.7	19
772.93	0.7	20
772.95	0.8	21
772.97	0.8	21
772.99	0.8	22
773.01	0.8	23
773.03	0.9	23
773.05	0.9	24
773.07	0.9	25
773.09	0.9	25
773.11	0.9	26
773.13	1.0	27
773.15	1.0	27
773.17	1.0	28
773.19	1.0	28
773.21	1.1	29
773.23	1.1	29
773.25	1.1	30
773.27	1.1	31
773.29	1.1	31
773.31	1.1	31
773.33	1.2	32
773.35	1.2	32
773.37	1.2	33
773.39	1.2	33
773.41	1.2	33
773.43	1.2	34
773.45	**1.2**	**34**

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment DA1: Walgreens Loading Runoff Area=1.086 ac 74.31% Impervious Runoff Depth=3.49"
Flow Length=256' Slope=0.0320 '/' Tc=18.2 min CN=93 Runoff=4.23 cfs 0.316 af

Subcatchment DA2: Riverfront Pipe Runoff Area=0.746 ac 97.99% Impervious Runoff Depth=4.04"
Tc=10.0 min CN=98 Runoff=3.97 cfs 0.251 af

Subcatchment DA3: Walgreens Parking Runoff Area=0.781 ac 100.00% Impervious Runoff Depth=4.04"
Tc=10.0 min CN=98 Runoff=4.16 cfs 0.263 af

Subcatchment PSB: Public Safety Building Runoff Area=2.011 ac 94.88% Impervious Runoff Depth=3.93"
Tc=10.0 min CN=97 Runoff=10.62 cfs 0.659 af

Reach 2.1: 12-in RCP Avg. Flow Depth=0.44' Max Vel=11.90 fps Inflow=3.97 cfs 0.251 af
12.0" Round Pipe n=0.013 L=14.5' S=0.0779 '/' Capacity=9.95 cfs Outflow=3.97 cfs 0.251 af

Reach 2.2: 21-in RCP Avg. Flow Depth=0.82' Max Vel=3.53 fps Inflow=3.97 cfs 0.251 af
21.0" Round Pipe n=0.015 L=56.2' S=0.0041 '/' Capacity=8.78 cfs Outflow=3.92 cfs 0.251 af

Reach 3.1: 12-in Catch Basin Avg. Flow Depth=1.00' Max Vel=4.38 fps Inflow=4.16 cfs 0.263 af
12.0" Round Pipe n=0.015 L=46.1' S=0.0095 '/' Capacity=3.02 cfs Outflow=3.21 cfs 0.263 af

Reach N FLOWS: 108-in RCP Avg. Flow Depth=1.93' Max Vel=0.48 fps Inflow=6.94 cfs 0.515 af
108.0" Round Pipe n=0.015 L=512.0' S=0.0000 '/' Capacity=47.83 cfs Outflow=4.81 cfs 0.515 af

Reach PSB.1: 15-in RCP from PSB Avg. Flow Depth=1.25' Max Vel=3.34 fps Inflow=10.62 cfs 0.659 af
15.0" Round Pipe n=0.015 L=9.7' S=0.0041 '/' Capacity=3.60 cfs Outflow=3.60 cfs 0.659 af

Reach PSB.2: 18-in RCP (OFFSITE) Avg. Flow Depth=1.50' Max Vel=4.22 fps Inflow=7.37 cfs 0.975 af
18.0" Round Pipe n=0.013 L=69.5' S=0.0039 '/' Capacity=6.55 cfs Outflow=6.96 cfs 0.975 af

Reach S FLOWS: 15-in RCP Avg. Flow Depth=1.25' Max Vel=3.29 fps Inflow=4.23 cfs 0.316 af
15.0" Round Pipe n=0.015 L=27.5' S=0.0040 '/' Capacity=3.54 cfs Outflow=3.77 cfs 0.316 af

Summary for Subcatchment DA1: Walgreens Loading Dock and Houses

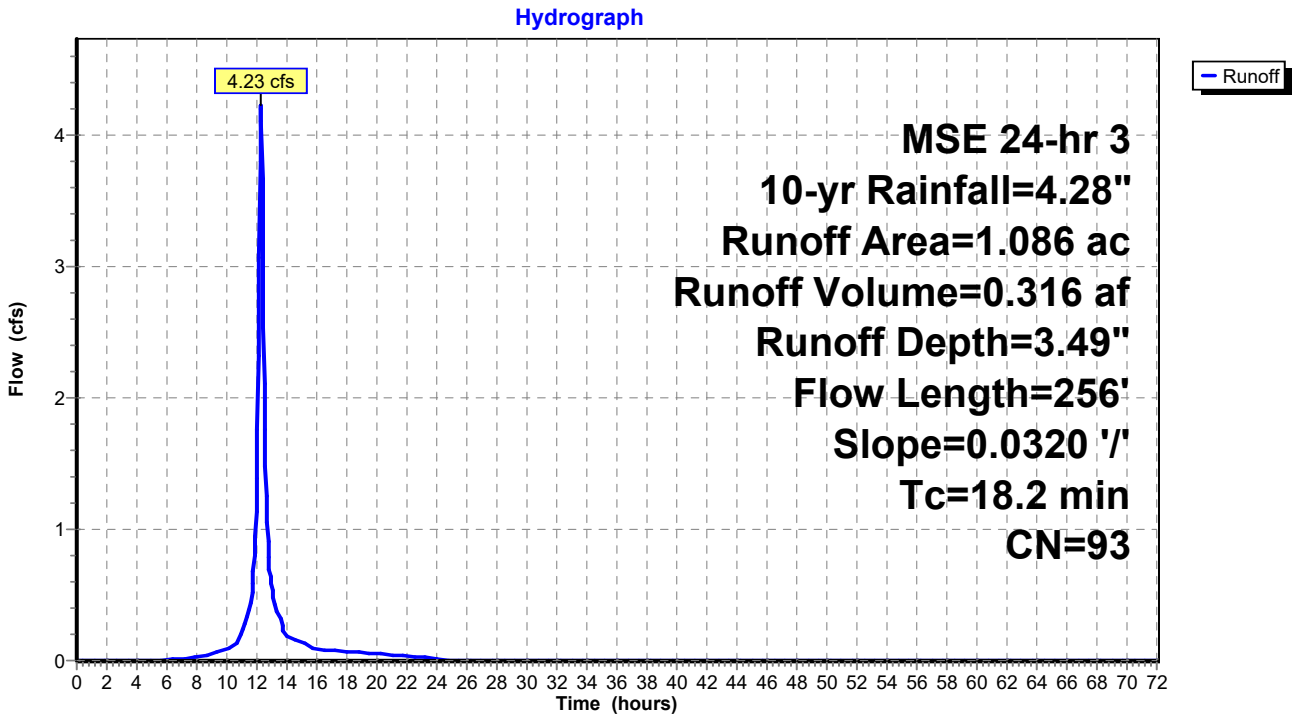
Runoff = 4.23 cfs @ 12.27 hrs, Volume= 0.316 af, Depth= 3.49"
Routed to Reach S FLOWS : 15-in RCP

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-yr Rainfall=4.28"

Area (ac)	CN	Description
0.807	98	Paved parking, HSG D
0.279	80	>75% Grass cover, Good, HSG D
1.086	93	Weighted Average
0.279		25.69% Pervious Area
0.807		74.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.2	256	0.0320	0.23		**Sheet Flow, Grass Sheet Flow to intake** Grass: Short n= 0.150 P2= 2.87"

Subcatchment DA1: Walgreens Loading Dock and Houses



Hydrograph for Subcatchment DA1: Walgreens Loading Dock and Houses

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.02	0.00	0.00
2.00	0.04	0.00	0.00
3.00	0.07	0.00	0.00
4.00	0.11	0.00	0.00
5.00	0.16	0.00	0.00
6.00	0.22	0.01	0.01
7.00	0.28	0.02	0.02
8.00	0.36	0.04	0.03
9.00	0.44	0.08	0.04
10.00	0.59	0.16	0.09
11.00	0.82	0.32	0.22
12.00	1.98	1.30	**1.39**
13.00	3.46	2.69	**0.55**
14.00	3.69	2.92	0.18
15.00	3.84	3.06	0.15
16.00	3.92	3.14	0.09
17.00	4.00	3.22	0.08
18.00	4.06	3.28	0.07
19.00	4.12	3.34	0.06
20.00	4.17	3.38	0.05
21.00	4.21	3.42	0.04
22.00	4.24	3.45	0.03
23.00	4.26	3.48	0.02
24.00	**4.28**	**3.49**	0.01
25.00	4.28	3.49	0.00
26.00	4.28	3.49	0.00
27.00	4.28	3.49	0.00
28.00	4.28	3.49	0.00
29.00	4.28	3.49	0.00
30.00	4.28	3.49	0.00
31.00	4.28	3.49	0.00
32.00	4.28	3.49	0.00
33.00	4.28	3.49	0.00
34.00	4.28	3.49	0.00
35.00	4.28	3.49	0.00
36.00	4.28	3.49	0.00
37.00	4.28	3.49	0.00
38.00	4.28	3.49	0.00
39.00	4.28	3.49	0.00
40.00	4.28	3.49	0.00
41.00	4.28	3.49	0.00
42.00	4.28	3.49	0.00
43.00	4.28	3.49	0.00
44.00	4.28	3.49	0.00
45.00	4.28	3.49	0.00
46.00	4.28	3.49	0.00
47.00	4.28	3.49	0.00
48.00	4.28	3.49	0.00
49.00	4.28	3.49	0.00
50.00	4.28	3.49	0.00
51.00	4.28	3.49	0.00
52.00	4.28	3.49	0.00
53.00	4.28	3.49	0.00
54.00	4.28	3.49	0.00
55.00	4.28	3.49	0.00
56.00	4.28	3.49	0.00
57.00	4.28	3.49	0.00
58.00	4.28	3.49	0.00
59.00	4.28	3.49	0.00
60.00	4.28	3.49	0.00
61.00	4.28	3.49	0.00
62.00	4.28	3.49	0.00
63.00	4.28	3.49	0.00
64.00	4.28	3.49	0.00
65.00	4.28	3.49	0.00
66.00	4.28	3.49	0.00
67.00	4.28	3.49	0.00
68.00	4.28	3.49	0.00
69.00	4.28	3.49	0.00
70.00	4.28	3.49	0.00
71.00	4.28	3.49	0.00
72.00	4.28	3.49	0.00

Summary for Subcatchment DA2: Riverfront Pipe

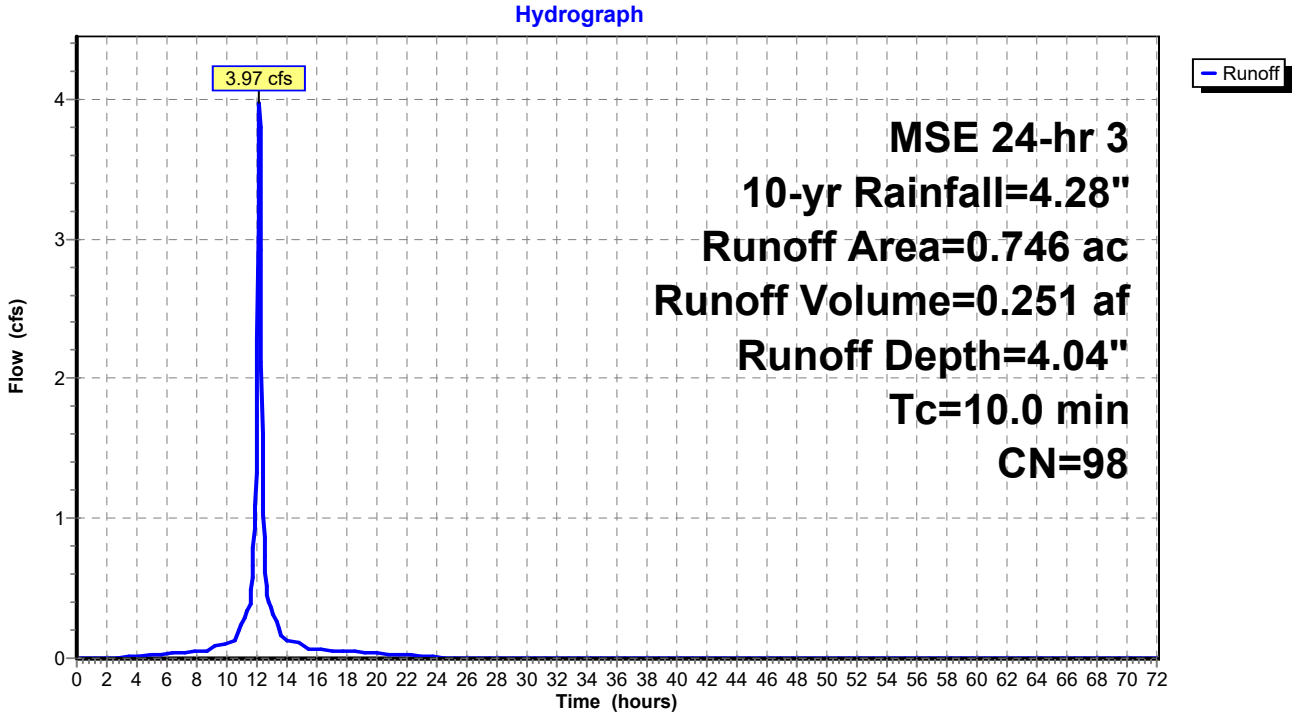
Runoff = 3.97 cfs @ 12.17 hrs, Volume= 0.251 af, Depth= 4.04"
Routed to Reach 2.1 : 12-in RCP

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-yr Rainfall=4.28"

Area (ac)	CN	Description
0.731	98	Paved parking, HSG D
0.015	80	>75% Grass cover, Good, HSG D
0.746	98	Weighted Average
0.015		2.01% Pervious Area
0.731		97.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, Minimum**

Subcatchment DA2: Riverfront Pipe



Hydrograph for Subcatchment DA2: Riverfront Pipe

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.02	0.00	0.00
2.00	0.04	0.00	0.00
3.00	0.07	0.00	0.01
4.00	0.11	0.02	0.01
5.00	0.16	0.04	0.02
6.00	0.22	0.08	0.03
7.00	0.28	0.13	0.04
8.00	0.36	0.19	0.05
9.00	0.44	0.27	0.06
10.00	0.59	0.40	0.11
11.00	0.82	0.62	0.25
12.00	1.98	1.76	**1.73**
13.00	3.46	3.22	**0.33**
14.00	3.69	3.46	0.12
15.00	3.84	3.60	0.11
16.00	3.92	3.69	0.06
17.00	4.00	3.76	0.05
18.00	4.06	3.83	0.05
19.00	4.12	3.88	0.04
20.00	4.17	3.93	0.03
21.00	4.21	3.97	0.03
22.00	4.24	4.01	0.02
23.00	4.26	4.03	0.02
24.00	**4.28**	**4.04**	0.01
25.00	4.28	4.04	0.00
26.00	4.28	4.04	0.00
27.00	4.28	4.04	0.00
28.00	4.28	4.04	0.00
29.00	4.28	4.04	0.00
30.00	4.28	4.04	0.00
31.00	4.28	4.04	0.00
32.00	4.28	4.04	0.00
33.00	4.28	4.04	0.00
34.00	4.28	4.04	0.00
35.00	4.28	4.04	0.00
36.00	4.28	4.04	0.00
37.00	4.28	4.04	0.00
38.00	4.28	4.04	0.00
39.00	4.28	4.04	0.00
40.00	4.28	4.04	0.00
41.00	4.28	4.04	0.00
42.00	4.28	4.04	0.00
43.00	4.28	4.04	0.00
44.00	4.28	4.04	0.00
45.00	4.28	4.04	0.00
46.00	4.28	4.04	0.00
47.00	4.28	4.04	0.00
48.00	4.28	4.04	0.00
49.00	4.28	4.04	0.00
50.00	4.28	4.04	0.00
51.00	4.28	4.04	0.00
52.00	4.28	4.04	0.00
53.00	4.28	4.04	0.00
54.00	4.28	4.04	0.00
55.00	4.28	4.04	0.00
56.00	4.28	4.04	0.00
57.00	4.28	4.04	0.00
58.00	4.28	4.04	0.00
59.00	4.28	4.04	0.00
60.00	4.28	4.04	0.00
61.00	4.28	4.04	0.00
62.00	4.28	4.04	0.00
63.00	4.28	4.04	0.00
64.00	4.28	4.04	0.00
65.00	4.28	4.04	0.00
66.00	4.28	4.04	0.00
67.00	4.28	4.04	0.00
68.00	4.28	4.04	0.00
69.00	4.28	4.04	0.00
70.00	4.28	4.04	0.00
71.00	4.28	4.04	0.00
72.00	4.28	4.04	0.00

Summary for Subcatchment DA3: Walgreens Parking lot to CB

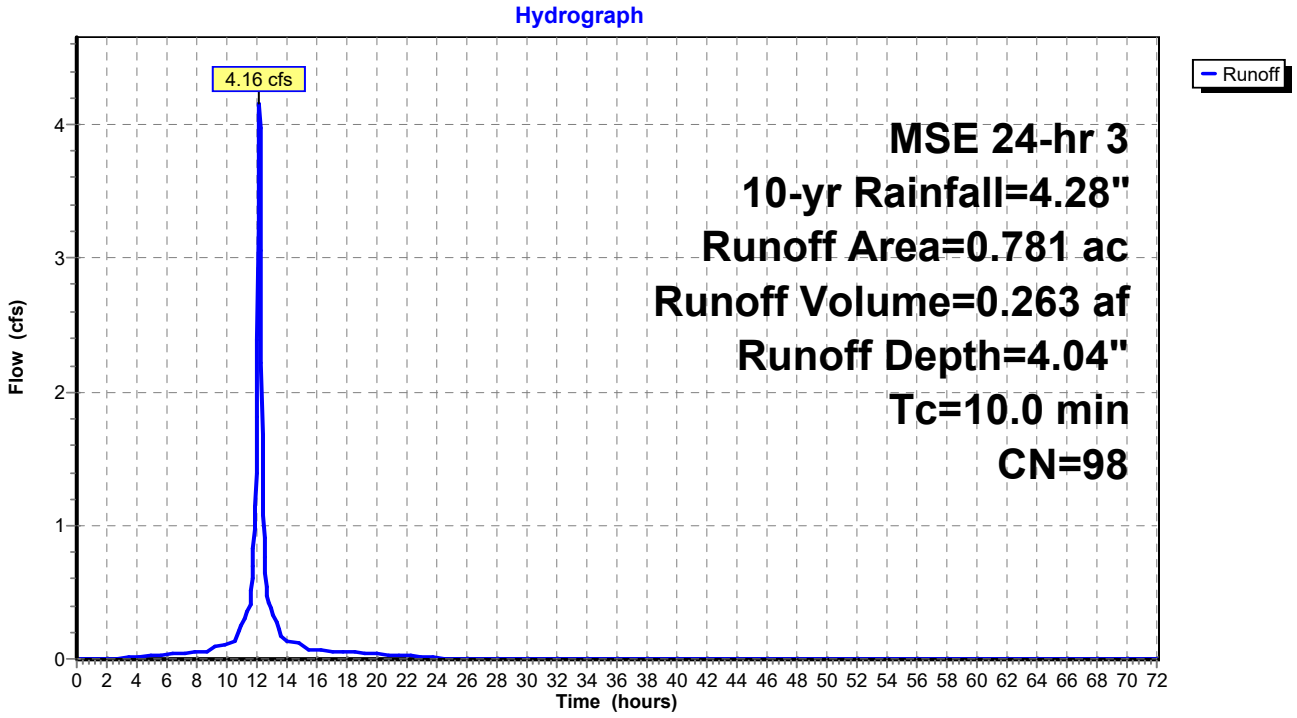
Runoff = 4.16 cfs @ 12.17 hrs, Volume= 0.263 af, Depth= 4.04"
Routed to Reach 3.1 : 12-in Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-yr Rainfall=4.28"

Area (ac)	CN	Description
0.781	98	Paved parking, HSG D
0.781		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, Minimum Entry**

Subcatchment DA3: Walgreens Parking lot to CB



Hydrograph for Subcatchment DA3: Walgreens Parking lot to CB

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.02	0.00	0.00
2.00	0.04	0.00	0.00
3.00	0.07	0.00	0.01
4.00	0.11	0.02	0.01
5.00	0.16	0.04	0.02
6.00	0.22	0.08	0.03
7.00	0.28	0.13	0.04
8.00	0.36	0.19	0.05
9.00	0.44	0.27	0.06
10.00	0.59	0.40	0.11
11.00	0.82	0.62	0.26
12.00	1.98	1.76	**1.81**
13.00	3.46	3.22	**0.35**
14.00	3.69	3.46	0.13
15.00	3.84	3.60	0.11
16.00	3.92	3.69	0.06
17.00	4.00	3.76	0.06
18.00	4.06	3.83	0.05
19.00	4.12	3.88	0.04
20.00	4.17	3.93	0.04
21.00	4.21	3.97	0.03
22.00	4.24	4.01	0.02
23.00	4.26	4.03	0.02
24.00	**4.28**	**4.04**	0.01
25.00	4.28	4.04	0.00
26.00	4.28	4.04	0.00
27.00	4.28	4.04	0.00
28.00	4.28	4.04	0.00
29.00	4.28	4.04	0.00
30.00	4.28	4.04	0.00
31.00	4.28	4.04	0.00
32.00	4.28	4.04	0.00
33.00	4.28	4.04	0.00
34.00	4.28	4.04	0.00
35.00	4.28	4.04	0.00
36.00	4.28	4.04	0.00
37.00	4.28	4.04	0.00
38.00	4.28	4.04	0.00
39.00	4.28	4.04	0.00
40.00	4.28	4.04	0.00
41.00	4.28	4.04	0.00
42.00	4.28	4.04	0.00
43.00	4.28	4.04	0.00
44.00	4.28	4.04	0.00
45.00	4.28	4.04	0.00
46.00	4.28	4.04	0.00
47.00	4.28	4.04	0.00
48.00	4.28	4.04	0.00
49.00	4.28	4.04	0.00
50.00	4.28	4.04	0.00
51.00	4.28	4.04	0.00
52.00	4.28	4.04	0.00
53.00	4.28	4.04	0.00
54.00	4.28	4.04	0.00
55.00	4.28	4.04	0.00
56.00	4.28	4.04	0.00
57.00	4.28	4.04	0.00
58.00	4.28	4.04	0.00
59.00	4.28	4.04	0.00
60.00	4.28	4.04	0.00
61.00	4.28	4.04	0.00
62.00	4.28	4.04	0.00
63.00	4.28	4.04	0.00
64.00	4.28	4.04	0.00
65.00	4.28	4.04	0.00
66.00	4.28	4.04	0.00
67.00	4.28	4.04	0.00
68.00	4.28	4.04	0.00
69.00	4.28	4.04	0.00
70.00	4.28	4.04	0.00
71.00	4.28	4.04	0.00
72.00	4.28	4.04	0.00

Summary for Subcatchment PSB: Public Safety Building (OFFSITE)

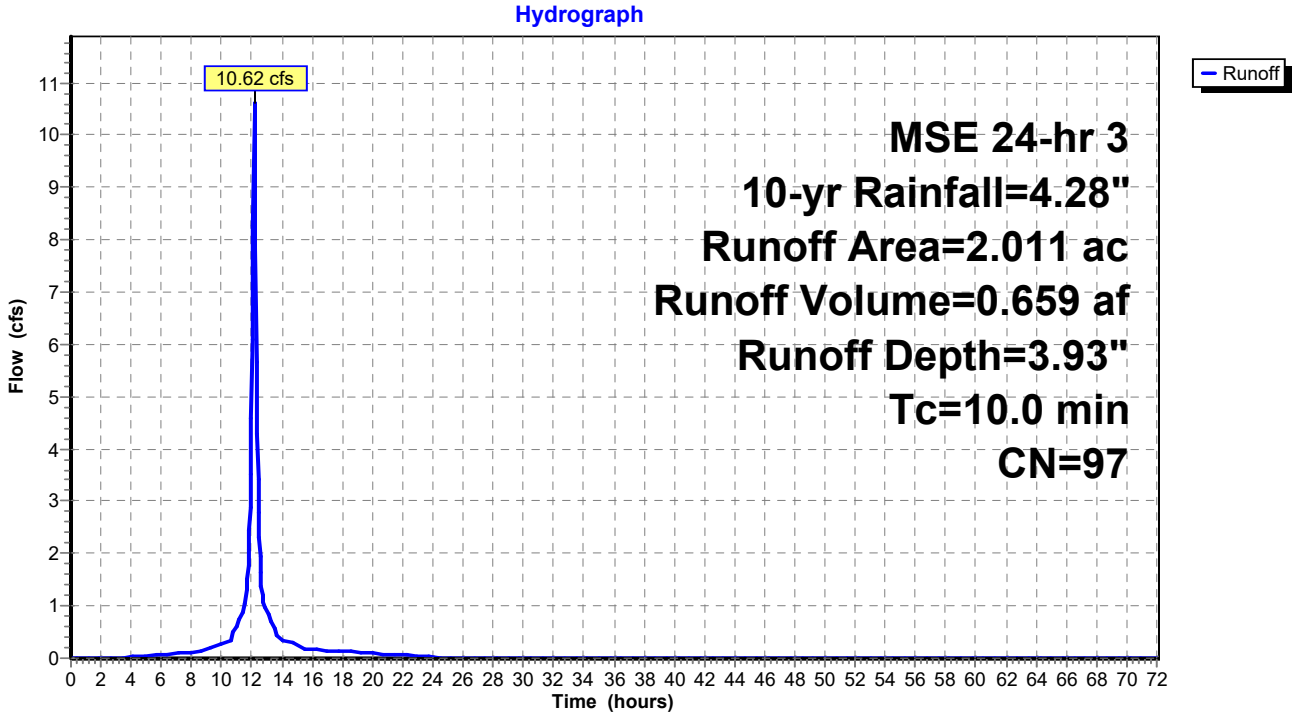
Runoff = 10.62 cfs @ 12.17 hrs, Volume= 0.659 af, Depth= 3.93"
Routed to Reach PSB.1 : 15-in RCP from PSB (OFFSITE)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-yr Rainfall=4.28"

Area (ac)	CN	Description
1.908	98	Roofs, HSG D
0.103	82	Woods/grass comb., Fair, HSG D
2.011	97	Weighted Average
0.103		5.12% Pervious Area
1.908		94.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, Minimum Entry**

Subcatchment PSB: Public Safety Building (OFFSITE)



Hydrograph for Subcatchment PSB: Public Safety Building (OFFSITE)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.02	0.00	0.00
2.00	0.04	0.00	0.00
3.00	0.07	0.00	0.00
4.00	0.11	0.01	0.02
5.00	0.16	0.02	0.04
6.00	0.22	0.05	0.07
7.00	0.28	0.09	0.09
8.00	0.36	0.15	0.11
9.00	0.44	0.21	0.14
10.00	0.59	0.33	0.27
11.00	0.82	0.54	0.63
12.00	1.98	1.65	**4.58**
13.00	3.46	3.11	**0.89**
14.00	3.69	3.34	0.32
15.00	3.84	3.49	0.28
16.00	3.92	3.57	0.16
17.00	4.00	3.65	0.14
18.00	4.06	3.71	0.13
19.00	4.12	3.77	0.11
20.00	4.17	3.82	0.09
21.00	4.21	3.86	0.08
22.00	4.24	3.89	0.06
23.00	4.26	3.91	0.04
24.00	**4.28**	**3.93**	0.02
25.00	4.28	3.93	0.00
26.00	4.28	3.93	0.00
27.00	4.28	3.93	0.00
28.00	4.28	3.93	0.00
29.00	4.28	3.93	0.00
30.00	4.28	3.93	0.00
31.00	4.28	3.93	0.00
32.00	4.28	3.93	0.00
33.00	4.28	3.93	0.00
34.00	4.28	3.93	0.00
35.00	4.28	3.93	0.00
36.00	4.28	3.93	0.00
37.00	4.28	3.93	0.00
38.00	4.28	3.93	0.00
39.00	4.28	3.93	0.00
40.00	4.28	3.93	0.00
41.00	4.28	3.93	0.00
42.00	4.28	3.93	0.00
43.00	4.28	3.93	0.00
44.00	4.28	3.93	0.00
45.00	4.28	3.93	0.00
46.00	4.28	3.93	0.00
47.00	4.28	3.93	0.00
48.00	4.28	3.93	0.00
49.00	4.28	3.93	0.00
50.00	4.28	3.93	0.00
51.00	4.28	3.93	0.00
52.00	4.28	3.93	0.00
53.00	4.28	3.93	0.00
54.00	4.28	3.93	0.00
55.00	4.28	3.93	0.00
56.00	4.28	3.93	0.00
57.00	4.28	3.93	0.00
58.00	4.28	3.93	0.00
59.00	4.28	3.93	0.00
60.00	4.28	3.93	0.00
61.00	4.28	3.93	0.00
62.00	4.28	3.93	0.00
63.00	4.28	3.93	0.00
64.00	4.28	3.93	0.00
65.00	4.28	3.93	0.00
66.00	4.28	3.93	0.00
67.00	4.28	3.93	0.00
68.00	4.28	3.93	0.00
69.00	4.28	3.93	0.00
70.00	4.28	3.93	0.00
71.00	4.28	3.93	0.00
72.00	4.28	3.93	0.00

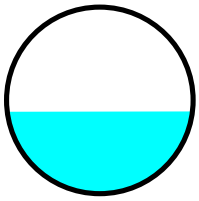
Summary for Reach 2.1: 12-in RCP

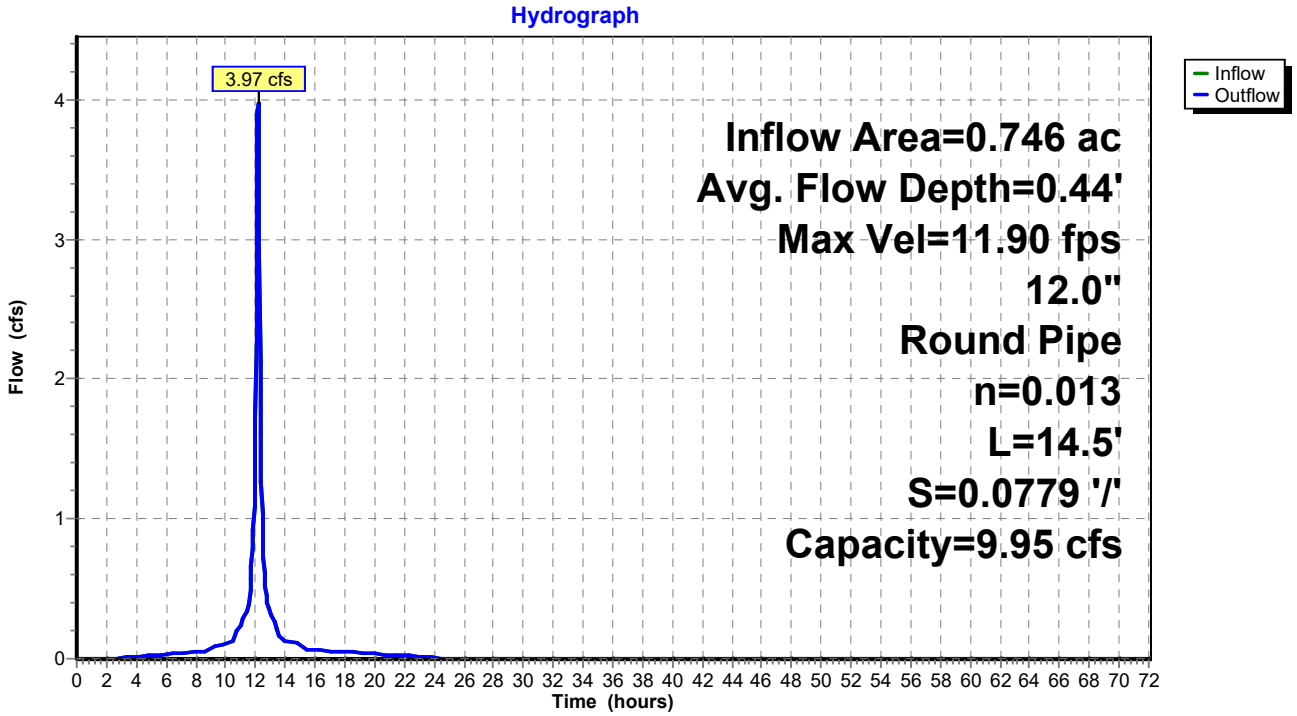
Inflow Area = 0.746 ac, 97.99% Impervious, Inflow Depth = 4.04" for 10-yr event
Inflow = 3.97 cfs @ 12.17 hrs, Volume= 0.251 af
Outflow = 3.97 cfs @ 12.17 hrs, Volume= 0.251 af, Atten= 0%, Lag= 0.0 min
Routed to Reach 2.2 : 21-in RCP

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 11.90 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.51 fps, Avg. Travel Time= 0.1 min

Peak Storage= 5 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.44' , Surface Width= 0.99'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 9.95 cfs

12.0" Round Pipe
n= 0.013 Concrete pipe, bends & connections
Length= 14.5' Slope= 0.0779 '/'
Inlet Invert= 773.11', Outlet Invert= 771.98'





Hydrograph for Reach 2.1: 12-in RCP

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	773.11	0.00
2.50	0.00	0	773.12	0.00
5.00	0.02	0	773.14	0.02
7.50	0.04	0	773.16	0.04
10.00	**0.11**	**0**	**773.18**	**0.11**
12.50	**0.86**	**2**	**773.31**	**0.86**
15.00	0.11	0	773.18	0.11
17.50	0.05	0	773.16	0.05
20.00	0.03	0	773.15	0.03
22.50	0.02	0	773.14	0.02
25.00	0.00	0	773.11	0.00
27.50	0.00	0	773.11	0.00
30.00	0.00	0	773.11	0.00
32.50	0.00	0	773.11	0.00
35.00	0.00	0	773.11	0.00
37.50	0.00	0	773.11	0.00
40.00	0.00	0	773.11	0.00
42.50	0.00	0	773.11	0.00
45.00	0.00	0	773.11	0.00
47.50	0.00	0	773.11	0.00
50.00	0.00	0	773.11	0.00
52.50	0.00	0	773.11	0.00
55.00	0.00	0	773.11	0.00
57.50	0.00	0	773.11	0.00
60.00	0.00	0	773.11	0.00
62.50	0.00	0	773.11	0.00
65.00	0.00	0	773.11	0.00
67.50	0.00	0	773.11	0.00
70.00	0.00	0	773.11	0.00

Stage-Discharge for Reach 2.1: 12-in RCP

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
773.11	0.00	0.00
773.12	1.13	0.00
773.13	1.78	0.01
773.14	2.33	0.02
773.15	2.81	0.03
773.16	3.25	0.05
773.17	3.66	0.07
773.18	4.04	0.10
773.19	4.41	0.13
773.20	4.75	0.17
773.21	5.08	0.21
773.22	5.40	0.25
773.23	5.70	0.30
773.24	5.99	0.36
773.25	6.27	0.42
773.26	6.54	0.48
773.27	6.81	0.55
773.28	7.06	0.63
773.29	7.31	0.70
773.30	7.55	0.78
773.31	7.79	0.87
773.32	8.02	0.96
773.33	8.24	1.06
773.34	8.46	1.15
773.35	8.67	1.26
773.36	8.87	1.36
773.37	9.07	1.47
773.38	9.27	1.59
773.39	9.46	1.70
773.40	9.65	1.82
773.41	9.83	1.95
773.42	10.01	2.08
773.43	10.18	2.21
773.44	10.35	2.34
773.45	10.51	2.48
773.46	10.68	2.62
773.47	10.83	2.76
773.48	10.99	2.90
773.49	11.14	3.05
773.50	11.28	3.20
773.51	11.42	3.35
773.52	11.56	3.51
773.53	11.70	3.66
773.54	11.83	3.82
773.55	11.96	3.98
773.56	12.09	4.14
773.57	12.21	4.31
773.58	12.33	4.47
773.59	12.44	4.64
773.60	12.55	4.80
773.61	12.66	4.97
773.62	12.77	5.14
773.63	12.87	5.31
773.64	12.97	5.48
773.65	13.07	5.65
773.66	13.16	5.83
773.67	13.25	6.00
773.68	13.34	6.17
773.69	13.42	6.34
773.70	13.50	6.51
773.71	13.58	6.68
773.72	13.66	6.85
773.73	13.73	7.02
773.74	13.79	7.19
773.75	13.86	7.36
773.76	13.92	7.52
773.77	13.98	7.69
773.78	14.03	7.85
773.79	14.09	8.01
773.80	14.14	8.17
773.81	14.18	8.33
773.82	14.22	8.48
773.83	14.26	8.63
773.84	14.30	8.78
773.85	14.33	8.93
773.86	14.35	9.07
773.87	14.38	9.21
773.88	14.40	9.34
773.89	14.41	9.47
773.90	14.43	9.60
773.91	14.43	9.72
773.92	**14.44**	9.84
773.93	14.44	9.95
773.94	14.43	10.06
773.95	14.42	10.16
773.96	14.40	10.25
773.97	14.38	10.34
773.98	14.36	10.41
773.99	14.32	10.48
774.00	14.28	10.55
774.01	14.24	10.60
774.02	14.18	10.64
774.03	14.12	10.67
774.04	14.05	10.69
774.05	13.96	**10.70**
774.06	13.87	10.69
774.07	13.75	10.66
774.08	13.62	10.60
774.09	13.45	10.51
774.10	13.22	10.36
774.11	12.66	9.95

Stage-Area-Storage for Reach 2.1: 12-in RCP

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
773.11	0.0	0
773.12	0.0	0
773.13	0.0	0
773.14	0.0	0
773.15	0.0	0
773.16	0.0	0
773.17	0.0	0
773.18	0.0	0
773.19	0.0	0
773.20	0.0	1
773.21	0.0	1
773.22	0.0	1
773.23	0.1	1
773.24	0.1	1
773.25	0.1	1
773.26	0.1	1
773.27	0.1	1
773.28	0.1	1
773.29	0.1	1
773.30	0.1	2
773.31	0.1	2
773.32	0.1	2
773.33	0.1	2
773.34	0.1	2
773.35	0.1	2
773.36	0.2	2
773.37	0.2	2
773.38	0.2	2
773.39	0.2	3
773.40	0.2	3
773.41	0.2	3
773.42	0.2	3
773.43	0.2	3
773.44	0.2	3
773.45	0.2	3
773.46	0.2	4
773.47	0.3	4
773.48	0.3	4
773.49	0.3	4
773.50	0.3	4
773.51	0.3	4
773.52	0.3	4
773.53	0.3	5
773.54	0.3	5
773.55	0.3	5
773.56	0.3	5
773.57	0.4	5
773.58	0.4	5
773.59	0.4	5
773.60	0.4	6
773.61	0.4	6
773.62	0.4	6
773.63	0.4	6
773.64	0.4	6
773.65	0.4	6
773.66	0.4	6
773.67	0.5	7
773.68	0.5	7
773.69	0.5	7
773.70	0.5	7
773.71	0.5	7
773.72	0.5	7
773.73	0.5	7
773.74	0.5	8
773.75	0.5	8
773.76	0.5	8
773.77	0.5	8
773.78	0.6	8
773.79	0.6	8
773.80	0.6	8
773.81	0.6	9
773.82	0.6	9
773.83	0.6	9
773.84	0.6	9
773.85	0.6	9
773.86	0.6	9
773.87	0.6	9
773.88	0.6	9
773.89	0.7	10
773.90	0.7	10
773.91	0.7	10
773.92	0.7	10
773.93	0.7	10
773.94	0.7	10
773.95	0.7	10
773.96	0.7	10
773.97	0.7	10
773.98	0.7	11
773.99	0.7	11
774.00	0.7	11
774.01	0.7	11
774.02	0.8	11
774.03	0.8	11
774.04	0.8	11
774.05	0.8	11
774.06	0.8	11
774.07	0.8	11
774.08	0.8	11
774.09	0.8	11
774.10	0.8	11
774.11	**0.8**	**11**

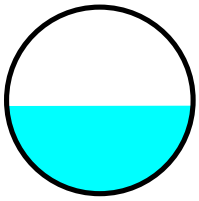
Summary for Reach 2.2: 21-in RCP

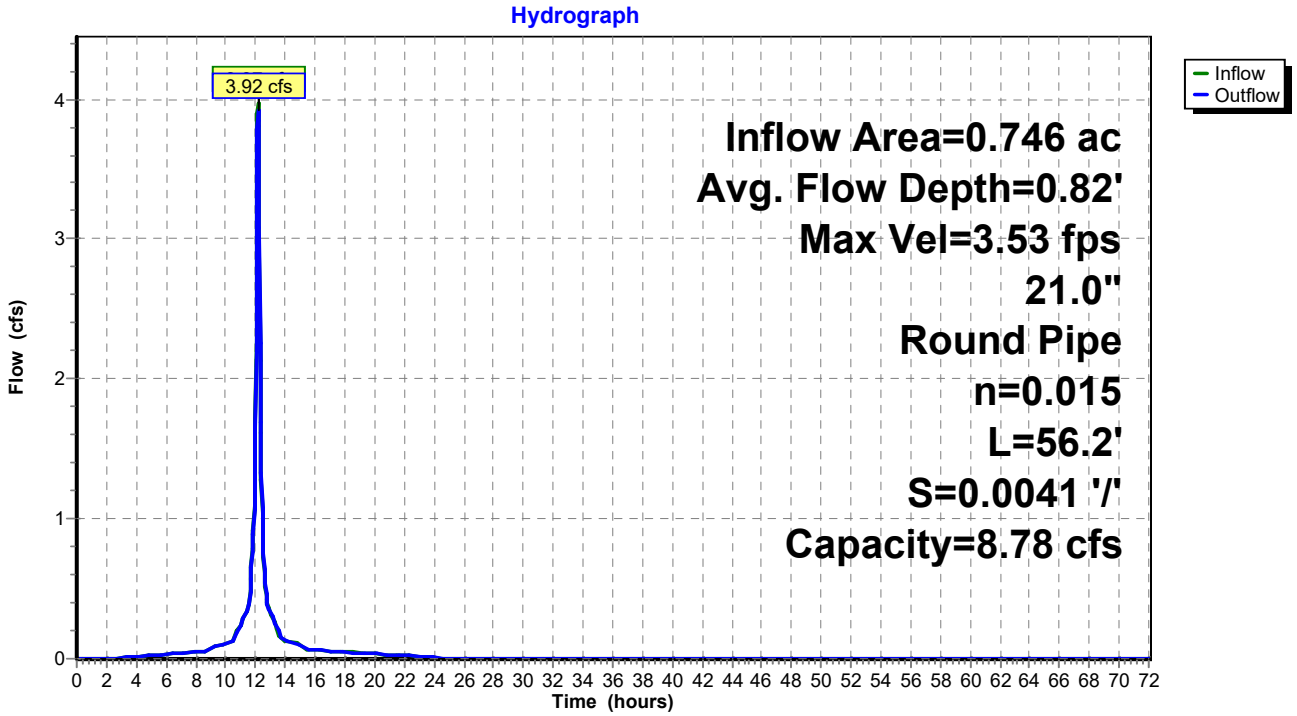
Inflow Area = 0.746 ac, 97.99% Impervious, Inflow Depth = 4.04" for 10-yr event
Inflow = 3.97 cfs @ 12.17 hrs, Volume= 0.251 af
Outflow = 3.92 cfs @ 12.18 hrs, Volume= 0.251 af, Atten= 1%, Lag= 0.6 min
Routed to Reach N FLOWS : 108-in RCP

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.53 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.04 fps, Avg. Travel Time= 0.9 min

Peak Storage= 63 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.82' , Surface Width= 1.75'
Bank-Full Depth= 1.75' Flow Area= 2.4 sf, Capacity= 8.78 cfs

21.0" Round Pipe
n= 0.015 Concrete sewer w/manholes & inlets
Length= 56.2' Slope= 0.0041 '/'
Inlet Invert= 771.98', Outlet Invert= 771.75'





Hydrograph for Reach 2.2: 21-in RCP

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	771.98	0.00
2.50	0.00	0	772.00	0.00
5.00	0.02	2	772.04	0.02
7.50	0.04	3	772.07	0.04
10.00	**0.11**	**5**	**772.12**	**0.11**
12.50	**0.86**	**21**	**772.35**	**0.89**
15.00	0.11	5	772.11	0.11
17.50	0.05	3	772.07	0.05
20.00	0.03	2	772.06	0.03
22.50	0.02	1	772.04	0.02
25.00	0.00	0	771.98	0.00
27.50	0.00	0	771.98	0.00
30.00	0.00	0	771.98	0.00
32.50	0.00	0	771.98	0.00
35.00	0.00	0	771.98	0.00
37.50	0.00	0	771.98	0.00
40.00	0.00	0	771.98	0.00
42.50	0.00	0	771.98	0.00
45.00	0.00	0	771.98	0.00
47.50	0.00	0	771.98	0.00
50.00	0.00	0	771.98	0.00
52.50	0.00	0	771.98	0.00
55.00	0.00	0	771.98	0.00
57.50	0.00	0	771.98	0.00
60.00	0.00	0	771.98	0.00
62.50	0.00	0	771.98	0.00
65.00	0.00	0	771.98	0.00
67.50	0.00	0	771.98	0.00
70.00	0.00	0	771.98	0.00

Stage-Discharge for Reach 2.2: 21-in RCP

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
771.98	0.00	0.00
772.00	0.35	0.00
772.02	0.56	0.01
772.04	0.73	0.02
772.06	0.88	0.04
772.08	1.02	0.06
772.10	1.15	0.08
772.12	1.27	0.11
772.14	1.38	0.15
772.16	1.49	0.20
772.18	1.59	0.24
772.20	1.69	0.30
772.22	1.79	0.36
772.24	1.88	0.42
772.26	1.96	0.49
772.28	2.05	0.56
772.30	2.13	0.64
772.32	2.21	0.73
772.34	2.28	0.81
772.36	2.36	0.91
772.38	2.43	1.01
772.40	2.50	1.11
772.42	2.57	1.22
772.44	2.63	1.33
772.46	2.70	1.45
772.48	2.76	1.57
772.50	2.82	1.69
772.52	2.88	1.82
772.54	2.94	1.95
772.56	2.99	2.08
772.58	3.05	2.22
772.60	3.10	2.36
772.62	3.15	2.51
772.64	3.20	2.66
772.66	3.25	2.81
772.68	3.30	2.96
772.70	3.34	3.12
772.72	3.39	3.27
772.74	3.43	3.44
772.76	3.47	3.60
772.78	3.51	3.76
772.80	3.55	3.93
772.82	3.59	4.10
772.84	3.63	4.27
772.86	3.66	4.44
772.88	3.70	4.61
772.90	3.73	4.78
772.92	3.76	4.95
772.94	3.79	5.12
772.96	3.82	5.30
772.98	3.85	5.47
773.00	3.88	5.64
773.02	3.90	5.82
773.04	3.93	5.99
773.06	3.95	6.16
773.08	3.98	6.33
773.10	4.00	6.50
773.12	4.02	6.67
773.14	4.04	6.83
773.16	4.05	7.00
773.18	4.07	7.16
773.20	4.09	7.32
773.22	4.10	7.47
773.24	4.11	7.63
773.26	4.12	7.77
773.28	4.13	7.92
773.30	4.14	8.06
773.32	4.15	8.20
773.34	4.16	8.33
773.36	4.16	8.46
773.38	4.16	8.59
773.40	**4.16**	8.70
773.42	4.16	8.82
773.44	4.16	8.92
773.46	4.16	9.02
773.48	4.15	9.11
773.50	4.14	9.19
773.52	4.13	9.26
773.54	4.12	9.32
773.56	4.10	9.37
773.58	4.08	9.41
773.60	4.06	9.44
773.62	4.03	**9.45**
773.64	4.00	9.44
773.66	3.97	9.41
773.68	3.92	9.35
773.70	3.86	9.25
773.72	3.74	9.00

Stage-Area-Storage for Reach 2.2: 21-in RCP

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
771.98	0.0	0
772.00	0.0	0
772.02	0.0	1
772.04	0.0	1
772.06	0.0	2
772.08	0.1	3
772.10	0.1	4
772.12	0.1	5
772.14	0.1	6
772.16	0.1	7
772.18	0.2	9
772.20	0.2	10
772.22	0.2	11
772.24	0.2	13
772.26	0.2	14
772.28	0.3	15
772.30	0.3	17
772.32	0.3	18
772.34	0.4	20
772.36	0.4	22
772.38	0.4	23
772.40	0.4	25
772.42	0.5	27
772.44	0.5	28
772.46	0.5	30
772.48	0.6	32
772.50	0.6	34
772.52	0.6	35
772.54	0.7	37
772.56	0.7	39
772.58	0.7	41
772.60	0.8	43
772.62	0.8	45
772.64	0.8	47
772.66	0.9	49
772.68	0.9	50
772.70	0.9	52
772.72	1.0	54
772.74	1.0	56
772.76	1.0	58
772.78	1.1	60
772.80	1.1	62
772.82	1.1	64
772.84	1.2	66
772.86	1.2	68
772.88	1.2	70
772.90	1.3	72
772.92	1.3	74
772.94	1.4	76
772.96	1.4	78
772.98	1.4	80
773.00	1.5	82
773.02	1.5	84
773.04	1.5	86
773.06	1.6	88
773.08	1.6	89
773.10	1.6	91
773.12	1.7	93
773.14	1.7	95
773.16	1.7	97
773.18	1.8	99
773.20	1.8	101
773.22	1.8	102
773.24	1.9	104
773.26	1.9	106
773.28	1.9	108
773.30	1.9	109
773.32	2.0	111
773.34	2.0	113
773.36	2.0	114
773.38	2.1	116
773.40	2.1	117
773.42	2.1	119
773.44	2.1	120
773.46	2.2	122
773.48	2.2	123
773.50	2.2	125
773.52	2.2	126
773.54	2.3	127
773.56	2.3	128
773.58	2.3	130
773.60	2.3	131
773.62	2.3	132
773.64	2.4	133
773.66	2.4	133
773.68	2.4	134
773.70	2.4	135
773.72	**2.4**	**135**

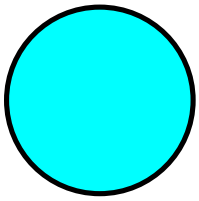
Summary for Reach 3.1: 12-in Catch Basin

Inflow Area = 0.781 ac,100.00% Impervious, Inflow Depth = 4.04" for 10-yr event
Inflow = 4.16 cfs @ 12.17 hrs, Volume= 0.263 af
Outflow = 3.21 cfs @ 12.12 hrs, Volume= 0.263 af, Atten= 23%, Lag= 0.0 min
Routed to Reach N FLOWS : 108-in RCP

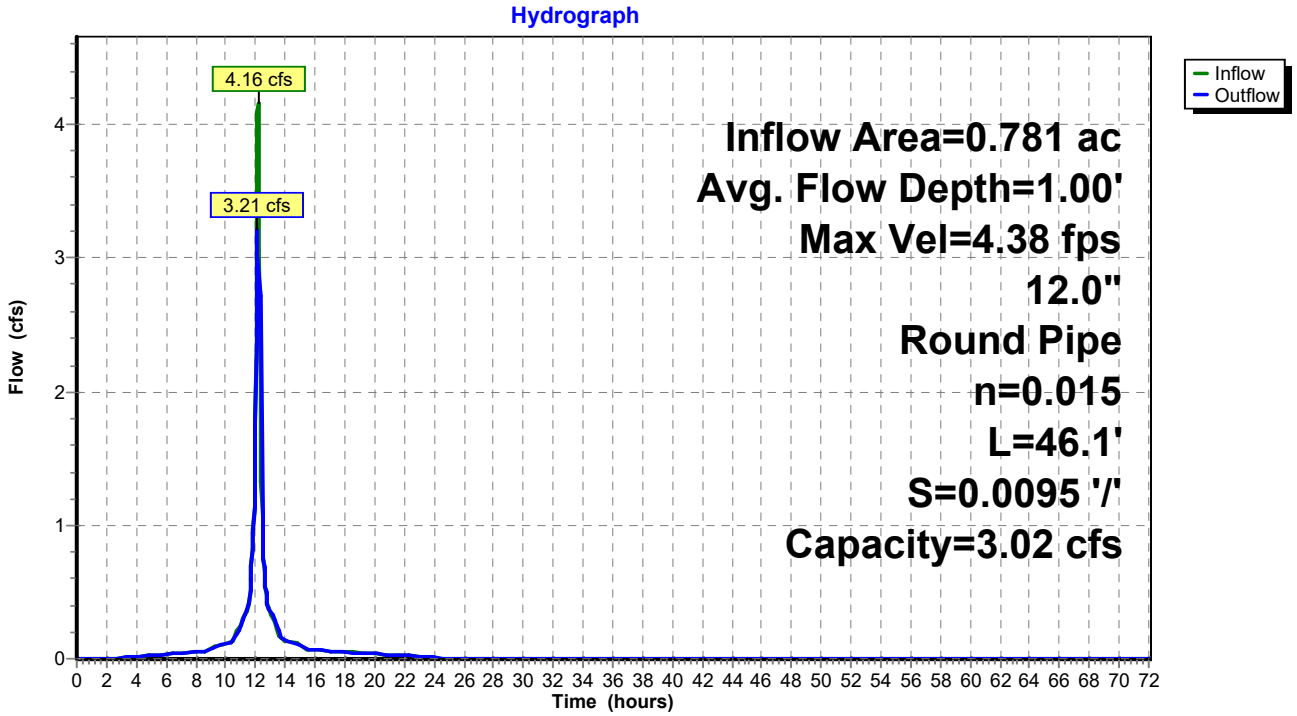
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.38 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.52 fps, Avg. Travel Time= 0.5 min

Peak Storage= 36 cf @ 12.15 hrs
Average Depth at Peak Storage= 1.00'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.02 cfs

12.0" Round Pipe
n= 0.015 Concrete sewer w/manholes & inlets
Length= 46.1' Slope= 0.0095 '/'
Inlet Invert= 772.55', Outlet Invert= 772.11'



Reach 3.1: 12-in Catch Basin



Hydrograph for Reach 3.1: 12-in Catch Basin

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	772.55	0.00
2.50	0.00	0	772.57	0.00
5.00	0.02	1	772.61	0.02
7.50	0.05	2	772.64	0.05
10.00	**0.11**	**3**	**772.68**	**0.11**
12.50	**0.90**	**13**	**772.94**	**0.96**
15.00	0.11	3	772.68	0.11
17.50	0.05	2	772.64	0.05
20.00	0.04	1	772.63	0.04
22.50	0.02	1	772.61	0.02
25.00	0.00	0	772.55	0.00
27.50	0.00	0	772.55	0.00
30.00	0.00	0	772.55	0.00
32.50	0.00	0	772.55	0.00
35.00	0.00	0	772.55	0.00
37.50	0.00	0	772.55	0.00
40.00	0.00	0	772.55	0.00
42.50	0.00	0	772.55	0.00
45.00	0.00	0	772.55	0.00
47.50	0.00	0	772.55	0.00
50.00	0.00	0	772.55	0.00
52.50	0.00	0	772.55	0.00
55.00	0.00	0	772.55	0.00
57.50	0.00	0	772.55	0.00
60.00	0.00	0	772.55	0.00
62.50	0.00	0	772.55	0.00
65.00	0.00	0	772.55	0.00
67.50	0.00	0	772.55	0.00
70.00	0.00	0	772.55	0.00

Stage-Discharge for Reach 3.1: 12-in Catch Basin

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
772.55	0.00	0.00
772.56	0.34	0.00
772.57	0.54	0.00
772.58	0.71	0.00
772.59	0.85	0.01
772.60	0.99	0.01
772.61	1.11	0.02
772.62	1.23	0.03
772.63	1.34	0.04
772.64	1.44	0.05
772.65	1.54	0.06
772.66	1.64	0.08
772.67	1.73	0.09
772.68	1.82	0.11
772.69	1.90	0.13
772.70	1.98	0.15
772.71	2.06	0.17
772.72	2.14	0.19
772.73	2.22	0.21
772.74	2.29	0.24
772.75	2.36	0.26
772.76	2.43	0.29
772.77	2.50	0.32
772.78	2.56	0.35
772.79	2.63	0.38
772.80	2.69	0.41
772.81	2.75	0.45
772.82	2.81	0.48
772.83	2.87	0.52
772.84	2.93	0.55
772.85	2.98	0.59
772.86	3.03	0.63
772.87	3.09	0.67
772.88	3.14	0.71
772.89	3.19	0.75
772.90	3.24	0.79
772.91	3.29	0.84
772.92	3.33	0.88
772.93	3.38	0.92
772.94	3.42	0.97
772.95	3.47	1.02
772.96	3.51	1.06
772.97	3.55	1.11
772.98	3.59	1.16
772.99	3.63	1.21
773.00	3.67	1.26
773.01	3.70	1.31
773.02	3.74	1.36
773.03	3.77	1.41
773.04	3.81	1.46
773.05	3.84	1.51
773.06	3.87	1.56
773.07	3.90	1.61
773.08	3.93	1.66
773.09	3.96	1.71
773.10	3.99	1.77
773.11	4.02	1.82
773.12	4.05	1.87
773.13	4.07	1.92
773.14	4.10	1.97
773.15	4.12	2.03
773.16	4.14	2.08
773.17	4.16	2.13
773.18	4.18	2.18
773.19	4.20	2.23
773.20	4.22	2.28
773.21	4.24	2.33
773.22	4.26	2.38
773.23	4.27	2.43
773.24	4.29	2.48
773.25	4.30	2.53
773.26	4.31	2.57
773.27	4.33	2.62
773.28	4.34	2.66
773.29	4.35	2.71
773.30	4.35	2.75
773.31	4.36	2.79
773.32	4.37	2.83
773.33	4.37	2.87
773.34	4.38	2.91
773.35	4.38	2.95
773.36	**4.38**	2.98
773.37	4.38	3.02
773.38	4.38	3.05
773.39	4.37	3.08
773.40	4.37	3.11
773.41	4.36	3.13
773.42	4.35	3.16
773.43	4.34	3.18
773.44	4.33	3.20
773.45	4.32	3.22
773.46	4.30	3.23
773.47	4.28	3.24
773.48	4.26	3.24
773.49	4.24	**3.24**
773.50	4.21	3.24
773.51	4.17	3.23
773.52	4.13	3.21
773.53	4.08	3.19
773.54	4.01	3.14
773.55	3.84	3.02

Stage-Area-Storage for Reach 3.1: 12-in Catch Basin

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
772.55	0.0	0
772.56	0.0	0
772.57	0.0	0
772.58	0.0	0
772.59	0.0	0
772.60	0.0	1
772.61	0.0	1
772.62	0.0	1
772.63	0.0	1
772.64	0.0	2
772.65	0.0	2
772.66	0.0	2
772.67	0.1	2
772.68	0.1	3
772.69	0.1	3
772.70	0.1	3
772.71	0.1	4
772.72	0.1	4
772.73	0.1	4
772.74	0.1	5
772.75	0.1	5
772.76	0.1	6
772.77	0.1	6
772.78	0.1	6
772.79	0.1	7
772.80	0.2	7
772.81	0.2	7
772.82	0.2	8
772.83	0.2	8
772.84	0.2	9
772.85	0.2	9
772.86	0.2	10
772.87	0.2	10
772.88	0.2	10
772.89	0.2	11
772.90	0.2	11
772.91	0.3	12
772.92	0.3	12
772.93	0.3	13
772.94	0.3	13
772.95	0.3	14
772.96	0.3	14
772.97	0.3	14
772.98	0.3	15
772.99	0.3	15
773.00	0.3	16
773.01	0.4	16
773.02	0.4	17
773.03	0.4	17
773.04	0.4	18
773.05	0.4	18
773.06	0.4	19
773.07	0.4	19
773.08	0.4	19
773.09	0.4	20
773.10	0.4	20
773.11	0.5	21
773.12	0.5	21
773.13	0.5	22
773.14	0.5	22
773.15	0.5	23
773.16	0.5	23
773.17	0.5	24
773.18	0.5	24
773.19	0.5	24
773.20	0.5	25
773.21	0.5	25
773.22	0.6	26
773.23	0.6	26
773.24	0.6	27
773.25	0.6	27
773.26	0.6	27
773.27	0.6	28
773.28	0.6	28
773.29	0.6	29
773.30	0.6	29
773.31	0.6	30
773.32	0.6	30
773.33	0.7	30
773.34	0.7	31
773.35	0.7	31
773.36	0.7	31
773.37	0.7	32
773.38	0.7	32
773.39	0.7	32
773.40	0.7	33
773.41	0.7	33
773.42	0.7	33
773.43	0.7	34
773.44	0.7	34
773.45	0.7	34
773.46	0.8	35
773.47	0.8	35
773.48	0.8	35
773.49	0.8	35
773.50	0.8	36
773.51	0.8	36
773.52	0.8	36
773.53	0.8	36
773.54	0.8	36
773.55	**0.8**	**36**

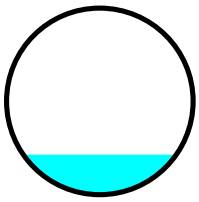
Summary for Reach N FLOWS: 108-in RCP

Inflow Area = 1.527 ac, 99.02% Impervious, Inflow Depth = 4.04" for 10-yr event
Inflow = 6.94 cfs @ 12.18 hrs, Volume= 0.515 af
Outflow = 4.81 cfs @ 12.63 hrs, Volume= 0.515 af, Atten= 31%, Lag= 27.1 min

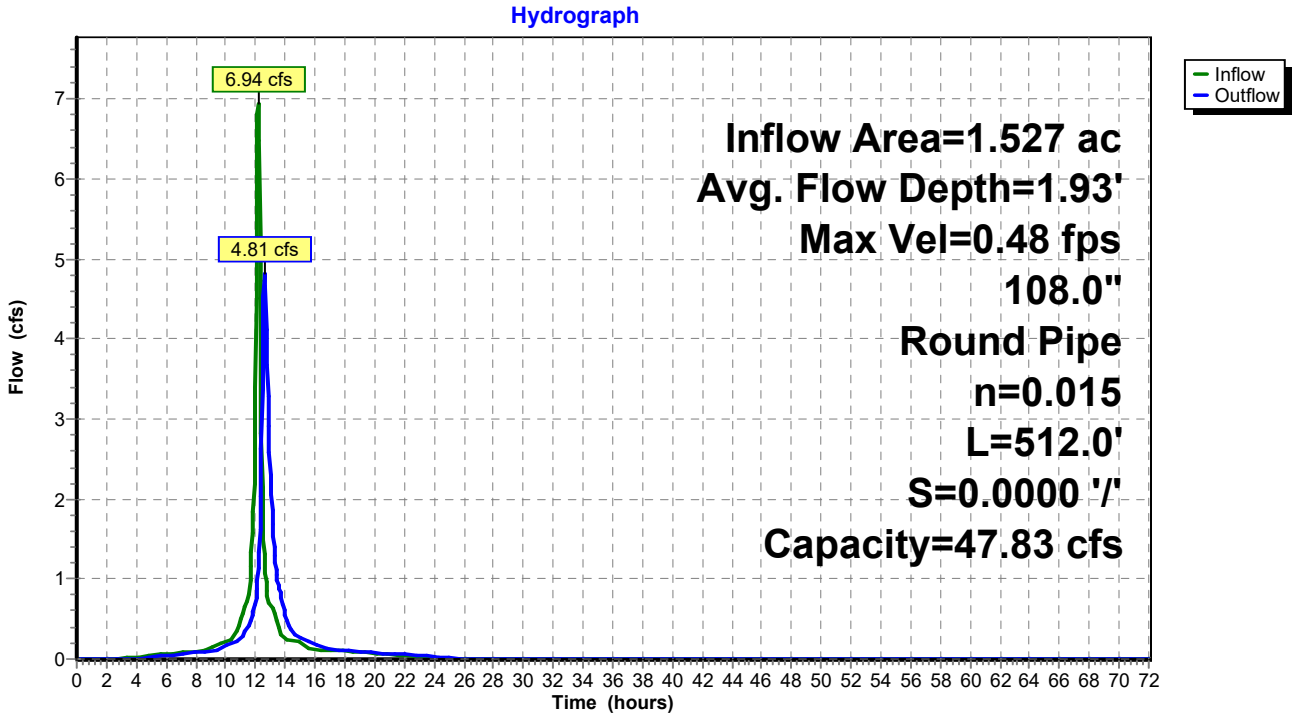
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.48 fps, Min. Travel Time= 17.7 min
Avg. Velocity = 0.12 fps, Avg. Travel Time= 69.6 min

Peak Storage= 5,126 cf @ 12.33 hrs
Average Depth at Peak Storage= 1.93' , Surface Width= 7.39'
Bank-Full Depth= 9.00' Flow Area= 63.6 sf, Capacity= 47.83 cfs

108.0" Round Pipe
n= 0.015 Concrete sewer w/manholes & inlets
Length= 512.0' Slope= 0.0000 '/'
Inlet Invert= 761.00', Outlet Invert= 760.99'



Reach N FLOWS: 108-in RCP



Hydrograph for Reach N FLOWS: 108-in RCP

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	761.00	0.00
2.50	0.00	1	761.00	0.00
5.00	0.05	133	761.16	0.02
7.50	0.09	284	761.27	0.07
10.00	**0.22**	**517**	**761.40**	0.16
12.50	**1.85**	**4,261**	**762.70**	**4.05**
15.00	0.22	640	761.46	**0.27**
17.50	0.10	370	761.32	0.12
20.00	0.07	290	761.27	0.08
22.50	0.04	204	761.21	0.05
25.00	0.00	81	761.11	0.02
27.50	0.00	24	761.04	0.00
30.00	0.00	7	761.01	0.00
32.50	0.00	2	761.00	0.00
35.00	0.00	1	761.00	0.00
37.50	0.00	0	761.00	0.00
40.00	0.00	0	761.00	0.00
42.50	0.00	0	761.00	0.00
45.00	0.00	0	761.00	0.00
47.50	0.00	0	761.00	0.00
50.00	0.00	0	761.00	0.00
52.50	0.00	0	761.00	0.00
55.00	0.00	0	761.00	0.00
57.50	0.00	0	761.00	0.00
60.00	0.00	0	761.00	0.00
62.50	0.00	0	761.00	0.00
65.00	0.00	0	761.00	0.00
67.50	0.00	0	761.00	0.00
70.00	0.00	0	761.00	0.00

Stage-Discharge for Reach N FLOWS: 108-in RCP

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
761.00	0.00	0.00
761.10	0.07	0.01
761.20	0.11	0.04
761.30	0.15	0.10
761.40	0.18	0.18
761.50	0.21	0.29
761.60	0.23	0.43
761.70	0.26	0.59
761.80	0.28	0.78
761.90	0.30	1.00
762.00	0.32	1.25
762.10	0.34	1.52
762.20	0.36	1.82
762.30	0.38	2.15
762.40	0.40	2.51
762.50	0.41	2.89
762.60	0.43	3.30
762.70	0.45	3.73
762.80	0.46	4.19
762.90	0.48	4.67
763.00	0.49	5.18
763.10	0.51	5.71
763.20	0.52	6.27
763.30	0.53	6.84
763.40	0.55	7.44
763.50	0.56	8.06
763.60	0.57	8.70
763.70	0.58	9.37
763.80	0.60	10.05
763.90	0.61	10.75
764.00	0.62	11.47
764.10	0.63	12.20
764.20	0.64	12.96
764.30	0.65	13.72
764.40	0.66	14.51
764.50	0.67	15.30
764.60	0.68	16.12
764.70	0.69	16.94
764.80	0.70	17.78
764.90	0.70	18.63
765.00	0.71	19.49
765.10	0.72	20.36
765.20	0.73	21.23
765.30	0.74	22.12
765.40	0.74	23.01
765.50	0.75	23.91
765.60	0.76	24.82
765.70	0.77	25.73
765.80	0.77	26.64
765.90	0.78	27.55
766.00	0.78	28.47
766.10	0.79	29.39
766.20	0.80	30.30
766.30	0.80	31.22
766.40	0.81	32.13
766.50	0.81	33.04
766.60	0.82	33.94
766.70	0.82	34.84
766.80	0.82	35.73
766.90	0.83	36.61
767.00	0.83	37.49
767.10	0.84	38.35
767.20	0.84	39.20
767.30	0.84	40.04
767.40	0.84	40.86
767.50	0.85	41.67
767.60	0.85	42.46
767.70	0.85	43.23
767.80	0.85	43.98
767.90	0.85	44.71
768.00	0.86	45.41
768.10	0.86	46.09
768.20	**0.86**	46.75
768.30	**0.86**	47.37
768.40	0.86	47.96
768.50	0.86	48.51
768.60	0.86	49.03
768.70	0.85	49.51
768.80	0.85	49.95
768.90	0.85	50.34
769.00	0.85	50.68
769.10	0.85	50.97
769.20	0.84	51.19
769.30	0.84	51.35
769.40	0.83	**51.43**
769.50	0.83	**51.42**
769.60	0.82	51.31
769.70	0.81	51.06
769.80	0.80	50.63
769.90	0.79	49.91
770.00	0.75	47.83

Stage-Area-Storage for Reach N FLOWS: 108-in RCP

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
761.00	0.0	0
761.10	0.1	66
761.20	0.4	184
761.30	0.7	335
761.40	1.0	513
761.50	1.4	714
761.60	1.8	934
761.70	2.3	1,172
761.80	2.8	1,426
761.90	3.3	1,695
762.00	3.9	1,979
762.10	4.4	2,275
762.20	5.0	2,583
762.30	5.7	2,901
762.40	6.3	3,230
762.50	7.0	3,569
762.60	7.7	3,917
762.70	8.3	4,273
762.80	9.1	4,638
762.90	9.8	5,010
763.00	10.5	5,390
763.10	11.3	5,777
763.20	12.1	6,170
763.30	12.8	6,569
763.40	13.6	6,973
763.50	14.4	7,383
763.60	15.2	7,799
763.70	16.1	8,218
763.80	16.9	8,643
763.90	17.7	9,072
764.00	18.6	9,505
764.10	19.4	9,941
764.20	20.3	10,380
764.30	21.1	10,823
764.40	22.0	11,268
764.50	22.9	11,716
764.60	23.8	12,167
764.70	24.6	12,619
764.80	25.5	13,074
764.90	26.4	13,530
765.00	27.3	13,987
765.10	28.2	14,445
765.20	29.1	14,905
765.30	30.0	15,365
765.40	30.9	15,825
765.50	31.8	16,286
765.60	32.7	16,747
765.70	33.6	17,207
765.80	34.5	17,667
765.90	35.4	18,127
766.00	36.3	18,585
766.10	37.2	19,042
766.20	38.1	19,498
766.30	39.0	19,953
766.40	39.9	20,405
766.50	40.7	20,856
766.60	41.6	21,304
766.70	42.5	21,749
766.80	43.3	22,192
766.90	44.2	22,631
767.00	45.1	23,067
767.10	45.9	23,500
767.20	46.7	23,929
767.30	47.6	24,354
767.40	48.4	24,773
767.50	49.2	25,189
767.60	50.0	25,599
767.70	50.8	26,003
767.80	51.6	26,402
767.90	52.3	26,795
768.00	53.1	27,182
768.10	53.8	27,562
768.20	54.6	27,934
768.30	55.3	28,299
768.40	56.0	28,655
768.50	56.6	29,003
768.60	57.3	29,342
768.70	58.0	29,671
768.80	58.6	29,989
768.90	59.2	30,297
769.00	59.8	30,593
769.10	60.3	30,877
769.20	60.8	31,146
769.30	61.3	31,400
769.40	61.8	31,638
769.50	62.2	31,858
769.60	62.6	32,059
769.70	63.0	32,237
769.80	63.3	32,388
769.90	63.5	32,506
770.00	**63.6**	**32,572**

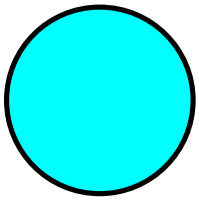
Summary for Reach PSB.1: 15-in RCP from PSB (OFFSITE)

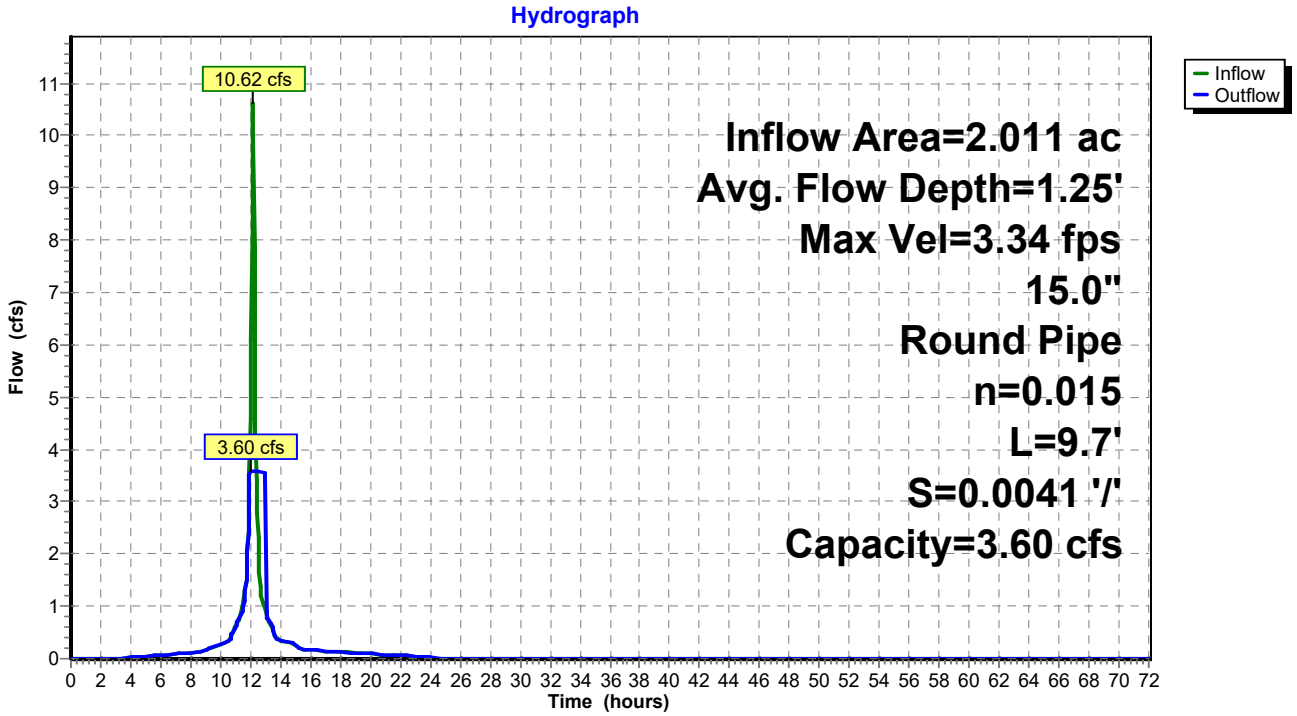
Inflow Area = 2.011 ac, 94.88% Impervious, Inflow Depth = 3.93" for 10-yr event
Inflow = 10.62 cfs @ 12.17 hrs, Volume= 0.659 af
Outflow = 3.60 cfs @ 12.05 hrs, Volume= 0.659 af, Atten= 66%, Lag= 0.0 min
Routed to Reach PSB.2 : 18-in RCP (OFFSITE)

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.34 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.43 fps, Avg. Travel Time= 0.1 min

Peak Storage= 12 cf @ 12.00 hrs
Average Depth at Peak Storage= 1.25'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 3.60 cfs

15.0" Round Pipe
n= 0.015 Concrete sewer w/manholes & inlets
Length= 9.7' Slope= 0.0041 '/'
Inlet Invert= 776.20', Outlet Invert= 776.16'





Hydrograph for Reach PSB.1: 15-in RCP from PSB (OFFSITE)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	776.20	0.00
2.50	0.00	0	776.20	0.00
5.00	0.04	0	776.30	0.04
7.50	0.10	1	776.34	0.10
10.00	**0.27**	**2**	**776.43**	**0.27**
12.50	**2.31**	**12**	**777.45**	**3.60**
15.00	0.28	2	776.44	0.28
17.50	0.14	1	776.37	0.14
20.00	0.09	1	776.34	0.09
22.50	0.05	0	776.30	0.05
25.00	0.00	0	776.20	0.00
27.50	0.00	0	776.20	0.00
30.00	0.00	0	776.20	0.00
32.50	0.00	0	776.20	0.00
35.00	0.00	0	776.20	0.00
37.50	0.00	0	776.20	0.00
40.00	0.00	0	776.20	0.00
42.50	0.00	0	776.20	0.00
45.00	0.00	0	776.20	0.00
47.50	0.00	0	776.20	0.00
50.00	0.00	0	776.20	0.00
52.50	0.00	0	776.20	0.00
55.00	0.00	0	776.20	0.00
57.50	0.00	0	776.20	0.00
60.00	0.00	0	776.20	0.00
62.50	0.00	0	776.20	0.00
65.00	0.00	0	776.20	0.00
67.50	0.00	0	776.20	0.00
70.00	0.00	0	776.20	0.00

Stage-Discharge for Reach PSB.1: 15-in RCP from PSB (OFFSITE)

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
776.20	0.00	0.00
776.21	0.21	0.00
776.22	0.35	0.00
776.23	0.46	0.00
776.24	0.56	0.01
776.25	0.65	0.01
776.26	0.73	0.02
776.27	0.81	0.02
776.28	0.88	0.03
776.29	0.95	0.04
776.30	1.02	0.05
776.31	1.08	0.06
776.32	1.14	0.07
776.33	1.20	0.08
776.34	1.26	0.10
776.35	1.32	0.11
776.36	1.37	0.13
776.37	1.42	0.14
776.38	1.48	0.16
776.39	1.53	0.18
776.40	1.58	0.20
776.41	1.62	0.22
776.42	1.67	0.24
776.43	1.71	0.27
776.44	1.76	0.29
776.45	1.80	0.31
776.46	1.84	0.34
776.47	1.89	0.37
776.48	1.93	0.40
776.49	1.97	0.42
776.50	2.01	0.45
776.51	2.04	0.48
776.52	2.08	0.52
776.53	2.12	0.55
776.54	2.15	0.58
776.55	2.19	0.62
776.56	2.22	0.65
776.57	2.26	0.69
776.58	2.29	0.72
776.59	2.32	0.76
776.60	2.35	0.80
776.61	2.39	0.84
776.62	2.42	0.88
776.63	2.45	0.92
776.64	2.48	0.96
776.65	2.51	1.00
776.66	2.53	1.04
776.67	2.56	1.08
776.68	2.59	1.12
776.69	2.62	1.17
776.70	2.64	1.21
776.71	2.67	1.26
776.72	2.69	1.30
776.73	2.72	1.35
776.74	2.74	1.39
776.75	2.77	1.44
776.76	2.79	1.49
776.77	2.81	1.53
776.78	2.84	1.58
776.79	2.86	1.63
776.80	2.88	1.68
776.81	2.90	1.72
776.82	2.92	1.77
776.83	2.94	1.82
776.84	2.96	1.87
776.85	2.98	1.92
776.86	3.00	1.97
776.87	3.01	2.02
776.88	3.03	2.07
776.89	3.05	2.12
776.90	3.07	2.17
776.91	3.08	2.22
776.92	3.10	2.27
776.93	3.11	2.32
776.94	3.13	2.37
776.95	3.14	2.42
776.96	3.16	2.46
776.97	3.17	2.51
776.98	3.18	2.56
776.99	3.19	2.61
777.00	3.21	2.66
777.01	3.22	2.71
777.02	3.23	2.76
777.03	3.24	2.80
777.04	3.25	2.85
777.05	3.26	2.90
777.06	3.27	2.94
777.07	3.28	2.99
777.08	3.28	3.03
777.09	3.29	3.08
777.10	3.30	3.12
777.11	3.31	3.16
777.12	3.31	3.21
777.13	3.32	3.25
777.14	3.32	3.29
777.15	3.33	3.33
777.16	3.33	3.37
777.17	3.33	3.41
777.18	3.34	3.44
777.19	3.34	3.48
777.20	3.34	3.51
777.21	3.34	3.55
777.22	**3.34**	3.58
777.23	3.34	3.61
777.24	3.34	3.64
777.25	3.34	3.67
777.26	3.33	3.70
777.27	3.33	3.72
777.28	3.32	3.75
777.29	3.32	3.77
777.30	3.31	3.79
777.31	3.31	3.81
777.32	3.30	3.82
777.33	3.29	3.84
777.34	3.28	3.85
777.35	3.27	3.86
777.36	3.25	3.86
777.37	3.24	**3.87**
777.38	3.22	3.87
777.39	3.20	3.86
777.40	3.18	3.85
777.41	3.16	3.84
777.42	3.13	3.81
777.43	3.09	3.78
777.44	3.03	3.72
777.45	2.93	3.60

Stage-Area-Storage for Reach PSB.1: 15-in RCP from PSB (OFFSITE)

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
776.20	0.0	0
776.22	0.0	0
776.24	0.0	0
776.26	0.0	0
776.28	0.0	0
776.30	0.0	0
776.32	0.1	1
776.34	0.1	1
776.36	0.1	1
776.38	0.1	1
776.40	0.1	1
776.42	0.1	1
776.44	0.2	2
776.46	0.2	2
776.48	0.2	2
776.50	0.2	2
776.52	0.2	2
776.54	0.3	3
776.56	0.3	3
776.58	0.3	3
776.60	0.3	3
776.62	0.4	4
776.64	0.4	4
776.66	0.4	4
776.68	0.4	4
776.70	0.5	4
776.72	0.5	5
776.74	0.5	5
776.76	0.5	5
776.78	0.6	5
776.80	0.6	6
776.82	0.6	6
776.84	0.6	6
776.86	0.7	6
776.88	0.7	7
776.90	0.7	7
776.92	0.7	7
776.94	0.8	7
776.96	0.8	8
776.98	0.8	8
777.00	0.8	8
777.02	0.9	8
777.04	0.9	9
777.06	0.9	9
777.08	0.9	9
777.10	0.9	9
777.12	1.0	9
777.14	1.0	10
777.16	1.0	10
777.18	1.0	10
777.20	1.1	10
777.22	1.1	10
777.24	1.1	11
777.26	1.1	11
777.28	1.1	11
777.30	1.1	11
777.32	1.2	11
777.34	1.2	11
777.36	1.2	12
777.38	1.2	12
777.40	1.2	12
777.42	1.2	12
777.44	**1.2**	**12**

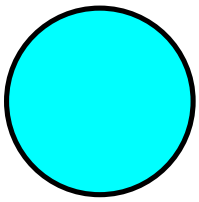
Summary for Reach PSB.2: 18-in RCP (OFFSITE)

Inflow Area = 3.097 ac, 87.67% Impervious, Inflow Depth = 3.78" for 10-yr event
Inflow = 7.37 cfs @ 12.22 hrs, Volume= 0.975 af
Outflow = 6.96 cfs @ 12.58 hrs, Volume= 0.975 af, Atten= 6%, Lag= 22.1 min

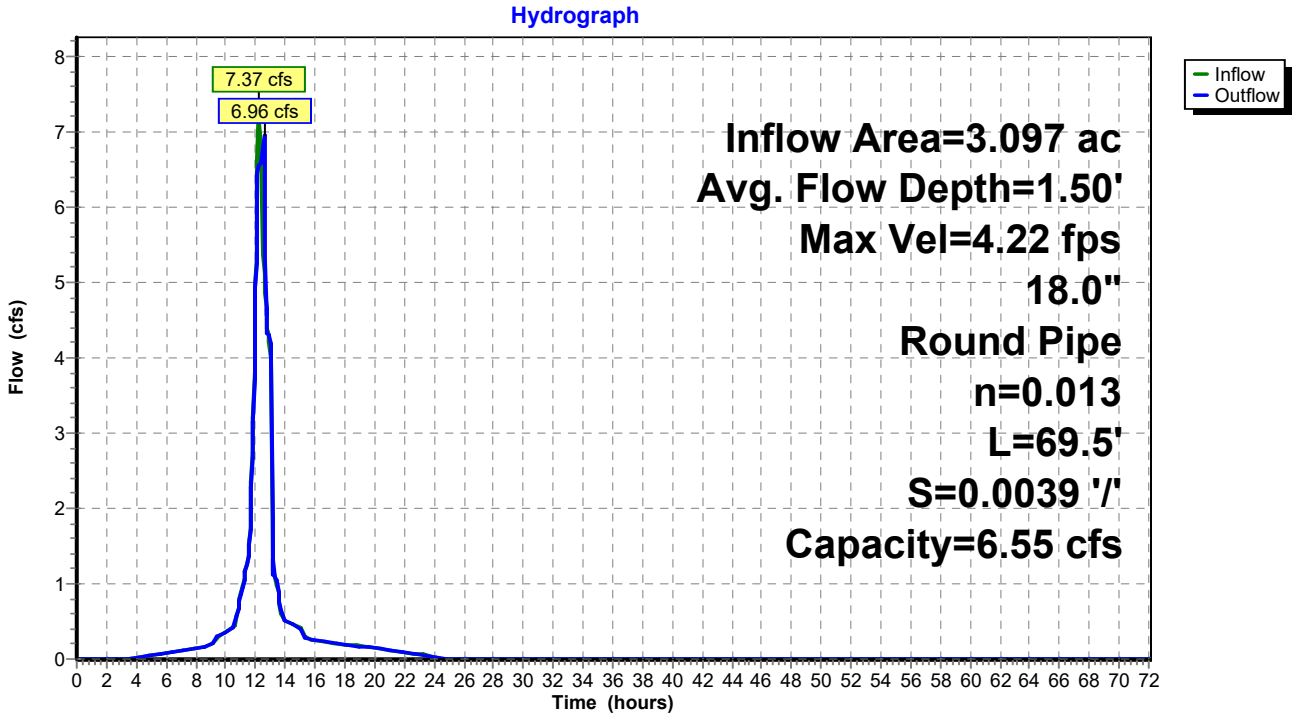
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.22 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.68 fps, Avg. Travel Time= 0.7 min

Peak Storage= 123 cf @ 12.20 hrs
Average Depth at Peak Storage= 1.50'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 6.55 cfs

18.0" Round Pipe
n= 0.013 Concrete pipe, bends & connections
Length= 69.5' Slope= 0.0039 '/'
Inlet Invert= 772.10', Outlet Invert= 771.83'



Reach PSB.2: 18-in RCP (OFFSITE)



Hydrograph for Reach PSB.2: 18-in RCP (OFFSITE)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	772.10	0.00
2.50	0.00	0	772.10	0.00
5.00	0.04	3	772.19	0.04
7.50	0.13	6	772.24	0.13
10.00	**0.36**	**13**	**772.34**	0.36
12.50	**5.81**	**123**	**773.60**	**6.55**
15.00	0.44	14	772.36	**0.44**
17.50	0.21	9	772.28	0.21
20.00	0.14	7	772.25	0.14
22.50	0.08	4	772.22	0.08
25.00	0.00	0	772.10	0.00
27.50	0.00	0	772.10	0.00
30.00	0.00	0	772.10	0.00
32.50	0.00	0	772.10	0.00
35.00	0.00	0	772.10	0.00
37.50	0.00	0	772.10	0.00
40.00	0.00	0	772.10	0.00
42.50	0.00	0	772.10	0.00
45.00	0.00	0	772.10	0.00
47.50	0.00	0	772.10	0.00
50.00	0.00	0	772.10	0.00
52.50	0.00	0	772.10	0.00
55.00	0.00	0	772.10	0.00
57.50	0.00	0	772.10	0.00
60.00	0.00	0	772.10	0.00
62.50	0.00	0	772.10	0.00
65.00	0.00	0	772.10	0.00
67.50	0.00	0	772.10	0.00
70.00	0.00	0	772.10	0.00

Stage-Discharge for Reach PSB.2: 18-in RCP (OFFSITE)

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
772.10	0.00	0.00
772.11	0.22	0.00
772.12	0.39	0.00
772.13	0.52	0.00
772.14	0.63	0.01
772.15	0.73	0.01
772.16	0.82	0.02
772.17	0.91	0.03
772.18	0.99	0.04
772.19	1.07	0.05
772.20	1.15	0.06
772.21	1.22	0.07
772.22	1.29	0.09
772.23	1.36	0.10
772.24	1.42	0.12
772.25	1.49	0.14
772.26	1.55	0.16
772.27	1.61	0.18
772.28	1.67	0.20
772.29	1.72	0.22
772.30	1.78	0.25
772.31	1.83	0.28
772.32	1.89	0.30
772.33	1.94	0.33
772.34	1.99	0.36
772.35	2.04	0.40
772.36	2.09	0.43
772.37	2.14	0.46
772.38	2.19	0.50
772.39	2.23	0.54
772.40	2.28	0.57
772.41	2.32	0.61
772.42	2.37	0.65
772.43	2.41	0.69
772.44	2.45	0.74
772.45	2.49	0.78
772.46	2.54	0.83
772.47	2.58	0.87
772.48	2.62	0.92
772.49	2.65	0.97
772.50	2.69	1.02
772.51	2.73	1.07
772.52	2.77	1.12
772.53	2.80	1.17
772.54	2.84	1.23
772.55	2.88	1.28
772.56	2.91	1.34
772.57	2.94	1.39
772.58	2.98	1.45
772.59	3.01	1.51
772.60	3.04	1.57
772.61	3.08	1.63
772.62	3.11	1.69
772.63	3.14	1.75
772.64	3.17	1.82
772.65	3.20	1.88
772.66	3.23	1.94
772.67	3.26	2.01
772.68	3.29	2.07
772.69	3.31	2.14
772.70	3.34	2.21
772.71	3.37	2.27
772.72	3.40	2.34
772.73	3.42	2.41
772.74	3.45	2.48
772.75	3.47	2.55
772.76	3.50	2.62
772.77	3.52	2.69
772.78	3.55	2.76
772.79	3.57	2.83
772.80	3.59	2.91
772.81	3.62	2.98
772.82	3.64	3.05
772.83	3.66	3.13
772.84	3.68	3.20
772.85	3.70	3.27
772.86	3.73	3.35
772.87	3.75	3.42
772.88	3.77	3.50
772.89	3.79	3.57
772.90	3.80	3.65
772.91	3.82	3.72
772.92	3.84	3.80
772.93	3.86	3.87
772.94	3.88	3.95
772.95	3.89	4.02
772.96	3.91	4.10
772.97	3.93	4.17
772.98	3.94	4.25
772.99	3.96	4.32
773.00	3.97	4.40
773.01	3.99	4.47
773.02	4.00	4.55
773.03	4.02	4.62
773.04	4.03	4.70
773.05	4.04	4.77
773.06	4.05	4.84
773.07	4.07	4.92
773.08	4.08	4.99
773.09	4.09	5.06
773.10	4.10	5.13
773.11	4.11	5.20
773.12	4.12	5.27
773.13	4.13	5.34
773.14	4.14	5.41
773.15	4.15	5.48
773.16	4.16	5.55
773.17	4.16	5.62
773.18	4.17	5.68
773.19	4.18	5.75
773.20	4.19	5.81
773.21	4.19	5.88
773.22	4.20	5.94
773.23	4.20	6.00
773.24	4.21	6.06
773.25	4.21	6.12
773.26	4.21	6.18
773.27	4.22	6.24
773.28	4.22	6.29
773.29	4.22	6.35
773.30	4.22	6.40
773.31	4.22	6.45
773.32	**4.22**	6.50
773.33	4.22	6.55
773.34	4.22	6.60
773.35	4.22	6.64
773.36	4.22	6.69
773.37	4.22	6.73
773.38	4.21	6.77
773.39	4.21	6.80
773.40	4.20	6.84
773.41	4.20	6.87
773.42	4.19	6.90
773.43	4.18	6.93
773.44	4.17	6.95
773.45	4.17	6.98
773.46	4.15	7.00
773.47	4.14	7.01
773.48	4.13	7.03
773.49	4.12	7.04
773.50	4.10	7.04
773.51	4.09	**7.04**
773.52	4.07	7.04
773.53	4.05	7.03
773.54	4.02	7.01
773.55	4.00	6.99
773.56	3.97	6.96
773.57	3.93	6.92
773.58	3.89	6.85
773.59	3.81	6.73
773.60	3.70	6.55

Stage-Area-Storage for Reach PSB.2: 18-in RCP (OFFSITE)

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
772.10	0.0	0
772.12	0.0	0
772.14	0.0	1
772.16	0.0	2
772.18	0.0	3
772.20	0.1	4
772.22	0.1	5
772.24	0.1	6
772.26	0.1	7
772.28	0.1	8
772.30	0.1	10
772.32	0.2	11
772.34	0.2	13
772.36	0.2	14
772.38	0.2	16
772.40	0.3	17
772.42	0.3	19
772.44	0.3	21
772.46	0.3	23
772.48	0.4	24
772.50	0.4	26
772.52	0.4	28
772.54	0.4	30
772.56	0.5	32
772.58	0.5	34
772.60	0.5	36
772.62	0.5	38
772.64	0.6	40
772.66	0.6	42
772.68	0.6	44
772.70	0.7	46
772.72	0.7	48
772.74	0.7	50
772.76	0.7	52
772.78	0.8	54
772.80	0.8	56
772.82	0.8	58
772.84	0.9	60
772.86	0.9	62
772.88	0.9	65
772.90	1.0	67
772.92	1.0	69
772.94	1.0	71
772.96	1.0	73
772.98	1.1	75
773.00	1.1	77
773.02	1.1	79
773.04	1.2	81
773.06	1.2	83
773.08	1.2	85
773.10	1.3	87
773.12	1.3	89
773.14	1.3	91
773.16	1.3	93
773.18	1.4	95
773.20	1.4	97
773.22	1.4	98
773.24	1.4	100
773.26	1.5	102
773.28	1.5	104
773.30	1.5	105
773.32	1.5	107
773.34	1.6	109
773.36	1.6	110
773.38	1.6	112
773.40	1.6	113
773.42	1.6	114
773.44	1.7	116
773.46	1.7	117
773.48	1.7	118
773.50	1.7	119
773.52	1.7	120
773.54	1.7	121
773.56	1.8	122
773.58	1.8	122
773.60	**1.8**	**123**

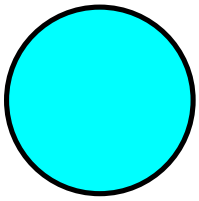
Summary for Reach S FLOWS: 15-in RCP

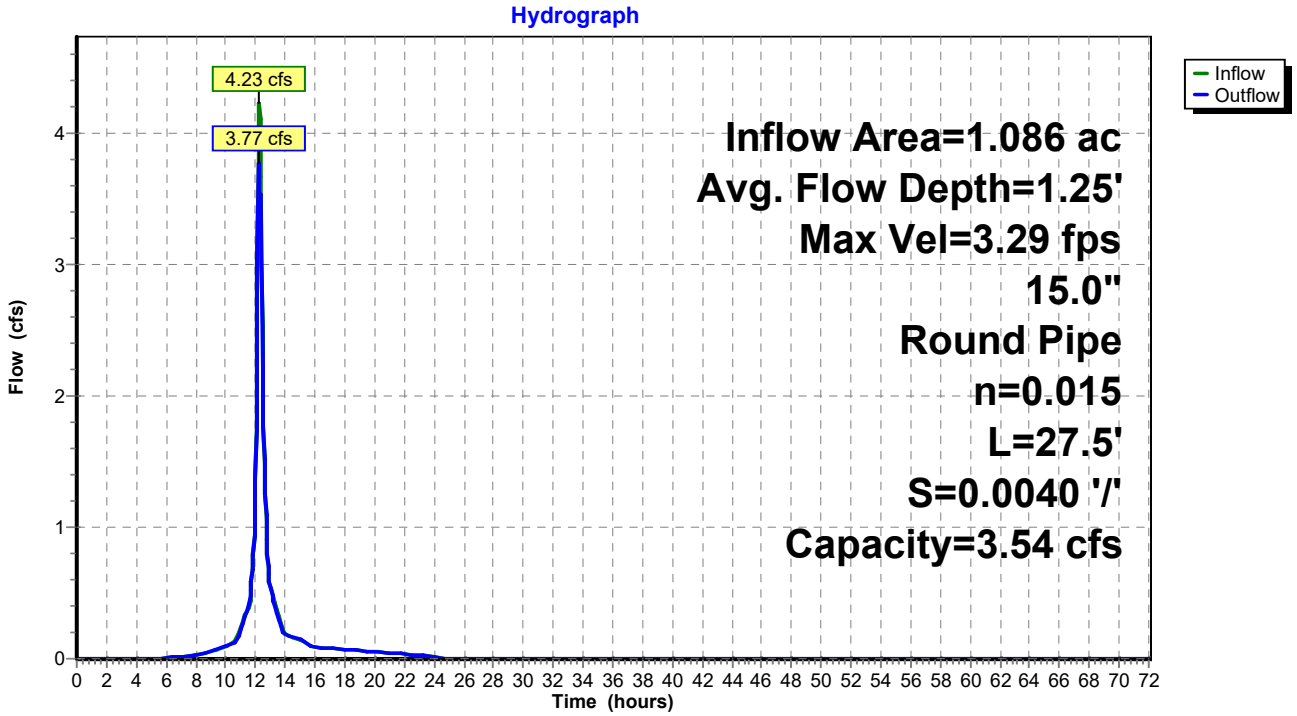
Inflow Area = 1.086 ac, 74.31% Impervious, Inflow Depth = 3.49" for 10-yr event
Inflow = 4.23 cfs @ 12.27 hrs, Volume= 0.316 af
Outflow = 3.77 cfs @ 12.22 hrs, Volume= 0.316 af, Atten= 11%, Lag= 0.0 min
Routed to Reach PSB.2 : 18-in RCP (OFFSITE)

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.29 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.16 fps, Avg. Travel Time= 0.4 min

Peak Storage= 34 cf @ 12.25 hrs
Average Depth at Peak Storage= 1.25'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 3.54 cfs

15.0" Round Pipe
n= 0.015 Concrete sewer w/manholes & inlets
Length= 27.5' Slope= 0.0040 '/'
Inlet Invert= 772.21', Outlet Invert= 772.10'





Hydrograph for Reach S FLOWS: 15-in RCP

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	772.21	0.00
2.50	0.00	0	772.21	0.00
5.00	0.00	0	772.21	0.00
7.50	0.02	1	772.28	0.02
10.00	**0.09**	**2**	**772.35**	**0.09**
12.50	**2.11**	**20**	**772.91**	**2.21**
15.00	0.15	3	772.39	0.15
17.50	0.07	2	772.33	0.07
20.00	0.05	1	772.31	0.05
22.50	0.03	1	772.29	0.03
25.00	0.00	0	772.21	0.00
27.50	0.00	0	772.21	0.00
30.00	0.00	0	772.21	0.00
32.50	0.00	0	772.21	0.00
35.00	0.00	0	772.21	0.00
37.50	0.00	0	772.21	0.00
40.00	0.00	0	772.21	0.00
42.50	0.00	0	772.21	0.00
45.00	0.00	0	772.21	0.00
47.50	0.00	0	772.21	0.00
50.00	0.00	0	772.21	0.00
52.50	0.00	0	772.21	0.00
55.00	0.00	0	772.21	0.00
57.50	0.00	0	772.21	0.00
60.00	0.00	0	772.21	0.00
62.50	0.00	0	772.21	0.00
65.00	0.00	0	772.21	0.00
67.50	0.00	0	772.21	0.00
70.00	0.00	0	772.21	0.00

Stage-Discharge for Reach S FLOWS: 15-in RCP

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
772.21	0.00	0.00
772.22	0.21	0.00
772.23	0.35	0.00
772.24	0.46	0.00
772.25	0.55	0.01
772.26	0.64	0.01
772.27	0.72	0.02
772.28	0.80	0.02
772.29	0.87	0.03
772.30	0.94	0.04
772.31	1.00	0.05
772.32	1.07	0.06
772.33	1.13	0.07
772.34	1.19	0.08
772.35	1.24	0.09
772.36	1.30	0.11
772.37	1.35	0.12
772.38	1.40	0.14
772.39	1.45	0.16
772.40	1.50	0.18
772.41	1.55	0.20
772.42	1.60	0.22
772.43	1.64	0.24
772.44	1.69	0.26
772.45	1.73	0.29
772.46	1.77	0.31
772.47	1.82	0.34
772.48	1.86	0.36
772.49	1.90	0.39
772.50	1.94	0.42
772.51	1.97	0.45
772.52	2.01	0.48
772.53	2.05	0.51
772.54	2.09	0.54
772.55	2.12	0.57
772.56	2.16	0.61
772.57	2.19	0.64
772.58	2.22	0.68
772.59	2.26	0.71
772.60	2.29	0.75
772.61	2.32	0.79
772.62	2.35	0.82
772.63	2.38	0.86
772.64	2.41	0.90
772.65	2.44	0.94
772.66	2.47	0.98
772.67	2.50	1.02
772.68	2.52	1.06
772.69	2.55	1.11
772.70	2.58	1.15
772.71	2.60	1.19
772.72	2.63	1.24
772.73	2.65	1.28
772.74	2.68	1.33
772.75	2.70	1.37
772.76	2.73	1.42
772.77	2.75	1.46
772.78	2.77	1.51
772.79	2.79	1.56
772.80	2.81	1.60
772.81	2.83	1.65
772.82	2.86	1.70
772.83	2.88	1.75
772.84	2.89	1.79
772.85	2.91	1.84
772.86	2.93	1.89
772.87	2.95	1.94
772.88	2.97	1.99
772.89	2.99	2.04
772.90	3.00	2.09
772.91	3.02	2.13
772.92	3.04	2.18
772.93	3.05	2.23
772.94	3.07	2.28
772.95	3.08	2.33
772.96	3.09	2.38
772.97	3.11	2.43
772.98	3.12	2.48
772.99	3.13	2.52
773.00	3.15	2.57
773.01	3.16	2.62
773.02	3.17	2.67
773.03	3.18	2.71
773.04	3.19	2.76
773.05	3.20	2.81
773.06	3.21	2.85
773.07	3.22	2.90
773.08	3.23	2.94
773.09	3.23	2.99
773.10	3.24	3.03
773.11	3.25	3.07
773.12	3.26	3.12
773.13	3.26	3.16
773.14	3.27	3.20
773.15	3.27	3.24
773.16	3.28	3.28
773.17	3.28	3.32
773.18	3.28	3.35
773.19	3.29	3.39
773.20	3.29	3.43
773.21	3.29	3.46
773.22	3.29	3.49
773.23	**3.29**	3.53
773.24	3.29	3.56
773.25	3.29	3.59
773.26	3.29	3.62
773.27	3.28	3.64
773.28	3.28	3.67
773.29	3.27	3.69
773.30	3.27	3.71
773.31	3.26	3.73
773.32	3.26	3.75
773.33	3.25	3.77
773.34	3.24	3.78
773.35	3.23	3.79
773.36	3.22	3.80
773.37	3.20	3.81
773.38	3.19	**3.81**
773.39	3.17	3.81
773.40	3.15	3.80
773.41	3.13	3.79
773.42	3.11	3.78
773.43	3.08	3.75
773.44	3.04	3.72
773.45	2.99	3.66
773.46	2.89	3.54

Stage-Area-Storage for Reach S FLOWS: 15-in RCP

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
772.21	0.0	0
772.23	0.0	0
772.25	0.0	0
772.27	0.0	1
772.29	0.0	1
772.31	0.0	1
772.33	0.1	2
772.35	0.1	2
772.37	0.1	3
772.39	0.1	3
772.41	0.1	3
772.43	0.1	4
772.45	0.2	5
772.47	0.2	5
772.49	0.2	6
772.51	0.2	6
772.53	0.2	7
772.55	0.3	7
772.57	0.3	8
772.59	0.3	9
772.61	0.3	9
772.63	0.4	10
772.65	0.4	11
772.67	0.4	11
772.69	0.4	12
772.71	0.5	13
772.73	0.5	13
772.75	0.5	14
772.77	0.5	15
772.79	0.6	15
772.81	0.6	16
772.83	0.6	17
772.85	0.6	17
772.87	0.7	18
772.89	0.7	19
772.91	0.7	19
772.93	0.7	20
772.95	0.8	21
772.97	0.8	21
772.99	0.8	22
773.01	0.8	23
773.03	0.9	23
773.05	0.9	24
773.07	0.9	25
773.09	0.9	25
773.11	0.9	26
773.13	1.0	27
773.15	1.0	27
773.17	1.0	28
773.19	1.0	28
773.21	1.1	29
773.23	1.1	29
773.25	1.1	30
773.27	1.1	31
773.29	1.1	31
773.31	1.1	31
773.33	1.2	32
773.35	1.2	32
773.37	1.2	33
773.39	1.2	33
773.41	1.2	33
773.43	1.2	34
773.45	**1.2**	**34**

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment DA1: Walgreens Loading Runoff Area=1.086 ac 74.31% Impervious Runoff Depth=7.72"
Flow Length=256' Slope=0.0320 '/' Tc=18.2 min CN=93 Runoff=4.53 cfs 0.699 af

Subcatchment DA2: Riverfront Pipe Runoff Area=0.746 ac 97.99% Impervious Runoff Depth=8.32"
Tc=10.0 min CN=98 Runoff=4.00 cfs 0.517 af

Subcatchment DA3: Walgreens Parking Runoff Area=0.781 ac 100.00% Impervious Runoff Depth=8.32"
Tc=10.0 min CN=98 Runoff=4.19 cfs 0.541 af

Subcatchment PSB: Public Safety Building Runoff Area=2.011 ac 94.88% Impervious Runoff Depth=8.20"
Tc=10.0 min CN=97 Runoff=10.77 cfs 1.374 af

Reach 2.1: 12-in RCP Avg. Flow Depth=0.44' Max Vel=11.92 fps Inflow=4.00 cfs 0.517 af
12.0" Round Pipe n=0.013 L=14.5' S=0.0779 '/' Capacity=9.95 cfs Outflow=4.00 cfs 0.517 af

Reach 2.2: 21-in RCP Avg. Flow Depth=0.83' Max Vel=3.54 fps Inflow=4.00 cfs 0.517 af
21.0" Round Pipe n=0.015 L=56.2' S=0.0041 '/' Capacity=8.78 cfs Outflow=3.95 cfs 0.517 af

Reach 3.1: 12-in Catch Basin Avg. Flow Depth=1.00' Max Vel=4.38 fps Inflow=4.19 cfs 0.541 af
12.0" Round Pipe n=0.015 L=46.1' S=0.0095 '/' Capacity=3.02 cfs Outflow=3.23 cfs 0.541 af

Reach N FLOWS: 108-in RCP Avg. Flow Depth=1.94' Max Vel=0.48 fps Inflow=6.97 cfs 1.059 af
108.0" Round Pipe n=0.015 L=512.0' S=0.0000 '/' Capacity=47.83 cfs Outflow=4.85 cfs 1.059 af

Reach PSB.1: 15-in RCP from PSB Avg. Flow Depth=1.25' Max Vel=3.34 fps Inflow=10.77 cfs 1.374 af
15.0" Round Pipe n=0.015 L=9.7' S=0.0041 '/' Capacity=3.60 cfs Outflow=3.62 cfs 1.374 af

Reach PSB.2: 18-in RCP (OFFSITE) Avg. Flow Depth=1.50' Max Vel=4.22 fps Inflow=7.37 cfs 2.073 af
18.0" Round Pipe n=0.013 L=69.5' S=0.0039 '/' Capacity=6.55 cfs Outflow=6.96 cfs 2.073 af

Reach S FLOWS: 15-in RCP Avg. Flow Depth=1.25' Max Vel=3.29 fps Inflow=4.53 cfs 0.699 af
15.0" Round Pipe n=0.015 L=27.5' S=0.0040 '/' Capacity=3.54 cfs Outflow=3.77 cfs 0.699 af

Summary for Subcatchment DA1: Walgreens Loading Dock and Houses

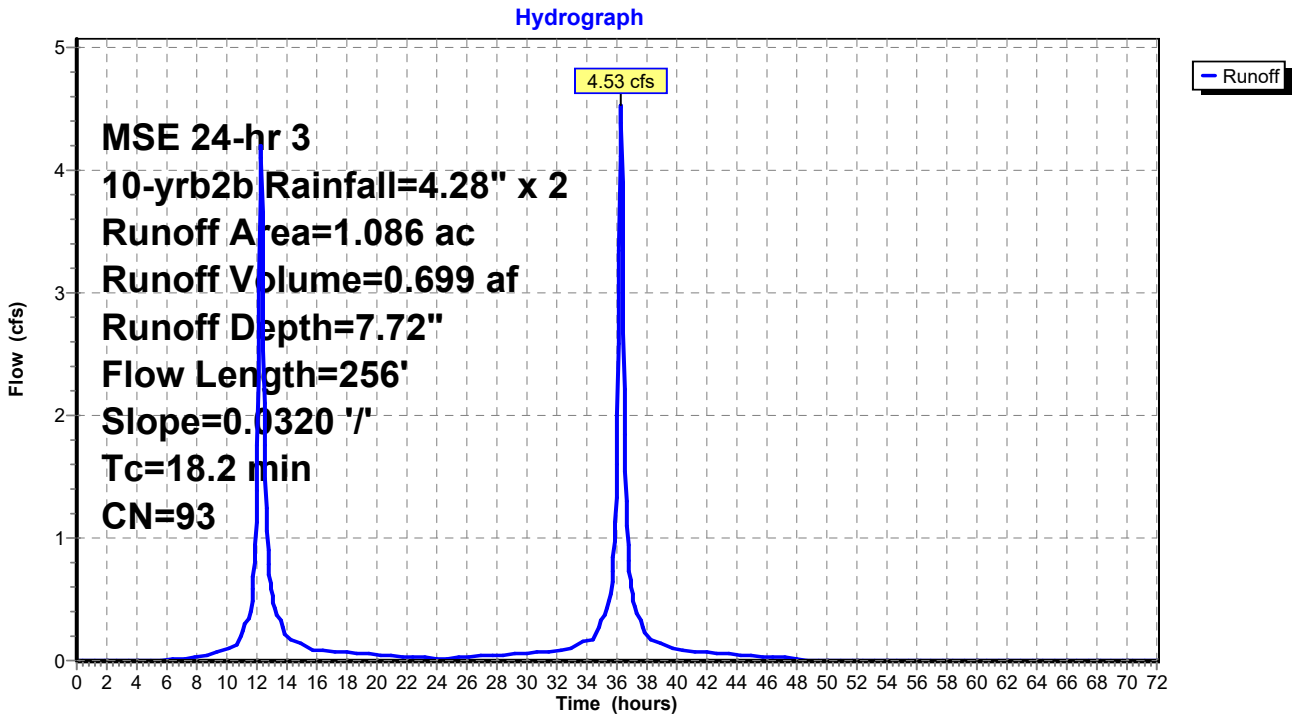
Runoff = 4.53 cfs @ 36.26 hrs, Volume= 0.699 af, Depth= 7.72"
Routed to Reach S FLOWS : 15-in RCP

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-yrb2b Rainfall=4.28" x 2

Area (ac)	CN	Description
0.807	98	Paved parking, HSG D
0.279	80	>75% Grass cover, Good, HSG D
1.086	93	Weighted Average
0.279		25.69% Pervious Area
0.807		74.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.2	256	0.0320	0.23		**Sheet Flow, Grass Sheet Flow to intake** Grass: Short n= 0.150 P2= 2.87"

Subcatchment DA1: Walgreens Loading Dock and Houses



Hydrograph for Subcatchment DA1: Walgreens Loading Dock and Houses

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.02	0.00	0.00
2.00	0.04	0.00	0.00
3.00	0.07	0.00	0.00
4.00	0.11	0.00	0.00
5.00	0.16	0.00	0.00
6.00	0.22	0.01	0.01
7.00	0.28	0.02	0.02
8.00	0.36	0.04	0.03
9.00	0.44	0.08	0.04
10.00	0.59	0.16	0.09
11.00	0.82	0.32	0.22
12.00	1.98	1.30	1.39
13.00	3.46	2.69	0.55
14.00	3.69	2.92	0.18
15.00	3.84	3.06	0.15
16.00	3.92	3.14	0.09
17.00	4.00	3.22	0.08
18.00	4.06	3.28	0.07
19.00	4.12	3.34	0.06
20.00	4.17	3.38	0.05
21.00	4.21	3.42	0.04
22.00	4.24	3.45	0.03
23.00	4.26	3.48	0.02
24.00	4.28	3.49	0.01
25.00	4.30	3.51	0.02
26.00	4.32	3.53	0.03
27.00	4.35	3.56	0.04
28.00	4.39	3.60	0.05
29.00	4.44	3.65	0.05
30.00	4.50	3.71	0.06
31.00	4.56	3.77	0.07
32.00	4.64	3.84	0.08
33.00	4.72	3.92	0.09
34.00	4.87	4.07	0.16
35.00	5.10	4.30	0.32
36.00	6.26	5.44	**1.61**
37.00	7.74	6.90	**0.57**
38.00	7.97	7.13	0.18
39.00	8.12	7.28	0.16
40.00	8.20	7.36	0.09
41.00	8.28	7.44	0.08
42.00	8.34	7.50	0.07
43.00	8.40	7.56	0.06
44.00	8.45	7.61	0.05
45.00	8.49	7.65	0.04
46.00	8.52	7.68	0.03
47.00	8.54	7.70	0.02
48.00	**8.56**	**7.72**	0.01
49.00	8.56	7.72	0.00
50.00	8.56	7.72	0.00
51.00	8.56	7.72	0.00
52.00	8.56	7.72	0.00
53.00	8.56	7.72	0.00
54.00	8.56	7.72	0.00
55.00	8.56	7.72	0.00
56.00	8.56	7.72	0.00
57.00	8.56	7.72	0.00
58.00	8.56	7.72	0.00
59.00	8.56	7.72	0.00
60.00	8.56	7.72	0.00
61.00	8.56	7.72	0.00
62.00	8.56	7.72	0.00
63.00	8.56	7.72	0.00
64.00	8.56	7.72	0.00
65.00	8.56	7.72	0.00
66.00	8.56	7.72	0.00
67.00	8.56	7.72	0.00
68.00	8.56	7.72	0.00
69.00	8.56	7.72	0.00
70.00	8.56	7.72	0.00
71.00	8.56	7.72	0.00
72.00	8.56	7.72	0.00

Summary for Subcatchment DA2: Riverfront Pipe

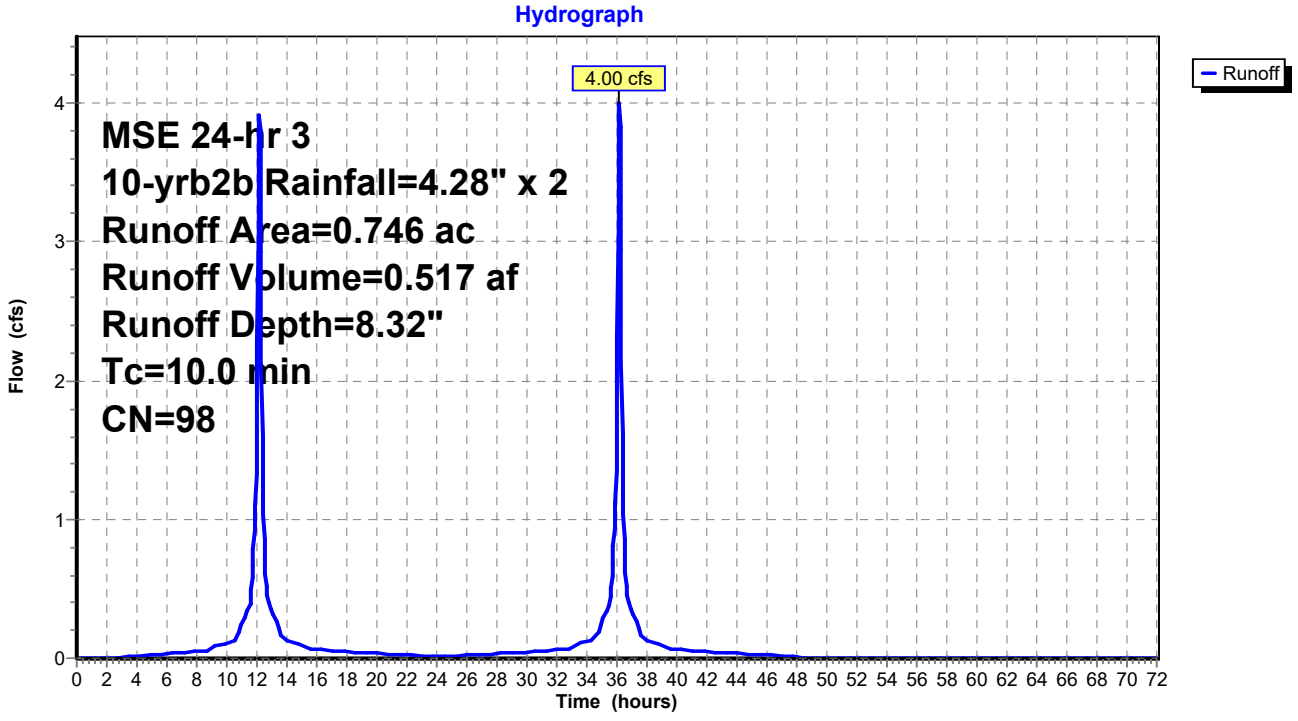
Runoff = 4.00 cfs @ 36.17 hrs, Volume= 0.517 af, Depth= 8.32"
Routed to Reach 2.1 : 12-in RCP

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-yrb2b Rainfall=4.28" x 2

Area (ac)	CN	Description
0.731	98	Paved parking, HSG D
0.015	80	>75% Grass cover, Good, HSG D
0.746	98	Weighted Average
0.015		2.01% Pervious Area
0.731		97.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, Minimum**

Subcatchment DA2: Riverfront Pipe



Hydrograph for Subcatchment DA2: Riverfront Pipe

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.02	0.00	0.00
2.00	0.04	0.00	0.00
3.00	0.07	0.00	0.01
4.00	0.11	0.02	0.01
5.00	0.16	0.04	0.02
6.00	0.22	0.08	0.03
7.00	0.28	0.13	0.04
8.00	0.36	0.19	0.05
9.00	0.44	0.27	0.06
10.00	0.59	0.40	0.11
11.00	0.82	0.62	0.25
12.00	1.98	1.76	1.73
13.00	3.46	3.22	0.33
14.00	3.69	3.46	0.12
15.00	3.84	3.60	0.11
16.00	3.92	3.69	0.06
17.00	4.00	3.76	0.05
18.00	4.06	3.83	0.05
19.00	4.12	3.88	0.04
20.00	4.17	3.93	0.03
21.00	4.21	3.97	0.03
22.00	4.24	4.01	0.02
23.00	4.26	4.03	0.02
24.00	4.28	4.04	0.01
25.00	4.30	4.06	0.01
26.00	4.32	4.08	0.02
27.00	4.35	4.12	0.03
28.00	4.39	4.16	0.03
29.00	4.44	4.20	0.04
30.00	4.50	4.26	0.05
31.00	4.56	4.33	0.05
32.00	4.64	4.40	0.06
33.00	4.72	4.48	0.06
34.00	4.87	4.63	0.12
35.00	5.10	4.87	0.26
36.00	6.26	6.02	**1.75**
37.00	7.74	7.50	**0.33**
38.00	7.97	7.73	0.12
39.00	8.12	7.88	0.11
40.00	8.20	7.96	0.06
41.00	8.28	8.04	0.05
42.00	8.34	8.10	0.05
43.00	8.40	8.16	0.04
44.00	8.45	8.21	0.03
45.00	8.49	8.25	0.03
46.00	8.52	8.28	0.02
47.00	8.54	8.30	0.02
48.00	**8.56**	**8.32**	0.01
49.00	8.56	8.32	0.00
50.00	8.56	8.32	0.00
51.00	8.56	8.32	0.00
52.00	8.56	8.32	0.00
53.00	8.56	8.32	0.00
54.00	8.56	8.32	0.00
55.00	8.56	8.32	0.00
56.00	8.56	8.32	0.00
57.00	8.56	8.32	0.00
58.00	8.56	8.32	0.00
59.00	8.56	8.32	0.00
60.00	8.56	8.32	0.00
61.00	8.56	8.32	0.00
62.00	8.56	8.32	0.00
63.00	8.56	8.32	0.00
64.00	8.56	8.32	0.00
65.00	8.56	8.32	0.00
66.00	8.56	8.32	0.00
67.00	8.56	8.32	0.00
68.00	8.56	8.32	0.00
69.00	8.56	8.32	0.00
70.00	8.56	8.32	0.00
71.00	8.56	8.32	0.00
72.00	8.56	8.32	0.00

Summary for Subcatchment DA3: Walgreens Parking lot to CB

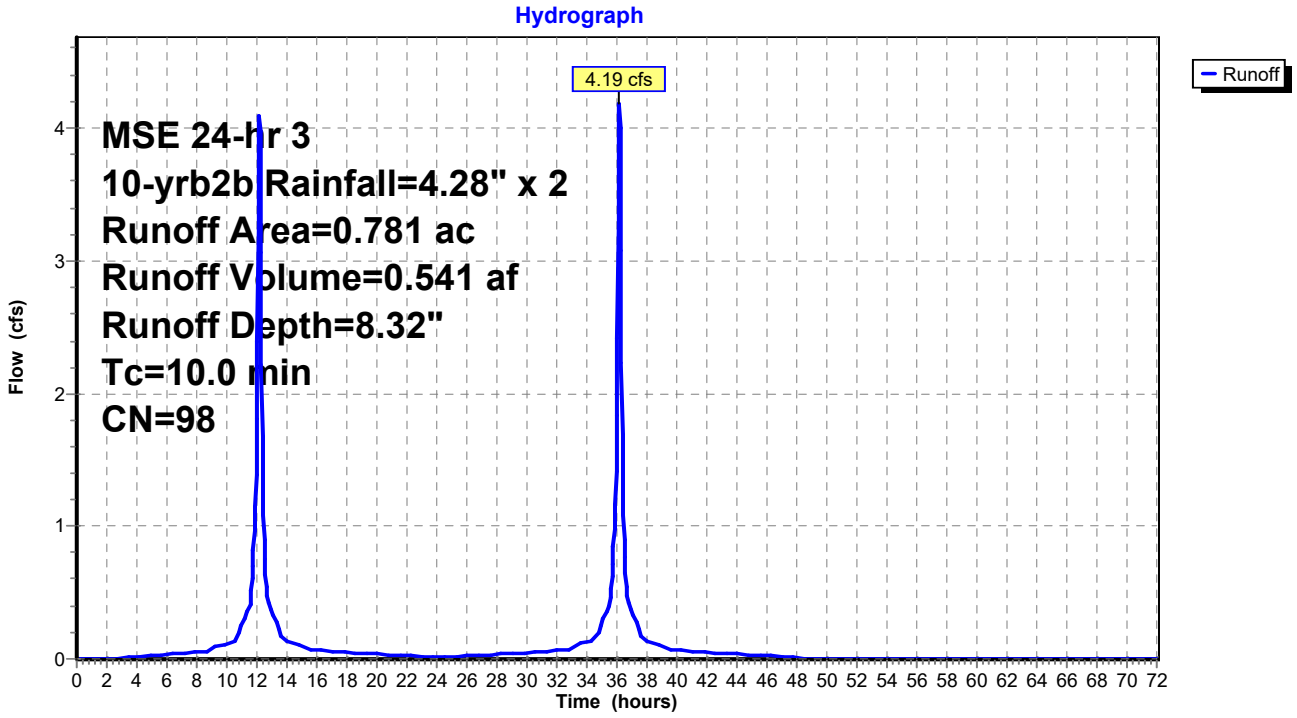
Runoff = 4.19 cfs @ 36.17 hrs, Volume= 0.541 af, Depth= 8.32"
Routed to Reach 3.1 : 12-in Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-yrb2b Rainfall=4.28" x 2

Area (ac)	CN	Description
0.781	98	Paved parking, HSG D
0.781		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, Minimum Entry**

Subcatchment DA3: Walgreens Parking lot to CB



Hydrograph for Subcatchment DA3: Walgreens Parking lot to CB

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.02	0.00	0.00
2.00	0.04	0.00	0.00
3.00	0.07	0.00	0.01
4.00	0.11	0.02	0.01
5.00	0.16	0.04	0.02
6.00	0.22	0.08	0.03
7.00	0.28	0.13	0.04
8.00	0.36	0.19	0.05
9.00	0.44	0.27	0.06
10.00	0.59	0.40	0.11
11.00	0.82	0.62	0.26
12.00	1.98	1.76	1.81
13.00	3.46	3.22	0.35
14.00	3.69	3.46	0.13
15.00	3.84	3.60	0.11
16.00	3.92	3.69	0.06
17.00	4.00	3.76	0.06
18.00	4.06	3.83	0.05
19.00	4.12	3.88	0.04
20.00	4.17	3.93	0.04
21.00	4.21	3.97	0.03
22.00	4.24	4.01	0.02
23.00	4.26	4.03	0.02
24.00	4.28	4.04	0.01
25.00	4.30	4.06	0.01
26.00	4.32	4.08	0.02
27.00	4.35	4.12	0.03
28.00	4.39	4.16	0.03
29.00	4.44	4.20	0.04
30.00	4.50	4.26	0.05
31.00	4.56	4.33	0.05
32.00	4.64	4.40	0.06
33.00	4.72	4.48	0.07
34.00	4.87	4.63	0.12
35.00	5.10	4.87	0.27
36.00	6.26	6.02	**1.83**
37.00	7.74	7.50	**0.35**
38.00	7.97	7.73	0.13
39.00	8.12	7.88	0.11
40.00	8.20	7.96	0.06
41.00	8.28	8.04	0.06
42.00	8.34	8.10	0.05
43.00	8.40	8.16	0.04
44.00	8.45	8.21	0.04
45.00	8.49	8.25	0.03
46.00	8.52	8.28	0.02
47.00	8.54	8.30	0.02
48.00	**8.56**	**8.32**	0.01
49.00	8.56	8.32	0.00
50.00	8.56	8.32	0.00
51.00	8.56	8.32	0.00
52.00	8.56	8.32	0.00
53.00	8.56	8.32	0.00
54.00	8.56	8.32	0.00
55.00	8.56	8.32	0.00
56.00	8.56	8.32	0.00
57.00	8.56	8.32	0.00
58.00	8.56	8.32	0.00
59.00	8.56	8.32	0.00
60.00	8.56	8.32	0.00
61.00	8.56	8.32	0.00
62.00	8.56	8.32	0.00
63.00	8.56	8.32	0.00
64.00	8.56	8.32	0.00
65.00	8.56	8.32	0.00
66.00	8.56	8.32	0.00
67.00	8.56	8.32	0.00
68.00	8.56	8.32	0.00
69.00	8.56	8.32	0.00
70.00	8.56	8.32	0.00
71.00	8.56	8.32	0.00
72.00	8.56	8.32	0.00

Summary for Subcatchment PSB: Public Safety Building (OFFSITE)

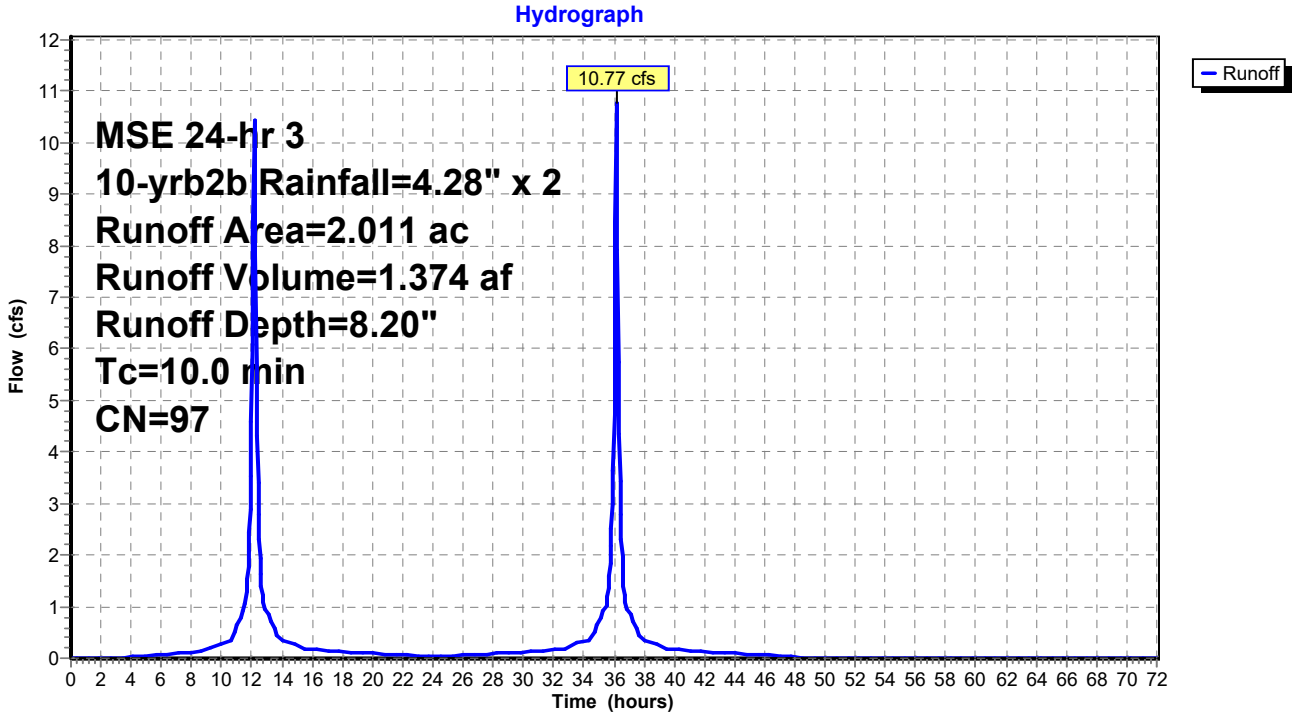
Runoff = 10.77 cfs @ 36.17 hrs, Volume= 1.374 af, Depth= 8.20"
Routed to Reach PSB.1 : 15-in RCP from PSB (OFFSITE)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-yrb2b Rainfall=4.28" x 2

Area (ac)	CN	Description
1.908	98	Roofs, HSG D
0.103	82	Woods/grass comb., Fair, HSG D
2.011	97	Weighted Average
0.103		5.12% Pervious Area
1.908		94.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, Minimum Entry**

Subcatchment PSB: Public Safety Building (OFFSITE)



Hydrograph for Subcatchment PSB: Public Safety Building (OFFSITE)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.02	0.00	0.00
2.00	0.04	0.00	0.00
3.00	0.07	0.00	0.00
4.00	0.11	0.01	0.02
5.00	0.16	0.02	0.04
6.00	0.22	0.05	0.07
7.00	0.28	0.09	0.09
8.00	0.36	0.15	0.11
9.00	0.44	0.21	0.14
10.00	0.59	0.33	0.27
11.00	0.82	0.54	0.63
12.00	1.98	1.65	4.58
13.00	3.46	3.11	0.89
14.00	3.69	3.34	0.32
15.00	3.84	3.49	0.28
16.00	3.92	3.57	0.16
17.00	4.00	3.65	0.14
18.00	4.06	3.71	0.13
19.00	4.12	3.77	0.11
20.00	4.17	3.82	0.09
21.00	4.21	3.86	0.08
22.00	4.24	3.89	0.06
23.00	4.26	3.91	0.04
24.00	4.28	3.93	0.02
25.00	4.30	3.95	0.04
26.00	4.32	3.97	0.05
27.00	4.35	4.00	0.07
28.00	4.39	4.04	0.09
29.00	4.44	4.09	0.10
30.00	4.50	4.15	0.12
31.00	4.56	4.21	0.14
32.00	4.64	4.29	0.16
33.00	4.72	4.37	0.17
34.00	4.87	4.52	0.31
35.00	5.10	4.75	0.69
36.00	6.26	5.90	**4.71**
37.00	7.74	7.38	**0.90**
38.00	7.97	7.61	0.32
39.00	8.12	7.76	0.28
40.00	8.20	7.84	0.16
41.00	8.28	7.92	0.14
42.00	8.34	7.98	0.13
43.00	8.40	8.04	0.11
44.00	8.45	8.09	0.09
45.00	8.49	8.13	0.08
46.00	8.52	8.16	0.06
47.00	8.54	8.18	0.04
48.00	**8.56**	**8.20**	0.02
49.00	8.56	8.20	0.00
50.00	8.56	8.20	0.00
51.00	8.56	8.20	0.00
52.00	8.56	8.20	0.00
53.00	8.56	8.20	0.00
54.00	8.56	8.20	0.00
55.00	8.56	8.20	0.00
56.00	8.56	8.20	0.00
57.00	8.56	8.20	0.00
58.00	8.56	8.20	0.00
59.00	8.56	8.20	0.00
60.00	8.56	8.20	0.00
61.00	8.56	8.20	0.00
62.00	8.56	8.20	0.00
63.00	8.56	8.20	0.00
64.00	8.56	8.20	0.00
65.00	8.56	8.20	0.00
66.00	8.56	8.20	0.00
67.00	8.56	8.20	0.00
68.00	8.56	8.20	0.00
69.00	8.56	8.20	0.00
70.00	8.56	8.20	0.00
71.00	8.56	8.20	0.00
72.00	8.56	8.20	0.00

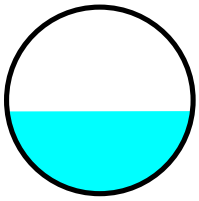
Summary for Reach 2.1: 12-in RCP

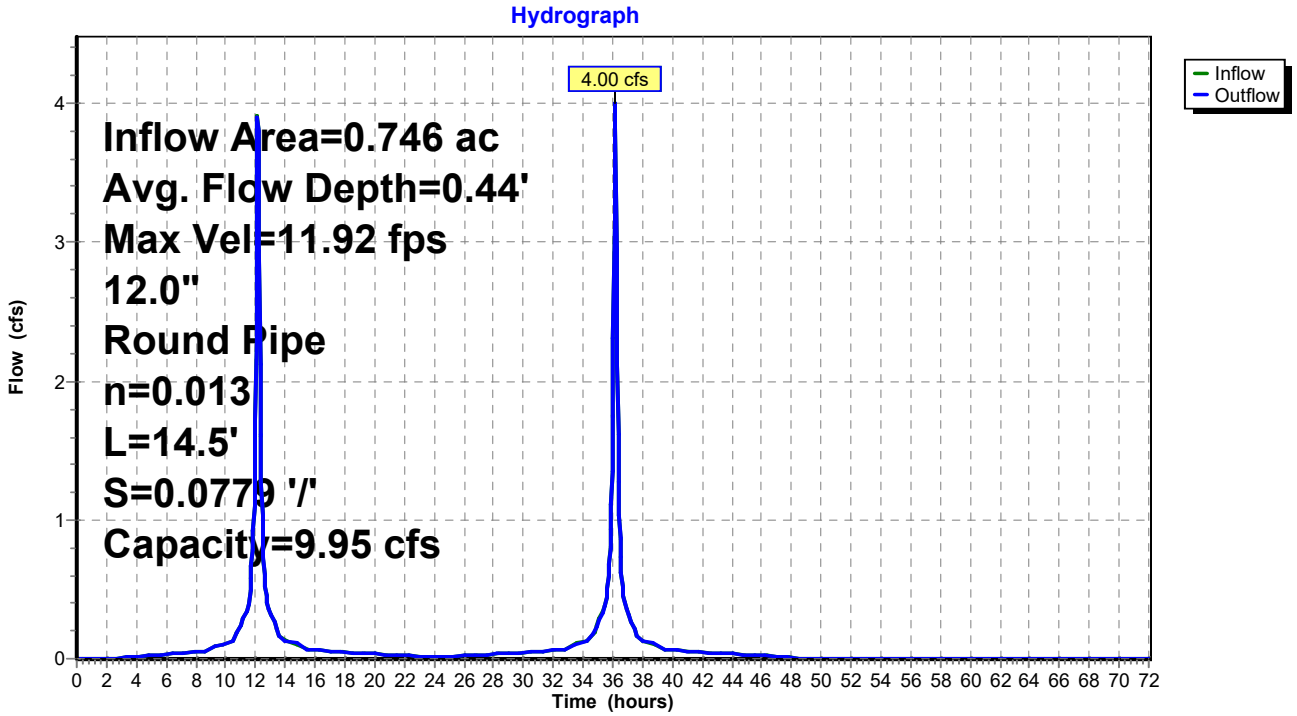
Inflow Area = 0.746 ac, 97.99% Impervious, Inflow Depth = 8.32" for 10-yrb2b event
Inflow = 4.00 cfs @ 36.17 hrs, Volume= 0.517 af
Outflow = 4.00 cfs @ 36.17 hrs, Volume= 0.517 af, Atten= 0%, Lag= 0.0 min
Routed to Reach 2.2 : 21-in RCP

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 11.92 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 3.55 fps, Avg. Travel Time= 0.1 min

Peak Storage= 5 cf @ 36.17 hrs
Average Depth at Peak Storage= 0.44' , Surface Width= 0.99'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 9.95 cfs

12.0" Round Pipe
n= 0.013 Concrete pipe, bends & connections
Length= 14.5' Slope= 0.0779 '/'
Inlet Invert= 773.11', Outlet Invert= 771.98'





Hydrograph for Reach 2.1: 12-in RCP

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	773.11	0.00
2.50	0.00	0	773.12	0.00
5.00	0.02	0	773.14	0.02
7.50	0.04	0	773.16	0.04
10.00	0.11	0	773.18	0.11
12.50	0.86	2	773.31	0.86
15.00	0.11	0	773.18	0.11
17.50	0.05	0	773.16	0.05
20.00	0.03	0	773.15	0.03
22.50	0.02	0	773.14	0.02
25.00	0.01	0	773.14	0.01
27.50	0.03	0	773.15	0.03
30.00	0.05	0	773.16	0.05
32.50	0.06	0	773.17	0.06
35.00	**0.26**	**1**	**773.22**	**0.26**
37.50	**0.21**	**1**	**773.21**	**0.21**
40.00	0.06	0	773.17	0.06
42.50	0.04	0	773.16	0.04
45.00	0.03	0	773.15	0.03
47.50	0.01	0	773.14	0.01
50.00	0.00	0	773.11	0.00
52.50	0.00	0	773.11	0.00
55.00	0.00	0	773.11	0.00
57.50	0.00	0	773.11	0.00
60.00	0.00	0	773.11	0.00
62.50	0.00	0	773.11	0.00
65.00	0.00	0	773.11	0.00
67.50	0.00	0	773.11	0.00
70.00	0.00	0	773.11	0.00

Stage-Discharge for Reach 2.1: 12-in RCP

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
773.11	0.00	0.00
773.12	1.13	0.00
773.13	1.78	0.01
773.14	2.33	0.02
773.15	2.81	0.03
773.16	3.25	0.05
773.17	3.66	0.07
773.18	4.04	0.10
773.19	4.41	0.13
773.20	4.75	0.17
773.21	5.08	0.21
773.22	5.40	0.25
773.23	5.70	0.30
773.24	5.99	0.36
773.25	6.27	0.42
773.26	6.54	0.48
773.27	6.81	0.55
773.28	7.06	0.63
773.29	7.31	0.70
773.30	7.55	0.78
773.31	7.79	0.87
773.32	8.02	0.96
773.33	8.24	1.06
773.34	8.46	1.15
773.35	8.67	1.26
773.36	8.87	1.36
773.37	9.07	1.47
773.38	9.27	1.59
773.39	9.46	1.70
773.40	9.65	1.82
773.41	9.83	1.95
773.42	10.01	2.08
773.43	10.18	2.21
773.44	10.35	2.34
773.45	10.51	2.48
773.46	10.68	2.62
773.47	10.83	2.76
773.48	10.99	2.90
773.49	11.14	3.05
773.50	11.28	3.20
773.51	11.42	3.35
773.52	11.56	3.51
773.53	11.70	3.66
773.54	11.83	3.82
773.55	11.96	3.98
773.56	12.09	4.14
773.57	12.21	4.31
773.58	12.33	4.47
773.59	12.44	4.64
773.60	12.55	4.80
773.61	12.66	4.97
773.62	12.77	5.14
773.63	12.87	5.31
773.64	12.97	5.48
773.65	13.07	5.65
773.66	13.16	5.83
773.67	13.25	6.00
773.68	13.34	6.17
773.69	13.42	6.34
773.70	13.50	6.51
773.71	13.58	6.68
773.72	13.66	6.85
773.73	13.73	7.02
773.74	13.79	7.19
773.75	13.86	7.36
773.76	13.92	7.52
773.77	13.98	7.69
773.78	14.03	7.85
773.79	14.09	8.01
773.80	14.14	8.17
773.81	14.18	8.33
773.82	14.22	8.48
773.83	14.26	8.63
773.84	14.30	8.78
773.85	14.33	8.93
773.86	14.35	9.07
773.87	14.38	9.21
773.88	14.40	9.34
773.89	14.41	9.47
773.90	14.43	9.60
773.91	14.43	9.72
773.92	**14.44**	9.84
773.93	14.44	9.95
773.94	14.43	10.06
773.95	14.42	10.16
773.96	14.40	10.25
773.97	14.38	10.34
773.98	14.36	10.41
773.99	14.32	10.48
774.00	14.28	10.55
774.01	14.24	10.60
774.02	14.18	10.64
774.03	14.12	10.67
774.04	14.05	10.69
774.05	13.96	**10.70**
774.06	13.87	10.69
774.07	13.75	10.66
774.08	13.62	10.60
774.09	13.45	10.51
774.10	13.22	10.36
774.11	12.66	9.95

Stage-Area-Storage for Reach 2.1: 12-in RCP

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
773.11	0.0	0
773.12	0.0	0
773.13	0.0	0
773.14	0.0	0
773.15	0.0	0
773.16	0.0	0
773.17	0.0	0
773.18	0.0	0
773.19	0.0	0
773.20	0.0	1
773.21	0.0	1
773.22	0.0	1
773.23	0.1	1
773.24	0.1	1
773.25	0.1	1
773.26	0.1	1
773.27	0.1	1
773.28	0.1	1
773.29	0.1	1
773.30	0.1	2
773.31	0.1	2
773.32	0.1	2
773.33	0.1	2
773.34	0.1	2
773.35	0.1	2
773.36	0.2	2
773.37	0.2	2
773.38	0.2	2
773.39	0.2	3
773.40	0.2	3
773.41	0.2	3
773.42	0.2	3
773.43	0.2	3
773.44	0.2	3
773.45	0.2	3
773.46	0.2	4
773.47	0.3	4
773.48	0.3	4
773.49	0.3	4
773.50	0.3	4
773.51	0.3	4
773.52	0.3	4
773.53	0.3	5
773.54	0.3	5
773.55	0.3	5
773.56	0.3	5
773.57	0.4	5
773.58	0.4	5
773.59	0.4	5
773.60	0.4	6
773.61	0.4	6
773.62	0.4	6
773.63	0.4	6
773.64	0.4	6
773.65	0.4	6
773.66	0.4	6
773.67	0.5	7
773.68	0.5	7
773.69	0.5	7
773.70	0.5	7
773.71	0.5	7
773.72	0.5	7
773.73	0.5	7
773.74	0.5	8
773.75	0.5	8
773.76	0.5	8
773.77	0.5	8
773.78	0.6	8
773.79	0.6	8
773.80	0.6	8
773.81	0.6	9
773.82	0.6	9
773.83	0.6	9
773.84	0.6	9
773.85	0.6	9
773.86	0.6	9
773.87	0.6	9
773.88	0.6	9
773.89	0.7	10
773.90	0.7	10
773.91	0.7	10
773.92	0.7	10
773.93	0.7	10
773.94	0.7	10
773.95	0.7	10
773.96	0.7	10
773.97	0.7	10
773.98	0.7	11
773.99	0.7	11
774.00	0.7	11
774.01	0.7	11
774.02	0.8	11
774.03	0.8	11
774.04	0.8	11
774.05	0.8	11
774.06	0.8	11
774.07	0.8	11
774.08	0.8	11
774.09	0.8	11
774.10	0.8	11
774.11	**0.8**	**11**

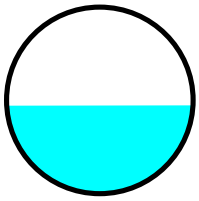
Summary for Reach 2.2: 21-in RCP

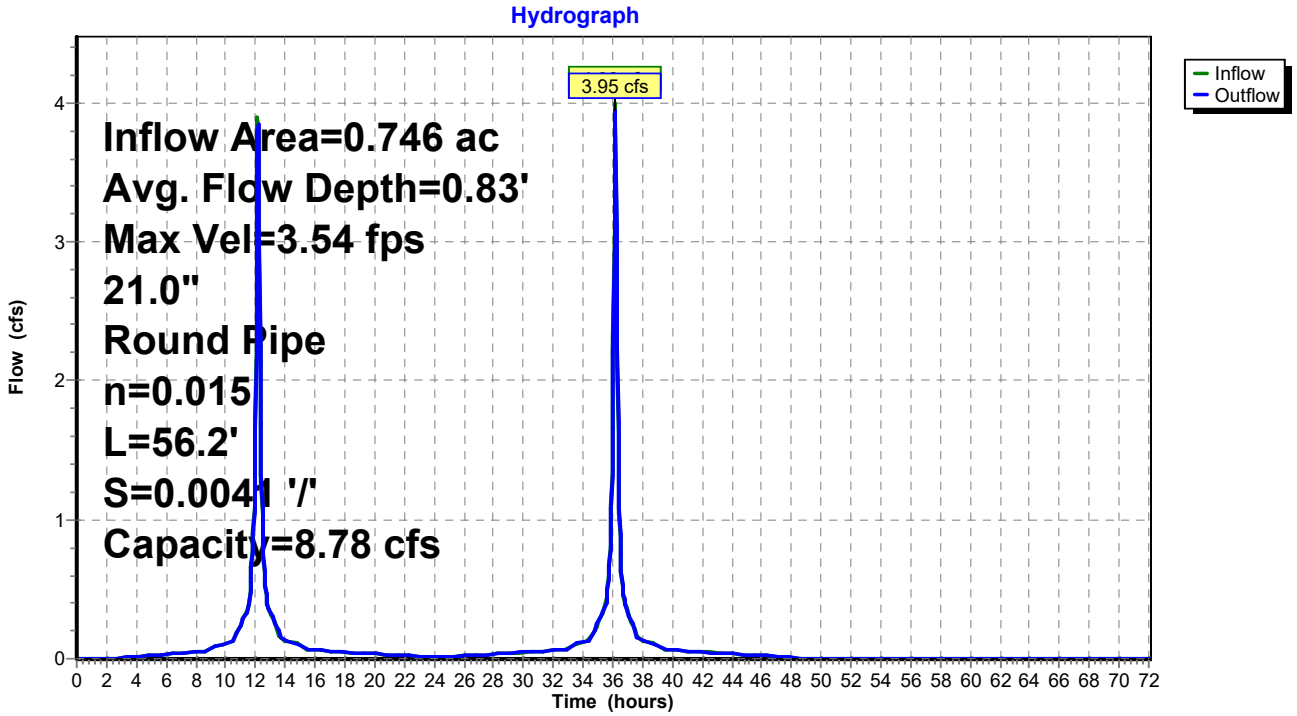
Inflow Area = 0.746 ac, 97.99% Impervious, Inflow Depth = 8.32" for 10-yrb2b event
Inflow = 4.00 cfs @ 36.17 hrs, Volume= 0.517 af
Outflow = 3.95 cfs @ 36.18 hrs, Volume= 0.517 af, Atten= 1%, Lag= 0.6 min
Routed to Reach N FLOWS : 108-in RCP

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.54 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.06 fps, Avg. Travel Time= 0.9 min

Peak Storage= 63 cf @ 36.17 hrs
Average Depth at Peak Storage= 0.83' , Surface Width= 1.75'
Bank-Full Depth= 1.75' Flow Area= 2.4 sf, Capacity= 8.78 cfs

21.0" Round Pipe
n= 0.015 Concrete sewer w/manholes & inlets
Length= 56.2' Slope= 0.0041 '/'
Inlet Invert= 771.98', Outlet Invert= 771.75'





Hydrograph for Reach 2.2: 21-in RCP

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	771.98	0.00
2.50	0.00	0	772.00	0.00
5.00	0.02	2	772.04	0.02
7.50	0.04	3	772.07	0.04
10.00	0.11	5	772.12	0.11
12.50	0.86	21	772.35	0.89
15.00	0.11	5	772.11	0.11
17.50	0.05	3	772.07	0.05
20.00	0.03	2	772.06	0.03
22.50	0.02	1	772.04	0.02
25.00	0.01	1	772.03	0.01
27.50	0.03	2	772.05	0.03
30.00	0.05	3	772.07	0.05
32.50	0.06	3	772.08	0.06
35.00	**0.26**	**9**	**772.18**	**0.25**
37.50	**0.21**	**8**	**772.17**	**0.21**
40.00	0.06	3	772.08	0.06
42.50	0.04	3	772.07	0.04
45.00	0.03	2	772.05	0.03
47.50	0.01	1	772.03	0.01
50.00	0.00	0	771.98	0.00
52.50	0.00	0	771.98	0.00
55.00	0.00	0	771.98	0.00
57.50	0.00	0	771.98	0.00
60.00	0.00	0	771.98	0.00
62.50	0.00	0	771.98	0.00
65.00	0.00	0	771.98	0.00
67.50	0.00	0	771.98	0.00
70.00	0.00	0	771.98	0.00

Stage-Discharge for Reach 2.2: 21-in RCP

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
771.98	0.00	0.00
772.00	0.35	0.00
772.02	0.56	0.01
772.04	0.73	0.02
772.06	0.88	0.04
772.08	1.02	0.06
772.10	1.15	0.08
772.12	1.27	0.11
772.14	1.38	0.15
772.16	1.49	0.20
772.18	1.59	0.24
772.20	1.69	0.30
772.22	1.79	0.36
772.24	1.88	0.42
772.26	1.96	0.49
772.28	2.05	0.56
772.30	2.13	0.64
772.32	2.21	0.73
772.34	2.28	0.81
772.36	2.36	0.91
772.38	2.43	1.01
772.40	2.50	1.11
772.42	2.57	1.22
772.44	2.63	1.33
772.46	2.70	1.45
772.48	2.76	1.57
772.50	2.82	1.69
772.52	2.88	1.82
772.54	2.94	1.95
772.56	2.99	2.08
772.58	3.05	2.22
772.60	3.10	2.36
772.62	3.15	2.51
772.64	3.20	2.66
772.66	3.25	2.81
772.68	3.30	2.96
772.70	3.34	3.12
772.72	3.39	3.27
772.74	3.43	3.44
772.76	3.47	3.60
772.78	3.51	3.76
772.80	3.55	3.93
772.82	3.59	4.10
772.84	3.63	4.27
772.86	3.66	4.44
772.88	3.70	4.61
772.90	3.73	4.78
772.92	3.76	4.95
772.94	3.79	5.12
772.96	3.82	5.30
772.98	3.85	5.47
773.00	3.88	5.64
773.02	3.90	5.82
773.04	3.93	5.99
773.06	3.95	6.16
773.08	3.98	6.33
773.10	4.00	6.50
773.12	4.02	6.67
773.14	4.04	6.83
773.16	4.05	7.00
773.18	4.07	7.16
773.20	4.09	7.32
773.22	4.10	7.47
773.24	4.11	7.63
773.26	4.12	7.77
773.28	4.13	7.92
773.30	4.14	8.06
773.32	4.15	8.20
773.34	4.16	8.33
773.36	4.16	8.46
773.38	4.16	8.59
773.40	**4.16**	8.70
773.42	4.16	8.82
773.44	4.16	8.92
773.46	4.16	9.02
773.48	4.15	9.11
773.50	4.14	9.19
773.52	4.13	9.26
773.54	4.12	9.32
773.56	4.10	9.37
773.58	4.08	9.41
773.60	4.06	9.44
773.62	4.03	**9.45**
773.64	4.00	9.44
773.66	3.97	9.41
773.68	3.92	9.35
773.70	3.86	9.25
773.72	3.74	9.00

Stage-Area-Storage for Reach 2.2: 21-in RCP

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
771.98	0.0	0
772.00	0.0	0
772.02	0.0	1
772.04	0.0	1
772.06	0.0	2
772.08	0.1	3
772.10	0.1	4
772.12	0.1	5
772.14	0.1	6
772.16	0.1	7
772.18	0.2	9
772.20	0.2	10
772.22	0.2	11
772.24	0.2	13
772.26	0.2	14
772.28	0.3	15
772.30	0.3	17
772.32	0.3	18
772.34	0.4	20
772.36	0.4	22
772.38	0.4	23
772.40	0.4	25
772.42	0.5	27
772.44	0.5	28
772.46	0.5	30
772.48	0.6	32
772.50	0.6	34
772.52	0.6	35
772.54	0.7	37
772.56	0.7	39
772.58	0.7	41
772.60	0.8	43
772.62	0.8	45
772.64	0.8	47
772.66	0.9	49
772.68	0.9	50
772.70	0.9	52
772.72	1.0	54
772.74	1.0	56
772.76	1.0	58
772.78	1.1	60
772.80	1.1	62
772.82	1.1	64
772.84	1.2	66
772.86	1.2	68
772.88	1.2	70
772.90	1.3	72
772.92	1.3	74
772.94	1.4	76
772.96	1.4	78
772.98	1.4	80
773.00	1.5	82
773.02	1.5	84
773.04	1.5	86
773.06	1.6	88
773.08	1.6	89
773.10	1.6	91
773.12	1.7	93
773.14	1.7	95
773.16	1.7	97
773.18	1.8	99
773.20	1.8	101
773.22	1.8	102
773.24	1.9	104
773.26	1.9	106
773.28	1.9	108
773.30	1.9	109
773.32	2.0	111
773.34	2.0	113
773.36	2.0	114
773.38	2.1	116
773.40	2.1	117
773.42	2.1	119
773.44	2.1	120
773.46	2.2	122
773.48	2.2	123
773.50	2.2	125
773.52	2.2	126
773.54	2.3	127
773.56	2.3	128
773.58	2.3	130
773.60	2.3	131
773.62	2.3	132
773.64	2.4	133
773.66	2.4	133
773.68	2.4	134
773.70	2.4	135
773.72	**2.4**	**135**

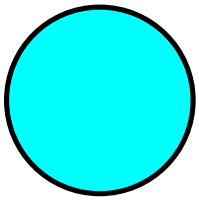
Summary for Reach 3.1: 12-in Catch Basin

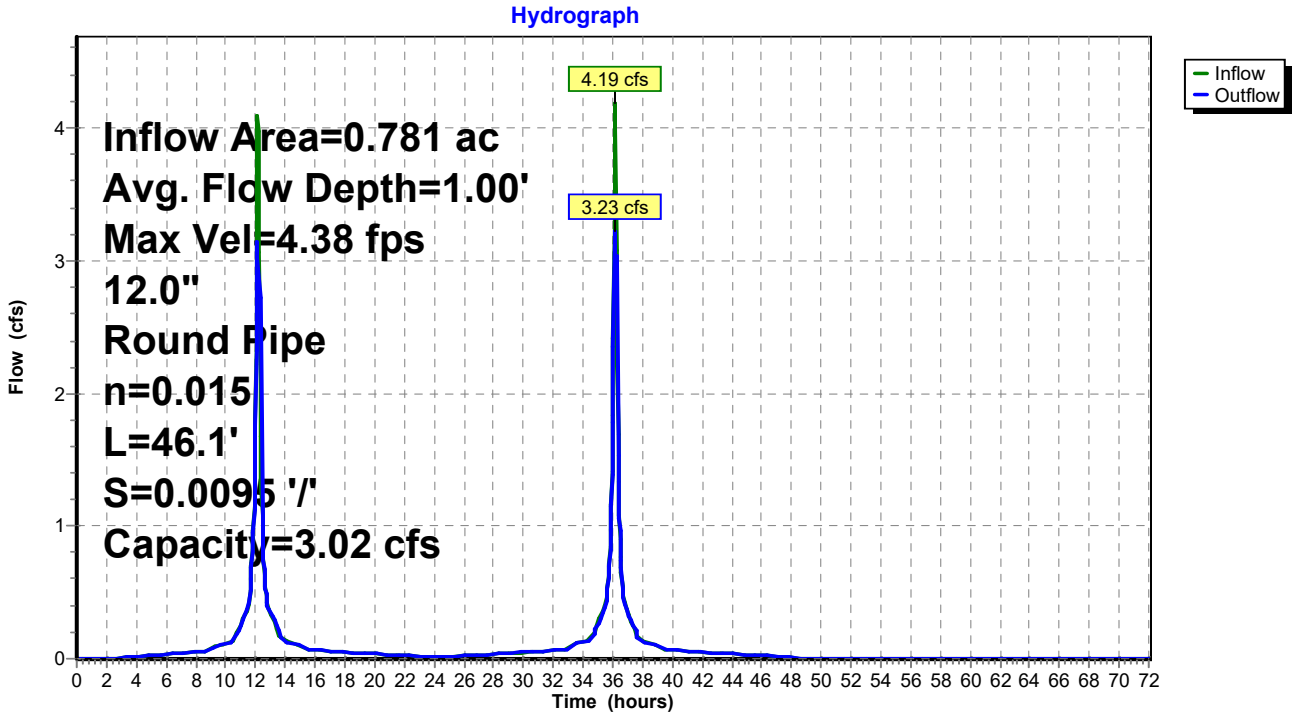
Inflow Area = 0.781 ac,100.00% Impervious, Inflow Depth = 8.32" for 10-yrb2b event
Inflow = 4.19 cfs @ 36.17 hrs, Volume= 0.541 af
Outflow = 3.23 cfs @ 36.12 hrs, Volume= 0.541 af, Atten= 23%, Lag= 0.0 min
Routed to Reach N FLOWS : 108-in RCP

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.38 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.54 fps, Avg. Travel Time= 0.5 min

Peak Storage= 36 cf @ 12.15 hrs
Average Depth at Peak Storage= 1.00'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.02 cfs

12.0" Round Pipe
n= 0.015 Concrete sewer w/manholes & inlets
Length= 46.1' Slope= 0.0095 '/'
Inlet Invert= 772.55', Outlet Invert= 772.11'





Hydrograph for Reach 3.1: 12-in Catch Basin

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	772.55	0.00
2.50	0.00	0	772.57	0.00
5.00	0.02	1	772.61	0.02
7.50	0.05	2	772.64	0.05
10.00	0.11	**3**	**772.68**	0.11
12.50	0.90	**13**	**772.94**	0.96
15.00	0.11	3	772.68	0.11
17.50	0.05	2	772.64	0.05
20.00	0.04	1	772.63	0.04
22.50	0.02	1	772.61	0.02
25.00	0.01	1	772.60	0.01
27.50	0.03	1	772.62	0.03
30.00	0.05	2	772.64	0.05
32.50	0.06	2	772.65	0.06
35.00	**0.27**	5	772.75	**0.27**
37.50	**0.22**	5	772.73	**0.22**
40.00	0.06	2	772.65	0.06
42.50	0.05	2	772.64	0.05
45.00	0.03	1	772.62	0.03
47.50	0.01	1	772.60	0.01
50.00	0.00	0	772.55	0.00
52.50	0.00	0	772.55	0.00
55.00	0.00	0	772.55	0.00
57.50	0.00	0	772.55	0.00
60.00	0.00	0	772.55	0.00
62.50	0.00	0	772.55	0.00
65.00	0.00	0	772.55	0.00
67.50	0.00	0	772.55	0.00
70.00	0.00	0	772.55	0.00

Stage-Discharge for Reach 3.1: 12-in Catch Basin

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
772.55	0.00	0.00
772.56	0.34	0.00
772.57	0.54	0.00
772.58	0.71	0.00
772.59	0.85	0.01
772.60	0.99	0.01
772.61	1.11	0.02
772.62	1.23	0.03
772.63	1.34	0.04
772.64	1.44	0.05
772.65	1.54	0.06
772.66	1.64	0.08
772.67	1.73	0.09
772.68	1.82	0.11
772.69	1.90	0.13
772.70	1.98	0.15
772.71	2.06	0.17
772.72	2.14	0.19
772.73	2.22	0.21
772.74	2.29	0.24
772.75	2.36	0.26
772.76	2.43	0.29
772.77	2.50	0.32
772.78	2.56	0.35
772.79	2.63	0.38
772.80	2.69	0.41
772.81	2.75	0.45
772.82	2.81	0.48
772.83	2.87	0.52
772.84	2.93	0.55
772.85	2.98	0.59
772.86	3.03	0.63
772.87	3.09	0.67
772.88	3.14	0.71
772.89	3.19	0.75
772.90	3.24	0.79
772.91	3.29	0.84
772.92	3.33	0.88
772.93	3.38	0.92
772.94	3.42	0.97
772.95	3.47	1.02
772.96	3.51	1.06
772.97	3.55	1.11
772.98	3.59	1.16
772.99	3.63	1.21
773.00	3.67	1.26
773.01	3.70	1.31
773.02	3.74	1.36
773.03	3.77	1.41
773.04	3.81	1.46
773.05	3.84	1.51
773.06	3.87	1.56
773.07	3.90	1.61
773.08	3.93	1.66
773.09	3.96	1.71
773.10	3.99	1.77
773.11	4.02	1.82
773.12	4.05	1.87
773.13	4.07	1.92
773.14	4.10	1.97
773.15	4.12	2.03
773.16	4.14	2.08
773.17	4.16	2.13
773.18	4.18	2.18
773.19	4.20	2.23
773.20	4.22	2.28
773.21	4.24	2.33
773.22	4.26	2.38
773.23	4.27	2.43
773.24	4.29	2.48
773.25	4.30	2.53
773.26	4.31	2.57
773.27	4.33	2.62
773.28	4.34	2.66
773.29	4.35	2.71
773.30	4.35	2.75
773.31	4.36	2.79
773.32	4.37	2.83
773.33	4.37	2.87
773.34	4.38	2.91
773.35	4.38	2.95
773.36	**4.38**	2.98
773.37	4.38	3.02
773.38	4.38	3.05
773.39	4.37	3.08
773.40	4.37	3.11
773.41	4.36	3.13
773.42	4.35	3.16
773.43	4.34	3.18
773.44	4.33	3.20
773.45	4.32	3.22
773.46	4.30	3.23
773.47	4.28	3.24
773.48	4.26	3.24
773.49	4.24	**3.24**
773.50	4.21	3.24
773.51	4.17	3.23
773.52	4.13	3.21
773.53	4.08	3.19
773.54	4.01	3.14
773.55	3.84	3.02

Stage-Area-Storage for Reach 3.1: 12-in Catch Basin

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
772.55	0.0	0
772.56	0.0	0
772.57	0.0	0
772.58	0.0	0
772.59	0.0	0
772.60	0.0	1
772.61	0.0	1
772.62	0.0	1
772.63	0.0	1
772.64	0.0	2
772.65	0.0	2
772.66	0.0	2
772.67	0.1	2
772.68	0.1	3
772.69	0.1	3
772.70	0.1	3
772.71	0.1	4
772.72	0.1	4
772.73	0.1	4
772.74	0.1	5
772.75	0.1	5
772.76	0.1	6
772.77	0.1	6
772.78	0.1	6
772.79	0.1	7
772.80	0.2	7
772.81	0.2	7
772.82	0.2	8
772.83	0.2	8
772.84	0.2	9
772.85	0.2	9
772.86	0.2	10
772.87	0.2	10
772.88	0.2	10
772.89	0.2	11
772.90	0.2	11
772.91	0.3	12
772.92	0.3	12
772.93	0.3	13
772.94	0.3	13
772.95	0.3	14
772.96	0.3	14
772.97	0.3	14
772.98	0.3	15
772.99	0.3	15
773.00	0.3	16
773.01	0.4	16
773.02	0.4	17
773.03	0.4	17
773.04	0.4	18
773.05	0.4	18
773.06	0.4	19
773.07	0.4	19
773.08	0.4	19
773.09	0.4	20
773.10	0.4	20
773.11	0.5	21
773.12	0.5	21
773.13	0.5	22
773.14	0.5	22
773.15	0.5	23
773.16	0.5	23
773.17	0.5	24
773.18	0.5	24
773.19	0.5	24
773.20	0.5	25
773.21	0.5	25
773.22	0.6	26
773.23	0.6	26
773.24	0.6	27
773.25	0.6	27
773.26	0.6	27
773.27	0.6	28
773.28	0.6	28
773.29	0.6	29
773.30	0.6	29
773.31	0.6	30
773.32	0.6	30
773.33	0.7	30
773.34	0.7	31
773.35	0.7	31
773.36	0.7	31
773.37	0.7	32
773.38	0.7	32
773.39	0.7	32
773.40	0.7	33
773.41	0.7	33
773.42	0.7	33
773.43	0.7	34
773.44	0.7	34
773.45	0.7	34
773.46	0.8	35
773.47	0.8	35
773.48	0.8	35
773.49	0.8	35
773.50	0.8	36
773.51	0.8	36
773.52	0.8	36
773.53	0.8	36
773.54	0.8	36
773.55	**0.8**	**36**

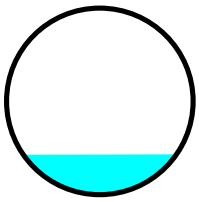
Summary for Reach N FLOWS: 108-in RCP

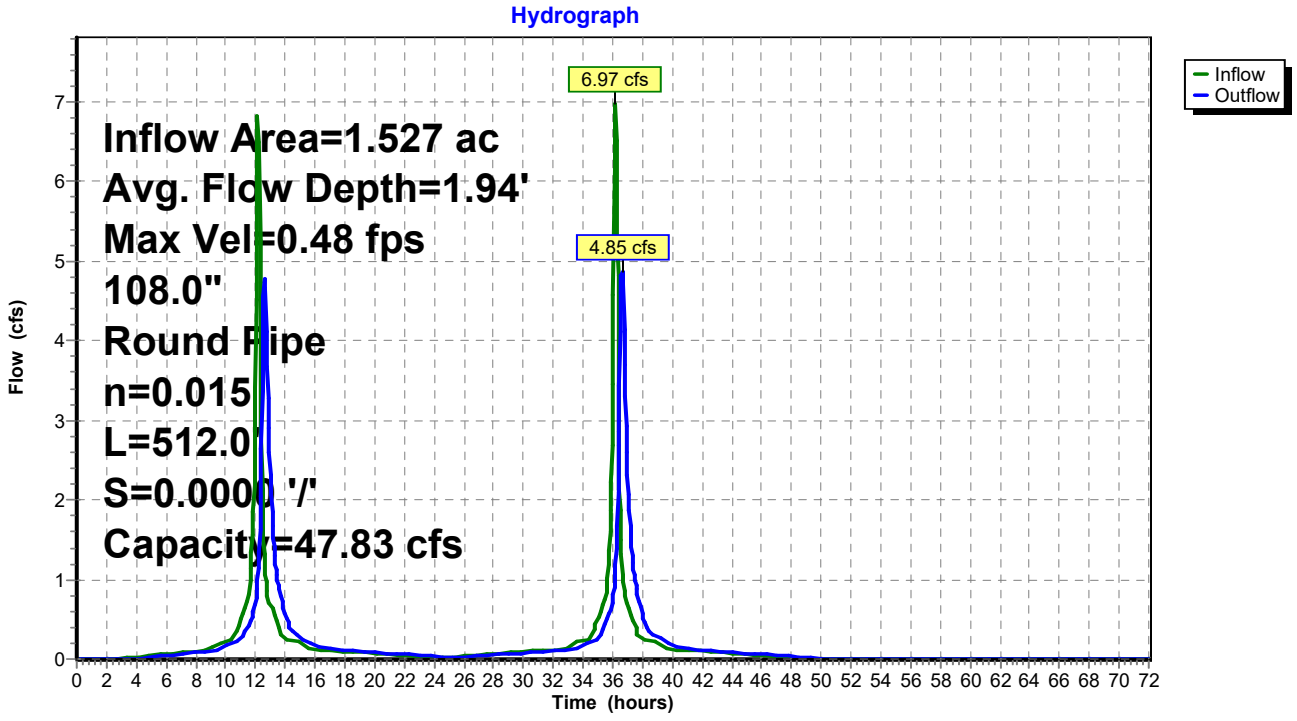
Inflow Area = 1.527 ac, 99.02% Impervious, Inflow Depth = 8.32" for 10-yrb2b event
Inflow = 6.97 cfs @ 36.18 hrs, Volume= 1.059 af
Outflow = 4.85 cfs @ 36.63 hrs, Volume= 1.059 af, Atten= 30%, Lag= 27.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.48 fps, Min. Travel Time= 17.7 min
Avg. Velocity = 0.14 fps, Avg. Travel Time= 61.1 min

Peak Storage= 5,156 cf @ 36.33 hrs
Average Depth at Peak Storage= 1.94' , Surface Width= 7.40'
Bank-Full Depth= 9.00' Flow Area= 63.6 sf, Capacity= 47.83 cfs

108.0" Round Pipe
n= 0.015 Concrete sewer w/manholes & inlets
Length= 512.0' Slope= 0.0000 '/'
Inlet Invert= 761.00', Outlet Invert= 760.99'





Hydrograph for Reach N FLOWS: 108-in RCP

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	761.00	0.00
2.50	0.00	1	761.00	0.00
5.00	0.05	133	761.16	0.02
7.50	0.09	284	761.27	0.07
10.00	0.22	517	761.40	0.16
12.50	1.85	4,261	762.70	4.06
15.00	0.22	640	761.46	0.27
17.50	0.10	370	761.32	0.12
20.00	0.07	290	761.27	0.08
22.50	0.04	204	761.21	0.05
25.00	0.03	129	761.16	0.03
27.50	0.06	207	761.22	0.05
30.00	0.09	299	761.28	0.08
32.50	0.13	377	761.32	0.11
35.00	**0.52**	**806**	**761.54**	**0.25**
37.50	**0.44**	**1,332**	**761.76**	**0.98**
40.00	0.12	454	761.37	0.17
42.50	0.09	337	761.30	0.10
45.00	0.06	258	761.25	0.07
47.50	0.03	167	761.19	0.04
50.00	0.00	48	761.08	0.01
52.50	0.00	15	761.02	0.00
55.00	0.00	5	761.01	0.00
57.50	0.00	1	761.00	0.00
60.00	0.00	0	761.00	0.00
62.50	0.00	0	761.00	0.00
65.00	0.00	0	761.00	0.00
67.50	0.00	0	761.00	0.00
70.00	0.00	0	761.00	0.00

Stage-Discharge for Reach N FLOWS: 108-in RCP

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
761.00	0.00	0.00
761.10	0.07	0.01
761.20	0.11	0.04
761.30	0.15	0.10
761.40	0.18	0.18
761.50	0.21	0.29
761.60	0.23	0.43
761.70	0.26	0.59
761.80	0.28	0.78
761.90	0.30	1.00
762.00	0.32	1.25
762.10	0.34	1.52
762.20	0.36	1.82
762.30	0.38	2.15
762.40	0.40	2.51
762.50	0.41	2.89
762.60	0.43	3.30
762.70	0.45	3.73
762.80	0.46	4.19
762.90	0.48	4.67
763.00	0.49	5.18
763.10	0.51	5.71
763.20	0.52	6.27
763.30	0.53	6.84
763.40	0.55	7.44
763.50	0.56	8.06
763.60	0.57	8.70
763.70	0.58	9.37
763.80	0.60	10.05
763.90	0.61	10.75
764.00	0.62	11.47
764.10	0.63	12.20
764.20	0.64	12.96
764.30	0.65	13.72
764.40	0.66	14.51
764.50	0.67	15.30
764.60	0.68	16.12
764.70	0.69	16.94
764.80	0.70	17.78
764.90	0.70	18.63
765.00	0.71	19.49
765.10	0.72	20.36
765.20	0.73	21.23
765.30	0.74	22.12
765.40	0.74	23.01
765.50	0.75	23.91
765.60	0.76	24.82
765.70	0.77	25.73
765.80	0.77	26.64
765.90	0.78	27.55
766.00	0.78	28.47
766.10	0.79	29.39
766.20	0.80	30.30
766.30	0.80	31.22
766.40	0.81	32.13
766.50	0.81	33.04
766.60	0.82	33.94
766.70	0.82	34.84
766.80	0.82	35.73
766.90	0.83	36.61
767.00	0.83	37.49
767.10	0.84	38.35
767.20	0.84	39.20
767.30	0.84	40.04
767.40	0.84	40.86
767.50	0.85	41.67
767.60	0.85	42.46
767.70	0.85	43.23
767.80	0.85	43.98
767.90	0.85	44.71
768.00	0.86	45.41
768.10	0.86	46.09
768.20	**0.86**	46.75
768.30	**0.86**	47.37
768.40	0.86	47.96
768.50	0.86	48.51
768.60	0.86	49.03
768.70	0.85	49.51
768.80	0.85	49.95
768.90	0.85	50.34
769.00	0.85	50.68
769.10	0.85	50.97
769.20	0.84	51.19
769.30	0.84	51.35
769.40	0.83	**51.43**
769.50	0.83	**51.42**
769.60	0.82	51.31
769.70	0.81	51.06
769.80	0.80	50.63
769.90	0.79	49.91
770.00	0.75	47.83

Stage-Area-Storage for Reach N FLOWS: 108-in RCP

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
761.00	0.0	0
761.10	0.1	66
761.20	0.4	184
761.30	0.7	335
761.40	1.0	513
761.50	1.4	714
761.60	1.8	934
761.70	2.3	1,172
761.80	2.8	1,426
761.90	3.3	1,695
762.00	3.9	1,979
762.10	4.4	2,275
762.20	5.0	2,583
762.30	5.7	2,901
762.40	6.3	3,230
762.50	7.0	3,569
762.60	7.7	3,917
762.70	8.3	4,273
762.80	9.1	4,638
762.90	9.8	5,010
763.00	10.5	5,390
763.10	11.3	5,777
763.20	12.1	6,170
763.30	12.8	6,569
763.40	13.6	6,973
763.50	14.4	7,383
763.60	15.2	7,799
763.70	16.1	8,218
763.80	16.9	8,643
763.90	17.7	9,072
764.00	18.6	9,505
764.10	19.4	9,941
764.20	20.3	10,380
764.30	21.1	10,823
764.40	22.0	11,268
764.50	22.9	11,716
764.60	23.8	12,167
764.70	24.6	12,619
764.80	25.5	13,074
764.90	26.4	13,530
765.00	27.3	13,987
765.10	28.2	14,445
765.20	29.1	14,905
765.30	30.0	15,365
765.40	30.9	15,825
765.50	31.8	16,286
765.60	32.7	16,747
765.70	33.6	17,207
765.80	34.5	17,667
765.90	35.4	18,127
766.00	36.3	18,585
766.10	37.2	19,042
766.20	38.1	19,498
766.30	39.0	19,953
766.40	39.9	20,405
766.50	40.7	20,856
766.60	41.6	21,304
766.70	42.5	21,749
766.80	43.3	22,192
766.90	44.2	22,631
767.00	45.1	23,067
767.10	45.9	23,500
767.20	46.7	23,929
767.30	47.6	24,354
767.40	48.4	24,773
767.50	49.2	25,189
767.60	50.0	25,599
767.70	50.8	26,003
767.80	51.6	26,402
767.90	52.3	26,795
768.00	53.1	27,182
768.10	53.8	27,562
768.20	54.6	27,934
768.30	55.3	28,299
768.40	56.0	28,655
768.50	56.6	29,003
768.60	57.3	29,342
768.70	58.0	29,671
768.80	58.6	29,989
768.90	59.2	30,297
769.00	59.8	30,593
769.10	60.3	30,877
769.20	60.8	31,146
769.30	61.3	31,400
769.40	61.8	31,638
769.50	62.2	31,858
769.60	62.6	32,059
769.70	63.0	32,237
769.80	63.3	32,388
769.90	63.5	32,506
770.00	**63.6**	**32,572**

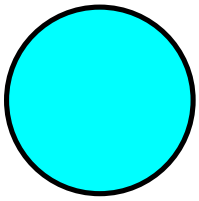
Summary for Reach PSB.1: 15-in RCP from PSB (OFFSITE)

Inflow Area = 2.011 ac, 94.88% Impervious, Inflow Depth = 8.20" for 10-yrb2b event
Inflow = 10.77 cfs @ 36.17 hrs, Volume= 1.374 af
Outflow = 3.62 cfs @ 35.95 hrs, Volume= 1.374 af, Atten= 66%, Lag= 0.0 min
Routed to Reach PSB.2 : 18-in RCP (OFFSITE)

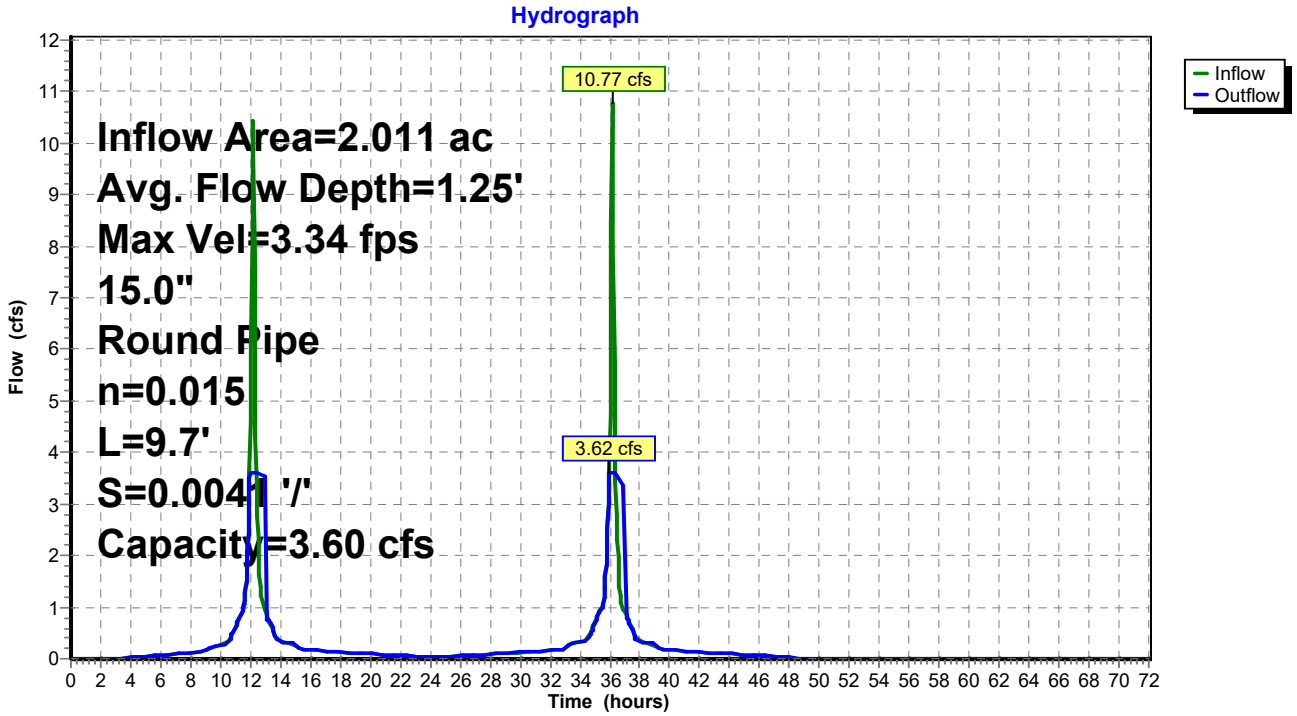
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.34 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.46 fps, Avg. Travel Time= 0.1 min

Peak Storage= 12 cf @ 12.00 hrs
Average Depth at Peak Storage= 1.25'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 3.60 cfs

15.0" Round Pipe
n= 0.015 Concrete sewer w/manholes & inlets
Length= 9.7' Slope= 0.0041 '/'
Inlet Invert= 776.20', Outlet Invert= 776.16'



Reach PSB.1: 15-in RCP from PSB (OFFSITE)



Hydrograph for Reach PSB.1: 15-in RCP from PSB (OFFSITE)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	776.20	0.00
2.50	0.00	0	776.20	0.00
5.00	0.04	0	776.30	0.04
7.50	0.10	1	776.34	0.10
10.00	0.27	**2**	**776.43**	0.27
12.50	2.31	**12**	**777.45**	3.60
15.00	0.28	2	776.44	0.28
17.50	0.14	1	776.37	0.14
20.00	0.09	1	776.34	0.09
22.50	0.05	0	776.30	0.05
25.00	0.04	0	776.29	0.04
27.50	0.08	1	776.33	0.08
30.00	0.12	1	776.36	0.12
32.50	0.16	1	776.38	0.16
35.00	**0.69**	3	776.57	**0.69**
37.50	**0.57**	3	776.54	**0.59**
40.00	0.16	1	776.38	0.16
42.50	0.12	1	776.36	0.12
45.00	0.08	1	776.33	0.08
47.50	0.03	0	776.29	0.03
50.00	0.00	0	776.20	0.00
52.50	0.00	0	776.20	0.00
55.00	0.00	0	776.20	0.00
57.50	0.00	0	776.20	0.00
60.00	0.00	0	776.20	0.00
62.50	0.00	0	776.20	0.00
65.00	0.00	0	776.20	0.00
67.50	0.00	0	776.20	0.00
70.00	0.00	0	776.20	0.00

Stage-Discharge for Reach PSB.1: 15-in RCP from PSB (OFFSITE)

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
776.20	0.00	0.00
776.21	0.21	0.00
776.22	0.35	0.00
776.23	0.46	0.00
776.24	0.56	0.01
776.25	0.65	0.01
776.26	0.73	0.02
776.27	0.81	0.02
776.28	0.88	0.03
776.29	0.95	0.04
776.30	1.02	0.05
776.31	1.08	0.06
776.32	1.14	0.07
776.33	1.20	0.08
776.34	1.26	0.10
776.35	1.32	0.11
776.36	1.37	0.13
776.37	1.42	0.14
776.38	1.48	0.16
776.39	1.53	0.18
776.40	1.58	0.20
776.41	1.62	0.22
776.42	1.67	0.24
776.43	1.71	0.27
776.44	1.76	0.29
776.45	1.80	0.31
776.46	1.84	0.34
776.47	1.89	0.37
776.48	1.93	0.40
776.49	1.97	0.42
776.50	2.01	0.45
776.51	2.04	0.48
776.52	2.08	0.52
776.53	2.12	0.55
776.54	2.15	0.58
776.55	2.19	0.62
776.56	2.22	0.65
776.57	2.26	0.69
776.58	2.29	0.72
776.59	2.32	0.76
776.60	2.35	0.80
776.61	2.39	0.84
776.62	2.42	0.88
776.63	2.45	0.92
776.64	2.48	0.96
776.65	2.51	1.00
776.66	2.53	1.04
776.67	2.56	1.08
776.68	2.59	1.12
776.69	2.62	1.17
776.70	2.64	1.21
776.71	2.67	1.26
776.72	2.69	1.30
776.73	2.72	1.35
776.74	2.74	1.39
776.75	2.77	1.44
776.76	2.79	1.49
776.77	2.81	1.53
776.78	2.84	1.58
776.79	2.86	1.63
776.80	2.88	1.68
776.81	2.90	1.72
776.82	2.92	1.77
776.83	2.94	1.82
776.84	2.96	1.87
776.85	2.98	1.92
776.86	3.00	1.97
776.87	3.01	2.02
776.88	3.03	2.07
776.89	3.05	2.12
776.90	3.07	2.17
776.91	3.08	2.22
776.92	3.10	2.27
776.93	3.11	2.32
776.94	3.13	2.37
776.95	3.14	2.42
776.96	3.16	2.46
776.97	3.17	2.51
776.98	3.18	2.56
776.99	3.19	2.61
777.00	3.21	2.66
777.01	3.22	2.71
777.02	3.23	2.76
777.03	3.24	2.80
777.04	3.25	2.85
777.05	3.26	2.90
777.06	3.27	2.94
777.07	3.28	2.99
777.08	3.28	3.03
777.09	3.29	3.08
777.10	3.30	3.12
777.11	3.31	3.16
777.12	3.31	3.21
777.13	3.32	3.25
777.14	3.32	3.29
777.15	3.33	3.33
777.16	3.33	3.37
777.17	3.33	3.41
777.18	3.34	3.44
777.19	3.34	3.48
777.20	3.34	3.51
777.21	3.34	3.55
777.22	**3.34**	3.58
777.23	3.34	3.61
777.24	3.34	3.64
777.25	3.34	3.67
777.26	3.33	3.70
777.27	3.33	3.72
777.28	3.32	3.75
777.29	3.32	3.77
777.30	3.31	3.79
777.31	3.31	3.81
777.32	3.30	3.82
777.33	3.29	3.84
777.34	3.28	3.85
777.35	3.27	3.86
777.36	3.25	3.86
777.37	3.24	**3.87**
777.38	3.22	3.87
777.39	3.20	3.86
777.40	3.18	3.85
777.41	3.16	3.84
777.42	3.13	3.81
777.43	3.09	3.78
777.44	3.03	3.72
777.45	2.93	3.60

Stage-Area-Storage for Reach PSB.1: 15-in RCP from PSB (OFFSITE)

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
776.20	0.0	0
776.22	0.0	0
776.24	0.0	0
776.26	0.0	0
776.28	0.0	0
776.30	0.0	0
776.32	0.1	1
776.34	0.1	1
776.36	0.1	1
776.38	0.1	1
776.40	0.1	1
776.42	0.1	1
776.44	0.2	2
776.46	0.2	2
776.48	0.2	2
776.50	0.2	2
776.52	0.2	2
776.54	0.3	3
776.56	0.3	3
776.58	0.3	3
776.60	0.3	3
776.62	0.4	4
776.64	0.4	4
776.66	0.4	4
776.68	0.4	4
776.70	0.5	4
776.72	0.5	5
776.74	0.5	5
776.76	0.5	5
776.78	0.6	5
776.80	0.6	6
776.82	0.6	6
776.84	0.6	6
776.86	0.7	6
776.88	0.7	7
776.90	0.7	7
776.92	0.7	7
776.94	0.8	7
776.96	0.8	8
776.98	0.8	8
777.00	0.8	8
777.02	0.9	8
777.04	0.9	9
777.06	0.9	9
777.08	0.9	9
777.10	0.9	9
777.12	1.0	9
777.14	1.0	10
777.16	1.0	10
777.18	1.0	10
777.20	1.1	10
777.22	1.1	10
777.24	1.1	11
777.26	1.1	11
777.28	1.1	11
777.30	1.1	11
777.32	1.2	11
777.34	1.2	11
777.36	1.2	12
777.38	1.2	12
777.40	1.2	12
777.42	1.2	12
777.44	**1.2**	**12**

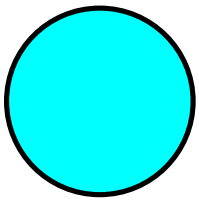
Summary for Reach PSB.2: 18-in RCP (OFFSITE)

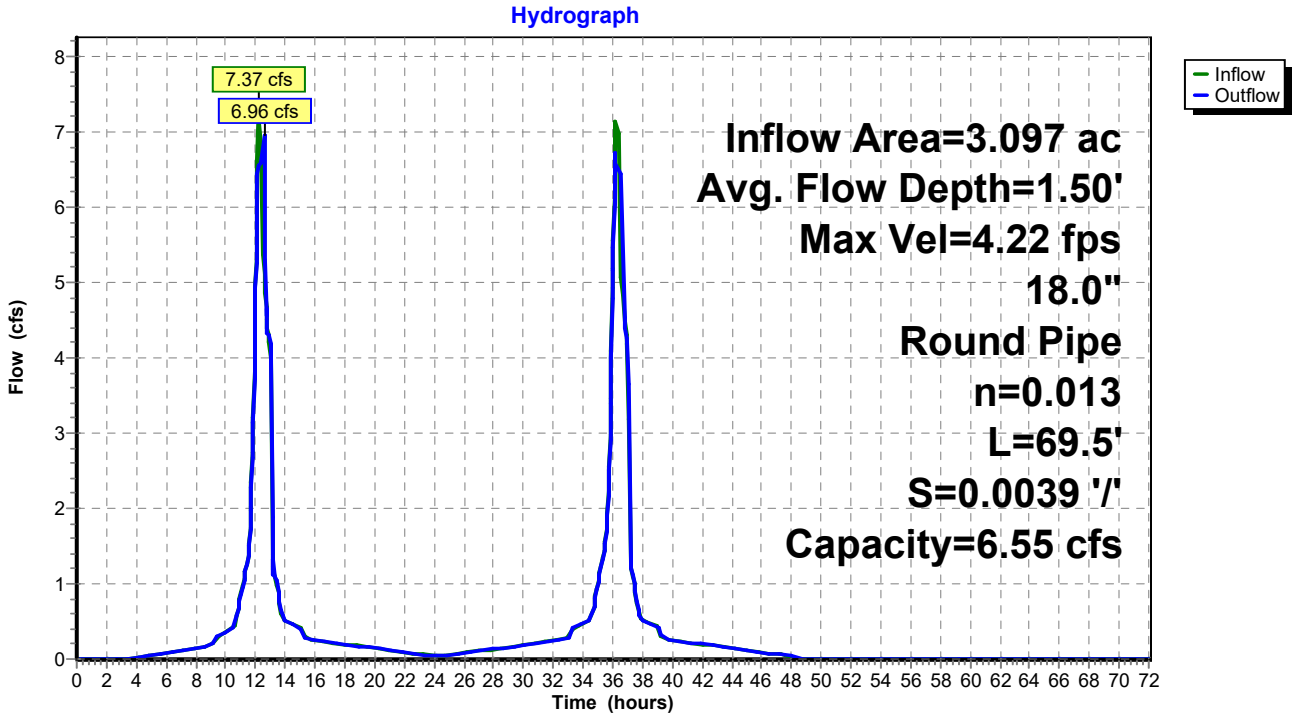
Inflow Area = 3.097 ac, 87.67% Impervious, Inflow Depth = 8.03" for 10-yrb2b event
Inflow = 7.37 cfs @ 12.22 hrs, Volume= 2.073 af
Outflow = 6.96 cfs @ 12.58 hrs, Volume= 2.073 af, Atten= 6%, Lag= 22.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.22 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.74 fps, Avg. Travel Time= 0.7 min

Peak Storage= 123 cf @ 12.20 hrs
Average Depth at Peak Storage= 1.50'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 6.55 cfs

18.0" Round Pipe
n= 0.013 Concrete pipe, bends & connections
Length= 69.5' Slope= 0.0039 '/'
Inlet Invert= 772.10', Outlet Invert= 771.83'





Hydrograph for Reach PSB.2: 18-in RCP (OFFSITE)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	772.10	0.00
2.50	0.00	0	772.10	0.00
5.00	0.04	3	772.19	0.04
7.50	0.13	6	772.24	0.13
10.00	**0.36**	**13**	**772.34**	0.36
12.50	**5.81**	**123**	**773.60**	**6.55**
15.00	0.44	14	772.36	**0.44**
17.50	0.21	9	772.28	0.21
20.00	0.14	7	772.25	0.14
22.50	0.08	4	772.22	0.08
25.00	0.05	3	772.20	0.05
27.50	0.12	6	772.24	0.12
30.00	0.19	8	772.27	0.18
32.50	0.25	10	772.30	0.25
35.00	1.01	26	772.50	1.00
37.50	0.94	25	772.48	0.93
40.00	0.25	10	772.30	0.25
42.50	0.18	8	772.27	0.18
45.00	0.12	6	772.24	0.12
47.50	0.05	3	772.20	0.05
50.00	0.00	0	772.10	0.00
52.50	0.00	0	772.10	0.00
55.00	0.00	0	772.10	0.00
57.50	0.00	0	772.10	0.00
60.00	0.00	0	772.10	0.00
62.50	0.00	0	772.10	0.00
65.00	0.00	0	772.10	0.00
67.50	0.00	0	772.10	0.00
70.00	0.00	0	772.10	0.00

Stage-Discharge for Reach PSB.2: 18-in RCP (OFFSITE)

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
772.10	0.00	0.00
772.11	0.22	0.00
772.12	0.39	0.00
772.13	0.52	0.00
772.14	0.63	0.01
772.15	0.73	0.01
772.16	0.82	0.02
772.17	0.91	0.03
772.18	0.99	0.04
772.19	1.07	0.05
772.20	1.15	0.06
772.21	1.22	0.07
772.22	1.29	0.09
772.23	1.36	0.10
772.24	1.42	0.12
772.25	1.49	0.14
772.26	1.55	0.16
772.27	1.61	0.18
772.28	1.67	0.20
772.29	1.72	0.22
772.30	1.78	0.25
772.31	1.83	0.28
772.32	1.89	0.30
772.33	1.94	0.33
772.34	1.99	0.36
772.35	2.04	0.40
772.36	2.09	0.43
772.37	2.14	0.46
772.38	2.19	0.50
772.39	2.23	0.54
772.40	2.28	0.57
772.41	2.32	0.61
772.42	2.37	0.65
772.43	2.41	0.69
772.44	2.45	0.74
772.45	2.49	0.78
772.46	2.54	0.83
772.47	2.58	0.87
772.48	2.62	0.92
772.49	2.65	0.97
772.50	2.69	1.02
772.51	2.73	1.07
772.52	2.77	1.12
772.53	2.80	1.17
772.54	2.84	1.23
772.55	2.88	1.28
772.56	2.91	1.34
772.57	2.94	1.39
772.58	2.98	1.45
772.59	3.01	1.51
772.60	3.04	1.57
772.61	3.08	1.63
772.62	3.11	1.69
772.63	3.14	1.75
772.64	3.17	1.82
772.65	3.20	1.88
772.66	3.23	1.94
772.67	3.26	2.01
772.68	3.29	2.07
772.69	3.31	2.14
772.70	3.34	2.21
772.71	3.37	2.27
772.72	3.40	2.34
772.73	3.42	2.41
772.74	3.45	2.48
772.75	3.47	2.55
772.76	3.50	2.62
772.77	3.52	2.69
772.78	3.55	2.76
772.79	3.57	2.83
772.80	3.59	2.91
772.81	3.62	2.98
772.82	3.64	3.05
772.83	3.66	3.13
772.84	3.68	3.20
772.85	3.70	3.27
772.86	3.73	3.35
772.87	3.75	3.42
772.88	3.77	3.50
772.89	3.79	3.57
772.90	3.80	3.65
772.91	3.82	3.72
772.92	3.84	3.80
772.93	3.86	3.87
772.94	3.88	3.95
772.95	3.89	4.02
772.96	3.91	4.10
772.97	3.93	4.17
772.98	3.94	4.25
772.99	3.96	4.32
773.00	3.97	4.40
773.01	3.99	4.47
773.02	4.00	4.55
773.03	4.02	4.62
773.04	4.03	4.70
773.05	4.04	4.77
773.06	4.05	4.84
773.07	4.07	4.92
773.08	4.08	4.99
773.09	4.09	5.06
773.10	4.10	5.13
773.11	4.11	5.20
773.12	4.12	5.27
773.13	4.13	5.34
773.14	4.14	5.41
773.15	4.15	5.48
773.16	4.16	5.55
773.17	4.16	5.62
773.18	4.17	5.68
773.19	4.18	5.75
773.20	4.19	5.81
773.21	4.19	5.88
773.22	4.20	5.94
773.23	4.20	6.00
773.24	4.21	6.06
773.25	4.21	6.12
773.26	4.21	6.18
773.27	4.22	6.24
773.28	4.22	6.29
773.29	4.22	6.35
773.30	4.22	6.40
773.31	4.22	6.45
773.32	**4.22**	6.50
773.33	4.22	6.55
773.34	4.22	6.60
773.35	4.22	6.64
773.36	4.22	6.69
773.37	4.22	6.73
773.38	4.21	6.77
773.39	4.21	6.80
773.40	4.20	6.84
773.41	4.20	6.87
773.42	4.19	6.90
773.43	4.18	6.93
773.44	4.17	6.95
773.45	4.17	6.98
773.46	4.15	7.00
773.47	4.14	7.01
773.48	4.13	7.03
773.49	4.12	7.04
773.50	4.10	7.04
773.51	4.09	**7.04**
773.52	4.07	7.04
773.53	4.05	7.03
773.54	4.02	7.01
773.55	4.00	6.99
773.56	3.97	6.96
773.57	3.93	6.92
773.58	3.89	6.85
773.59	3.81	6.73
773.60	3.70	6.55

Stage-Area-Storage for Reach PSB.2: 18-in RCP (OFFSITE)

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
772.10	0.0	0
772.12	0.0	0
772.14	0.0	1
772.16	0.0	2
772.18	0.0	3
772.20	0.1	4
772.22	0.1	5
772.24	0.1	6
772.26	0.1	7
772.28	0.1	8
772.30	0.1	10
772.32	0.2	11
772.34	0.2	13
772.36	0.2	14
772.38	0.2	16
772.40	0.3	17
772.42	0.3	19
772.44	0.3	21
772.46	0.3	23
772.48	0.4	24
772.50	0.4	26
772.52	0.4	28
772.54	0.4	30
772.56	0.5	32
772.58	0.5	34
772.60	0.5	36
772.62	0.5	38
772.64	0.6	40
772.66	0.6	42
772.68	0.6	44
772.70	0.7	46
772.72	0.7	48
772.74	0.7	50
772.76	0.7	52
772.78	0.8	54
772.80	0.8	56
772.82	0.8	58
772.84	0.9	60
772.86	0.9	62
772.88	0.9	65
772.90	1.0	67
772.92	1.0	69
772.94	1.0	71
772.96	1.0	73
772.98	1.1	75
773.00	1.1	77
773.02	1.1	79
773.04	1.2	81
773.06	1.2	83
773.08	1.2	85
773.10	1.3	87
773.12	1.3	89
773.14	1.3	91
773.16	1.3	93
773.18	1.4	95
773.20	1.4	97
773.22	1.4	98
773.24	1.4	100
773.26	1.5	102
773.28	1.5	104
773.30	1.5	105
773.32	1.5	107
773.34	1.6	109
773.36	1.6	110
773.38	1.6	112
773.40	1.6	113
773.42	1.6	114
773.44	1.7	116
773.46	1.7	117
773.48	1.7	118
773.50	1.7	119
773.52	1.7	120
773.54	1.7	121
773.56	1.8	122
773.58	1.8	122
773.60	**1.8**	**123**

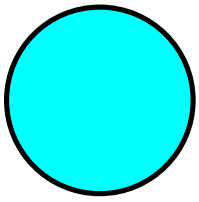
Summary for Reach S FLOWS: 15-in RCP

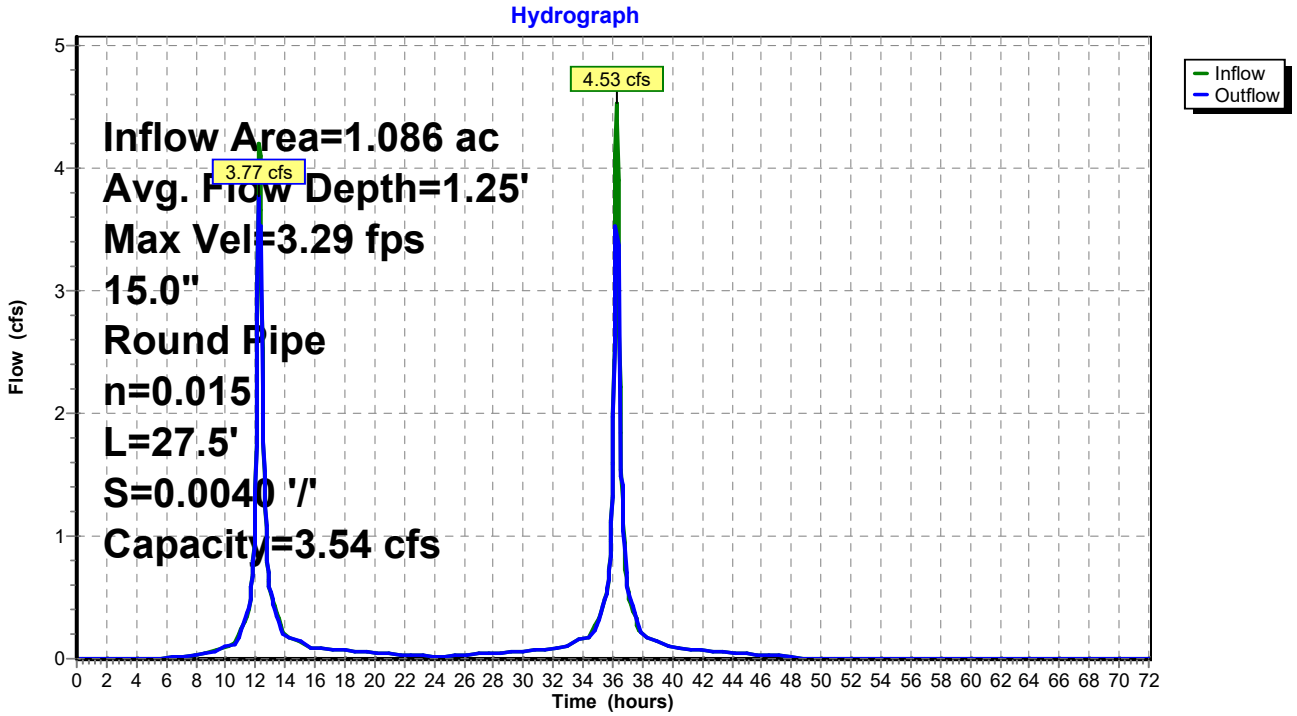
Inflow Area = 1.086 ac, 74.31% Impervious, Inflow Depth = 7.72" for 10-yrb2b event
Inflow = 4.53 cfs @ 36.26 hrs, Volume= 0.699 af
Outflow = 3.77 cfs @ 12.22 hrs, Volume= 0.699 af, Atten= 17%, Lag= 0.0 min
Routed to Reach PSB.2 : 18-in RCP (OFFSITE)

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.29 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.20 fps, Avg. Travel Time= 0.4 min

Peak Storage= 34 cf @ 12.25 hrs
Average Depth at Peak Storage= 1.25'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 3.54 cfs

15.0" Round Pipe
n= 0.015 Concrete sewer w/manholes & inlets
Length= 27.5' Slope= 0.0040 '/'
Inlet Invert= 772.21', Outlet Invert= 772.10'





Hydrograph for Reach S FLOWS: 15-in RCP

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	772.21	0.00
2.50	0.00	0	772.21	0.00
5.00	0.00	0	772.21	0.00
7.50	0.02	1	772.28	0.02
10.00	0.09	**2**	**772.35**	**0.09**
12.50	2.11	**20**	**772.91**	**2.21**
15.00	0.15	3	772.39	0.15
17.50	0.07	2	772.33	0.07
20.00	0.05	1	772.31	0.05
22.50	0.03	1	772.29	0.03
25.00	0.02	1	772.27	0.02
27.50	0.04	1	772.30	0.04
30.00	0.06	2	772.33	0.06
32.50	0.09	2	772.34	0.09
35.00	**0.32**	5	772.46	0.32
37.50	**0.35**	5	772.47	0.35
40.00	0.09	2	772.35	0.09
42.50	0.06	2	772.33	0.07
45.00	0.04	1	772.31	0.04
47.50	0.02	1	772.28	0.02
50.00	0.00	0	772.21	0.00
52.50	0.00	0	772.21	0.00
55.00	0.00	0	772.21	0.00
57.50	0.00	0	772.21	0.00
60.00	0.00	0	772.21	0.00
62.50	0.00	0	772.21	0.00
65.00	0.00	0	772.21	0.00
67.50	0.00	0	772.21	0.00
70.00	0.00	0	772.21	0.00

Stage-Discharge for Reach S FLOWS: 15-in RCP

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
772.21	0.00	0.00
772.22	0.21	0.00
772.23	0.35	0.00
772.24	0.46	0.00
772.25	0.55	0.01
772.26	0.64	0.01
772.27	0.72	0.02
772.28	0.80	0.02
772.29	0.87	0.03
772.30	0.94	0.04
772.31	1.00	0.05
772.32	1.07	0.06
772.33	1.13	0.07
772.34	1.19	0.08
772.35	1.24	0.09
772.36	1.30	0.11
772.37	1.35	0.12
772.38	1.40	0.14
772.39	1.45	0.16
772.40	1.50	0.18
772.41	1.55	0.20
772.42	1.60	0.22
772.43	1.64	0.24
772.44	1.69	0.26
772.45	1.73	0.29
772.46	1.77	0.31
772.47	1.82	0.34
772.48	1.86	0.36
772.49	1.90	0.39
772.50	1.94	0.42
772.51	1.97	0.45
772.52	2.01	0.48
772.53	2.05	0.51
772.54	2.09	0.54
772.55	2.12	0.57
772.56	2.16	0.61
772.57	2.19	0.64
772.58	2.22	0.68
772.59	2.26	0.71
772.60	2.29	0.75
772.61	2.32	0.79
772.62	2.35	0.82
772.63	2.38	0.86
772.64	2.41	0.90
772.65	2.44	0.94
772.66	2.47	0.98
772.67	2.50	1.02
772.68	2.52	1.06
772.69	2.55	1.11
772.70	2.58	1.15
772.71	2.60	1.19
772.72	2.63	1.24
772.73	2.65	1.28
772.74	2.68	1.33
772.75	2.70	1.37
772.76	2.73	1.42
772.77	2.75	1.46
772.78	2.77	1.51
772.79	2.79	1.56
772.80	2.81	1.60
772.81	2.83	1.65
772.82	2.86	1.70
772.83	2.88	1.75
772.84	2.89	1.79
772.85	2.91	1.84
772.86	2.93	1.89
772.87	2.95	1.94
772.88	2.97	1.99
772.89	2.99	2.04
772.90	3.00	2.09
772.91	3.02	2.13
772.92	3.04	2.18
772.93	3.05	2.23
772.94	3.07	2.28
772.95	3.08	2.33
772.96	3.09	2.38
772.97	3.11	2.43
772.98	3.12	2.48
772.99	3.13	2.52
773.00	3.15	2.57
773.01	3.16	2.62
773.02	3.17	2.67
773.03	3.18	2.71
773.04	3.19	2.76
773.05	3.20	2.81
773.06	3.21	2.85
773.07	3.22	2.90
773.08	3.23	2.94
773.09	3.23	2.99
773.10	3.24	3.03
773.11	3.25	3.07
773.12	3.26	3.12
773.13	3.26	3.16
773.14	3.27	3.20
773.15	3.27	3.24
773.16	3.28	3.28
773.17	3.28	3.32
773.18	3.28	3.35
773.19	3.29	3.39
773.20	3.29	3.43
773.21	3.29	3.46
773.22	3.29	3.49
773.23	**3.29**	3.53
773.24	3.29	3.56
773.25	3.29	3.59
773.26	3.29	3.62
773.27	3.28	3.64
773.28	3.28	3.67
773.29	3.27	3.69
773.30	3.27	3.71
773.31	3.26	3.73
773.32	3.26	3.75
773.33	3.25	3.77
773.34	3.24	3.78
773.35	3.23	3.79
773.36	3.22	3.80
773.37	3.20	3.81
773.38	3.19	**3.81**
773.39	3.17	3.81
773.40	3.15	3.80
773.41	3.13	3.79
773.42	3.11	3.78
773.43	3.08	3.75
773.44	3.04	3.72
773.45	2.99	3.66
773.46	2.89	3.54

Stage-Area-Storage for Reach S FLOWS: 15-in RCP

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
772.21	0.0	0
772.23	0.0	0
772.25	0.0	0
772.27	0.0	1
772.29	0.0	1
772.31	0.0	1
772.33	0.1	2
772.35	0.1	2
772.37	0.1	3
772.39	0.1	3
772.41	0.1	3
772.43	0.1	4
772.45	0.2	5
772.47	0.2	5
772.49	0.2	6
772.51	0.2	6
772.53	0.2	7
772.55	0.3	7
772.57	0.3	8
772.59	0.3	9
772.61	0.3	9
772.63	0.4	10
772.65	0.4	11
772.67	0.4	11
772.69	0.4	12
772.71	0.5	13
772.73	0.5	13
772.75	0.5	14
772.77	0.5	15
772.79	0.6	15
772.81	0.6	16
772.83	0.6	17
772.85	0.6	17
772.87	0.7	18
772.89	0.7	19
772.91	0.7	19
772.93	0.7	20
772.95	0.8	21
772.97	0.8	21
772.99	0.8	22
773.01	0.8	23
773.03	0.9	23
773.05	0.9	24
773.07	0.9	25
773.09	0.9	25
773.11	0.9	26
773.13	1.0	27
773.15	1.0	27
773.17	1.0	28
773.19	1.0	28
773.21	1.1	29
773.23	1.1	29
773.25	1.1	30
773.27	1.1	31
773.29	1.1	31
773.31	1.1	31
773.33	1.2	32
773.35	1.2	32
773.37	1.2	33
773.39	1.2	33
773.41	1.2	33
773.43	1.2	34
773.45	**1.2**	**34**

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment DA1: Walgreens Loading Runoff Area=1.086 ac 74.31% Impervious Runoff Depth=6.36"
Flow Length=256' Slope=0.0320 '/' Tc=18.2 min CN=93 Runoff=7.45 cfs 0.576 af

Subcatchment DA2: Riverfront Pipe Runoff Area=0.746 ac 97.99% Impervious Runoff Depth=6.95"
Tc=10.0 min CN=98 Runoff=6.71 cfs 0.432 af

Subcatchment DA3: Walgreens Parking Runoff Area=0.781 ac 100.00% Impervious Runoff Depth=6.95"
Tc=10.0 min CN=98 Runoff=7.02 cfs 0.452 af

Subcatchment PSB: Public Safety Building Runoff Area=2.011 ac 94.88% Impervious Runoff Depth=6.83"
Tc=10.0 min CN=97 Runoff=18.02 cfs 1.145 af

Reach 2.1: 12-in RCP Avg. Flow Depth=0.60' Max Vel=13.54 fps Inflow=6.71 cfs 0.432 af
12.0" Round Pipe n=0.013 L=14.5' S=0.0779 '/' Capacity=9.95 cfs Outflow=6.70 cfs 0.432 af

Reach 2.2: 21-in RCP Avg. Flow Depth=1.14' Max Vel=4.00 fps Inflow=6.70 cfs 0.432 af
21.0" Round Pipe n=0.015 L=56.2' S=0.0041 '/' Capacity=8.78 cfs Outflow=6.63 cfs 0.432 af

Reach 3.1: 12-in Catch Basin Avg. Flow Depth=1.00' Max Vel=4.38 fps Inflow=7.02 cfs 0.452 af
12.0" Round Pipe n=0.015 L=46.1' S=0.0095 '/' Capacity=3.02 cfs Outflow=3.08 cfs 0.452 af

Reach N FLOWS: 108-in RCP Avg. Flow Depth=2.32' Max Vel=0.54 fps Inflow=9.65 cfs 0.884 af
108.0" Round Pipe n=0.015 L=512.0' S=0.0000 '/' Capacity=47.83 cfs Outflow=6.95 cfs 0.884 af

Reach PSB.1: 15-in RCP from PSB Avg. Flow Depth=1.25' Max Vel=3.34 fps Inflow=18.02 cfs 1.145 af
15.0" Round Pipe n=0.015 L=9.7' S=0.0041 '/' Capacity=3.60 cfs Outflow=3.60 cfs 1.145 af

Reach PSB.2: 18-in RCP (OFFSITE) Avg. Flow Depth=1.50' Max Vel=4.22 fps Inflow=7.14 cfs 1.720 af
18.0" Round Pipe n=0.013 L=69.5' S=0.0039 '/' Capacity=6.55 cfs Outflow=6.68 cfs 1.720 af

Reach S FLOWS: 15-in RCP Avg. Flow Depth=1.25' Max Vel=3.26 fps Inflow=7.45 cfs 0.576 af
15.0" Round Pipe n=0.015 L=27.5' S=0.0040 '/' Capacity=3.54 cfs Outflow=3.54 cfs 0.576 af

Summary for Subcatchment DA1: Walgreens Loading Dock and Houses

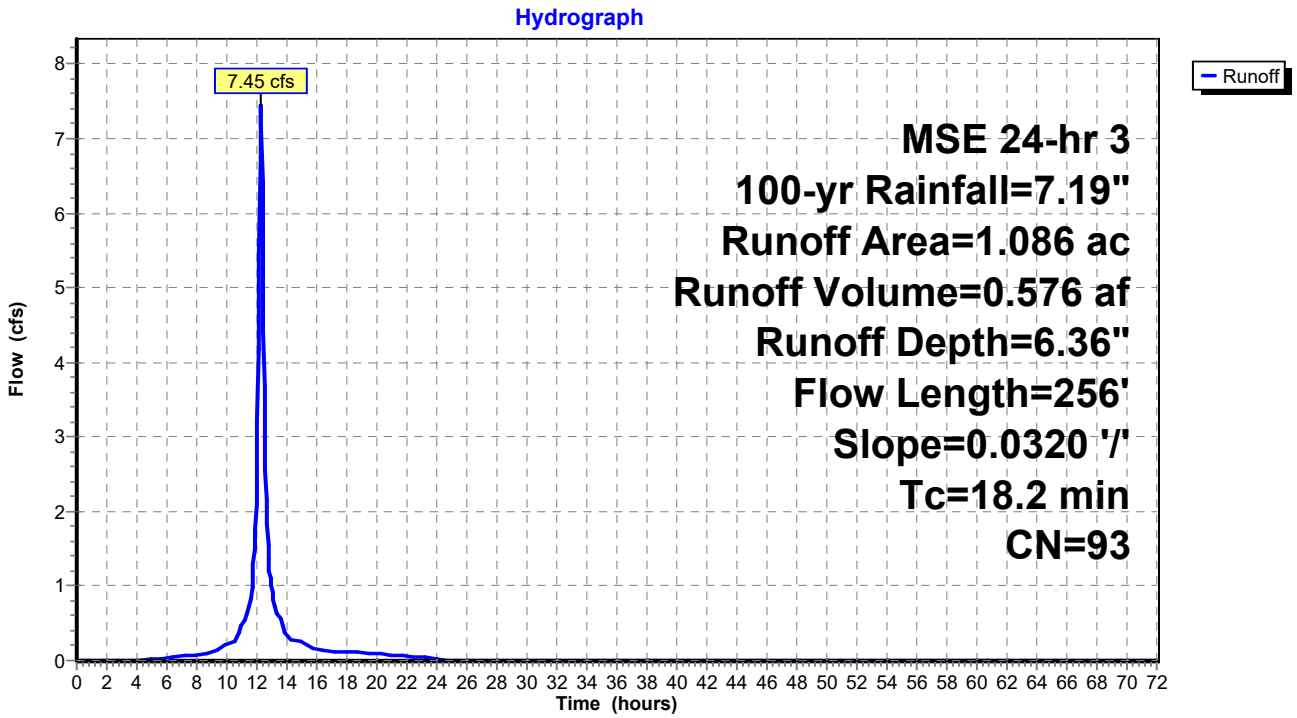
Runoff = 7.45 cfs @ 12.26 hrs, Volume= 0.576 af, Depth= 6.36"
Routed to Reach S FLOWS : 15-in RCP

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-yr Rainfall=7.19"

Area (ac)	CN	Description
0.807	98	Paved parking, HSG D
0.279	80	>75% Grass cover, Good, HSG D
1.086	93	Weighted Average
0.279		25.69% Pervious Area
0.807		74.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.2	256	0.0320	0.23		**Sheet Flow, Grass Sheet Flow to intake** Grass: Short n= 0.150 P2= 2.87"

Subcatchment DA1: Walgreens Loading Dock and Houses



Hydrograph for Subcatchment DA1: Walgreens Loading Dock and Houses

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.03	0.00	0.00
2.00	0.07	0.00	0.00
3.00	0.12	0.00	0.00
4.00	0.19	0.00	0.00
5.00	0.27	0.02	0.02
6.00	0.37	0.05	0.04
7.00	0.48	0.10	0.06
8.00	0.60	0.17	0.08
9.00	0.74	0.26	0.10
10.00	0.99	0.44	0.21
11.00	1.39	0.77	0.46
12.00	3.33	2.57	**2.55**
13.00	5.80	4.99	**0.94**
14.00	6.20	5.38	0.31
15.00	6.45	5.63	0.26
16.00	6.59	5.76	0.15
17.00	6.71	5.89	0.13
18.00	6.82	6.00	0.12
19.00	6.92	6.09	0.10
20.00	7.00	6.17	0.09
21.00	7.07	6.24	0.07
22.00	7.12	6.29	0.06
23.00	7.16	6.33	0.04
24.00	**7.19**	**6.36**	0.02
25.00	7.19	6.36	0.00
26.00	7.19	6.36	0.00
27.00	7.19	6.36	0.00
28.00	7.19	6.36	0.00
29.00	7.19	6.36	0.00
30.00	7.19	6.36	0.00
31.00	7.19	6.36	0.00
32.00	7.19	6.36	0.00
33.00	7.19	6.36	0.00
34.00	7.19	6.36	0.00
35.00	7.19	6.36	0.00
36.00	7.19	6.36	0.00
37.00	7.19	6.36	0.00
38.00	7.19	6.36	0.00
39.00	7.19	6.36	0.00
40.00	7.19	6.36	0.00
41.00	7.19	6.36	0.00
42.00	7.19	6.36	0.00
43.00	7.19	6.36	0.00
44.00	7.19	6.36	0.00
45.00	7.19	6.36	0.00
46.00	7.19	6.36	0.00
47.00	7.19	6.36	0.00
48.00	7.19	6.36	0.00
49.00	7.19	6.36	0.00
50.00	7.19	6.36	0.00
51.00	7.19	6.36	0.00
52.00	7.19	6.36	0.00
53.00	7.19	6.36	0.00
54.00	7.19	6.36	0.00
55.00	7.19	6.36	0.00
56.00	7.19	6.36	0.00
57.00	7.19	6.36	0.00
58.00	7.19	6.36	0.00
59.00	7.19	6.36	0.00
60.00	7.19	6.36	0.00
61.00	7.19	6.36	0.00
62.00	7.19	6.36	0.00
63.00	7.19	6.36	0.00
64.00	7.19	6.36	0.00
65.00	7.19	6.36	0.00
66.00	7.19	6.36	0.00
67.00	7.19	6.36	0.00
68.00	7.19	6.36	0.00
69.00	7.19	6.36	0.00
70.00	7.19	6.36	0.00
71.00	7.19	6.36	0.00
72.00	7.19	6.36	0.00

Summary for Subcatchment DA2: Riverfront Pipe

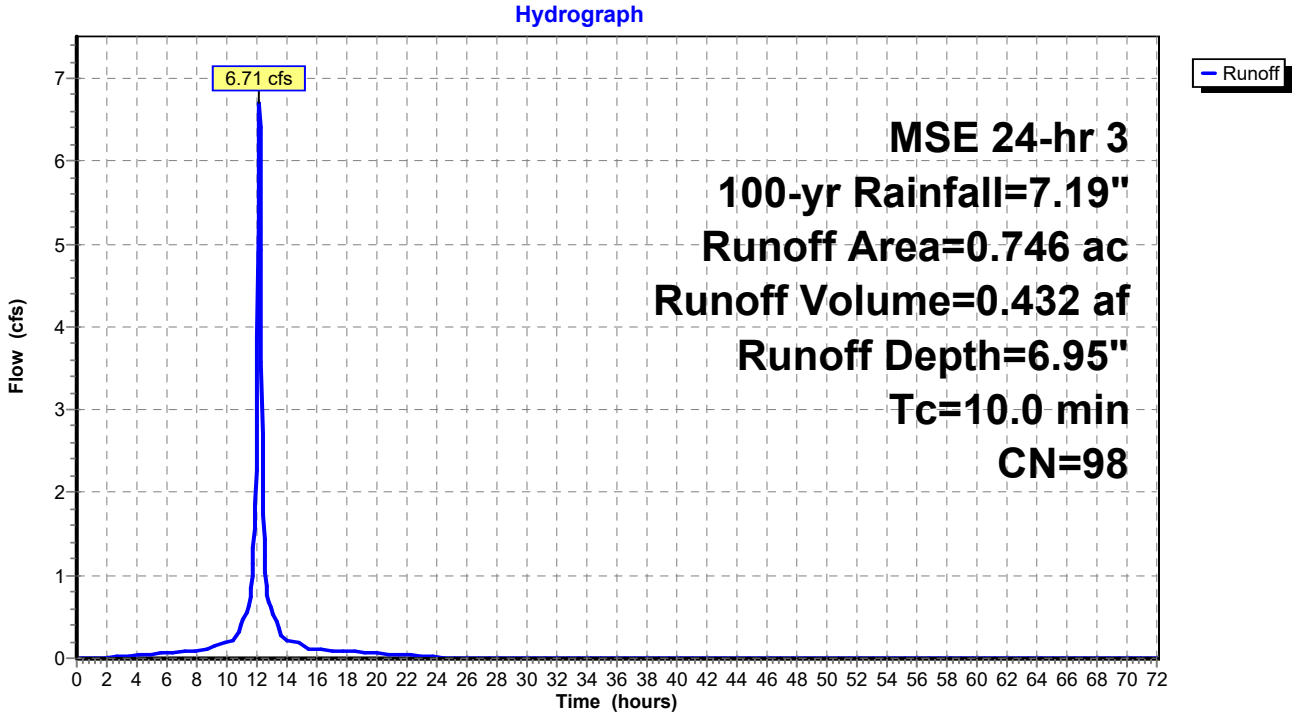
Runoff = 6.71 cfs @ 12.17 hrs, Volume= 0.432 af, Depth= 6.95"
Routed to Reach 2.1 : 12-in RCP

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-yr Rainfall=7.19"

Area (ac)	CN	Description
0.731	98	Paved parking, HSG D
0.015	80	>75% Grass cover, Good, HSG D
0.746	98	Weighted Average
0.015		2.01% Pervious Area
0.731		97.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, Minimum**

Subcatchment DA2: Riverfront Pipe



Hydrograph for Subcatchment DA2: Riverfront Pipe

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.03	0.00	0.00
2.00	0.07	0.00	0.01
3.00	0.12	0.02	0.02
4.00	0.19	0.06	0.03
5.00	0.27	0.12	0.05
6.00	0.37	0.20	0.06
7.00	0.48	0.30	0.08
8.00	0.60	0.41	0.09
9.00	0.74	0.54	0.10
10.00	0.99	0.78	0.19
11.00	1.39	1.17	0.42
12.00	3.33	3.10	**2.93**
13.00	5.80	5.57	**0.56**
14.00	6.20	5.96	0.20
15.00	6.45	6.21	0.18
16.00	6.59	6.35	0.10
17.00	6.71	6.47	0.09
18.00	6.82	6.58	0.08
19.00	6.92	6.68	0.07
20.00	7.00	6.76	0.06
21.00	7.07	6.83	0.05
22.00	7.12	6.89	0.04
23.00	7.16	6.93	0.03
24.00	**7.19**	**6.95**	0.02
25.00	7.19	6.95	0.00
26.00	7.19	6.95	0.00
27.00	7.19	6.95	0.00
28.00	7.19	6.95	0.00
29.00	7.19	6.95	0.00
30.00	7.19	6.95	0.00
31.00	7.19	6.95	0.00
32.00	7.19	6.95	0.00
33.00	7.19	6.95	0.00
34.00	7.19	6.95	0.00
35.00	7.19	6.95	0.00
36.00	7.19	6.95	0.00
37.00	7.19	6.95	0.00
38.00	7.19	6.95	0.00
39.00	7.19	6.95	0.00
40.00	7.19	6.95	0.00
41.00	7.19	6.95	0.00
42.00	7.19	6.95	0.00
43.00	7.19	6.95	0.00
44.00	7.19	6.95	0.00
45.00	7.19	6.95	0.00
46.00	7.19	6.95	0.00
47.00	7.19	6.95	0.00
48.00	7.19	6.95	0.00
49.00	7.19	6.95	0.00
50.00	7.19	6.95	0.00
51.00	7.19	6.95	0.00
52.00	7.19	6.95	0.00
53.00	7.19	6.95	0.00
54.00	7.19	6.95	0.00
55.00	7.19	6.95	0.00
56.00	7.19	6.95	0.00
57.00	7.19	6.95	0.00
58.00	7.19	6.95	0.00
59.00	7.19	6.95	0.00
60.00	7.19	6.95	0.00
61.00	7.19	6.95	0.00
62.00	7.19	6.95	0.00
63.00	7.19	6.95	0.00
64.00	7.19	6.95	0.00
65.00	7.19	6.95	0.00
66.00	7.19	6.95	0.00
67.00	7.19	6.95	0.00
68.00	7.19	6.95	0.00
69.00	7.19	6.95	0.00
70.00	7.19	6.95	0.00
71.00	7.19	6.95	0.00
72.00	7.19	6.95	0.00

Summary for Subcatchment DA3: Walgreens Parking lot to CB

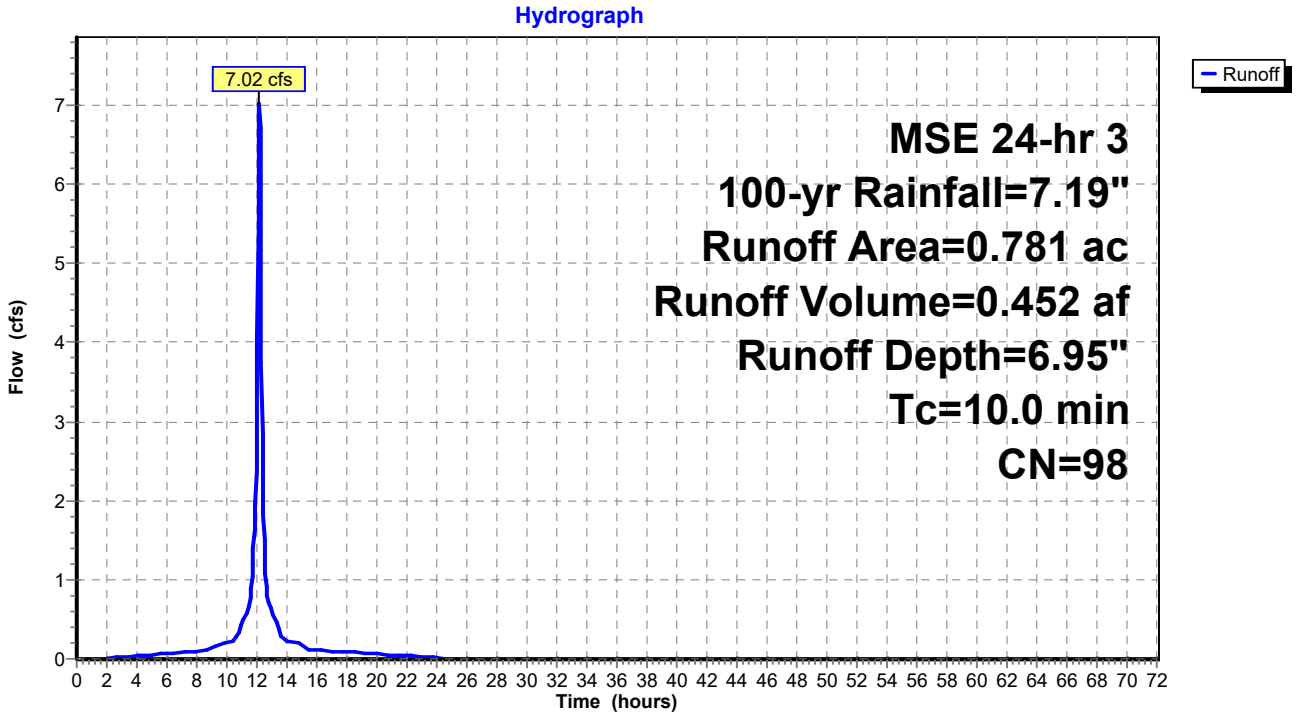
Runoff = 7.02 cfs @ 12.17 hrs, Volume= 0.452 af, Depth= 6.95"
Routed to Reach 3.1 : 12-in Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-yr Rainfall=7.19"

Area (ac)	CN	Description
0.781	98	Paved parking, HSG D
0.781		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, Minimum Entry**

Subcatchment DA3: Walgreens Parking lot to CB



Hydrograph for Subcatchment DA3: Walgreens Parking lot to CB

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.03	0.00	0.00
2.00	0.07	0.00	0.01
3.00	0.12	0.02	0.02
4.00	0.19	0.06	0.04
5.00	0.27	0.12	0.05
6.00	0.37	0.20	0.07
7.00	0.48	0.30	0.08
8.00	0.60	0.41	0.09
9.00	0.74	0.54	0.11
10.00	0.99	0.78	0.20
11.00	1.39	1.17	0.44
12.00	3.33	3.10	**3.06**
13.00	5.80	5.57	**0.58**
14.00	6.20	5.96	0.21
15.00	6.45	6.21	0.19
16.00	6.59	6.35	0.11
17.00	6.71	6.47	0.09
18.00	6.82	6.58	0.08
19.00	6.92	6.68	0.07
20.00	7.00	6.76	0.06
21.00	7.07	6.83	0.05
22.00	7.12	6.89	0.04
23.00	7.16	6.93	0.03
24.00	**7.19**	**6.95**	0.02
25.00	7.19	6.95	0.00
26.00	7.19	6.95	0.00
27.00	7.19	6.95	0.00
28.00	7.19	6.95	0.00
29.00	7.19	6.95	0.00
30.00	7.19	6.95	0.00
31.00	7.19	6.95	0.00
32.00	7.19	6.95	0.00
33.00	7.19	6.95	0.00
34.00	7.19	6.95	0.00
35.00	7.19	6.95	0.00
36.00	7.19	6.95	0.00
37.00	7.19	6.95	0.00
38.00	7.19	6.95	0.00
39.00	7.19	6.95	0.00
40.00	7.19	6.95	0.00
41.00	7.19	6.95	0.00
42.00	7.19	6.95	0.00
43.00	7.19	6.95	0.00
44.00	7.19	6.95	0.00
45.00	7.19	6.95	0.00
46.00	7.19	6.95	0.00
47.00	7.19	6.95	0.00
48.00	7.19	6.95	0.00
49.00	7.19	6.95	0.00
50.00	7.19	6.95	0.00
51.00	7.19	6.95	0.00
52.00	7.19	6.95	0.00
53.00	7.19	6.95	0.00
54.00	7.19	6.95	0.00
55.00	7.19	6.95	0.00
56.00	7.19	6.95	0.00
57.00	7.19	6.95	0.00
58.00	7.19	6.95	0.00
59.00	7.19	6.95	0.00
60.00	7.19	6.95	0.00
61.00	7.19	6.95	0.00
62.00	7.19	6.95	0.00
63.00	7.19	6.95	0.00
64.00	7.19	6.95	0.00
65.00	7.19	6.95	0.00
66.00	7.19	6.95	0.00
67.00	7.19	6.95	0.00
68.00	7.19	6.95	0.00
69.00	7.19	6.95	0.00
70.00	7.19	6.95	0.00
71.00	7.19	6.95	0.00
72.00	7.19	6.95	0.00

Summary for Subcatchment PSB: Public Safety Building (OFFSITE)

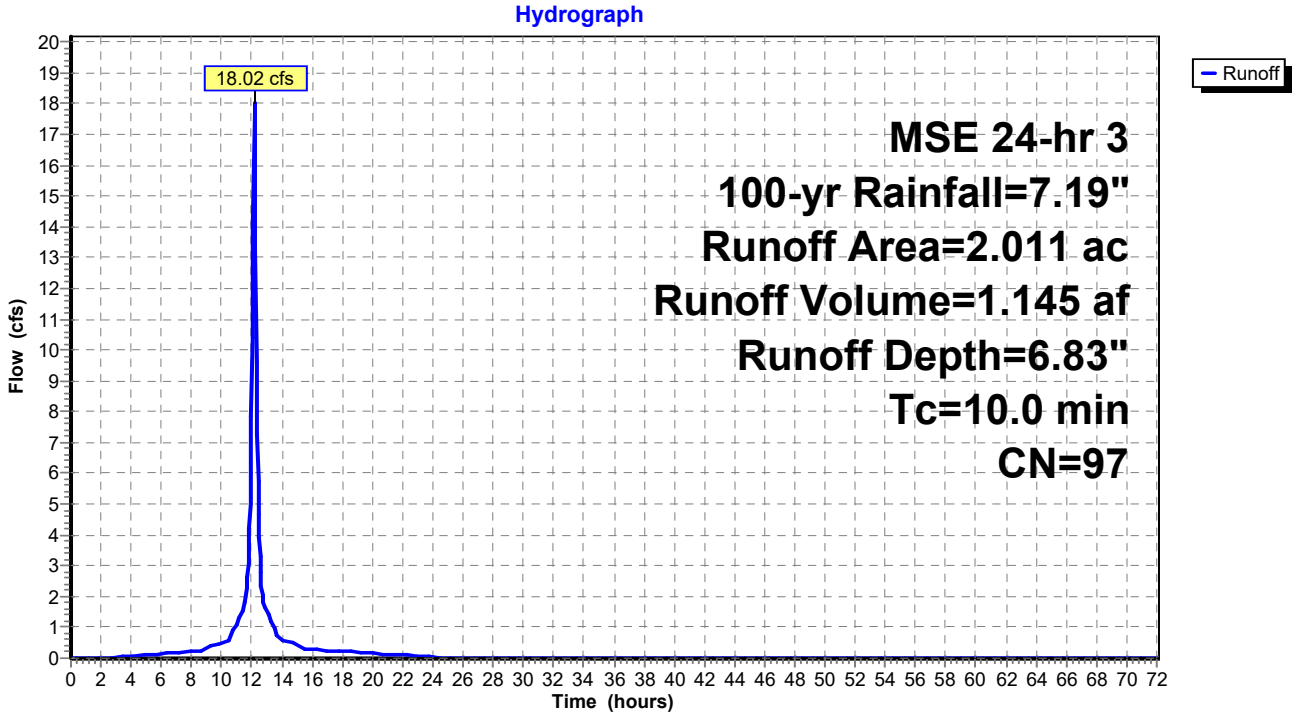
Runoff = 18.02 cfs @ 12.17 hrs, Volume= 1.145 af, Depth= 6.83"
Routed to Reach PSB.1 : 15-in RCP from PSB (OFFSITE)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-yr Rainfall=7.19"

Area (ac)	CN	Description
1.908	98	Roofs, HSG D
0.103	82	Woods/grass comb., Fair, HSG D
2.011	97	Weighted Average
0.103		5.12% Pervious Area
1.908		94.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, Minimum Entry**

Subcatchment PSB: Public Safety Building (OFFSITE)



Hydrograph for Subcatchment PSB: Public Safety Building (OFFSITE)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
1.00	0.03	0.00	0.00
2.00	0.07	0.00	0.00
3.00	0.12	0.01	0.03
4.00	0.19	0.04	0.07
5.00	0.27	0.08	0.11
6.00	0.37	0.15	0.15
7.00	0.48	0.24	0.19
8.00	0.60	0.34	0.23
9.00	0.74	0.47	0.26
10.00	0.99	0.69	0.49
11.00	1.39	1.07	1.12
12.00	3.33	2.98	**7.84**
13.00	5.80	5.45	**1.50**
14.00	6.20	5.85	0.54
15.00	6.45	6.09	0.48
16.00	6.59	6.23	0.27
17.00	6.71	6.36	0.24
18.00	6.82	6.47	0.21
19.00	6.92	6.56	0.19
20.00	7.00	6.64	0.16
21.00	7.07	6.71	0.13
22.00	7.12	6.77	0.10
23.00	7.16	6.81	0.07
24.00	**7.19**	**6.83**	0.04
25.00	7.19	6.83	0.00
26.00	7.19	6.83	0.00
27.00	7.19	6.83	0.00
28.00	7.19	6.83	0.00
29.00	7.19	6.83	0.00
30.00	7.19	6.83	0.00
31.00	7.19	6.83	0.00
32.00	7.19	6.83	0.00
33.00	7.19	6.83	0.00
34.00	7.19	6.83	0.00
35.00	7.19	6.83	0.00
36.00	7.19	6.83	0.00
37.00	7.19	6.83	0.00
38.00	7.19	6.83	0.00
39.00	7.19	6.83	0.00
40.00	7.19	6.83	0.00
41.00	7.19	6.83	0.00
42.00	7.19	6.83	0.00
43.00	7.19	6.83	0.00
44.00	7.19	6.83	0.00
45.00	7.19	6.83	0.00
46.00	7.19	6.83	0.00
47.00	7.19	6.83	0.00
48.00	7.19	6.83	0.00
49.00	7.19	6.83	0.00
50.00	7.19	6.83	0.00
51.00	7.19	6.83	0.00
52.00	7.19	6.83	0.00
53.00	7.19	6.83	0.00
54.00	7.19	6.83	0.00
55.00	7.19	6.83	0.00
56.00	7.19	6.83	0.00
57.00	7.19	6.83	0.00
58.00	7.19	6.83	0.00
59.00	7.19	6.83	0.00
60.00	7.19	6.83	0.00
61.00	7.19	6.83	0.00
62.00	7.19	6.83	0.00
63.00	7.19	6.83	0.00
64.00	7.19	6.83	0.00
65.00	7.19	6.83	0.00
66.00	7.19	6.83	0.00
67.00	7.19	6.83	0.00
68.00	7.19	6.83	0.00
69.00	7.19	6.83	0.00
70.00	7.19	6.83	0.00
71.00	7.19	6.83	0.00
72.00	7.19	6.83	0.00

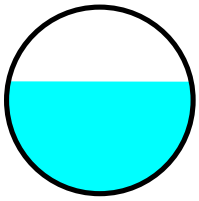
Summary for Reach 2.1: 12-in RCP

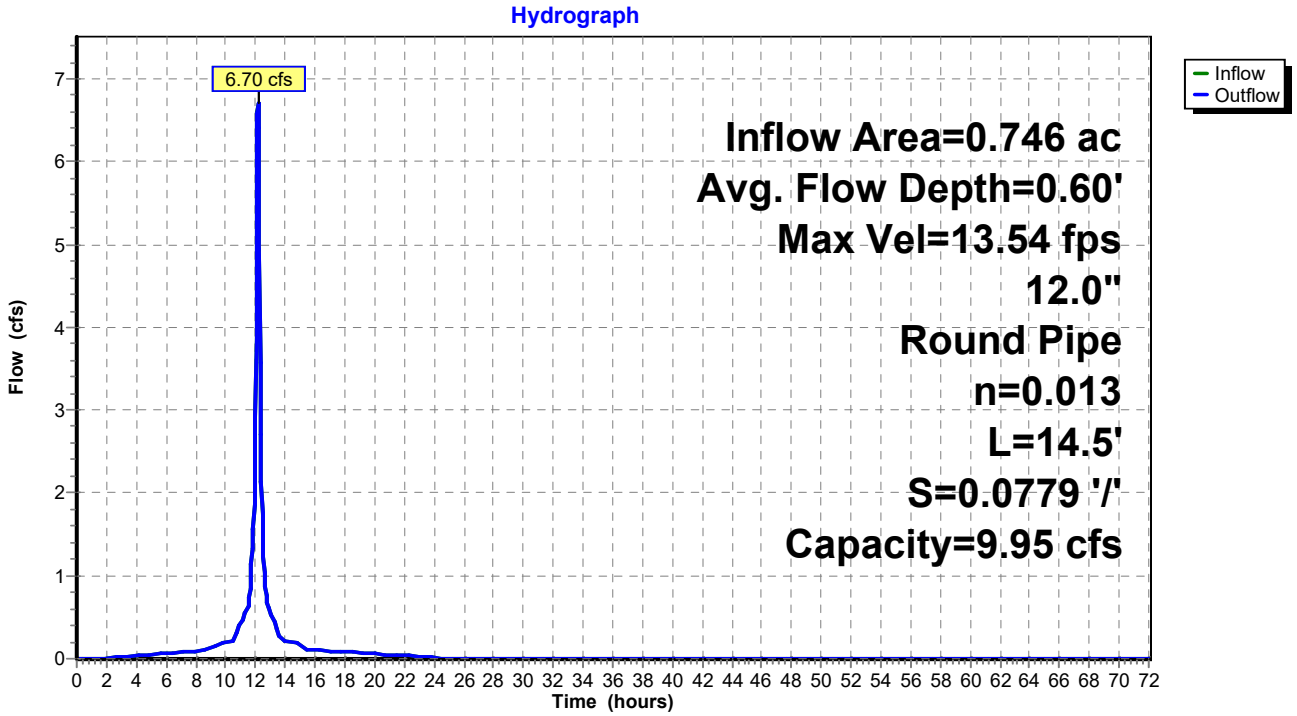
Inflow Area = 0.746 ac, 97.99% Impervious, Inflow Depth = 6.95" for 100-yr event
Inflow = 6.71 cfs @ 12.17 hrs, Volume= 0.432 af
Outflow = 6.70 cfs @ 12.17 hrs, Volume= 0.432 af, Atten= 0%, Lag= 0.0 min
Routed to Reach 2.2 : 21-in RCP

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 13.54 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 4.10 fps, Avg. Travel Time= 0.1 min

Peak Storage= 7 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.60' , Surface Width= 0.98'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 9.95 cfs

12.0" Round Pipe
n= 0.013 Concrete pipe, bends & connections
Length= 14.5' Slope= 0.0779 '/'
Inlet Invert= 773.11', Outlet Invert= 771.98'





Hydrograph for Reach 2.1: 12-in RCP

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	773.11	0.00
2.50	0.01	0	773.14	0.01
5.00	0.05	0	773.16	0.05
7.50	0.08	0	773.17	0.08
10.00	**0.19**	**1**	**773.21**	**0.19**
12.50	**1.45**	**2**	**773.37**	**1.45**
15.00	0.18	1	773.20	0.18
17.50	0.08	0	773.18	0.08
20.00	0.06	0	773.16	0.06
22.50	0.03	0	773.15	0.03
25.00	0.00	0	773.11	0.00
27.50	0.00	0	773.11	0.00
30.00	0.00	0	773.11	0.00
32.50	0.00	0	773.11	0.00
35.00	0.00	0	773.11	0.00
37.50	0.00	0	773.11	0.00
40.00	0.00	0	773.11	0.00
42.50	0.00	0	773.11	0.00
45.00	0.00	0	773.11	0.00
47.50	0.00	0	773.11	0.00
50.00	0.00	0	773.11	0.00
52.50	0.00	0	773.11	0.00
55.00	0.00	0	773.11	0.00
57.50	0.00	0	773.11	0.00
60.00	0.00	0	773.11	0.00
62.50	0.00	0	773.11	0.00
65.00	0.00	0	773.11	0.00
67.50	0.00	0	773.11	0.00
70.00	0.00	0	773.11	0.00

Stage-Discharge for Reach 2.1: 12-in RCP

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
773.11	0.00	0.00
773.12	1.13	0.00
773.13	1.78	0.01
773.14	2.33	0.02
773.15	2.81	0.03
773.16	3.25	0.05
773.17	3.66	0.07
773.18	4.04	0.10
773.19	4.41	0.13
773.20	4.75	0.17
773.21	5.08	0.21
773.22	5.40	0.25
773.23	5.70	0.30
773.24	5.99	0.36
773.25	6.27	0.42
773.26	6.54	0.48
773.27	6.81	0.55
773.28	7.06	0.63
773.29	7.31	0.70
773.30	7.55	0.78
773.31	7.79	0.87
773.32	8.02	0.96
773.33	8.24	1.06
773.34	8.46	1.15
773.35	8.67	1.26
773.36	8.87	1.36
773.37	9.07	1.47
773.38	9.27	1.59
773.39	9.46	1.70
773.40	9.65	1.82
773.41	9.83	1.95
773.42	10.01	2.08
773.43	10.18	2.21
773.44	10.35	2.34
773.45	10.51	2.48
773.46	10.68	2.62
773.47	10.83	2.76
773.48	10.99	2.90
773.49	11.14	3.05
773.50	11.28	3.20
773.51	11.42	3.35
773.52	11.56	3.51
773.53	11.70	3.66
773.54	11.83	3.82
773.55	11.96	3.98
773.56	12.09	4.14
773.57	12.21	4.31
773.58	12.33	4.47
773.59	12.44	4.64
773.60	12.55	4.80
773.61	12.66	4.97
773.62	12.77	5.14
773.63	12.87	5.31
773.64	12.97	5.48
773.65	13.07	5.65
773.66	13.16	5.83
773.67	13.25	6.00
773.68	13.34	6.17
773.69	13.42	6.34
773.70	13.50	6.51
773.71	13.58	6.68
773.72	13.66	6.85
773.73	13.73	7.02
773.74	13.79	7.19
773.75	13.86	7.36
773.76	13.92	7.52
773.77	13.98	7.69
773.78	14.03	7.85
773.79	14.09	8.01
773.80	14.14	8.17
773.81	14.18	8.33
773.82	14.22	8.48
773.83	14.26	8.63
773.84	14.30	8.78
773.85	14.33	8.93
773.86	14.35	9.07
773.87	14.38	9.21
773.88	14.40	9.34
773.89	14.41	9.47
773.90	14.43	9.60
773.91	14.43	9.72
773.92	**14.44**	9.84
773.93	14.44	9.95
773.94	14.43	10.06
773.95	14.42	10.16
773.96	14.40	10.25
773.97	14.38	10.34
773.98	14.36	10.41
773.99	14.32	10.48
774.00	14.28	10.55
774.01	14.24	10.60
774.02	14.18	10.64
774.03	14.12	10.67
774.04	14.05	10.69
774.05	13.96	**10.70**
774.06	13.87	10.69
774.07	13.75	10.66
774.08	13.62	10.60
774.09	13.45	10.51
774.10	13.22	10.36
774.11	12.66	9.95

Stage-Area-Storage for Reach 2.1: 12-in RCP

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
773.11	0.0	0
773.12	0.0	0
773.13	0.0	0
773.14	0.0	0
773.15	0.0	0
773.16	0.0	0
773.17	0.0	0
773.18	0.0	0
773.19	0.0	0
773.20	0.0	1
773.21	0.0	1
773.22	0.0	1
773.23	0.1	1
773.24	0.1	1
773.25	0.1	1
773.26	0.1	1
773.27	0.1	1
773.28	0.1	1
773.29	0.1	1
773.30	0.1	2
773.31	0.1	2
773.32	0.1	2
773.33	0.1	2
773.34	0.1	2
773.35	0.1	2
773.36	0.2	2
773.37	0.2	2
773.38	0.2	2
773.39	0.2	3
773.40	0.2	3
773.41	0.2	3
773.42	0.2	3
773.43	0.2	3
773.44	0.2	3
773.45	0.2	3
773.46	0.2	4
773.47	0.3	4
773.48	0.3	4
773.49	0.3	4
773.50	0.3	4
773.51	0.3	4
773.52	0.3	4
773.53	0.3	5
773.54	0.3	5
773.55	0.3	5
773.56	0.3	5
773.57	0.4	5
773.58	0.4	5
773.59	0.4	5
773.60	0.4	6
773.61	0.4	6
773.62	0.4	6
773.63	0.4	6
773.64	0.4	6
773.65	0.4	6
773.66	0.4	6
773.67	0.5	7
773.68	0.5	7
773.69	0.5	7
773.70	0.5	7
773.71	0.5	7
773.72	0.5	7
773.73	0.5	7
773.74	0.5	8
773.75	0.5	8
773.76	0.5	8
773.77	0.5	8
773.78	0.6	8
773.79	0.6	8
773.80	0.6	8
773.81	0.6	9
773.82	0.6	9
773.83	0.6	9
773.84	0.6	9
773.85	0.6	9
773.86	0.6	9
773.87	0.6	9
773.88	0.6	9
773.89	0.7	10
773.90	0.7	10
773.91	0.7	10
773.92	0.7	10
773.93	0.7	10
773.94	0.7	10
773.95	0.7	10
773.96	0.7	10
773.97	0.7	10
773.98	0.7	11
773.99	0.7	11
774.00	0.7	11
774.01	0.7	11
774.02	0.8	11
774.03	0.8	11
774.04	0.8	11
774.05	0.8	11
774.06	0.8	11
774.07	0.8	11
774.08	0.8	11
774.09	0.8	11
774.10	0.8	11
774.11	**0.8**	**11**

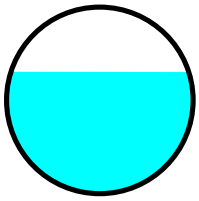
Summary for Reach 2.2: 21-in RCP

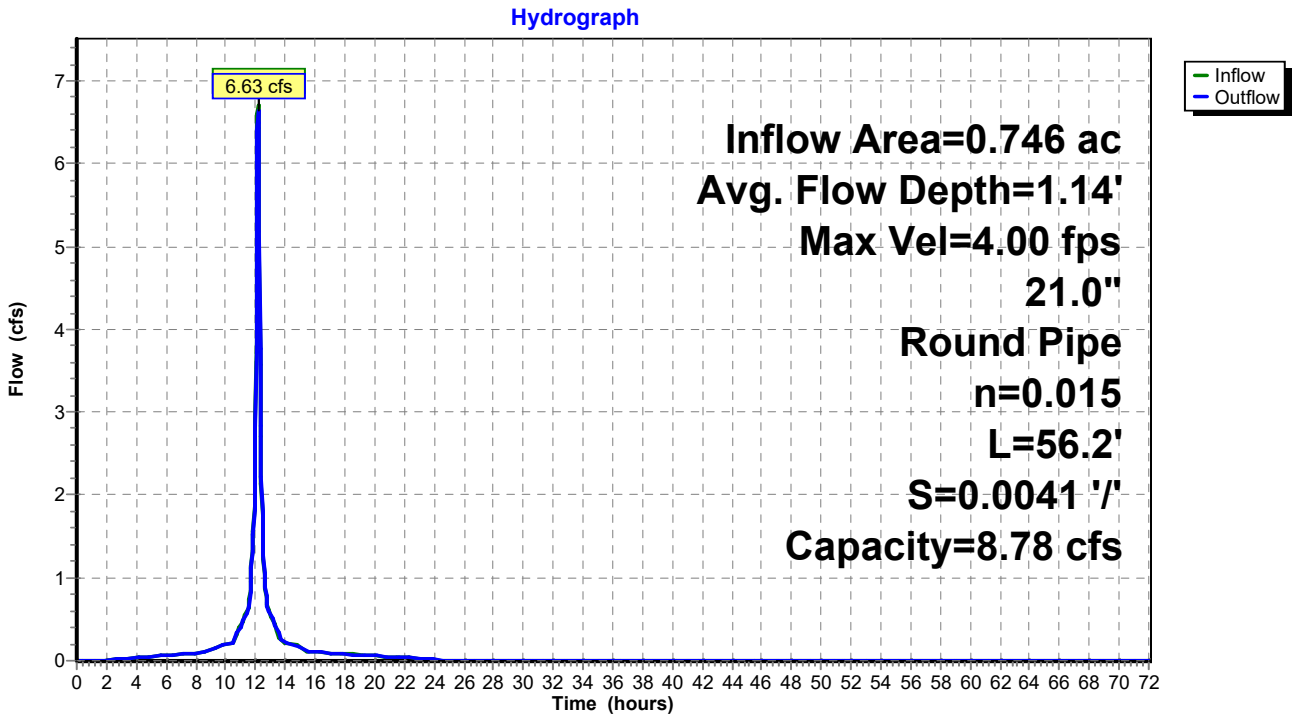
Inflow Area = 0.746 ac, 97.99% Impervious, Inflow Depth = 6.95" for 100-yr event
Inflow = 6.70 cfs @ 12.17 hrs, Volume= 0.432 af
Outflow = 6.63 cfs @ 12.18 hrs, Volume= 0.432 af, Atten= 1%, Lag= 0.5 min
Routed to Reach N FLOWS : 108-in RCP

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.00 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.22 fps, Avg. Travel Time= 0.8 min

Peak Storage= 93 cf @ 12.17 hrs
Average Depth at Peak Storage= 1.14' , Surface Width= 1.67'
Bank-Full Depth= 1.75' Flow Area= 2.4 sf, Capacity= 8.78 cfs

21.0" Round Pipe
n= 0.015 Concrete sewer w/manholes & inlets
Length= 56.2' Slope= 0.0041 '/'
Inlet Invert= 771.98', Outlet Invert= 771.75'





Hydrograph for Reach 2.2: 21-in RCP

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	771.98	0.00
2.50	0.01	1	772.03	0.01
5.00	0.05	3	772.07	0.05
7.50	0.08	4	772.10	0.08
10.00	**0.19**	**7**	**772.16**	**0.19**
12.50	**1.45**	**31**	**772.46**	**1.50**
15.00	0.18	7	772.15	0.18
17.50	0.08	4	772.10	0.09
20.00	0.06	3	772.08	0.06
22.50	0.03	2	772.06	0.03
25.00	0.00	0	771.98	0.00
27.50	0.00	0	771.98	0.00
30.00	0.00	0	771.98	0.00
32.50	0.00	0	771.98	0.00
35.00	0.00	0	771.98	0.00
37.50	0.00	0	771.98	0.00
40.00	0.00	0	771.98	0.00
42.50	0.00	0	771.98	0.00
45.00	0.00	0	771.98	0.00
47.50	0.00	0	771.98	0.00
50.00	0.00	0	771.98	0.00
52.50	0.00	0	771.98	0.00
55.00	0.00	0	771.98	0.00
57.50	0.00	0	771.98	0.00
60.00	0.00	0	771.98	0.00
62.50	0.00	0	771.98	0.00
65.00	0.00	0	771.98	0.00
67.50	0.00	0	771.98	0.00
70.00	0.00	0	771.98	0.00

Stage-Discharge for Reach 2.2: 21-in RCP

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
771.98	0.00	0.00
772.00	0.35	0.00
772.02	0.56	0.01
772.04	0.73	0.02
772.06	0.88	0.04
772.08	1.02	0.06
772.10	1.15	0.08
772.12	1.27	0.11
772.14	1.38	0.15
772.16	1.49	0.20
772.18	1.59	0.24
772.20	1.69	0.30
772.22	1.79	0.36
772.24	1.88	0.42
772.26	1.96	0.49
772.28	2.05	0.56
772.30	2.13	0.64
772.32	2.21	0.73
772.34	2.28	0.81
772.36	2.36	0.91
772.38	2.43	1.01
772.40	2.50	1.11
772.42	2.57	1.22
772.44	2.63	1.33
772.46	2.70	1.45
772.48	2.76	1.57
772.50	2.82	1.69
772.52	2.88	1.82
772.54	2.94	1.95
772.56	2.99	2.08
772.58	3.05	2.22
772.60	3.10	2.36
772.62	3.15	2.51
772.64	3.20	2.66
772.66	3.25	2.81
772.68	3.30	2.96
772.70	3.34	3.12
772.72	3.39	3.27
772.74	3.43	3.44
772.76	3.47	3.60
772.78	3.51	3.76
772.80	3.55	3.93
772.82	3.59	4.10
772.84	3.63	4.27
772.86	3.66	4.44
772.88	3.70	4.61
772.90	3.73	4.78
772.92	3.76	4.95
772.94	3.79	5.12
772.96	3.82	5.30
772.98	3.85	5.47
773.00	3.88	5.64
773.02	3.90	5.82
773.04	3.93	5.99
773.06	3.95	6.16
773.08	3.98	6.33
773.10	4.00	6.50
773.12	4.02	6.67
773.14	4.04	6.83
773.16	4.05	7.00
773.18	4.07	7.16
773.20	4.09	7.32
773.22	4.10	7.47
773.24	4.11	7.63
773.26	4.12	7.77
773.28	4.13	7.92
773.30	4.14	8.06
773.32	4.15	8.20
773.34	4.16	8.33
773.36	4.16	8.46
773.38	4.16	8.59
773.40	**4.16**	8.70
773.42	4.16	8.82
773.44	4.16	8.92
773.46	4.16	9.02
773.48	4.15	9.11
773.50	4.14	9.19
773.52	4.13	9.26
773.54	4.12	9.32
773.56	4.10	9.37
773.58	4.08	9.41
773.60	4.06	9.44
773.62	4.03	**9.45**
773.64	4.00	9.44
773.66	3.97	9.41
773.68	3.92	9.35
773.70	3.86	9.25
773.72	3.74	9.00

Stage-Area-Storage for Reach 2.2: 21-in RCP

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
771.98	0.0	0
772.00	0.0	0
772.02	0.0	1
772.04	0.0	1
772.06	0.0	2
772.08	0.1	3
772.10	0.1	4
772.12	0.1	5
772.14	0.1	6
772.16	0.1	7
772.18	0.2	9
772.20	0.2	10
772.22	0.2	11
772.24	0.2	13
772.26	0.2	14
772.28	0.3	15
772.30	0.3	17
772.32	0.3	18
772.34	0.4	20
772.36	0.4	22
772.38	0.4	23
772.40	0.4	25
772.42	0.5	27
772.44	0.5	28
772.46	0.5	30
772.48	0.6	32
772.50	0.6	34
772.52	0.6	35
772.54	0.7	37
772.56	0.7	39
772.58	0.7	41
772.60	0.8	43
772.62	0.8	45
772.64	0.8	47
772.66	0.9	49
772.68	0.9	50
772.70	0.9	52
772.72	1.0	54
772.74	1.0	56
772.76	1.0	58
772.78	1.1	60
772.80	1.1	62
772.82	1.1	64
772.84	1.2	66
772.86	1.2	68
772.88	1.2	70
772.90	1.3	72
772.92	1.3	74
772.94	1.4	76
772.96	1.4	78
772.98	1.4	80
773.00	1.5	82
773.02	1.5	84
773.04	1.5	86
773.06	1.6	88
773.08	1.6	89
773.10	1.6	91
773.12	1.7	93
773.14	1.7	95
773.16	1.7	97
773.18	1.8	99
773.20	1.8	101
773.22	1.8	102
773.24	1.9	104
773.26	1.9	106
773.28	1.9	108
773.30	1.9	109
773.32	2.0	111
773.34	2.0	113
773.36	2.0	114
773.38	2.1	116
773.40	2.1	117
773.42	2.1	119
773.44	2.1	120
773.46	2.2	122
773.48	2.2	123
773.50	2.2	125
773.52	2.2	126
773.54	2.3	127
773.56	2.3	128
773.58	2.3	130
773.60	2.3	131
773.62	2.3	132
773.64	2.4	133
773.66	2.4	133
773.68	2.4	134
773.70	2.4	135
773.72	**2.4**	**135**

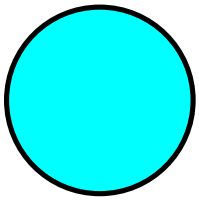
Summary for Reach 3.1: 12-in Catch Basin

Inflow Area = 0.781 ac,100.00% Impervious, Inflow Depth = 6.95" for 100-yr event
Inflow = 7.02 cfs @ 12.17 hrs, Volume= 0.452 af
Outflow = 3.08 cfs @ 12.75 hrs, Volume= 0.452 af, Atten= 56%, Lag= 34.9 min
Routed to Reach N FLOWS : 108-in RCP

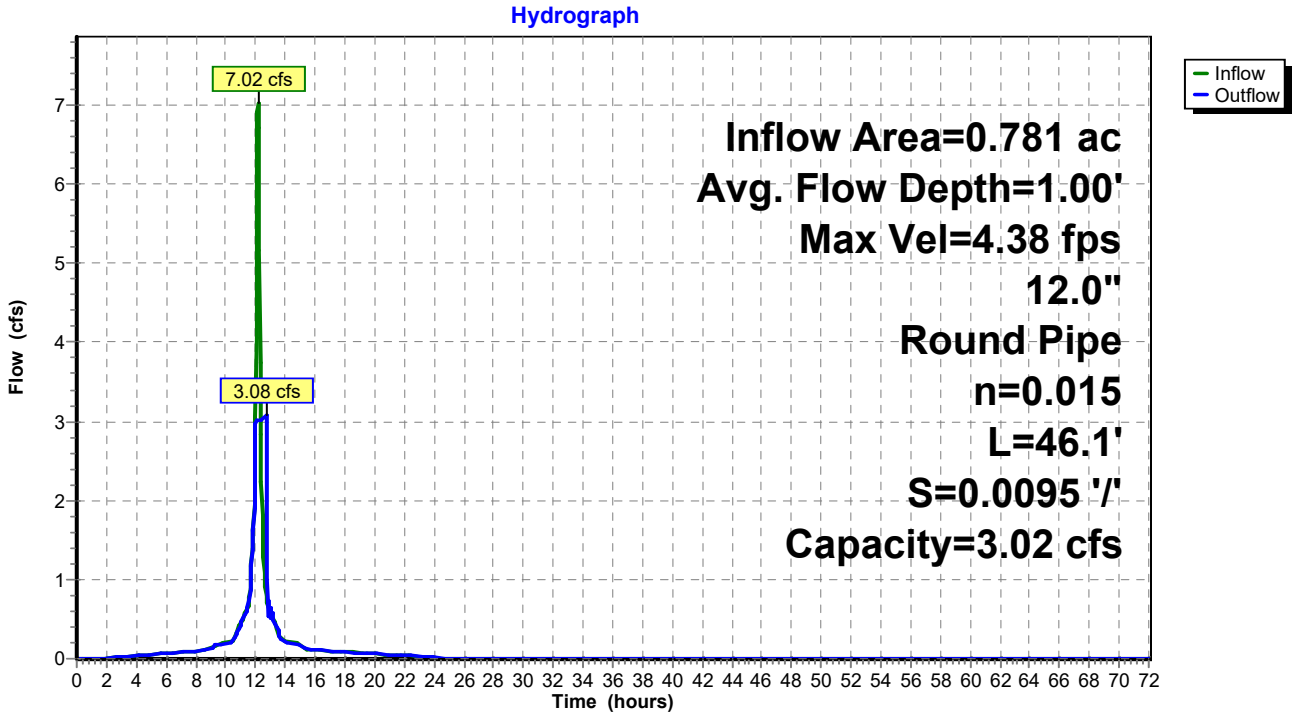
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.38 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.77 fps, Avg. Travel Time= 0.4 min

Peak Storage= 36 cf @ 12.05 hrs
Average Depth at Peak Storage= 1.00'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.02 cfs

12.0" Round Pipe
n= 0.015 Concrete sewer w/manholes & inlets
Length= 46.1' Slope= 0.0095 '/'
Inlet Invert= 772.55', Outlet Invert= 772.11'



Reach 3.1: 12-in Catch Basin



Hydrograph for Reach 3.1: 12-in Catch Basin

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	772.55	0.00
2.50	0.01	1	772.60	0.01
5.00	0.05	2	772.64	0.05
7.50	0.09	2	772.67	0.09
10.00	**0.20**	**4**	**772.72**	0.20
12.50	**1.52**	**36**	**773.55**	**3.02**
15.00	0.19	4	772.72	**0.19**
17.50	0.09	2	772.67	0.09
20.00	0.06	2	772.65	0.06
22.50	0.03	1	772.62	0.03
25.00	0.00	0	772.55	0.00
27.50	0.00	0	772.55	0.00
30.00	0.00	0	772.55	0.00
32.50	0.00	0	772.55	0.00
35.00	0.00	0	772.55	0.00
37.50	0.00	0	772.55	0.00
40.00	0.00	0	772.55	0.00
42.50	0.00	0	772.55	0.00
45.00	0.00	0	772.55	0.00
47.50	0.00	0	772.55	0.00
50.00	0.00	0	772.55	0.00
52.50	0.00	0	772.55	0.00
55.00	0.00	0	772.55	0.00
57.50	0.00	0	772.55	0.00
60.00	0.00	0	772.55	0.00
62.50	0.00	0	772.55	0.00
65.00	0.00	0	772.55	0.00
67.50	0.00	0	772.55	0.00
70.00	0.00	0	772.55	0.00

Stage-Discharge for Reach 3.1: 12-in Catch Basin

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
772.55	0.00	0.00
772.56	0.34	0.00
772.57	0.54	0.00
772.58	0.71	0.00
772.59	0.85	0.01
772.60	0.99	0.01
772.61	1.11	0.02
772.62	1.23	0.03
772.63	1.34	0.04
772.64	1.44	0.05
772.65	1.54	0.06
772.66	1.64	0.08
772.67	1.73	0.09
772.68	1.82	0.11
772.69	1.90	0.13
772.70	1.98	0.15
772.71	2.06	0.17
772.72	2.14	0.19
772.73	2.22	0.21
772.74	2.29	0.24
772.75	2.36	0.26
772.76	2.43	0.29
772.77	2.50	0.32
772.78	2.56	0.35
772.79	2.63	0.38
772.80	2.69	0.41
772.81	2.75	0.45
772.82	2.81	0.48
772.83	2.87	0.52
772.84	2.93	0.55
772.85	2.98	0.59
772.86	3.03	0.63
772.87	3.09	0.67
772.88	3.14	0.71
772.89	3.19	0.75
772.90	3.24	0.79
772.91	3.29	0.84
772.92	3.33	0.88
772.93	3.38	0.92
772.94	3.42	0.97
772.95	3.47	1.02
772.96	3.51	1.06
772.97	3.55	1.11
772.98	3.59	1.16
772.99	3.63	1.21
773.00	3.67	1.26
773.01	3.70	1.31
773.02	3.74	1.36
773.03	3.77	1.41
773.04	3.81	1.46
773.05	3.84	1.51
773.06	3.87	1.56
773.07	3.90	1.61
773.08	3.93	1.66
773.09	3.96	1.71
773.10	3.99	1.77
773.11	4.02	1.82
773.12	4.05	1.87
773.13	4.07	1.92
773.14	4.10	1.97
773.15	4.12	2.03
773.16	4.14	2.08
773.17	4.16	2.13
773.18	4.18	2.18
773.19	4.20	2.23
773.20	4.22	2.28
773.21	4.24	2.33
773.22	4.26	2.38
773.23	4.27	2.43
773.24	4.29	2.48
773.25	4.30	2.53
773.26	4.31	2.57
773.27	4.33	2.62
773.28	4.34	2.66
773.29	4.35	2.71
773.30	4.35	2.75
773.31	4.36	2.79
773.32	4.37	2.83
773.33	4.37	2.87
773.34	4.38	2.91
773.35	4.38	2.95
773.36	**4.38**	2.98
773.37	4.38	3.02
773.38	4.38	3.05
773.39	4.37	3.08
773.40	4.37	3.11
773.41	4.36	3.13
773.42	4.35	3.16
773.43	4.34	3.18
773.44	4.33	3.20
773.45	4.32	3.22
773.46	4.30	3.23
773.47	4.28	3.24
773.48	4.26	3.24
773.49	4.24	**3.24**
773.50	4.21	3.24
773.51	4.17	3.23
773.52	4.13	3.21
773.53	4.08	3.19
773.54	4.01	3.14
773.55	3.84	3.02

Stage-Area-Storage for Reach 3.1: 12-in Catch Basin

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
772.55	0.0	0
772.56	0.0	0
772.57	0.0	0
772.58	0.0	0
772.59	0.0	0
772.60	0.0	1
772.61	0.0	1
772.62	0.0	1
772.63	0.0	1
772.64	0.0	2
772.65	0.0	2
772.66	0.0	2
772.67	0.1	2
772.68	0.1	3
772.69	0.1	3
772.70	0.1	3
772.71	0.1	4
772.72	0.1	4
772.73	0.1	4
772.74	0.1	5
772.75	0.1	5
772.76	0.1	6
772.77	0.1	6
772.78	0.1	6
772.79	0.1	7
772.80	0.2	7
772.81	0.2	7
772.82	0.2	8
772.83	0.2	8
772.84	0.2	9
772.85	0.2	9
772.86	0.2	10
772.87	0.2	10
772.88	0.2	10
772.89	0.2	11
772.90	0.2	11
772.91	0.3	12
772.92	0.3	12
772.93	0.3	13
772.94	0.3	13
772.95	0.3	14
772.96	0.3	14
772.97	0.3	14
772.98	0.3	15
772.99	0.3	15
773.00	0.3	16
773.01	0.4	16
773.02	0.4	17
773.03	0.4	17
773.04	0.4	18
773.05	0.4	18
773.06	0.4	19
773.07	0.4	19
773.08	0.4	19
773.09	0.4	20
773.10	0.4	20
773.11	0.5	21
773.12	0.5	21
773.13	0.5	22
773.14	0.5	22
773.15	0.5	23
773.16	0.5	23
773.17	0.5	24
773.18	0.5	24
773.19	0.5	24
773.20	0.5	25
773.21	0.5	25
773.22	0.6	26
773.23	0.6	26
773.24	0.6	27
773.25	0.6	27
773.26	0.6	27
773.27	0.6	28
773.28	0.6	28
773.29	0.6	29
773.30	0.6	29
773.31	0.6	30
773.32	0.6	30
773.33	0.7	30
773.34	0.7	31
773.35	0.7	31
773.36	0.7	31
773.37	0.7	32
773.38	0.7	32
773.39	0.7	32
773.40	0.7	33
773.41	0.7	33
773.42	0.7	33
773.43	0.7	34
773.44	0.7	34
773.45	0.7	34
773.46	0.8	35
773.47	0.8	35
773.48	0.8	35
773.49	0.8	35
773.50	0.8	36
773.51	0.8	36
773.52	0.8	36
773.53	0.8	36
773.54	0.8	36
773.55	**0.8**	**36**

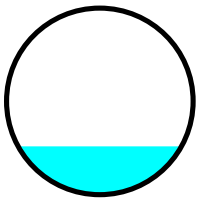
Summary for Reach N FLOWS: 108-in RCP

Inflow Area = 1.527 ac, 99.02% Impervious, Inflow Depth = 6.95" for 100-yr event
Inflow = 9.65 cfs @ 12.18 hrs, Volume= 0.884 af
Outflow = 6.95 cfs @ 12.57 hrs, Volume= 0.884 af, Atten= 28%, Lag= 23.3 min

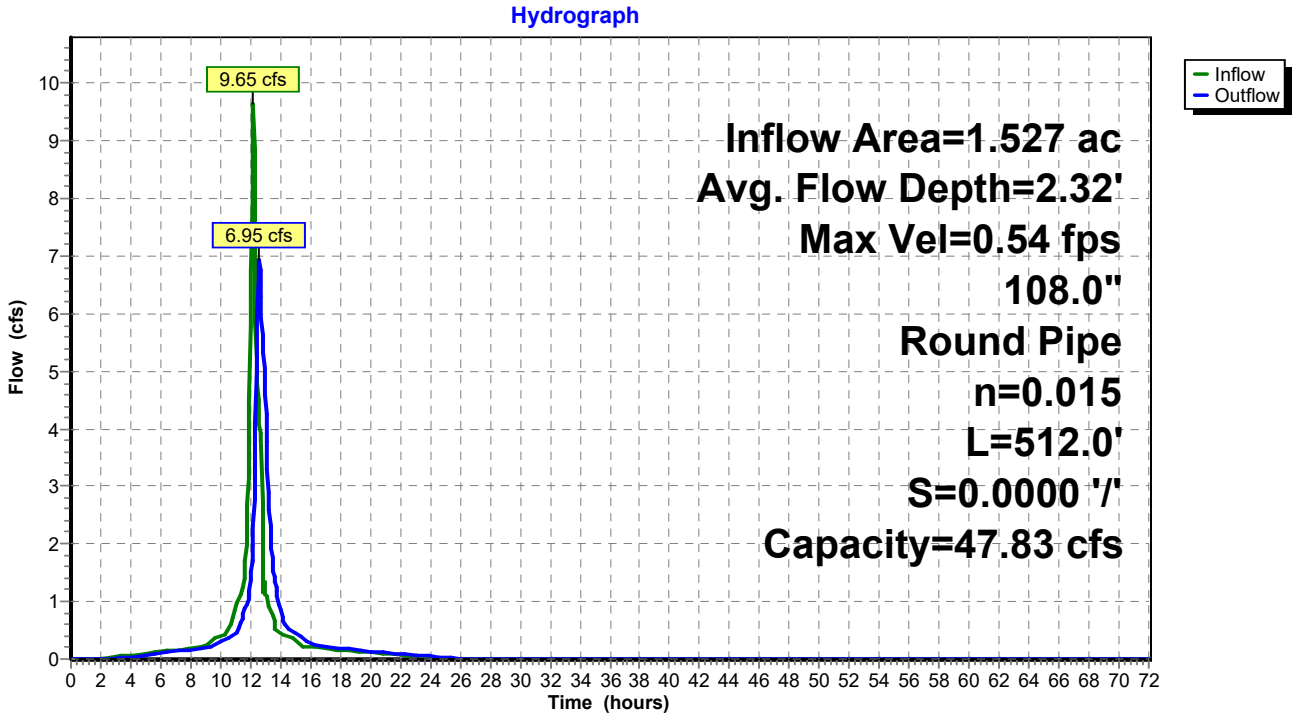
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.54 fps, Min. Travel Time= 15.9 min
Avg. Velocity = 0.14 fps, Avg. Travel Time= 61.4 min

Peak Storage= 6,659 cf @ 12.30 hrs
Average Depth at Peak Storage= 2.32' , Surface Width= 7.88'
Bank-Full Depth= 9.00' Flow Area= 63.6 sf, Capacity= 47.83 cfs

108.0" Round Pipe
n= 0.015 Concrete sewer w/manholes & inlets
Length= 512.0' Slope= 0.0000 '/'
Inlet Invert= 761.00', Outlet Invert= 760.99'



Reach N FLOWS: 108-in RCP



Hydrograph for Reach N FLOWS: 108-in RCP

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	761.00	0.00
2.50	0.02	33	761.05	0.00
5.00	0.10	283	761.27	0.07
7.50	0.17	463	761.37	0.15
10.00	**0.38**	**795**	**761.54**	0.31
12.50	**4.51**	**5,870**	**763.12**	**6.64**
15.00	0.36	897	761.58	**0.43**
17.50	0.17	525	761.41	0.19
20.00	0.12	414	761.35	0.14
22.50	0.06	289	761.27	0.08
25.00	0.00	106	761.14	0.03
27.50	0.00	29	761.05	0.00
30.00	0.00	9	761.01	0.00
32.50	0.00	3	761.00	0.00
35.00	0.00	1	761.00	0.00
37.50	0.00	0	761.00	0.00
40.00	0.00	0	761.00	0.00
42.50	0.00	0	761.00	0.00
45.00	0.00	0	761.00	0.00
47.50	0.00	0	761.00	0.00
50.00	0.00	0	761.00	0.00
52.50	0.00	0	761.00	0.00
55.00	0.00	0	761.00	0.00
57.50	0.00	0	761.00	0.00
60.00	0.00	0	761.00	0.00
62.50	0.00	0	761.00	0.00
65.00	0.00	0	761.00	0.00
67.50	0.00	0	761.00	0.00
70.00	0.00	0	761.00	0.00

Stage-Discharge for Reach N FLOWS: 108-in RCP

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
761.00	0.00	0.00
761.10	0.07	0.01
761.20	0.11	0.04
761.30	0.15	0.10
761.40	0.18	0.18
761.50	0.21	0.29
761.60	0.23	0.43
761.70	0.26	0.59
761.80	0.28	0.78
761.90	0.30	1.00
762.00	0.32	1.25
762.10	0.34	1.52
762.20	0.36	1.82
762.30	0.38	2.15
762.40	0.40	2.51
762.50	0.41	2.89
762.60	0.43	3.30
762.70	0.45	3.73
762.80	0.46	4.19
762.90	0.48	4.67
763.00	0.49	5.18
763.10	0.51	5.71
763.20	0.52	6.27
763.30	0.53	6.84
763.40	0.55	7.44
763.50	0.56	8.06
763.60	0.57	8.70
763.70	0.58	9.37
763.80	0.60	10.05
763.90	0.61	10.75
764.00	0.62	11.47
764.10	0.63	12.20
764.20	0.64	12.96
764.30	0.65	13.72
764.40	0.66	14.51
764.50	0.67	15.30
764.60	0.68	16.12
764.70	0.69	16.94
764.80	0.70	17.78
764.90	0.70	18.63
765.00	0.71	19.49
765.10	0.72	20.36
765.20	0.73	21.23
765.30	0.74	22.12
765.40	0.74	23.01
765.50	0.75	23.91
765.60	0.76	24.82
765.70	0.77	25.73
765.80	0.77	26.64
765.90	0.78	27.55
766.00	0.78	28.47
766.10	0.79	29.39
766.20	0.80	30.30
766.30	0.80	31.22
766.40	0.81	32.13
766.50	0.81	33.04
766.60	0.82	33.94
766.70	0.82	34.84
766.80	0.82	35.73
766.90	0.83	36.61
767.00	0.83	37.49
767.10	0.84	38.35
767.20	0.84	39.20
767.30	0.84	40.04
767.40	0.84	40.86
767.50	0.85	41.67
767.60	0.85	42.46
767.70	0.85	43.23
767.80	0.85	43.98
767.90	0.85	44.71
768.00	0.86	45.41
768.10	0.86	46.09
768.20	**0.86**	46.75
768.30	**0.86**	47.37
768.40	0.86	47.96
768.50	0.86	48.51
768.60	0.86	49.03
768.70	0.85	49.51
768.80	0.85	49.95
768.90	0.85	50.34
769.00	0.85	50.68
769.10	0.85	50.97
769.20	0.84	51.19
769.30	0.84	51.35
769.40	0.83	**51.43**
769.50	0.83	**51.42**
769.60	0.82	51.31
769.70	0.81	51.06
769.80	0.80	50.63
769.90	0.79	49.91
770.00	0.75	47.83

Stage-Area-Storage for Reach N FLOWS: 108-in RCP

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
761.00	0.0	0
761.10	0.1	66
761.20	0.4	184
761.30	0.7	335
761.40	1.0	513
761.50	1.4	714
761.60	1.8	934
761.70	2.3	1,172
761.80	2.8	1,426
761.90	3.3	1,695
762.00	3.9	1,979
762.10	4.4	2,275
762.20	5.0	2,583
762.30	5.7	2,901
762.40	6.3	3,230
762.50	7.0	3,569
762.60	7.7	3,917
762.70	8.3	4,273
762.80	9.1	4,638
762.90	9.8	5,010
763.00	10.5	5,390
763.10	11.3	5,777
763.20	12.1	6,170
763.30	12.8	6,569
763.40	13.6	6,973
763.50	14.4	7,383
763.60	15.2	7,799
763.70	16.1	8,218
763.80	16.9	8,643
763.90	17.7	9,072
764.00	18.6	9,505
764.10	19.4	9,941
764.20	20.3	10,380
764.30	21.1	10,823
764.40	22.0	11,268
764.50	22.9	11,716
764.60	23.8	12,167
764.70	24.6	12,619
764.80	25.5	13,074
764.90	26.4	13,530
765.00	27.3	13,987
765.10	28.2	14,445
765.20	29.1	14,905
765.30	30.0	15,365
765.40	30.9	15,825
765.50	31.8	16,286
765.60	32.7	16,747
765.70	33.6	17,207
765.80	34.5	17,667
765.90	35.4	18,127
766.00	36.3	18,585
766.10	37.2	19,042
766.20	38.1	19,498
766.30	39.0	19,953
766.40	39.9	20,405
766.50	40.7	20,856
766.60	41.6	21,304
766.70	42.5	21,749
766.80	43.3	22,192
766.90	44.2	22,631
767.00	45.1	23,067
767.10	45.9	23,500
767.20	46.7	23,929
767.30	47.6	24,354
767.40	48.4	24,773
767.50	49.2	25,189
767.60	50.0	25,599
767.70	50.8	26,003
767.80	51.6	26,402
767.90	52.3	26,795
768.00	53.1	27,182
768.10	53.8	27,562
768.20	54.6	27,934
768.30	55.3	28,299
768.40	56.0	28,655
768.50	56.6	29,003
768.60	57.3	29,342
768.70	58.0	29,671
768.80	58.6	29,989
768.90	59.2	30,297
769.00	59.8	30,593
769.10	60.3	30,877
769.20	60.8	31,146
769.30	61.3	31,400
769.40	61.8	31,638
769.50	62.2	31,858
769.60	62.6	32,059
769.70	63.0	32,237
769.80	63.3	32,388
769.90	63.5	32,506
770.00	**63.6**	**32,572**

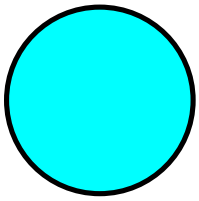
Summary for Reach PSB.1: 15-in RCP from PSB (OFFSITE)

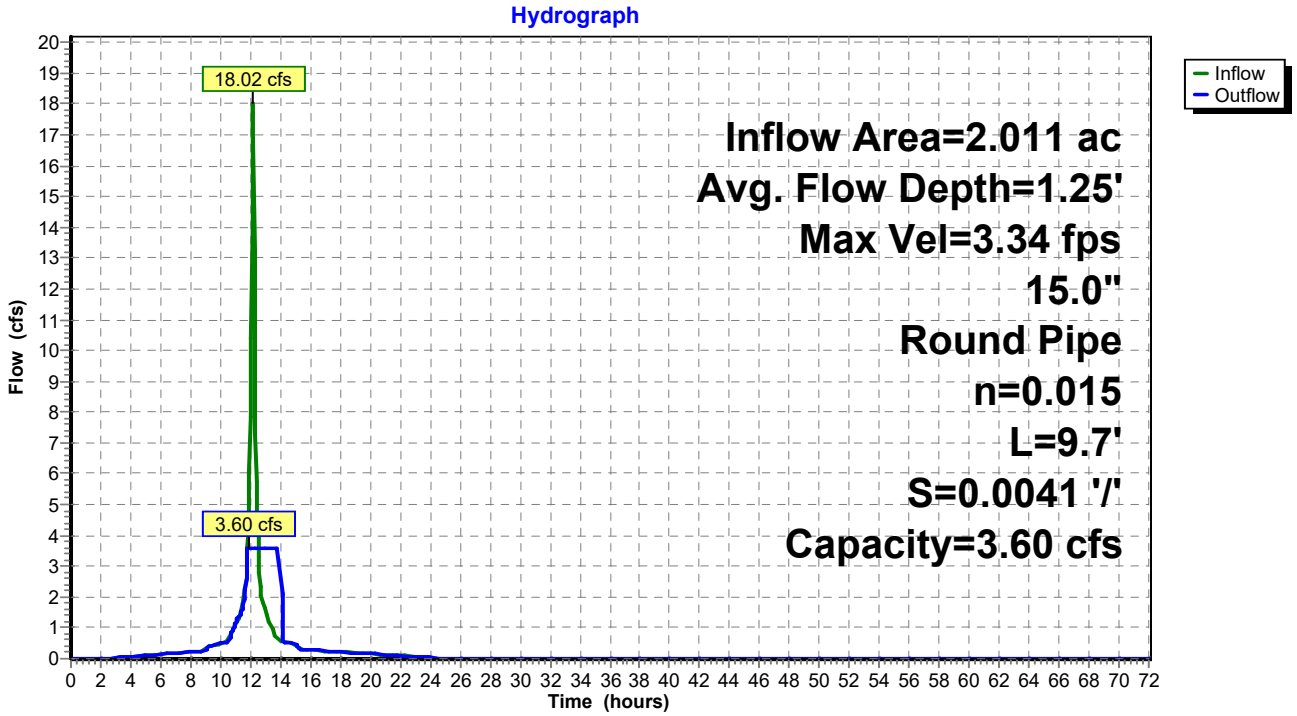
Inflow Area = 2.011 ac, 94.88% Impervious, Inflow Depth = 6.83" for 100-yr event
Inflow = 18.02 cfs @ 12.17 hrs, Volume= 1.145 af
Outflow = 3.60 cfs @ 11.90 hrs, Volume= 1.145 af, Atten= 80%, Lag= 0.0 min
Routed to Reach PSB.2 : 18-in RCP (OFFSITE)

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.34 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.68 fps, Avg. Travel Time= 0.1 min

Peak Storage= 12 cf @ 11.85 hrs
Average Depth at Peak Storage= 1.25'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 3.60 cfs

15.0" Round Pipe
n= 0.015 Concrete sewer w/manholes & inlets
Length= 9.7' Slope= 0.0041 '/'
Inlet Invert= 776.20', Outlet Invert= 776.16'





Hydrograph for Reach PSB.1: 15-in RCP from PSB (OFFSITE)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	776.20	0.00
2.50	0.01	0	776.25	0.01
5.00	0.11	1	776.35	0.11
7.50	0.21	1	776.40	0.21
10.00	**0.49**	**2**	**776.51**	**0.49**
12.50	**3.90**	**12**	**777.45**	**3.60**
15.00	0.48	2	776.51	0.48
17.50	0.23	1	776.41	0.23
20.00	0.16	1	776.38	0.16
22.50	0.08	1	776.33	0.08
25.00	0.00	0	776.20	0.00
27.50	0.00	0	776.20	0.00
30.00	0.00	0	776.20	0.00
32.50	0.00	0	776.20	0.00
35.00	0.00	0	776.20	0.00
37.50	0.00	0	776.20	0.00
40.00	0.00	0	776.20	0.00
42.50	0.00	0	776.20	0.00
45.00	0.00	0	776.20	0.00
47.50	0.00	0	776.20	0.00
50.00	0.00	0	776.20	0.00
52.50	0.00	0	776.20	0.00
55.00	0.00	0	776.20	0.00
57.50	0.00	0	776.20	0.00
60.00	0.00	0	776.20	0.00
62.50	0.00	0	776.20	0.00
65.00	0.00	0	776.20	0.00
67.50	0.00	0	776.20	0.00
70.00	0.00	0	776.20	0.00

Stage-Discharge for Reach PSB.1: 15-in RCP from PSB (OFFSITE)

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
776.20	0.00	0.00
776.21	0.21	0.00
776.22	0.35	0.00
776.23	0.46	0.00
776.24	0.56	0.01
776.25	0.65	0.01
776.26	0.73	0.02
776.27	0.81	0.02
776.28	0.88	0.03
776.29	0.95	0.04
776.30	1.02	0.05
776.31	1.08	0.06
776.32	1.14	0.07
776.33	1.20	0.08
776.34	1.26	0.10
776.35	1.32	0.11
776.36	1.37	0.13
776.37	1.42	0.14
776.38	1.48	0.16
776.39	1.53	0.18
776.40	1.58	0.20
776.41	1.62	0.22
776.42	1.67	0.24
776.43	1.71	0.27
776.44	1.76	0.29
776.45	1.80	0.31
776.46	1.84	0.34
776.47	1.89	0.37
776.48	1.93	0.40
776.49	1.97	0.42
776.50	2.01	0.45
776.51	2.04	0.48
776.52	2.08	0.52
776.53	2.12	0.55
776.54	2.15	0.58
776.55	2.19	0.62
776.56	2.22	0.65
776.57	2.26	0.69
776.58	2.29	0.72
776.59	2.32	0.76
776.60	2.35	0.80
776.61	2.39	0.84
776.62	2.42	0.88
776.63	2.45	0.92
776.64	2.48	0.96
776.65	2.51	1.00
776.66	2.53	1.04
776.67	2.56	1.08
776.68	2.59	1.12
776.69	2.62	1.17
776.70	2.64	1.21
776.71	2.67	1.26
776.72	2.69	1.30
776.73	2.72	1.35
776.74	2.74	1.39
776.75	2.77	1.44
776.76	2.79	1.49
776.77	2.81	1.53
776.78	2.84	1.58
776.79	2.86	1.63
776.80	2.88	1.68
776.81	2.90	1.72
776.82	2.92	1.77
776.83	2.94	1.82
776.84	2.96	1.87
776.85	2.98	1.92
776.86	3.00	1.97
776.87	3.01	2.02
776.88	3.03	2.07
776.89	3.05	2.12
776.90	3.07	2.17
776.91	3.08	2.22
776.92	3.10	2.27
776.93	3.11	2.32
776.94	3.13	2.37
776.95	3.14	2.42
776.96	3.16	2.46
776.97	3.17	2.51
776.98	3.18	2.56
776.99	3.19	2.61
777.00	3.21	2.66
777.01	3.22	2.71
777.02	3.23	2.76
777.03	3.24	2.80
777.04	3.25	2.85
777.05	3.26	2.90
777.06	3.27	2.94
777.07	3.28	2.99
777.08	3.28	3.03
777.09	3.29	3.08
777.10	3.30	3.12
777.11	3.31	3.16
777.12	3.31	3.21
777.13	3.32	3.25
777.14	3.32	3.29
777.15	3.33	3.33
777.16	3.33	3.37
777.17	3.33	3.41
777.18	3.34	3.44
777.19	3.34	3.48
777.20	3.34	3.51
777.21	3.34	3.55
777.22	**3.34**	3.58
777.23	3.34	3.61
777.24	3.34	3.64
777.25	3.34	3.67
777.26	3.33	3.70
777.27	3.33	3.72
777.28	3.32	3.75
777.29	3.32	3.77
777.30	3.31	3.79
777.31	3.31	3.81
777.32	3.30	3.82
777.33	3.29	3.84
777.34	3.28	3.85
777.35	3.27	3.86
777.36	3.25	3.86
777.37	3.24	**3.87**
777.38	3.22	3.87
777.39	3.20	3.86
777.40	3.18	3.85
777.41	3.16	3.84
777.42	3.13	3.81
777.43	3.09	3.78
777.44	3.03	3.72
777.45	2.93	3.60

Stage-Area-Storage for Reach PSB.1: 15-in RCP from PSB (OFFSITE)

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
776.20	0.0	0
776.22	0.0	0
776.24	0.0	0
776.26	0.0	0
776.28	0.0	0
776.30	0.0	0
776.32	0.1	1
776.34	0.1	1
776.36	0.1	1
776.38	0.1	1
776.40	0.1	1
776.42	0.1	1
776.44	0.2	2
776.46	0.2	2
776.48	0.2	2
776.50	0.2	2
776.52	0.2	2
776.54	0.3	3
776.56	0.3	3
776.58	0.3	3
776.60	0.3	3
776.62	0.4	4
776.64	0.4	4
776.66	0.4	4
776.68	0.4	4
776.70	0.5	4
776.72	0.5	5
776.74	0.5	5
776.76	0.5	5
776.78	0.6	5
776.80	0.6	6
776.82	0.6	6
776.84	0.6	6
776.86	0.7	6
776.88	0.7	7
776.90	0.7	7
776.92	0.7	7
776.94	0.8	7
776.96	0.8	8
776.98	0.8	8
777.00	0.8	8
777.02	0.9	8
777.04	0.9	9
777.06	0.9	9
777.08	0.9	9
777.10	0.9	9
777.12	1.0	9
777.14	1.0	10
777.16	1.0	10
777.18	1.0	10
777.20	1.1	10
777.22	1.1	10
777.24	1.1	11
777.26	1.1	11
777.28	1.1	11
777.30	1.1	11
777.32	1.2	11
777.34	1.2	11
777.36	1.2	12
777.38	1.2	12
777.40	1.2	12
777.42	1.2	12
777.44	**1.2**	**12**

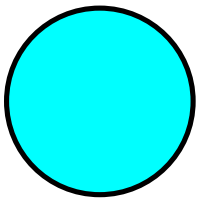
Summary for Reach PSB.2: 18-in RCP (OFFSITE)

Inflow Area = 3.097 ac, 87.67% Impervious, Inflow Depth = 6.67" for 100-yr event
Inflow = 7.14 cfs @ 12.15 hrs, Volume= 1.720 af
Outflow = 6.68 cfs @ 12.07 hrs, Volume= 1.720 af, Atten= 6%, Lag= 0.0 min

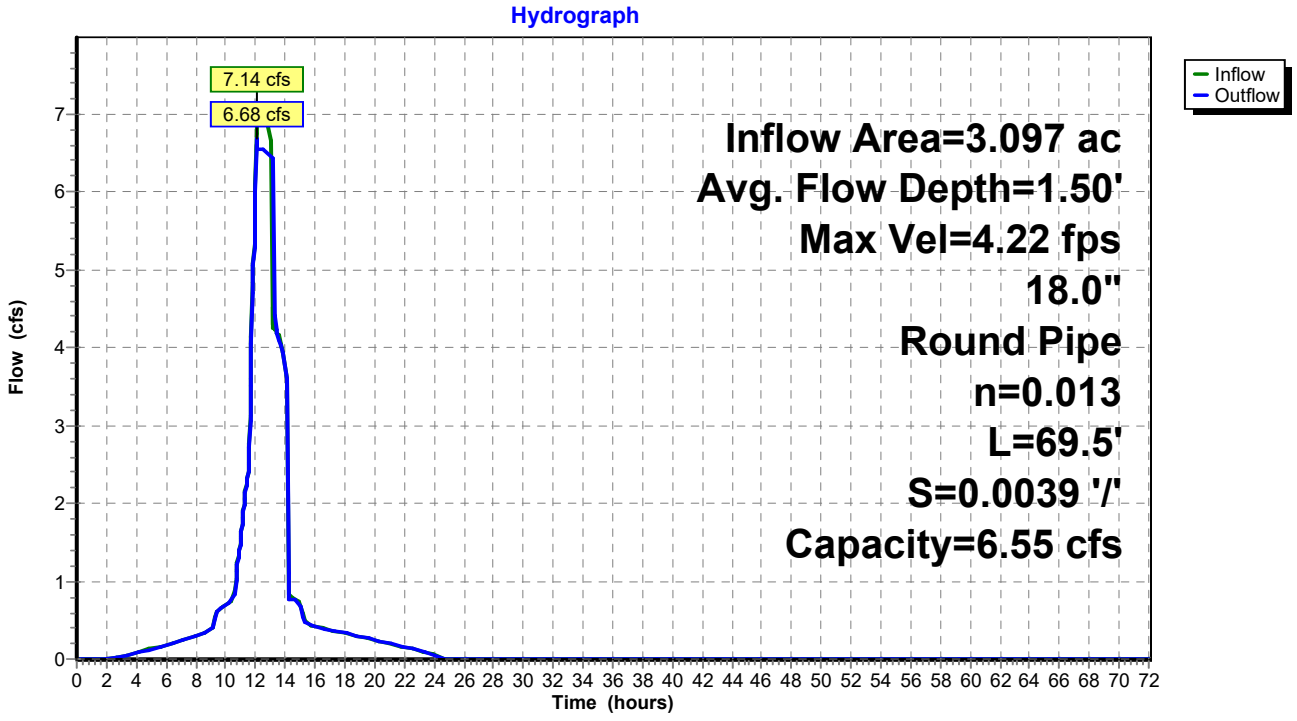
Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.22 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.98 fps, Avg. Travel Time= 0.6 min

Peak Storage= 123 cf @ 12.10 hrs
Average Depth at Peak Storage= 1.50'
Bank-Full Depth= 1.50' Flow Area= 1.8 sf, Capacity= 6.55 cfs

18.0" Round Pipe
n= 0.013 Concrete pipe, bends & connections
Length= 69.5' Slope= 0.0039 '/'
Inlet Invert= 772.10', Outlet Invert= 771.83'



Reach PSB.2: 18-in RCP (OFFSITE)



Hydrograph for Reach PSB.2: 18-in RCP (OFFSITE)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	772.10	0.00
2.50	0.01	1	772.15	0.01
5.00	0.13	6	772.25	0.13
7.50	0.28	11	772.31	0.28
10.00	**0.70**	**20**	**772.43**	**0.70**
12.50	**7.14**	**123**	**773.60**	**6.55**
15.00	0.74	21	772.44	0.74
17.50	0.35	12	772.34	0.35
20.00	0.24	10	772.30	0.24
22.50	0.13	6	772.25	0.13
25.00	0.00	0	772.10	0.00
27.50	0.00	0	772.10	0.00
30.00	0.00	0	772.10	0.00
32.50	0.00	0	772.10	0.00
35.00	0.00	0	772.10	0.00
37.50	0.00	0	772.10	0.00
40.00	0.00	0	772.10	0.00
42.50	0.00	0	772.10	0.00
45.00	0.00	0	772.10	0.00
47.50	0.00	0	772.10	0.00
50.00	0.00	0	772.10	0.00
52.50	0.00	0	772.10	0.00
55.00	0.00	0	772.10	0.00
57.50	0.00	0	772.10	0.00
60.00	0.00	0	772.10	0.00
62.50	0.00	0	772.10	0.00
65.00	0.00	0	772.10	0.00
67.50	0.00	0	772.10	0.00
70.00	0.00	0	772.10	0.00

Stage-Discharge for Reach PSB.2: 18-in RCP (OFFSITE)

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
772.10	0.00	0.00
772.11	0.22	0.00
772.12	0.39	0.00
772.13	0.52	0.00
772.14	0.63	0.01
772.15	0.73	0.01
772.16	0.82	0.02
772.17	0.91	0.03
772.18	0.99	0.04
772.19	1.07	0.05
772.20	1.15	0.06
772.21	1.22	0.07
772.22	1.29	0.09
772.23	1.36	0.10
772.24	1.42	0.12
772.25	1.49	0.14
772.26	1.55	0.16
772.27	1.61	0.18
772.28	1.67	0.20
772.29	1.72	0.22
772.30	1.78	0.25
772.31	1.83	0.28
772.32	1.89	0.30
772.33	1.94	0.33
772.34	1.99	0.36
772.35	2.04	0.40
772.36	2.09	0.43
772.37	2.14	0.46
772.38	2.19	0.50
772.39	2.23	0.54
772.40	2.28	0.57
772.41	2.32	0.61
772.42	2.37	0.65
772.43	2.41	0.69
772.44	2.45	0.74
772.45	2.49	0.78
772.46	2.54	0.83
772.47	2.58	0.87
772.48	2.62	0.92
772.49	2.65	0.97
772.50	2.69	1.02
772.51	2.73	1.07
772.52	2.77	1.12
772.53	2.80	1.17
772.54	2.84	1.23
772.55	2.88	1.28
772.56	2.91	1.34
772.57	2.94	1.39
772.58	2.98	1.45
772.59	3.01	1.51
772.60	3.04	1.57
772.61	3.08	1.63
772.62	3.11	1.69
772.63	3.14	1.75
772.64	3.17	1.82
772.65	3.20	1.88
772.66	3.23	1.94
772.67	3.26	2.01
772.68	3.29	2.07
772.69	3.31	2.14
772.70	3.34	2.21
772.71	3.37	2.27
772.72	3.40	2.34
772.73	3.42	2.41
772.74	3.45	2.48
772.75	3.47	2.55
772.76	3.50	2.62
772.77	3.52	2.69
772.78	3.55	2.76
772.79	3.57	2.83
772.80	3.59	2.91
772.81	3.62	2.98
772.82	3.64	3.05
772.83	3.66	3.13
772.84	3.68	3.20
772.85	3.70	3.27
772.86	3.73	3.35
772.87	3.75	3.42
772.88	3.77	3.50
772.89	3.79	3.57
772.90	3.80	3.65
772.91	3.82	3.72
772.92	3.84	3.80
772.93	3.86	3.87
772.94	3.88	3.95
772.95	3.89	4.02
772.96	3.91	4.10
772.97	3.93	4.17
772.98	3.94	4.25
772.99	3.96	4.32
773.00	3.97	4.40
773.01	3.99	4.47
773.02	4.00	4.55
773.03	4.02	4.62
773.04	4.03	4.70
773.05	4.04	4.77
773.06	4.05	4.84
773.07	4.07	4.92
773.08	4.08	4.99
773.09	4.09	5.06
773.10	4.10	5.13
773.11	4.11	5.20
773.12	4.12	5.27
773.13	4.13	5.34
773.14	4.14	5.41
773.15	4.15	5.48
773.16	4.16	5.55
773.17	4.16	5.62
773.18	4.17	5.68
773.19	4.18	5.75
773.20	4.19	5.81
773.21	4.19	5.88
773.22	4.20	5.94
773.23	4.20	6.00
773.24	4.21	6.06
773.25	4.21	6.12
773.26	4.21	6.18
773.27	4.22	6.24
773.28	4.22	6.29
773.29	4.22	6.35
773.30	4.22	6.40
773.31	4.22	6.45
773.32	**4.22**	6.50
773.33	4.22	6.55
773.34	4.22	6.60
773.35	4.22	6.64
773.36	4.22	6.69
773.37	4.22	6.73
773.38	4.21	6.77
773.39	4.21	6.80
773.40	4.20	6.84
773.41	4.20	6.87
773.42	4.19	6.90
773.43	4.18	6.93
773.44	4.17	6.95
773.45	4.17	6.98
773.46	4.15	7.00
773.47	4.14	7.01
773.48	4.13	7.03
773.49	4.12	7.04
773.50	4.10	7.04
773.51	4.09	**7.04**
773.52	4.07	7.04
773.53	4.05	7.03
773.54	4.02	7.01
773.55	4.00	6.99
773.56	3.97	6.96
773.57	3.93	6.92
773.58	3.89	6.85
773.59	3.81	6.73
773.60	3.70	6.55

Stage-Area-Storage for Reach PSB.2: 18-in RCP (OFFSITE)

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
772.10	0.0	0
772.12	0.0	0
772.14	0.0	1
772.16	0.0	2
772.18	0.0	3
772.20	0.1	4
772.22	0.1	5
772.24	0.1	6
772.26	0.1	7
772.28	0.1	8
772.30	0.1	10
772.32	0.2	11
772.34	0.2	13
772.36	0.2	14
772.38	0.2	16
772.40	0.3	17
772.42	0.3	19
772.44	0.3	21
772.46	0.3	23
772.48	0.4	24
772.50	0.4	26
772.52	0.4	28
772.54	0.4	30
772.56	0.5	32
772.58	0.5	34
772.60	0.5	36
772.62	0.5	38
772.64	0.6	40
772.66	0.6	42
772.68	0.6	44
772.70	0.7	46
772.72	0.7	48
772.74	0.7	50
772.76	0.7	52
772.78	0.8	54
772.80	0.8	56
772.82	0.8	58
772.84	0.9	60
772.86	0.9	62
772.88	0.9	65
772.90	1.0	67
772.92	1.0	69
772.94	1.0	71
772.96	1.0	73
772.98	1.1	75
773.00	1.1	77
773.02	1.1	79
773.04	1.2	81
773.06	1.2	83
773.08	1.2	85
773.10	1.3	87
773.12	1.3	89
773.14	1.3	91
773.16	1.3	93
773.18	1.4	95
773.20	1.4	97
773.22	1.4	98
773.24	1.4	100
773.26	1.5	102
773.28	1.5	104
773.30	1.5	105
773.32	1.5	107
773.34	1.6	109
773.36	1.6	110
773.38	1.6	112
773.40	1.6	113
773.42	1.6	114
773.44	1.7	116
773.46	1.7	117
773.48	1.7	118
773.50	1.7	119
773.52	1.7	120
773.54	1.7	121
773.56	1.8	122
773.58	1.8	122
773.60	**1.8**	**123**

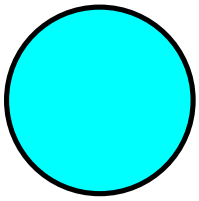
Summary for Reach S FLOWS: 15-in RCP

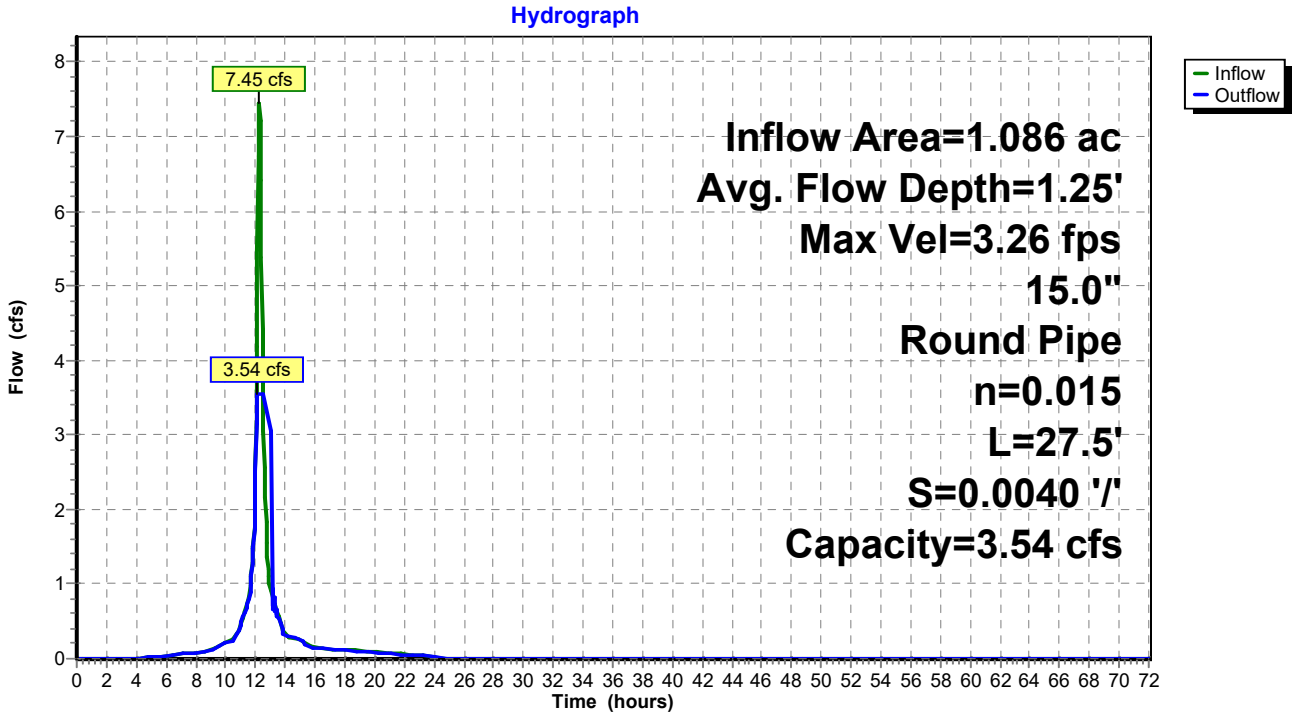
Inflow Area = 1.086 ac, 74.31% Impervious, Inflow Depth = 6.36" for 100-yr event
Inflow = 7.45 cfs @ 12.26 hrs, Volume= 0.576 af
Outflow = 3.54 cfs @ 12.15 hrs, Volume= 0.576 af, Atten= 52%, Lag= 0.0 min
Routed to Reach PSB.2 : 18-in RCP (OFFSITE)

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.26 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.35 fps, Avg. Travel Time= 0.3 min

Peak Storage= 34 cf @ 12.10 hrs
Average Depth at Peak Storage= 1.25'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 3.54 cfs

15.0" Round Pipe
n= 0.015 Concrete sewer w/manholes & inlets
Length= 27.5' Slope= 0.0040 '/'
Inlet Invert= 772.21', Outlet Invert= 772.10'





Hydrograph for Reach S FLOWS: 15-in RCP

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	772.21	0.00
2.50	0.00	0	772.21	0.00
5.00	0.02	1	772.28	0.02
7.50	0.07	2	772.33	0.07
10.00	**0.21**	**4**	**772.42**	**0.21**
12.50	**3.67**	**34**	**773.46**	**3.54**
15.00	0.26	4	772.44	0.26
17.50	0.12	3	772.37	0.12
20.00	0.09	2	772.34	0.09
22.50	0.05	1	772.31	0.05
25.00	0.00	0	772.21	0.00
27.50	0.00	0	772.21	0.00
30.00	0.00	0	772.21	0.00
32.50	0.00	0	772.21	0.00
35.00	0.00	0	772.21	0.00
37.50	0.00	0	772.21	0.00
40.00	0.00	0	772.21	0.00
42.50	0.00	0	772.21	0.00
45.00	0.00	0	772.21	0.00
47.50	0.00	0	772.21	0.00
50.00	0.00	0	772.21	0.00
52.50	0.00	0	772.21	0.00
55.00	0.00	0	772.21	0.00
57.50	0.00	0	772.21	0.00
60.00	0.00	0	772.21	0.00
62.50	0.00	0	772.21	0.00
65.00	0.00	0	772.21	0.00
67.50	0.00	0	772.21	0.00
70.00	0.00	0	772.21	0.00

Stage-Discharge for Reach S FLOWS: 15-in RCP

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
772.21	0.00	0.00
772.22	0.21	0.00
772.23	0.35	0.00
772.24	0.46	0.00
772.25	0.55	0.01
772.26	0.64	0.01
772.27	0.72	0.02
772.28	0.80	0.02
772.29	0.87	0.03
772.30	0.94	0.04
772.31	1.00	0.05
772.32	1.07	0.06
772.33	1.13	0.07
772.34	1.19	0.08
772.35	1.24	0.09
772.36	1.30	0.11
772.37	1.35	0.12
772.38	1.40	0.14
772.39	1.45	0.16
772.40	1.50	0.18
772.41	1.55	0.20
772.42	1.60	0.22
772.43	1.64	0.24
772.44	1.69	0.26
772.45	1.73	0.29
772.46	1.77	0.31
772.47	1.82	0.34
772.48	1.86	0.36
772.49	1.90	0.39
772.50	1.94	0.42
772.51	1.97	0.45
772.52	2.01	0.48
772.53	2.05	0.51
772.54	2.09	0.54
772.55	2.12	0.57
772.56	2.16	0.61
772.57	2.19	0.64
772.58	2.22	0.68
772.59	2.26	0.71
772.60	2.29	0.75
772.61	2.32	0.79
772.62	2.35	0.82
772.63	2.38	0.86
772.64	2.41	0.90
772.65	2.44	0.94
772.66	2.47	0.98
772.67	2.50	1.02
772.68	2.52	1.06
772.69	2.55	1.11
772.70	2.58	1.15
772.71	2.60	1.19
772.72	2.63	1.24
772.73	2.65	1.28
772.74	2.68	1.33
772.75	2.70	1.37
772.76	2.73	1.42
772.77	2.75	1.46
772.78	2.77	1.51
772.79	2.79	1.56
772.80	2.81	1.60
772.81	2.83	1.65
772.82	2.86	1.70
772.83	2.88	1.75
772.84	2.89	1.79
772.85	2.91	1.84
772.86	2.93	1.89
772.87	2.95	1.94
772.88	2.97	1.99
772.89	2.99	2.04
772.90	3.00	2.09
772.91	3.02	2.13
772.92	3.04	2.18
772.93	3.05	2.23
772.94	3.07	2.28
772.95	3.08	2.33
772.96	3.09	2.38
772.97	3.11	2.43
772.98	3.12	2.48
772.99	3.13	2.52
773.00	3.15	2.57
773.01	3.16	2.62
773.02	3.17	2.67
773.03	3.18	2.71
773.04	3.19	2.76
773.05	3.20	2.81
773.06	3.21	2.85
773.07	3.22	2.90
773.08	3.23	2.94
773.09	3.23	2.99
773.10	3.24	3.03
773.11	3.25	3.07
773.12	3.26	3.12
773.13	3.26	3.16
773.14	3.27	3.20
773.15	3.27	3.24
773.16	3.28	3.28
773.17	3.28	3.32
773.18	3.28	3.35
773.19	3.29	3.39
773.20	3.29	3.43
773.21	3.29	3.46
773.22	3.29	3.49
773.23	**3.29**	3.53
773.24	3.29	3.56
773.25	3.29	3.59
773.26	3.29	3.62
773.27	3.28	3.64
773.28	3.28	3.67
773.29	3.27	3.69
773.30	3.27	3.71
773.31	3.26	3.73
773.32	3.26	3.75
773.33	3.25	3.77
773.34	3.24	3.78
773.35	3.23	3.79
773.36	3.22	3.80
773.37	3.20	3.81
773.38	3.19	**3.81**
773.39	3.17	3.81
773.40	3.15	3.80
773.41	3.13	3.79
773.42	3.11	3.78
773.43	3.08	3.75
773.44	3.04	3.72
773.45	2.99	3.66
773.46	2.89	3.54

Stage-Area-Storage for Reach S FLOWS: 15-in RCP

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
772.21	0.0	0
772.23	0.0	0
772.25	0.0	0
772.27	0.0	1
772.29	0.0	1
772.31	0.0	1
772.33	0.1	2
772.35	0.1	2
772.37	0.1	3
772.39	0.1	3
772.41	0.1	3
772.43	0.1	4
772.45	0.2	5
772.47	0.2	5
772.49	0.2	6
772.51	0.2	6
772.53	0.2	7
772.55	0.3	7
772.57	0.3	8
772.59	0.3	9
772.61	0.3	9
772.63	0.4	10
772.65	0.4	11
772.67	0.4	11
772.69	0.4	12
772.71	0.5	13
772.73	0.5	13
772.75	0.5	14
772.77	0.5	15
772.79	0.6	15
772.81	0.6	16
772.83	0.6	17
772.85	0.6	17
772.87	0.7	18
772.89	0.7	19
772.91	0.7	19
772.93	0.7	20
772.95	0.8	21
772.97	0.8	21
772.99	0.8	22
773.01	0.8	23
773.03	0.9	23
773.05	0.9	24
773.07	0.9	25
773.09	0.9	25
773.11	0.9	26
773.13	1.0	27
773.15	1.0	27
773.17	1.0	28
773.19	1.0	28
773.21	1.1	29
773.23	1.1	29
773.25	1.1	30
773.27	1.1	31
773.29	1.1	31
773.31	1.1	31
773.33	1.2	32
773.35	1.2	32
773.37	1.2	33
773.39	1.2	33
773.41	1.2	33
773.43	1.2	34
773.45	**1.2**	**34**

Events for Subcatchment DA1: Walgreens Loading Dock and Houses

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
2-yr	2.87	2.64	0.193	2.13
10-yr	4.28	4.23	0.316	3.49
10-yrb2b	4.28	4.53	**0.699**	**7.72**
100-yr	**7.19**	**7.45**	0.576	6.36

Events for Subcatchment DA2: Riverfront Pipe

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
2-yr	2.87	2.64	0.164	2.64
10-yr	4.28	3.97	0.251	4.04
10-yrb2b	4.28	4.00	**0.517**	**8.32**
100-yr	**7.19**	**6.71**	0.432	6.95

Events for Subcatchment DA3: Walgreens Parking lot to CB

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
2-yr	2.87	2.77	0.172	2.64
10-yr	4.28	4.16	0.263	4.04
10-yrb2b	4.28	4.19	**0.541**	**8.32**
100-yr	**7.19**	**7.02**	0.452	6.95

Events for Subcatchment PSB: Public Safety Building (OFFSITE)

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
2-yr	2.87	7.00	0.424	2.53
10-yr	4.28	10.62	0.659	3.93
10-yrb2b	4.28	10.77	**1.374**	**8.20**
100-yr	**7.19**	**18.02**	1.145	6.83

Events for Reach 2.1: 12-in RCP

Event	Inflow (cfs)	Outflow (cfs)	Elevation (feet)	Storage (cubic-feet)
2-yr	2.64	2.64	773.46	4
10-yr	3.97	3.97	773.55	5
10-yrb2b	4.00	4.00	773.55	5
100-yr	**6.71**	**6.70**	**773.71**	**7**

Events for Reach 2.2: 21-in RCP

Event	Inflow (cfs)	Outflow (cfs)	Elevation (feet)	Storage (cubic-feet)
2-yr	2.64	2.61	772.64	46
10-yr	3.97	3.92	772.80	63
10-yrb2b	4.00	3.95	772.81	63
100-yr	**6.70**	**6.63**	**773.12**	**93**

Events for Reach 3.1: 12-in Catch Basin

Event	Inflow (cfs)	Outflow (cfs)	Elevation (feet)	Storage (cubic-feet)
2-yr	2.77	2.74	773.30	29
10-yr	4.16	3.21	**773.55**	**36**
10-yrb2b	4.19	**3.23**	773.55	36
100-yr	**7.02**	3.08	773.55	36

Events for Reach N FLOWS: 108-in RCP

Event	Inflow (cfs)	Outflow (cfs)	Elevation (feet)	Storage (cubic-feet)
2-yr	5.35	3.10	762.56	3,770
10-yr	6.94	4.81	762.93	5,126
10-yrb2b	6.97	4.85	762.94	5,156
100-yr	**9.65**	**6.95**	**763.32**	**6,659**

Events for Reach PSB.1: 15-in RCP from PSB (OFFSITE)

Event	Inflow (cfs)	Outflow (cfs)	Elevation (feet)	Storage (cubic-feet)
2-yr	7.00	3.60	**777.45**	**12**
10-yr	10.62	3.60	777.45	12
10-yrb2b	10.77	**3.62**	777.45	12
100-yr	**18.02**	3.60	777.45	12

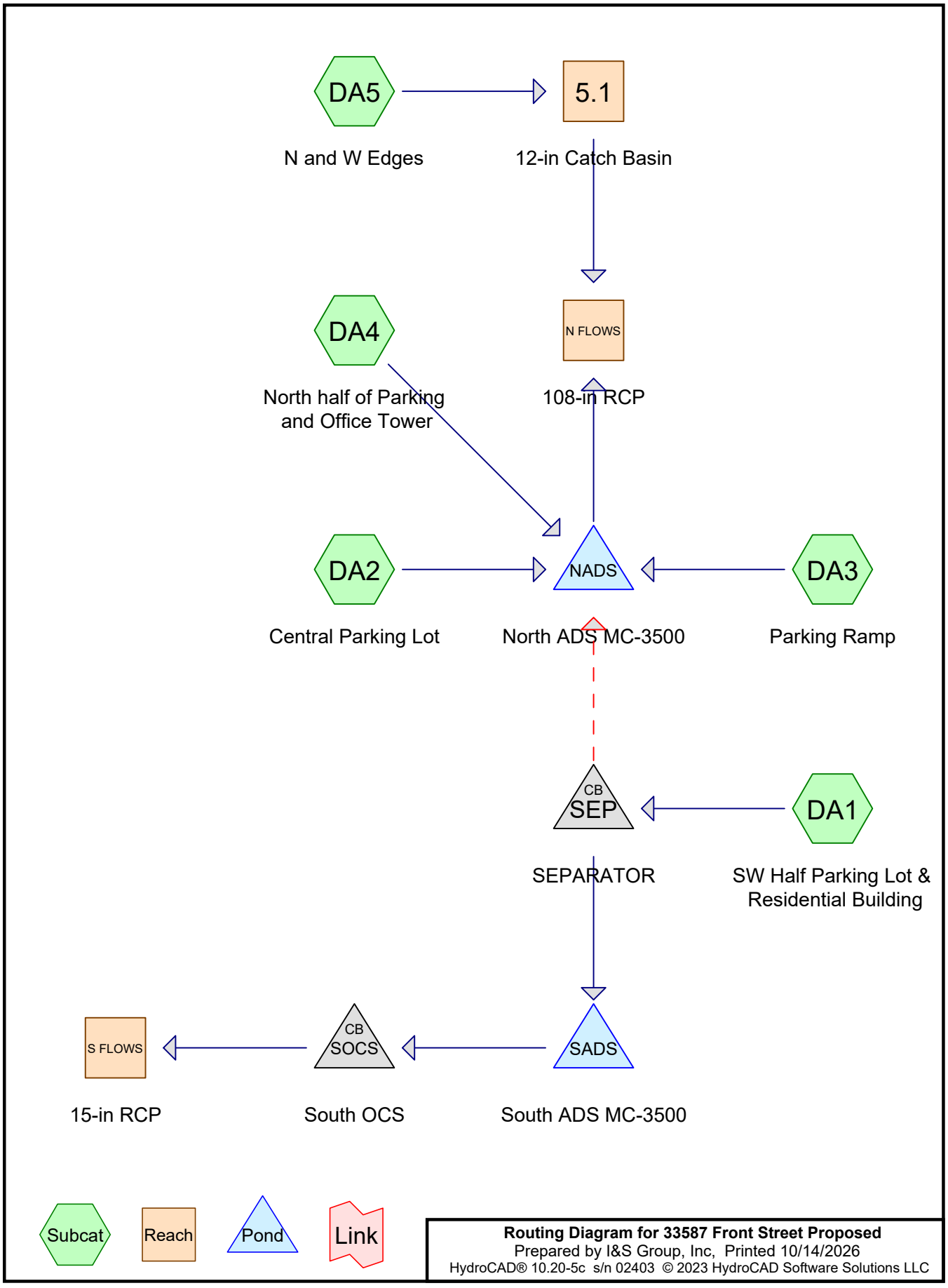
Events for Reach PSB.2: 18-in RCP (OFFSITE)

Event	Inflow (cfs)	Outflow (cfs)	Elevation (feet)	Storage (cubic-feet)
2-yr	6.23	6.21	773.27	103
10-yr	**7.37**	**6.96**	**773.60**	**123**
10-yrb2b	7.37	6.96	773.60	123
100-yr	7.14	6.68	773.60	123

Events for Reach S FLOWS: 15-in RCP

Event	Inflow (cfs)	Outflow (cfs)	Elevation (feet)	Storage (cubic-feet)
2-yr	2.64	2.63	773.01	23
10-yr	4.23	**3.77**	**773.46**	**34**
10-yrb2b	4.53	3.77	773.46	34
100-yr	**7.45**	3.54	773.46	34

Appendix D: Proposed HydroCAD Report



Routing Diagram for 33587 Front Street Proposed
Prepared by I&S Group, Inc, Printed 10/14/2026
HydroCAD® 10.20-5c s/n 02403 © 2023 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-yr	MSE 24-hr	3	Default	24.00	1	2.87	2
2	10-yr	MSE 24-hr	3	Default	24.00	1	4.28	2
3	10-yrb2b	MSE 24-hr	3	Default	24.00	2	4.28	2
4	100-yr	MSE 24-hr	3	Default	24.00	1	7.19	2

Time span=0.00-72.00 hrs, dt=0.04 hrs, 1801 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentDA1: SW Half Parking Lot & Runoff Area=1.280 ac 99.06% Impervious Runoff Depth=2.64"
Tc=10.0 min CN=98 Runoff=4.58 cfs 0.281 af

SubcatchmentDA2: Central Parking Lot Runoff Area=0.058 ac 100.00% Impervious Runoff Depth=2.64"
Tc=10.0 min CN=98 Runoff=0.21 cfs 0.013 af

SubcatchmentDA3: Parking Ramp Runoff Area=29,103 sf 100.00% Impervious Runoff Depth=2.64"
Tc=10.0 min CN=98 Runoff=2.39 cfs 0.147 af

SubcatchmentDA4: North half of Parking Runoff Area=0.307 ac 96.74% Impervious Runoff Depth=2.53"
Tc=10.0 min CN=97 Runoff=1.08 cfs 0.065 af

SubcatchmentDA5: N and W Edges Runoff Area=0.300 ac 76.33% Impervious Runoff Depth=2.22"
Tc=10.0 min CN=94 Runoff=0.98 cfs 0.056 af

Reach 5.1: 12-in Catch Basin Avg. Flow Depth=0.39' Max Vel=3.42 fps Inflow=0.98 cfs 0.056 af
12.0" Round Pipe n=0.015 L=46.1' S=0.0095 '/' Capacity=3.02 cfs Outflow=0.98 cfs 0.056 af

Reach N FLOWS: 108-in RCP Avg. Flow Depth=1.31' Max Vel=0.38 fps Inflow=3.56 cfs 0.290 af
108.0" Round Pipe n=0.015 L=512.0' S=0.0000 '/' Capacity=47.83 cfs Outflow=2.18 cfs 0.290 af

Reach S FLOWS: 15-in RCP Avg. Flow Depth=0.37' Max Vel=8.75 fps Inflow=2.67 cfs 0.271 af
15.0" Round Pipe n=0.015 L=27.5' S=0.0618 '/' Capacity=13.92 cfs Outflow=2.67 cfs 0.271 af

Pond NADS: North ADS MC-3500 Peak Elev=772.10' Storage=0.067 af Inflow=4.75 cfs 0.235 af
18.0" Round Culvert n=0.013 L=216.0' S=0.0050 '/' Outflow=2.80 cfs 0.234 af

Pond SADS: South ADS MC-3500 Peak Elev=775.29' Storage=0.051 af Inflow=3.51 cfs 0.271 af
12.0" Round Culvert n=0.013 L=30.0' S=0.0033 '/' Outflow=2.67 cfs 0.271 af

Pond SEP: SEPARATOR Peak Elev=778.70' Inflow=4.58 cfs 0.281 af
Primary=3.51 cfs 0.271 af Secondary=1.07 cfs 0.010 af Outflow=4.58 cfs 0.281 af

Pond SOCS: South OCS Peak Elev=776.33' Inflow=2.67 cfs 0.271 af
Outflow=2.67 cfs 0.271 af

Summary for Subcatchment DA1: SW Half Parking Lot & Residential Building

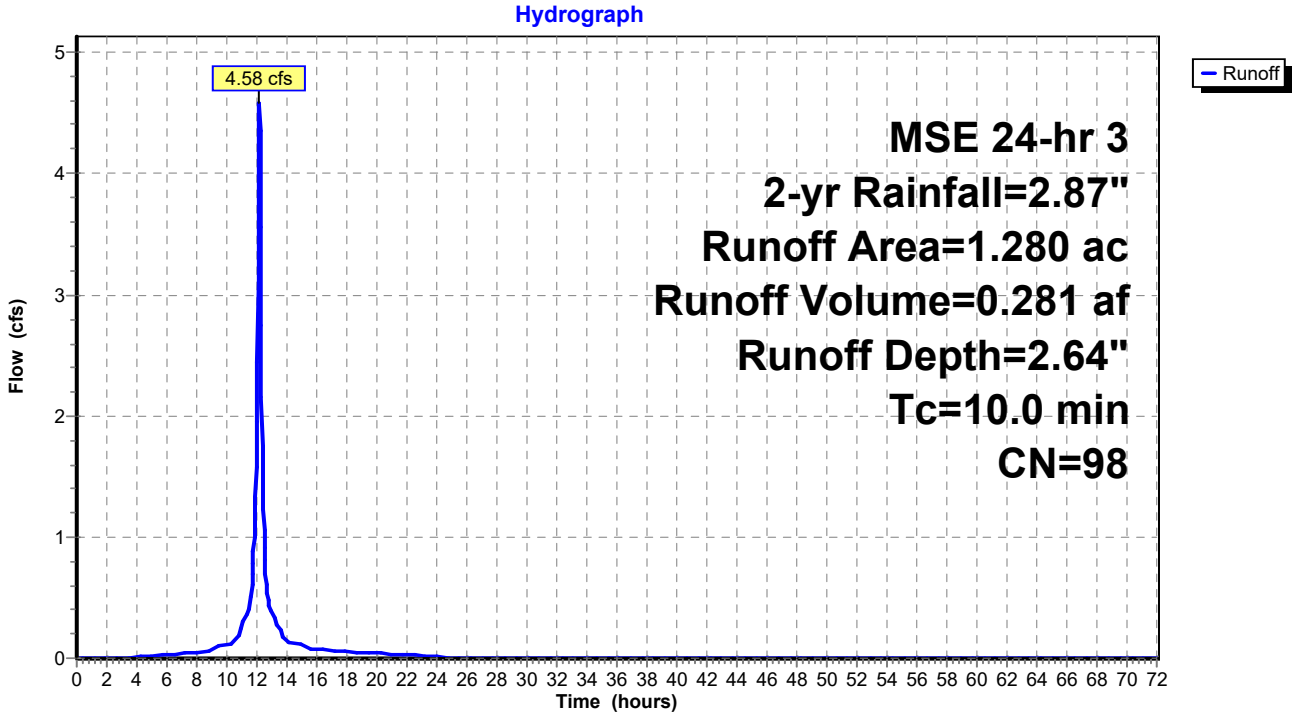
Runoff = 4.58 cfs @ 12.17 hrs, Volume= 0.281 af, Depth= 2.64"
Routed to Pond SEP : SEPARATOR

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs
MSE 24-hr 3 2-yr Rainfall=2.87"

Area (ac)	CN	Description
1.268	98	Paved parking, HSG D
0.012	80	>75% Grass cover, Good, HSG D
1.280	98	Weighted Average
0.012		0.94% Pervious Area
1.268		99.06% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, 10 min Minimum**

Subcatchment DA1: SW Half Parking Lot & Residential Building



Hydrograph for Subcatchment DA1: SW Half Parking Lot & Residential Building

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.80	0.01	0.00	0.00
1.60	0.02	0.00	0.00
2.40	0.03	0.00	0.00
3.20	0.05	0.00	0.00
4.00	0.07	0.00	0.01
4.80	0.10	0.01	0.02
5.60	0.13	0.03	0.02
6.40	0.16	0.05	0.03
7.20	0.20	0.07	0.04
8.00	0.24	0.10	0.05
8.80	0.28	0.13	0.06
9.60	0.35	0.19	0.11
10.40	0.44	0.26	0.12
11.20	0.61	0.42	0.32
12.00	1.33	1.11	**1.95**
12.80	2.26	2.03	**0.45**
13.60	2.43	2.20	0.20
14.40	2.52	2.29	0.13
15.20	2.59	2.36	0.08
16.00	2.63	2.40	0.07
16.80	2.67	2.44	0.06
17.60	2.71	2.48	0.06
18.40	2.74	2.51	0.05
19.20	2.77	2.54	0.05
20.00	2.80	2.56	0.04
20.80	2.82	2.59	0.03
21.60	2.84	2.60	0.03
22.40	2.85	2.62	0.02
23.20	2.86	2.63	0.02
24.00	**2.87**	**2.64**	0.01
24.80	2.87	2.64	0.00
25.60	2.87	2.64	0.00
26.40	2.87	2.64	0.00
27.20	2.87	2.64	0.00
28.00	2.87	2.64	0.00
28.80	2.87	2.64	0.00
29.60	2.87	2.64	0.00
30.40	2.87	2.64	0.00
31.20	2.87	2.64	0.00
32.00	2.87	2.64	0.00
32.80	2.87	2.64	0.00
33.60	2.87	2.64	0.00
34.40	2.87	2.64	0.00
35.20	2.87	2.64	0.00
36.00	2.87	2.64	0.00
36.80	2.87	2.64	0.00
37.60	2.87	2.64	0.00
38.40	2.87	2.64	0.00
39.20	2.87	2.64	0.00
40.00	2.87	2.64	0.00
40.80	2.87	2.64	0.00
41.60	2.87	2.64	0.00
42.40	2.87	2.64	0.00
43.20	2.87	2.64	0.00
44.00	2.87	2.64	0.00
44.80	2.87	2.64	0.00
45.60	2.87	2.64	0.00
46.40	2.87	2.64	0.00
47.20	2.87	2.64	0.00
48.00	2.87	2.64	0.00
48.80	2.87	2.64	0.00
49.60	2.87	2.64	0.00
50.40	2.87	2.64	0.00
51.20	2.87	2.64	0.00
52.00	2.87	2.64	0.00
52.80	2.87	2.64	0.00
53.60	2.87	2.64	0.00
54.40	2.87	2.64	0.00
55.20	2.87	2.64	0.00
56.00	2.87	2.64	0.00
56.80	2.87	2.64	0.00
57.60	2.87	2.64	0.00
58.40	2.87	2.64	0.00
59.20	2.87	2.64	0.00
60.00	2.87	2.64	0.00
60.80	2.87	2.64	0.00
61.60	2.87	2.64	0.00
62.40	2.87	2.64	0.00
63.20	2.87	2.64	0.00
64.00	2.87	2.64	0.00
64.80	2.87	2.64	0.00
65.60	2.87	2.64	0.00
66.40	2.87	2.64	0.00
67.20	2.87	2.64	0.00
68.00	2.87	2.64	0.00
68.80	2.87	2.64	0.00
69.60	2.87	2.64	0.00
70.40	2.87	2.64	0.00
71.20	2.87	2.64	0.00
72.00	2.87	2.64	0.00

Summary for Subcatchment DA2: Central Parking Lot

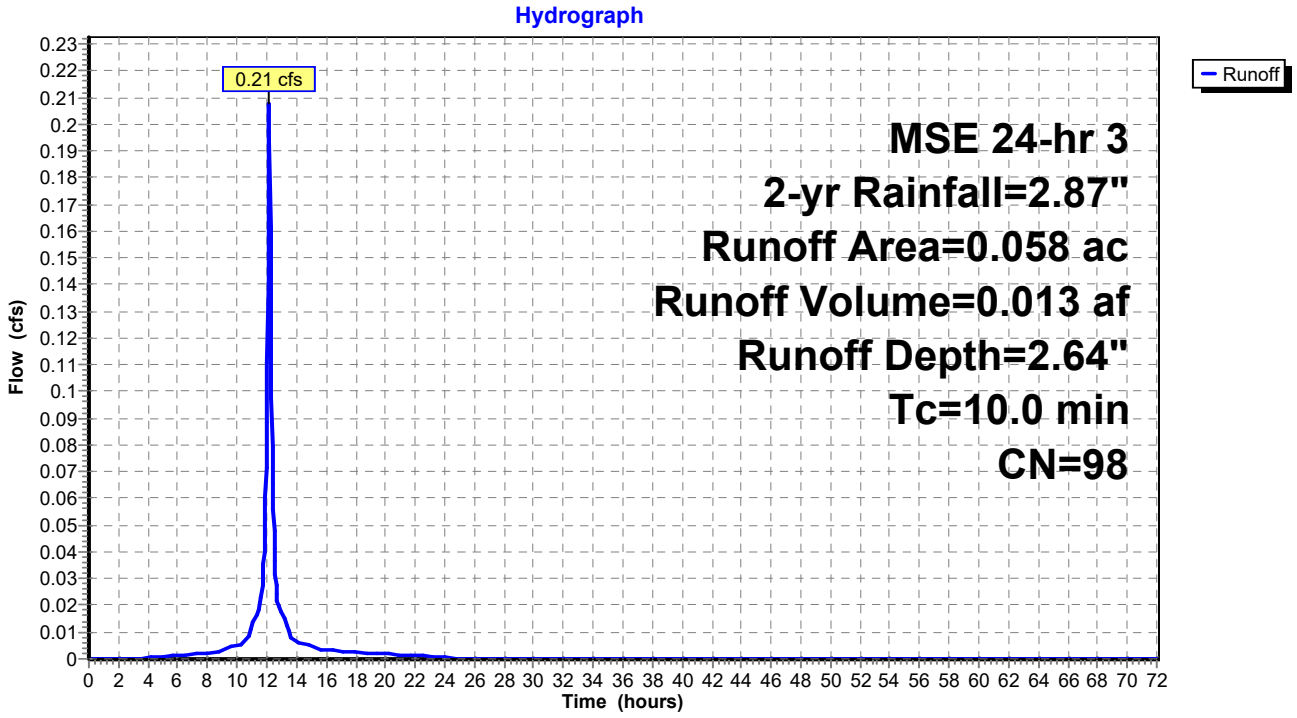
Runoff = 0.21 cfs @ 12.17 hrs, Volume= 0.013 af, Depth= 2.64"
Routed to Pond NADS : North ADS MC-3500

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs
MSE 24-hr 3 2-yr Rainfall=2.87"

	Area (ac)	CN	Description
*	0.058	98	Paved Surfaces
	0.058		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, minimum**

Subcatchment DA2: Central Parking Lot



Hydrograph for Subcatchment DA2: Central Parking Lot

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.80	0.01	0.00	0.00
1.60	0.02	0.00	0.00
2.40	0.03	0.00	0.00
3.20	0.05	0.00	0.00
4.00	0.07	0.00	0.00
4.80	0.10	0.01	0.00
5.60	0.13	0.03	0.00
6.40	0.16	0.05	0.00
7.20	0.20	0.07	0.00
8.00	0.24	0.10	0.00
8.80	0.28	0.13	0.00
9.60	0.35	0.19	0.00
10.40	0.44	0.26	0.01
11.20	0.61	0.42	0.01
12.00	1.33	1.11	**0.09**
12.80	2.26	2.03	**0.02**
13.60	2.43	2.20	0.01
14.40	2.52	2.29	0.01
15.20	2.59	2.36	0.00
16.00	2.63	2.40	0.00
16.80	2.67	2.44	0.00
17.60	2.71	2.48	0.00
18.40	2.74	2.51	0.00
19.20	2.77	2.54	0.00
20.00	2.80	2.56	0.00
20.80	2.82	2.59	0.00
21.60	2.84	2.60	0.00
22.40	2.85	2.62	0.00
23.20	2.86	2.63	0.00
24.00	**2.87**	**2.64**	0.00
24.80	2.87	2.64	0.00
25.60	2.87	2.64	0.00
26.40	2.87	2.64	0.00
27.20	2.87	2.64	0.00
28.00	2.87	2.64	0.00
28.80	2.87	2.64	0.00
29.60	2.87	2.64	0.00
30.40	2.87	2.64	0.00
31.20	2.87	2.64	0.00
32.00	2.87	2.64	0.00
32.80	2.87	2.64	0.00
33.60	2.87	2.64	0.00
34.40	2.87	2.64	0.00
35.20	2.87	2.64	0.00
36.00	2.87	2.64	0.00
36.80	2.87	2.64	0.00
37.60	2.87	2.64	0.00
38.40	2.87	2.64	0.00
39.20	2.87	2.64	0.00
40.00	2.87	2.64	0.00
40.80	2.87	2.64	0.00
41.60	2.87	2.64	0.00
42.40	2.87	2.64	0.00
43.20	2.87	2.64	0.00
44.00	2.87	2.64	0.00
44.80	2.87	2.64	0.00
45.60	2.87	2.64	0.00
46.40	2.87	2.64	0.00
47.20	2.87	2.64	0.00
48.00	2.87	2.64	0.00
48.80	2.87	2.64	0.00
49.60	2.87	2.64	0.00
50.40	2.87	2.64	0.00
51.20	2.87	2.64	0.00
52.00	2.87	2.64	0.00
52.80	2.87	2.64	0.00
53.60	2.87	2.64	0.00
54.40	2.87	2.64	0.00
55.20	2.87	2.64	0.00
56.00	2.87	2.64	0.00
56.80	2.87	2.64	0.00
57.60	2.87	2.64	0.00
58.40	2.87	2.64	0.00
59.20	2.87	2.64	0.00
60.00	2.87	2.64	0.00
60.80	2.87	2.64	0.00
61.60	2.87	2.64	0.00
62.40	2.87	2.64	0.00
63.20	2.87	2.64	0.00
64.00	2.87	2.64	0.00
64.80	2.87	2.64	0.00
65.60	2.87	2.64	0.00
66.40	2.87	2.64	0.00
67.20	2.87	2.64	0.00
68.00	2.87	2.64	0.00
68.80	2.87	2.64	0.00
69.60	2.87	2.64	0.00
70.40	2.87	2.64	0.00
71.20	2.87	2.64	0.00
72.00	2.87	2.64	0.00

Summary for Subcatchment DA3: Parking Ramp

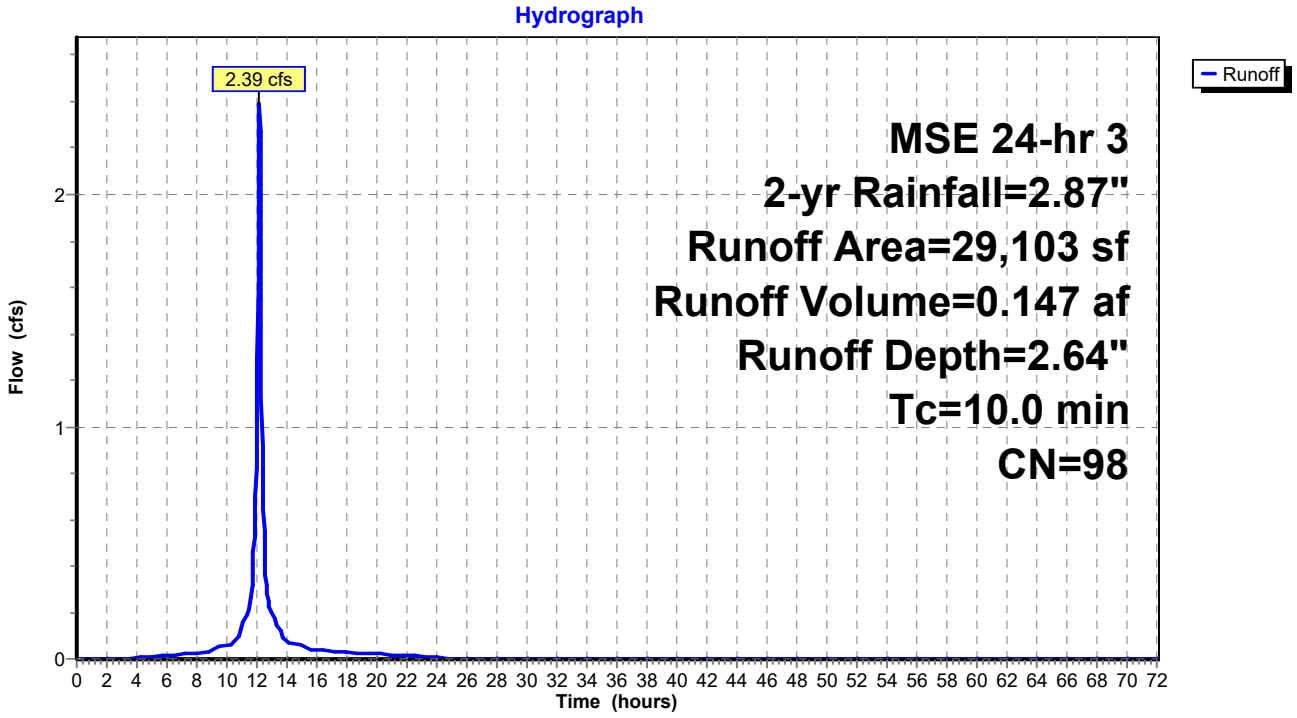
Runoff = 2.39 cfs @ 12.17 hrs, Volume= 0.147 af, Depth= 2.64"
Routed to Pond NADS : North ADS MC-3500

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs
MSE 24-hr 3 2-yr Rainfall=2.87"

	Area (sf)	CN	Description
*	29,103	98	Paved Parking Ramp
	29,103		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, Minimum**

Subcatchment DA3: Parking Ramp



Hydrograph for Subcatchment DA3: Parking Ramp

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.80	0.01	0.00	0.00
1.60	0.02	0.00	0.00
2.40	0.03	0.00	0.00
3.20	0.05	0.00	0.00
4.00	0.07	0.00	0.00
4.80	0.10	0.01	0.01
5.60	0.13	0.03	0.01
6.40	0.16	0.05	0.02
7.20	0.20	0.07	0.02
8.00	0.24	0.10	0.03
8.80	0.28	0.13	0.03
9.60	0.35	0.19	0.06
10.40	0.44	0.26	0.06
11.20	0.61	0.42	0.17
12.00	1.33	1.11	**1.02**
12.80	2.26	2.03	**0.23**
13.60	2.43	2.20	0.11
14.40	2.52	2.29	0.07
15.20	2.59	2.36	0.04
16.00	2.63	2.40	0.04
16.80	2.67	2.44	0.03
17.60	2.71	2.48	0.03
18.40	2.74	2.51	0.03
19.20	2.77	2.54	0.02
20.00	2.80	2.56	0.02
20.80	2.82	2.59	0.02
21.60	2.84	2.60	0.01
22.40	2.85	2.62	0.01
23.20	2.86	2.63	0.01
24.00	**2.87**	**2.64**	0.01
24.80	2.87	2.64	0.00
25.60	2.87	2.64	0.00
26.40	2.87	2.64	0.00
27.20	2.87	2.64	0.00
28.00	2.87	2.64	0.00
28.80	2.87	2.64	0.00
29.60	2.87	2.64	0.00
30.40	2.87	2.64	0.00
31.20	2.87	2.64	0.00
32.00	2.87	2.64	0.00
32.80	2.87	2.64	0.00
33.60	2.87	2.64	0.00
34.40	2.87	2.64	0.00
35.20	2.87	2.64	0.00
36.00	2.87	2.64	0.00
36.80	2.87	2.64	0.00
37.60	2.87	2.64	0.00
38.40	2.87	2.64	0.00
39.20	2.87	2.64	0.00
40.00	2.87	2.64	0.00
40.80	2.87	2.64	0.00
41.60	2.87	2.64	0.00
42.40	2.87	2.64	0.00
43.20	2.87	2.64	0.00
44.00	2.87	2.64	0.00
44.80	2.87	2.64	0.00
45.60	2.87	2.64	0.00
46.40	2.87	2.64	0.00
47.20	2.87	2.64	0.00
48.00	2.87	2.64	0.00
48.80	2.87	2.64	0.00
49.60	2.87	2.64	0.00
50.40	2.87	2.64	0.00
51.20	2.87	2.64	0.00
52.00	2.87	2.64	0.00
52.80	2.87	2.64	0.00
53.60	2.87	2.64	0.00
54.40	2.87	2.64	0.00
55.20	2.87	2.64	0.00
56.00	2.87	2.64	0.00
56.80	2.87	2.64	0.00
57.60	2.87	2.64	0.00
58.40	2.87	2.64	0.00
59.20	2.87	2.64	0.00
60.00	2.87	2.64	0.00
60.80	2.87	2.64	0.00
61.60	2.87	2.64	0.00
62.40	2.87	2.64	0.00
63.20	2.87	2.64	0.00
64.00	2.87	2.64	0.00
64.80	2.87	2.64	0.00
65.60	2.87	2.64	0.00
66.40	2.87	2.64	0.00
67.20	2.87	2.64	0.00
68.00	2.87	2.64	0.00
68.80	2.87	2.64	0.00
69.60	2.87	2.64	0.00
70.40	2.87	2.64	0.00
71.20	2.87	2.64	0.00
72.00	2.87	2.64	0.00

Summary for Subcatchment DA4: North half of Parking and Office Tower

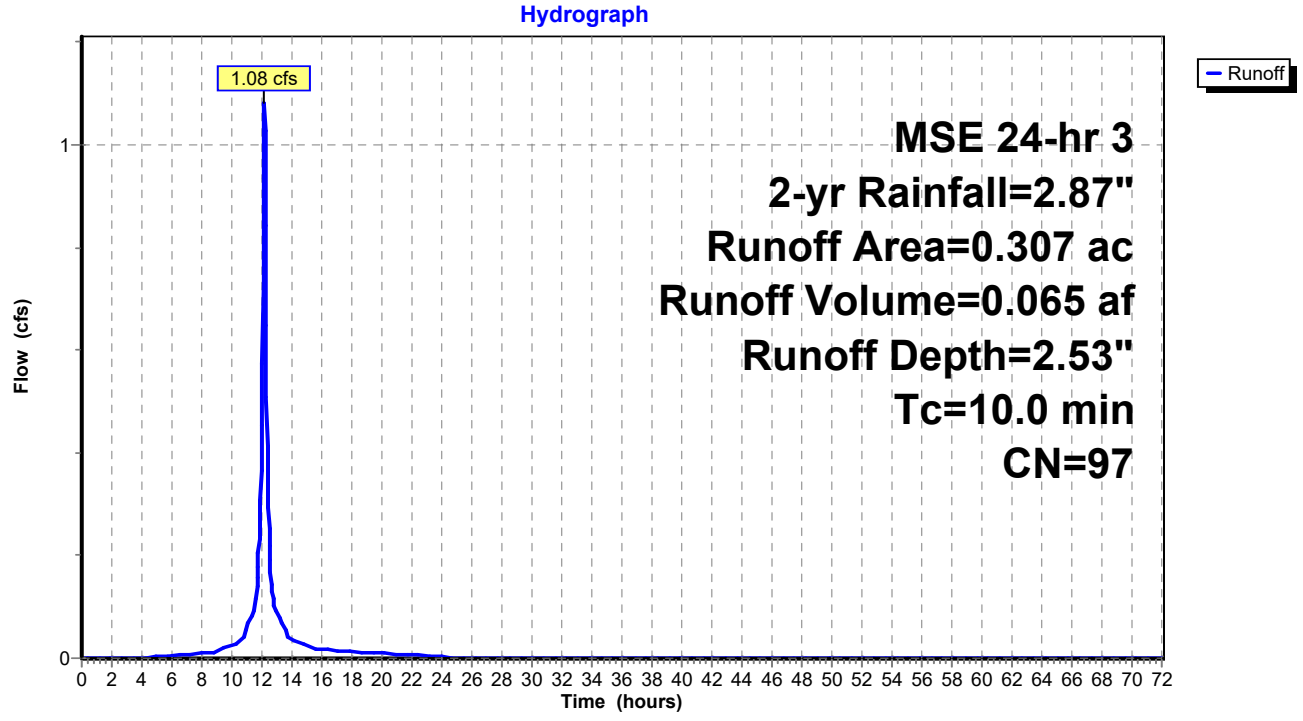
Runoff = 1.08 cfs @ 12.17 hrs, Volume= 0.065 af, Depth= 2.53"
Routed to Pond NADS : North ADS MC-3500

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs
MSE 24-hr 3 2-yr Rainfall=2.87"

	Area (ac)	CN	Description
*	0.297	98	Paved Surfaces
*	0.010	80	Grass cover D soils
	0.307	97	Weighted Average
	0.010		3.26% Pervious Area
	0.297		96.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, minimum**

Subcatchment DA4: North half of Parking and Office Tower



Hydrograph for Subcatchment DA4: North half of Parking and Office Tower

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.80	0.01	0.00	0.00
1.60	0.02	0.00	0.00
2.40	0.03	0.00	0.00
3.20	0.05	0.00	0.00
4.00	0.07	0.00	0.00
4.80	0.10	0.00	0.00
5.60	0.13	0.01	0.00
6.40	0.16	0.03	0.01
7.20	0.20	0.04	0.01
8.00	0.24	0.07	0.01
8.80	0.28	0.09	0.01
9.60	0.35	0.14	0.02
10.40	0.44	0.21	0.03
11.20	0.61	0.35	0.07
12.00	1.33	1.02	**0.45**
12.80	2.26	1.93	**0.11**
13.60	2.43	2.10	0.05
14.40	2.52	2.18	0.03
15.20	2.59	2.25	0.02
16.00	2.63	2.29	0.02
16.80	2.67	2.33	0.02
17.60	2.71	2.37	0.01
18.40	2.74	2.40	0.01
19.20	2.77	2.43	0.01
20.00	2.80	2.46	0.01
20.80	2.82	2.48	0.01
21.60	2.84	2.50	0.01
22.40	2.85	2.51	0.01
23.20	2.86	2.52	0.00
24.00	**2.87**	**2.53**	0.00
24.80	2.87	2.53	0.00
25.60	2.87	2.53	0.00
26.40	2.87	2.53	0.00
27.20	2.87	2.53	0.00
28.00	2.87	2.53	0.00
28.80	2.87	2.53	0.00
29.60	2.87	2.53	0.00
30.40	2.87	2.53	0.00
31.20	2.87	2.53	0.00
32.00	2.87	2.53	0.00
32.80	2.87	2.53	0.00
33.60	2.87	2.53	0.00
34.40	2.87	2.53	0.00
35.20	2.87	2.53	0.00
36.00	2.87	2.53	0.00
36.80	2.87	2.53	0.00
37.60	2.87	2.53	0.00
38.40	2.87	2.53	0.00
39.20	2.87	2.53	0.00
40.00	2.87	2.53	0.00
40.80	2.87	2.53	0.00
41.60	2.87	2.53	0.00
42.40	2.87	2.53	0.00
43.20	2.87	2.53	0.00
44.00	2.87	2.53	0.00
44.80	2.87	2.53	0.00
45.60	2.87	2.53	0.00
46.40	2.87	2.53	0.00
47.20	2.87	2.53	0.00
48.00	2.87	2.53	0.00
48.80	2.87	2.53	0.00
49.60	2.87	2.53	0.00
50.40	2.87	2.53	0.00
51.20	2.87	2.53	0.00
52.00	2.87	2.53	0.00
52.80	2.87	2.53	0.00
53.60	2.87	2.53	0.00
54.40	2.87	2.53	0.00
55.20	2.87	2.53	0.00
56.00	2.87	2.53	0.00
56.80	2.87	2.53	0.00
57.60	2.87	2.53	0.00
58.40	2.87	2.53	0.00
59.20	2.87	2.53	0.00
60.00	2.87	2.53	0.00
60.80	2.87	2.53	0.00
61.60	2.87	2.53	0.00
62.40	2.87	2.53	0.00
63.20	2.87	2.53	0.00
64.00	2.87	2.53	0.00
64.80	2.87	2.53	0.00
65.60	2.87	2.53	0.00
66.40	2.87	2.53	0.00
67.20	2.87	2.53	0.00
68.00	2.87	2.53	0.00
68.80	2.87	2.53	0.00
69.60	2.87	2.53	0.00
70.40	2.87	2.53	0.00
71.20	2.87	2.53	0.00
72.00	2.87	2.53	0.00

Summary for Subcatchment DA5: N and W Edges

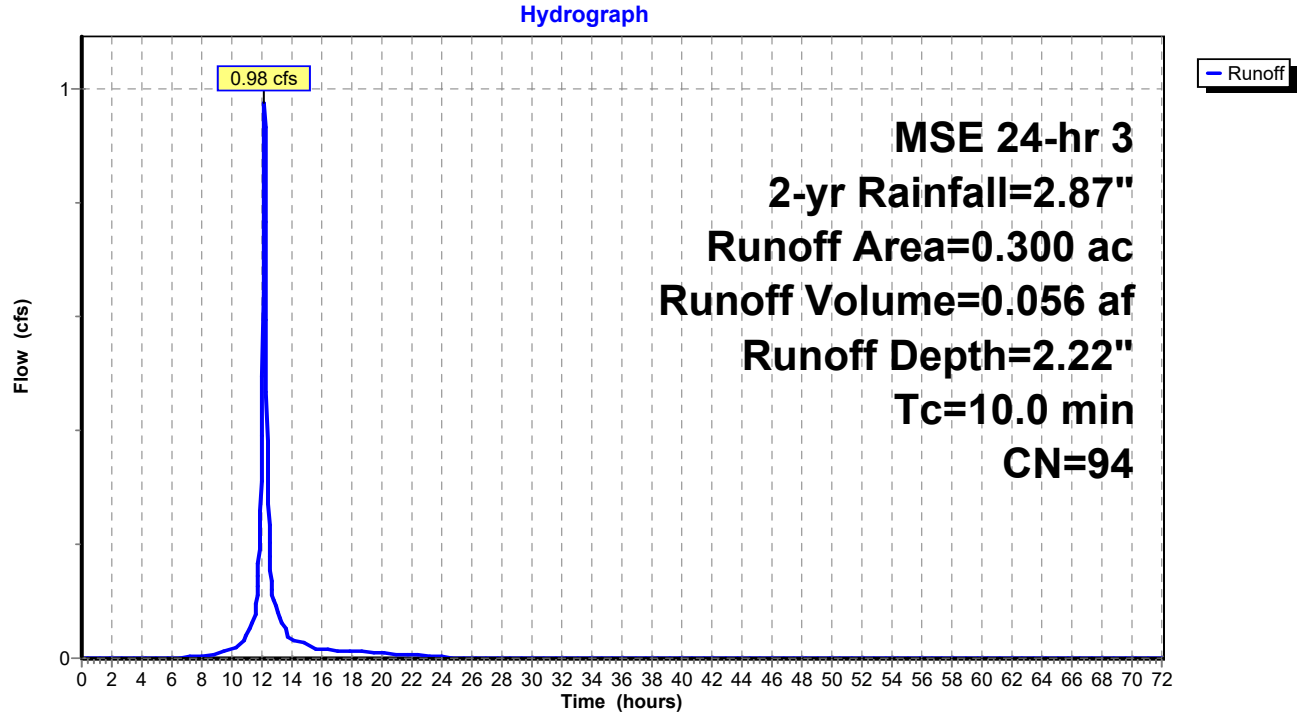
Runoff = 0.98 cfs @ 12.17 hrs, Volume= 0.056 af, Depth= 2.22"
Routed to Reach 5.1 : 12-in Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs
MSE 24-hr 3 2-yr Rainfall=2.87"

	Area (ac)	CN	Description
*	0.229	98	Paved Surfaces
	0.071	80	>75% Grass cover, Good, HSG D
	0.300	94	Weighted Average
	0.071		23.67% Pervious Area
	0.229		76.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Subcatchment DA5: N and W Edges



Hydrograph for Subcatchment DA5: N and W Edges

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.80	0.01	0.00	0.00
1.60	0.02	0.00	0.00
2.40	0.03	0.00	0.00
3.20	0.05	0.00	0.00
4.00	0.07	0.00	0.00
4.80	0.10	0.00	0.00
5.60	0.13	0.00	0.00
6.40	0.16	0.00	0.00
7.20	0.20	0.01	0.00
8.00	0.24	0.02	0.00
8.80	0.28	0.03	0.01
9.60	0.35	0.06	0.01
10.40	0.44	0.10	0.02
11.20	0.61	0.21	0.05
12.00	1.33	0.78	**0.39**
12.80	2.26	1.64	**0.10**
13.60	2.43	1.80	0.05
14.40	2.52	1.89	0.03
15.20	2.59	1.95	0.02
16.00	2.63	1.99	0.02
16.80	2.67	2.03	0.01
17.60	2.71	2.07	0.01
18.40	2.74	2.10	0.01
19.20	2.77	2.13	0.01
20.00	2.80	2.15	0.01
20.80	2.82	2.17	0.01
21.60	2.84	2.19	0.01
22.40	2.85	2.21	0.01
23.20	2.86	2.22	0.00
24.00	**2.87**	**2.22**	0.00
24.80	2.87	2.22	0.00
25.60	2.87	2.22	0.00
26.40	2.87	2.22	0.00
27.20	2.87	2.22	0.00
28.00	2.87	2.22	0.00
28.80	2.87	2.22	0.00
29.60	2.87	2.22	0.00
30.40	2.87	2.22	0.00
31.20	2.87	2.22	0.00
32.00	2.87	2.22	0.00
32.80	2.87	2.22	0.00
33.60	2.87	2.22	0.00
34.40	2.87	2.22	0.00
35.20	2.87	2.22	0.00
36.00	2.87	2.22	0.00
36.80	2.87	2.22	0.00
37.60	2.87	2.22	0.00
38.40	2.87	2.22	0.00
39.20	2.87	2.22	0.00
40.00	2.87	2.22	0.00
40.80	2.87	2.22	0.00
41.60	2.87	2.22	0.00
42.40	2.87	2.22	0.00
43.20	2.87	2.22	0.00
44.00	2.87	2.22	0.00
44.80	2.87	2.22	0.00
45.60	2.87	2.22	0.00
46.40	2.87	2.22	0.00
47.20	2.87	2.22	0.00
48.00	2.87	2.22	0.00
48.80	2.87	2.22	0.00
49.60	2.87	2.22	0.00
50.40	2.87	2.22	0.00
51.20	2.87	2.22	0.00
52.00	2.87	2.22	0.00
52.80	2.87	2.22	0.00
53.60	2.87	2.22	0.00
54.40	2.87	2.22	0.00
55.20	2.87	2.22	0.00
56.00	2.87	2.22	0.00
56.80	2.87	2.22	0.00
57.60	2.87	2.22	0.00
58.40	2.87	2.22	0.00
59.20	2.87	2.22	0.00
60.00	2.87	2.22	0.00
60.80	2.87	2.22	0.00
61.60	2.87	2.22	0.00
62.40	2.87	2.22	0.00
63.20	2.87	2.22	0.00
64.00	2.87	2.22	0.00
64.80	2.87	2.22	0.00
65.60	2.87	2.22	0.00
66.40	2.87	2.22	0.00
67.20	2.87	2.22	0.00
68.00	2.87	2.22	0.00
68.80	2.87	2.22	0.00
69.60	2.87	2.22	0.00
70.40	2.87	2.22	0.00
71.20	2.87	2.22	0.00
72.00	2.87	2.22	0.00

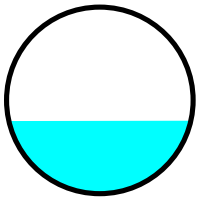
Summary for Reach 5.1: 12-in Catch Basin

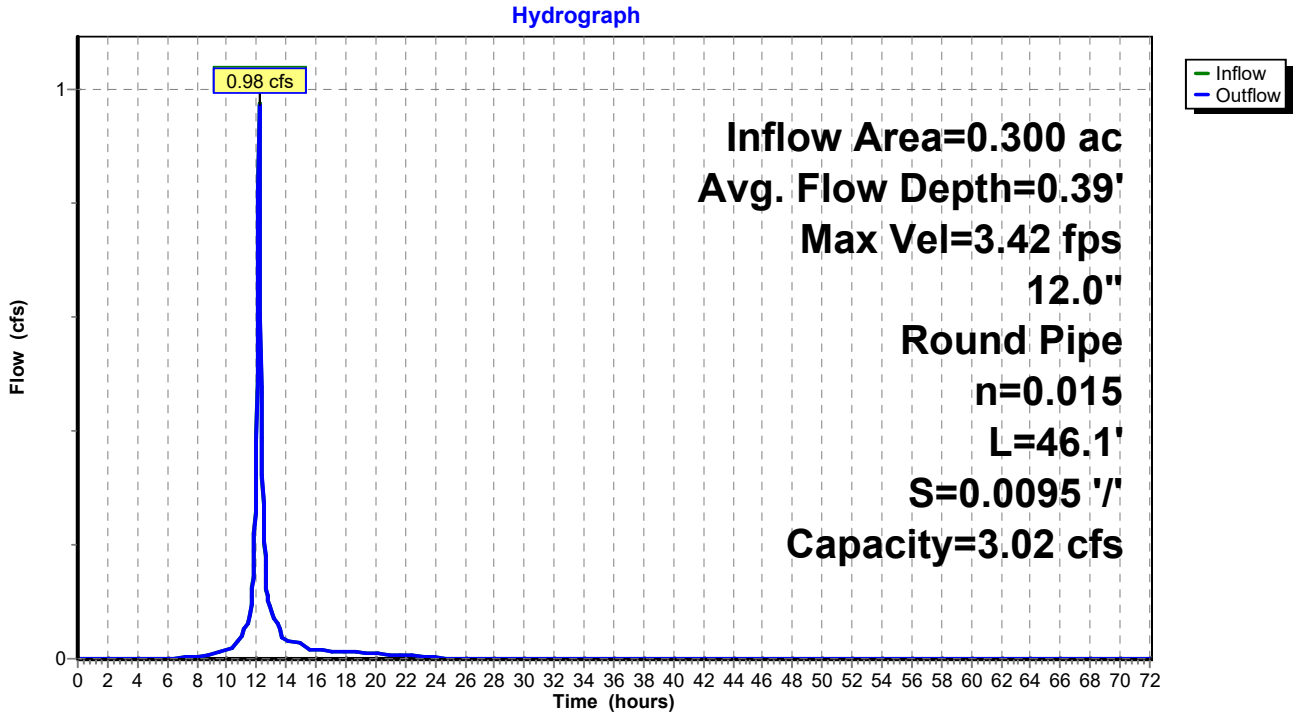
Inflow Area = 0.300 ac, 76.33% Impervious, Inflow Depth = 2.22" for 2-yr event
Inflow = 0.98 cfs @ 12.17 hrs, Volume= 0.056 af
Outflow = 0.98 cfs @ 12.17 hrs, Volume= 0.056 af, Atten= 0%, Lag= 0.2 min
Routed to Reach N FLOWS : 108-in RCP

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs / 2
Max. Velocity= 3.42 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.00 fps, Avg. Travel Time= 0.8 min

Peak Storage= 13 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.39' , Surface Width= 0.98'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.02 cfs

12.0" Round Pipe
n= 0.015 Concrete sewer w/manholes & inlets
Length= 46.1' Slope= 0.0095 '/'
Inlet Invert= 772.55', Outlet Invert= 772.11'





Hydrograph for Reach 5.1: 12-in Catch Basin

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	772.55	0.00
2.00	0.00	0	772.55	0.00
4.00	0.00	0	772.55	0.00
6.00	0.00	0	772.56	0.00
8.00	0.00	0	772.58	0.00
10.00	0.02	1	772.60	0.02
12.00	**0.39**	**7**	**772.79**	**0.38**
14.00	**0.03**	**1**	**772.62**	**0.03**
16.00	0.02	1	772.60	0.02
18.00	0.01	1	772.60	0.01
20.00	0.01	0	772.59	0.01
22.00	0.01	0	772.58	0.01
24.00	0.00	0	772.57	0.00
26.00	0.00	0	772.55	0.00
28.00	0.00	0	772.55	0.00
30.00	0.00	0	772.55	0.00
32.00	0.00	0	772.55	0.00
34.00	0.00	0	772.55	0.00
36.00	0.00	0	772.55	0.00
38.00	0.00	0	772.55	0.00
40.00	0.00	0	772.55	0.00
42.00	0.00	0	772.55	0.00
44.00	0.00	0	772.55	0.00
46.00	0.00	0	772.55	0.00
48.00	0.00	0	772.55	0.00
50.00	0.00	0	772.55	0.00
52.00	0.00	0	772.55	0.00
54.00	0.00	0	772.55	0.00
56.00	0.00	0	772.55	0.00
58.00	0.00	0	772.55	0.00
60.00	0.00	0	772.55	0.00
62.00	0.00	0	772.55	0.00
64.00	0.00	0	772.55	0.00
66.00	0.00	0	772.55	0.00
68.00	0.00	0	772.55	0.00
70.00	0.00	0	772.55	0.00
72.00	0.00	0	772.55	0.00

Stage-Discharge for Reach 5.1: 12-in Catch Basin

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
772.55	0.00	0.00
772.56	0.34	0.00
772.57	0.54	0.00
772.58	0.71	0.00
772.59	0.85	0.01
772.60	0.99	0.01
772.61	1.11	0.02
772.62	1.23	0.03
772.63	1.34	0.04
772.64	1.44	0.05
772.65	1.54	0.06
772.66	1.64	0.08
772.67	1.73	0.09
772.68	1.82	0.11
772.69	1.90	0.13
772.70	1.98	0.15
772.71	2.06	0.17
772.72	2.14	0.19
772.73	2.22	0.21
772.74	2.29	0.24
772.75	2.36	0.26
772.76	2.43	0.29
772.77	2.50	0.32
772.78	2.56	0.35
772.79	2.63	0.38
772.80	2.69	0.41
772.81	2.75	0.45
772.82	2.81	0.48
772.83	2.87	0.52
772.84	2.93	0.55
772.85	2.98	0.59
772.86	3.03	0.63
772.87	3.09	0.67
772.88	3.14	0.71
772.89	3.19	0.75
772.90	3.24	0.79
772.91	3.29	0.84
772.92	3.33	0.88
772.93	3.38	0.92
772.94	3.42	0.97
772.95	3.47	1.02
772.96	3.51	1.06
772.97	3.55	1.11
772.98	3.59	1.16
772.99	3.63	1.21
773.00	3.67	1.26
773.01	3.70	1.31
773.02	3.74	1.36
773.03	3.77	1.41
773.04	3.81	1.46
773.05	3.84	1.51
773.06	3.87	1.56
773.07	3.90	1.61
773.08	3.93	1.66
773.09	3.96	1.71
773.10	3.99	1.77
773.11	4.02	1.82
773.12	4.05	1.87
773.13	4.07	1.92
773.14	4.10	1.97
773.15	4.12	2.03
773.16	4.14	2.08
773.17	4.16	2.13
773.18	4.18	2.18
773.19	4.20	2.23
773.20	4.22	2.28
773.21	4.24	2.33
773.22	4.26	2.38
773.23	4.27	2.43
773.24	4.29	2.48
773.25	4.30	2.53
773.26	4.31	2.57
773.27	4.33	2.62
773.28	4.34	2.66
773.29	4.35	2.71
773.30	4.35	2.75
773.31	4.36	2.79
773.32	4.37	2.83
773.33	4.37	2.87
773.34	4.38	2.91
773.35	4.38	2.95
773.36	**4.38**	2.98
773.37	4.38	3.02
773.38	4.38	3.05
773.39	4.37	3.08
773.40	4.37	3.11
773.41	4.36	3.13
773.42	4.35	3.16
773.43	4.34	3.18
773.44	4.33	3.20
773.45	4.32	3.22
773.46	4.30	3.23
773.47	4.28	3.24
773.48	4.26	3.24
773.49	4.24	**3.24**
773.50	4.21	3.24
773.51	4.17	3.23
773.52	4.13	3.21
773.53	4.08	3.19
773.54	4.01	3.14
773.55	3.84	3.02

Stage-Area-Storage for Reach 5.1: 12-in Catch Basin

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
772.55	0.0	0
772.56	0.0	0
772.57	0.0	0
772.58	0.0	0
772.59	0.0	0
772.60	0.0	1
772.61	0.0	1
772.62	0.0	1
772.63	0.0	1
772.64	0.0	2
772.65	0.0	2
772.66	0.0	2
772.67	0.1	2
772.68	0.1	3
772.69	0.1	3
772.70	0.1	3
772.71	0.1	4
772.72	0.1	4
772.73	0.1	4
772.74	0.1	5
772.75	0.1	5
772.76	0.1	6
772.77	0.1	6
772.78	0.1	6
772.79	0.1	7
772.80	0.2	7
772.81	0.2	7
772.82	0.2	8
772.83	0.2	8
772.84	0.2	9
772.85	0.2	9
772.86	0.2	10
772.87	0.2	10
772.88	0.2	10
772.89	0.2	11
772.90	0.2	11
772.91	0.3	12
772.92	0.3	12
772.93	0.3	13
772.94	0.3	13
772.95	0.3	14
772.96	0.3	14
772.97	0.3	14
772.98	0.3	15
772.99	0.3	15
773.00	0.3	16
773.01	0.4	16
773.02	0.4	17
773.03	0.4	17
773.04	0.4	18
773.05	0.4	18
773.06	0.4	19
773.07	0.4	19
773.08	0.4	19
773.09	0.4	20
773.10	0.4	20
773.11	0.5	21
773.12	0.5	21
773.13	0.5	22
773.14	0.5	22
773.15	0.5	23
773.16	0.5	23
773.17	0.5	24
773.18	0.5	24
773.19	0.5	24
773.20	0.5	25
773.21	0.5	25
773.22	0.6	26
773.23	0.6	26
773.24	0.6	27
773.25	0.6	27
773.26	0.6	27
773.27	0.6	28
773.28	0.6	28
773.29	0.6	29
773.30	0.6	29
773.31	0.6	30
773.32	0.6	30
773.33	0.7	30
773.34	0.7	31
773.35	0.7	31
773.36	0.7	31
773.37	0.7	32
773.38	0.7	32
773.39	0.7	32
773.40	0.7	33
773.41	0.7	33
773.42	0.7	33
773.43	0.7	34
773.44	0.7	34
773.45	0.7	34
773.46	0.8	35
773.47	0.8	35
773.48	0.8	35
773.49	0.8	35
773.50	0.8	36
773.51	0.8	36
773.52	0.8	36
773.53	0.8	36
773.54	0.8	36
773.55	**0.8**	**36**

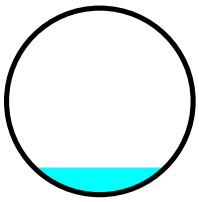
Summary for Reach N FLOWS: 108-in RCP

Inflow Area = 1.333 ac, 93.92% Impervious, Inflow Depth = 2.61" for 2-yr event
Inflow = 3.56 cfs @ 12.24 hrs, Volume= 0.290 af
Outflow = 2.18 cfs @ 12.45 hrs, Volume= 0.290 af, Atten= 39%, Lag= 12.7 min

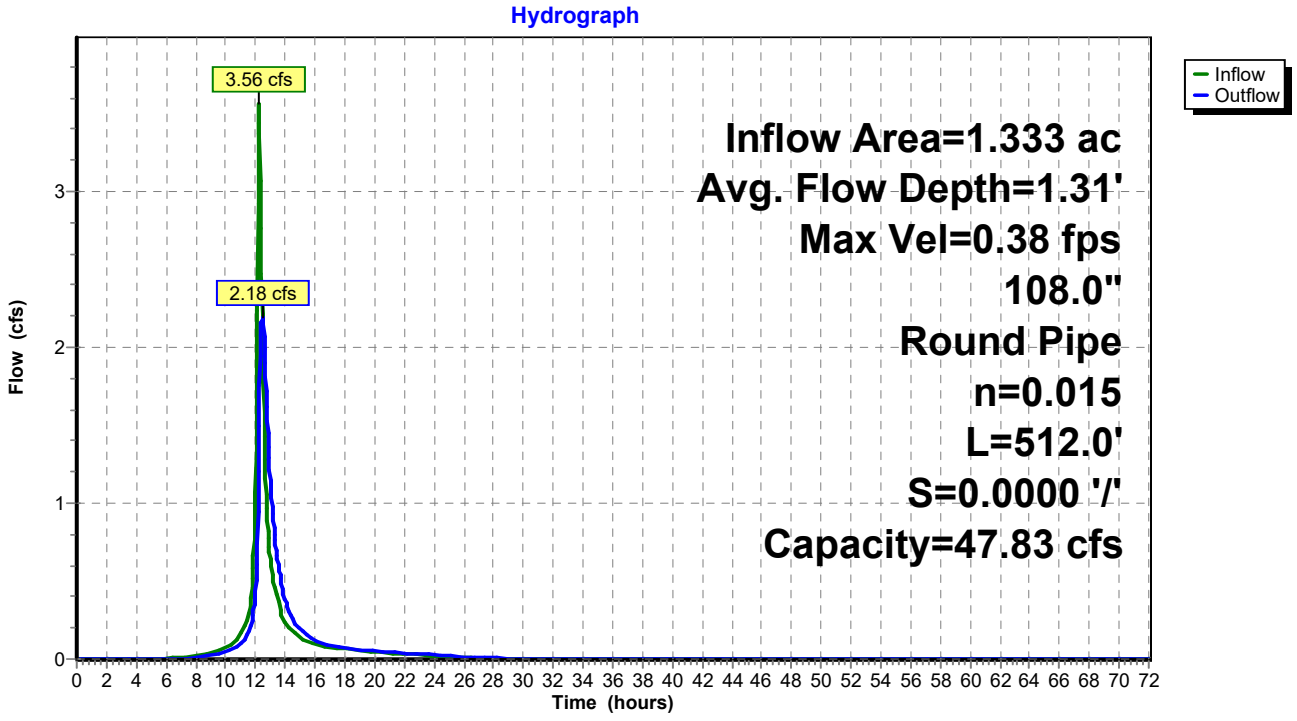
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs / 2
Max. Velocity= 0.38 fps, Min. Travel Time= 22.4 min
Avg. Velocity = 0.09 fps, Avg. Travel Time= 95.9 min

Peak Storage= 2,929 cf @ 12.45 hrs
Average Depth at Peak Storage= 1.31' , Surface Width= 6.34'
Bank-Full Depth= 9.00' Flow Area= 63.6 sf, Capacity= 47.83 cfs

108.0" Round Pipe
n= 0.015 Concrete sewer w/manholes & inlets
Length= 512.0' Slope= 0.0000 '/'
Inlet Invert= 761.00', Outlet Invert= 760.99'



Reach N FLOWS: 108-in RCP



Hydrograph for Reach N FLOWS: 108-in RCP

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	761.00	0.00
2.00	0.00	0	761.00	0.00
4.00	0.00	0	761.00	0.00
6.00	0.00	4	761.01	0.00
8.00	0.02	60	761.09	0.01
10.00	0.07	195	761.21	0.05
12.00	**1.07**	**951**	**761.61**	**0.44**
14.00	**0.22**	**857**	**761.57**	**0.38**
16.00	0.09	391	761.33	0.12
18.00	0.06	272	761.26	0.07
20.00	0.05	219	761.22	0.05
22.00	0.03	176	761.19	0.04
24.00	0.02	133	761.16	0.03
26.00	0.01	78	761.11	0.01
28.00	0.00	51	761.08	0.01
30.00	0.00	35	761.06	0.00
32.00	0.00	23	761.04	0.00
34.00	0.00	16	761.03	0.00
36.00	0.00	12	761.02	0.00
38.00	0.00	9	761.01	0.00
40.00	0.00	7	761.01	0.00
42.00	0.00	5	761.01	0.00
44.00	0.00	4	761.01	0.00
46.00	0.00	4	761.01	0.00
48.00	0.00	3	761.01	0.00
50.00	0.00	3	761.00	0.00
52.00	0.00	2	761.00	0.00
54.00	0.00	2	761.00	0.00
56.00	0.00	2	761.00	0.00
58.00	0.00	2	761.00	0.00
60.00	0.00	1	761.00	0.00
62.00	0.00	1	761.00	0.00
64.00	0.00	1	761.00	0.00
66.00	0.00	1	761.00	0.00
68.00	0.00	1	761.00	0.00
70.00	0.00	1	761.00	0.00
72.00	0.00	1	761.00	0.00

Stage-Discharge for Reach N FLOWS: 108-in RCP

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
761.00	0.00	0.00
761.10	0.07	0.01
761.20	0.11	0.04
761.30	0.15	0.10
761.40	0.18	0.18
761.50	0.21	0.29
761.60	0.23	0.43
761.70	0.26	0.59
761.80	0.28	0.78
761.90	0.30	1.00
762.00	0.32	1.25
762.10	0.34	1.52
762.20	0.36	1.82
762.30	0.38	2.15
762.40	0.40	2.51
762.50	0.41	2.89
762.60	0.43	3.30
762.70	0.45	3.73
762.80	0.46	4.19
762.90	0.48	4.67
763.00	0.49	5.18
763.10	0.51	5.71
763.20	0.52	6.27
763.30	0.53	6.84
763.40	0.55	7.44
763.50	0.56	8.06
763.60	0.57	8.70
763.70	0.58	9.37
763.80	0.60	10.05
763.90	0.61	10.75
764.00	0.62	11.47
764.10	0.63	12.20
764.20	0.64	12.96
764.30	0.65	13.72
764.40	0.66	14.51
764.50	0.67	15.30
764.60	0.68	16.12
764.70	0.69	16.94
764.80	0.70	17.78
764.90	0.70	18.63
765.00	0.71	19.49
765.10	0.72	20.36
765.20	0.73	21.23
765.30	0.74	22.12
765.40	0.74	23.01
765.50	0.75	23.91
765.60	0.76	24.82
765.70	0.77	25.73
765.80	0.77	26.64
765.90	0.78	27.55
766.00	0.78	28.47
766.10	0.79	29.39
766.20	0.80	30.30
766.30	0.80	31.22
766.40	0.81	32.13
766.50	0.81	33.04
766.60	0.82	33.94
766.70	0.82	34.84
766.80	0.82	35.73
766.90	0.83	36.61
767.00	0.83	37.49
767.10	0.84	38.35
767.20	0.84	39.20
767.30	0.84	40.04
767.40	0.84	40.86
767.50	0.85	41.67
767.60	0.85	42.46
767.70	0.85	43.23
767.80	0.85	43.98
767.90	0.85	44.71
768.00	0.86	45.41
768.10	0.86	46.09
768.20	**0.86**	46.75
768.30	**0.86**	47.37
768.40	0.86	47.96
768.50	0.86	48.51
768.60	0.86	49.03
768.70	0.85	49.51
768.80	0.85	49.95
768.90	0.85	50.34
769.00	0.85	50.68
769.10	0.85	50.97
769.20	0.84	51.19
769.30	0.84	51.35
769.40	0.83	**51.43**
769.50	0.83	**51.42**
769.60	0.82	51.31
769.70	0.81	51.06
769.80	0.80	50.63
769.90	0.79	49.91
770.00	0.75	47.83

Stage-Area-Storage for Reach N FLOWS: 108-in RCP

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
761.00	0.0	0
761.10	0.1	66
761.20	0.4	184
761.30	0.7	335
761.40	1.0	513
761.50	1.4	714
761.60	1.8	934
761.70	2.3	1,172
761.80	2.8	1,426
761.90	3.3	1,695
762.00	3.9	1,979
762.10	4.4	2,275
762.20	5.0	2,583
762.30	5.7	2,901
762.40	6.3	3,230
762.50	7.0	3,569
762.60	7.7	3,917
762.70	8.3	4,273
762.80	9.1	4,638
762.90	9.8	5,010
763.00	10.5	5,390
763.10	11.3	5,777
763.20	12.1	6,170
763.30	12.8	6,569
763.40	13.6	6,973
763.50	14.4	7,383
763.60	15.2	7,799
763.70	16.1	8,218
763.80	16.9	8,643
763.90	17.7	9,072
764.00	18.6	9,505
764.10	19.4	9,941
764.20	20.3	10,380
764.30	21.1	10,823
764.40	22.0	11,268
764.50	22.9	11,716
764.60	23.8	12,167
764.70	24.6	12,619
764.80	25.5	13,074
764.90	26.4	13,530
765.00	27.3	13,987
765.10	28.2	14,445
765.20	29.1	14,905
765.30	30.0	15,365
765.40	30.9	15,825
765.50	31.8	16,286
765.60	32.7	16,747
765.70	33.6	17,207
765.80	34.5	17,667
765.90	35.4	18,127
766.00	36.3	18,585
766.10	37.2	19,042
766.20	38.1	19,498
766.30	39.0	19,953
766.40	39.9	20,405
766.50	40.7	20,856
766.60	41.6	21,304
766.70	42.5	21,749
766.80	43.3	22,192
766.90	44.2	22,631
767.00	45.1	23,067
767.10	45.9	23,500
767.20	46.7	23,929
767.30	47.6	24,354
767.40	48.4	24,773
767.50	49.2	25,189
767.60	50.0	25,599
767.70	50.8	26,003
767.80	51.6	26,402
767.90	52.3	26,795
768.00	53.1	27,182
768.10	53.8	27,562
768.20	54.6	27,934
768.30	55.3	28,299
768.40	56.0	28,655
768.50	56.6	29,003
768.60	57.3	29,342
768.70	58.0	29,671
768.80	58.6	29,989
768.90	59.2	30,297
769.00	59.8	30,593
769.10	60.3	30,877
769.20	60.8	31,146
769.30	61.3	31,400
769.40	61.8	31,638
769.50	62.2	31,858
769.60	62.6	32,059
769.70	63.0	32,237
769.80	63.3	32,388
769.90	63.5	32,506
770.00	**63.6**	**32,572**

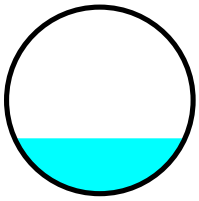
Summary for Reach S FLOWS: 15-in RCP

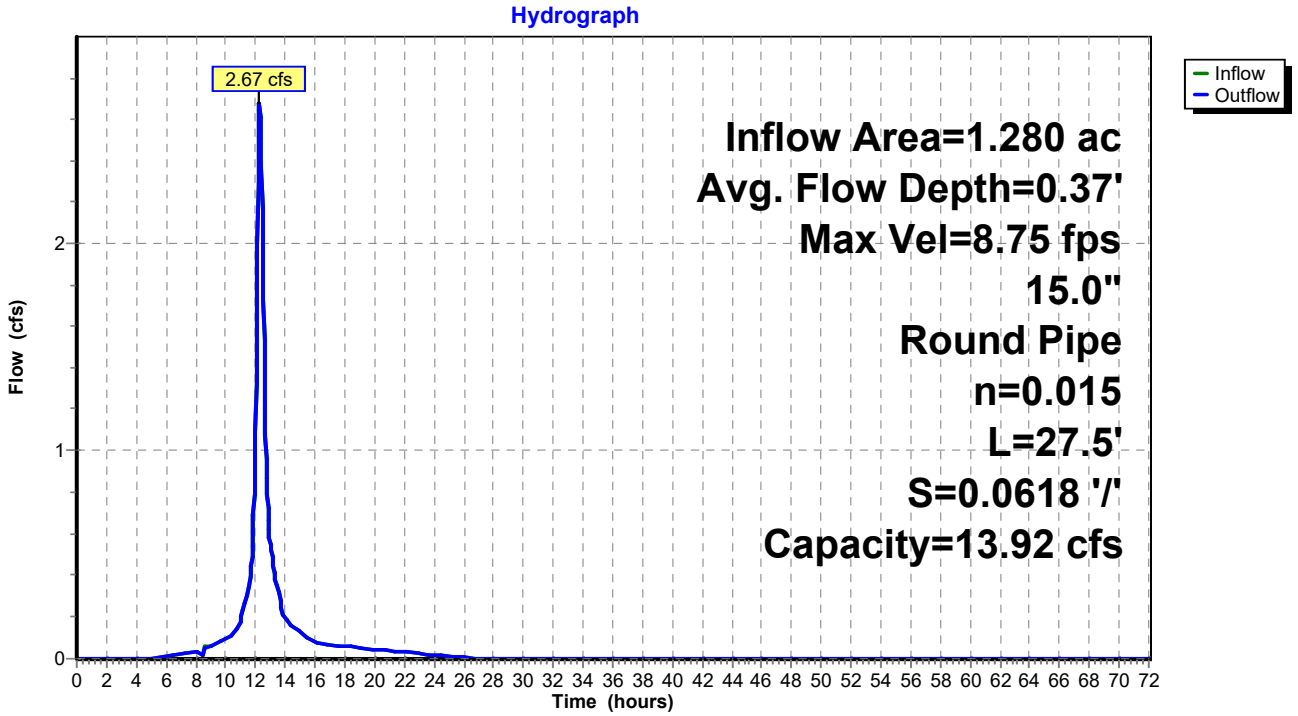
Inflow Area = 1.280 ac, 99.06% Impervious, Inflow Depth = 2.54" for 2-yr event
Inflow = 2.67 cfs @ 12.28 hrs, Volume= 0.271 af
Outflow = 2.67 cfs @ 12.28 hrs, Volume= 0.271 af, Atten= 0%, Lag= 0.0 min
Routed to nonexistent node 5R

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs / 2
Max. Velocity= 8.75 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 1.82 fps, Avg. Travel Time= 0.3 min

Peak Storage= 8 cf @ 12.28 hrs
Average Depth at Peak Storage= 0.37' , Surface Width= 1.14'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 13.92 cfs

15.0" Round Pipe
n= 0.015 Concrete sewer w/manholes & inlets
Length= 27.5' Slope= 0.0618 '/'
Inlet Invert= 773.80', Outlet Invert= 772.10'





Hydrograph for Reach S FLOWS: 15-in RCP

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	773.80	0.00
2.00	0.00	0	773.80	0.00
4.00	0.00	0	773.80	0.00
6.00	0.01	0	773.83	0.01
8.00	0.03	0	773.85	0.03
10.00	0.10	1	773.87	0.10
12.00	**1.09**	**4**	**774.04**	**1.09**
14.00	**0.19**	**1**	**773.90**	**0.19**
16.00	0.08	1	773.87	0.08
18.00	0.06	1	773.86	0.06
20.00	0.04	0	773.85	0.04
22.00	0.03	0	773.84	0.03
24.00	0.02	0	773.83	0.02
26.00	0.01	0	773.82	0.01
28.00	0.00	0	773.81	0.00
30.00	0.00	0	773.81	0.00
32.00	0.00	0	773.81	0.00
34.00	0.00	0	773.80	0.00
36.00	0.00	0	773.80	0.00
38.00	0.00	0	773.80	0.00
40.00	0.00	0	773.80	0.00
42.00	0.00	0	773.80	0.00
44.00	0.00	0	773.80	0.00
46.00	0.00	0	773.80	0.00
48.00	0.00	0	773.80	0.00
50.00	0.00	0	773.80	0.00
52.00	0.00	0	773.80	0.00
54.00	0.00	0	773.80	0.00
56.00	0.00	0	773.80	0.00
58.00	0.00	0	773.80	0.00
60.00	0.00	0	773.80	0.00
62.00	0.00	0	773.80	0.00
64.00	0.00	0	773.80	0.00
66.00	0.00	0	773.80	0.00
68.00	0.00	0	773.80	0.00
70.00	0.00	0	773.80	0.00
72.00	0.00	0	773.80	0.00

Stage-Discharge for Reach S FLOWS: 15-in RCP

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
773.80	0.00	0.00
773.81	0.81	0.00
773.82	1.36	0.01
773.83	1.79	0.01
773.84	2.17	0.03
773.85	2.52	0.04
773.86	2.83	0.06
773.87	3.13	0.09
773.88	3.42	0.11
773.89	3.69	0.15
773.90	3.95	0.18
773.91	4.19	0.22
773.92	4.43	0.27
773.93	4.66	0.32
773.94	4.89	0.37
773.95	5.10	0.43
773.96	5.31	0.49
773.97	5.52	0.55
773.98	5.72	0.62
773.99	5.91	0.70
774.00	6.10	0.77
774.01	6.28	0.85
774.02	6.46	0.94
774.03	6.64	1.03
774.04	6.81	1.12
774.05	6.98	1.22
774.06	7.14	1.32
774.07	7.30	1.42
774.08	7.46	1.53
774.09	7.61	1.64
774.10	7.76	1.76
774.11	7.91	1.88
774.12	8.06	2.00
774.13	8.20	2.12
774.14	8.34	2.25
774.15	8.47	2.38
774.16	8.61	2.52
774.17	8.74	2.66
774.18	8.87	2.80
774.19	8.99	2.94
774.20	9.12	3.09
774.21	9.24	3.24
774.22	9.36	3.39
774.23	9.48	3.54
774.24	9.59	3.70
774.25	9.70	3.86
774.26	9.81	4.02
774.27	9.92	4.19
774.28	10.03	4.35
774.29	10.13	4.52
774.30	10.23	4.69
774.31	10.33	4.86
774.32	10.43	5.04
774.33	10.53	5.21
774.34	10.62	5.39
774.35	10.71	5.57
774.36	10.80	5.75
774.37	10.89	5.94
774.38	10.98	6.12
774.39	11.06	6.30
774.40	11.14	6.49
774.41	11.22	6.68
774.42	11.30	6.87
774.43	11.38	7.05
774.44	11.46	7.24
774.45	11.53	7.43
774.46	11.60	7.63
774.47	11.67	7.82
774.48	11.74	8.01
774.49	11.80	8.20
774.50	11.87	8.39
774.51	11.93	8.59
774.52	11.99	8.78
774.53	12.05	8.97
774.54	12.11	9.16
774.55	12.16	9.35
774.56	12.22	9.54
774.57	12.27	9.73
774.58	12.32	9.92
774.59	12.37	10.11
774.60	12.41	10.30
774.61	12.46	10.48
774.62	12.50	10.67
774.63	12.54	10.85
774.64	12.58	11.03
774.65	12.62	11.21
774.66	12.65	11.39
774.67	12.69	11.57
774.68	12.72	11.74
774.69	12.75	11.91
774.70	12.77	12.08
774.71	12.80	12.25
774.72	12.82	12.41
774.73	12.84	12.57
774.74	12.86	12.73
774.75	12.88	12.89
774.76	12.89	13.04
774.77	12.90	13.19
774.78	12.91	13.33
774.79	12.92	13.47
774.80	12.93	13.61
774.81	12.93	13.74
774.82	**12.93**	13.86
774.83	12.93	13.98
774.84	12.92	14.10
774.85	12.92	14.21
774.86	12.90	14.32
774.87	12.89	14.42
774.88	12.87	14.51
774.89	12.85	14.59
774.90	12.83	14.67
774.91	12.80	14.74
774.92	12.77	14.81
774.93	12.73	14.86
774.94	12.69	14.90
774.95	12.65	14.94
774.96	12.60	14.96
774.97	12.54	**14.97**
774.98	12.47	14.97
774.99	12.40	14.95
775.00	12.32	14.91
775.01	12.22	14.85
775.02	12.10	14.76
775.03	11.96	14.63
775.04	11.74	14.39
775.05	11.34	13.92

Stage-Area-Storage for Reach S FLOWS: 15-in RCP

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
773.80	0.0	0
773.82	0.0	0
773.84	0.0	0
773.86	0.0	1
773.88	0.0	1
773.90	0.0	1
773.92	0.1	2
773.94	0.1	2
773.96	0.1	3
773.98	0.1	3
774.00	0.1	3
774.02	0.1	4
774.04	0.2	5
774.06	0.2	5
774.08	0.2	6
774.10	0.2	6
774.12	0.2	7
774.14	0.3	7
774.16	0.3	8
774.18	0.3	9
774.20	0.3	9
774.22	0.4	10
774.24	0.4	11
774.26	0.4	11
774.28	0.4	12
774.30	0.5	13
774.32	0.5	13
774.34	0.5	14
774.36	0.5	15
774.38	0.6	15
774.40	0.6	16
774.42	0.6	17
774.44	0.6	17
774.46	0.7	18
774.48	0.7	19
774.50	0.7	19
774.52	0.7	20
774.54	0.8	21
774.56	0.8	21
774.58	0.8	22
774.60	0.8	23
774.62	0.9	23
774.64	0.9	24
774.66	0.9	25
774.68	0.9	25
774.70	0.9	26
774.72	1.0	27
774.74	1.0	27
774.76	1.0	28
774.78	1.0	28
774.80	1.1	29
774.82	1.1	29
774.84	1.1	30
774.86	1.1	31
774.88	1.1	31
774.90	1.1	31
774.92	1.2	32
774.94	1.2	32
774.96	1.2	33
774.98	1.2	33
775.00	1.2	33
775.02	1.2	34
775.04	**1.2**	**34**

Summary for Pond NADS: North ADS MC-3500

Inflow Area = 1.033 ac, 99.03% Impervious, Inflow Depth = 2.72" for 2-yr event
Inflow = 4.75 cfs @ 12.17 hrs, Volume= 0.235 af
Outflow = 2.80 cfs @ 12.26 hrs, Volume= 0.234 af, Atten= 41%, Lag= 5.3 min
Primary = 2.80 cfs @ 12.26 hrs, Volume= 0.234 af
Routed to Reach N FLOWS : 108-in RCP

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs / 2
Peak Elev= 772.10' @ 12.26 hrs Surf.Area= 0.072 ac Storage= 0.067 af

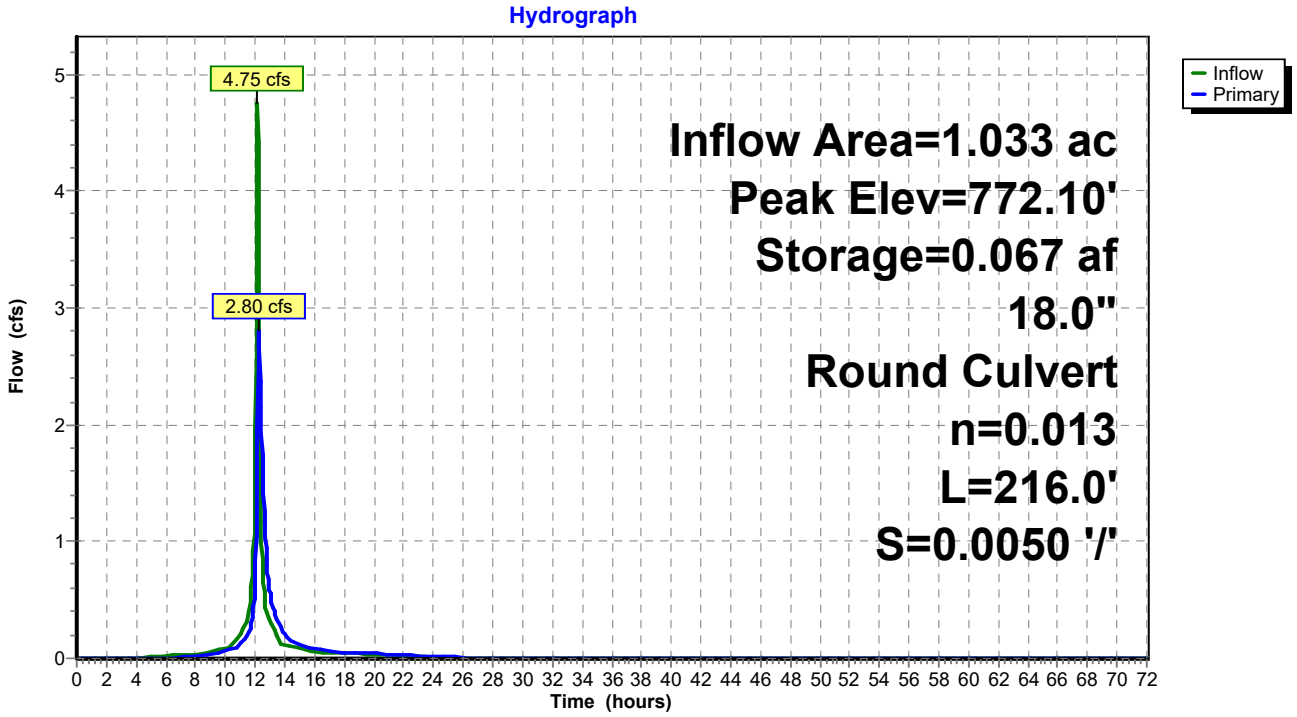
Plug-Flow detention time= 64.1 min calculated for 0.234 af (100% of inflow)
Center-of-Mass det. time= 62.6 min (821.0 - 758.3)

Volume	Invert	Avail.Storage	Storage Description
#1	771.20'	0.201 af	**ADS_StormTech MC-3500 d +Cap @ 112.50' L**x 5 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 112.50'L = 1,725.2 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 5 Chambers in 5 Rows Cap Storage= 14.9 cf x 2 x 5 rows = 149.0 cf

Device	Routing	Invert	Outlet Devices
#1	Primary	771.20'	**18.0" Round Culvert** L= 216.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 771.20' / 770.12' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf

Primary OutFlow Max=2.77 cfs @ 12.26 hrs HW=772.09' TW=762.13' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 2.77 cfs @ 2.53 fps)

Pond NADS: North ADS MC-3500



Hydrograph for Pond NADS: North ADS MC-3500

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.000	771.20	0.00
2.00	0.00	0.000	771.20	0.00
4.00	0.01	0.000	771.20	0.00
6.00	0.02	0.002	771.23	0.00
8.00	0.04	0.006	771.27	0.02
10.00	0.09	0.010	771.33	0.06
12.00	**1.56**	**0.032**	**771.62**	**0.69**
14.00	**0.11**	**0.017**	**771.42**	**0.19**
16.00	0.06	0.011	771.34	0.08
18.00	0.04	0.009	771.32	0.05
20.00	0.03	0.008	771.30	0.04
22.00	0.02	0.007	771.29	0.03
24.00	0.01	0.006	771.27	0.02
26.00	0.00	0.004	771.25	0.01
28.00	0.00	0.003	771.24	0.00
30.00	0.00	0.002	771.23	0.00
32.00	0.00	0.002	771.22	0.00
34.00	0.00	0.002	771.22	0.00
36.00	0.00	0.001	771.22	0.00
38.00	0.00	0.001	771.22	0.00
40.00	0.00	0.001	771.22	0.00
42.00	0.00	0.001	771.21	0.00
44.00	0.00	0.001	771.21	0.00
46.00	0.00	0.001	771.21	0.00
48.00	0.00	0.001	771.21	0.00
50.00	0.00	0.001	771.21	0.00
52.00	0.00	0.001	771.21	0.00
54.00	0.00	0.001	771.21	0.00
56.00	0.00	0.001	771.21	0.00
58.00	0.00	0.001	771.21	0.00
60.00	0.00	0.001	771.21	0.00
62.00	0.00	0.001	771.21	0.00
64.00	0.00	0.001	771.21	0.00
66.00	0.00	0.001	771.21	0.00
68.00	0.00	0.001	771.21	0.00
70.00	0.00	0.001	771.21	0.00
72.00	0.00	0.001	771.21	0.00

Stage-Discharge for Pond NADS: North ADS MC-3500

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
771.20	0.00	772.24	3.58	773.28	7.55	774.32	9.63
771.22	0.00	772.26	3.69	773.30	7.60	774.34	9.67
771.24	0.00	772.28	3.80	773.32	7.64	774.36	9.71
771.26	0.01	772.30	3.92	773.34	7.69	774.38	9.74
771.28	0.02	772.32	4.03	773.36	7.73	774.40	9.78
771.30	0.04	772.34	4.14	773.38	7.78	774.42	9.81
771.32	0.05	772.36	4.25	773.40	7.82	774.44	9.85
771.34	0.07	772.38	4.35	773.42	7.87	774.46	9.88
771.36	0.10	772.40	4.46	773.44	7.91	774.48	9.92
771.38	0.12	772.42	4.57	773.46	7.95	774.50	9.95
771.40	0.15	772.44	4.68	773.48	8.00	774.52	9.98
771.42	0.19	772.46	4.78	773.50	8.04	774.54	10.02
771.44	0.22	772.48	4.88	773.52	8.08	774.56	10.05
771.46	0.26	772.50	4.99	773.54	8.12	774.58	10.09
771.48	0.31	772.52	5.09	773.56	8.17	774.60	10.12
771.50	0.35	772.54	5.18	773.58	8.21	774.62	10.16
771.52	0.40	772.56	5.28	773.60	8.25	774.64	10.19
771.54	0.45	772.58	5.37	773.62	8.29	774.66	10.22
771.56	0.51	772.60	5.46	773.64	8.33	774.68	10.26
771.58	0.56	772.62	5.54	773.66	8.37	774.70	10.29
771.60	0.62	772.64	5.62	773.68	8.42	774.72	10.32
771.62	0.69	772.66	5.70	773.70	8.46	774.74	10.36
771.64	0.75	772.68	5.76	773.72	8.50	774.76	10.39
771.66	0.82	772.70	5.82	773.74	8.54	774.78	10.42
771.68	0.89	772.72	5.89	773.76	8.58	774.80	10.46
771.70	0.97	772.74	5.97	773.78	8.62	774.82	10.49
771.72	1.04	772.76	6.05	773.80	8.66	774.84	10.52
771.74	1.12	772.78	6.12	773.82	8.70	774.86	10.55
771.76	1.20	772.80	6.19	773.84	8.74	774.88	10.59
771.78	1.28	772.82	6.27	773.86	8.78	774.90	10.62
771.80	1.36	772.84	6.34	773.88	8.81	774.92	10.65
771.82	1.45	772.86	6.41	773.90	8.85	774.94	**10.68**
771.84	1.54	772.88	6.48	773.92	8.89		
771.86	1.63	772.90	6.55	773.94	8.93		
771.88	1.72	772.92	6.62	773.96	8.97		
771.90	1.81	772.94	6.68	773.98	9.01		
771.92	1.91	772.96	6.75	774.00	9.05		
771.94	2.01	772.98	6.82	774.02	9.08		
771.96	2.11	773.00	6.88	774.04	9.12		
771.98	2.20	773.02	6.95	774.06	9.16		
772.00	2.30	773.04	7.01	774.08	9.20		
772.02	2.41	773.06	7.08	774.10	9.23		
772.04	2.51	773.08	7.14	774.12	9.27		
772.06	2.61	773.10	7.20	774.14	9.31		
772.08	2.72	773.12	7.27	774.16	9.34		
772.10	2.82	773.14	7.33	774.18	9.38		
772.12	2.93	773.16	7.39	774.20	9.42		
772.14	3.04	773.18	7.45	774.22	9.45		
772.16	3.15	773.20	7.37	774.24	9.49		
772.18	3.25	773.22	7.42	774.26	9.53		
772.20	3.36	773.24	7.46	774.28	9.56		
772.22	3.47	773.26	7.51	774.30	9.60		

Stage-Area-Storage for Pond NADS: North ADS MC-3500

Elevation (feet)	Storage (acre-feet)
771.20	0.000
771.25	0.004
771.30	0.008
771.35	0.012
771.40	0.015
771.45	0.019
771.50	0.023
771.55	0.027
771.60	0.030
771.65	0.034
771.70	0.038
771.75	0.042
771.80	0.045
771.85	0.049
771.90	0.053
771.95	0.056
772.00	0.060
772.05	0.064
772.10	0.067
772.15	0.071
772.20	0.074
772.25	0.078
772.30	0.081
772.35	0.085
772.40	0.088
772.45	0.092
772.50	0.095
772.55	0.098
772.60	0.102
772.65	0.105
772.70	0.108
772.75	0.112
772.80	0.115
772.85	0.118
772.90	0.121
772.95	0.124
773.00	0.128
773.05	0.131
773.10	0.134
773.15	0.137
773.20	0.140
773.25	0.143
773.30	0.146
773.35	0.148
773.40	0.151
773.45	0.154
773.50	0.157
773.55	0.159
773.60	0.162
773.65	0.165
773.70	0.167
773.75	0.170
773.80	0.172
773.85	0.174
773.90	0.177
773.95	0.179
774.00	0.181
774.05	0.183
774.10	0.185
774.15	0.187
774.20	0.189
774.25	0.191
774.30	0.192
774.35	0.194
774.40	0.195
774.45	0.197
774.50	0.198
774.55	0.199
774.60	0.199
774.65	0.200
774.70	0.200
774.75	0.201
774.80	0.201
774.85	0.201
774.90	0.201
774.95	**0.201**

Summary for Pond SADS: South ADS MC-3500

Inflow Area = 1.280 ac, 99.06% Impervious, Inflow Depth = 2.54" for 2-yr event
Inflow = 3.51 cfs @ 12.17 hrs, Volume= 0.271 af
Outflow = 2.67 cfs @ 12.28 hrs, Volume= 0.271 af, Atten= 24%, Lag= 6.9 min
Primary = 2.67 cfs @ 12.28 hrs, Volume= 0.271 af
Routed to Pond SOCS : South OCS

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs / 2
Peak Elev= 775.29' @ 12.28 hrs Surf.Area= 0.037 ac Storage= 0.051 af

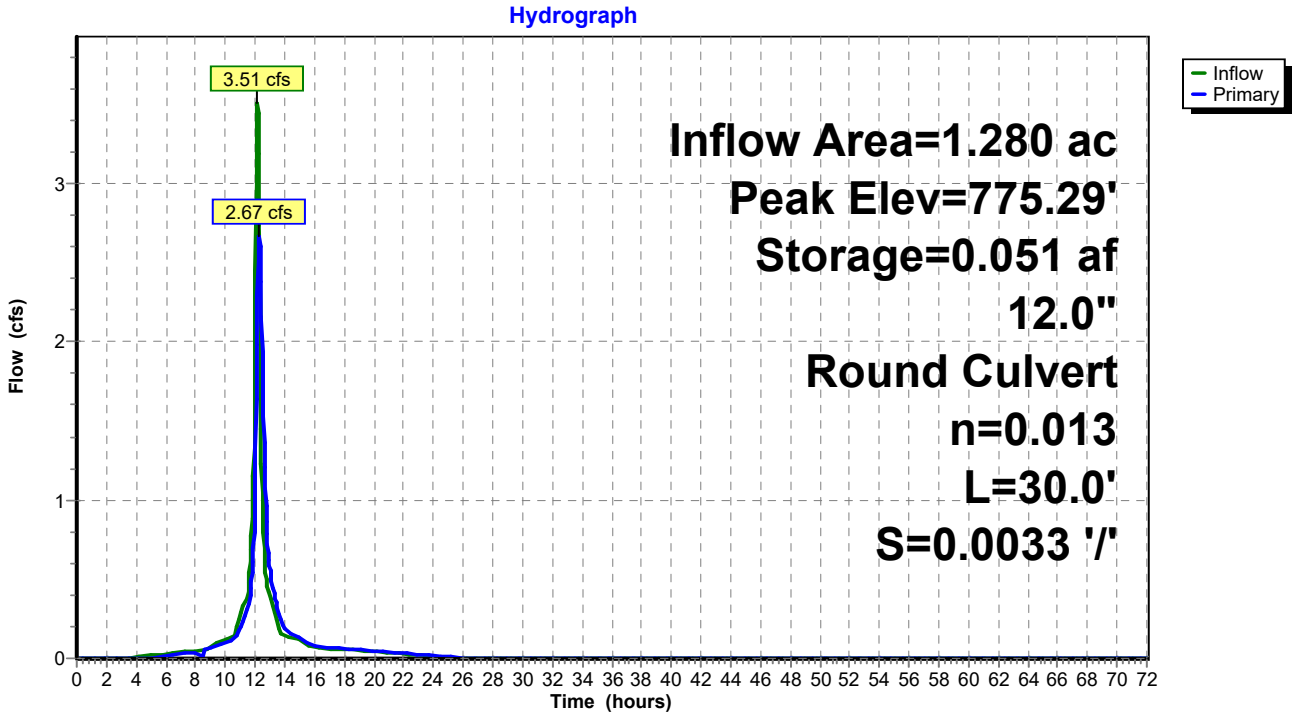
Plug-Flow detention time= 38.6 min calculated for 0.271 af (100% of inflow)
Center-of-Mass det. time= 39.2 min (797.6 - 758.4)

Volume	Invert	Avail.Storage	Storage Description
#1	774.00'	0.108 af	**ADS_StormTech MC-3500 d +Cap @ 75.00' L**x 4 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 75.00'L = 1,150.1 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 4 Chambers in 4 Rows Cap Storage= 14.9 cf x 2 x 4 rows = 119.2 cf

Device	Routing	Invert	Outlet Devices
#1	Primary	774.00'	**12.0" Round Culvert** L= 30.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 774.00' / 773.90' S= 0.0033 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.28 hrs HW=775.29' TW=776.33' (Dynamic Tailwater)
↑—**1=Culvert** (Controls 0.00 cfs)

Pond SADS: South ADS MC-3500



Hydrograph for Pond SADS: South ADS MC-3500

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.000	774.00	0.00
2.00	0.00	0.000	774.00	0.00
4.00	0.01	0.000	774.01	0.00
6.00	0.03	0.003	774.07	0.01
8.00	0.05	0.005	774.13	0.03
10.00	0.11	0.008	774.20	0.10
12.00	**1.95**	**0.028**	**774.69**	**1.09**
14.00	**0.14**	**0.011**	**774.27**	**0.19**
16.00	0.07	0.007	774.18	0.08
18.00	0.05	0.006	774.15	0.06
20.00	0.04	0.006	774.13	0.04
22.00	0.03	0.005	774.11	0.03
24.00	0.01	0.004	774.09	0.02
26.00	0.00	0.002	774.05	0.01
28.00	0.00	0.001	774.03	0.00
30.00	0.00	0.001	774.03	0.00
32.00	0.00	0.001	774.02	0.00
34.00	0.00	0.001	774.02	0.00
36.00	0.00	0.001	774.02	0.00
38.00	0.00	0.001	774.02	0.00
40.00	0.00	0.001	774.01	0.00
42.00	0.00	0.001	774.01	0.00
44.00	0.00	0.000	774.01	0.00
46.00	0.00	0.000	774.01	0.00
48.00	0.00	0.000	774.01	0.00
50.00	0.00	0.000	774.01	0.00
52.00	0.00	0.000	774.01	0.00
54.00	0.00	0.000	774.01	0.00
56.00	0.00	0.000	774.01	0.00
58.00	0.00	0.000	774.01	0.00
60.00	0.00	0.000	774.01	0.00
62.00	0.00	0.000	774.01	0.00
64.00	0.00	0.000	774.01	0.00
66.00	0.00	0.000	774.01	0.00
68.00	0.00	0.000	774.01	0.00
70.00	0.00	0.000	774.01	0.00
72.00	0.00	0.000	774.01	0.00

Stage-Discharge for Pond SADS: South ADS MC-3500

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
774.00	0.00	775.04	2.12	776.08	4.38	777.12	6.01
774.02	0.00	775.06	2.18	776.10	4.42	777.14	6.04
774.04	0.00	775.08	2.23	776.12	4.45	777.16	6.06
774.06	0.01	775.10	2.28	776.14	4.49	777.18	6.09
774.08	0.01	775.12	2.33	776.16	4.53	777.20	6.12
774.10	0.02	775.14	2.38	776.18	4.56	777.22	6.14
774.12	0.04	775.16	2.43	776.20	4.60	777.24	6.17
774.14	0.05	775.18	2.48	776.22	4.63	777.26	6.20
774.16	0.06	775.20	2.52	776.24	4.67	777.28	6.22
774.18	0.08	775.22	2.56	776.26	4.70	777.30	6.25
774.20	0.10	775.24	2.60	776.28	4.74	777.32	6.27
774.22	0.12	775.26	2.63	776.30	4.77	777.34	6.30
774.24	0.15	775.28	2.66	776.32	4.81	777.36	6.33
774.26	0.17	775.30	2.68	776.34	4.84	777.38	6.35
774.28	0.20	775.32	2.68	776.36	4.87	777.40	6.38
774.30	0.23	775.34	2.68	776.38	4.91	777.42	6.40
774.32	0.26	775.36	2.74	776.40	4.94	777.44	6.43
774.34	0.30	775.38	2.79	776.42	4.97	777.46	6.45
774.36	0.33	775.40	2.85	776.44	5.01	777.48	6.48
774.38	0.37	775.42	2.91	776.46	5.04	777.50	6.50
774.40	0.41	775.44	2.96	776.48	5.07	777.52	6.53
774.42	0.45	775.46	3.02	776.50	5.10	777.54	6.55
774.44	0.49	775.48	3.07	776.52	5.13	777.56	6.58
774.46	0.53	775.50	3.12	776.54	5.17	777.58	6.60
774.48	0.57	775.52	3.18	776.56	5.20	777.60	6.63
774.50	0.62	775.54	3.23	776.58	5.23	777.62	6.65
774.52	0.67	775.56	3.28	776.60	5.26	777.64	6.68
774.54	0.71	775.58	3.33	776.62	5.29	777.66	6.70
774.56	0.76	775.60	3.37	776.64	5.32	777.68	6.72
774.58	0.81	775.62	3.42	776.66	5.35	777.70	6.75
774.60	0.86	775.64	3.47	776.68	5.38	777.72	6.77
774.62	0.92	775.66	3.52	776.70	5.41	777.74	**6.80**
774.64	0.97	775.68	3.56	776.72	5.44		
774.66	1.02	775.70	3.61	776.74	5.47		
774.68	1.08	775.72	3.65	776.76	5.50		
774.70	1.13	775.74	3.70	776.78	5.53		
774.72	1.19	775.76	3.74	776.80	5.56		
774.74	1.25	775.78	3.78	776.82	5.59		
774.76	1.30	775.80	3.83	776.84	5.62		
774.78	1.36	775.82	3.87	776.86	5.65		
774.80	1.42	775.84	3.91	776.88	5.68		
774.82	1.48	775.86	3.95	776.90	5.70		
774.84	1.54	775.88	3.99	776.92	5.73		
774.86	1.60	775.90	4.03	776.94	5.76		
774.88	1.66	775.92	4.07	776.96	5.79		
774.90	1.72	775.94	4.11	776.98	5.82		
774.92	1.77	775.96	4.15	777.00	5.84		
774.94	1.83	775.98	4.19	777.02	5.87		
774.96	1.89	776.00	4.23	777.04	5.90		
774.98	1.95	776.02	4.27	777.06	5.93		
775.00	2.01	776.04	4.31	777.08	5.96		
775.02	2.06	776.06	4.34	777.10	5.98		

Stage-Area-Storage for Pond SADS: South ADS MC-3500

Elevation (feet)	Storage (acre-feet)
774.00	0.000
774.05	0.002
774.10	0.004
774.15	0.006
774.20	0.008
774.25	0.010
774.30	0.012
774.35	0.014
774.40	0.016
774.45	0.018
774.50	0.020
774.55	0.022
774.60	0.024
774.65	0.026
774.70	0.028
774.75	0.030
774.80	0.032
774.85	0.034
774.90	0.036
774.95	0.038
775.00	0.040
775.05	0.042
775.10	0.044
775.15	0.046
775.20	0.047
775.25	0.049
775.30	0.051
775.35	0.053
775.40	0.055
775.45	0.057
775.50	0.058
775.55	0.060
775.60	0.062
775.65	0.064
775.70	0.065
775.75	0.067
775.80	0.069
775.85	0.070
775.90	0.072
775.95	0.074
776.00	0.075
776.05	0.077
776.10	0.078
776.15	0.080
776.20	0.081
776.25	0.083
776.30	0.084
776.35	0.086
776.40	0.087
776.45	0.088
776.50	0.090
776.55	0.091
776.60	0.092
776.65	0.094
776.70	0.095
776.75	0.096
776.80	0.097
776.85	0.098
776.90	0.100
776.95	0.101
777.00	0.102
777.05	0.102
777.10	0.103
777.15	0.104
777.20	0.105
777.25	0.106
777.30	0.106
777.35	0.107
777.40	0.107
777.45	0.108
777.50	0.108
777.55	0.108
777.60	0.108
777.65	0.108
777.70	0.108
777.75	**0.108**

Summary for Pond SEP: SEPARATOR

Inflow Area = 1.280 ac, 99.06% Impervious, Inflow Depth = 2.64" for 2-yr event
Inflow = 4.58 cfs @ 12.17 hrs, Volume= 0.281 af
Outflow = 4.58 cfs @ 12.17 hrs, Volume= 0.281 af, Atten= 0%, Lag= 0.0 min
Primary = 3.51 cfs @ 12.17 hrs, Volume= 0.271 af
Routed to Pond SADS : South ADS MC-3500
Secondary = 1.07 cfs @ 12.17 hrs, Volume= 0.010 af
Routed to Pond NADS : North ADS MC-3500

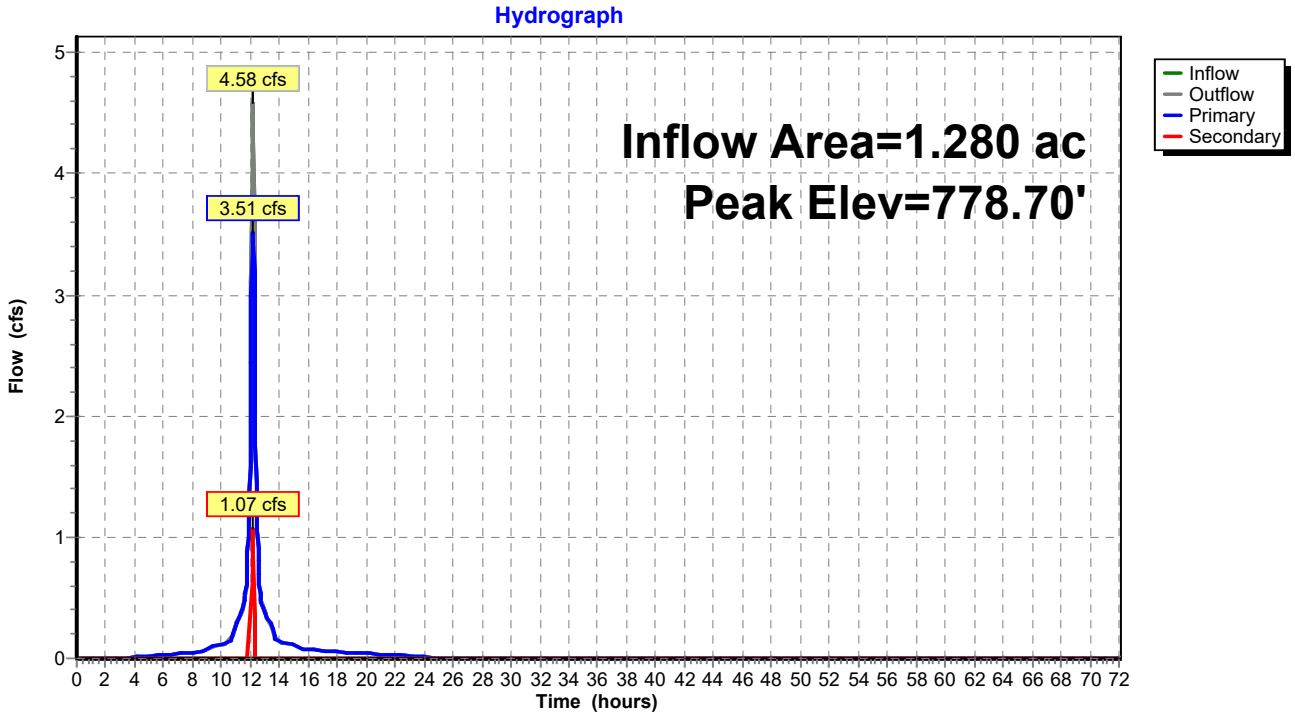
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs / 2
Peak Elev= 778.70' @ 12.17 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	776.50'	**10.0" Round SADS** L= 18.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 776.50' / 774.90' S= 0.0889 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.55 sf
#2	Secondary	778.00'	**12.0" Round NADS** L= 57.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 778.00' / 777.90' S= 0.0018 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=3.49 cfs @ 12.17 hrs HW=778.68' TW=775.13' (Dynamic Tailwater)
↑—**1=SADS** (Inlet Controls 3.49 cfs @ 6.40 fps)

Secondary OutFlow Max=1.02 cfs @ 12.17 hrs HW=778.68' TW=771.95' (Dynamic Tailwater)
↑—**2=NADS** (Barrel Controls 1.02 cfs @ 2.52 fps)

Pond SEP: SEPARATOR



Hydrograph for Pond SEP: SEPARATOR

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	776.50	0.00	0.00	0.00
2.00	0.00	776.50	0.00	0.00	0.00
4.00	0.01	776.55	0.01	0.01	0.00
6.00	0.03	776.58	0.03	0.03	0.00
8.00	0.05	776.61	0.05	0.05	0.00
10.00	0.11	776.67	0.11	0.11	0.00
12.00	**1.95**	**777.47**	**1.95**	**1.95**	**0.00**
14.00	**0.14**	**776.69**	**0.14**	**0.14**	**0.00**
16.00	0.07	776.63	0.07	0.07	0.00
18.00	0.05	776.62	0.05	0.05	0.00
20.00	0.04	776.60	0.04	0.04	0.00
22.00	0.03	776.58	0.03	0.03	0.00
24.00	0.01	776.55	0.01	0.01	0.00
26.00	0.00	776.50	0.00	0.00	0.00
28.00	0.00	776.50	0.00	0.00	0.00
30.00	0.00	776.50	0.00	0.00	0.00
32.00	0.00	776.50	0.00	0.00	0.00
34.00	0.00	776.50	0.00	0.00	0.00
36.00	0.00	776.50	0.00	0.00	0.00
38.00	0.00	776.50	0.00	0.00	0.00
40.00	0.00	776.50	0.00	0.00	0.00
42.00	0.00	776.50	0.00	0.00	0.00
44.00	0.00	776.50	0.00	0.00	0.00
46.00	0.00	776.50	0.00	0.00	0.00
48.00	0.00	776.50	0.00	0.00	0.00
50.00	0.00	776.50	0.00	0.00	0.00
52.00	0.00	776.50	0.00	0.00	0.00
54.00	0.00	776.50	0.00	0.00	0.00
56.00	0.00	776.50	0.00	0.00	0.00
58.00	0.00	776.50	0.00	0.00	0.00
60.00	0.00	776.50	0.00	0.00	0.00
62.00	0.00	776.50	0.00	0.00	0.00
64.00	0.00	776.50	0.00	0.00	0.00
66.00	0.00	776.50	0.00	0.00	0.00
68.00	0.00	776.50	0.00	0.00	0.00
70.00	0.00	776.50	0.00	0.00	0.00
72.00	0.00	776.50	0.00	0.00	0.00

Stage-Discharge for Pond SEP: SEPARATOR

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
776.50	0.00	0.00	0.00
776.55	0.01	0.01	0.00
776.60	0.04	0.04	0.00
776.65	0.09	0.09	0.00
776.70	0.15	0.15	0.00
776.75	0.23	0.23	0.00
776.80	0.33	0.33	0.00
776.85	0.44	0.44	0.00
776.90	0.56	0.56	0.00
776.95	0.69	0.69	0.00
777.00	0.82	0.82	0.00
777.05	0.96	0.96	0.00
777.10	1.11	1.11	0.00
777.15	1.25	1.25	0.00
777.20	1.39	1.39	0.00
777.25	1.52	1.52	0.00
777.30	1.64	1.64	0.00
777.35	1.73	1.73	0.00
777.40	1.83	1.83	0.00
777.45	1.92	1.92	0.00
777.50	2.01	2.01	0.00
777.55	2.09	2.09	0.00
777.60	2.17	2.17	0.00
777.65	2.25	2.25	0.00
777.70	2.32	2.32	0.00
777.75	2.40	2.40	0.00
777.80	2.47	2.47	0.00
777.85	2.54	2.54	0.00
777.90	2.60	2.60	0.00
777.95	2.67	2.67	0.00
778.00	2.73	2.73	0.00
778.05	2.80	2.80	0.00
778.10	2.88	2.86	0.02
778.15	2.97	2.92	0.05
778.20	3.07	2.98	0.09
778.25	3.18	3.03	0.15
778.30	3.30	3.09	0.21
778.35	3.43	3.14	0.29
778.40	3.57	3.20	0.37
778.45	3.72	3.25	0.47
778.50	3.88	3.30	0.57
778.55	4.04	3.36	0.69
778.60	4.21	3.41	0.81
778.65	4.39	3.46	0.93
778.70	4.57	3.51	1.06
778.75	4.75	3.56	1.20
778.80	4.94	3.60	1.34
778.85	5.13	3.65	1.48
778.90	5.32	3.70	1.62
778.95	5.50	3.74	1.76
779.00	**5.69**	**3.79**	**1.90**

Stage-Area-Storage for Pond SEP: SEPARATOR

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
776.50	**0.000**	777.54	0.000	778.58	0.000
776.52	0.000	777.56	0.000	778.60	0.000
776.54	0.000	777.58	0.000	778.62	0.000
776.56	0.000	777.60	0.000	778.64	0.000
776.58	0.000	777.62	0.000	778.66	0.000
776.60	0.000	777.64	0.000	778.68	0.000
776.62	0.000	777.66	0.000	778.70	0.000
776.64	0.000	777.68	0.000	778.72	0.000
776.66	0.000	777.70	0.000	778.74	0.000
776.68	0.000	777.72	0.000	778.76	0.000
776.70	0.000	777.74	0.000	778.78	0.000
776.72	0.000	777.76	0.000	778.80	0.000
776.74	0.000	777.78	0.000	778.82	0.000
776.76	0.000	777.80	0.000	778.84	0.000
776.78	0.000	777.82	0.000	778.86	0.000
776.80	0.000	777.84	0.000	778.88	0.000
776.82	0.000	777.86	0.000	778.90	0.000
776.84	0.000	777.88	0.000	778.92	0.000
776.86	0.000	777.90	0.000	778.94	0.000
776.88	0.000	777.92	0.000	778.96	0.000
776.90	0.000	777.94	0.000	778.98	0.000
776.92	0.000	777.96	0.000	779.00	0.000
776.94	0.000	777.98	0.000		
776.96	0.000	778.00	0.000		
776.98	0.000	778.02	0.000		
777.00	0.000	778.04	0.000		
777.02	0.000	778.06	0.000		
777.04	0.000	778.08	0.000		
777.06	0.000	778.10	0.000		
777.08	0.000	778.12	0.000		
777.10	0.000	778.14	0.000		
777.12	0.000	778.16	0.000		
777.14	0.000	778.18	0.000		
777.16	0.000	778.20	0.000		
777.18	0.000	778.22	0.000		
777.20	0.000	778.24	0.000		
777.22	0.000	778.26	0.000		
777.24	0.000	778.28	0.000		
777.26	0.000	778.30	0.000		
777.28	0.000	778.32	0.000		
777.30	0.000	778.34	0.000		
777.32	0.000	778.36	0.000		
777.34	0.000	778.38	0.000		
777.36	0.000	778.40	0.000		
777.38	0.000	778.42	0.000		
777.40	0.000	778.44	0.000		
777.42	0.000	778.46	0.000		
777.44	0.000	778.48	0.000		
777.46	0.000	778.50	0.000		
777.48	0.000	778.52	0.000		
777.50	0.000	778.54	0.000		
777.52	0.000	778.56	0.000		

Summary for Pond SOCS: South OCS

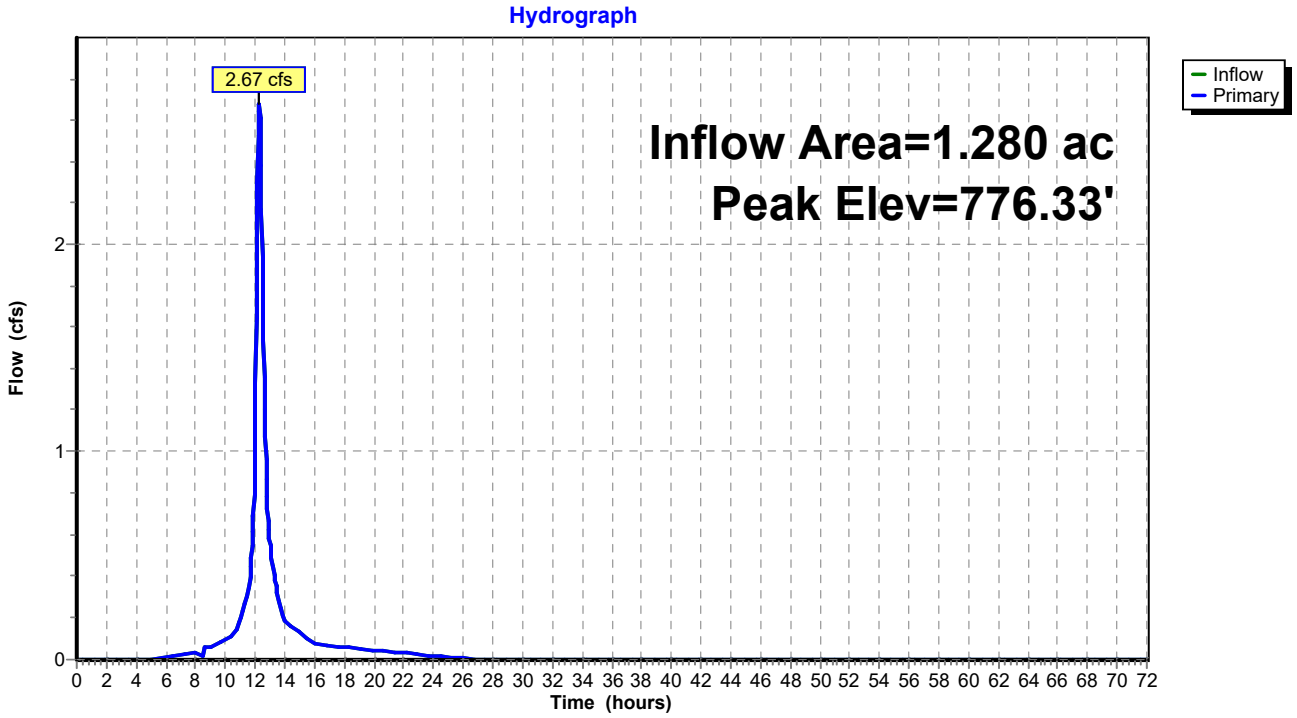
Inflow Area = 1.280 ac, 99.06% Impervious, Inflow Depth = 2.54" for 2-yr event
Inflow = 2.67 cfs @ 12.28 hrs, Volume= 0.271 af
Outflow = 2.67 cfs @ 12.28 hrs, Volume= 0.271 af, Atten= 0%, Lag= 0.0 min
Primary = 2.67 cfs @ 12.28 hrs, Volume= 0.271 af
Routed to Reach S FLOWS : 15-in RCP

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs / 2
Peak Elev= 776.33' @ 12.28 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	776.00'	**OCS Weir, Cv= 2.62 (C= 3.28)** Head (feet) 2.30 6.80 Width (feet) 4.00 4.00
#2	Primary	773.80'	**2.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.66 cfs @ 12.28 hrs HW=776.33' TW=774.17' (Dynamic Tailwater)
1=OCS Weir (Weir Controls 2.50 cfs @ 1.89 fps)
2=Orifice/Grate (Orifice Controls 0.15 cfs @ 7.08 fps)

Pond SOCS: South OCS



Hydrograph for Pond SOCS: South OCS

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	773.80	0.00
0.80	0.00	773.80	0.00
1.60	0.00	773.80	0.00
2.40	0.00	773.80	0.00
3.20	0.00	773.80	0.00
4.00	0.00	773.81	0.00
4.80	0.00	773.83	0.00
5.60	0.01	773.86	0.01
6.40	0.02	773.91	0.02
7.20	0.03	773.95	0.03
8.00	0.03	773.99	0.03
8.80	0.06	774.21	0.06
9.60	0.08	774.50	0.08
10.40	0.11	774.98	0.11
11.20	0.24	776.03	0.24
12.00	**1.09**	**776.17**	**1.09**
12.80	**0.79**	**776.13**	**0.79**
13.60	0.29	776.05	0.29
14.40	0.15	776.00	0.15
15.20	0.12	775.22	0.12
16.00	0.08	774.48	0.08
16.80	0.07	774.31	0.07
17.60	0.06	774.23	0.06
18.40	0.06	774.17	0.06
19.20	0.05	774.11	0.05
20.00	0.04	774.06	0.04
20.80	0.04	774.02	0.04
21.60	0.03	773.99	0.03
22.40	0.03	773.95	0.03
23.20	0.02	773.93	0.02
24.00	0.02	773.91	0.02
24.80	0.01	773.88	0.01
25.60	0.01	773.86	0.01
26.40	0.00	773.85	0.00
27.20	0.00	773.84	0.00
28.00	0.00	773.84	0.00
28.80	0.00	773.83	0.00
29.60	0.00	773.83	0.00
30.40	0.00	773.83	0.00
31.20	0.00	773.83	0.00
32.00	0.00	773.82	0.00
32.80	0.00	773.82	0.00
33.60	0.00	773.82	0.00
34.40	0.00	773.82	0.00
35.20	0.00	773.82	0.00
36.00	0.00	773.82	0.00
36.80	0.00	773.82	0.00
37.60	0.00	773.82	0.00
38.40	0.00	773.81	0.00
39.20	0.00	773.81	0.00
40.00	0.00	773.81	0.00
40.80	0.00	773.81	0.00
41.60	0.00	773.81	0.00
42.40	0.00	773.81	0.00
43.20	0.00	773.81	0.00
44.00	0.00	773.81	0.00
44.80	0.00	773.81	0.00
45.60	0.00	773.81	0.00
46.40	0.00	773.81	0.00
47.20	0.00	773.81	0.00
48.00	0.00	773.81	0.00
48.80	0.00	773.81	0.00
49.60	0.00	773.81	0.00
50.40	0.00	773.81	0.00
51.20	0.00	773.81	0.00
52.00	0.00	773.81	0.00
52.80	0.00	773.81	0.00
53.60	0.00	773.81	0.00
54.40	0.00	773.81	0.00
55.20	0.00	773.81	0.00
56.00	0.00	773.81	0.00
56.80	0.00	773.81	0.00
57.60	0.00	773.81	0.00
58.40	0.00	773.81	0.00
59.20	0.00	773.81	0.00
60.00	0.00	773.81	0.00
60.80	0.00	773.81	0.00
61.60	0.00	773.81	0.00
62.40	0.00	773.81	0.00
63.20	0.00	773.81	0.00
64.00	0.00	773.81	0.00
64.80	0.00	773.81	0.00
65.60	0.00	773.81	0.00
66.40	0.00	773.81	0.00
67.20	0.00	773.81	0.00
68.00	0.00	773.81	0.00
68.80	0.00	773.81	0.00
69.60	0.00	773.81	0.00
70.40	0.00	773.81	0.00
71.20	0.00	773.81	0.00
72.00	0.00	773.81	0.00

Stage-Discharge for Pond SOCS: South OCS

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
773.80	0.00	776.40	3.48	779.00	68.31
773.85	0.00	776.45	4.12	779.05	70.02
773.90	0.01	776.50	4.80	779.10	71.74
773.95	0.03	776.55	5.51	779.15	73.48
774.00	0.04	776.60	6.26	779.20	75.23
774.05	0.04	776.65	7.04	779.25	77.00
774.10	0.05	776.70	7.85	779.30	78.78
774.15	0.05	776.75	8.69	779.35	80.57
774.20	0.06	776.80	9.55	779.40	82.37
774.25	0.06	776.85	10.45	779.45	84.19
774.30	0.07	776.90	11.37	779.50	86.03
774.35	0.07	776.95	12.31	779.55	87.87
774.40	0.08	777.00	13.29	779.60	89.73
774.45	0.08	777.05	14.28	779.65	91.60
774.50	0.08	777.10	15.30	779.70	93.49
774.55	0.09	777.15	16.35	779.75	95.38
774.60	0.09	777.20	17.41	779.80	97.29
774.65	0.09	777.25	18.50	779.85	99.22
774.70	0.09	777.30	19.61	779.90	101.15
774.75	0.10	777.35	20.74	779.95	103.10
774.80	0.10	777.40	21.90	780.00	105.06
774.85	0.10	777.45	23.07	780.05	107.03
774.90	0.11	777.50	24.27	780.10	109.02
774.95	0.11	777.55	25.48	780.15	111.01
775.00	0.11	777.60	26.72	780.20	113.02
775.05	0.11	777.65	27.97	780.25	115.04
775.10	0.12	777.70	29.24	780.30	117.07
775.15	0.12	777.75	30.53	780.35	119.12
775.20	0.12	777.80	31.84	780.40	121.17
775.25	0.12	777.85	33.17	780.45	123.24
775.30	0.13	777.90	34.52	780.50	**125.32**
775.35	0.13	777.95	35.88		
775.40	0.13	778.00	37.27		
775.45	0.13	778.05	38.66		
775.50	0.13	778.10	40.08		
775.55	0.14	778.15	41.51		
775.60	0.14	778.20	42.97		
775.65	0.14	778.25	44.43		
775.70	0.14	778.30	45.92		
775.75	0.14	778.35	47.41		
775.80	0.15	778.40	48.93		
775.85	0.15	778.45	50.46		
775.90	0.15	778.50	52.01		
775.95	0.15	778.55	53.57		
776.00	0.15	778.60	55.15		
776.05	0.30	778.65	56.74		
776.10	0.57	778.70	58.35		
776.15	0.92	778.75	59.97		
776.20	1.33	778.80	61.61		
776.25	1.80	778.85	63.26		
776.30	2.32	778.90	64.93		
776.35	2.88	778.95	66.61		

Stage-Area-Storage for Pond SOCS: South OCS

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
773.80	**0.000**	776.40	0.000	779.00	0.000
773.85	0.000	776.45	0.000	779.05	0.000
773.90	0.000	776.50	0.000	779.10	0.000
773.95	0.000	776.55	0.000	779.15	0.000
774.00	0.000	776.60	0.000	779.20	0.000
774.05	0.000	776.65	0.000	779.25	0.000
774.10	0.000	776.70	0.000	779.30	0.000
774.15	0.000	776.75	0.000	779.35	0.000
774.20	0.000	776.80	0.000	779.40	0.000
774.25	0.000	776.85	0.000	779.45	0.000
774.30	0.000	776.90	0.000	779.50	0.000
774.35	0.000	776.95	0.000	779.55	0.000
774.40	0.000	777.00	0.000	779.60	0.000
774.45	0.000	777.05	0.000	779.65	0.000
774.50	0.000	777.10	0.000	779.70	0.000
774.55	0.000	777.15	0.000	779.75	0.000
774.60	0.000	777.20	0.000	779.80	0.000
774.65	0.000	777.25	0.000	779.85	0.000
774.70	0.000	777.30	0.000	779.90	0.000
774.75	0.000	777.35	0.000	779.95	0.000
774.80	0.000	777.40	0.000	780.00	0.000
774.85	0.000	777.45	0.000	780.05	0.000
774.90	0.000	777.50	0.000	780.10	0.000
774.95	0.000	777.55	0.000	780.15	0.000
775.00	0.000	777.60	0.000	780.20	0.000
775.05	0.000	777.65	0.000	780.25	0.000
775.10	0.000	777.70	0.000	780.30	0.000
775.15	0.000	777.75	0.000	780.35	0.000
775.20	0.000	777.80	0.000	780.40	0.000
775.25	0.000	777.85	0.000	780.45	0.000
775.30	0.000	777.90	0.000	780.50	0.000
775.35	0.000	777.95	0.000		
775.40	0.000	778.00	0.000		
775.45	0.000	778.05	0.000		
775.50	0.000	778.10	0.000		
775.55	0.000	778.15	0.000		
775.60	0.000	778.20	0.000		
775.65	0.000	778.25	0.000		
775.70	0.000	778.30	0.000		
775.75	0.000	778.35	0.000		
775.80	0.000	778.40	0.000		
775.85	0.000	778.45	0.000		
775.90	0.000	778.50	0.000		
775.95	0.000	778.55	0.000		
776.00	0.000	778.60	0.000		
776.05	0.000	778.65	0.000		
776.10	0.000	778.70	0.000		
776.15	0.000	778.75	0.000		
776.20	0.000	778.80	0.000		
776.25	0.000	778.85	0.000		
776.30	0.000	778.90	0.000		
776.35	0.000	778.95	0.000		

Time span=0.00-72.00 hrs, dt=0.04 hrs, 1801 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentDA1: SW Half Parking Lot & Runoff Area=1.280 ac 99.06% Impervious Runoff Depth=4.04"
Tc=10.0 min CN=98 Runoff=6.89 cfs 0.431 af

SubcatchmentDA2: Central Parking Lot Runoff Area=0.058 ac 100.00% Impervious Runoff Depth=4.04"
Tc=10.0 min CN=98 Runoff=0.31 cfs 0.020 af

SubcatchmentDA3: Parking Ramp Runoff Area=29,103 sf 100.00% Impervious Runoff Depth=4.04"
Tc=10.0 min CN=98 Runoff=3.60 cfs 0.225 af

SubcatchmentDA4: North half of Parking Runoff Area=0.307 ac 96.74% Impervious Runoff Depth=3.93"
Tc=10.0 min CN=97 Runoff=1.64 cfs 0.101 af

SubcatchmentDA5: N and W Edges Runoff Area=0.300 ac 76.33% Impervious Runoff Depth=3.60"
Tc=10.0 min CN=94 Runoff=1.54 cfs 0.090 af

Reach 5.1: 12-in Catch Basin Avg. Flow Depth=0.50' Max Vel=3.85 fps Inflow=1.54 cfs 0.090 af
12.0" Round Pipe n=0.015 L=46.1' S=0.0095 '/' Capacity=3.02 cfs Outflow=1.53 cfs 0.090 af

Reach N FLOWS: 108-in RCP Avg. Flow Depth=1.81' Max Vel=0.46 fps Inflow=6.50 cfs 0.473 af
108.0" Round Pipe n=0.015 L=512.0' S=0.0000 '/' Capacity=47.83 cfs Outflow=4.23 cfs 0.473 af

Reach S FLOWS: 15-in RCP Avg. Flow Depth=0.41' Max Vel=9.27 fps Inflow=3.29 cfs 0.393 af
15.0" Round Pipe n=0.015 L=27.5' S=0.0618 '/' Capacity=13.92 cfs Outflow=3.29 cfs 0.393 af

Pond NADS: North ADS MC-3500 Peak Elev=772.57' Storage=0.100 af Inflow=8.28 cfs 0.383 af
18.0" Round Culvert n=0.013 L=216.0' S=0.0050 '/' Outflow=5.31 cfs 0.383 af

Pond SADS: South ADS MC-3500 Peak Elev=775.56' Storage=0.061 af Inflow=4.16 cfs 0.393 af
12.0" Round Culvert n=0.013 L=30.0' S=0.0033 '/' Outflow=3.29 cfs 0.393 af

Pond SEP: SEPARATOR Peak Elev=779.42' Inflow=6.89 cfs 0.431 af
Primary=4.16 cfs 0.393 af Secondary=2.73 cfs 0.038 af Outflow=6.89 cfs 0.431 af

Pond SOCS: South OCS Peak Elev=776.38' Inflow=3.29 cfs 0.393 af
Outflow=3.29 cfs 0.393 af

Summary for Subcatchment DA1: SW Half Parking Lot & Residential Building

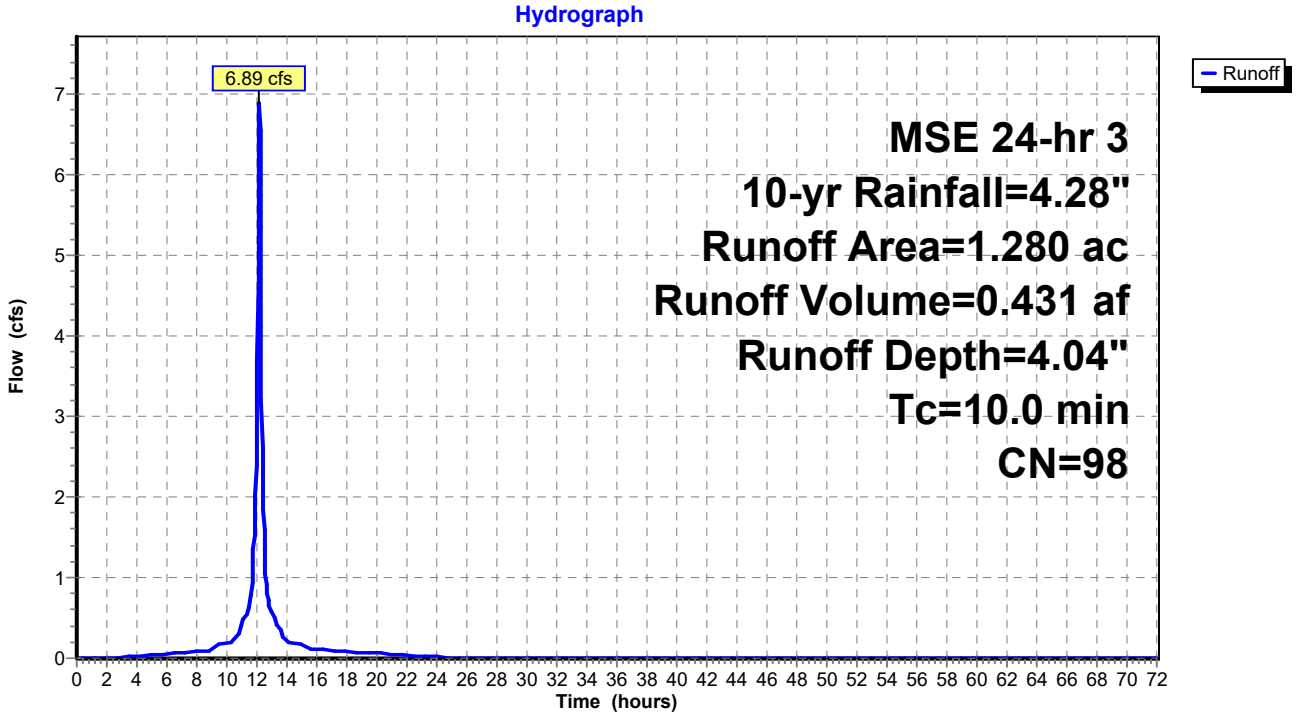
Runoff = 6.89 cfs @ 12.17 hrs, Volume= 0.431 af, Depth= 4.04"
Routed to Pond SEP : SEPARATOR

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs
MSE 24-hr 3 10-yr Rainfall=4.28"

Area (ac)	CN	Description
1.268	98	Paved parking, HSG D
0.012	80	>75% Grass cover, Good, HSG D
1.280	98	Weighted Average
0.012		0.94% Pervious Area
1.268		99.06% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, 10 min Minimum**

Subcatchment DA1: SW Half Parking Lot & Residential Building



Hydrograph for Subcatchment DA1: SW Half Parking Lot & Residential Building

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.80	0.01	0.00	0.00
1.60	0.03	0.00	0.00
2.40	0.05	0.00	0.00
3.20	0.08	0.01	0.01
4.00	0.11	0.02	0.02
4.80	0.15	0.04	0.04
5.60	0.19	0.07	0.05
6.40	0.24	0.10	0.06
7.20	0.30	0.14	0.07
8.00	0.36	0.19	0.08
8.80	0.42	0.25	0.09
9.60	0.53	0.34	0.17
10.40	0.65	0.46	0.20
11.20	0.91	0.70	0.50
12.00	1.98	1.76	**2.96**
12.80	3.37	3.14	**0.67**
13.60	3.63	3.39	0.30
14.40	3.75	3.52	0.20
15.20	3.86	3.62	0.13
16.00	3.92	3.69	0.10
16.80	3.98	3.75	0.09
17.60	4.04	3.80	0.09
18.40	4.09	3.85	0.08
19.20	4.13	3.89	0.07
20.00	4.17	3.93	0.06
20.80	4.20	3.97	0.05
21.60	4.23	3.99	0.04
22.40	4.25	4.02	0.03
23.20	4.27	4.03	0.02
24.00	**4.28**	**4.04**	0.02
24.80	4.28	4.04	0.00
25.60	4.28	4.04	0.00
26.40	4.28	4.04	0.00
27.20	4.28	4.04	0.00
28.00	4.28	4.04	0.00
28.80	4.28	4.04	0.00
29.60	4.28	4.04	0.00
30.40	4.28	4.04	0.00
31.20	4.28	4.04	0.00
32.00	4.28	4.04	0.00
32.80	4.28	4.04	0.00
33.60	4.28	4.04	0.00
34.40	4.28	4.04	0.00
35.20	4.28	4.04	0.00
36.00	4.28	4.04	0.00
36.80	4.28	4.04	0.00
37.60	4.28	4.04	0.00
38.40	4.28	4.04	0.00
39.20	4.28	4.04	0.00
40.00	4.28	4.04	0.00
40.80	4.28	4.04	0.00
41.60	4.28	4.04	0.00
42.40	4.28	4.04	0.00
43.20	4.28	4.04	0.00
44.00	4.28	4.04	0.00
44.80	4.28	4.04	0.00
45.60	4.28	4.04	0.00
46.40	4.28	4.04	0.00
47.20	4.28	4.04	0.00
48.00	4.28	4.04	0.00
48.80	4.28	4.04	0.00
49.60	4.28	4.04	0.00
50.40	4.28	4.04	0.00
51.20	4.28	4.04	0.00
52.00	4.28	4.04	0.00
52.80	4.28	4.04	0.00
53.60	4.28	4.04	0.00
54.40	4.28	4.04	0.00
55.20	4.28	4.04	0.00
56.00	4.28	4.04	0.00
56.80	4.28	4.04	0.00
57.60	4.28	4.04	0.00
58.40	4.28	4.04	0.00
59.20	4.28	4.04	0.00
60.00	4.28	4.04	0.00
60.80	4.28	4.04	0.00
61.60	4.28	4.04	0.00
62.40	4.28	4.04	0.00
63.20	4.28	4.04	0.00
64.00	4.28	4.04	0.00
64.80	4.28	4.04	0.00
65.60	4.28	4.04	0.00
66.40	4.28	4.04	0.00
67.20	4.28	4.04	0.00
68.00	4.28	4.04	0.00
68.80	4.28	4.04	0.00
69.60	4.28	4.04	0.00
70.40	4.28	4.04	0.00
71.20	4.28	4.04	0.00
72.00	4.28	4.04	0.00

Summary for Subcatchment DA2: Central Parking Lot

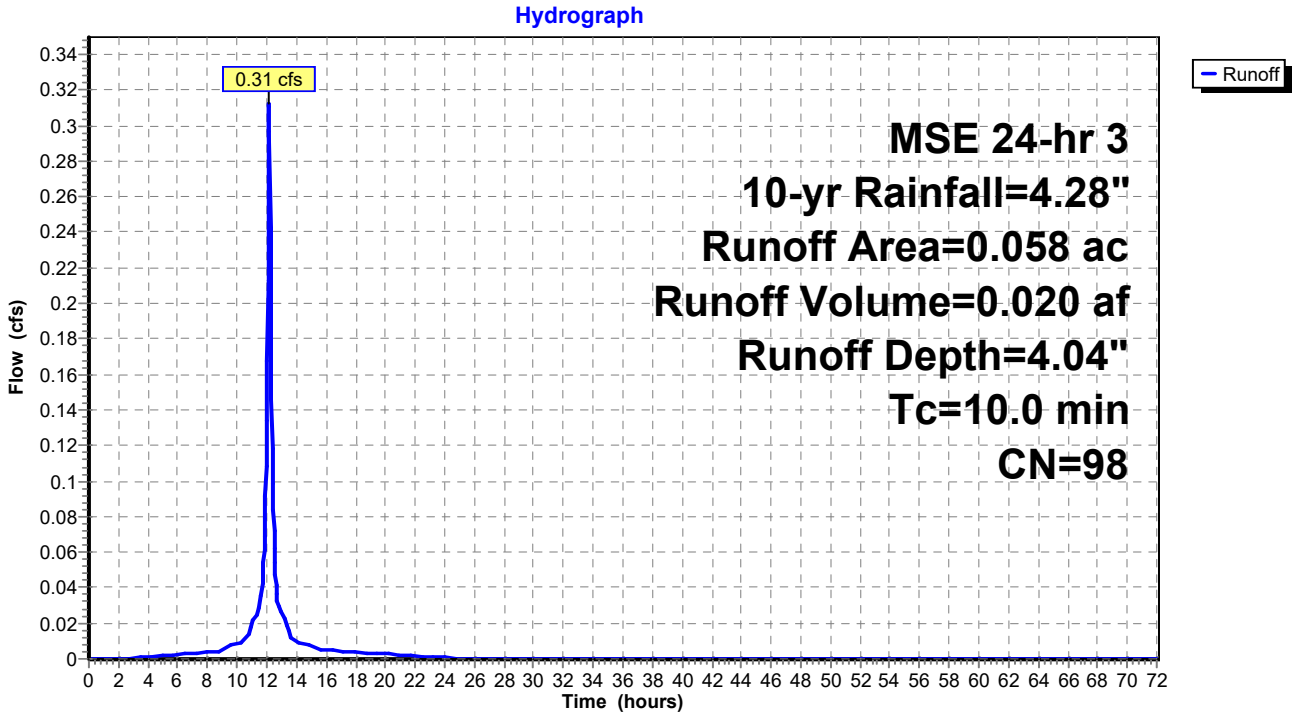
Runoff = 0.31 cfs @ 12.17 hrs, Volume= 0.020 af, Depth= 4.04"
Routed to Pond NADS : North ADS MC-3500

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs
MSE 24-hr 3 10-yr Rainfall=4.28"

	Area (ac)	CN	Description
*	0.058	98	Paved Surfaces
	0.058		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, minimum**

Subcatchment DA2: Central Parking Lot



Hydrograph for Subcatchment DA2: Central Parking Lot

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.80	0.01	0.00	0.00
1.60	0.03	0.00	0.00
2.40	0.05	0.00	0.00
3.20	0.08	0.01	0.00
4.00	0.11	0.02	0.00
4.80	0.15	0.04	0.00
5.60	0.19	0.07	0.00
6.40	0.24	0.10	0.00
7.20	0.30	0.14	0.00
8.00	0.36	0.19	0.00
8.80	0.42	0.25	0.00
9.60	0.53	0.34	0.01
10.40	0.65	0.46	0.01
11.20	0.91	0.70	0.02
12.00	1.98	1.76	**0.13**
12.80	3.37	3.14	**0.03**
13.60	3.63	3.39	0.01
14.40	3.75	3.52	0.01
15.20	3.86	3.62	0.01
16.00	3.92	3.69	0.00
16.80	3.98	3.75	0.00
17.60	4.04	3.80	0.00
18.40	4.09	3.85	0.00
19.20	4.13	3.89	0.00
20.00	4.17	3.93	0.00
20.80	4.20	3.97	0.00
21.60	4.23	3.99	0.00
22.40	4.25	4.02	0.00
23.20	4.27	4.03	0.00
24.00	**4.28**	**4.04**	0.00
24.80	4.28	4.04	0.00
25.60	4.28	4.04	0.00
26.40	4.28	4.04	0.00
27.20	4.28	4.04	0.00
28.00	4.28	4.04	0.00
28.80	4.28	4.04	0.00
29.60	4.28	4.04	0.00
30.40	4.28	4.04	0.00
31.20	4.28	4.04	0.00
32.00	4.28	4.04	0.00
32.80	4.28	4.04	0.00
33.60	4.28	4.04	0.00
34.40	4.28	4.04	0.00
35.20	4.28	4.04	0.00
36.00	4.28	4.04	0.00
36.80	4.28	4.04	0.00
37.60	4.28	4.04	0.00
38.40	4.28	4.04	0.00
39.20	4.28	4.04	0.00
40.00	4.28	4.04	0.00
40.80	4.28	4.04	0.00
41.60	4.28	4.04	0.00
42.40	4.28	4.04	0.00
43.20	4.28	4.04	0.00
44.00	4.28	4.04	0.00
44.80	4.28	4.04	0.00
45.60	4.28	4.04	0.00
46.40	4.28	4.04	0.00
47.20	4.28	4.04	0.00
48.00	4.28	4.04	0.00
48.80	4.28	4.04	0.00
49.60	4.28	4.04	0.00
50.40	4.28	4.04	0.00
51.20	4.28	4.04	0.00
52.00	4.28	4.04	0.00
52.80	4.28	4.04	0.00
53.60	4.28	4.04	0.00
54.40	4.28	4.04	0.00
55.20	4.28	4.04	0.00
56.00	4.28	4.04	0.00
56.80	4.28	4.04	0.00
57.60	4.28	4.04	0.00
58.40	4.28	4.04	0.00
59.20	4.28	4.04	0.00
60.00	4.28	4.04	0.00
60.80	4.28	4.04	0.00
61.60	4.28	4.04	0.00
62.40	4.28	4.04	0.00
63.20	4.28	4.04	0.00
64.00	4.28	4.04	0.00
64.80	4.28	4.04	0.00
65.60	4.28	4.04	0.00
66.40	4.28	4.04	0.00
67.20	4.28	4.04	0.00
68.00	4.28	4.04	0.00
68.80	4.28	4.04	0.00
69.60	4.28	4.04	0.00
70.40	4.28	4.04	0.00
71.20	4.28	4.04	0.00
72.00	4.28	4.04	0.00

Summary for Subcatchment DA3: Parking Ramp

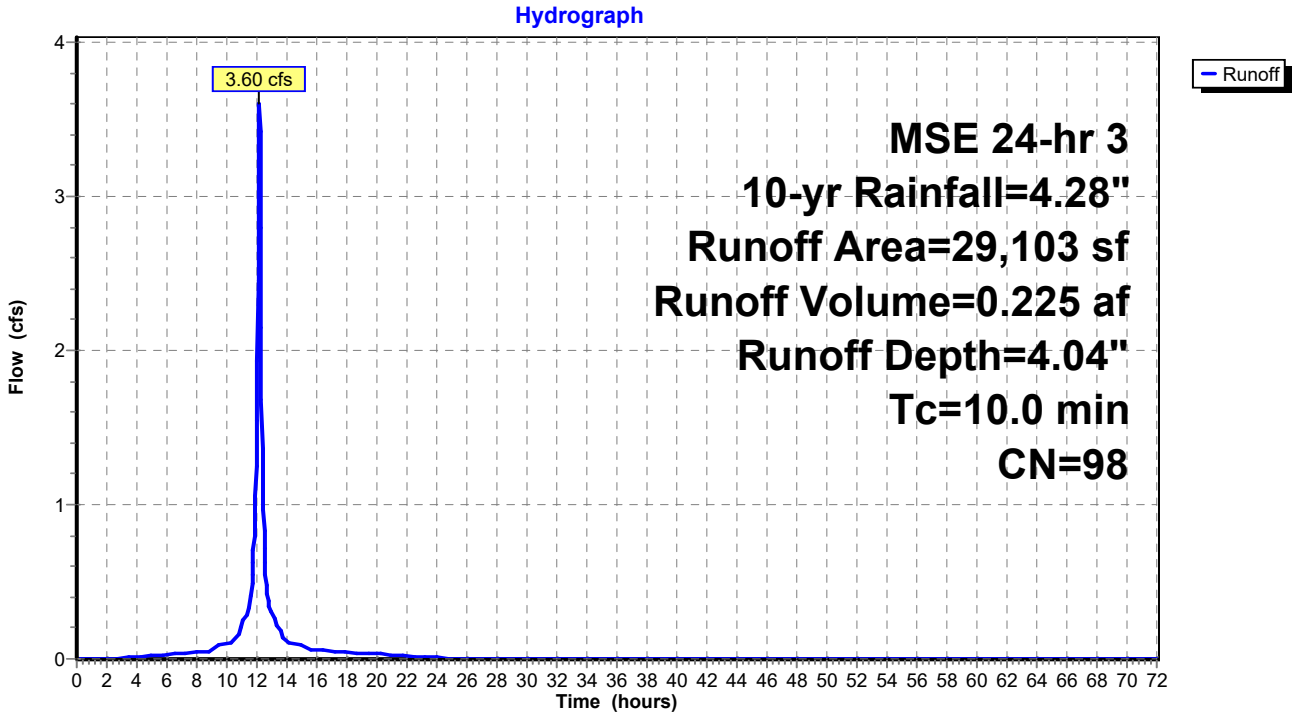
Runoff = 3.60 cfs @ 12.17 hrs, Volume= 0.225 af, Depth= 4.04"
Routed to Pond NADS : North ADS MC-3500

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs
MSE 24-hr 3 10-yr Rainfall=4.28"

	Area (sf)	CN	Description
*	29,103	98	Paved Parking Ramp
	29,103		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, Minimum**

Subcatchment DA3: Parking Ramp



Hydrograph for Subcatchment DA3: Parking Ramp

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.80	0.01	0.00	0.00
1.60	0.03	0.00	0.00
2.40	0.05	0.00	0.00
3.20	0.08	0.01	0.01
4.00	0.11	0.02	0.01
4.80	0.15	0.04	0.02
5.60	0.19	0.07	0.03
6.40	0.24	0.10	0.03
7.20	0.30	0.14	0.04
8.00	0.36	0.19	0.04
8.80	0.42	0.25	0.05
9.60	0.53	0.34	0.09
10.40	0.65	0.46	0.10
11.20	0.91	0.70	0.26
12.00	1.98	1.76	**1.54**
12.80	3.37	3.14	**0.35**
13.60	3.63	3.39	0.16
14.40	3.75	3.52	0.10
15.20	3.86	3.62	0.07
16.00	3.92	3.69	0.05
16.80	3.98	3.75	0.05
17.60	4.04	3.80	0.04
18.40	4.09	3.85	0.04
19.20	4.13	3.89	0.04
20.00	4.17	3.93	0.03
20.80	4.20	3.97	0.03
21.60	4.23	3.99	0.02
22.40	4.25	4.02	0.02
23.20	4.27	4.03	0.01
24.00	**4.28**	**4.04**	0.01
24.80	4.28	4.04	0.00
25.60	4.28	4.04	0.00
26.40	4.28	4.04	0.00
27.20	4.28	4.04	0.00
28.00	4.28	4.04	0.00
28.80	4.28	4.04	0.00
29.60	4.28	4.04	0.00
30.40	4.28	4.04	0.00
31.20	4.28	4.04	0.00
32.00	4.28	4.04	0.00
32.80	4.28	4.04	0.00
33.60	4.28	4.04	0.00
34.40	4.28	4.04	0.00
35.20	4.28	4.04	0.00
36.00	4.28	4.04	0.00
36.80	4.28	4.04	0.00
37.60	4.28	4.04	0.00
38.40	4.28	4.04	0.00
39.20	4.28	4.04	0.00
40.00	4.28	4.04	0.00
40.80	4.28	4.04	0.00
41.60	4.28	4.04	0.00
42.40	4.28	4.04	0.00
43.20	4.28	4.04	0.00
44.00	4.28	4.04	0.00
44.80	4.28	4.04	0.00
45.60	4.28	4.04	0.00
46.40	4.28	4.04	0.00
47.20	4.28	4.04	0.00
48.00	4.28	4.04	0.00
48.80	4.28	4.04	0.00
49.60	4.28	4.04	0.00
50.40	4.28	4.04	0.00
51.20	4.28	4.04	0.00
52.00	4.28	4.04	0.00
52.80	4.28	4.04	0.00
53.60	4.28	4.04	0.00
54.40	4.28	4.04	0.00
55.20	4.28	4.04	0.00
56.00	4.28	4.04	0.00
56.80	4.28	4.04	0.00
57.60	4.28	4.04	0.00
58.40	4.28	4.04	0.00
59.20	4.28	4.04	0.00
60.00	4.28	4.04	0.00
60.80	4.28	4.04	0.00
61.60	4.28	4.04	0.00
62.40	4.28	4.04	0.00
63.20	4.28	4.04	0.00
64.00	4.28	4.04	0.00
64.80	4.28	4.04	0.00
65.60	4.28	4.04	0.00
66.40	4.28	4.04	0.00
67.20	4.28	4.04	0.00
68.00	4.28	4.04	0.00
68.80	4.28	4.04	0.00
69.60	4.28	4.04	0.00
70.40	4.28	4.04	0.00
71.20	4.28	4.04	0.00
72.00	4.28	4.04	0.00

Summary for Subcatchment DA4: North half of Parking and Office Tower

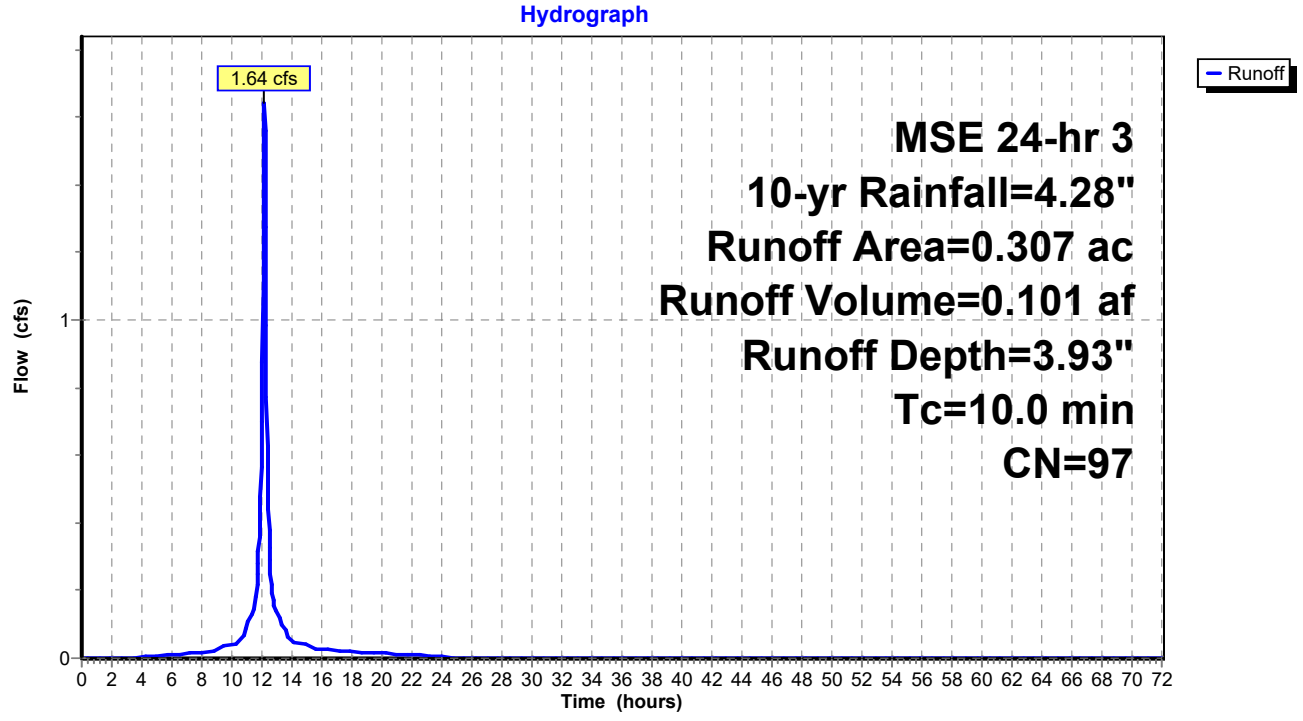
Runoff = 1.64 cfs @ 12.17 hrs, Volume= 0.101 af, Depth= 3.93"
Routed to Pond NADS : North ADS MC-3500

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs
MSE 24-hr 3 10-yr Rainfall=4.28"

	Area (ac)	CN	Description
*	0.297	98	Paved Surfaces
*	0.010	80	Grass cover D soils
	0.307	97	Weighted Average
	0.010		3.26% Pervious Area
	0.297		96.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, minimum**

Subcatchment DA4: North half of Parking and Office Tower



Hydrograph for Subcatchment DA4: North half of Parking and Office Tower

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.80	0.01	0.00	0.00
1.60	0.03	0.00	0.00
2.40	0.05	0.00	0.00
3.20	0.08	0.00	0.00
4.00	0.11	0.01	0.00
4.80	0.15	0.02	0.01
5.60	0.19	0.04	0.01
6.40	0.24	0.07	0.01
7.20	0.30	0.10	0.01
8.00	0.36	0.15	0.02
8.80	0.42	0.20	0.02
9.60	0.53	0.28	0.04
10.40	0.65	0.39	0.04
11.20	0.91	0.62	0.12
12.00	1.98	1.65	**0.70**
12.80	3.37	3.03	**0.16**
13.60	3.63	3.28	0.07
14.40	3.75	3.41	0.05
15.20	3.86	3.51	0.03
16.00	3.92	3.57	0.02
16.80	3.98	3.63	0.02
17.60	4.04	3.69	0.02
18.40	4.09	3.74	0.02
19.20	4.13	3.78	0.02
20.00	4.17	3.82	0.01
20.80	4.20	3.85	0.01
21.60	4.23	3.88	0.01
22.40	4.25	3.90	0.01
23.20	4.27	3.92	0.01
24.00	**4.28**	**3.93**	0.00
24.80	4.28	3.93	0.00
25.60	4.28	3.93	0.00
26.40	4.28	3.93	0.00
27.20	4.28	3.93	0.00
28.00	4.28	3.93	0.00
28.80	4.28	3.93	0.00
29.60	4.28	3.93	0.00
30.40	4.28	3.93	0.00
31.20	4.28	3.93	0.00
32.00	4.28	3.93	0.00
32.80	4.28	3.93	0.00
33.60	4.28	3.93	0.00
34.40	4.28	3.93	0.00
35.20	4.28	3.93	0.00
36.00	4.28	3.93	0.00
36.80	4.28	3.93	0.00
37.60	4.28	3.93	0.00
38.40	4.28	3.93	0.00
39.20	4.28	3.93	0.00
40.00	4.28	3.93	0.00
40.80	4.28	3.93	0.00
41.60	4.28	3.93	0.00
42.40	4.28	3.93	0.00
43.20	4.28	3.93	0.00
44.00	4.28	3.93	0.00
44.80	4.28	3.93	0.00
45.60	4.28	3.93	0.00
46.40	4.28	3.93	0.00
47.20	4.28	3.93	0.00
48.00	4.28	3.93	0.00
48.80	4.28	3.93	0.00
49.60	4.28	3.93	0.00
50.40	4.28	3.93	0.00
51.20	4.28	3.93	0.00
52.00	4.28	3.93	0.00
52.80	4.28	3.93	0.00
53.60	4.28	3.93	0.00
54.40	4.28	3.93	0.00
55.20	4.28	3.93	0.00
56.00	4.28	3.93	0.00
56.80	4.28	3.93	0.00
57.60	4.28	3.93	0.00
58.40	4.28	3.93	0.00
59.20	4.28	3.93	0.00
60.00	4.28	3.93	0.00
60.80	4.28	3.93	0.00
61.60	4.28	3.93	0.00
62.40	4.28	3.93	0.00
63.20	4.28	3.93	0.00
64.00	4.28	3.93	0.00
64.80	4.28	3.93	0.00
65.60	4.28	3.93	0.00
66.40	4.28	3.93	0.00
67.20	4.28	3.93	0.00
68.00	4.28	3.93	0.00
68.80	4.28	3.93	0.00
69.60	4.28	3.93	0.00
70.40	4.28	3.93	0.00
71.20	4.28	3.93	0.00
72.00	4.28	3.93	0.00

Summary for Subcatchment DA5: N and W Edges

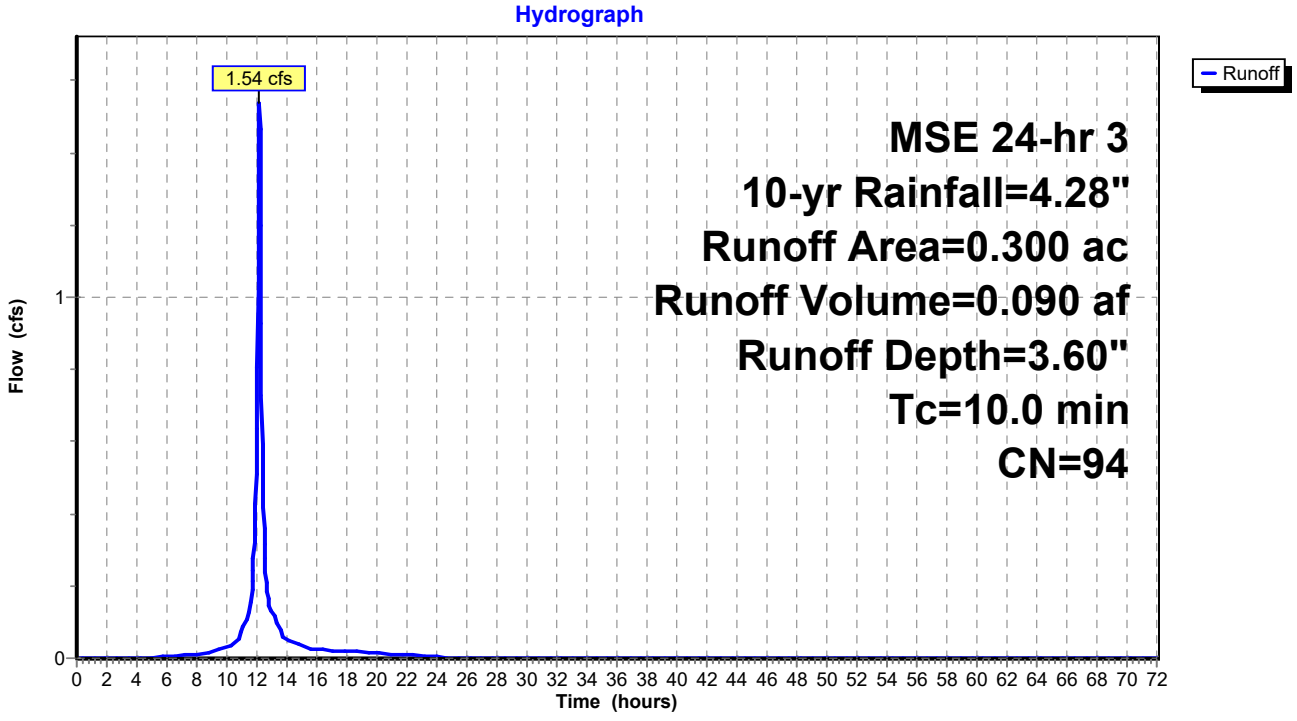
Runoff = 1.54 cfs @ 12.17 hrs, Volume= 0.090 af, Depth= 3.60"
Routed to Reach 5.1 : 12-in Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs
MSE 24-hr 3 10-yr Rainfall=4.28"

	Area (ac)	CN	Description
*	0.229	98	Paved Surfaces
	0.071	80	>75% Grass cover, Good, HSG D
	0.300	94	Weighted Average
	0.071		23.67% Pervious Area
	0.229		76.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Subcatchment DA5: N and W Edges



Hydrograph for Subcatchment DA5: N and W Edges

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.80	0.01	0.00	0.00
1.60	0.03	0.00	0.00
2.40	0.05	0.00	0.00
3.20	0.08	0.00	0.00
4.00	0.11	0.00	0.00
4.80	0.15	0.00	0.00
5.60	0.19	0.01	0.00
6.40	0.24	0.02	0.01
7.20	0.30	0.04	0.01
8.00	0.36	0.06	0.01
8.80	0.42	0.09	0.01
9.60	0.53	0.15	0.03
10.40	0.65	0.24	0.03
11.20	0.91	0.43	0.10
12.00	1.98	1.38	**0.64**
12.80	3.37	2.71	**0.15**
13.60	3.63	2.96	0.07
14.40	3.75	3.08	0.05
15.20	3.86	3.18	0.03
16.00	3.92	3.25	0.02
16.80	3.98	3.31	0.02
17.60	4.04	3.36	0.02
18.40	4.09	3.41	0.02
19.20	4.13	3.45	0.02
20.00	4.17	3.49	0.01
20.80	4.20	3.52	0.01
21.60	4.23	3.55	0.01
22.40	4.25	3.57	0.01
23.20	4.27	3.59	0.01
24.00	**4.28**	**3.60**	0.00
24.80	4.28	3.60	0.00
25.60	4.28	3.60	0.00
26.40	4.28	3.60	0.00
27.20	4.28	3.60	0.00
28.00	4.28	3.60	0.00
28.80	4.28	3.60	0.00
29.60	4.28	3.60	0.00
30.40	4.28	3.60	0.00
31.20	4.28	3.60	0.00
32.00	4.28	3.60	0.00
32.80	4.28	3.60	0.00
33.60	4.28	3.60	0.00
34.40	4.28	3.60	0.00
35.20	4.28	3.60	0.00
36.00	4.28	3.60	0.00
36.80	4.28	3.60	0.00
37.60	4.28	3.60	0.00
38.40	4.28	3.60	0.00
39.20	4.28	3.60	0.00
40.00	4.28	3.60	0.00
40.80	4.28	3.60	0.00
41.60	4.28	3.60	0.00
42.40	4.28	3.60	0.00
43.20	4.28	3.60	0.00
44.00	4.28	3.60	0.00
44.80	4.28	3.60	0.00
45.60	4.28	3.60	0.00
46.40	4.28	3.60	0.00
47.20	4.28	3.60	0.00
48.00	4.28	3.60	0.00
48.80	4.28	3.60	0.00
49.60	4.28	3.60	0.00
50.40	4.28	3.60	0.00
51.20	4.28	3.60	0.00
52.00	4.28	3.60	0.00
52.80	4.28	3.60	0.00
53.60	4.28	3.60	0.00
54.40	4.28	3.60	0.00
55.20	4.28	3.60	0.00
56.00	4.28	3.60	0.00
56.80	4.28	3.60	0.00
57.60	4.28	3.60	0.00
58.40	4.28	3.60	0.00
59.20	4.28	3.60	0.00
60.00	4.28	3.60	0.00
60.80	4.28	3.60	0.00
61.60	4.28	3.60	0.00
62.40	4.28	3.60	0.00
63.20	4.28	3.60	0.00
64.00	4.28	3.60	0.00
64.80	4.28	3.60	0.00
65.60	4.28	3.60	0.00
66.40	4.28	3.60	0.00
67.20	4.28	3.60	0.00
68.00	4.28	3.60	0.00
68.80	4.28	3.60	0.00
69.60	4.28	3.60	0.00
70.40	4.28	3.60	0.00
71.20	4.28	3.60	0.00
72.00	4.28	3.60	0.00

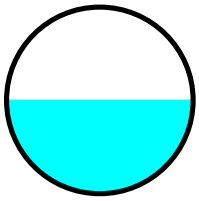
Summary for Reach 5.1: 12-in Catch Basin

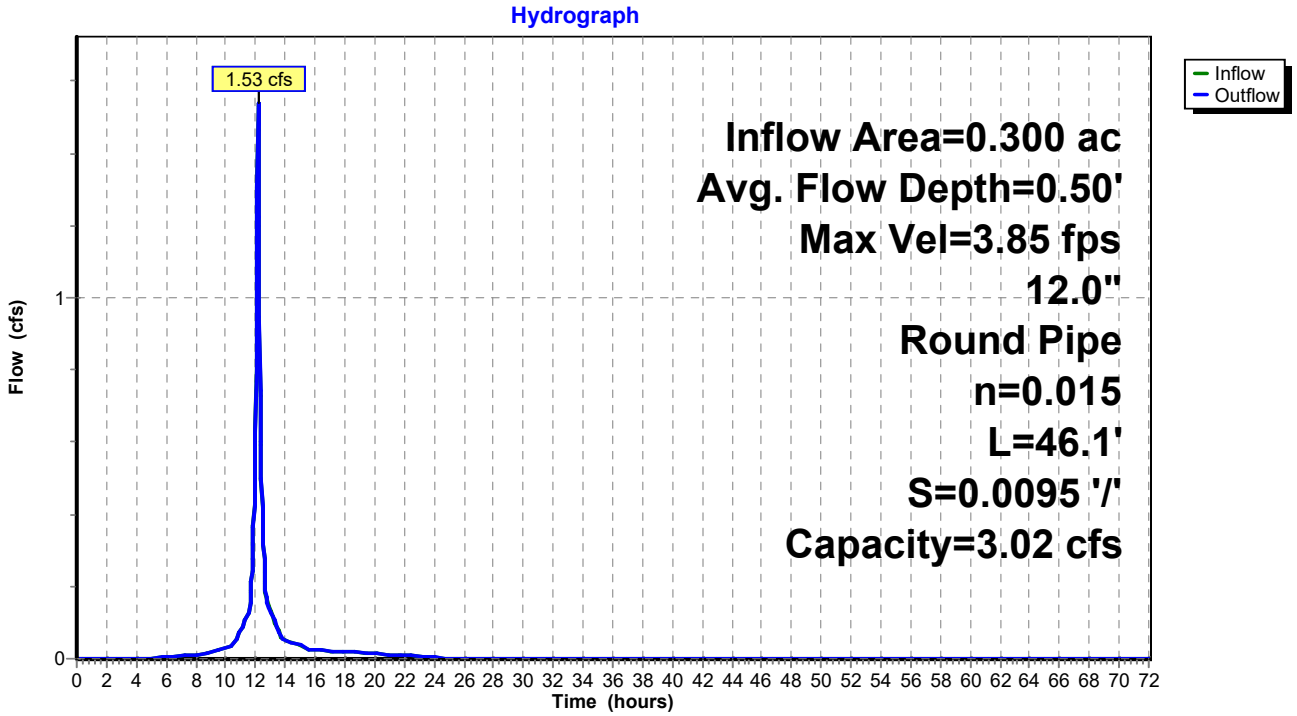
Inflow Area = 0.300 ac, 76.33% Impervious, Inflow Depth = 3.60" for 10-yr event
Inflow = 1.54 cfs @ 12.17 hrs, Volume= 0.090 af
Outflow = 1.53 cfs @ 12.17 hrs, Volume= 0.090 af, Atten= 0%, Lag= 0.2 min
Routed to Reach N FLOWS : 108-in RCP

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs / 2
Max. Velocity= 3.85 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.13 fps, Avg. Travel Time= 0.7 min

Peak Storage= 18 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.50' , Surface Width= 1.00'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.02 cfs

12.0" Round Pipe
n= 0.015 Concrete sewer w/manholes & inlets
Length= 46.1' Slope= 0.0095 '/'
Inlet Invert= 772.55', Outlet Invert= 772.11'





Hydrograph for Reach 5.1: 12-in Catch Basin

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	772.55	0.00
2.00	0.00	0	772.55	0.00
4.00	0.00	0	772.55	0.00
6.00	0.00	0	772.58	0.00
8.00	0.01	1	772.59	0.01
10.00	0.03	1	772.62	0.03
12.00	**0.64**	**9**	**772.86**	**0.62**
14.00	**0.05**	**2**	**772.64**	**0.05**
16.00	0.02	1	772.61	0.02
18.00	0.02	1	772.61	0.02
20.00	0.01	1	772.60	0.01
22.00	0.01	0	772.59	0.01
24.00	0.00	0	772.58	0.00
26.00	0.00	0	772.55	0.00
28.00	0.00	0	772.55	0.00
30.00	0.00	0	772.55	0.00
32.00	0.00	0	772.55	0.00
34.00	0.00	0	772.55	0.00
36.00	0.00	0	772.55	0.00
38.00	0.00	0	772.55	0.00
40.00	0.00	0	772.55	0.00
42.00	0.00	0	772.55	0.00
44.00	0.00	0	772.55	0.00
46.00	0.00	0	772.55	0.00
48.00	0.00	0	772.55	0.00
50.00	0.00	0	772.55	0.00
52.00	0.00	0	772.55	0.00
54.00	0.00	0	772.55	0.00
56.00	0.00	0	772.55	0.00
58.00	0.00	0	772.55	0.00
60.00	0.00	0	772.55	0.00
62.00	0.00	0	772.55	0.00
64.00	0.00	0	772.55	0.00
66.00	0.00	0	772.55	0.00
68.00	0.00	0	772.55	0.00
70.00	0.00	0	772.55	0.00
72.00	0.00	0	772.55	0.00

Stage-Discharge for Reach 5.1: 12-in Catch Basin

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
772.55	0.00	0.00
772.56	0.34	0.00
772.57	0.54	0.00
772.58	0.71	0.00
772.59	0.85	0.01
772.60	0.99	0.01
772.61	1.11	0.02
772.62	1.23	0.03
772.63	1.34	0.04
772.64	1.44	0.05
772.65	1.54	0.06
772.66	1.64	0.08
772.67	1.73	0.09
772.68	1.82	0.11
772.69	1.90	0.13
772.70	1.98	0.15
772.71	2.06	0.17
772.72	2.14	0.19
772.73	2.22	0.21
772.74	2.29	0.24
772.75	2.36	0.26
772.76	2.43	0.29
772.77	2.50	0.32
772.78	2.56	0.35
772.79	2.63	0.38
772.80	2.69	0.41
772.81	2.75	0.45
772.82	2.81	0.48
772.83	2.87	0.52
772.84	2.93	0.55
772.85	2.98	0.59
772.86	3.03	0.63
772.87	3.09	0.67
772.88	3.14	0.71
772.89	3.19	0.75
772.90	3.24	0.79
772.91	3.29	0.84
772.92	3.33	0.88
772.93	3.38	0.92
772.94	3.42	0.97
772.95	3.47	1.02
772.96	3.51	1.06
772.97	3.55	1.11
772.98	3.59	1.16
772.99	3.63	1.21
773.00	3.67	1.26
773.01	3.70	1.31
773.02	3.74	1.36
773.03	3.77	1.41
773.04	3.81	1.46
773.05	3.84	1.51
773.06	3.87	1.56
773.07	3.90	1.61
773.08	3.93	1.66
773.09	3.96	1.71
773.10	3.99	1.77
773.11	4.02	1.82
773.12	4.05	1.87
773.13	4.07	1.92
773.14	4.10	1.97
773.15	4.12	2.03
773.16	4.14	2.08
773.17	4.16	2.13
773.18	4.18	2.18
773.19	4.20	2.23
773.20	4.22	2.28
773.21	4.24	2.33
773.22	4.26	2.38
773.23	4.27	2.43
773.24	4.29	2.48
773.25	4.30	2.53
773.26	4.31	2.57
773.27	4.33	2.62
773.28	4.34	2.66
773.29	4.35	2.71
773.30	4.35	2.75
773.31	4.36	2.79
773.32	4.37	2.83
773.33	4.37	2.87
773.34	4.38	2.91
773.35	4.38	2.95
773.36	**4.38**	2.98
773.37	4.38	3.02
773.38	4.38	3.05
773.39	4.37	3.08
773.40	4.37	3.11
773.41	4.36	3.13
773.42	4.35	3.16
773.43	4.34	3.18
773.44	4.33	3.20
773.45	4.32	3.22
773.46	4.30	3.23
773.47	4.28	3.24
773.48	4.26	3.24
773.49	4.24	**3.24**
773.50	4.21	3.24
773.51	4.17	3.23
773.52	4.13	3.21
773.53	4.08	3.19
773.54	4.01	3.14
773.55	3.84	3.02

Stage-Area-Storage for Reach 5.1: 12-in Catch Basin

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
772.55	0.0	0
772.56	0.0	0
772.57	0.0	0
772.58	0.0	0
772.59	0.0	0
772.60	0.0	1
772.61	0.0	1
772.62	0.0	1
772.63	0.0	1
772.64	0.0	2
772.65	0.0	2
772.66	0.0	2
772.67	0.1	2
772.68	0.1	3
772.69	0.1	3
772.70	0.1	3
772.71	0.1	4
772.72	0.1	4
772.73	0.1	4
772.74	0.1	5
772.75	0.1	5
772.76	0.1	6
772.77	0.1	6
772.78	0.1	6
772.79	0.1	7
772.80	0.2	7
772.81	0.2	7
772.82	0.2	8
772.83	0.2	8
772.84	0.2	9
772.85	0.2	9
772.86	0.2	10
772.87	0.2	10
772.88	0.2	10
772.89	0.2	11
772.90	0.2	11
772.91	0.3	12
772.92	0.3	12
772.93	0.3	13
772.94	0.3	13
772.95	0.3	14
772.96	0.3	14
772.97	0.3	14
772.98	0.3	15
772.99	0.3	15
773.00	0.3	16
773.01	0.4	16
773.02	0.4	17
773.03	0.4	17
773.04	0.4	18
773.05	0.4	18
773.06	0.4	19
773.07	0.4	19
773.08	0.4	19
773.09	0.4	20
773.10	0.4	20
773.11	0.5	21
773.12	0.5	21
773.13	0.5	22
773.14	0.5	22
773.15	0.5	23
773.16	0.5	23
773.17	0.5	24
773.18	0.5	24
773.19	0.5	24
773.20	0.5	25
773.21	0.5	25
773.22	0.6	26
773.23	0.6	26
773.24	0.6	27
773.25	0.6	27
773.26	0.6	27
773.27	0.6	28
773.28	0.6	28
773.29	0.6	29
773.30	0.6	29
773.31	0.6	30
773.32	0.6	30
773.33	0.7	30
773.34	0.7	31
773.35	0.7	31
773.36	0.7	31
773.37	0.7	32
773.38	0.7	32
773.39	0.7	32
773.40	0.7	33
773.41	0.7	33
773.42	0.7	33
773.43	0.7	34
773.44	0.7	34
773.45	0.7	34
773.46	0.8	35
773.47	0.8	35
773.48	0.8	35
773.49	0.8	35
773.50	0.8	36
773.51	0.8	36
773.52	0.8	36
773.53	0.8	36
773.54	0.8	36
773.55	**0.8**	**36**

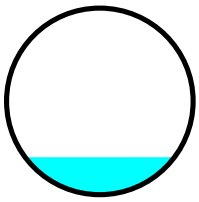
Summary for Reach N FLOWS: 108-in RCP

Inflow Area = 1.333 ac, 93.92% Impervious, Inflow Depth = 4.26" for 10-yr event
Inflow = 6.50 cfs @ 12.23 hrs, Volume= 0.473 af
Outflow = 4.23 cfs @ 12.40 hrs, Volume= 0.473 af, Atten= 35%, Lag= 10.2 min

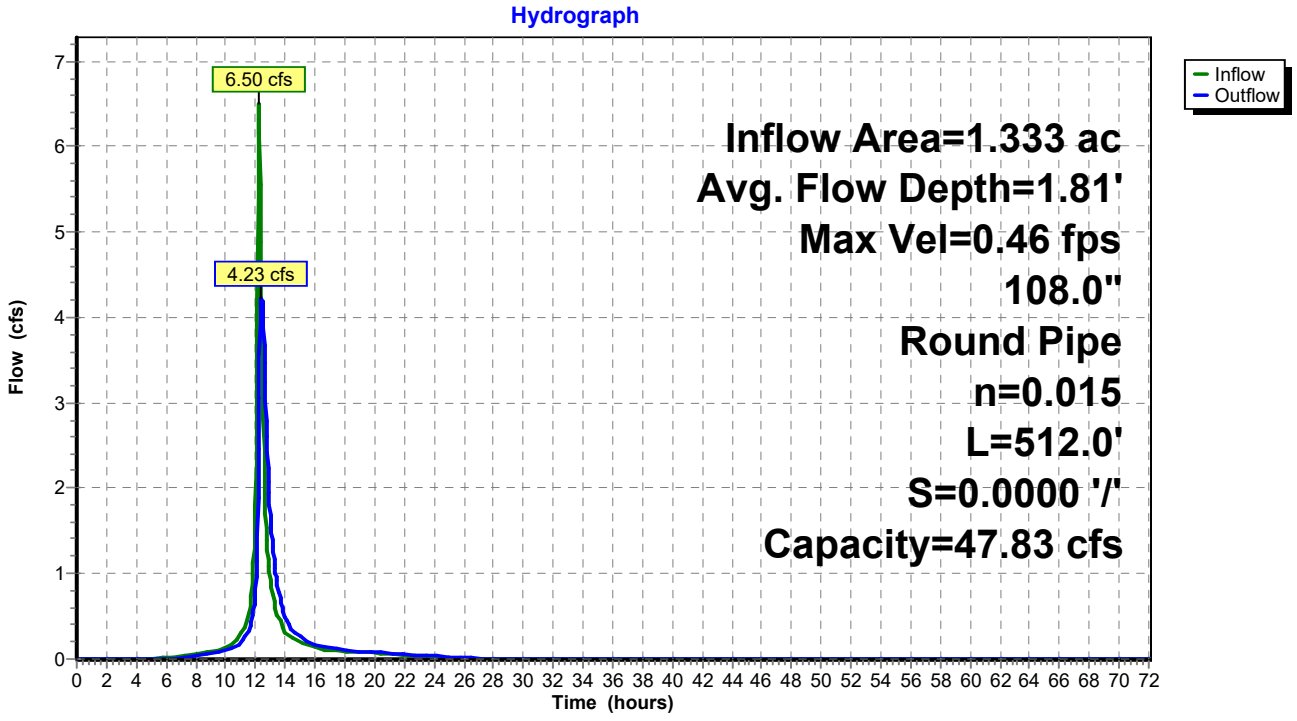
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs / 2
Max. Velocity= 0.46 fps, Min. Travel Time= 18.4 min
Avg. Velocity = 0.10 fps, Avg. Travel Time= 89.6 min

Peak Storage= 4,667 cf @ 12.40 hrs
Average Depth at Peak Storage= 1.81' , Surface Width= 7.21'
Bank-Full Depth= 9.00' Flow Area= 63.6 sf, Capacity= 47.83 cfs

108.0" Round Pipe
n= 0.015 Concrete sewer w/manholes & inlets
Length= 512.0' Slope= 0.0000 '/'
Inlet Invert= 761.00', Outlet Invert= 760.99'



Reach N FLOWS: 108-in RCP



Hydrograph for Reach N FLOWS: 108-in RCP

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	761.00	0.00
2.00	0.00	0	761.00	0.00
4.00	0.00	0	761.00	0.00
6.00	0.02	36	761.06	0.00
8.00	0.06	170	761.19	0.04
10.00	0.14	351	761.31	0.11
12.00	**1.81**	**1,478**	**761.82**	**0.82**
14.00	**0.31**	**1,048**	**761.65**	**0.50**
16.00	0.13	486	761.39	0.17
18.00	0.09	345	761.31	0.10
20.00	0.07	285	761.27	0.08
22.00	0.05	227	761.23	0.06
24.00	0.03	167	761.19	0.04
26.00	0.01	94	761.12	0.02
28.00	0.00	57	761.09	0.01
30.00	0.00	39	761.06	0.01
32.00	0.00	26	761.04	0.00
34.00	0.00	18	761.03	0.00
36.00	0.00	13	761.02	0.00
38.00	0.00	9	761.02	0.00
40.00	0.00	7	761.01	0.00
42.00	0.00	6	761.01	0.00
44.00	0.00	5	761.01	0.00
46.00	0.00	4	761.01	0.00
48.00	0.00	3	761.01	0.00
50.00	0.00	3	761.00	0.00
52.00	0.00	2	761.00	0.00
54.00	0.00	2	761.00	0.00
56.00	0.00	2	761.00	0.00
58.00	0.00	2	761.00	0.00
60.00	0.00	2	761.00	0.00
62.00	0.00	1	761.00	0.00
64.00	0.00	1	761.00	0.00
66.00	0.00	1	761.00	0.00
68.00	0.00	1	761.00	0.00
70.00	0.00	1	761.00	0.00
72.00	0.00	1	761.00	0.00

Stage-Discharge for Reach N FLOWS: 108-in RCP

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
761.00	0.00	0.00
761.10	0.07	0.01
761.20	0.11	0.04
761.30	0.15	0.10
761.40	0.18	0.18
761.50	0.21	0.29
761.60	0.23	0.43
761.70	0.26	0.59
761.80	0.28	0.78
761.90	0.30	1.00
762.00	0.32	1.25
762.10	0.34	1.52
762.20	0.36	1.82
762.30	0.38	2.15
762.40	0.40	2.51
762.50	0.41	2.89
762.60	0.43	3.30
762.70	0.45	3.73
762.80	0.46	4.19
762.90	0.48	4.67
763.00	0.49	5.18
763.10	0.51	5.71
763.20	0.52	6.27
763.30	0.53	6.84
763.40	0.55	7.44
763.50	0.56	8.06
763.60	0.57	8.70
763.70	0.58	9.37
763.80	0.60	10.05
763.90	0.61	10.75
764.00	0.62	11.47
764.10	0.63	12.20
764.20	0.64	12.96
764.30	0.65	13.72
764.40	0.66	14.51
764.50	0.67	15.30
764.60	0.68	16.12
764.70	0.69	16.94
764.80	0.70	17.78
764.90	0.70	18.63
765.00	0.71	19.49
765.10	0.72	20.36
765.20	0.73	21.23
765.30	0.74	22.12
765.40	0.74	23.01
765.50	0.75	23.91
765.60	0.76	24.82
765.70	0.77	25.73
765.80	0.77	26.64
765.90	0.78	27.55
766.00	0.78	28.47
766.10	0.79	29.39
766.20	0.80	30.30
766.30	0.80	31.22
766.40	0.81	32.13
766.50	0.81	33.04
766.60	0.82	33.94
766.70	0.82	34.84
766.80	0.82	35.73
766.90	0.83	36.61
767.00	0.83	37.49
767.10	0.84	38.35
767.20	0.84	39.20
767.30	0.84	40.04
767.40	0.84	40.86
767.50	0.85	41.67
767.60	0.85	42.46
767.70	0.85	43.23
767.80	0.85	43.98
767.90	0.85	44.71
768.00	0.86	45.41
768.10	0.86	46.09
768.20	**0.86**	46.75
768.30	**0.86**	47.37
768.40	0.86	47.96
768.50	0.86	48.51
768.60	0.86	49.03
768.70	0.85	49.51
768.80	0.85	49.95
768.90	0.85	50.34
769.00	0.85	50.68
769.10	0.85	50.97
769.20	0.84	51.19
769.30	0.84	51.35
769.40	0.83	**51.43**
769.50	0.83	**51.42**
769.60	0.82	51.31
769.70	0.81	51.06
769.80	0.80	50.63
769.90	0.79	49.91
770.00	0.75	47.83

Stage-Area-Storage for Reach N FLOWS: 108-in RCP

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
761.00	0.0	0
761.10	0.1	66
761.20	0.4	184
761.30	0.7	335
761.40	1.0	513
761.50	1.4	714
761.60	1.8	934
761.70	2.3	1,172
761.80	2.8	1,426
761.90	3.3	1,695
762.00	3.9	1,979
762.10	4.4	2,275
762.20	5.0	2,583
762.30	5.7	2,901
762.40	6.3	3,230
762.50	7.0	3,569
762.60	7.7	3,917
762.70	8.3	4,273
762.80	9.1	4,638
762.90	9.8	5,010
763.00	10.5	5,390
763.10	11.3	5,777
763.20	12.1	6,170
763.30	12.8	6,569
763.40	13.6	6,973
763.50	14.4	7,383
763.60	15.2	7,799
763.70	16.1	8,218
763.80	16.9	8,643
763.90	17.7	9,072
764.00	18.6	9,505
764.10	19.4	9,941
764.20	20.3	10,380
764.30	21.1	10,823
764.40	22.0	11,268
764.50	22.9	11,716
764.60	23.8	12,167
764.70	24.6	12,619
764.80	25.5	13,074
764.90	26.4	13,530
765.00	27.3	13,987
765.10	28.2	14,445
765.20	29.1	14,905
765.30	30.0	15,365
765.40	30.9	15,825
765.50	31.8	16,286
765.60	32.7	16,747
765.70	33.6	17,207
765.80	34.5	17,667
765.90	35.4	18,127
766.00	36.3	18,585
766.10	37.2	19,042
766.20	38.1	19,498
766.30	39.0	19,953
766.40	39.9	20,405
766.50	40.7	20,856
766.60	41.6	21,304
766.70	42.5	21,749
766.80	43.3	22,192
766.90	44.2	22,631
767.00	45.1	23,067
767.10	45.9	23,500
767.20	46.7	23,929
767.30	47.6	24,354
767.40	48.4	24,773
767.50	49.2	25,189
767.60	50.0	25,599
767.70	50.8	26,003
767.80	51.6	26,402
767.90	52.3	26,795
768.00	53.1	27,182
768.10	53.8	27,562
768.20	54.6	27,934
768.30	55.3	28,299
768.40	56.0	28,655
768.50	56.6	29,003
768.60	57.3	29,342
768.70	58.0	29,671
768.80	58.6	29,989
768.90	59.2	30,297
769.00	59.8	30,593
769.10	60.3	30,877
769.20	60.8	31,146
769.30	61.3	31,400
769.40	61.8	31,638
769.50	62.2	31,858
769.60	62.6	32,059
769.70	63.0	32,237
769.80	63.3	32,388
769.90	63.5	32,506
770.00	**63.6**	**32,572**

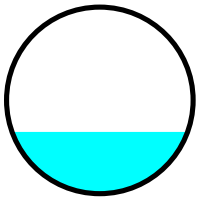
Summary for Reach S FLOWS: 15-in RCP

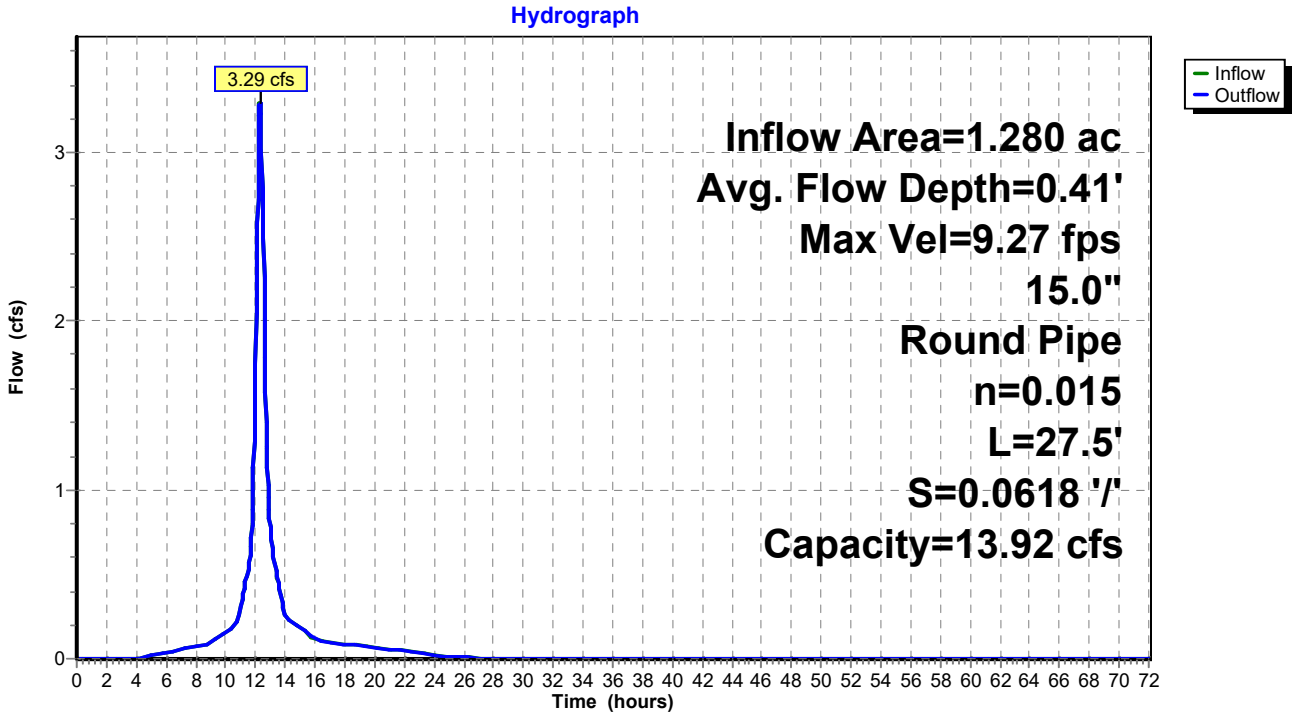
Inflow Area = 1.280 ac, 99.06% Impervious, Inflow Depth = 3.69" for 10-yr event
Inflow = 3.29 cfs @ 12.29 hrs, Volume= 0.393 af
Outflow = 3.29 cfs @ 12.30 hrs, Volume= 0.393 af, Atten= 0%, Lag= 0.2 min
Routed to nonexistent node 5R

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs / 2
Max. Velocity= 9.27 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 1.99 fps, Avg. Travel Time= 0.2 min

Peak Storage= 10 cf @ 12.30 hrs
Average Depth at Peak Storage= 0.41' , Surface Width= 1.18'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 13.92 cfs

15.0" Round Pipe
n= 0.015 Concrete sewer w/manholes & inlets
Length= 27.5' Slope= 0.0618 '/'
Inlet Invert= 773.80', Outlet Invert= 772.10'





Hydrograph for Reach S FLOWS: 15-in RCP

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	773.80	0.00
2.00	0.00	0	773.80	0.00
4.00	0.00	0	773.81	0.00
6.00	0.03	0	773.85	0.03
8.00	0.08	1	773.87	0.08
10.00	0.16	1	773.90	0.16
12.00	**1.75**	**6**	**774.10**	**1.75**
14.00	**0.27**	**2**	**773.92**	**0.27**
16.00	0.12	1	773.88	0.12
18.00	0.09	1	773.87	0.09
20.00	0.07	1	773.86	0.07
22.00	0.04	0	773.85	0.04
24.00	0.03	0	773.84	0.03
26.00	0.01	0	773.82	0.01
28.00	0.00	0	773.81	0.00
30.00	0.00	0	773.81	0.00
32.00	0.00	0	773.81	0.00
34.00	0.00	0	773.80	0.00
36.00	0.00	0	773.80	0.00
38.00	0.00	0	773.80	0.00
40.00	0.00	0	773.80	0.00
42.00	0.00	0	773.80	0.00
44.00	0.00	0	773.80	0.00
46.00	0.00	0	773.80	0.00
48.00	0.00	0	773.80	0.00
50.00	0.00	0	773.80	0.00
52.00	0.00	0	773.80	0.00
54.00	0.00	0	773.80	0.00
56.00	0.00	0	773.80	0.00
58.00	0.00	0	773.80	0.00
60.00	0.00	0	773.80	0.00
62.00	0.00	0	773.80	0.00
64.00	0.00	0	773.80	0.00
66.00	0.00	0	773.80	0.00
68.00	0.00	0	773.80	0.00
70.00	0.00	0	773.80	0.00
72.00	0.00	0	773.80	0.00

Stage-Discharge for Reach S FLOWS: 15-in RCP

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
773.80	0.00	0.00
773.81	0.81	0.00
773.82	1.36	0.01
773.83	1.79	0.01
773.84	2.17	0.03
773.85	2.52	0.04
773.86	2.83	0.06
773.87	3.13	0.09
773.88	3.42	0.11
773.89	3.69	0.15
773.90	3.95	0.18
773.91	4.19	0.22
773.92	4.43	0.27
773.93	4.66	0.32
773.94	4.89	0.37
773.95	5.10	0.43
773.96	5.31	0.49
773.97	5.52	0.55
773.98	5.72	0.62
773.99	5.91	0.70
774.00	6.10	0.77
774.01	6.28	0.85
774.02	6.46	0.94
774.03	6.64	1.03
774.04	6.81	1.12
774.05	6.98	1.22
774.06	7.14	1.32
774.07	7.30	1.42
774.08	7.46	1.53
774.09	7.61	1.64
774.10	7.76	1.76
774.11	7.91	1.88
774.12	8.06	2.00
774.13	8.20	2.12
774.14	8.34	2.25
774.15	8.47	2.38
774.16	8.61	2.52
774.17	8.74	2.66
774.18	8.87	2.80
774.19	8.99	2.94
774.20	9.12	3.09
774.21	9.24	3.24
774.22	9.36	3.39
774.23	9.48	3.54
774.24	9.59	3.70
774.25	9.70	3.86
774.26	9.81	4.02
774.27	9.92	4.19
774.28	10.03	4.35
774.29	10.13	4.52
774.30	10.23	4.69
774.31	10.33	4.86
774.32	10.43	5.04
774.33	10.53	5.21
774.34	10.62	5.39
774.35	10.71	5.57
774.36	10.80	5.75
774.37	10.89	5.94
774.38	10.98	6.12
774.39	11.06	6.30
774.40	11.14	6.49
774.41	11.22	6.68
774.42	11.30	6.87
774.43	11.38	7.05
774.44	11.46	7.24
774.45	11.53	7.43
774.46	11.60	7.63
774.47	11.67	7.82
774.48	11.74	8.01
774.49	11.80	8.20
774.50	11.87	8.39
774.51	11.93	8.59
774.52	11.99	8.78
774.53	12.05	8.97
774.54	12.11	9.16
774.55	12.16	9.35
774.56	12.22	9.54
774.57	12.27	9.73
774.58	12.32	9.92
774.59	12.37	10.11
774.60	12.41	10.30
774.61	12.46	10.48
774.62	12.50	10.67
774.63	12.54	10.85
774.64	12.58	11.03
774.65	12.62	11.21
774.66	12.65	11.39
774.67	12.69	11.57
774.68	12.72	11.74
774.69	12.75	11.91
774.70	12.77	12.08
774.71	12.80	12.25
774.72	12.82	12.41
774.73	12.84	12.57
774.74	12.86	12.73
774.75	12.88	12.89
774.76	12.89	13.04
774.77	12.90	13.19
774.78	12.91	13.33
774.79	12.92	13.47
774.80	12.93	13.61
774.81	12.93	13.74
774.82	**12.93**	13.86
774.83	12.93	13.98
774.84	12.92	14.10
774.85	12.92	14.21
774.86	12.90	14.32
774.87	12.89	14.42
774.88	12.87	14.51
774.89	12.85	14.59
774.90	12.83	14.67
774.91	12.80	14.74
774.92	12.77	14.81
774.93	12.73	14.86
774.94	12.69	14.90
774.95	12.65	14.94
774.96	12.60	14.96
774.97	12.54	**14.97**
774.98	12.47	14.97
774.99	12.40	14.95
775.00	12.32	14.91
775.01	12.22	14.85
775.02	12.10	14.76
775.03	11.96	14.63
775.04	11.74	14.39
775.05	11.34	13.92

Stage-Area-Storage for Reach S FLOWS: 15-in RCP

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
773.80	0.0	0
773.82	0.0	0
773.84	0.0	0
773.86	0.0	1
773.88	0.0	1
773.90	0.0	1
773.92	0.1	2
773.94	0.1	2
773.96	0.1	3
773.98	0.1	3
774.00	0.1	3
774.02	0.1	4
774.04	0.2	5
774.06	0.2	5
774.08	0.2	6
774.10	0.2	6
774.12	0.2	7
774.14	0.3	7
774.16	0.3	8
774.18	0.3	9
774.20	0.3	9
774.22	0.4	10
774.24	0.4	11
774.26	0.4	11
774.28	0.4	12
774.30	0.5	13
774.32	0.5	13
774.34	0.5	14
774.36	0.5	15
774.38	0.6	15
774.40	0.6	16
774.42	0.6	17
774.44	0.6	17
774.46	0.7	18
774.48	0.7	19
774.50	0.7	19
774.52	0.7	20
774.54	0.8	21
774.56	0.8	21
774.58	0.8	22
774.60	0.8	23
774.62	0.9	23
774.64	0.9	24
774.66	0.9	25
774.68	0.9	25
774.70	0.9	26
774.72	1.0	27
774.74	1.0	27
774.76	1.0	28
774.78	1.0	28
774.80	1.1	29
774.82	1.1	29
774.84	1.1	30
774.86	1.1	31
774.88	1.1	31
774.90	1.1	31
774.92	1.2	32
774.94	1.2	32
774.96	1.2	33
774.98	1.2	33
775.00	1.2	33
775.02	1.2	34
775.04	**1.2**	**34**

Summary for Pond NADS: North ADS MC-3500

Inflow Area = 1.033 ac, 99.03% Impervious, Inflow Depth = 4.45" for 10-yr event
Inflow = 8.28 cfs @ 12.17 hrs, Volume= 0.383 af
Outflow = 5.31 cfs @ 12.26 hrs, Volume= 0.383 af, Atten= 36%, Lag= 5.1 min
Primary = 5.31 cfs @ 12.26 hrs, Volume= 0.383 af
Routed to Reach N FLOWS : 108-in RCP

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs / 2
Peak Elev= 772.57' @ 12.26 hrs Surf.Area= 0.067 ac Storage= 0.100 af

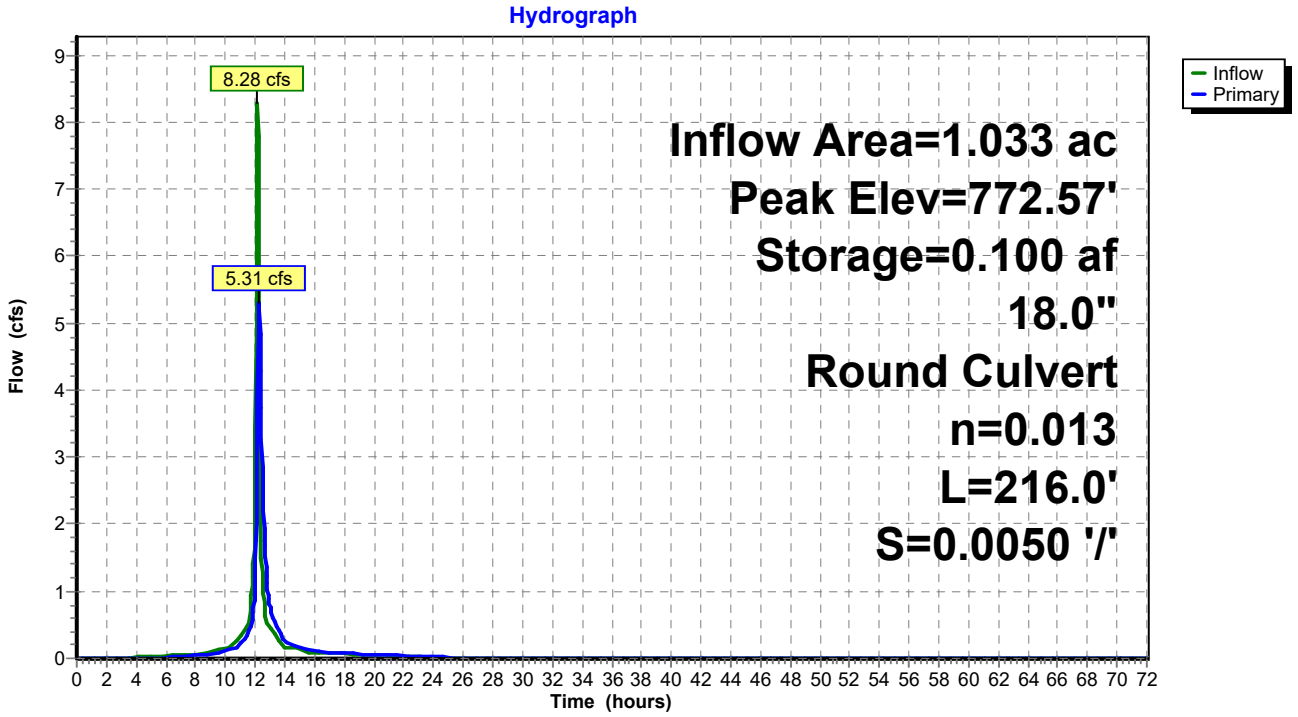
Plug-Flow detention time= 49.3 min calculated for 0.383 af (100% of inflow)
Center-of-Mass det. time= 48.4 min (799.1 - 750.7)

Volume	Invert	Avail.Storage	Storage Description
#1	771.20'	0.201 af	**ADS_StormTech MC-3500 d +Cap @ 112.50' L**x 5 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 112.50'L = 1,725.2 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 5 Chambers in 5 Rows Cap Storage= 14.9 cf x 2 x 5 rows = 149.0 cf

Device	Routing	Invert	Outlet Devices
#1	Primary	771.20'	**18.0" Round Culvert** L= 216.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 771.20' / 770.12' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf

Primary OutFlow Max=5.25 cfs @ 12.26 hrs HW=772.55' TW=762.59' (Dynamic Tailwater)
1=Culvert (Inlet Controls 5.25 cfs @ 3.13 fps)

Pond NADS: North ADS MC-3500



Hydrograph for Pond NADS: North ADS MC-3500

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.000	771.20	0.00
2.00	0.00	0.000	771.20	0.00
4.00	0.02	0.001	771.21	0.00
6.00	0.04	0.005	771.26	0.01
8.00	0.06	0.009	771.31	0.05
10.00	0.14	0.013	771.37	0.11
12.00	**2.42**	**0.042**	**771.76**	**1.19**
14.00	**0.17**	**0.020**	**771.46**	**0.26**
16.00	0.08	0.013	771.37	0.11
18.00	0.07	0.011	771.34	0.07
20.00	0.05	0.010	771.32	0.06
22.00	0.03	0.008	771.31	0.04
24.00	0.01	0.006	771.28	0.02
26.00	0.00	0.004	771.25	0.01
28.00	0.00	0.003	771.24	0.00
30.00	0.00	0.002	771.23	0.00
32.00	0.00	0.002	771.23	0.00
34.00	0.00	0.002	771.22	0.00
36.00	0.00	0.002	771.22	0.00
38.00	0.00	0.001	771.22	0.00
40.00	0.00	0.001	771.22	0.00
42.00	0.00	0.001	771.21	0.00
44.00	0.00	0.001	771.21	0.00
46.00	0.00	0.001	771.21	0.00
48.00	0.00	0.001	771.21	0.00
50.00	0.00	0.001	771.21	0.00
52.00	0.00	0.001	771.21	0.00
54.00	0.00	0.001	771.21	0.00
56.00	0.00	0.001	771.21	0.00
58.00	0.00	0.001	771.21	0.00
60.00	0.00	0.001	771.21	0.00
62.00	0.00	0.001	771.21	0.00
64.00	0.00	0.001	771.21	0.00
66.00	0.00	0.001	771.21	0.00
68.00	0.00	0.001	771.21	0.00
70.00	0.00	0.001	771.21	0.00
72.00	0.00	0.001	771.21	0.00

Stage-Discharge for Pond NADS: North ADS MC-3500

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
771.20	0.00	772.24	3.58	773.28	7.55	774.32	9.63
771.22	0.00	772.26	3.69	773.30	7.60	774.34	9.67
771.24	0.00	772.28	3.80	773.32	7.64	774.36	9.71
771.26	0.01	772.30	3.92	773.34	7.69	774.38	9.74
771.28	0.02	772.32	4.03	773.36	7.73	774.40	9.78
771.30	0.04	772.34	4.14	773.38	7.78	774.42	9.81
771.32	0.05	772.36	4.25	773.40	7.82	774.44	9.85
771.34	0.07	772.38	4.35	773.42	7.87	774.46	9.88
771.36	0.10	772.40	4.46	773.44	7.91	774.48	9.92
771.38	0.12	772.42	4.57	773.46	7.95	774.50	9.95
771.40	0.15	772.44	4.68	773.48	8.00	774.52	9.98
771.42	0.19	772.46	4.78	773.50	8.04	774.54	10.02
771.44	0.22	772.48	4.88	773.52	8.08	774.56	10.05
771.46	0.26	772.50	4.99	773.54	8.12	774.58	10.09
771.48	0.31	772.52	5.09	773.56	8.17	774.60	10.12
771.50	0.35	772.54	5.18	773.58	8.21	774.62	10.16
771.52	0.40	772.56	5.28	773.60	8.25	774.64	10.19
771.54	0.45	772.58	5.37	773.62	8.29	774.66	10.22
771.56	0.51	772.60	5.46	773.64	8.33	774.68	10.26
771.58	0.56	772.62	5.54	773.66	8.37	774.70	10.29
771.60	0.62	772.64	5.62	773.68	8.42	774.72	10.32
771.62	0.69	772.66	5.70	773.70	8.46	774.74	10.36
771.64	0.75	772.68	5.76	773.72	8.50	774.76	10.39
771.66	0.82	772.70	5.82	773.74	8.54	774.78	10.42
771.68	0.89	772.72	5.89	773.76	8.58	774.80	10.46
771.70	0.97	772.74	5.97	773.78	8.62	774.82	10.49
771.72	1.04	772.76	6.05	773.80	8.66	774.84	10.52
771.74	1.12	772.78	6.12	773.82	8.70	774.86	10.55
771.76	1.20	772.80	6.19	773.84	8.74	774.88	10.59
771.78	1.28	772.82	6.27	773.86	8.78	774.90	10.62
771.80	1.36	772.84	6.34	773.88	8.81	774.92	10.65
771.82	1.45	772.86	6.41	773.90	8.85	774.94	**10.68**
771.84	1.54	772.88	6.48	773.92	8.89		
771.86	1.63	772.90	6.55	773.94	8.93		
771.88	1.72	772.92	6.62	773.96	8.97		
771.90	1.81	772.94	6.68	773.98	9.01		
771.92	1.91	772.96	6.75	774.00	9.05		
771.94	2.01	772.98	6.82	774.02	9.08		
771.96	2.11	773.00	6.88	774.04	9.12		
771.98	2.20	773.02	6.95	774.06	9.16		
772.00	2.30	773.04	7.01	774.08	9.20		
772.02	2.41	773.06	7.08	774.10	9.23		
772.04	2.51	773.08	7.14	774.12	9.27		
772.06	2.61	773.10	7.20	774.14	9.31		
772.08	2.72	773.12	7.27	774.16	9.34		
772.10	2.82	773.14	7.33	774.18	9.38		
772.12	2.93	773.16	7.39	774.20	9.42		
772.14	3.04	773.18	7.45	774.22	9.45		
772.16	3.15	773.20	7.37	774.24	9.49		
772.18	3.25	773.22	7.42	774.26	9.53		
772.20	3.36	773.24	7.46	774.28	9.56		
772.22	3.47	773.26	7.51	774.30	9.60		

Stage-Area-Storage for Pond NADS: North ADS MC-3500

Elevation (feet)	Storage (acre-feet)
771.20	0.000
771.25	0.004
771.30	0.008
771.35	0.012
771.40	0.015
771.45	0.019
771.50	0.023
771.55	0.027
771.60	0.030
771.65	0.034
771.70	0.038
771.75	0.042
771.80	0.045
771.85	0.049
771.90	0.053
771.95	0.056
772.00	0.060
772.05	0.064
772.10	0.067
772.15	0.071
772.20	0.074
772.25	0.078
772.30	0.081
772.35	0.085
772.40	0.088
772.45	0.092
772.50	0.095
772.55	0.098
772.60	0.102
772.65	0.105
772.70	0.108
772.75	0.112
772.80	0.115
772.85	0.118
772.90	0.121
772.95	0.124
773.00	0.128
773.05	0.131
773.10	0.134
773.15	0.137
773.20	0.140
773.25	0.143
773.30	0.146
773.35	0.148
773.40	0.151
773.45	0.154
773.50	0.157
773.55	0.159
773.60	0.162
773.65	0.165
773.70	0.167
773.75	0.170
773.80	0.172
773.85	0.174
773.90	0.177
773.95	0.179
774.00	0.181
774.05	0.183
774.10	0.185
774.15	0.187
774.20	0.189
774.25	0.191
774.30	0.192
774.35	0.194
774.40	0.195
774.45	0.197
774.50	0.198
774.55	0.199
774.60	0.199
774.65	0.200
774.70	0.200
774.75	0.201
774.80	0.201
774.85	0.201
774.90	0.201
774.95	**0.201**

Summary for Pond SADS: South ADS MC-3500

Inflow Area = 1.280 ac, 99.06% Impervious, Inflow Depth = 3.69" for 10-yr event
Inflow = 4.16 cfs @ 12.17 hrs, Volume= 0.393 af
Outflow = 3.29 cfs @ 12.29 hrs, Volume= 0.393 af, Atten= 21%, Lag= 7.5 min
Primary = 3.29 cfs @ 12.29 hrs, Volume= 0.393 af
Routed to Pond SOCS : South OCS

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs / 2
Peak Elev= 775.56' @ 12.29 hrs Surf.Area= 0.035 ac Storage= 0.061 af

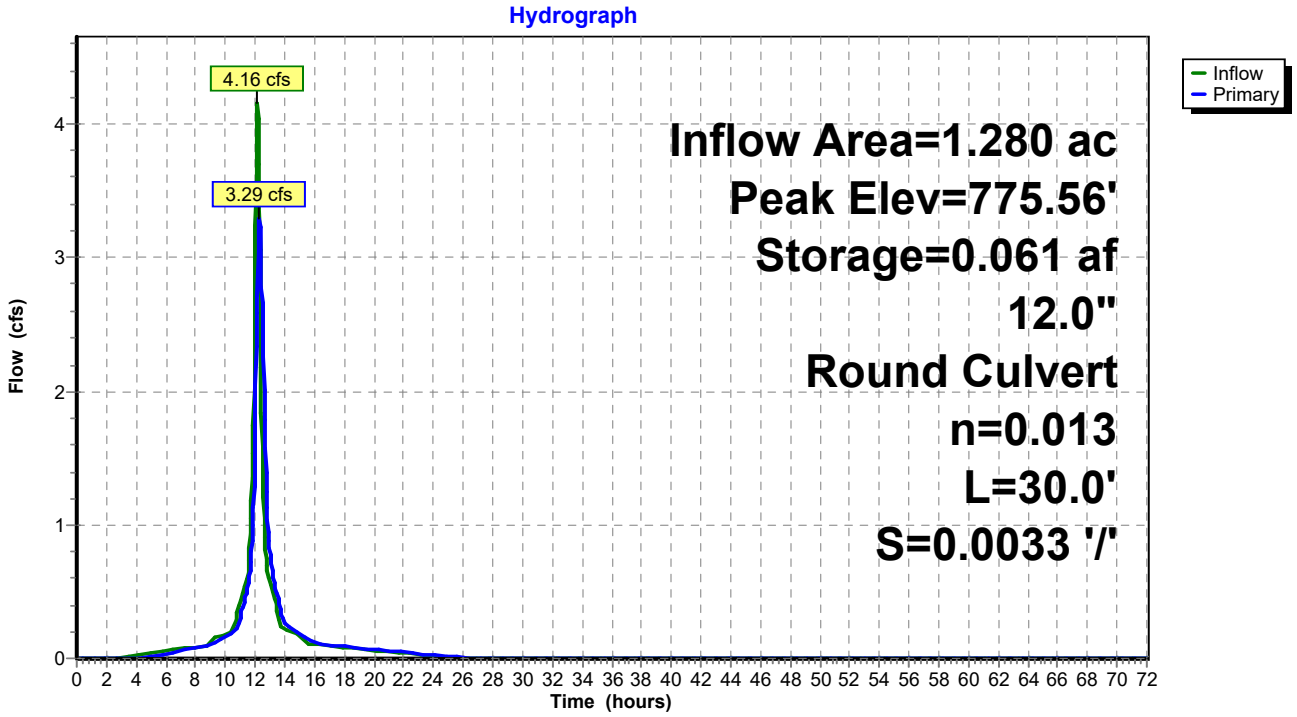
Plug-Flow detention time= 34.3 min calculated for 0.393 af (100% of inflow)
Center-of-Mass det. time= 33.8 min (786.9 - 753.1)

Volume	Invert	Avail.Storage	Storage Description
#1	774.00'	0.108 af	**ADS_StormTech MC-3500 d +Cap @ 75.00' L**x 4 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 75.00'L = 1,150.1 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 4 Chambers in 4 Rows Cap Storage= 14.9 cf x 2 x 4 rows = 119.2 cf

Device	Routing	Invert	Outlet Devices
#1	Primary	774.00'	**12.0" Round Culvert** L= 30.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 774.00' / 773.90' S= 0.0033 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.29 hrs HW=775.56' TW=776.38' (Dynamic Tailwater)
↑**1=Culvert** (Controls 0.00 cfs)

Pond SADS: South ADS MC-3500



Hydrograph for Pond SADS: South ADS MC-3500

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.000	774.00	0.00
2.00	0.00	0.000	774.00	0.00
4.00	0.02	0.002	774.04	0.00
6.00	0.05	0.005	774.12	0.03
8.00	0.08	0.007	774.17	0.08
10.00	0.18	0.010	774.25	0.16
12.00	**2.91**	**0.037**	**774.91**	**1.75**
14.00	**0.21**	**0.013**	**774.32**	**0.27**
16.00	0.10	0.009	774.21	0.12
18.00	0.08	0.008	774.18	0.09
20.00	0.06	0.007	774.16	0.07
22.00	0.04	0.006	774.13	0.04
24.00	0.02	0.004	774.10	0.03
26.00	0.00	0.002	774.05	0.01
28.00	0.00	0.002	774.04	0.00
30.00	0.00	0.001	774.03	0.00
32.00	0.00	0.001	774.02	0.00
34.00	0.00	0.001	774.02	0.00
36.00	0.00	0.001	774.02	0.00
38.00	0.00	0.001	774.02	0.00
40.00	0.00	0.001	774.01	0.00
42.00	0.00	0.001	774.01	0.00
44.00	0.00	0.000	774.01	0.00
46.00	0.00	0.000	774.01	0.00
48.00	0.00	0.000	774.01	0.00
50.00	0.00	0.000	774.01	0.00
52.00	0.00	0.000	774.01	0.00
54.00	0.00	0.000	774.01	0.00
56.00	0.00	0.000	774.01	0.00
58.00	0.00	0.000	774.01	0.00
60.00	0.00	0.000	774.01	0.00
62.00	0.00	0.000	774.01	0.00
64.00	0.00	0.000	774.01	0.00
66.00	0.00	0.000	774.01	0.00
68.00	0.00	0.000	774.01	0.00
70.00	0.00	0.000	774.01	0.00
72.00	0.00	0.000	774.01	0.00

Stage-Discharge for Pond SADS: South ADS MC-3500

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
774.00	0.00	775.04	2.12	776.08	4.38	777.12	6.01
774.02	0.00	775.06	2.18	776.10	4.42	777.14	6.04
774.04	0.00	775.08	2.23	776.12	4.45	777.16	6.06
774.06	0.01	775.10	2.28	776.14	4.49	777.18	6.09
774.08	0.01	775.12	2.33	776.16	4.53	777.20	6.12
774.10	0.02	775.14	2.38	776.18	4.56	777.22	6.14
774.12	0.04	775.16	2.43	776.20	4.60	777.24	6.17
774.14	0.05	775.18	2.48	776.22	4.63	777.26	6.20
774.16	0.06	775.20	2.52	776.24	4.67	777.28	6.22
774.18	0.08	775.22	2.56	776.26	4.70	777.30	6.25
774.20	0.10	775.24	2.60	776.28	4.74	777.32	6.27
774.22	0.12	775.26	2.63	776.30	4.77	777.34	6.30
774.24	0.15	775.28	2.66	776.32	4.81	777.36	6.33
774.26	0.17	775.30	2.68	776.34	4.84	777.38	6.35
774.28	0.20	775.32	2.68	776.36	4.87	777.40	6.38
774.30	0.23	775.34	2.68	776.38	4.91	777.42	6.40
774.32	0.26	775.36	2.74	776.40	4.94	777.44	6.43
774.34	0.30	775.38	2.79	776.42	4.97	777.46	6.45
774.36	0.33	775.40	2.85	776.44	5.01	777.48	6.48
774.38	0.37	775.42	2.91	776.46	5.04	777.50	6.50
774.40	0.41	775.44	2.96	776.48	5.07	777.52	6.53
774.42	0.45	775.46	3.02	776.50	5.10	777.54	6.55
774.44	0.49	775.48	3.07	776.52	5.13	777.56	6.58
774.46	0.53	775.50	3.12	776.54	5.17	777.58	6.60
774.48	0.57	775.52	3.18	776.56	5.20	777.60	6.63
774.50	0.62	775.54	3.23	776.58	5.23	777.62	6.65
774.52	0.67	775.56	3.28	776.60	5.26	777.64	6.68
774.54	0.71	775.58	3.33	776.62	5.29	777.66	6.70
774.56	0.76	775.60	3.37	776.64	5.32	777.68	6.72
774.58	0.81	775.62	3.42	776.66	5.35	777.70	6.75
774.60	0.86	775.64	3.47	776.68	5.38	777.72	6.77
774.62	0.92	775.66	3.52	776.70	5.41	777.74	**6.80**
774.64	0.97	775.68	3.56	776.72	5.44		
774.66	1.02	775.70	3.61	776.74	5.47		
774.68	1.08	775.72	3.65	776.76	5.50		
774.70	1.13	775.74	3.70	776.78	5.53		
774.72	1.19	775.76	3.74	776.80	5.56		
774.74	1.25	775.78	3.78	776.82	5.59		
774.76	1.30	775.80	3.83	776.84	5.62		
774.78	1.36	775.82	3.87	776.86	5.65		
774.80	1.42	775.84	3.91	776.88	5.68		
774.82	1.48	775.86	3.95	776.90	5.70		
774.84	1.54	775.88	3.99	776.92	5.73		
774.86	1.60	775.90	4.03	776.94	5.76		
774.88	1.66	775.92	4.07	776.96	5.79		
774.90	1.72	775.94	4.11	776.98	5.82		
774.92	1.77	775.96	4.15	777.00	5.84		
774.94	1.83	775.98	4.19	777.02	5.87		
774.96	1.89	776.00	4.23	777.04	5.90		
774.98	1.95	776.02	4.27	777.06	5.93		
775.00	2.01	776.04	4.31	777.08	5.96		
775.02	2.06	776.06	4.34	777.10	5.98		

Stage-Area-Storage for Pond SADS: South ADS MC-3500

Elevation (feet)	Storage (acre-feet)
774.00	0.000
774.05	0.002
774.10	0.004
774.15	0.006
774.20	0.008
774.25	0.010
774.30	0.012
774.35	0.014
774.40	0.016
774.45	0.018
774.50	0.020
774.55	0.022
774.60	0.024
774.65	0.026
774.70	0.028
774.75	0.030
774.80	0.032
774.85	0.034
774.90	0.036
774.95	0.038
775.00	0.040
775.05	0.042
775.10	0.044
775.15	0.046
775.20	0.047
775.25	0.049
775.30	0.051
775.35	0.053
775.40	0.055
775.45	0.057
775.50	0.058
775.55	0.060
775.60	0.062
775.65	0.064
775.70	0.065
775.75	0.067
775.80	0.069
775.85	0.070
775.90	0.072
775.95	0.074
776.00	0.075
776.05	0.077
776.10	0.078
776.15	0.080
776.20	0.081
776.25	0.083
776.30	0.084
776.35	0.086
776.40	0.087
776.45	0.088
776.50	0.090
776.55	0.091
776.60	0.092
776.65	0.094
776.70	0.095
776.75	0.096
776.80	0.097
776.85	0.098
776.90	0.100
776.95	0.101
777.00	0.102
777.05	0.102
777.10	0.103
777.15	0.104
777.20	0.105
777.25	0.106
777.30	0.106
777.35	0.107
777.40	0.107
777.45	0.108
777.50	0.108
777.55	0.108
777.60	0.108
777.65	0.108
777.70	0.108
777.75	**0.108**

Summary for Pond SEP: SEPARATOR

Inflow Area = 1.280 ac, 99.06% Impervious, Inflow Depth = 4.04" for 10-yr event
Inflow = 6.89 cfs @ 12.17 hrs, Volume= 0.431 af
Outflow = 6.89 cfs @ 12.17 hrs, Volume= 0.431 af, Atten= 0%, Lag= 0.0 min
Primary = 4.16 cfs @ 12.17 hrs, Volume= 0.393 af
Routed to Pond SADS : South ADS MC-3500
Secondary = 2.73 cfs @ 12.17 hrs, Volume= 0.038 af
Routed to Pond NADS : North ADS MC-3500

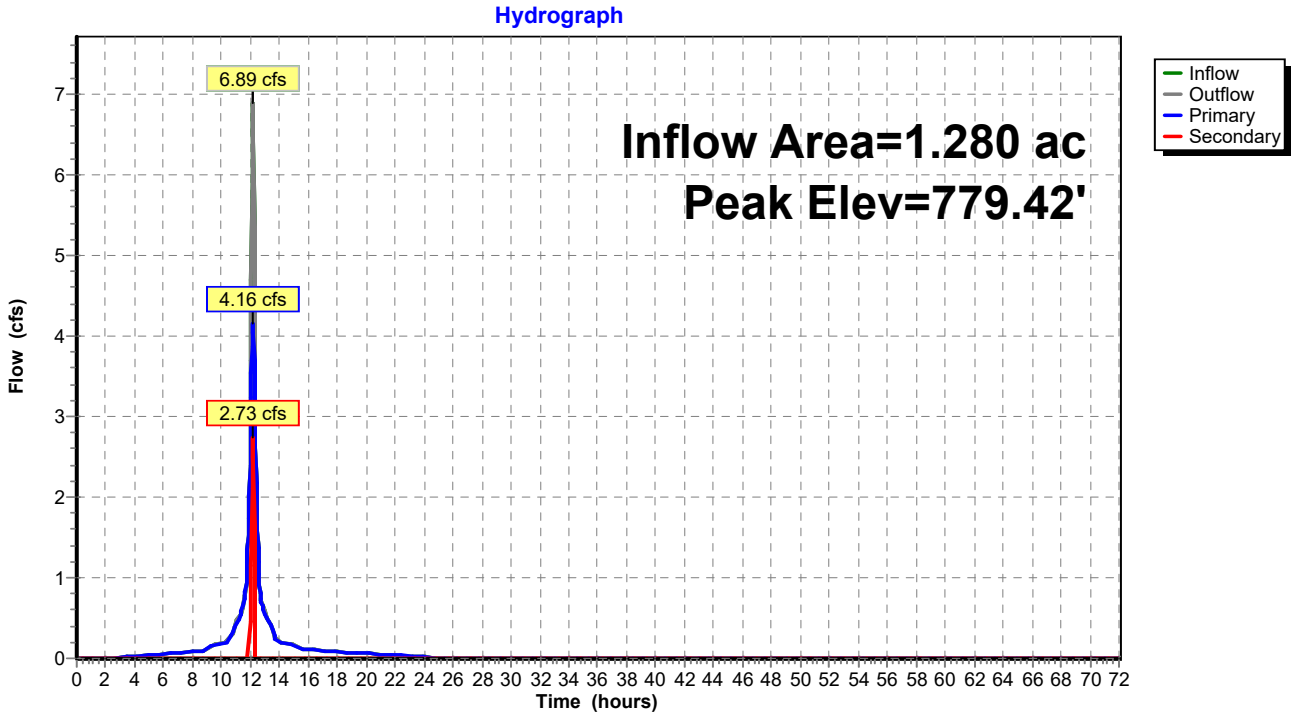
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs / 2
Peak Elev= 779.42' @ 12.17 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	776.50'	**10.0" Round SADS** L= 18.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 776.50' / 774.90' S= 0.0889 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.55 sf
#2	Secondary	778.00'	**12.0" Round NADS** L= 57.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 778.00' / 777.90' S= 0.0018 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=4.13 cfs @ 12.17 hrs HW=779.39' TW=775.38' (Dynamic Tailwater)
↑—**1=SADS** (Inlet Controls 4.13 cfs @ 7.57 fps)

Secondary OutFlow Max=2.62 cfs @ 12.17 hrs HW=779.38' TW=772.34' (Dynamic Tailwater)
↑—**2=NADS** (Barrel Controls 2.62 cfs @ 3.34 fps)

Pond SEP: SEPARATOR



Hydrograph for Pond SEP: SEPARATOR

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	776.50	0.00	0.00	0.00
2.00	0.00	776.50	0.00	0.00	0.00
4.00	0.02	776.58	0.02	0.02	0.00
6.00	0.05	776.62	0.05	0.05	0.00
8.00	0.08	776.65	0.08	0.08	0.00
10.00	0.18	776.72	0.18	0.18	0.00
12.00	**2.96**	**778.15**	**2.96**	**2.91**	**0.05**
14.00	**0.21**	**776.73**	**0.21**	**0.21**	**0.00**
16.00	0.10	776.66	0.10	0.10	0.00
18.00	0.08	776.64	0.08	0.08	0.00
20.00	0.06	776.62	0.06	0.06	0.00
22.00	0.04	776.60	0.04	0.04	0.00
24.00	0.02	776.56	0.02	0.02	0.00
26.00	0.00	776.50	0.00	0.00	0.00
28.00	0.00	776.50	0.00	0.00	0.00
30.00	0.00	776.50	0.00	0.00	0.00
32.00	0.00	776.50	0.00	0.00	0.00
34.00	0.00	776.50	0.00	0.00	0.00
36.00	0.00	776.50	0.00	0.00	0.00
38.00	0.00	776.50	0.00	0.00	0.00
40.00	0.00	776.50	0.00	0.00	0.00
42.00	0.00	776.50	0.00	0.00	0.00
44.00	0.00	776.50	0.00	0.00	0.00
46.00	0.00	776.50	0.00	0.00	0.00
48.00	0.00	776.50	0.00	0.00	0.00
50.00	0.00	776.50	0.00	0.00	0.00
52.00	0.00	776.50	0.00	0.00	0.00
54.00	0.00	776.50	0.00	0.00	0.00
56.00	0.00	776.50	0.00	0.00	0.00
58.00	0.00	776.50	0.00	0.00	0.00
60.00	0.00	776.50	0.00	0.00	0.00
62.00	0.00	776.50	0.00	0.00	0.00
64.00	0.00	776.50	0.00	0.00	0.00
66.00	0.00	776.50	0.00	0.00	0.00
68.00	0.00	776.50	0.00	0.00	0.00
70.00	0.00	776.50	0.00	0.00	0.00
72.00	0.00	776.50	0.00	0.00	0.00

Stage-Discharge for Pond SEP: SEPARATOR

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
776.50	0.00	0.00	0.00
776.55	0.01	0.01	0.00
776.60	0.04	0.04	0.00
776.65	0.09	0.09	0.00
776.70	0.15	0.15	0.00
776.75	0.23	0.23	0.00
776.80	0.33	0.33	0.00
776.85	0.44	0.44	0.00
776.90	0.56	0.56	0.00
776.95	0.69	0.69	0.00
777.00	0.82	0.82	0.00
777.05	0.96	0.96	0.00
777.10	1.11	1.11	0.00
777.15	1.25	1.25	0.00
777.20	1.39	1.39	0.00
777.25	1.52	1.52	0.00
777.30	1.64	1.64	0.00
777.35	1.73	1.73	0.00
777.40	1.83	1.83	0.00
777.45	1.92	1.92	0.00
777.50	2.01	2.01	0.00
777.55	2.09	2.09	0.00
777.60	2.17	2.17	0.00
777.65	2.25	2.25	0.00
777.70	2.32	2.32	0.00
777.75	2.40	2.40	0.00
777.80	2.47	2.47	0.00
777.85	2.54	2.54	0.00
777.90	2.60	2.60	0.00
777.95	2.67	2.67	0.00
778.00	2.73	2.73	0.00
778.05	2.80	2.80	0.00
778.10	2.88	2.86	0.02
778.15	2.97	2.92	0.05
778.20	3.07	2.98	0.09
778.25	3.18	3.03	0.15
778.30	3.30	3.09	0.21
778.35	3.43	3.14	0.29
778.40	3.57	3.20	0.37
778.45	3.72	3.25	0.47
778.50	3.88	3.30	0.57
778.55	4.04	3.36	0.69
778.60	4.21	3.41	0.81
778.65	4.39	3.46	0.93
778.70	4.57	3.51	1.06
778.75	4.75	3.56	1.20
778.80	4.94	3.60	1.34
778.85	5.13	3.65	1.48
778.90	5.32	3.70	1.62
778.95	5.50	3.74	1.76
779.00	5.69	3.79	1.90
779.05	5.87	3.84	2.03
779.10	6.04	3.88	2.16
779.15	6.20	3.92	2.28
779.20	6.35	3.97	2.38
779.25	6.48	4.01	2.47
779.30	6.58	4.05	2.52
779.35	6.63	4.10	2.54
779.40	**6.81**	**4.14**	**2.67**

Stage-Area-Storage for Pond SEP: SEPARATOR

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
776.50	**0.000**	777.54	0.000	778.58	0.000
776.52	0.000	777.56	0.000	778.60	0.000
776.54	0.000	777.58	0.000	778.62	0.000
776.56	0.000	777.60	0.000	778.64	0.000
776.58	0.000	777.62	0.000	778.66	0.000
776.60	0.000	777.64	0.000	778.68	0.000
776.62	0.000	777.66	0.000	778.70	0.000
776.64	0.000	777.68	0.000	778.72	0.000
776.66	0.000	777.70	0.000	778.74	0.000
776.68	0.000	777.72	0.000	778.76	0.000
776.70	0.000	777.74	0.000	778.78	0.000
776.72	0.000	777.76	0.000	778.80	0.000
776.74	0.000	777.78	0.000	778.82	0.000
776.76	0.000	777.80	0.000	778.84	0.000
776.78	0.000	777.82	0.000	778.86	0.000
776.80	0.000	777.84	0.000	778.88	0.000
776.82	0.000	777.86	0.000	778.90	0.000
776.84	0.000	777.88	0.000	778.92	0.000
776.86	0.000	777.90	0.000	778.94	0.000
776.88	0.000	777.92	0.000	778.96	0.000
776.90	0.000	777.94	0.000	778.98	0.000
776.92	0.000	777.96	0.000	779.00	0.000
776.94	0.000	777.98	0.000	779.02	0.000
776.96	0.000	778.00	0.000	779.04	0.000
776.98	0.000	778.02	0.000	779.06	0.000
777.00	0.000	778.04	0.000	779.08	0.000
777.02	0.000	778.06	0.000	779.10	0.000
777.04	0.000	778.08	0.000	779.12	0.000
777.06	0.000	778.10	0.000	779.14	0.000
777.08	0.000	778.12	0.000	779.16	0.000
777.10	0.000	778.14	0.000	779.18	0.000
777.12	0.000	778.16	0.000	779.20	0.000
777.14	0.000	778.18	0.000	779.22	0.000
777.16	0.000	778.20	0.000	779.24	0.000
777.18	0.000	778.22	0.000	779.26	0.000
777.20	0.000	778.24	0.000	779.28	0.000
777.22	0.000	778.26	0.000	779.30	0.000
777.24	0.000	778.28	0.000	779.32	0.000
777.26	0.000	778.30	0.000	779.34	0.000
777.28	0.000	778.32	0.000	779.36	0.000
777.30	0.000	778.34	0.000	779.38	0.000
777.32	0.000	778.36	0.000	779.40	0.000
777.34	0.000	778.38	0.000	779.42	0.000
777.36	0.000	778.40	0.000		
777.38	0.000	778.42	0.000		
777.40	0.000	778.44	0.000		
777.42	0.000	778.46	0.000		
777.44	0.000	778.48	0.000		
777.46	0.000	778.50	0.000		
777.48	0.000	778.52	0.000		
777.50	0.000	778.54	0.000		
777.52	0.000	778.56	0.000		

Summary for Pond SOCS: South OCS

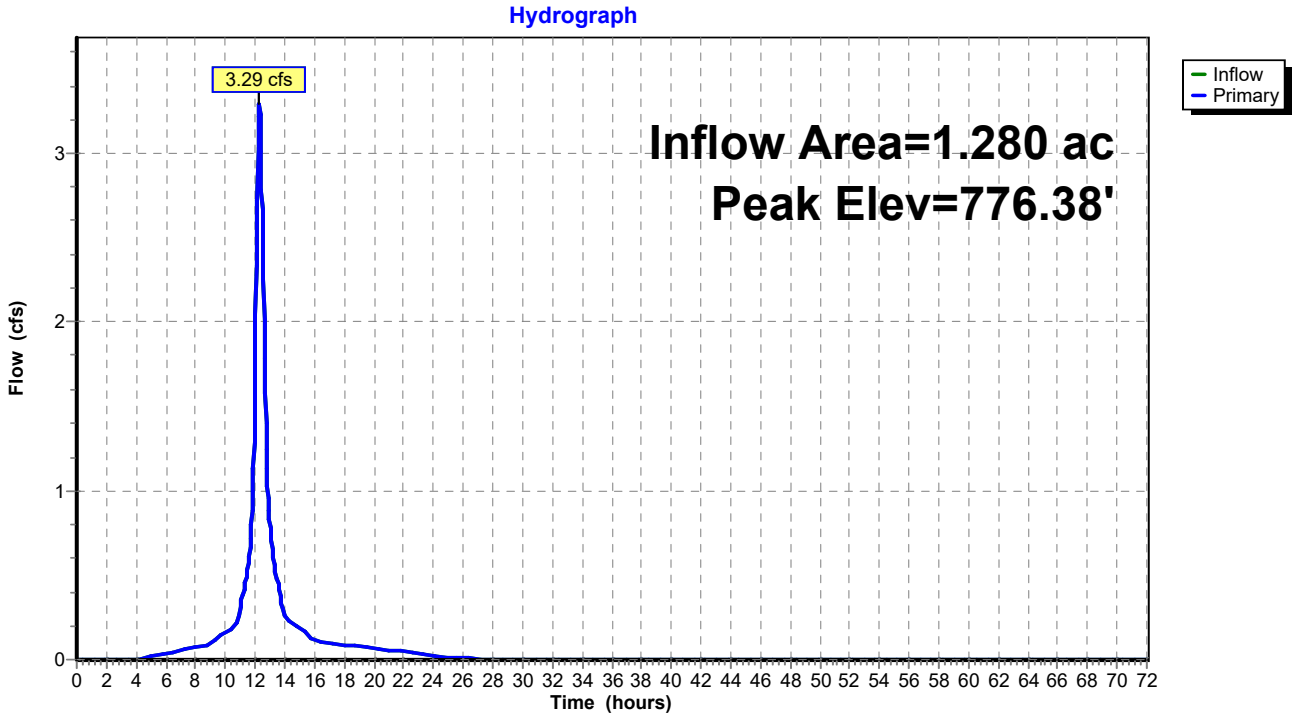
Inflow Area = 1.280 ac, 99.06% Impervious, Inflow Depth = 3.69" for 10-yr event
Inflow = 3.29 cfs @ 12.29 hrs, Volume= 0.393 af
Outflow = 3.29 cfs @ 12.29 hrs, Volume= 0.393 af, Atten= 0%, Lag= 0.0 min
Primary = 3.29 cfs @ 12.29 hrs, Volume= 0.393 af
Routed to Reach S FLOWS : 15-in RCP

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs / 2
Peak Elev= 776.38' @ 12.29 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	776.00'	**OCS Weir, Cv= 2.62 (C= 3.28)** Head (feet) 2.30 6.80 Width (feet) 4.00 4.00
#2	Primary	773.80'	**2.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=3.27 cfs @ 12.29 hrs HW=776.38' TW=774.21' (Dynamic Tailwater)
1=OCS Weir (Weir Controls 3.11 cfs @ 2.03 fps)
2=Orifice/Grate (Orifice Controls 0.15 cfs @ 7.09 fps)

Pond SOCS: South OCS



Hydrograph for Pond SOCS: South OCS

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	773.80	0.00
0.80	0.00	773.80	0.00
1.60	0.00	773.80	0.00
2.40	0.00	773.80	0.00
3.20	0.00	773.81	0.00
4.00	0.00	773.84	0.00
4.80	0.01	773.89	0.01
5.60	0.03	773.96	0.03
6.40	0.02	773.93	0.02
7.20	0.07	774.27	0.07
8.00	0.08	774.41	0.08
8.80	0.09	774.58	0.09
9.60	0.14	775.62	0.14
10.40	0.18	776.02	0.18
11.20	0.39	776.07	0.39
12.00	**1.75**	**776.25**	**1.75**
12.80	**1.13**	**776.18**	**1.13**
13.60	0.42	776.07	0.42
14.40	0.22	776.03	0.22
15.20	0.18	776.01	0.18
16.00	0.12	775.11	0.12
16.80	0.10	774.80	0.10
17.60	0.09	774.63	0.09
18.40	0.08	774.50	0.08
19.20	0.07	774.38	0.07
20.00	0.07	774.27	0.07
20.80	0.06	774.18	0.06
21.60	0.05	774.10	0.05
22.40	0.04	774.03	0.04
23.20	0.03	773.98	0.03
24.00	0.03	773.94	0.03
24.80	0.01	773.89	0.01
25.60	0.01	773.87	0.01
26.40	0.01	773.86	0.01
27.20	0.00	773.85	0.00
28.00	0.00	773.84	0.00
28.80	0.00	773.84	0.00
29.60	0.00	773.83	0.00
30.40	0.00	773.83	0.00
31.20	0.00	773.83	0.00
32.00	0.00	773.82	0.00
32.80	0.00	773.82	0.00
33.60	0.00	773.82	0.00
34.40	0.00	773.82	0.00
35.20	0.00	773.82	0.00
36.00	0.00	773.82	0.00
36.80	0.00	773.82	0.00
37.60	0.00	773.82	0.00
38.40	0.00	773.81	0.00
39.20	0.00	773.81	0.00
40.00	0.00	773.81	0.00
40.80	0.00	773.81	0.00
41.60	0.00	773.81	0.00
42.40	0.00	773.81	0.00
43.20	0.00	773.81	0.00
44.00	0.00	773.81	0.00
44.80	0.00	773.81	0.00
45.60	0.00	773.81	0.00
46.40	0.00	773.81	0.00
47.20	0.00	773.81	0.00
48.00	0.00	773.81	0.00
48.80	0.00	773.81	0.00
49.60	0.00	773.81	0.00
50.40	0.00	773.81	0.00
51.20	0.00	773.81	0.00
52.00	0.00	773.81	0.00
52.80	0.00	773.81	0.00
53.60	0.00	773.81	0.00
54.40	0.00	773.81	0.00
55.20	0.00	773.81	0.00
56.00	0.00	773.81	0.00
56.80	0.00	773.81	0.00
57.60	0.00	773.81	0.00
58.40	0.00	773.81	0.00
59.20	0.00	773.81	0.00
60.00	0.00	773.81	0.00
60.80	0.00	773.81	0.00
61.60	0.00	773.81	0.00
62.40	0.00	773.81	0.00
63.20	0.00	773.81	0.00
64.00	0.00	773.81	0.00
64.80	0.00	773.81	0.00
65.60	0.00	773.81	0.00
66.40	0.00	773.81	0.00
67.20	0.00	773.81	0.00
68.00	0.00	773.81	0.00
68.80	0.00	773.81	0.00
69.60	0.00	773.81	0.00
70.40	0.00	773.81	0.00
71.20	0.00	773.81	0.00
72.00	0.00	773.81	0.00

Stage-Discharge for Pond SOCS: South OCS

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
773.80	0.00	776.40	3.48	779.00	68.31
773.85	0.00	776.45	4.12	779.05	70.02
773.90	0.01	776.50	4.80	779.10	71.74
773.95	0.03	776.55	5.51	779.15	73.48
774.00	0.04	776.60	6.26	779.20	75.23
774.05	0.04	776.65	7.04	779.25	77.00
774.10	0.05	776.70	7.85	779.30	78.78
774.15	0.05	776.75	8.69	779.35	80.57
774.20	0.06	776.80	9.55	779.40	82.37
774.25	0.06	776.85	10.45	779.45	84.19
774.30	0.07	776.90	11.37	779.50	86.03
774.35	0.07	776.95	12.31	779.55	87.87
774.40	0.08	777.00	13.29	779.60	89.73
774.45	0.08	777.05	14.28	779.65	91.60
774.50	0.08	777.10	15.30	779.70	93.49
774.55	0.09	777.15	16.35	779.75	95.38
774.60	0.09	777.20	17.41	779.80	97.29
774.65	0.09	777.25	18.50	779.85	99.22
774.70	0.09	777.30	19.61	779.90	101.15
774.75	0.10	777.35	20.74	779.95	103.10
774.80	0.10	777.40	21.90	780.00	105.06
774.85	0.10	777.45	23.07	780.05	107.03
774.90	0.11	777.50	24.27	780.10	109.02
774.95	0.11	777.55	25.48	780.15	111.01
775.00	0.11	777.60	26.72	780.20	113.02
775.05	0.11	777.65	27.97	780.25	115.04
775.10	0.12	777.70	29.24	780.30	117.07
775.15	0.12	777.75	30.53	780.35	119.12
775.20	0.12	777.80	31.84	780.40	121.17
775.25	0.12	777.85	33.17	780.45	123.24
775.30	0.13	777.90	34.52	780.50	**125.32**
775.35	0.13	777.95	35.88		
775.40	0.13	778.00	37.27		
775.45	0.13	778.05	38.66		
775.50	0.13	778.10	40.08		
775.55	0.14	778.15	41.51		
775.60	0.14	778.20	42.97		
775.65	0.14	778.25	44.43		
775.70	0.14	778.30	45.92		
775.75	0.14	778.35	47.41		
775.80	0.15	778.40	48.93		
775.85	0.15	778.45	50.46		
775.90	0.15	778.50	52.01		
775.95	0.15	778.55	53.57		
776.00	0.15	778.60	55.15		
776.05	0.30	778.65	56.74		
776.10	0.57	778.70	58.35		
776.15	0.92	778.75	59.97		
776.20	1.33	778.80	61.61		
776.25	1.80	778.85	63.26		
776.30	2.32	778.90	64.93		
776.35	2.88	778.95	66.61		

Stage-Area-Storage for Pond SOCS: South OCS

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
773.80	**0.000**	776.40	0.000	779.00	0.000
773.85	0.000	776.45	0.000	779.05	0.000
773.90	0.000	776.50	0.000	779.10	0.000
773.95	0.000	776.55	0.000	779.15	0.000
774.00	0.000	776.60	0.000	779.20	0.000
774.05	0.000	776.65	0.000	779.25	0.000
774.10	0.000	776.70	0.000	779.30	0.000
774.15	0.000	776.75	0.000	779.35	0.000
774.20	0.000	776.80	0.000	779.40	0.000
774.25	0.000	776.85	0.000	779.45	0.000
774.30	0.000	776.90	0.000	779.50	0.000
774.35	0.000	776.95	0.000	779.55	0.000
774.40	0.000	777.00	0.000	779.60	0.000
774.45	0.000	777.05	0.000	779.65	0.000
774.50	0.000	777.10	0.000	779.70	0.000
774.55	0.000	777.15	0.000	779.75	0.000
774.60	0.000	777.20	0.000	779.80	0.000
774.65	0.000	777.25	0.000	779.85	0.000
774.70	0.000	777.30	0.000	779.90	0.000
774.75	0.000	777.35	0.000	779.95	0.000
774.80	0.000	777.40	0.000	780.00	0.000
774.85	0.000	777.45	0.000	780.05	0.000
774.90	0.000	777.50	0.000	780.10	0.000
774.95	0.000	777.55	0.000	780.15	0.000
775.00	0.000	777.60	0.000	780.20	0.000
775.05	0.000	777.65	0.000	780.25	0.000
775.10	0.000	777.70	0.000	780.30	0.000
775.15	0.000	777.75	0.000	780.35	0.000
775.20	0.000	777.80	0.000	780.40	0.000
775.25	0.000	777.85	0.000	780.45	0.000
775.30	0.000	777.90	0.000	780.50	0.000
775.35	0.000	777.95	0.000		
775.40	0.000	778.00	0.000		
775.45	0.000	778.05	0.000		
775.50	0.000	778.10	0.000		
775.55	0.000	778.15	0.000		
775.60	0.000	778.20	0.000		
775.65	0.000	778.25	0.000		
775.70	0.000	778.30	0.000		
775.75	0.000	778.35	0.000		
775.80	0.000	778.40	0.000		
775.85	0.000	778.45	0.000		
775.90	0.000	778.50	0.000		
775.95	0.000	778.55	0.000		
776.00	0.000	778.60	0.000		
776.05	0.000	778.65	0.000		
776.10	0.000	778.70	0.000		
776.15	0.000	778.75	0.000		
776.20	0.000	778.80	0.000		
776.25	0.000	778.85	0.000		
776.30	0.000	778.90	0.000		
776.35	0.000	778.95	0.000		

Time span=0.00-72.00 hrs, dt=0.04 hrs, 1801 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentDA1: SW Half Parking Lot & Runoff Area=1.280 ac 99.06% Impervious Runoff Depth=8.32"
Tc=10.0 min CN=98 Runoff=6.94 cfs 0.887 af

SubcatchmentDA2: Central Parking Lot Runoff Area=0.058 ac 100.00% Impervious Runoff Depth=8.32"
Tc=10.0 min CN=98 Runoff=0.31 cfs 0.040 af

SubcatchmentDA3: Parking Ramp Runoff Area=29,103 sf 100.00% Impervious Runoff Depth=8.32"
Tc=10.0 min CN=98 Runoff=3.62 cfs 0.463 af

SubcatchmentDA4: North half of Parking Runoff Area=0.307 ac 96.74% Impervious Runoff Depth=8.20"
Tc=10.0 min CN=97 Runoff=1.66 cfs 0.210 af

SubcatchmentDA5: N and W Edges Runoff Area=0.300 ac 76.33% Impervious Runoff Depth=7.84"
Tc=10.0 min CN=94 Runoff=1.61 cfs 0.196 af

Reach 5.1: 12-in Catch Basin Avg. Flow Depth=0.52' Max Vel=3.90 fps Inflow=1.61 cfs 0.196 af
12.0" Round Pipe n=0.015 L=46.1' S=0.0095 '/' Capacity=3.02 cfs Outflow=1.61 cfs 0.196 af

Reach N FLOWS: 108-in RCP Avg. Flow Depth=1.83' Max Vel=0.47 fps Inflow=6.62 cfs 0.985 af
108.0" Round Pipe n=0.015 L=512.0' S=0.0000 '/' Capacity=47.83 cfs Outflow=4.35 cfs 0.985 af

Reach S FLOWS: 15-in RCP Avg. Flow Depth=0.41' Max Vel=9.29 fps Inflow=3.30 cfs 0.810 af
15.0" Round Pipe n=0.015 L=27.5' S=0.0618 '/' Capacity=13.92 cfs Outflow=3.30 cfs 0.810 af

Pond NADS: North ADS MC-3500 Peak Elev=772.58' Storage=0.100 af Inflow=8.37 cfs 0.790 af
18.0" Round Culvert n=0.013 L=216.0' S=0.0050 '/' Outflow=5.38 cfs 0.789 af

Pond SADS: South ADS MC-3500 Peak Elev=775.57' Storage=0.061 af Inflow=4.17 cfs 0.810 af
12.0" Round Culvert n=0.013 L=30.0' S=0.0033 '/' Outflow=3.30 cfs 0.810 af

Pond SEP: SEPARATOR Peak Elev=779.44' Inflow=6.94 cfs 0.887 af
Primary=4.17 cfs 0.810 af Secondary=2.77 cfs 0.077 af Outflow=6.94 cfs 0.887 af

Pond SOCS: South OCS Peak Elev=776.39' Inflow=3.30 cfs 0.810 af
Outflow=3.30 cfs 0.810 af

Summary for Subcatchment DA1: SW Half Parking Lot & Residential Building

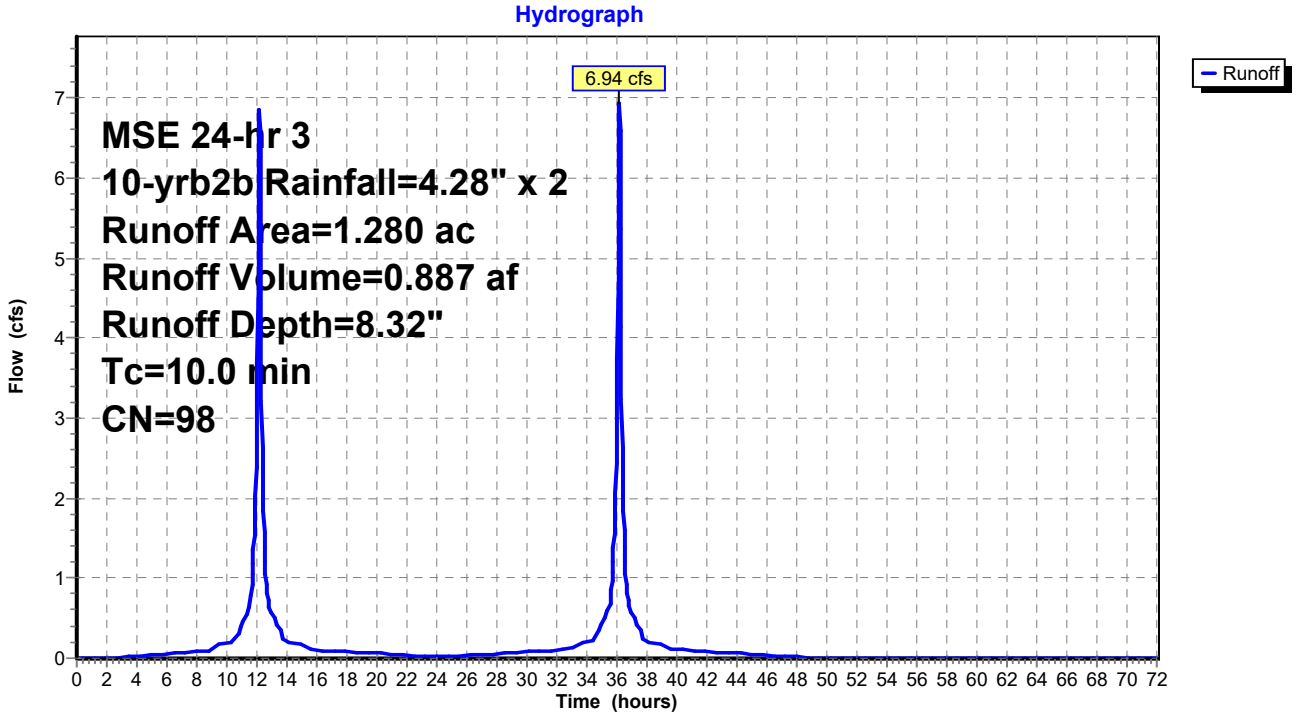
Runoff = 6.94 cfs @ 36.17 hrs, Volume= 0.887 af, Depth= 8.32"
Routed to Pond SEP : SEPARATOR

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs
MSE 24-hr 3 10-yrb2b Rainfall=4.28" x 2

Area (ac)	CN	Description
1.268	98	Paved parking, HSG D
0.012	80	>75% Grass cover, Good, HSG D
1.280	98	Weighted Average
0.012		0.94% Pervious Area
1.268		99.06% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, 10 min Minimum**

Subcatchment DA1: SW Half Parking Lot & Residential Building



Hydrograph for Subcatchment DA1: SW Half Parking Lot & Residential Building

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.80	0.01	0.00	0.00
1.60	0.03	0.00	0.00
2.40	0.05	0.00	0.00
3.20	0.08	0.01	0.01
4.00	0.11	0.02	0.02
4.80	0.15	0.04	0.04
5.60	0.19	0.07	0.05
6.40	0.24	0.10	0.06
7.20	0.30	0.14	0.07
8.00	0.36	0.19	0.08
8.80	0.42	0.25	0.09
9.60	0.53	0.34	0.17
10.40	0.65	0.46	0.20
11.20	0.91	0.70	0.50
12.00	1.98	1.76	2.96
12.80	3.37	3.14	0.67
13.60	3.63	3.39	0.30
14.40	3.75	3.52	0.20
15.20	3.86	3.62	0.13
16.00	3.92	3.69	0.10
16.80	3.98	3.75	0.09
17.60	4.04	3.80	0.09
18.40	4.09	3.85	0.08
19.20	4.13	3.89	0.07
20.00	4.17	3.93	0.06
20.80	4.20	3.97	0.05
21.60	4.23	3.99	0.04
22.40	4.25	4.02	0.03
23.20	4.27	4.03	0.02
24.00	4.28	4.04	0.02
24.80	4.29	4.06	0.02
25.60	4.31	4.07	0.03
26.40	4.33	4.10	0.04
27.20	4.36	4.12	0.05
28.00	4.39	4.16	0.06
28.80	4.43	4.19	0.06
29.60	4.47	4.24	0.07
30.40	4.52	4.29	0.08
31.20	4.58	4.34	0.09
32.00	4.64	4.40	0.10
32.80	4.70	4.47	0.11
33.60	4.81	4.57	0.19
34.40	4.93	4.70	0.21
35.20	5.19	4.95	0.52
36.00	6.26	6.02	**3.00**
36.80	7.65	7.41	**0.67**
37.60	7.91	7.67	0.31
38.40	8.03	7.79	0.20
39.20	8.14	7.90	0.13
40.00	8.20	7.96	0.10
40.80	8.26	8.02	0.09
41.60	8.32	8.08	0.09
42.40	8.37	8.13	0.08
43.20	8.41	8.17	0.07
44.00	8.45	8.21	0.06
44.80	8.48	8.24	0.05
45.60	8.51	8.27	0.04
46.40	8.53	8.29	0.03
47.20	8.55	8.31	0.02
48.00	**8.56**	**8.32**	0.02
48.80	8.56	8.32	0.00
49.60	8.56	8.32	0.00
50.40	8.56	8.32	0.00
51.20	8.56	8.32	0.00
52.00	8.56	8.32	0.00
52.80	8.56	8.32	0.00
53.60	8.56	8.32	0.00
54.40	8.56	8.32	0.00
55.20	8.56	8.32	0.00
56.00	8.56	8.32	0.00
56.80	8.56	8.32	0.00
57.60	8.56	8.32	0.00
58.40	8.56	8.32	0.00
59.20	8.56	8.32	0.00
60.00	8.56	8.32	0.00
60.80	8.56	8.32	0.00
61.60	8.56	8.32	0.00
62.40	8.56	8.32	0.00
63.20	8.56	8.32	0.00
64.00	8.56	8.32	0.00
64.80	8.56	8.32	0.00
65.60	8.56	8.32	0.00
66.40	8.56	8.32	0.00
67.20	8.56	8.32	0.00
68.00	8.56	8.32	0.00
68.80	8.56	8.32	0.00
69.60	8.56	8.32	0.00
70.40	8.56	8.32	0.00
71.20	8.56	8.32	0.00
72.00	8.56	8.32	0.00

Summary for Subcatchment DA2: Central Parking Lot

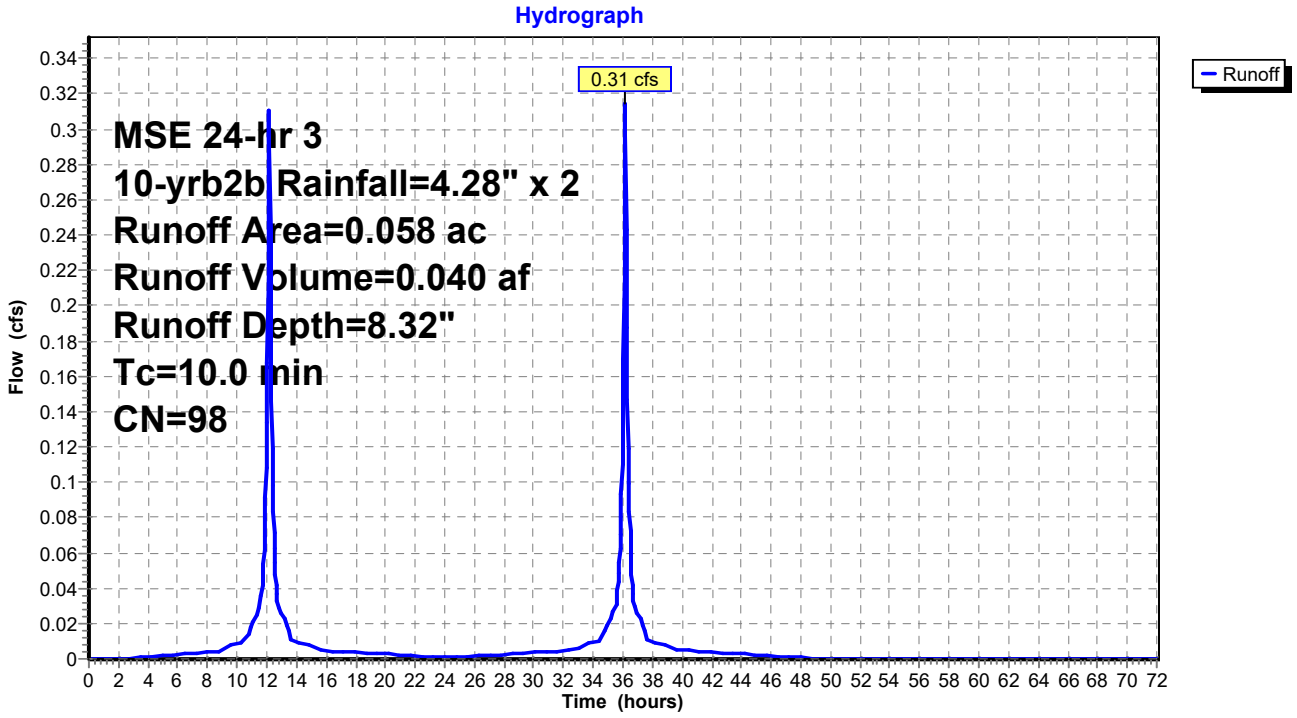
Runoff = 0.31 cfs @ 36.17 hrs, Volume= 0.040 af, Depth= 8.32"
Routed to Pond NADS : North ADS MC-3500

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs
MSE 24-hr 3 10-yrb2b Rainfall=4.28" x 2

	Area (ac)	CN	Description
*	0.058	98	Paved Surfaces
	0.058		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, minimum**

Subcatchment DA2: Central Parking Lot



Hydrograph for Subcatchment DA2: Central Parking Lot

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.80	0.01	0.00	0.00
1.60	0.03	0.00	0.00
2.40	0.05	0.00	0.00
3.20	0.08	0.01	0.00
4.00	0.11	0.02	0.00
4.80	0.15	0.04	0.00
5.60	0.19	0.07	0.00
6.40	0.24	0.10	0.00
7.20	0.30	0.14	0.00
8.00	0.36	0.19	0.00
8.80	0.42	0.25	0.00
9.60	0.53	0.34	0.01
10.40	0.65	0.46	0.01
11.20	0.91	0.70	0.02
12.00	1.98	1.76	0.13
12.80	3.37	3.14	0.03
13.60	3.63	3.39	0.01
14.40	3.75	3.52	0.01
15.20	3.86	3.62	0.01
16.00	3.92	3.69	0.00
16.80	3.98	3.75	0.00
17.60	4.04	3.80	0.00
18.40	4.09	3.85	0.00
19.20	4.13	3.89	0.00
20.00	4.17	3.93	0.00
20.80	4.20	3.97	0.00
21.60	4.23	3.99	0.00
22.40	4.25	4.02	0.00
23.20	4.27	4.03	0.00
24.00	4.28	4.04	0.00
24.80	4.29	4.06	0.00
25.60	4.31	4.07	0.00
26.40	4.33	4.10	0.00
27.20	4.36	4.12	0.00
28.00	4.39	4.16	0.00
28.80	4.43	4.19	0.00
29.60	4.47	4.24	0.00
30.40	4.52	4.29	0.00
31.20	4.58	4.34	0.00
32.00	4.64	4.40	0.00
32.80	4.70	4.47	0.00
33.60	4.81	4.57	0.01
34.40	4.93	4.70	0.01
35.20	5.19	4.95	0.02
36.00	6.26	6.02	**0.14**
36.80	7.65	7.41	**0.03**
37.60	7.91	7.67	0.01
38.40	8.03	7.79	0.01
39.20	8.14	7.90	0.01
40.00	8.20	7.96	0.00
40.80	8.26	8.02	0.00
41.60	8.32	8.08	0.00
42.40	8.37	8.13	0.00
43.20	8.41	8.17	0.00
44.00	8.45	8.21	0.00
44.80	8.48	8.24	0.00
45.60	8.51	8.27	0.00
46.40	8.53	8.29	0.00
47.20	8.55	8.31	0.00
48.00	**8.56**	**8.32**	0.00
48.80	8.56	8.32	0.00
49.60	8.56	8.32	0.00
50.40	8.56	8.32	0.00
51.20	8.56	8.32	0.00
52.00	8.56	8.32	0.00
52.80	8.56	8.32	0.00
53.60	8.56	8.32	0.00
54.40	8.56	8.32	0.00
55.20	8.56	8.32	0.00
56.00	8.56	8.32	0.00
56.80	8.56	8.32	0.00
57.60	8.56	8.32	0.00
58.40	8.56	8.32	0.00
59.20	8.56	8.32	0.00
60.00	8.56	8.32	0.00
60.80	8.56	8.32	0.00
61.60	8.56	8.32	0.00
62.40	8.56	8.32	0.00
63.20	8.56	8.32	0.00
64.00	8.56	8.32	0.00
64.80	8.56	8.32	0.00
65.60	8.56	8.32	0.00
66.40	8.56	8.32	0.00
67.20	8.56	8.32	0.00
68.00	8.56	8.32	0.00
68.80	8.56	8.32	0.00
69.60	8.56	8.32	0.00
70.40	8.56	8.32	0.00
71.20	8.56	8.32	0.00
72.00	8.56	8.32	0.00

Summary for Subcatchment DA3: Parking Ramp

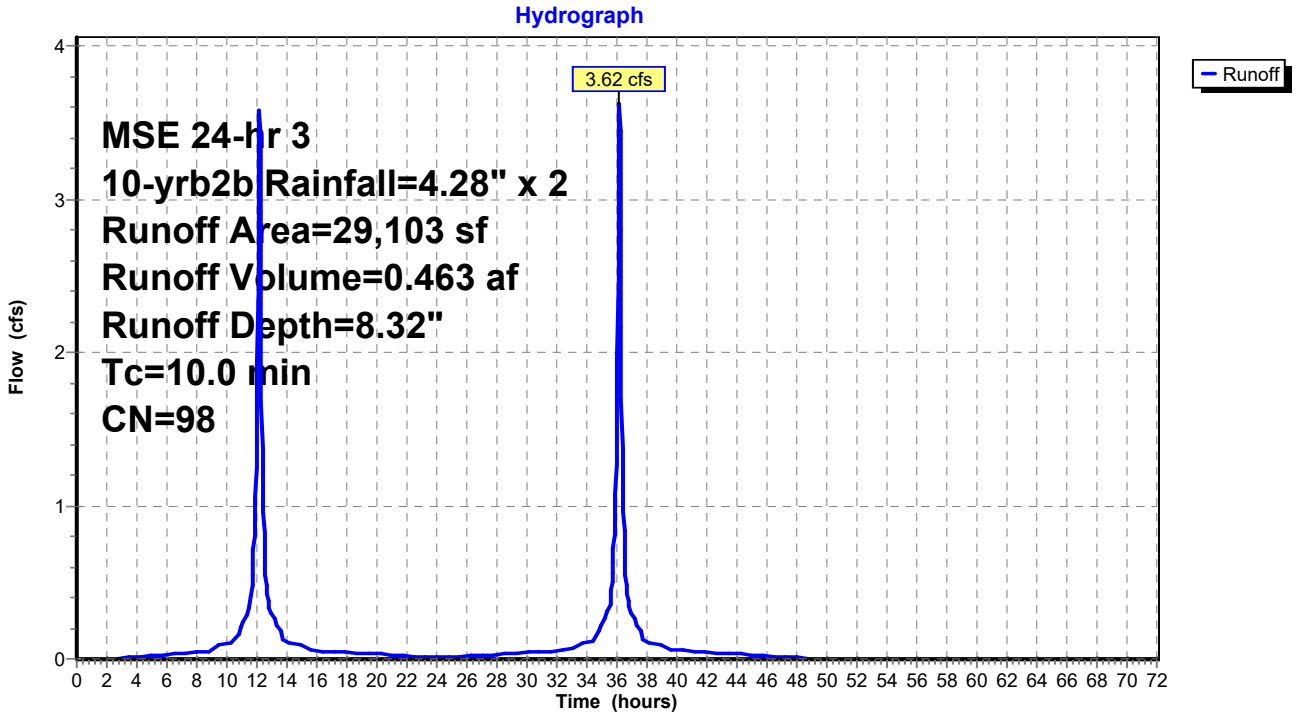
Runoff = 3.62 cfs @ 36.17 hrs, Volume= 0.463 af, Depth= 8.32"
Routed to Pond NADS : North ADS MC-3500

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs
MSE 24-hr 3 10-yrb2b Rainfall=4.28" x 2

	Area (sf)	CN	Description
*	29,103	98	Paved Parking Ramp
	29,103		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, Minimum**

Subcatchment DA3: Parking Ramp



Hydrograph for Subcatchment DA3: Parking Ramp

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.80	0.01	0.00	0.00
1.60	0.03	0.00	0.00
2.40	0.05	0.00	0.00
3.20	0.08	0.01	0.01
4.00	0.11	0.02	0.01
4.80	0.15	0.04	0.02
5.60	0.19	0.07	0.03
6.40	0.24	0.10	0.03
7.20	0.30	0.14	0.04
8.00	0.36	0.19	0.04
8.80	0.42	0.25	0.05
9.60	0.53	0.34	0.09
10.40	0.65	0.46	0.10
11.20	0.91	0.70	0.26
12.00	1.98	1.76	1.54
12.80	3.37	3.14	0.35
13.60	3.63	3.39	0.16
14.40	3.75	3.52	0.10
15.20	3.86	3.62	0.07
16.00	3.92	3.69	0.05
16.80	3.98	3.75	0.05
17.60	4.04	3.80	0.04
18.40	4.09	3.85	0.04
19.20	4.13	3.89	0.04
20.00	4.17	3.93	0.03
20.80	4.20	3.97	0.03
21.60	4.23	3.99	0.02
22.40	4.25	4.02	0.02
23.20	4.27	4.03	0.01
24.00	4.28	4.04	0.01
24.80	4.29	4.06	0.01
25.60	4.31	4.07	0.02
26.40	4.33	4.10	0.02
27.20	4.36	4.12	0.02
28.00	4.39	4.16	0.03
28.80	4.43	4.19	0.03
29.60	4.47	4.24	0.04
30.40	4.52	4.29	0.04
31.20	4.58	4.34	0.05
32.00	4.64	4.40	0.05
32.80	4.70	4.47	0.06
33.60	4.81	4.57	0.10
34.40	4.93	4.70	0.11
35.20	5.19	4.95	0.27
36.00	6.26	6.02	**1.57**
36.80	7.65	7.41	**0.35**
37.60	7.91	7.67	0.16
38.40	8.03	7.79	0.10
39.20	8.14	7.90	0.07
40.00	8.20	7.96	0.05
40.80	8.26	8.02	0.05
41.60	8.32	8.08	0.04
42.40	8.37	8.13	0.04
43.20	8.41	8.17	0.04
44.00	8.45	8.21	0.03
44.80	8.48	8.24	0.03
45.60	8.51	8.27	0.02
46.40	8.53	8.29	0.02
47.20	8.55	8.31	0.01
48.00	**8.56**	**8.32**	0.01
48.80	8.56	8.32	0.00
49.60	8.56	8.32	0.00
50.40	8.56	8.32	0.00
51.20	8.56	8.32	0.00
52.00	8.56	8.32	0.00
52.80	8.56	8.32	0.00
53.60	8.56	8.32	0.00
54.40	8.56	8.32	0.00
55.20	8.56	8.32	0.00
56.00	8.56	8.32	0.00
56.80	8.56	8.32	0.00
57.60	8.56	8.32	0.00
58.40	8.56	8.32	0.00
59.20	8.56	8.32	0.00
60.00	8.56	8.32	0.00
60.80	8.56	8.32	0.00
61.60	8.56	8.32	0.00
62.40	8.56	8.32	0.00
63.20	8.56	8.32	0.00
64.00	8.56	8.32	0.00
64.80	8.56	8.32	0.00
65.60	8.56	8.32	0.00
66.40	8.56	8.32	0.00
67.20	8.56	8.32	0.00
68.00	8.56	8.32	0.00
68.80	8.56	8.32	0.00
69.60	8.56	8.32	0.00
70.40	8.56	8.32	0.00
71.20	8.56	8.32	0.00
72.00	8.56	8.32	0.00

Summary for Subcatchment DA4: North half of Parking and Office Tower

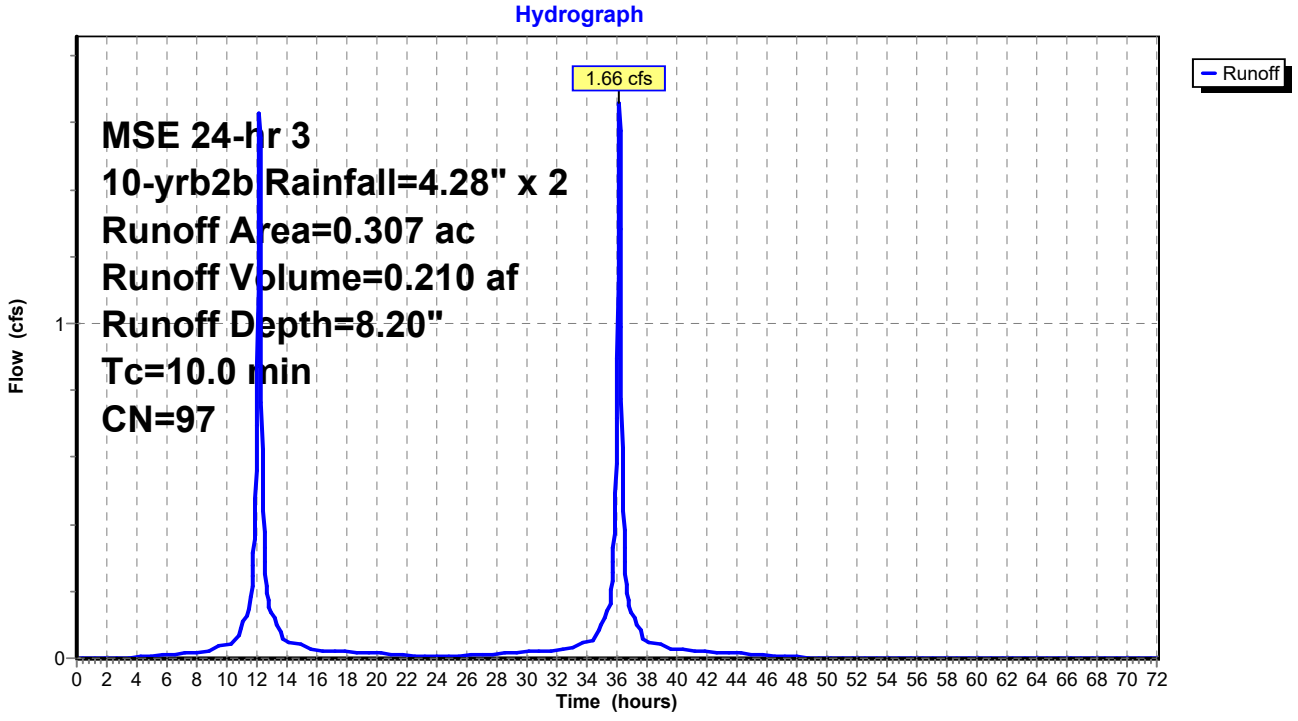
Runoff = 1.66 cfs @ 36.17 hrs, Volume= 0.210 af, Depth= 8.20"
Routed to Pond NADS : North ADS MC-3500

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs
MSE 24-hr 3 10-yrb2b Rainfall=4.28" x 2

	Area (ac)	CN	Description
*	0.297	98	Paved Surfaces
*	0.010	80	Grass cover D soils
	0.307	97	Weighted Average
	0.010		3.26% Pervious Area
	0.297		96.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, minimum**

Subcatchment DA4: North half of Parking and Office Tower



Hydrograph for Subcatchment DA4: North half of Parking and Office Tower

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.80	0.01	0.00	0.00
1.60	0.03	0.00	0.00
2.40	0.05	0.00	0.00
3.20	0.08	0.00	0.00
4.00	0.11	0.01	0.00
4.80	0.15	0.02	0.01
5.60	0.19	0.04	0.01
6.40	0.24	0.07	0.01
7.20	0.30	0.10	0.01
8.00	0.36	0.15	0.02
8.80	0.42	0.20	0.02
9.60	0.53	0.28	0.04
10.40	0.65	0.39	0.04
11.20	0.91	0.62	0.12
12.00	1.98	1.65	0.70
12.80	3.37	3.03	0.16
13.60	3.63	3.28	0.07
14.40	3.75	3.41	0.05
15.20	3.86	3.51	0.03
16.00	3.92	3.57	0.02
16.80	3.98	3.63	0.02
17.60	4.04	3.69	0.02
18.40	4.09	3.74	0.02
19.20	4.13	3.78	0.02
20.00	4.17	3.82	0.01
20.80	4.20	3.85	0.01
21.60	4.23	3.88	0.01
22.40	4.25	3.90	0.01
23.20	4.27	3.92	0.01
24.00	4.28	3.93	0.00
24.80	4.29	3.94	0.01
25.60	4.31	3.96	0.01
26.40	4.33	3.98	0.01
27.20	4.36	4.01	0.01
28.00	4.39	4.04	0.01
28.80	4.43	4.08	0.02
29.60	4.47	4.12	0.02
30.40	4.52	4.17	0.02
31.20	4.58	4.23	0.02
32.00	4.64	4.29	0.02
32.80	4.70	4.35	0.03
33.60	4.81	4.45	0.05
34.40	4.93	4.58	0.05
35.20	5.19	4.84	0.13
36.00	6.26	5.90	**0.72**
36.80	7.65	7.29	**0.16**
37.60	7.91	7.55	0.07
38.40	8.03	7.67	0.05
39.20	8.14	7.78	0.03
40.00	8.20	7.84	0.02
40.80	8.26	7.90	0.02
41.60	8.32	7.96	0.02
42.40	8.37	8.01	0.02
43.20	8.41	8.05	0.02
44.00	8.45	8.09	0.01
44.80	8.48	8.12	0.01
45.60	8.51	8.15	0.01
46.40	8.53	8.17	0.01
47.20	8.55	8.19	0.01
48.00	**8.56**	**8.20**	0.00
48.80	8.56	8.20	0.00
49.60	8.56	8.20	0.00
50.40	8.56	8.20	0.00
51.20	8.56	8.20	0.00
52.00	8.56	8.20	0.00
52.80	8.56	8.20	0.00
53.60	8.56	8.20	0.00
54.40	8.56	8.20	0.00
55.20	8.56	8.20	0.00
56.00	8.56	8.20	0.00
56.80	8.56	8.20	0.00
57.60	8.56	8.20	0.00
58.40	8.56	8.20	0.00
59.20	8.56	8.20	0.00
60.00	8.56	8.20	0.00
60.80	8.56	8.20	0.00
61.60	8.56	8.20	0.00
62.40	8.56	8.20	0.00
63.20	8.56	8.20	0.00
64.00	8.56	8.20	0.00
64.80	8.56	8.20	0.00
65.60	8.56	8.20	0.00
66.40	8.56	8.20	0.00
67.20	8.56	8.20	0.00
68.00	8.56	8.20	0.00
68.80	8.56	8.20	0.00
69.60	8.56	8.20	0.00
70.40	8.56	8.20	0.00
71.20	8.56	8.20	0.00
72.00	8.56	8.20	0.00

Summary for Subcatchment DA5: N and W Edges

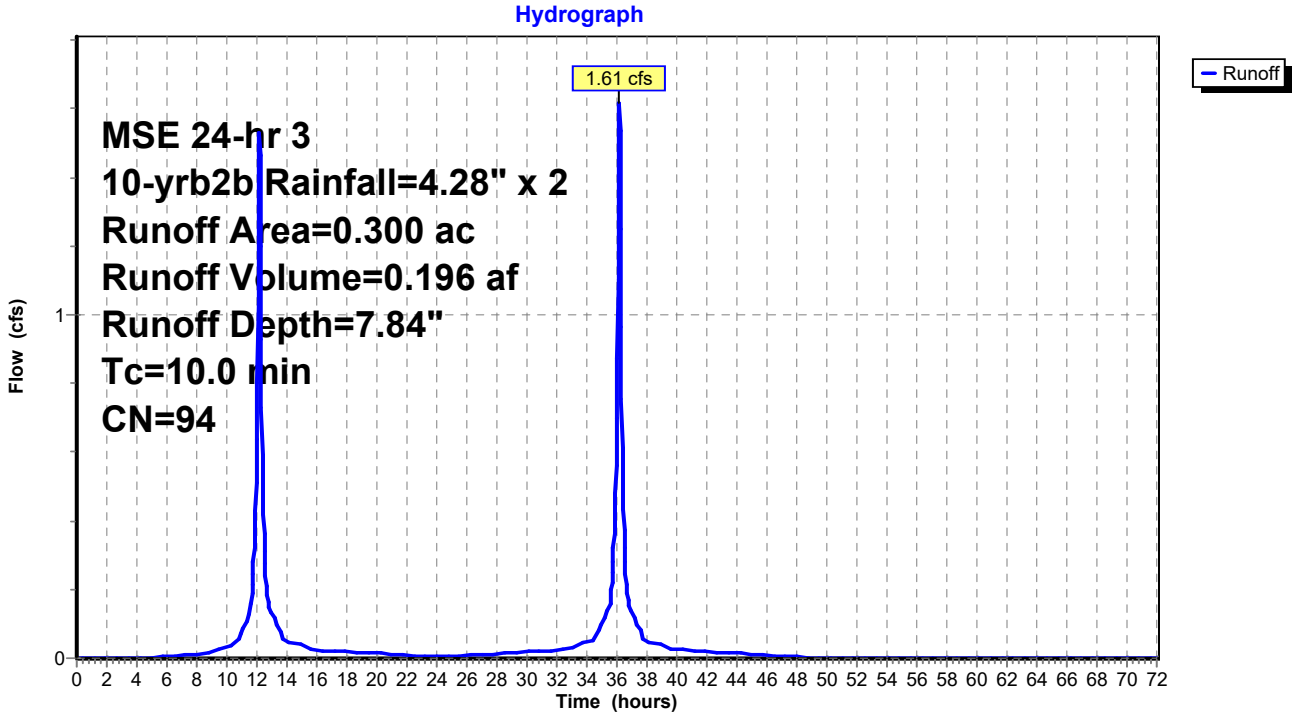
Runoff = 1.61 cfs @ 36.17 hrs, Volume= 0.196 af, Depth= 7.84"
Routed to Reach 5.1 : 12-in Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs
MSE 24-hr 3 10-yrb2b Rainfall=4.28" x 2

	Area (ac)	CN	Description
*	0.229	98	Paved Surfaces
	0.071	80	>75% Grass cover, Good, HSG D
	0.300	94	Weighted Average
	0.071		23.67% Pervious Area
	0.229		76.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Subcatchment DA5: N and W Edges



Hydrograph for Subcatchment DA5: N and W Edges

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.80	0.01	0.00	0.00
1.60	0.03	0.00	0.00
2.40	0.05	0.00	0.00
3.20	0.08	0.00	0.00
4.00	0.11	0.00	0.00
4.80	0.15	0.00	0.00
5.60	0.19	0.01	0.00
6.40	0.24	0.02	0.01
7.20	0.30	0.04	0.01
8.00	0.36	0.06	0.01
8.80	0.42	0.09	0.01
9.60	0.53	0.15	0.03
10.40	0.65	0.24	0.03
11.20	0.91	0.43	0.10
12.00	1.98	1.38	0.64
12.80	3.37	2.71	0.15
13.60	3.63	2.96	0.07
14.40	3.75	3.08	0.05
15.20	3.86	3.18	0.03
16.00	3.92	3.25	0.02
16.80	3.98	3.31	0.02
17.60	4.04	3.36	0.02
18.40	4.09	3.41	0.02
19.20	4.13	3.45	0.02
20.00	4.17	3.49	0.01
20.80	4.20	3.52	0.01
21.60	4.23	3.55	0.01
22.40	4.25	3.57	0.01
23.20	4.27	3.59	0.01
24.00	4.28	3.60	0.00
24.80	4.29	3.61	0.00
25.60	4.31	3.63	0.01
26.40	4.33	3.65	0.01
27.20	4.36	3.68	0.01
28.00	4.39	3.71	0.01
28.80	4.43	3.75	0.01
29.60	4.47	3.79	0.02
30.40	4.52	3.84	0.02
31.20	4.58	3.89	0.02
32.00	4.64	3.95	0.02
32.80	4.70	4.02	0.03
33.60	4.81	4.12	0.04
34.40	4.93	4.24	0.05
35.20	5.19	4.50	0.12
36.00	6.26	5.56	**0.70**
36.80	7.65	6.93	**0.16**
37.60	7.91	7.19	0.07
38.40	8.03	7.31	0.05
39.20	8.14	7.42	0.03
40.00	8.20	7.48	0.02
40.80	8.26	7.54	0.02
41.60	8.32	7.60	0.02
42.40	8.37	7.65	0.02
43.20	8.41	7.69	0.02
44.00	8.45	7.73	0.01
44.80	8.48	7.76	0.01
45.60	8.51	7.79	0.01
46.40	8.53	7.81	0.01
47.20	8.55	7.83	0.01
48.00	**8.56**	**7.84**	0.00
48.80	8.56	7.84	0.00
49.60	8.56	7.84	0.00
50.40	8.56	7.84	0.00
51.20	8.56	7.84	0.00
52.00	8.56	7.84	0.00
52.80	8.56	7.84	0.00
53.60	8.56	7.84	0.00
54.40	8.56	7.84	0.00
55.20	8.56	7.84	0.00
56.00	8.56	7.84	0.00
56.80	8.56	7.84	0.00
57.60	8.56	7.84	0.00
58.40	8.56	7.84	0.00
59.20	8.56	7.84	0.00
60.00	8.56	7.84	0.00
60.80	8.56	7.84	0.00
61.60	8.56	7.84	0.00
62.40	8.56	7.84	0.00
63.20	8.56	7.84	0.00
64.00	8.56	7.84	0.00
64.80	8.56	7.84	0.00
65.60	8.56	7.84	0.00
66.40	8.56	7.84	0.00
67.20	8.56	7.84	0.00
68.00	8.56	7.84	0.00
68.80	8.56	7.84	0.00
69.60	8.56	7.84	0.00
70.40	8.56	7.84	0.00
71.20	8.56	7.84	0.00
72.00	8.56	7.84	0.00

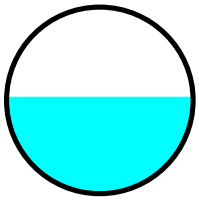
Summary for Reach 5.1: 12-in Catch Basin

Inflow Area = 0.300 ac, 76.33% Impervious, Inflow Depth = 7.84" for 10-yrb2b event
Inflow = 1.61 cfs @ 36.17 hrs, Volume= 0.196 af
Outflow = 1.61 cfs @ 36.17 hrs, Volume= 0.196 af, Atten= 0%, Lag= 0.2 min
Routed to Reach N FLOWS : 108-in RCP

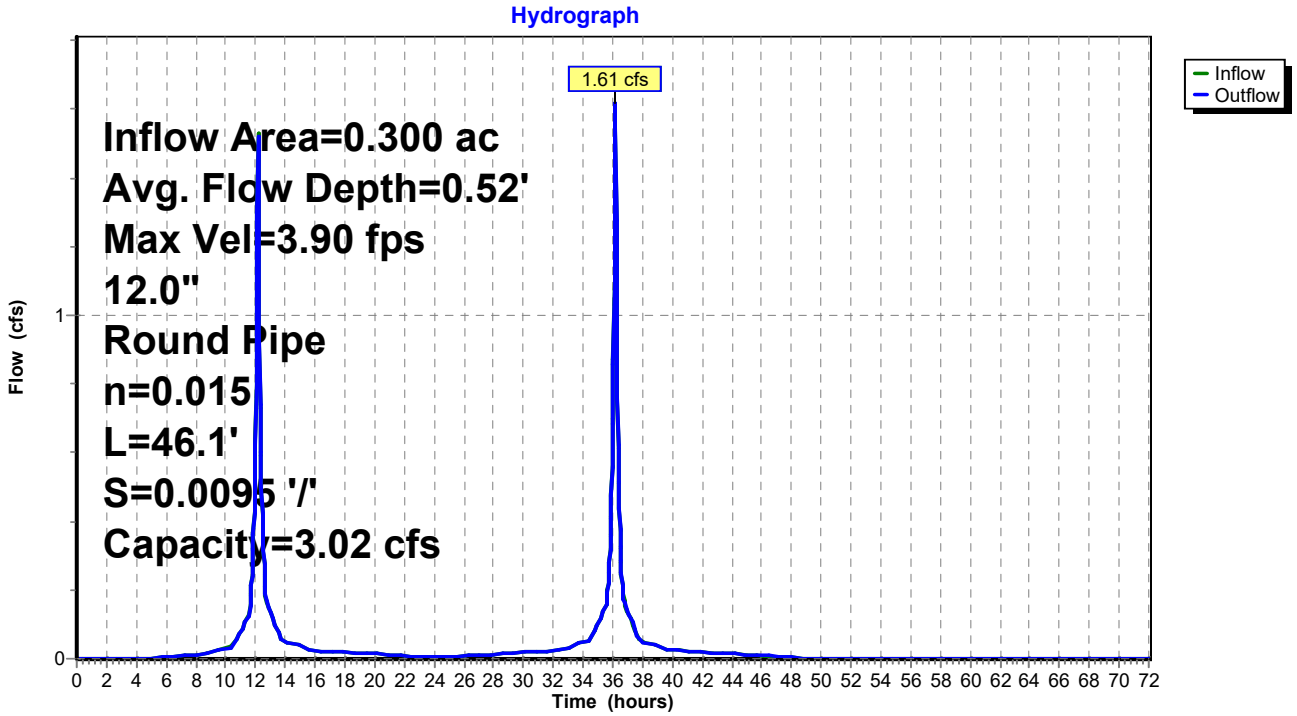
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs / 2
Max. Velocity= 3.90 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.16 fps, Avg. Travel Time= 0.7 min

Peak Storage= 19 cf @ 36.17 hrs
Average Depth at Peak Storage= 0.52' , Surface Width= 1.00'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.02 cfs

12.0" Round Pipe
n= 0.015 Concrete sewer w/manholes & inlets
Length= 46.1' Slope= 0.0095 '/'
Inlet Invert= 772.55', Outlet Invert= 772.11'



Reach 5.1: 12-in Catch Basin



Hydrograph for Reach 5.1: 12-in Catch Basin

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	772.55	0.00
2.00	0.00	0	772.55	0.00
4.00	0.00	0	772.55	0.00
6.00	0.00	0	772.58	0.00
8.00	0.01	1	772.59	0.01
10.00	0.03	1	772.62	0.03
12.00	0.64	9	772.86	0.62
14.00	0.05	2	772.64	0.05
16.00	0.02	1	772.61	0.02
18.00	0.02	1	772.61	0.02
20.00	0.01	1	772.60	0.01
22.00	0.01	0	772.59	0.01
24.00	0.00	0	772.58	0.00
26.00	0.01	0	772.59	0.01
28.00	0.01	1	772.60	0.01
30.00	0.02	1	772.61	0.02
32.00	0.02	1	772.61	0.02
34.00	0.05	2	772.64	0.05
36.00	**0.70**	**10**	**772.87**	**0.68**
38.00	**0.05**	**2**	**772.64**	**0.05**
40.00	0.02	1	772.61	0.02
42.00	0.02	1	772.61	0.02
44.00	0.01	1	772.60	0.01
46.00	0.01	0	772.59	0.01
48.00	0.00	0	772.58	0.00
50.00	0.00	0	772.55	0.00
52.00	0.00	0	772.55	0.00
54.00	0.00	0	772.55	0.00
56.00	0.00	0	772.55	0.00
58.00	0.00	0	772.55	0.00
60.00	0.00	0	772.55	0.00
62.00	0.00	0	772.55	0.00
64.00	0.00	0	772.55	0.00
66.00	0.00	0	772.55	0.00
68.00	0.00	0	772.55	0.00
70.00	0.00	0	772.55	0.00
72.00	0.00	0	772.55	0.00

Stage-Discharge for Reach 5.1: 12-in Catch Basin

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
772.55	0.00	0.00
772.56	0.34	0.00
772.57	0.54	0.00
772.58	0.71	0.00
772.59	0.85	0.01
772.60	0.99	0.01
772.61	1.11	0.02
772.62	1.23	0.03
772.63	1.34	0.04
772.64	1.44	0.05
772.65	1.54	0.06
772.66	1.64	0.08
772.67	1.73	0.09
772.68	1.82	0.11
772.69	1.90	0.13
772.70	1.98	0.15
772.71	2.06	0.17
772.72	2.14	0.19
772.73	2.22	0.21
772.74	2.29	0.24
772.75	2.36	0.26
772.76	2.43	0.29
772.77	2.50	0.32
772.78	2.56	0.35
772.79	2.63	0.38
772.80	2.69	0.41
772.81	2.75	0.45
772.82	2.81	0.48
772.83	2.87	0.52
772.84	2.93	0.55
772.85	2.98	0.59
772.86	3.03	0.63
772.87	3.09	0.67
772.88	3.14	0.71
772.89	3.19	0.75
772.90	3.24	0.79
772.91	3.29	0.84
772.92	3.33	0.88
772.93	3.38	0.92
772.94	3.42	0.97
772.95	3.47	1.02
772.96	3.51	1.06
772.97	3.55	1.11
772.98	3.59	1.16
772.99	3.63	1.21
773.00	3.67	1.26
773.01	3.70	1.31
773.02	3.74	1.36
773.03	3.77	1.41
773.04	3.81	1.46
773.05	3.84	1.51
773.06	3.87	1.56
773.07	3.90	1.61
773.08	3.93	1.66
773.09	3.96	1.71
773.10	3.99	1.77
773.11	4.02	1.82
773.12	4.05	1.87
773.13	4.07	1.92
773.14	4.10	1.97
773.15	4.12	2.03
773.16	4.14	2.08
773.17	4.16	2.13
773.18	4.18	2.18
773.19	4.20	2.23
773.20	4.22	2.28
773.21	4.24	2.33
773.22	4.26	2.38
773.23	4.27	2.43
773.24	4.29	2.48
773.25	4.30	2.53
773.26	4.31	2.57
773.27	4.33	2.62
773.28	4.34	2.66
773.29	4.35	2.71
773.30	4.35	2.75
773.31	4.36	2.79
773.32	4.37	2.83
773.33	4.37	2.87
773.34	4.38	2.91
773.35	4.38	2.95
773.36	**4.38**	2.98
773.37	4.38	3.02
773.38	4.38	3.05
773.39	4.37	3.08
773.40	4.37	3.11
773.41	4.36	3.13
773.42	4.35	3.16
773.43	4.34	3.18
773.44	4.33	3.20
773.45	4.32	3.22
773.46	4.30	3.23
773.47	4.28	3.24
773.48	4.26	3.24
773.49	4.24	**3.24**
773.50	4.21	3.24
773.51	4.17	3.23
773.52	4.13	3.21
773.53	4.08	3.19
773.54	4.01	3.14
773.55	3.84	3.02

Stage-Area-Storage for Reach 5.1: 12-in Catch Basin

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
772.55	0.0	0
772.56	0.0	0
772.57	0.0	0
772.58	0.0	0
772.59	0.0	0
772.60	0.0	1
772.61	0.0	1
772.62	0.0	1
772.63	0.0	1
772.64	0.0	2
772.65	0.0	2
772.66	0.0	2
772.67	0.1	2
772.68	0.1	3
772.69	0.1	3
772.70	0.1	3
772.71	0.1	4
772.72	0.1	4
772.73	0.1	4
772.74	0.1	5
772.75	0.1	5
772.76	0.1	6
772.77	0.1	6
772.78	0.1	6
772.79	0.1	7
772.80	0.2	7
772.81	0.2	7
772.82	0.2	8
772.83	0.2	8
772.84	0.2	9
772.85	0.2	9
772.86	0.2	10
772.87	0.2	10
772.88	0.2	10
772.89	0.2	11
772.90	0.2	11
772.91	0.3	12
772.92	0.3	12
772.93	0.3	13
772.94	0.3	13
772.95	0.3	14
772.96	0.3	14
772.97	0.3	14
772.98	0.3	15
772.99	0.3	15
773.00	0.3	16
773.01	0.4	16
773.02	0.4	17
773.03	0.4	17
773.04	0.4	18
773.05	0.4	18
773.06	0.4	19
773.07	0.4	19
773.08	0.4	19
773.09	0.4	20
773.10	0.4	20
773.11	0.5	21
773.12	0.5	21
773.13	0.5	22
773.14	0.5	22
773.15	0.5	23
773.16	0.5	23
773.17	0.5	24
773.18	0.5	24
773.19	0.5	24
773.20	0.5	25
773.21	0.5	25
773.22	0.6	26
773.23	0.6	26
773.24	0.6	27
773.25	0.6	27
773.26	0.6	27
773.27	0.6	28
773.28	0.6	28
773.29	0.6	29
773.30	0.6	29
773.31	0.6	30
773.32	0.6	30
773.33	0.7	30
773.34	0.7	31
773.35	0.7	31
773.36	0.7	31
773.37	0.7	32
773.38	0.7	32
773.39	0.7	32
773.40	0.7	33
773.41	0.7	33
773.42	0.7	33
773.43	0.7	34
773.44	0.7	34
773.45	0.7	34
773.46	0.8	35
773.47	0.8	35
773.48	0.8	35
773.49	0.8	35
773.50	0.8	36
773.51	0.8	36
773.52	0.8	36
773.53	0.8	36
773.54	0.8	36
773.55	**0.8**	**36**

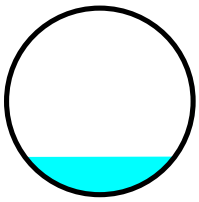
Summary for Reach N FLOWS: 108-in RCP

Inflow Area = 1.333 ac, 93.92% Impervious, Inflow Depth = 8.87" for 10-yrb2b event
Inflow = 6.62 cfs @ 36.23 hrs, Volume= 0.985 af
Outflow = 4.35 cfs @ 36.40 hrs, Volume= 0.985 af, Atten= 34%, Lag= 10.1 min

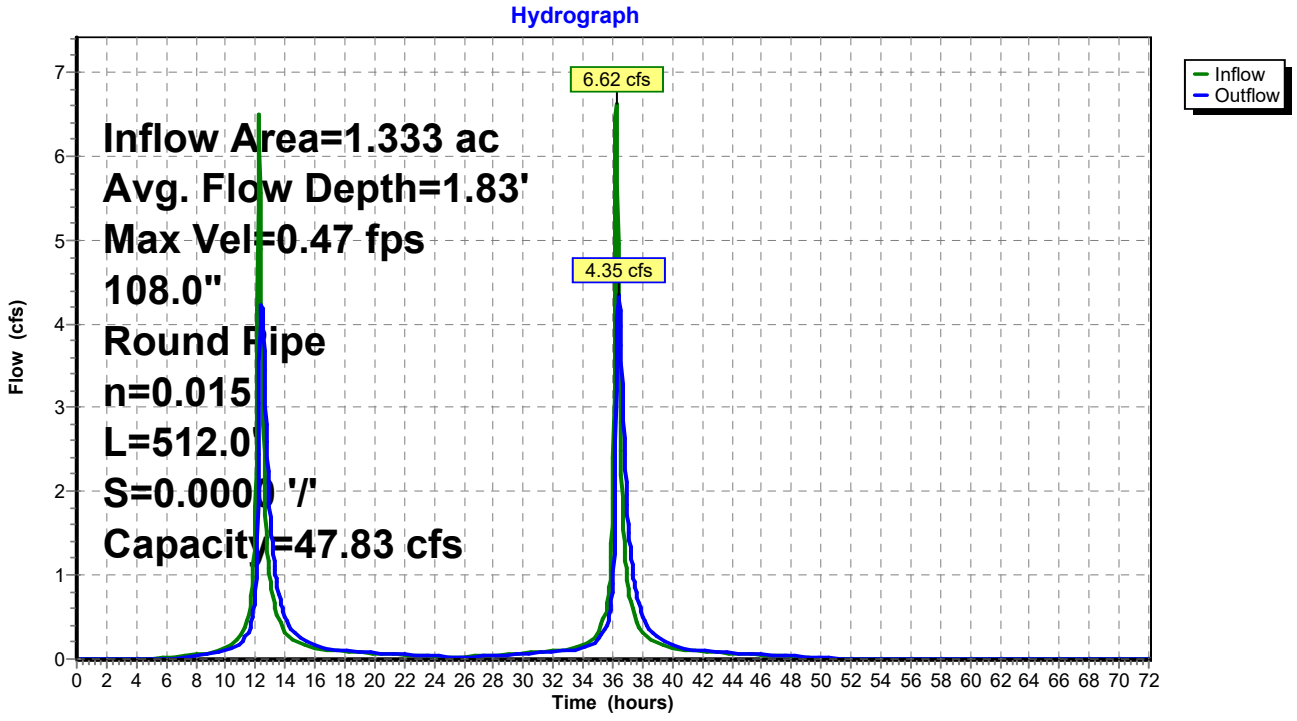
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs / 2
Max. Velocity= 0.47 fps, Min. Travel Time= 18.3 min
Avg. Velocity = 0.13 fps, Avg. Travel Time= 66.4 min

Peak Storage= 4,760 cf @ 36.40 hrs
Average Depth at Peak Storage= 1.83' , Surface Width= 7.25'
Bank-Full Depth= 9.00' Flow Area= 63.6 sf, Capacity= 47.83 cfs

108.0" Round Pipe
n= 0.015 Concrete sewer w/manholes & inlets
Length= 512.0' Slope= 0.0000 '/'
Inlet Invert= 761.00', Outlet Invert= 760.99'



Reach N FLOWS: 108-in RCP



Hydrograph for Reach N FLOWS: 108-in RCP

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	761.00	0.00
2.00	0.00	0	761.00	0.00
4.00	0.00	0	761.00	0.00
6.00	0.02	36	761.06	0.00
8.00	0.06	170	761.19	0.04
10.00	0.14	351	761.31	0.11
12.00	1.81	1,478	761.82	0.82
14.00	0.31	1,048	761.65	0.50
16.00	0.13	486	761.39	0.17
18.00	0.09	345	761.31	0.10
20.00	0.07	285	761.27	0.08
22.00	0.05	227	761.23	0.06
24.00	0.03	167	761.19	0.04
26.00	0.03	139	761.17	0.03
28.00	0.05	178	761.20	0.04
30.00	0.07	241	761.24	0.06
32.00	0.10	308	761.28	0.09
34.00	0.18	440	761.36	0.14
36.00	**1.92**	**1,576**	**761.86**	**0.90**
38.00	**0.31**	**1,051**	**761.65**	**0.50**
40.00	0.13	487	761.39	0.17
42.00	0.09	346	761.31	0.10
44.00	0.07	286	761.27	0.08
46.00	0.05	227	761.23	0.06
48.00	0.03	167	761.19	0.04
50.00	0.01	94	761.12	0.02
52.00	0.00	57	761.09	0.01
54.00	0.00	39	761.06	0.01
56.00	0.00	26	761.04	0.00
58.00	0.00	18	761.03	0.00
60.00	0.00	13	761.02	0.00
62.00	0.00	9	761.02	0.00
64.00	0.00	7	761.01	0.00
66.00	0.00	6	761.01	0.00
68.00	0.00	5	761.01	0.00
70.00	0.00	4	761.01	0.00
72.00	0.00	3	761.01	0.00

Stage-Discharge for Reach N FLOWS: 108-in RCP

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
761.00	0.00	0.00
761.10	0.07	0.01
761.20	0.11	0.04
761.30	0.15	0.10
761.40	0.18	0.18
761.50	0.21	0.29
761.60	0.23	0.43
761.70	0.26	0.59
761.80	0.28	0.78
761.90	0.30	1.00
762.00	0.32	1.25
762.10	0.34	1.52
762.20	0.36	1.82
762.30	0.38	2.15
762.40	0.40	2.51
762.50	0.41	2.89
762.60	0.43	3.30
762.70	0.45	3.73
762.80	0.46	4.19
762.90	0.48	4.67
763.00	0.49	5.18
763.10	0.51	5.71
763.20	0.52	6.27
763.30	0.53	6.84
763.40	0.55	7.44
763.50	0.56	8.06
763.60	0.57	8.70
763.70	0.58	9.37
763.80	0.60	10.05
763.90	0.61	10.75
764.00	0.62	11.47
764.10	0.63	12.20
764.20	0.64	12.96
764.30	0.65	13.72
764.40	0.66	14.51
764.50	0.67	15.30
764.60	0.68	16.12
764.70	0.69	16.94
764.80	0.70	17.78
764.90	0.70	18.63
765.00	0.71	19.49
765.10	0.72	20.36
765.20	0.73	21.23
765.30	0.74	22.12
765.40	0.74	23.01
765.50	0.75	23.91
765.60	0.76	24.82
765.70	0.77	25.73
765.80	0.77	26.64
765.90	0.78	27.55
766.00	0.78	28.47
766.10	0.79	29.39
766.20	0.80	30.30
766.30	0.80	31.22
766.40	0.81	32.13
766.50	0.81	33.04
766.60	0.82	33.94
766.70	0.82	34.84
766.80	0.82	35.73
766.90	0.83	36.61
767.00	0.83	37.49
767.10	0.84	38.35
767.20	0.84	39.20
767.30	0.84	40.04
767.40	0.84	40.86
767.50	0.85	41.67
767.60	0.85	42.46
767.70	0.85	43.23
767.80	0.85	43.98
767.90	0.85	44.71
768.00	0.86	45.41
768.10	0.86	46.09
768.20	**0.86**	46.75
768.30	**0.86**	47.37
768.40	0.86	47.96
768.50	0.86	48.51
768.60	0.86	49.03
768.70	0.85	49.51
768.80	0.85	49.95
768.90	0.85	50.34
769.00	0.85	50.68
769.10	0.85	50.97
769.20	0.84	51.19
769.30	0.84	51.35
769.40	0.83	**51.43**
769.50	0.83	**51.42**
769.60	0.82	51.31
769.70	0.81	51.06
769.80	0.80	50.63
769.90	0.79	49.91
770.00	0.75	47.83

Stage-Area-Storage for Reach N FLOWS: 108-in RCP

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
761.00	0.0	0
761.10	0.1	66
761.20	0.4	184
761.30	0.7	335
761.40	1.0	513
761.50	1.4	714
761.60	1.8	934
761.70	2.3	1,172
761.80	2.8	1,426
761.90	3.3	1,695
762.00	3.9	1,979
762.10	4.4	2,275
762.20	5.0	2,583
762.30	5.7	2,901
762.40	6.3	3,230
762.50	7.0	3,569
762.60	7.7	3,917
762.70	8.3	4,273
762.80	9.1	4,638
762.90	9.8	5,010
763.00	10.5	5,390
763.10	11.3	5,777
763.20	12.1	6,170
763.30	12.8	6,569
763.40	13.6	6,973
763.50	14.4	7,383
763.60	15.2	7,799
763.70	16.1	8,218
763.80	16.9	8,643
763.90	17.7	9,072
764.00	18.6	9,505
764.10	19.4	9,941
764.20	20.3	10,380
764.30	21.1	10,823
764.40	22.0	11,268
764.50	22.9	11,716
764.60	23.8	12,167
764.70	24.6	12,619
764.80	25.5	13,074
764.90	26.4	13,530
765.00	27.3	13,987
765.10	28.2	14,445
765.20	29.1	14,905
765.30	30.0	15,365
765.40	30.9	15,825
765.50	31.8	16,286
765.60	32.7	16,747
765.70	33.6	17,207
765.80	34.5	17,667
765.90	35.4	18,127
766.00	36.3	18,585
766.10	37.2	19,042
766.20	38.1	19,498
766.30	39.0	19,953
766.40	39.9	20,405
766.50	40.7	20,856
766.60	41.6	21,304
766.70	42.5	21,749
766.80	43.3	22,192
766.90	44.2	22,631
767.00	45.1	23,067
767.10	45.9	23,500
767.20	46.7	23,929
767.30	47.6	24,354
767.40	48.4	24,773
767.50	49.2	25,189
767.60	50.0	25,599
767.70	50.8	26,003
767.80	51.6	26,402
767.90	52.3	26,795
768.00	53.1	27,182
768.10	53.8	27,562
768.20	54.6	27,934
768.30	55.3	28,299
768.40	56.0	28,655
768.50	56.6	29,003
768.60	57.3	29,342
768.70	58.0	29,671
768.80	58.6	29,989
768.90	59.2	30,297
769.00	59.8	30,593
769.10	60.3	30,877
769.20	60.8	31,146
769.30	61.3	31,400
769.40	61.8	31,638
769.50	62.2	31,858
769.60	62.6	32,059
769.70	63.0	32,237
769.80	63.3	32,388
769.90	63.5	32,506
770.00	**63.6**	**32,572**

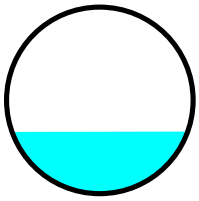
Summary for Reach S FLOWS: 15-in RCP

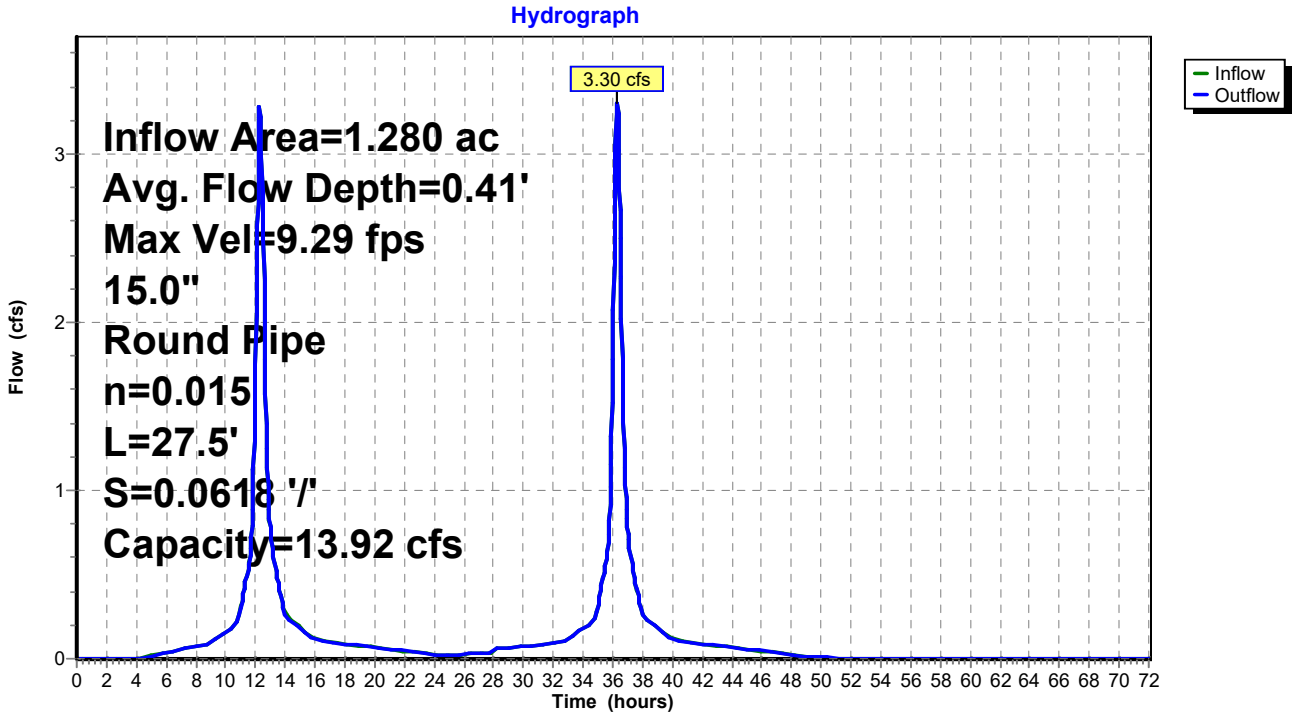
Inflow Area = 1.280 ac, 99.06% Impervious, Inflow Depth = 7.60" for 10-yrb2b event
Inflow = 3.30 cfs @ 36.29 hrs, Volume= 0.810 af
Outflow = 3.30 cfs @ 36.30 hrs, Volume= 0.810 af, Atten= 0%, Lag= 0.2 min
Routed to nonexistent node 5R

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs / 2
Max. Velocity= 9.29 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.60 fps, Avg. Travel Time= 0.2 min

Peak Storage= 10 cf @ 36.30 hrs
Average Depth at Peak Storage= 0.41' , Surface Width= 1.18'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 13.92 cfs

15.0" Round Pipe
n= 0.015 Concrete sewer w/manholes & inlets
Length= 27.5' Slope= 0.0618 '/'
Inlet Invert= 773.80', Outlet Invert= 772.10'





Hydrograph for Reach S FLOWS: 15-in RCP

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	773.80	0.00
2.00	0.00	0	773.80	0.00
4.00	0.00	0	773.81	0.00
6.00	0.03	0	773.85	0.03
8.00	0.08	1	773.87	0.08
10.00	0.16	1	773.90	0.16
12.00	1.75	6	774.10	1.75
14.00	0.27	2	773.92	0.27
16.00	0.12	1	773.88	0.12
18.00	0.09	1	773.87	0.09
20.00	0.07	1	773.86	0.07
22.00	0.04	0	773.85	0.04
24.00	0.03	0	773.84	0.03
26.00	0.03	0	773.84	0.03
28.00	0.06	1	773.86	0.06
30.00	0.07	1	773.86	0.07
32.00	0.09	1	773.87	0.09
34.00	0.18	1	773.90	0.18
36.00	**1.78**	**6**	**774.10**	**1.78**
38.00	**0.27**	**2**	**773.92**	**0.27**
40.00	0.12	1	773.88	0.12
42.00	0.09	1	773.87	0.09
44.00	0.07	1	773.86	0.07
46.00	0.04	0	773.85	0.04
48.00	0.03	0	773.84	0.03
50.00	0.01	0	773.82	0.01
52.00	0.00	0	773.81	0.00
54.00	0.00	0	773.81	0.00
56.00	0.00	0	773.81	0.00
58.00	0.00	0	773.80	0.00
60.00	0.00	0	773.80	0.00
62.00	0.00	0	773.80	0.00
64.00	0.00	0	773.80	0.00
66.00	0.00	0	773.80	0.00
68.00	0.00	0	773.80	0.00
70.00	0.00	0	773.80	0.00
72.00	0.00	0	773.80	0.00

Stage-Discharge for Reach S FLOWS: 15-in RCP

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
773.80	0.00	0.00
773.81	0.81	0.00
773.82	1.36	0.01
773.83	1.79	0.01
773.84	2.17	0.03
773.85	2.52	0.04
773.86	2.83	0.06
773.87	3.13	0.09
773.88	3.42	0.11
773.89	3.69	0.15
773.90	3.95	0.18
773.91	4.19	0.22
773.92	4.43	0.27
773.93	4.66	0.32
773.94	4.89	0.37
773.95	5.10	0.43
773.96	5.31	0.49
773.97	5.52	0.55
773.98	5.72	0.62
773.99	5.91	0.70
774.00	6.10	0.77
774.01	6.28	0.85
774.02	6.46	0.94
774.03	6.64	1.03
774.04	6.81	1.12
774.05	6.98	1.22
774.06	7.14	1.32
774.07	7.30	1.42
774.08	7.46	1.53
774.09	7.61	1.64
774.10	7.76	1.76
774.11	7.91	1.88
774.12	8.06	2.00
774.13	8.20	2.12
774.14	8.34	2.25
774.15	8.47	2.38
774.16	8.61	2.52
774.17	8.74	2.66
774.18	8.87	2.80
774.19	8.99	2.94
774.20	9.12	3.09
774.21	9.24	3.24
774.22	9.36	3.39
774.23	9.48	3.54
774.24	9.59	3.70
774.25	9.70	3.86
774.26	9.81	4.02
774.27	9.92	4.19
774.28	10.03	4.35
774.29	10.13	4.52
774.30	10.23	4.69
774.31	10.33	4.86
774.32	10.43	5.04
774.33	10.53	5.21
774.34	10.62	5.39
774.35	10.71	5.57
774.36	10.80	5.75
774.37	10.89	5.94
774.38	10.98	6.12
774.39	11.06	6.30
774.40	11.14	6.49
774.41	11.22	6.68
774.42	11.30	6.87
774.43	11.38	7.05
774.44	11.46	7.24
774.45	11.53	7.43
774.46	11.60	7.63
774.47	11.67	7.82
774.48	11.74	8.01
774.49	11.80	8.20
774.50	11.87	8.39
774.51	11.93	8.59
774.52	11.99	8.78
774.53	12.05	8.97
774.54	12.11	9.16
774.55	12.16	9.35
774.56	12.22	9.54
774.57	12.27	9.73
774.58	12.32	9.92
774.59	12.37	10.11
774.60	12.41	10.30
774.61	12.46	10.48
774.62	12.50	10.67
774.63	12.54	10.85
774.64	12.58	11.03
774.65	12.62	11.21
774.66	12.65	11.39
774.67	12.69	11.57
774.68	12.72	11.74
774.69	12.75	11.91
774.70	12.77	12.08
774.71	12.80	12.25
774.72	12.82	12.41
774.73	12.84	12.57
774.74	12.86	12.73
774.75	12.88	12.89
774.76	12.89	13.04
774.77	12.90	13.19
774.78	12.91	13.33
774.79	12.92	13.47
774.80	12.93	13.61
774.81	12.93	13.74
774.82	**12.93**	13.86
774.83	12.93	13.98
774.84	12.92	14.10
774.85	12.92	14.21
774.86	12.90	14.32
774.87	12.89	14.42
774.88	12.87	14.51
774.89	12.85	14.59
774.90	12.83	14.67
774.91	12.80	14.74
774.92	12.77	14.81
774.93	12.73	14.86
774.94	12.69	14.90
774.95	12.65	14.94
774.96	12.60	14.96
774.97	12.54	**14.97**
774.98	12.47	14.97
774.99	12.40	14.95
775.00	12.32	14.91
775.01	12.22	14.85
775.02	12.10	14.76
775.03	11.96	14.63
775.04	11.74	14.39
775.05	11.34	13.92

Stage-Area-Storage for Reach S FLOWS: 15-in RCP

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
773.80	0.0	0
773.82	0.0	0
773.84	0.0	0
773.86	0.0	1
773.88	0.0	1
773.90	0.0	1
773.92	0.1	2
773.94	0.1	2
773.96	0.1	3
773.98	0.1	3
774.00	0.1	3
774.02	0.1	4
774.04	0.2	5
774.06	0.2	5
774.08	0.2	6
774.10	0.2	6
774.12	0.2	7
774.14	0.3	7
774.16	0.3	8
774.18	0.3	9
774.20	0.3	9
774.22	0.4	10
774.24	0.4	11
774.26	0.4	11
774.28	0.4	12
774.30	0.5	13
774.32	0.5	13
774.34	0.5	14
774.36	0.5	15
774.38	0.6	15
774.40	0.6	16
774.42	0.6	17
774.44	0.6	17
774.46	0.7	18
774.48	0.7	19
774.50	0.7	19
774.52	0.7	20
774.54	0.8	21
774.56	0.8	21
774.58	0.8	22
774.60	0.8	23
774.62	0.9	23
774.64	0.9	24
774.66	0.9	25
774.68	0.9	25
774.70	0.9	26
774.72	1.0	27
774.74	1.0	27
774.76	1.0	28
774.78	1.0	28
774.80	1.1	29
774.82	1.1	29
774.84	1.1	30
774.86	1.1	31
774.88	1.1	31
774.90	1.1	31
774.92	1.2	32
774.94	1.2	32
774.96	1.2	33
774.98	1.2	33
775.00	1.2	33
775.02	1.2	34
775.04	**1.2**	**34**

Summary for Pond NADS: North ADS MC-3500

Inflow Area = 1.033 ac, 99.03% Impervious, Inflow Depth = 9.18" for 10-yrb2b event
Inflow = 8.37 cfs @ 36.17 hrs, Volume= 0.790 af
Outflow = 5.38 cfs @ 36.25 hrs, Volume= 0.789 af, Atten= 36%, Lag= 5.2 min
Primary = 5.38 cfs @ 36.25 hrs, Volume= 0.789 af
Routed to Reach N FLOWS : 108-in RCP

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs / 2
Peak Elev= 772.58' @ 36.25 hrs Surf.Area= 0.067 ac Storage= 0.100 af

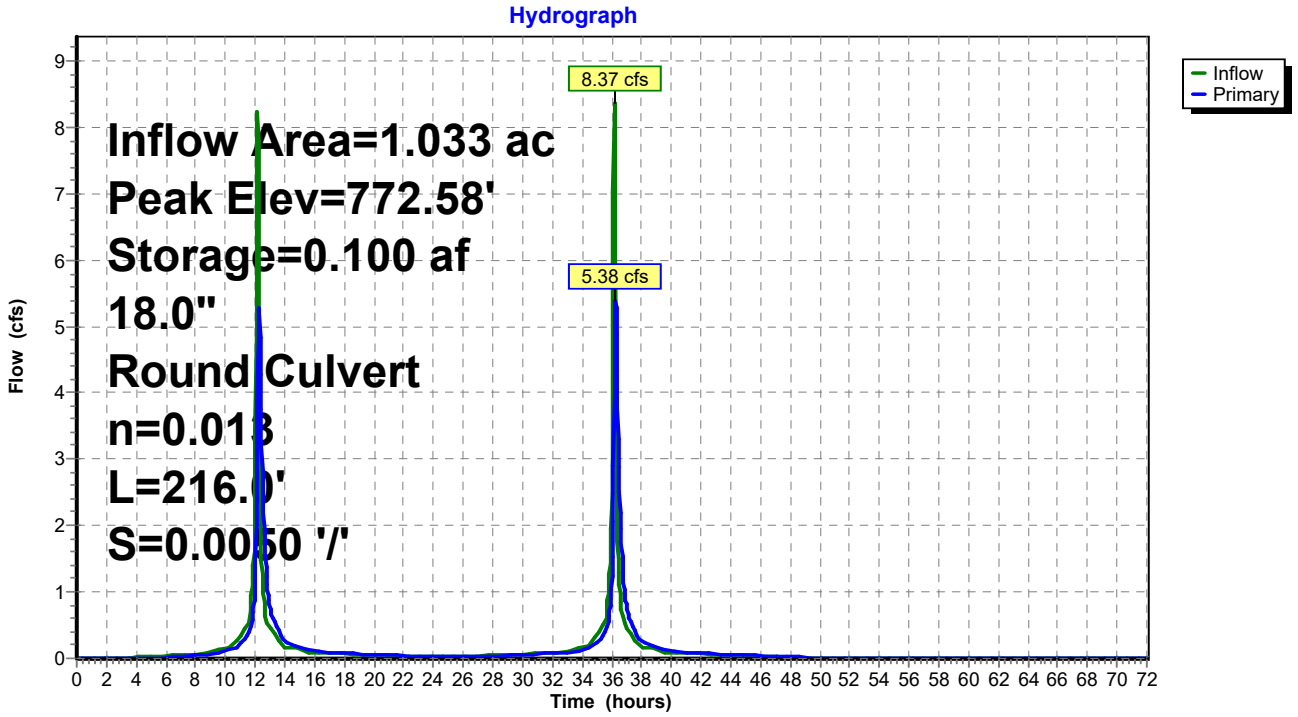
Plug-Flow detention time= 47.5 min calculated for 0.789 af (100% of inflow)
Center-of-Mass det. time= 45.9 min (1,527.1 - 1,481.2)

Volume	Invert	Avail.Storage	Storage Description
#1	771.20'	0.201 af	**ADS_StormTech MC-3500 d +Cap @ 112.50' L**x 5 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 112.50'L = 1,725.2 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 5 Chambers in 5 Rows Cap Storage= 14.9 cf x 2 x 5 rows = 149.0 cf

Device	Routing	Invert	Outlet Devices
#1	Primary	771.20'	**18.0" Round Culvert** L= 216.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 771.20' / 770.12' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf

Primary OutFlow Max=5.32 cfs @ 36.25 hrs HW=772.57' TW=762.62' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 5.32 cfs @ 3.14 fps)

Pond NADS: North ADS MC-3500



Hydrograph for Pond NADS: North ADS MC-3500

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.000	771.20	0.00
2.00	0.00	0.000	771.20	0.00
4.00	0.02	0.001	771.21	0.00
6.00	0.04	0.005	771.26	0.01
8.00	0.06	0.009	771.31	0.05
10.00	0.14	0.013	771.37	0.11
12.00	2.42	0.042	771.76	1.19
14.00	0.17	0.020	771.46	0.26
16.00	0.08	0.013	771.37	0.11
18.00	0.07	0.011	771.34	0.07
20.00	0.05	0.010	771.32	0.06
22.00	0.03	0.008	771.31	0.04
24.00	0.01	0.006	771.28	0.02
26.00	0.03	0.006	771.28	0.02
28.00	0.05	0.008	771.30	0.03
30.00	0.06	0.009	771.32	0.05
32.00	0.08	0.011	771.34	0.07
34.00	0.16	0.014	771.39	0.13
36.00	**2.48**	**0.043**	**771.77**	**1.23**
38.00	**0.17**	**0.020**	**771.46**	**0.26**
40.00	0.08	0.013	771.37	0.11
42.00	0.07	0.011	771.34	0.07
44.00	0.05	0.010	771.32	0.06
46.00	0.03	0.008	771.31	0.04
48.00	0.01	0.006	771.28	0.02
50.00	0.00	0.004	771.25	0.01
52.00	0.00	0.003	771.24	0.00
54.00	0.00	0.002	771.23	0.00
56.00	0.00	0.002	771.23	0.00
58.00	0.00	0.002	771.22	0.00
60.00	0.00	0.002	771.22	0.00
62.00	0.00	0.001	771.22	0.00
64.00	0.00	0.001	771.22	0.00
66.00	0.00	0.001	771.21	0.00
68.00	0.00	0.001	771.21	0.00
70.00	0.00	0.001	771.21	0.00
72.00	0.00	0.001	771.21	0.00

Stage-Discharge for Pond NADS: North ADS MC-3500

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
771.20	0.00	772.24	3.58	773.28	7.55	774.32	9.63
771.22	0.00	772.26	3.69	773.30	7.60	774.34	9.67
771.24	0.00	772.28	3.80	773.32	7.64	774.36	9.71
771.26	0.01	772.30	3.92	773.34	7.69	774.38	9.74
771.28	0.02	772.32	4.03	773.36	7.73	774.40	9.78
771.30	0.04	772.34	4.14	773.38	7.78	774.42	9.81
771.32	0.05	772.36	4.25	773.40	7.82	774.44	9.85
771.34	0.07	772.38	4.35	773.42	7.87	774.46	9.88
771.36	0.10	772.40	4.46	773.44	7.91	774.48	9.92
771.38	0.12	772.42	4.57	773.46	7.95	774.50	9.95
771.40	0.15	772.44	4.68	773.48	8.00	774.52	9.98
771.42	0.19	772.46	4.78	773.50	8.04	774.54	10.02
771.44	0.22	772.48	4.88	773.52	8.08	774.56	10.05
771.46	0.26	772.50	4.99	773.54	8.12	774.58	10.09
771.48	0.31	772.52	5.09	773.56	8.17	774.60	10.12
771.50	0.35	772.54	5.18	773.58	8.21	774.62	10.16
771.52	0.40	772.56	5.28	773.60	8.25	774.64	10.19
771.54	0.45	772.58	5.37	773.62	8.29	774.66	10.22
771.56	0.51	772.60	5.46	773.64	8.33	774.68	10.26
771.58	0.56	772.62	5.54	773.66	8.37	774.70	10.29
771.60	0.62	772.64	5.62	773.68	8.42	774.72	10.32
771.62	0.69	772.66	5.70	773.70	8.46	774.74	10.36
771.64	0.75	772.68	5.76	773.72	8.50	774.76	10.39
771.66	0.82	772.70	5.82	773.74	8.54	774.78	10.42
771.68	0.89	772.72	5.89	773.76	8.58	774.80	10.46
771.70	0.97	772.74	5.97	773.78	8.62	774.82	10.49
771.72	1.04	772.76	6.05	773.80	8.66	774.84	10.52
771.74	1.12	772.78	6.12	773.82	8.70	774.86	10.55
771.76	1.20	772.80	6.19	773.84	8.74	774.88	10.59
771.78	1.28	772.82	6.27	773.86	8.78	774.90	10.62
771.80	1.36	772.84	6.34	773.88	8.81	774.92	10.65
771.82	1.45	772.86	6.41	773.90	8.85	774.94	**10.68**
771.84	1.54	772.88	6.48	773.92	8.89		
771.86	1.63	772.90	6.55	773.94	8.93		
771.88	1.72	772.92	6.62	773.96	8.97		
771.90	1.81	772.94	6.68	773.98	9.01		
771.92	1.91	772.96	6.75	774.00	9.05		
771.94	2.01	772.98	6.82	774.02	9.08		
771.96	2.11	773.00	6.88	774.04	9.12		
771.98	2.20	773.02	6.95	774.06	9.16		
772.00	2.30	773.04	7.01	774.08	9.20		
772.02	2.41	773.06	7.08	774.10	9.23		
772.04	2.51	773.08	7.14	774.12	9.27		
772.06	2.61	773.10	7.20	774.14	9.31		
772.08	2.72	773.12	7.27	774.16	9.34		
772.10	2.82	773.14	7.33	774.18	9.38		
772.12	2.93	773.16	7.39	774.20	9.42		
772.14	3.04	773.18	7.45	774.22	9.45		
772.16	3.15	773.20	7.37	774.24	9.49		
772.18	3.25	773.22	7.42	774.26	9.53		
772.20	3.36	773.24	7.46	774.28	9.56		
772.22	3.47	773.26	7.51	774.30	9.60		

Stage-Area-Storage for Pond NADS: North ADS MC-3500

Elevation (feet)	Storage (acre-feet)
771.20	0.000
771.25	0.004
771.30	0.008
771.35	0.012
771.40	0.015
771.45	0.019
771.50	0.023
771.55	0.027
771.60	0.030
771.65	0.034
771.70	0.038
771.75	0.042
771.80	0.045
771.85	0.049
771.90	0.053
771.95	0.056
772.00	0.060
772.05	0.064
772.10	0.067
772.15	0.071
772.20	0.074
772.25	0.078
772.30	0.081
772.35	0.085
772.40	0.088
772.45	0.092
772.50	0.095
772.55	0.098
772.60	0.102
772.65	0.105
772.70	0.108
772.75	0.112
772.80	0.115
772.85	0.118
772.90	0.121
772.95	0.124
773.00	0.128
773.05	0.131
773.10	0.134
773.15	0.137
773.20	0.140
773.25	0.143
773.30	0.146
773.35	0.148
773.40	0.151
773.45	0.154
773.50	0.157
773.55	0.159
773.60	0.162
773.65	0.165
773.70	0.167
773.75	0.170
773.80	0.172
773.85	0.174
773.90	0.177
773.95	0.179
774.00	0.181
774.05	0.183
774.10	0.185
774.15	0.187
774.20	0.189
774.25	0.191
774.30	0.192
774.35	0.194
774.40	0.195
774.45	0.197
774.50	0.198
774.55	0.199
774.60	0.199
774.65	0.200
774.70	0.200
774.75	0.201
774.80	0.201
774.85	0.201
774.90	0.201
774.95	**0.201**

Summary for Pond SADS: South ADS MC-3500

Inflow Area = 1.280 ac, 99.06% Impervious, Inflow Depth = 7.60" for 10-yrb2b event
Inflow = 4.17 cfs @ 36.17 hrs, Volume= 0.810 af
Outflow = 3.30 cfs @ 36.29 hrs, Volume= 0.810 af, Atten= 21%, Lag= 7.4 min
Primary = 3.30 cfs @ 36.29 hrs, Volume= 0.810 af
Routed to Pond SOCS : South OCS

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs / 2
Peak Elev= 775.57' @ 36.29 hrs Surf.Area= 0.035 ac Storage= 0.061 af

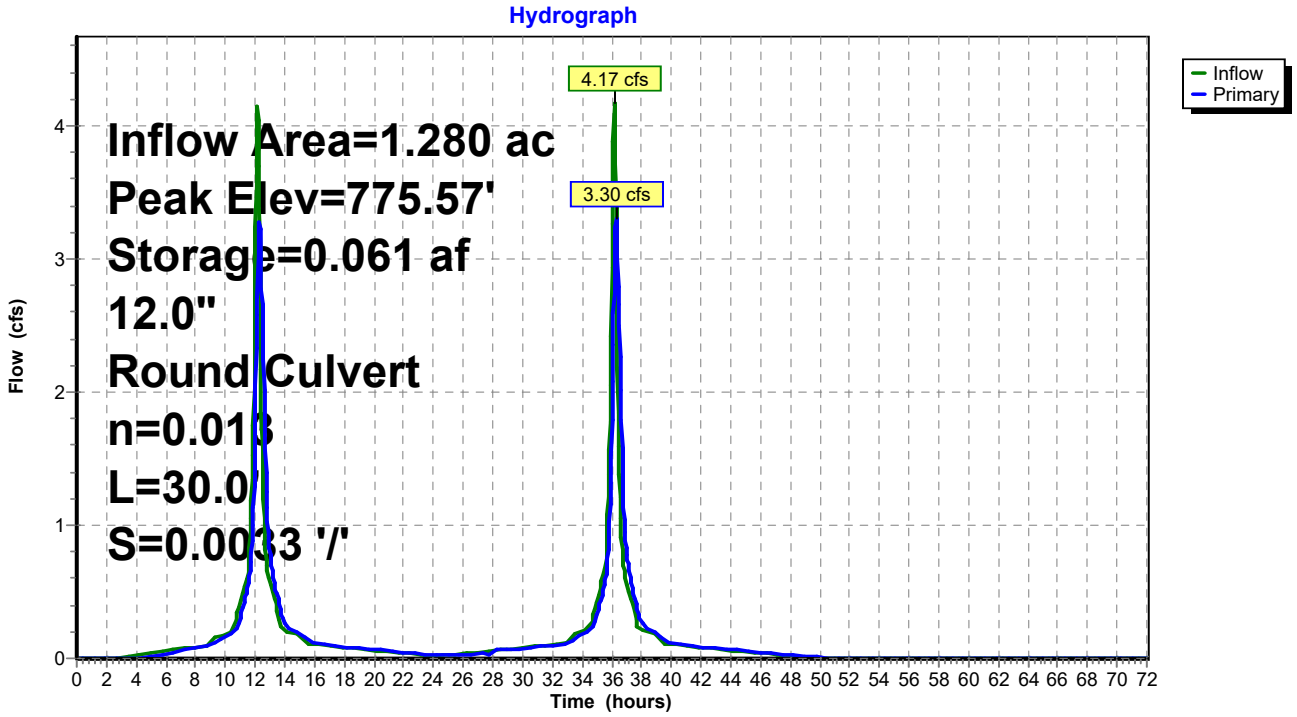
Plug-Flow detention time= 32.8 min calculated for 0.810 af (100% of inflow)
Center-of-Mass det. time= 32.6 min (1,514.8 - 1,482.2)

Volume	Invert	Avail.Storage	Storage Description
#1	774.00'	0.108 af	**ADS_StormTech MC-3500 d +Cap @ 75.00' L**x 4 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 75.00'L = 1,150.1 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 4 Chambers in 4 Rows Cap Storage= 14.9 cf x 2 x 4 rows = 119.2 cf

Device	Routing	Invert	Outlet Devices
#1	Primary	774.00'	**12.0" Round Culvert** L= 30.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 774.00' / 773.90' S= 0.0033 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 36.29 hrs HW=775.57' TW=776.38' (Dynamic Tailwater)
↑**1=Culvert** (Controls 0.00 cfs)

Pond SADS: South ADS MC-3500



Hydrograph for Pond SADS: South ADS MC-3500

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.000	774.00	0.00
2.00	0.00	0.000	774.00	0.00
4.00	0.02	0.002	774.04	0.00
6.00	0.05	0.005	774.12	0.03
8.00	0.08	0.007	774.17	0.08
10.00	0.18	0.010	774.25	0.16
12.00	2.91	0.037	774.91	1.75
14.00	0.21	0.013	774.32	0.27
16.00	0.10	0.009	774.21	0.12
18.00	0.08	0.008	774.18	0.09
20.00	0.06	0.007	774.16	0.07
22.00	0.04	0.006	774.13	0.04
24.00	0.02	0.004	774.10	0.03
26.00	0.03	0.004	774.10	0.03
28.00	0.06	0.006	774.15	0.06
30.00	0.08	0.007	774.17	0.07
32.00	0.10	0.008	774.19	0.09
34.00	0.20	0.011	774.27	0.18
36.00	**2.94**	**0.037**	**774.92**	**1.78**
38.00	**0.21**	**0.013**	**774.32**	**0.27**
40.00	0.10	0.009	774.21	0.12
42.00	0.08	0.008	774.18	0.09
44.00	0.06	0.007	774.16	0.07
46.00	0.04	0.006	774.13	0.04
48.00	0.02	0.004	774.10	0.03
50.00	0.00	0.002	774.05	0.01
52.00	0.00	0.002	774.04	0.00
54.00	0.00	0.001	774.03	0.00
56.00	0.00	0.001	774.02	0.00
58.00	0.00	0.001	774.02	0.00
60.00	0.00	0.001	774.02	0.00
62.00	0.00	0.001	774.02	0.00
64.00	0.00	0.001	774.01	0.00
66.00	0.00	0.001	774.01	0.00
68.00	0.00	0.000	774.01	0.00
70.00	0.00	0.000	774.01	0.00
72.00	0.00	0.000	774.01	0.00

Stage-Discharge for Pond SADS: South ADS MC-3500

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
774.00	0.00	775.04	2.12	776.08	4.38	777.12	6.01
774.02	0.00	775.06	2.18	776.10	4.42	777.14	6.04
774.04	0.00	775.08	2.23	776.12	4.45	777.16	6.06
774.06	0.01	775.10	2.28	776.14	4.49	777.18	6.09
774.08	0.01	775.12	2.33	776.16	4.53	777.20	6.12
774.10	0.02	775.14	2.38	776.18	4.56	777.22	6.14
774.12	0.04	775.16	2.43	776.20	4.60	777.24	6.17
774.14	0.05	775.18	2.48	776.22	4.63	777.26	6.20
774.16	0.06	775.20	2.52	776.24	4.67	777.28	6.22
774.18	0.08	775.22	2.56	776.26	4.70	777.30	6.25
774.20	0.10	775.24	2.60	776.28	4.74	777.32	6.27
774.22	0.12	775.26	2.63	776.30	4.77	777.34	6.30
774.24	0.15	775.28	2.66	776.32	4.81	777.36	6.33
774.26	0.17	775.30	2.68	776.34	4.84	777.38	6.35
774.28	0.20	775.32	2.68	776.36	4.87	777.40	6.38
774.30	0.23	775.34	2.68	776.38	4.91	777.42	6.40
774.32	0.26	775.36	2.74	776.40	4.94	777.44	6.43
774.34	0.30	775.38	2.79	776.42	4.97	777.46	6.45
774.36	0.33	775.40	2.85	776.44	5.01	777.48	6.48
774.38	0.37	775.42	2.91	776.46	5.04	777.50	6.50
774.40	0.41	775.44	2.96	776.48	5.07	777.52	6.53
774.42	0.45	775.46	3.02	776.50	5.10	777.54	6.55
774.44	0.49	775.48	3.07	776.52	5.13	777.56	6.58
774.46	0.53	775.50	3.12	776.54	5.17	777.58	6.60
774.48	0.57	775.52	3.18	776.56	5.20	777.60	6.63
774.50	0.62	775.54	3.23	776.58	5.23	777.62	6.65
774.52	0.67	775.56	3.28	776.60	5.26	777.64	6.68
774.54	0.71	775.58	3.33	776.62	5.29	777.66	6.70
774.56	0.76	775.60	3.37	776.64	5.32	777.68	6.72
774.58	0.81	775.62	3.42	776.66	5.35	777.70	6.75
774.60	0.86	775.64	3.47	776.68	5.38	777.72	6.77
774.62	0.92	775.66	3.52	776.70	5.41	777.74	**6.80**
774.64	0.97	775.68	3.56	776.72	5.44		
774.66	1.02	775.70	3.61	776.74	5.47		
774.68	1.08	775.72	3.65	776.76	5.50		
774.70	1.13	775.74	3.70	776.78	5.53		
774.72	1.19	775.76	3.74	776.80	5.56		
774.74	1.25	775.78	3.78	776.82	5.59		
774.76	1.30	775.80	3.83	776.84	5.62		
774.78	1.36	775.82	3.87	776.86	5.65		
774.80	1.42	775.84	3.91	776.88	5.68		
774.82	1.48	775.86	3.95	776.90	5.70		
774.84	1.54	775.88	3.99	776.92	5.73		
774.86	1.60	775.90	4.03	776.94	5.76		
774.88	1.66	775.92	4.07	776.96	5.79		
774.90	1.72	775.94	4.11	776.98	5.82		
774.92	1.77	775.96	4.15	777.00	5.84		
774.94	1.83	775.98	4.19	777.02	5.87		
774.96	1.89	776.00	4.23	777.04	5.90		
774.98	1.95	776.02	4.27	777.06	5.93		
775.00	2.01	776.04	4.31	777.08	5.96		
775.02	2.06	776.06	4.34	777.10	5.98		

Stage-Area-Storage for Pond SADS: South ADS MC-3500

Elevation (feet)	Storage (acre-feet)
774.00	0.000
774.05	0.002
774.10	0.004
774.15	0.006
774.20	0.008
774.25	0.010
774.30	0.012
774.35	0.014
774.40	0.016
774.45	0.018
774.50	0.020
774.55	0.022
774.60	0.024
774.65	0.026
774.70	0.028
774.75	0.030
774.80	0.032
774.85	0.034
774.90	0.036
774.95	0.038
775.00	0.040
775.05	0.042
775.10	0.044
775.15	0.046
775.20	0.047
775.25	0.049
775.30	0.051
775.35	0.053
775.40	0.055
775.45	0.057
775.50	0.058
775.55	0.060
775.60	0.062
775.65	0.064
775.70	0.065
775.75	0.067
775.80	0.069
775.85	0.070
775.90	0.072
775.95	0.074
776.00	0.075
776.05	0.077
776.10	0.078
776.15	0.080
776.20	0.081
776.25	0.083
776.30	0.084
776.35	0.086
776.40	0.087
776.45	0.088
776.50	0.090
776.55	0.091
776.60	0.092
776.65	0.094
776.70	0.095
776.75	0.096
776.80	0.097
776.85	0.098
776.90	0.100
776.95	0.101
777.00	0.102
777.05	0.102
777.10	0.103
777.15	0.104
777.20	0.105
777.25	0.106
777.30	0.106
777.35	0.107
777.40	0.107
777.45	0.108
777.50	0.108
777.55	0.108
777.60	0.108
777.65	0.108
777.70	0.108
777.75	**0.108**

Summary for Pond SEP: SEPARATOR

Inflow Area = 1.280 ac, 99.06% Impervious, Inflow Depth = 8.32" for 10-yrb2b event
Inflow = 6.94 cfs @ 36.17 hrs, Volume= 0.887 af
Outflow = 6.94 cfs @ 36.17 hrs, Volume= 0.887 af, Atten= 0%, Lag= 0.0 min
Primary = 4.17 cfs @ 36.17 hrs, Volume= 0.810 af
Routed to Pond SADS : South ADS MC-3500
Secondary = 2.77 cfs @ 36.17 hrs, Volume= 0.077 af
Routed to Pond NADS : North ADS MC-3500

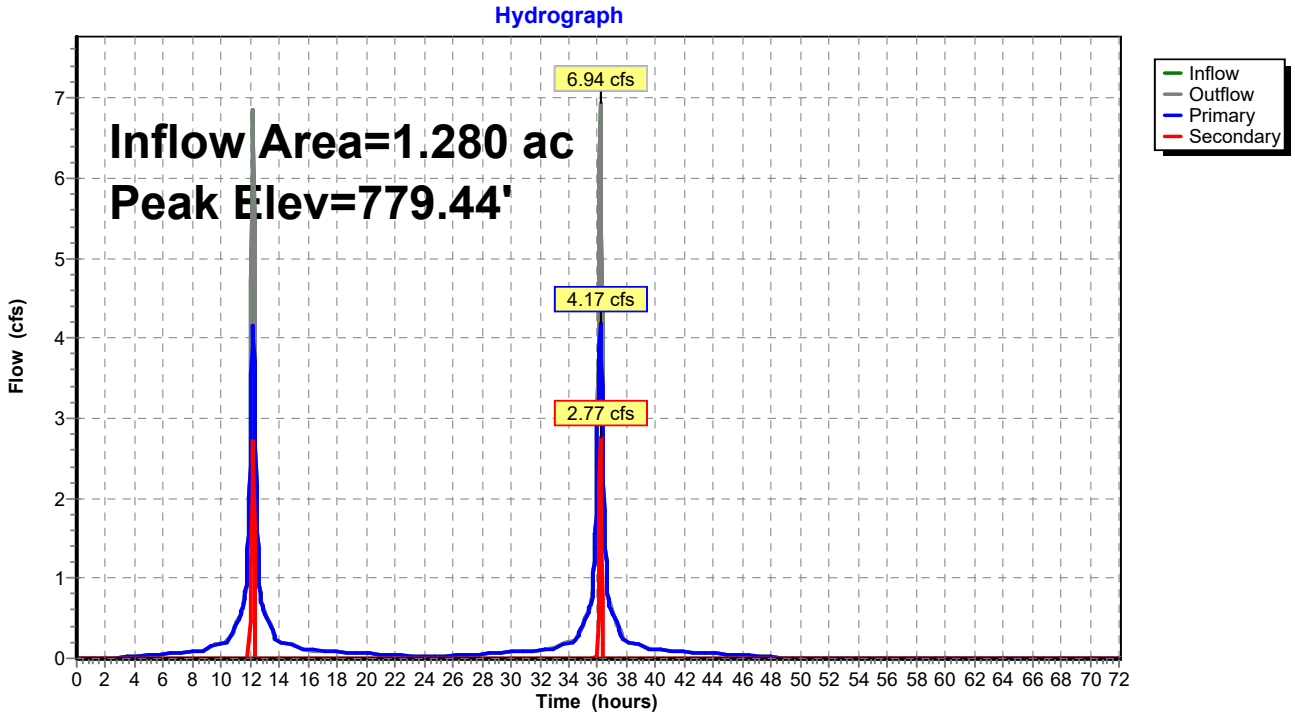
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs / 2
Peak Elev= 779.44' @ 36.17 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	776.50'	**10.0" Round SADS** L= 18.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 776.50' / 774.90' S= 0.0889 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.55 sf
#2	Secondary	778.00'	**12.0" Round NADS** L= 57.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 778.00' / 777.90' S= 0.0018 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=4.14 cfs @ 36.17 hrs HW=779.40' TW=775.39' (Dynamic Tailwater)
↑—**1=SADS** (Inlet Controls 4.14 cfs @ 7.59 fps)

Secondary OutFlow Max=2.68 cfs @ 36.17 hrs HW=779.40' TW=772.35' (Dynamic Tailwater)
↑—**2=NADS** (Barrel Controls 2.68 cfs @ 3.41 fps)

Pond SEP: SEPARATOR



Hydrograph for Pond SEP: SEPARATOR

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	776.50	0.00	0.00	0.00
2.00	0.00	776.50	0.00	0.00	0.00
4.00	0.02	776.58	0.02	0.02	0.00
6.00	0.05	776.62	0.05	0.05	0.00
8.00	0.08	776.65	0.08	0.08	0.00
10.00	0.18	776.72	0.18	0.18	0.00
12.00	2.96	778.15	2.96	2.91	0.05
14.00	0.21	776.73	0.21	0.21	0.00
16.00	0.10	776.66	0.10	0.10	0.00
18.00	0.08	776.64	0.08	0.08	0.00
20.00	0.06	776.62	0.06	0.06	0.00
22.00	0.04	776.60	0.04	0.04	0.00
24.00	0.02	776.56	0.02	0.02	0.00
26.00	0.03	776.59	0.03	0.03	0.00
28.00	0.06	776.62	0.06	0.06	0.00
30.00	0.08	776.64	0.08	0.08	0.00
32.00	0.10	776.66	0.10	0.10	0.00
34.00	0.20	776.73	0.20	0.20	0.00
36.00	**3.00**	**778.17**	**3.00**	**2.94**	**0.06**
38.00	**0.21**	**776.73**	**0.21**	**0.21**	**0.00**
40.00	0.10	776.66	0.10	0.10	0.00
42.00	0.08	776.64	0.08	0.08	0.00
44.00	0.06	776.62	0.06	0.06	0.00
46.00	0.04	776.60	0.04	0.04	0.00
48.00	0.02	776.56	0.02	0.02	0.00
50.00	0.00	776.50	0.00	0.00	0.00
52.00	0.00	776.50	0.00	0.00	0.00
54.00	0.00	776.50	0.00	0.00	0.00
56.00	0.00	776.50	0.00	0.00	0.00
58.00	0.00	776.50	0.00	0.00	0.00
60.00	0.00	776.50	0.00	0.00	0.00
62.00	0.00	776.50	0.00	0.00	0.00
64.00	0.00	776.50	0.00	0.00	0.00
66.00	0.00	776.50	0.00	0.00	0.00
68.00	0.00	776.50	0.00	0.00	0.00
70.00	0.00	776.50	0.00	0.00	0.00
72.00	0.00	776.50	0.00	0.00	0.00

Stage-Discharge for Pond SEP: SEPARATOR

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
776.50	0.00	0.00	0.00
776.55	0.01	0.01	0.00
776.60	0.04	0.04	0.00
776.65	0.09	0.09	0.00
776.70	0.15	0.15	0.00
776.75	0.23	0.23	0.00
776.80	0.33	0.33	0.00
776.85	0.44	0.44	0.00
776.90	0.56	0.56	0.00
776.95	0.69	0.69	0.00
777.00	0.82	0.82	0.00
777.05	0.96	0.96	0.00
777.10	1.11	1.11	0.00
777.15	1.25	1.25	0.00
777.20	1.39	1.39	0.00
777.25	1.52	1.52	0.00
777.30	1.64	1.64	0.00
777.35	1.73	1.73	0.00
777.40	1.83	1.83	0.00
777.45	1.92	1.92	0.00
777.50	2.01	2.01	0.00
777.55	2.09	2.09	0.00
777.60	2.17	2.17	0.00
777.65	2.25	2.25	0.00
777.70	2.32	2.32	0.00
777.75	2.40	2.40	0.00
777.80	2.47	2.47	0.00
777.85	2.54	2.54	0.00
777.90	2.60	2.60	0.00
777.95	2.67	2.67	0.00
778.00	2.73	2.73	0.00
778.05	2.80	2.80	0.00
778.10	2.88	2.86	0.02
778.15	2.97	2.92	0.05
778.20	3.07	2.98	0.09
778.25	3.18	3.03	0.15
778.30	3.30	3.09	0.21
778.35	3.43	3.14	0.29
778.40	3.57	3.20	0.37
778.45	3.72	3.25	0.47
778.50	3.88	3.30	0.57
778.55	4.04	3.36	0.69
778.60	4.21	3.41	0.81
778.65	4.39	3.46	0.93
778.70	4.57	3.51	1.06
778.75	4.75	3.56	1.20
778.80	4.94	3.60	1.34
778.85	5.13	3.65	1.48
778.90	5.32	3.70	1.62
778.95	5.50	3.74	1.76
779.00	5.69	3.79	1.90
779.05	5.87	3.84	2.03
779.10	6.04	3.88	2.16
779.15	6.20	3.92	2.28
779.20	6.35	3.97	2.38
779.25	6.48	4.01	2.47
779.30	6.58	4.05	2.52
779.35	6.63	4.10	2.54
779.40	6.81	4.14	2.67
779.45	**6.98**	**4.18**	**2.80**

Stage-Area-Storage for Pond SEP: SEPARATOR

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
776.50	**0.000**	777.54	0.000	778.58	0.000
776.52	0.000	777.56	0.000	778.60	0.000
776.54	0.000	777.58	0.000	778.62	0.000
776.56	0.000	777.60	0.000	778.64	0.000
776.58	0.000	777.62	0.000	778.66	0.000
776.60	0.000	777.64	0.000	778.68	0.000
776.62	0.000	777.66	0.000	778.70	0.000
776.64	0.000	777.68	0.000	778.72	0.000
776.66	0.000	777.70	0.000	778.74	0.000
776.68	0.000	777.72	0.000	778.76	0.000
776.70	0.000	777.74	0.000	778.78	0.000
776.72	0.000	777.76	0.000	778.80	0.000
776.74	0.000	777.78	0.000	778.82	0.000
776.76	0.000	777.80	0.000	778.84	0.000
776.78	0.000	777.82	0.000	778.86	0.000
776.80	0.000	777.84	0.000	778.88	0.000
776.82	0.000	777.86	0.000	778.90	0.000
776.84	0.000	777.88	0.000	778.92	0.000
776.86	0.000	777.90	0.000	778.94	0.000
776.88	0.000	777.92	0.000	778.96	0.000
776.90	0.000	777.94	0.000	778.98	0.000
776.92	0.000	777.96	0.000	779.00	0.000
776.94	0.000	777.98	0.000	779.02	0.000
776.96	0.000	778.00	0.000	779.04	0.000
776.98	0.000	778.02	0.000	779.06	0.000
777.00	0.000	778.04	0.000	779.08	0.000
777.02	0.000	778.06	0.000	779.10	0.000
777.04	0.000	778.08	0.000	779.12	0.000
777.06	0.000	778.10	0.000	779.14	0.000
777.08	0.000	778.12	0.000	779.16	0.000
777.10	0.000	778.14	0.000	779.18	0.000
777.12	0.000	778.16	0.000	779.20	0.000
777.14	0.000	778.18	0.000	779.22	0.000
777.16	0.000	778.20	0.000	779.24	0.000
777.18	0.000	778.22	0.000	779.26	0.000
777.20	0.000	778.24	0.000	779.28	0.000
777.22	0.000	778.26	0.000	779.30	0.000
777.24	0.000	778.28	0.000	779.32	0.000
777.26	0.000	778.30	0.000	779.34	0.000
777.28	0.000	778.32	0.000	779.36	0.000
777.30	0.000	778.34	0.000	779.38	0.000
777.32	0.000	778.36	0.000	779.40	0.000
777.34	0.000	778.38	0.000	779.42	0.000
777.36	0.000	778.40	0.000	779.44	0.000
777.38	0.000	778.42	0.000		
777.40	0.000	778.44	0.000		
777.42	0.000	778.46	0.000		
777.44	0.000	778.48	0.000		
777.46	0.000	778.50	0.000		
777.48	0.000	778.52	0.000		
777.50	0.000	778.54	0.000		
777.52	0.000	778.56	0.000		

Summary for Pond SOCS: South OCS

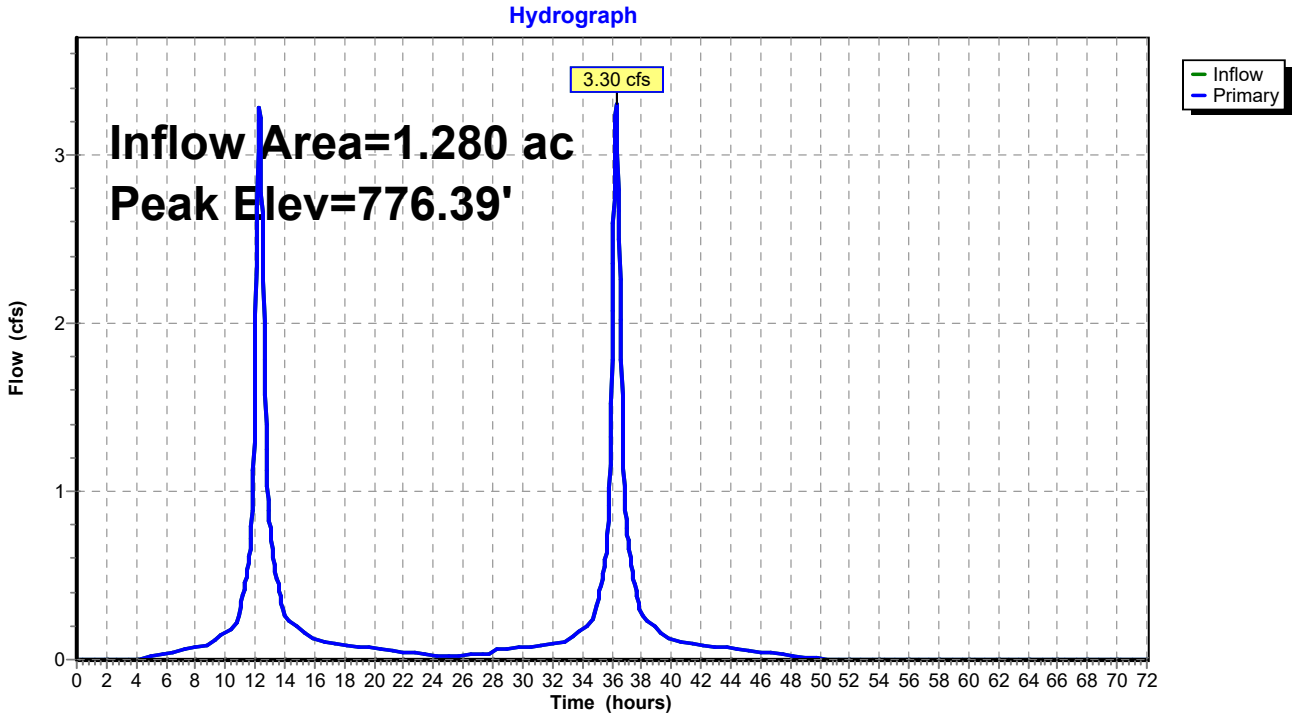
Inflow Area = 1.280 ac, 99.06% Impervious, Inflow Depth = 7.60" for 10-yrb2b event
Inflow = 3.30 cfs @ 36.29 hrs, Volume= 0.810 af
Outflow = 3.30 cfs @ 36.29 hrs, Volume= 0.810 af, Atten= 0%, Lag= 0.0 min
Primary = 3.30 cfs @ 36.29 hrs, Volume= 0.810 af
Routed to Reach S FLOWS : 15-in RCP

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs / 2
Peak Elev= 776.39' @ 36.29 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	776.00'	**OCS Weir, Cv= 2.62 (C= 3.28)** Head (feet) 2.30 6.80 Width (feet) 4.00 4.00
#2	Primary	773.80'	**2.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=3.28 cfs @ 36.29 hrs HW=776.38' TW=774.21' (Dynamic Tailwater)
└─**1=OCS Weir** (Weir Controls 3.13 cfs @ 2.03 fps)
└─**2=Orifice/Grate** (Orifice Controls 0.15 cfs @ 7.09 fps)

Pond SOCS: South OCS



Hydrograph for Pond SOCS: South OCS

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	773.80	0.00
0.80	0.00	773.80	0.00
1.60	0.00	773.80	0.00
2.40	0.00	773.80	0.00
3.20	0.00	773.81	0.00
4.00	0.00	773.84	0.00
4.80	0.01	773.89	0.01
5.60	0.03	773.96	0.03
6.40	0.02	773.93	0.02
7.20	0.07	774.27	0.07
8.00	0.08	774.41	0.08
8.80	0.09	774.58	0.09
9.60	0.14	775.62	0.14
10.40	0.18	776.02	0.18
11.20	0.39	776.07	0.39
12.00	1.75	776.25	1.75
12.80	1.13	776.18	1.13
13.60	0.42	776.07	0.42
14.40	0.22	776.03	0.22
15.20	0.18	776.01	0.18
16.00	0.12	775.11	0.12
16.80	0.10	774.80	0.10
17.60	0.09	774.63	0.09
18.40	0.08	774.50	0.08
19.20	0.07	774.38	0.07
20.00	0.07	774.27	0.07
20.80	0.06	774.18	0.06
21.60	0.05	774.10	0.05
22.40	0.04	774.03	0.04
23.20	0.03	773.98	0.03
24.00	0.03	773.94	0.03
24.80	0.02	773.92	0.02
25.60	0.02	773.94	0.02
26.40	0.03	773.97	0.03
27.20	0.03	773.99	0.03
28.00	0.06	774.21	0.06
28.80	0.06	774.22	0.06
29.60	0.07	774.30	0.07
30.40	0.08	774.41	0.08
31.20	0.09	774.54	0.09
32.00	0.09	774.68	0.09
32.80	0.10	774.84	0.10
33.60	0.16	776.00	0.16
34.40	0.20	776.02	0.20
35.20	0.41	776.07	0.41
36.00	**1.78**	**776.25**	**1.78**
36.80	**1.13**	**776.18**	**1.13**
37.60	0.42	776.07	0.42
38.40	0.22	776.03	0.22
39.20	0.18	776.01	0.18
40.00	0.12	775.12	0.12
40.80	0.10	774.81	0.10
41.60	0.09	774.64	0.09
42.40	0.08	774.50	0.08
43.20	0.07	774.38	0.07
44.00	0.07	774.27	0.07
44.80	0.06	774.18	0.06
45.60	0.05	774.10	0.05
46.40	0.04	774.03	0.04
47.20	0.03	773.98	0.03
48.00	0.03	773.94	0.03
48.80	0.01	773.89	0.01
49.60	0.01	773.87	0.01
50.40	0.01	773.86	0.01
51.20	0.00	773.85	0.00
52.00	0.00	773.84	0.00
52.80	0.00	773.84	0.00
53.60	0.00	773.83	0.00
54.40	0.00	773.83	0.00
55.20	0.00	773.83	0.00
56.00	0.00	773.82	0.00
56.80	0.00	773.82	0.00
57.60	0.00	773.82	0.00
58.40	0.00	773.82	0.00
59.20	0.00	773.82	0.00
60.00	0.00	773.82	0.00
60.80	0.00	773.82	0.00
61.60	0.00	773.82	0.00
62.40	0.00	773.81	0.00
63.20	0.00	773.81	0.00
64.00	0.00	773.81	0.00
64.80	0.00	773.81	0.00
65.60	0.00	773.81	0.00
66.40	0.00	773.81	0.00
67.20	0.00	773.81	0.00
68.00	0.00	773.81	0.00
68.80	0.00	773.81	0.00
69.60	0.00	773.81	0.00
70.40	0.00	773.81	0.00
71.20	0.00	773.81	0.00
72.00	0.00	773.81	0.00

Stage-Discharge for Pond SOCS: South OCS

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
773.80	0.00	776.40	3.48	779.00	68.31
773.85	0.00	776.45	4.12	779.05	70.02
773.90	0.01	776.50	4.80	779.10	71.74
773.95	0.03	776.55	5.51	779.15	73.48
774.00	0.04	776.60	6.26	779.20	75.23
774.05	0.04	776.65	7.04	779.25	77.00
774.10	0.05	776.70	7.85	779.30	78.78
774.15	0.05	776.75	8.69	779.35	80.57
774.20	0.06	776.80	9.55	779.40	82.37
774.25	0.06	776.85	10.45	779.45	84.19
774.30	0.07	776.90	11.37	779.50	86.03
774.35	0.07	776.95	12.31	779.55	87.87
774.40	0.08	777.00	13.29	779.60	89.73
774.45	0.08	777.05	14.28	779.65	91.60
774.50	0.08	777.10	15.30	779.70	93.49
774.55	0.09	777.15	16.35	779.75	95.38
774.60	0.09	777.20	17.41	779.80	97.29
774.65	0.09	777.25	18.50	779.85	99.22
774.70	0.09	777.30	19.61	779.90	101.15
774.75	0.10	777.35	20.74	779.95	103.10
774.80	0.10	777.40	21.90	780.00	105.06
774.85	0.10	777.45	23.07	780.05	107.03
774.90	0.11	777.50	24.27	780.10	109.02
774.95	0.11	777.55	25.48	780.15	111.01
775.00	0.11	777.60	26.72	780.20	113.02
775.05	0.11	777.65	27.97	780.25	115.04
775.10	0.12	777.70	29.24	780.30	117.07
775.15	0.12	777.75	30.53	780.35	119.12
775.20	0.12	777.80	31.84	780.40	121.17
775.25	0.12	777.85	33.17	780.45	123.24
775.30	0.13	777.90	34.52	780.50	**125.32**
775.35	0.13	777.95	35.88		
775.40	0.13	778.00	37.27		
775.45	0.13	778.05	38.66		
775.50	0.13	778.10	40.08		
775.55	0.14	778.15	41.51		
775.60	0.14	778.20	42.97		
775.65	0.14	778.25	44.43		
775.70	0.14	778.30	45.92		
775.75	0.14	778.35	47.41		
775.80	0.15	778.40	48.93		
775.85	0.15	778.45	50.46		
775.90	0.15	778.50	52.01		
775.95	0.15	778.55	53.57		
776.00	0.15	778.60	55.15		
776.05	0.30	778.65	56.74		
776.10	0.57	778.70	58.35		
776.15	0.92	778.75	59.97		
776.20	1.33	778.80	61.61		
776.25	1.80	778.85	63.26		
776.30	2.32	778.90	64.93		
776.35	2.88	778.95	66.61		

Stage-Area-Storage for Pond SOCS: South OCS

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
773.80	**0.000**	776.40	0.000	779.00	0.000
773.85	0.000	776.45	0.000	779.05	0.000
773.90	0.000	776.50	0.000	779.10	0.000
773.95	0.000	776.55	0.000	779.15	0.000
774.00	0.000	776.60	0.000	779.20	0.000
774.05	0.000	776.65	0.000	779.25	0.000
774.10	0.000	776.70	0.000	779.30	0.000
774.15	0.000	776.75	0.000	779.35	0.000
774.20	0.000	776.80	0.000	779.40	0.000
774.25	0.000	776.85	0.000	779.45	0.000
774.30	0.000	776.90	0.000	779.50	0.000
774.35	0.000	776.95	0.000	779.55	0.000
774.40	0.000	777.00	0.000	779.60	0.000
774.45	0.000	777.05	0.000	779.65	0.000
774.50	0.000	777.10	0.000	779.70	0.000
774.55	0.000	777.15	0.000	779.75	0.000
774.60	0.000	777.20	0.000	779.80	0.000
774.65	0.000	777.25	0.000	779.85	0.000
774.70	0.000	777.30	0.000	779.90	0.000
774.75	0.000	777.35	0.000	779.95	0.000
774.80	0.000	777.40	0.000	780.00	0.000
774.85	0.000	777.45	0.000	780.05	0.000
774.90	0.000	777.50	0.000	780.10	0.000
774.95	0.000	777.55	0.000	780.15	0.000
775.00	0.000	777.60	0.000	780.20	0.000
775.05	0.000	777.65	0.000	780.25	0.000
775.10	0.000	777.70	0.000	780.30	0.000
775.15	0.000	777.75	0.000	780.35	0.000
775.20	0.000	777.80	0.000	780.40	0.000
775.25	0.000	777.85	0.000	780.45	0.000
775.30	0.000	777.90	0.000	780.50	0.000
775.35	0.000	777.95	0.000		
775.40	0.000	778.00	0.000		
775.45	0.000	778.05	0.000		
775.50	0.000	778.10	0.000		
775.55	0.000	778.15	0.000		
775.60	0.000	778.20	0.000		
775.65	0.000	778.25	0.000		
775.70	0.000	778.30	0.000		
775.75	0.000	778.35	0.000		
775.80	0.000	778.40	0.000		
775.85	0.000	778.45	0.000		
775.90	0.000	778.50	0.000		
775.95	0.000	778.55	0.000		
776.00	0.000	778.60	0.000		
776.05	0.000	778.65	0.000		
776.10	0.000	778.70	0.000		
776.15	0.000	778.75	0.000		
776.20	0.000	778.80	0.000		
776.25	0.000	778.85	0.000		
776.30	0.000	778.90	0.000		
776.35	0.000	778.95	0.000		

Time span=0.00-72.00 hrs, dt=0.04 hrs, 1801 points x 2
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentDA1: SW Half Parking Lot & Runoff Area=1.280 ac 99.06% Impervious Runoff Depth=6.95"
Tc=10.0 min CN=98 Runoff=11.64 cfs 0.741 af

SubcatchmentDA2: Central Parking Lot Runoff Area=0.058 ac 100.00% Impervious Runoff Depth=6.95"
Tc=10.0 min CN=98 Runoff=0.53 cfs 0.034 af

SubcatchmentDA3: Parking Ramp Runoff Area=29,103 sf 100.00% Impervious Runoff Depth=6.95"
Tc=10.0 min CN=98 Runoff=6.07 cfs 0.387 af

SubcatchmentDA4: North half of Parking Runoff Area=0.307 ac 96.74% Impervious Runoff Depth=6.83"
Tc=10.0 min CN=97 Runoff=2.78 cfs 0.175 af

SubcatchmentDA5: N and W Edges Runoff Area=0.300 ac 76.33% Impervious Runoff Depth=6.48"
Tc=10.0 min CN=94 Runoff=2.67 cfs 0.162 af

Reach 5.1: 12-in Catch Basin Avg. Flow Depth=0.73' Max Vel=4.33 fps Inflow=2.67 cfs 0.162 af
12.0" Round Pipe n=0.015 L=46.1' S=0.0095 '/' Capacity=3.02 cfs Outflow=2.67 cfs 0.162 af

Reach N FLOWS: 108-in RCP Avg. Flow Depth=2.54' Max Vel=0.56 fps Inflow=10.90 cfs 0.873 af
108.0" Round Pipe n=0.015 L=512.0' S=0.0000 '/' Capacity=47.83 cfs Outflow=8.33 cfs 0.873 af

Reach S FLOWS: 15-in RCP Avg. Flow Depth=0.48' Max Vel=10.01 fps Inflow=4.31 cfs 0.625 af
15.0" Round Pipe n=0.015 L=27.5' S=0.0618 '/' Capacity=13.92 cfs Outflow=4.32 cfs 0.625 af

Pond NADS: North ADS MC-3500 Peak Elev=773.95' Storage=0.179 af Inflow=15.43 cfs 0.712 af
18.0" Round Culvert n=0.013 L=216.0' S=0.0050 '/' Outflow=8.95 cfs 0.711 af

Pond SADS: South ADS MC-3500 Peak Elev=776.04' Storage=0.077 af Inflow=5.59 cfs 0.625 af
12.0" Round Culvert n=0.013 L=30.0' S=0.0033 '/' Outflow=4.31 cfs 0.625 af

Pond SEP: SEPARATOR Peak Elev=781.45' Inflow=11.64 cfs 0.741 af
Primary=5.59 cfs 0.625 af Secondary=6.04 cfs 0.116 af Outflow=11.64 cfs 0.741 af

Pond SOCS: South OCS Peak Elev=776.46' Inflow=4.31 cfs 0.625 af
Outflow=4.31 cfs 0.625 af

Summary for Subcatchment DA1: SW Half Parking Lot & Residential Building

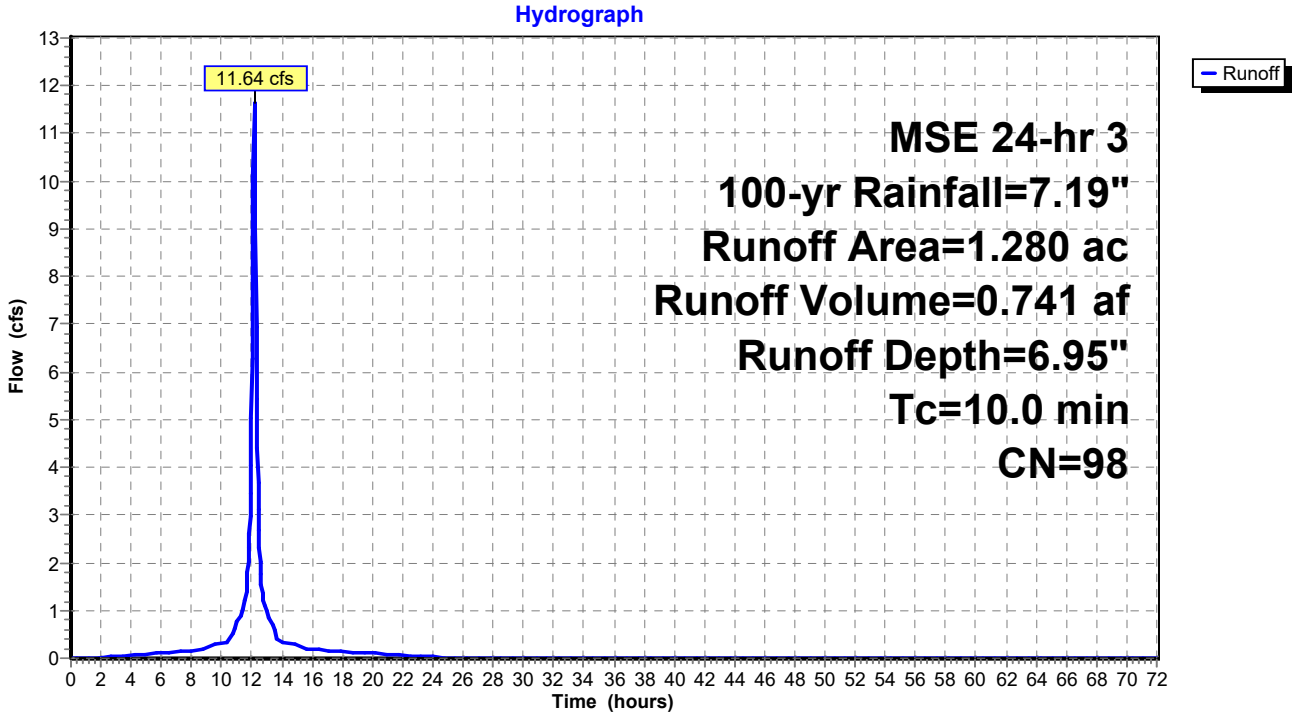
Runoff = 11.64 cfs @ 12.17 hrs, Volume= 0.741 af, Depth= 6.95"
Routed to Pond SEP : SEPARATOR

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs
MSE 24-hr 3 100-yr Rainfall=7.19"

Area (ac)	CN	Description
1.268	98	Paved parking, HSG D
0.012	80	>75% Grass cover, Good, HSG D
1.280	98	Weighted Average
0.012		0.94% Pervious Area
1.268		99.06% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, 10 min Minimum**

Subcatchment DA1: SW Half Parking Lot & Residential Building



Hydrograph for Subcatchment DA1: SW Half Parking Lot & Residential Building

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.80	0.02	0.00	0.00
1.60	0.05	0.00	0.00
2.40	0.09	0.01	0.02
3.20	0.13	0.03	0.04
4.00	0.19	0.06	0.06
4.80	0.25	0.11	0.08
5.60	0.33	0.17	0.10
6.40	0.41	0.24	0.12
7.20	0.50	0.32	0.14
8.00	0.60	0.41	0.15
8.80	0.71	0.51	0.17
9.60	0.89	0.68	0.30
10.40	1.10	0.88	0.34
11.20	1.53	1.31	0.87
12.00	3.33	3.10	**5.02**
12.80	5.66	5.42	**1.13**
13.60	6.09	5.86	0.51
14.40	6.30	6.07	0.33
15.20	6.48	6.24	0.21
16.00	6.59	6.35	0.17
16.80	6.69	6.45	0.16
17.60	6.78	6.54	0.14
18.40	6.86	6.62	0.13
19.20	6.94	6.70	0.11
20.00	7.00	6.76	0.10
20.80	7.06	6.82	0.09
21.60	7.10	6.87	0.07
22.40	7.14	6.90	0.06
23.20	7.17	6.93	0.04
24.00	**7.19**	**6.95**	0.03
24.80	7.19	6.95	0.00
25.60	7.19	6.95	0.00
26.40	7.19	6.95	0.00
27.20	7.19	6.95	0.00
28.00	7.19	6.95	0.00
28.80	7.19	6.95	0.00
29.60	7.19	6.95	0.00
30.40	7.19	6.95	0.00
31.20	7.19	6.95	0.00
32.00	7.19	6.95	0.00
32.80	7.19	6.95	0.00
33.60	7.19	6.95	0.00
34.40	7.19	6.95	0.00
35.20	7.19	6.95	0.00
36.00	7.19	6.95	0.00
36.80	7.19	6.95	0.00
37.60	7.19	6.95	0.00
38.40	7.19	6.95	0.00
39.20	7.19	6.95	0.00
40.00	7.19	6.95	0.00
40.80	7.19	6.95	0.00
41.60	7.19	6.95	0.00
42.40	7.19	6.95	0.00
43.20	7.19	6.95	0.00
44.00	7.19	6.95	0.00
44.80	7.19	6.95	0.00
45.60	7.19	6.95	0.00
46.40	7.19	6.95	0.00
47.20	7.19	6.95	0.00
48.00	7.19	6.95	0.00
48.80	7.19	6.95	0.00
49.60	7.19	6.95	0.00
50.40	7.19	6.95	0.00
51.20	7.19	6.95	0.00
52.00	7.19	6.95	0.00
52.80	7.19	6.95	0.00
53.60	7.19	6.95	0.00
54.40	7.19	6.95	0.00
55.20	7.19	6.95	0.00
56.00	7.19	6.95	0.00
56.80	7.19	6.95	0.00
57.60	7.19	6.95	0.00
58.40	7.19	6.95	0.00
59.20	7.19	6.95	0.00
60.00	7.19	6.95	0.00
60.80	7.19	6.95	0.00
61.60	7.19	6.95	0.00
62.40	7.19	6.95	0.00
63.20	7.19	6.95	0.00
64.00	7.19	6.95	0.00
64.80	7.19	6.95	0.00
65.60	7.19	6.95	0.00
66.40	7.19	6.95	0.00
67.20	7.19	6.95	0.00
68.00	7.19	6.95	0.00
68.80	7.19	6.95	0.00
69.60	7.19	6.95	0.00
70.40	7.19	6.95	0.00
71.20	7.19	6.95	0.00
72.00	7.19	6.95	0.00

Summary for Subcatchment DA2: Central Parking Lot

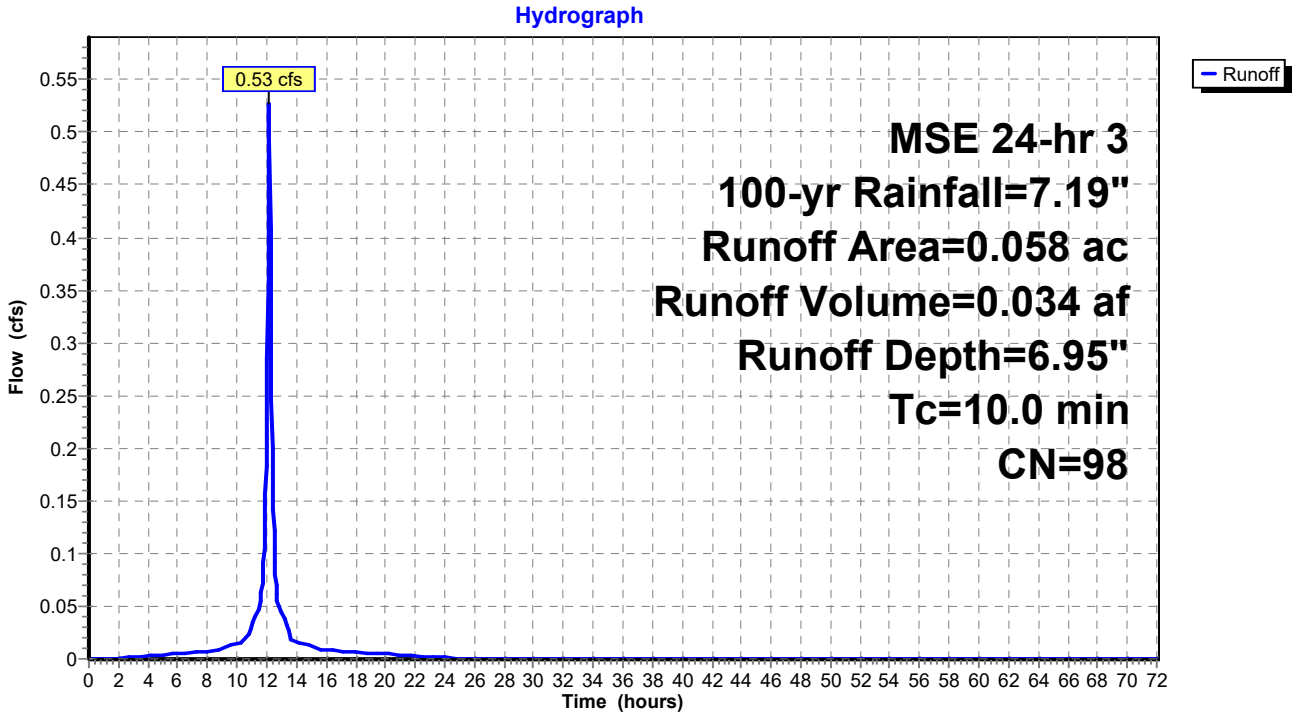
Runoff = 0.53 cfs @ 12.17 hrs, Volume= 0.034 af, Depth= 6.95"
Routed to Pond NADS : North ADS MC-3500

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs
MSE 24-hr 3 100-yr Rainfall=7.19"

	Area (ac)	CN	Description
*	0.058	98	Paved Surfaces
	0.058		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, minimum**

Subcatchment DA2: Central Parking Lot



Hydrograph for Subcatchment DA2: Central Parking Lot

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.80	0.02	0.00	0.00
1.60	0.05	0.00	0.00
2.40	0.09	0.01	0.00
3.20	0.13	0.03	0.00
4.00	0.19	0.06	0.00
4.80	0.25	0.11	0.00
5.60	0.33	0.17	0.00
6.40	0.41	0.24	0.01
7.20	0.50	0.32	0.01
8.00	0.60	0.41	0.01
8.80	0.71	0.51	0.01
9.60	0.89	0.68	0.01
10.40	1.10	0.88	0.02
11.20	1.53	1.31	0.04
12.00	3.33	3.10	**0.23**
12.80	5.66	5.42	**0.05**
13.60	6.09	5.86	0.02
14.40	6.30	6.07	0.01
15.20	6.48	6.24	0.01
16.00	6.59	6.35	0.01
16.80	6.69	6.45	0.01
17.60	6.78	6.54	0.01
18.40	6.86	6.62	0.01
19.20	6.94	6.70	0.01
20.00	7.00	6.76	0.00
20.80	7.06	6.82	0.00
21.60	7.10	6.87	0.00
22.40	7.14	6.90	0.00
23.20	7.17	6.93	0.00
24.00	**7.19**	**6.95**	0.00
24.80	7.19	6.95	0.00
25.60	7.19	6.95	0.00
26.40	7.19	6.95	0.00
27.20	7.19	6.95	0.00
28.00	7.19	6.95	0.00
28.80	7.19	6.95	0.00
29.60	7.19	6.95	0.00
30.40	7.19	6.95	0.00
31.20	7.19	6.95	0.00
32.00	7.19	6.95	0.00
32.80	7.19	6.95	0.00
33.60	7.19	6.95	0.00
34.40	7.19	6.95	0.00
35.20	7.19	6.95	0.00
36.00	7.19	6.95	0.00
36.80	7.19	6.95	0.00
37.60	7.19	6.95	0.00
38.40	7.19	6.95	0.00
39.20	7.19	6.95	0.00
40.00	7.19	6.95	0.00
40.80	7.19	6.95	0.00
41.60	7.19	6.95	0.00
42.40	7.19	6.95	0.00
43.20	7.19	6.95	0.00
44.00	7.19	6.95	0.00
44.80	7.19	6.95	0.00
45.60	7.19	6.95	0.00
46.40	7.19	6.95	0.00
47.20	7.19	6.95	0.00
48.00	7.19	6.95	0.00
48.80	7.19	6.95	0.00
49.60	7.19	6.95	0.00
50.40	7.19	6.95	0.00
51.20	7.19	6.95	0.00
52.00	7.19	6.95	0.00
52.80	7.19	6.95	0.00
53.60	7.19	6.95	0.00
54.40	7.19	6.95	0.00
55.20	7.19	6.95	0.00
56.00	7.19	6.95	0.00
56.80	7.19	6.95	0.00
57.60	7.19	6.95	0.00
58.40	7.19	6.95	0.00
59.20	7.19	6.95	0.00
60.00	7.19	6.95	0.00
60.80	7.19	6.95	0.00
61.60	7.19	6.95	0.00
62.40	7.19	6.95	0.00
63.20	7.19	6.95	0.00
64.00	7.19	6.95	0.00
64.80	7.19	6.95	0.00
65.60	7.19	6.95	0.00
66.40	7.19	6.95	0.00
67.20	7.19	6.95	0.00
68.00	7.19	6.95	0.00
68.80	7.19	6.95	0.00
69.60	7.19	6.95	0.00
70.40	7.19	6.95	0.00
71.20	7.19	6.95	0.00
72.00	7.19	6.95	0.00

Summary for Subcatchment DA3: Parking Ramp

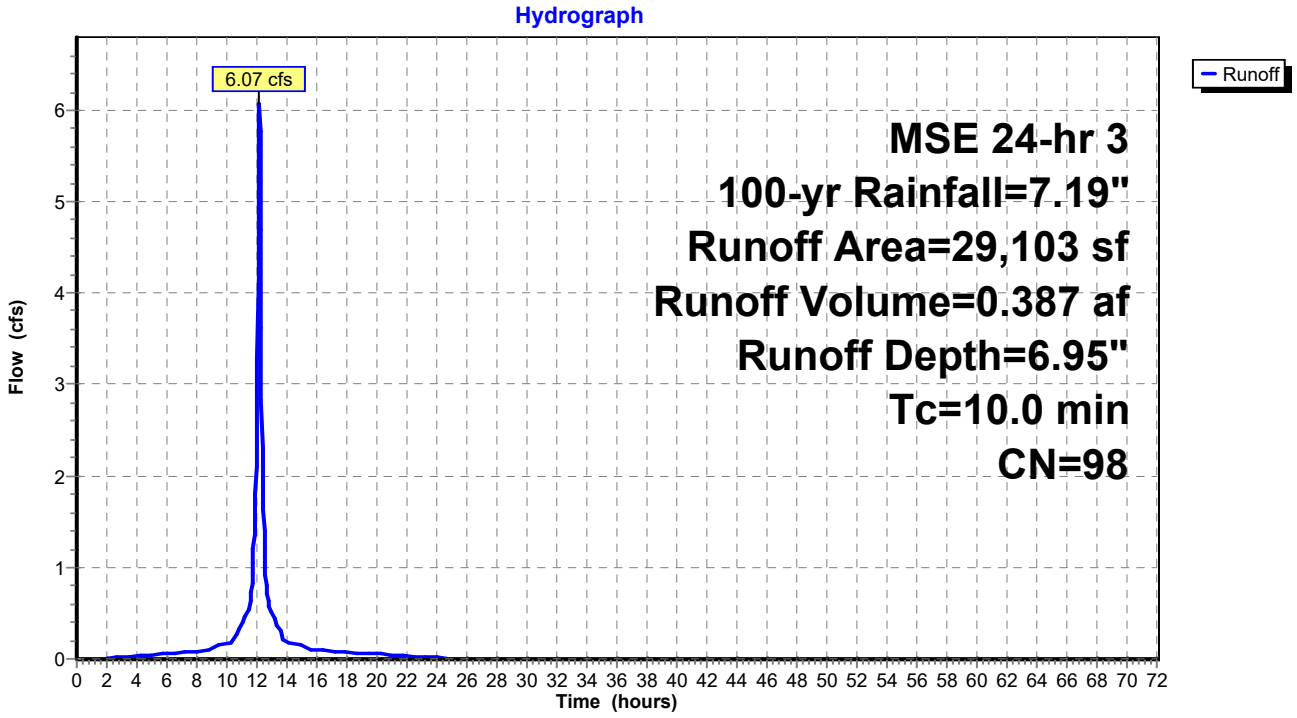
Runoff = 6.07 cfs @ 12.17 hrs, Volume= 0.387 af, Depth= 6.95"
Routed to Pond NADS : North ADS MC-3500

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs
MSE 24-hr 3 100-yr Rainfall=7.19"

	Area (sf)	CN	Description
*	29,103	98	Paved Parking Ramp
	29,103		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, Minimum**

Subcatchment DA3: Parking Ramp



Hydrograph for Subcatchment DA3: Parking Ramp

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.80	0.02	0.00	0.00
1.60	0.05	0.00	0.00
2.40	0.09	0.01	0.01
3.20	0.13	0.03	0.02
4.00	0.19	0.06	0.03
4.80	0.25	0.11	0.04
5.60	0.33	0.17	0.05
6.40	0.41	0.24	0.06
7.20	0.50	0.32	0.07
8.00	0.60	0.41	0.08
8.80	0.71	0.51	0.09
9.60	0.89	0.68	0.16
10.40	1.10	0.88	0.18
11.20	1.53	1.31	0.45
12.00	3.33	3.10	**2.62**
12.80	5.66	5.42	**0.59**
13.60	6.09	5.86	0.27
14.40	6.30	6.07	0.17
15.20	6.48	6.24	0.11
16.00	6.59	6.35	0.09
16.80	6.69	6.45	0.08
17.60	6.78	6.54	0.08
18.40	6.86	6.62	0.07
19.20	6.94	6.70	0.06
20.00	7.00	6.76	0.05
20.80	7.06	6.82	0.04
21.60	7.10	6.87	0.04
22.40	7.14	6.90	0.03
23.20	7.17	6.93	0.02
24.00	**7.19**	**6.95**	0.01
24.80	7.19	6.95	0.00
25.60	7.19	6.95	0.00
26.40	7.19	6.95	0.00
27.20	7.19	6.95	0.00
28.00	7.19	6.95	0.00
28.80	7.19	6.95	0.00
29.60	7.19	6.95	0.00
30.40	7.19	6.95	0.00
31.20	7.19	6.95	0.00
32.00	7.19	6.95	0.00
32.80	7.19	6.95	0.00
33.60	7.19	6.95	0.00
34.40	7.19	6.95	0.00
35.20	7.19	6.95	0.00
36.00	7.19	6.95	0.00
36.80	7.19	6.95	0.00
37.60	7.19	6.95	0.00
38.40	7.19	6.95	0.00
39.20	7.19	6.95	0.00
40.00	7.19	6.95	0.00
40.80	7.19	6.95	0.00
41.60	7.19	6.95	0.00
42.40	7.19	6.95	0.00
43.20	7.19	6.95	0.00
44.00	7.19	6.95	0.00
44.80	7.19	6.95	0.00
45.60	7.19	6.95	0.00
46.40	7.19	6.95	0.00
47.20	7.19	6.95	0.00
48.00	7.19	6.95	0.00
48.80	7.19	6.95	0.00
49.60	7.19	6.95	0.00
50.40	7.19	6.95	0.00
51.20	7.19	6.95	0.00
52.00	7.19	6.95	0.00
52.80	7.19	6.95	0.00
53.60	7.19	6.95	0.00
54.40	7.19	6.95	0.00
55.20	7.19	6.95	0.00
56.00	7.19	6.95	0.00
56.80	7.19	6.95	0.00
57.60	7.19	6.95	0.00
58.40	7.19	6.95	0.00
59.20	7.19	6.95	0.00
60.00	7.19	6.95	0.00
60.80	7.19	6.95	0.00
61.60	7.19	6.95	0.00
62.40	7.19	6.95	0.00
63.20	7.19	6.95	0.00
64.00	7.19	6.95	0.00
64.80	7.19	6.95	0.00
65.60	7.19	6.95	0.00
66.40	7.19	6.95	0.00
67.20	7.19	6.95	0.00
68.00	7.19	6.95	0.00
68.80	7.19	6.95	0.00
69.60	7.19	6.95	0.00
70.40	7.19	6.95	0.00
71.20	7.19	6.95	0.00
72.00	7.19	6.95	0.00

Summary for Subcatchment DA4: North half of Parking and Office Tower

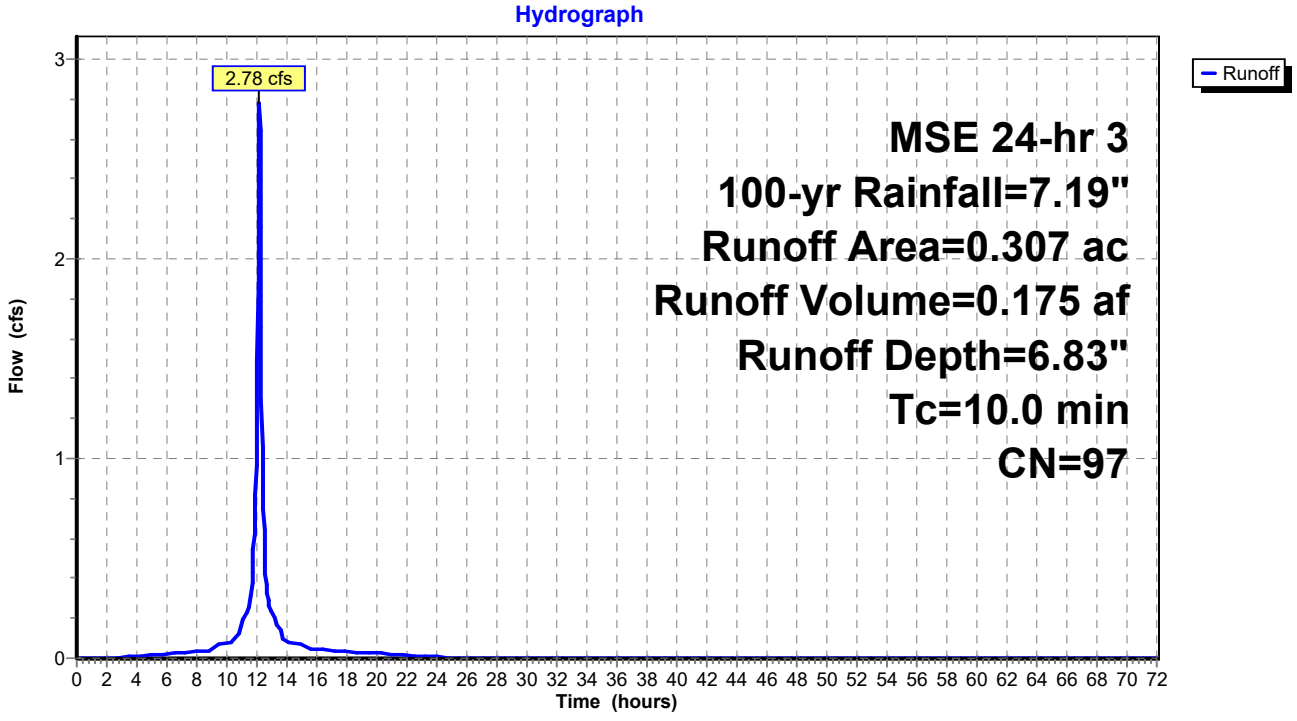
Runoff = 2.78 cfs @ 12.17 hrs, Volume= 0.175 af, Depth= 6.83"
Routed to Pond NADS : North ADS MC-3500

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs
MSE 24-hr 3 100-yr Rainfall=7.19"

	Area (ac)	CN	Description
*	0.297	98	Paved Surfaces
*	0.010	80	Grass cover D soils
	0.307	97	Weighted Average
	0.010		3.26% Pervious Area
	0.297		96.74% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry, minimum**

Subcatchment DA4: North half of Parking and Office Tower



Hydrograph for Subcatchment DA4: North half of Parking and Office Tower

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.80	0.02	0.00	0.00
1.60	0.05	0.00	0.00
2.40	0.09	0.00	0.00
3.20	0.13	0.01	0.01
4.00	0.19	0.04	0.01
4.80	0.25	0.07	0.02
5.60	0.33	0.12	0.02
6.40	0.41	0.18	0.03
7.20	0.50	0.26	0.03
8.00	0.60	0.34	0.03
8.80	0.71	0.44	0.04
9.60	0.89	0.60	0.07
10.40	1.10	0.80	0.08
11.20	1.53	1.21	0.20
12.00	3.33	2.98	**1.20**
12.80	5.66	5.31	**0.27**
13.60	6.09	5.74	0.12
14.40	6.30	5.95	0.08
15.20	6.48	6.12	0.05
16.00	6.59	6.23	0.04
16.80	6.69	6.33	0.04
17.60	6.78	6.42	0.03
18.40	6.86	6.51	0.03
19.20	6.94	6.58	0.03
20.00	7.00	6.64	0.02
20.80	7.06	6.70	0.02
21.60	7.10	6.75	0.02
22.40	7.14	6.78	0.01
23.20	7.17	6.81	0.01
24.00	**7.19**	**6.83**	0.01
24.80	7.19	6.83	0.00
25.60	7.19	6.83	0.00
26.40	7.19	6.83	0.00
27.20	7.19	6.83	0.00
28.00	7.19	6.83	0.00
28.80	7.19	6.83	0.00
29.60	7.19	6.83	0.00
30.40	7.19	6.83	0.00
31.20	7.19	6.83	0.00
32.00	7.19	6.83	0.00
32.80	7.19	6.83	0.00
33.60	7.19	6.83	0.00
34.40	7.19	6.83	0.00
35.20	7.19	6.83	0.00
36.00	7.19	6.83	0.00
36.80	7.19	6.83	0.00
37.60	7.19	6.83	0.00
38.40	7.19	6.83	0.00
39.20	7.19	6.83	0.00
40.00	7.19	6.83	0.00
40.80	7.19	6.83	0.00
41.60	7.19	6.83	0.00
42.40	7.19	6.83	0.00
43.20	7.19	6.83	0.00
44.00	7.19	6.83	0.00
44.80	7.19	6.83	0.00
45.60	7.19	6.83	0.00
46.40	7.19	6.83	0.00
47.20	7.19	6.83	0.00
48.00	7.19	6.83	0.00
48.80	7.19	6.83	0.00
49.60	7.19	6.83	0.00
50.40	7.19	6.83	0.00
51.20	7.19	6.83	0.00
52.00	7.19	6.83	0.00
52.80	7.19	6.83	0.00
53.60	7.19	6.83	0.00
54.40	7.19	6.83	0.00
55.20	7.19	6.83	0.00
56.00	7.19	6.83	0.00
56.80	7.19	6.83	0.00
57.60	7.19	6.83	0.00
58.40	7.19	6.83	0.00
59.20	7.19	6.83	0.00
60.00	7.19	6.83	0.00
60.80	7.19	6.83	0.00
61.60	7.19	6.83	0.00
62.40	7.19	6.83	0.00
63.20	7.19	6.83	0.00
64.00	7.19	6.83	0.00
64.80	7.19	6.83	0.00
65.60	7.19	6.83	0.00
66.40	7.19	6.83	0.00
67.20	7.19	6.83	0.00
68.00	7.19	6.83	0.00
68.80	7.19	6.83	0.00
69.60	7.19	6.83	0.00
70.40	7.19	6.83	0.00
71.20	7.19	6.83	0.00
72.00	7.19	6.83	0.00

Summary for Subcatchment DA5: N and W Edges

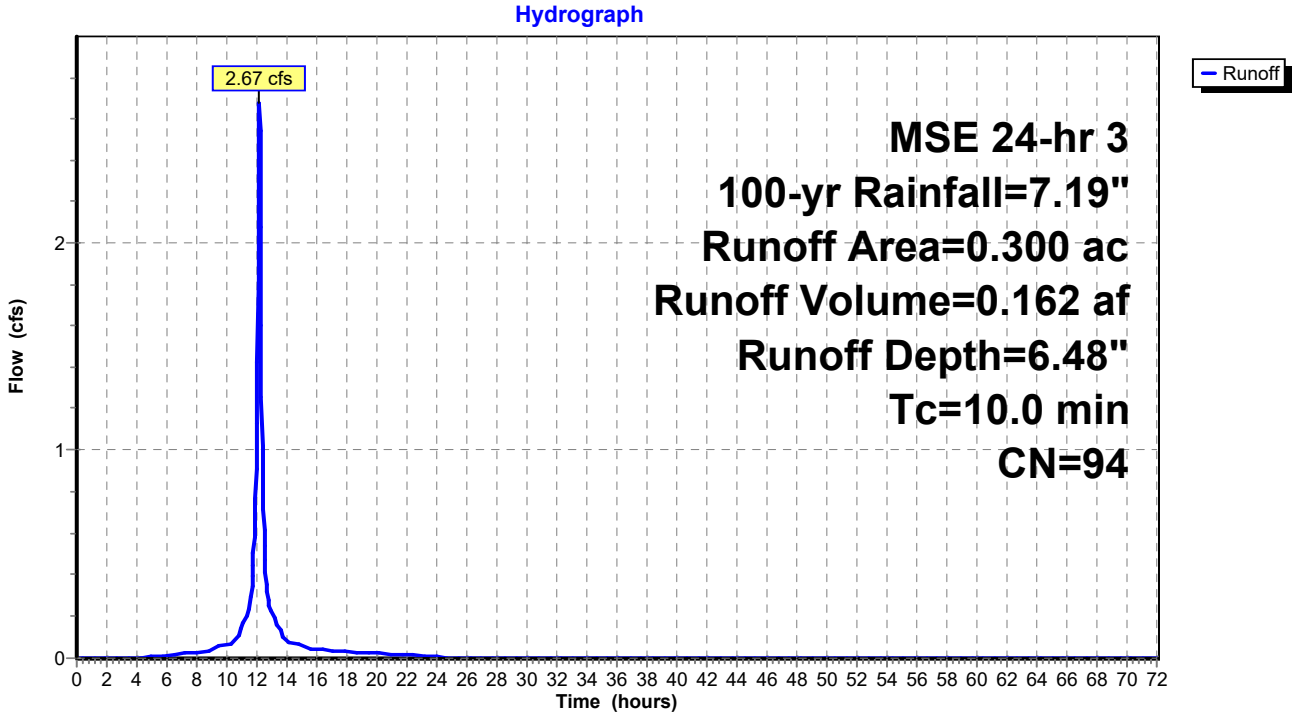
Runoff = 2.67 cfs @ 12.17 hrs, Volume= 0.162 af, Depth= 6.48"
Routed to Reach 5.1 : 12-in Catch Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs
MSE 24-hr 3 100-yr Rainfall=7.19"

	Area (ac)	CN	Description
*	0.229	98	Paved Surfaces
	0.071	80	>75% Grass cover, Good, HSG D
	0.300	94	Weighted Average
	0.071		23.67% Pervious Area
	0.229		76.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Subcatchment DA5: N and W Edges



Hydrograph for Subcatchment DA5: N and W Edges

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
0.80	0.02	0.00	0.00
1.60	0.05	0.00	0.00
2.40	0.09	0.00	0.00
3.20	0.13	0.00	0.00
4.00	0.19	0.01	0.00
4.80	0.25	0.02	0.01
5.60	0.33	0.05	0.01
6.40	0.41	0.09	0.02
7.20	0.50	0.14	0.02
8.00	0.60	0.20	0.03
8.80	0.71	0.28	0.03
9.60	0.89	0.41	0.06
10.40	1.10	0.58	0.07
11.20	1.53	0.96	0.18
12.00	3.33	2.67	**1.13**
12.80	5.66	4.96	**0.26**
13.60	6.09	5.39	0.12
14.40	6.30	5.60	0.08
15.20	6.48	5.77	0.05
16.00	6.59	5.88	0.04
16.80	6.69	5.98	0.04
17.60	6.78	6.07	0.03
18.40	6.86	6.15	0.03
19.20	6.94	6.23	0.03
20.00	7.00	6.29	0.02
20.80	7.06	6.35	0.02
21.60	7.10	6.39	0.02
22.40	7.14	6.43	0.01
23.20	7.17	6.46	0.01
24.00	**7.19**	**6.48**	0.01
24.80	7.19	6.48	0.00
25.60	7.19	6.48	0.00
26.40	7.19	6.48	0.00
27.20	7.19	6.48	0.00
28.00	7.19	6.48	0.00
28.80	7.19	6.48	0.00
29.60	7.19	6.48	0.00
30.40	7.19	6.48	0.00
31.20	7.19	6.48	0.00
32.00	7.19	6.48	0.00
32.80	7.19	6.48	0.00
33.60	7.19	6.48	0.00
34.40	7.19	6.48	0.00
35.20	7.19	6.48	0.00
36.00	7.19	6.48	0.00
36.80	7.19	6.48	0.00
37.60	7.19	6.48	0.00
38.40	7.19	6.48	0.00
39.20	7.19	6.48	0.00
40.00	7.19	6.48	0.00
40.80	7.19	6.48	0.00
41.60	7.19	6.48	0.00
42.40	7.19	6.48	0.00
43.20	7.19	6.48	0.00
44.00	7.19	6.48	0.00
44.80	7.19	6.48	0.00
45.60	7.19	6.48	0.00
46.40	7.19	6.48	0.00
47.20	7.19	6.48	0.00
48.00	7.19	6.48	0.00
48.80	7.19	6.48	0.00
49.60	7.19	6.48	0.00
50.40	7.19	6.48	0.00
51.20	7.19	6.48	0.00
52.00	7.19	6.48	0.00
52.80	7.19	6.48	0.00
53.60	7.19	6.48	0.00
54.40	7.19	6.48	0.00
55.20	7.19	6.48	0.00
56.00	7.19	6.48	0.00
56.80	7.19	6.48	0.00
57.60	7.19	6.48	0.00
58.40	7.19	6.48	0.00
59.20	7.19	6.48	0.00
60.00	7.19	6.48	0.00
60.80	7.19	6.48	0.00
61.60	7.19	6.48	0.00
62.40	7.19	6.48	0.00
63.20	7.19	6.48	0.00
64.00	7.19	6.48	0.00
64.80	7.19	6.48	0.00
65.60	7.19	6.48	0.00
66.40	7.19	6.48	0.00
67.20	7.19	6.48	0.00
68.00	7.19	6.48	0.00
68.80	7.19	6.48	0.00
69.60	7.19	6.48	0.00
70.40	7.19	6.48	0.00
71.20	7.19	6.48	0.00
72.00	7.19	6.48	0.00

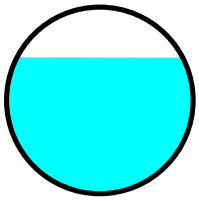
Summary for Reach 5.1: 12-in Catch Basin

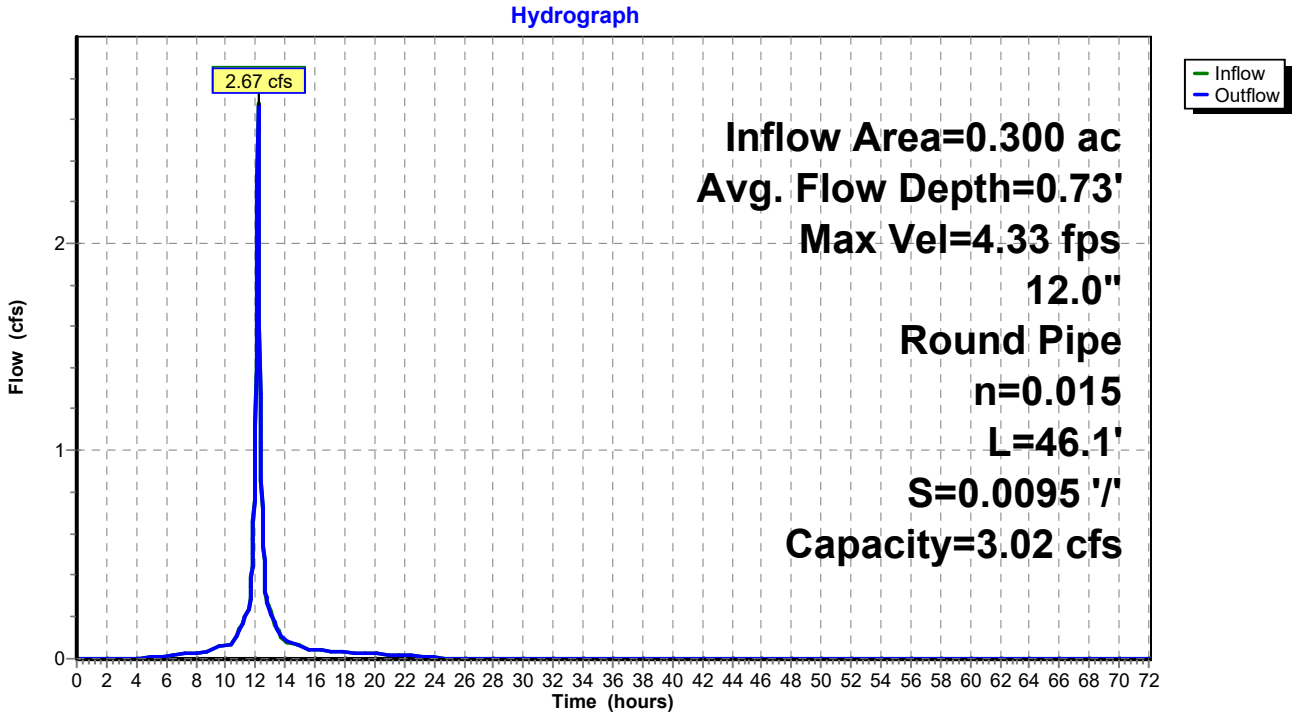
Inflow Area = 0.300 ac, 76.33% Impervious, Inflow Depth = 6.48" for 100-yr event
Inflow = 2.67 cfs @ 12.17 hrs, Volume= 0.162 af
Outflow = 2.67 cfs @ 12.17 hrs, Volume= 0.162 af, Atten= 0%, Lag= 0.2 min
Routed to Reach N FLOWS : 108-in RCP

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs / 2
Max. Velocity= 4.33 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.33 fps, Avg. Travel Time= 0.6 min

Peak Storage= 28 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.73' , Surface Width= 0.89'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.02 cfs

12.0" Round Pipe
n= 0.015 Concrete sewer w/manholes & inlets
Length= 46.1' Slope= 0.0095 '/'
Inlet Invert= 772.55', Outlet Invert= 772.11'





Hydrograph for Reach 5.1: 12-in Catch Basin

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	772.55	0.00
2.00	0.00	0	772.55	0.00
4.00	0.00	0	772.57	0.00
6.00	0.01	1	772.60	0.01
8.00	0.03	1	772.62	0.03
10.00	0.06	2	772.65	0.06
12.00	**1.13**	**14**	**772.97**	**1.11**
14.00	**0.08**	**2**	**772.66**	**0.08**
16.00	0.04	1	772.63	0.04
18.00	0.03	1	772.62	0.03
20.00	0.02	1	772.61	0.02
22.00	0.01	1	772.60	0.01
24.00	0.01	0	772.58	0.01
26.00	0.00	0	772.55	0.00
28.00	0.00	0	772.55	0.00
30.00	0.00	0	772.55	0.00
32.00	0.00	0	772.55	0.00
34.00	0.00	0	772.55	0.00
36.00	0.00	0	772.55	0.00
38.00	0.00	0	772.55	0.00
40.00	0.00	0	772.55	0.00
42.00	0.00	0	772.55	0.00
44.00	0.00	0	772.55	0.00
46.00	0.00	0	772.55	0.00
48.00	0.00	0	772.55	0.00
50.00	0.00	0	772.55	0.00
52.00	0.00	0	772.55	0.00
54.00	0.00	0	772.55	0.00
56.00	0.00	0	772.55	0.00
58.00	0.00	0	772.55	0.00
60.00	0.00	0	772.55	0.00
62.00	0.00	0	772.55	0.00
64.00	0.00	0	772.55	0.00
66.00	0.00	0	772.55	0.00
68.00	0.00	0	772.55	0.00
70.00	0.00	0	772.55	0.00
72.00	0.00	0	772.55	0.00

Stage-Discharge for Reach 5.1: 12-in Catch Basin

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
772.55	0.00	0.00
772.56	0.34	0.00
772.57	0.54	0.00
772.58	0.71	0.00
772.59	0.85	0.01
772.60	0.99	0.01
772.61	1.11	0.02
772.62	1.23	0.03
772.63	1.34	0.04
772.64	1.44	0.05
772.65	1.54	0.06
772.66	1.64	0.08
772.67	1.73	0.09
772.68	1.82	0.11
772.69	1.90	0.13
772.70	1.98	0.15
772.71	2.06	0.17
772.72	2.14	0.19
772.73	2.22	0.21
772.74	2.29	0.24
772.75	2.36	0.26
772.76	2.43	0.29
772.77	2.50	0.32
772.78	2.56	0.35
772.79	2.63	0.38
772.80	2.69	0.41
772.81	2.75	0.45
772.82	2.81	0.48
772.83	2.87	0.52
772.84	2.93	0.55
772.85	2.98	0.59
772.86	3.03	0.63
772.87	3.09	0.67
772.88	3.14	0.71
772.89	3.19	0.75
772.90	3.24	0.79
772.91	3.29	0.84
772.92	3.33	0.88
772.93	3.38	0.92
772.94	3.42	0.97
772.95	3.47	1.02
772.96	3.51	1.06
772.97	3.55	1.11
772.98	3.59	1.16
772.99	3.63	1.21
773.00	3.67	1.26
773.01	3.70	1.31
773.02	3.74	1.36
773.03	3.77	1.41
773.04	3.81	1.46
773.05	3.84	1.51
773.06	3.87	1.56
773.07	3.90	1.61
773.08	3.93	1.66
773.09	3.96	1.71
773.10	3.99	1.77
773.11	4.02	1.82
773.12	4.05	1.87
773.13	4.07	1.92
773.14	4.10	1.97
773.15	4.12	2.03
773.16	4.14	2.08
773.17	4.16	2.13
773.18	4.18	2.18
773.19	4.20	2.23
773.20	4.22	2.28
773.21	4.24	2.33
773.22	4.26	2.38
773.23	4.27	2.43
773.24	4.29	2.48
773.25	4.30	2.53
773.26	4.31	2.57
773.27	4.33	2.62
773.28	4.34	2.66
773.29	4.35	2.71
773.30	4.35	2.75
773.31	4.36	2.79
773.32	4.37	2.83
773.33	4.37	2.87
773.34	4.38	2.91
773.35	4.38	2.95
773.36	**4.38**	2.98
773.37	4.38	3.02
773.38	4.38	3.05
773.39	4.37	3.08
773.40	4.37	3.11
773.41	4.36	3.13
773.42	4.35	3.16
773.43	4.34	3.18
773.44	4.33	3.20
773.45	4.32	3.22
773.46	4.30	3.23
773.47	4.28	3.24
773.48	4.26	3.24
773.49	4.24	**3.24**
773.50	4.21	3.24
773.51	4.17	3.23
773.52	4.13	3.21
773.53	4.08	3.19
773.54	4.01	3.14
773.55	3.84	3.02

Stage-Area-Storage for Reach 5.1: 12-in Catch Basin

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
772.55	0.0	0
772.56	0.0	0
772.57	0.0	0
772.58	0.0	0
772.59	0.0	0
772.60	0.0	1
772.61	0.0	1
772.62	0.0	1
772.63	0.0	1
772.64	0.0	2
772.65	0.0	2
772.66	0.0	2
772.67	0.1	2
772.68	0.1	3
772.69	0.1	3
772.70	0.1	3
772.71	0.1	4
772.72	0.1	4
772.73	0.1	4
772.74	0.1	5
772.75	0.1	5
772.76	0.1	6
772.77	0.1	6
772.78	0.1	6
772.79	0.1	7
772.80	0.2	7
772.81	0.2	7
772.82	0.2	8
772.83	0.2	8
772.84	0.2	9
772.85	0.2	9
772.86	0.2	10
772.87	0.2	10
772.88	0.2	10
772.89	0.2	11
772.90	0.2	11
772.91	0.3	12
772.92	0.3	12
772.93	0.3	13
772.94	0.3	13
772.95	0.3	14
772.96	0.3	14
772.97	0.3	14
772.98	0.3	15
772.99	0.3	15
773.00	0.3	16
773.01	0.4	16
773.02	0.4	17
773.03	0.4	17
773.04	0.4	18
773.05	0.4	18
773.06	0.4	19
773.07	0.4	19
773.08	0.4	19
773.09	0.4	20
773.10	0.4	20
773.11	0.5	21
773.12	0.5	21
773.13	0.5	22
773.14	0.5	22
773.15	0.5	23
773.16	0.5	23
773.17	0.5	24
773.18	0.5	24
773.19	0.5	24
773.20	0.5	25
773.21	0.5	25
773.22	0.6	26
773.23	0.6	26
773.24	0.6	27
773.25	0.6	27
773.26	0.6	27
773.27	0.6	28
773.28	0.6	28
773.29	0.6	29
773.30	0.6	29
773.31	0.6	30
773.32	0.6	30
773.33	0.7	30
773.34	0.7	31
773.35	0.7	31
773.36	0.7	31
773.37	0.7	32
773.38	0.7	32
773.39	0.7	32
773.40	0.7	33
773.41	0.7	33
773.42	0.7	33
773.43	0.7	34
773.44	0.7	34
773.45	0.7	34
773.46	0.8	35
773.47	0.8	35
773.48	0.8	35
773.49	0.8	35
773.50	0.8	36
773.51	0.8	36
773.52	0.8	36
773.53	0.8	36
773.54	0.8	36
773.55	**0.8**	**36**

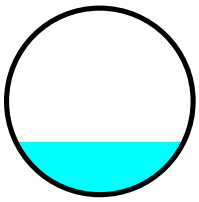
Summary for Reach N FLOWS: 108-in RCP

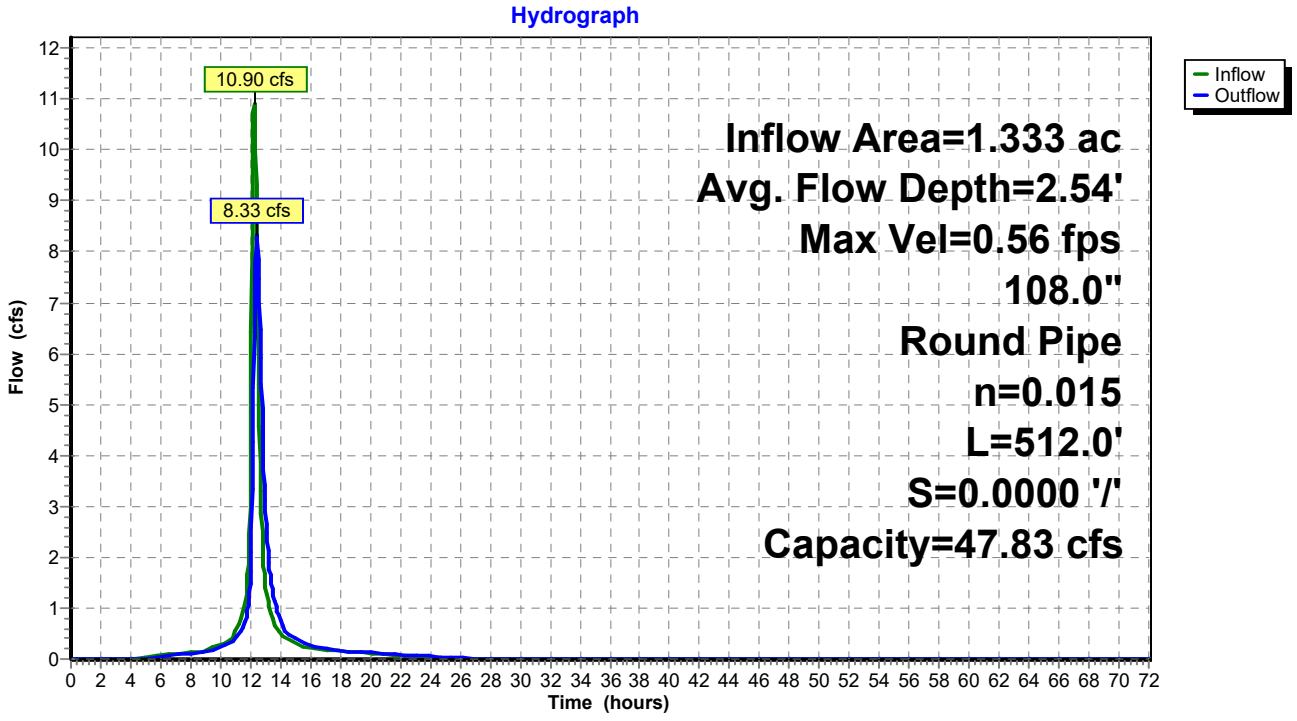
Inflow Area = 1.333 ac, 93.92% Impervious, Inflow Depth = 7.86" for 100-yr event
Inflow = 10.90 cfs @ 12.23 hrs, Volume= 0.873 af
Outflow = 8.33 cfs @ 12.42 hrs, Volume= 0.873 af, Atten= 24%, Lag= 11.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs / 2
Max. Velocity= 0.56 fps, Min. Travel Time= 15.1 min
Avg. Velocity = 0.10 fps, Avg. Travel Time= 81.3 min

Peak Storage= 7,556 cf @ 12.42 hrs
Average Depth at Peak Storage= 2.54' , Surface Width= 8.10'
Bank-Full Depth= 9.00' Flow Area= 63.6 sf, Capacity= 47.83 cfs

108.0" Round Pipe
n= 0.015 Concrete sewer w/manholes & inlets
Length= 512.0' Slope= 0.0000 '/'
Inlet Invert= 761.00', Outlet Invert= 760.99'





Hydrograph for Reach N FLOWS: 108-in RCP

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	761.00	0.00
2.00	0.00	0	761.00	0.00
4.00	0.01	14	761.02	0.00
6.00	0.07	179	761.20	0.04
8.00	0.13	369	761.32	0.11
10.00	0.29	609	761.45	0.23
12.00	**3.71**	**2,494**	**762.17**	**1.73**
14.00	**0.48**	**1,377**	**761.78**	**0.74**
16.00	0.21	654	761.47	0.26
18.00	0.15	481	761.38	0.16
20.00	0.11	399	761.34	0.13
22.00	0.08	315	761.29	0.09
24.00	0.04	226	761.23	0.06
26.00	0.01	117	761.15	0.02
28.00	0.01	66	761.10	0.01
30.00	0.00	44	761.07	0.01
32.00	0.00	29	761.05	0.00
34.00	0.00	20	761.03	0.00
36.00	0.00	14	761.02	0.00
38.00	0.00	10	761.02	0.00
40.00	0.00	8	761.01	0.00
42.00	0.00	6	761.01	0.00
44.00	0.00	5	761.01	0.00
46.00	0.00	4	761.01	0.00
48.00	0.00	3	761.01	0.00
50.00	0.00	3	761.00	0.00
52.00	0.00	3	761.00	0.00
54.00	0.00	2	761.00	0.00
56.00	0.00	2	761.00	0.00
58.00	0.00	2	761.00	0.00
60.00	0.00	2	761.00	0.00
62.00	0.00	1	761.00	0.00
64.00	0.00	1	761.00	0.00
66.00	0.00	1	761.00	0.00
68.00	0.00	1	761.00	0.00
70.00	0.00	1	761.00	0.00
72.00	0.00	1	761.00	0.00

Stage-Discharge for Reach N FLOWS: 108-in RCP

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
761.00	0.00	0.00
761.10	0.07	0.01
761.20	0.11	0.04
761.30	0.15	0.10
761.40	0.18	0.18
761.50	0.21	0.29
761.60	0.23	0.43
761.70	0.26	0.59
761.80	0.28	0.78
761.90	0.30	1.00
762.00	0.32	1.25
762.10	0.34	1.52
762.20	0.36	1.82
762.30	0.38	2.15
762.40	0.40	2.51
762.50	0.41	2.89
762.60	0.43	3.30
762.70	0.45	3.73
762.80	0.46	4.19
762.90	0.48	4.67
763.00	0.49	5.18
763.10	0.51	5.71
763.20	0.52	6.27
763.30	0.53	6.84
763.40	0.55	7.44
763.50	0.56	8.06
763.60	0.57	8.70
763.70	0.58	9.37
763.80	0.60	10.05
763.90	0.61	10.75
764.00	0.62	11.47
764.10	0.63	12.20
764.20	0.64	12.96
764.30	0.65	13.72
764.40	0.66	14.51
764.50	0.67	15.30
764.60	0.68	16.12
764.70	0.69	16.94
764.80	0.70	17.78
764.90	0.70	18.63
765.00	0.71	19.49
765.10	0.72	20.36
765.20	0.73	21.23
765.30	0.74	22.12
765.40	0.74	23.01
765.50	0.75	23.91
765.60	0.76	24.82
765.70	0.77	25.73
765.80	0.77	26.64
765.90	0.78	27.55
766.00	0.78	28.47
766.10	0.79	29.39
766.20	0.80	30.30
766.30	0.80	31.22
766.40	0.81	32.13
766.50	0.81	33.04
766.60	0.82	33.94
766.70	0.82	34.84
766.80	0.82	35.73
766.90	0.83	36.61
767.00	0.83	37.49
767.10	0.84	38.35
767.20	0.84	39.20
767.30	0.84	40.04
767.40	0.84	40.86
767.50	0.85	41.67
767.60	0.85	42.46
767.70	0.85	43.23
767.80	0.85	43.98
767.90	0.85	44.71
768.00	0.86	45.41
768.10	0.86	46.09
768.20	**0.86**	46.75
768.30	**0.86**	47.37
768.40	0.86	47.96
768.50	0.86	48.51
768.60	0.86	49.03
768.70	0.85	49.51
768.80	0.85	49.95
768.90	0.85	50.34
769.00	0.85	50.68
769.10	0.85	50.97
769.20	0.84	51.19
769.30	0.84	51.35
769.40	0.83	**51.43**
769.50	0.83	**51.42**
769.60	0.82	51.31
769.70	0.81	51.06
769.80	0.80	50.63
769.90	0.79	49.91
770.00	0.75	47.83

Stage-Area-Storage for Reach N FLOWS: 108-in RCP

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
761.00	0.0	0
761.10	0.1	66
761.20	0.4	184
761.30	0.7	335
761.40	1.0	513
761.50	1.4	714
761.60	1.8	934
761.70	2.3	1,172
761.80	2.8	1,426
761.90	3.3	1,695
762.00	3.9	1,979
762.10	4.4	2,275
762.20	5.0	2,583
762.30	5.7	2,901
762.40	6.3	3,230
762.50	7.0	3,569
762.60	7.7	3,917
762.70	8.3	4,273
762.80	9.1	4,638
762.90	9.8	5,010
763.00	10.5	5,390
763.10	11.3	5,777
763.20	12.1	6,170
763.30	12.8	6,569
763.40	13.6	6,973
763.50	14.4	7,383
763.60	15.2	7,799
763.70	16.1	8,218
763.80	16.9	8,643
763.90	17.7	9,072
764.00	18.6	9,505
764.10	19.4	9,941
764.20	20.3	10,380
764.30	21.1	10,823
764.40	22.0	11,268
764.50	22.9	11,716
764.60	23.8	12,167
764.70	24.6	12,619
764.80	25.5	13,074
764.90	26.4	13,530
765.00	27.3	13,987
765.10	28.2	14,445
765.20	29.1	14,905
765.30	30.0	15,365
765.40	30.9	15,825
765.50	31.8	16,286
765.60	32.7	16,747
765.70	33.6	17,207
765.80	34.5	17,667
765.90	35.4	18,127
766.00	36.3	18,585
766.10	37.2	19,042
766.20	38.1	19,498
766.30	39.0	19,953
766.40	39.9	20,405
766.50	40.7	20,856
766.60	41.6	21,304
766.70	42.5	21,749
766.80	43.3	22,192
766.90	44.2	22,631
767.00	45.1	23,067
767.10	45.9	23,500
767.20	46.7	23,929
767.30	47.6	24,354
767.40	48.4	24,773
767.50	49.2	25,189
767.60	50.0	25,599
767.70	50.8	26,003
767.80	51.6	26,402
767.90	52.3	26,795
768.00	53.1	27,182
768.10	53.8	27,562
768.20	54.6	27,934
768.30	55.3	28,299
768.40	56.0	28,655
768.50	56.6	29,003
768.60	57.3	29,342
768.70	58.0	29,671
768.80	58.6	29,989
768.90	59.2	30,297
769.00	59.8	30,593
769.10	60.3	30,877
769.20	60.8	31,146
769.30	61.3	31,400
769.40	61.8	31,638
769.50	62.2	31,858
769.60	62.6	32,059
769.70	63.0	32,237
769.80	63.3	32,388
769.90	63.5	32,506
770.00	**63.6**	**32,572**

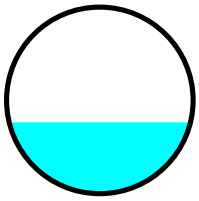
Summary for Reach S FLOWS: 15-in RCP

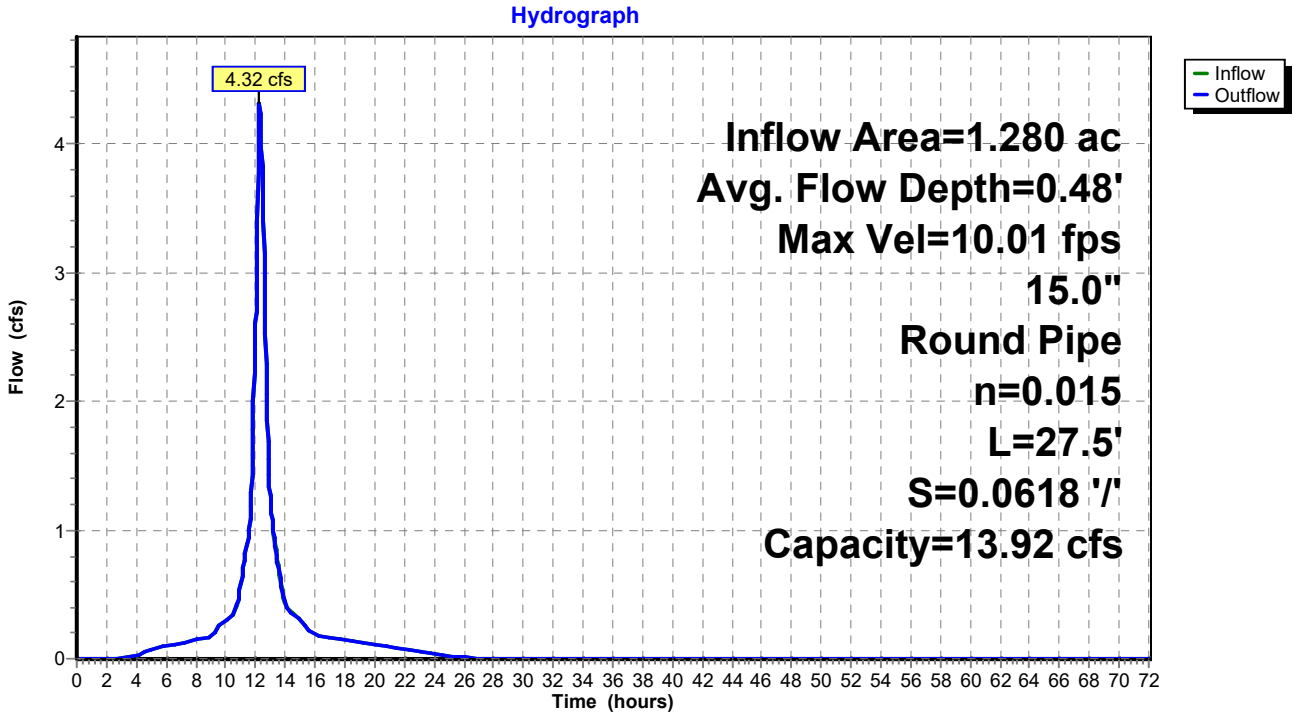
Inflow Area = 1.280 ac, 99.06% Impervious, Inflow Depth = 5.86" for 100-yr event
Inflow = 4.31 cfs @ 12.27 hrs, Volume= 0.625 af
Outflow = 4.32 cfs @ 12.27 hrs, Volume= 0.625 af, Atten= 0%, Lag= 0.1 min
Routed to nonexistent node 5R

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs / 2
Max. Velocity= 10.01 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 2.23 fps, Avg. Travel Time= 0.2 min

Peak Storage= 12 cf @ 12.27 hrs
Average Depth at Peak Storage= 0.48' , Surface Width= 1.21'
Bank-Full Depth= 1.25' Flow Area= 1.2 sf, Capacity= 13.92 cfs

15.0" Round Pipe
n= 0.015 Concrete sewer w/manholes & inlets
Length= 27.5' Slope= 0.0618 '/'
Inlet Invert= 773.80', Outlet Invert= 772.10'





Hydrograph for Reach S FLOWS: 15-in RCP

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
0.00	0.00	0	773.80	0.00
2.00	0.00	0	773.80	0.00
4.00	0.03	0	773.84	0.03
6.00	0.10	1	773.87	0.10
8.00	0.15	1	773.89	0.15
10.00	0.30	2	773.93	0.30
12.00	**2.61**	**8**	**774.17**	**2.61**
14.00	**0.42**	**2**	**773.95**	**0.42**
16.00	0.19	1	773.90	0.19
18.00	0.14	1	773.89	0.14
20.00	0.11	1	773.88	0.11
22.00	0.07	1	773.86	0.07
24.00	0.04	0	773.85	0.04
26.00	0.01	0	773.82	0.01
28.00	0.00	0	773.81	0.00
30.00	0.00	0	773.81	0.00
32.00	0.00	0	773.81	0.00
34.00	0.00	0	773.80	0.00
36.00	0.00	0	773.80	0.00
38.00	0.00	0	773.80	0.00
40.00	0.00	0	773.80	0.00
42.00	0.00	0	773.80	0.00
44.00	0.00	0	773.80	0.00
46.00	0.00	0	773.80	0.00
48.00	0.00	0	773.80	0.00
50.00	0.00	0	773.80	0.00
52.00	0.00	0	773.80	0.00
54.00	0.00	0	773.80	0.00
56.00	0.00	0	773.80	0.00
58.00	0.00	0	773.80	0.00
60.00	0.00	0	773.80	0.00
62.00	0.00	0	773.80	0.00
64.00	0.00	0	773.80	0.00
66.00	0.00	0	773.80	0.00
68.00	0.00	0	773.80	0.00
70.00	0.00	0	773.80	0.00
72.00	0.00	0	773.80	0.00

Stage-Discharge for Reach S FLOWS: 15-in RCP

Elevation (feet)	Velocity (ft/sec)	Discharge (cfs)
773.80	0.00	0.00
773.81	0.81	0.00
773.82	1.36	0.01
773.83	1.79	0.01
773.84	2.17	0.03
773.85	2.52	0.04
773.86	2.83	0.06
773.87	3.13	0.09
773.88	3.42	0.11
773.89	3.69	0.15
773.90	3.95	0.18
773.91	4.19	0.22
773.92	4.43	0.27
773.93	4.66	0.32
773.94	4.89	0.37
773.95	5.10	0.43
773.96	5.31	0.49
773.97	5.52	0.55
773.98	5.72	0.62
773.99	5.91	0.70
774.00	6.10	0.77
774.01	6.28	0.85
774.02	6.46	0.94
774.03	6.64	1.03
774.04	6.81	1.12
774.05	6.98	1.22
774.06	7.14	1.32
774.07	7.30	1.42
774.08	7.46	1.53
774.09	7.61	1.64
774.10	7.76	1.76
774.11	7.91	1.88
774.12	8.06	2.00
774.13	8.20	2.12
774.14	8.34	2.25
774.15	8.47	2.38
774.16	8.61	2.52
774.17	8.74	2.66
774.18	8.87	2.80
774.19	8.99	2.94
774.20	9.12	3.09
774.21	9.24	3.24
774.22	9.36	3.39
774.23	9.48	3.54
774.24	9.59	3.70
774.25	9.70	3.86
774.26	9.81	4.02
774.27	9.92	4.19
774.28	10.03	4.35
774.29	10.13	4.52
774.30	10.23	4.69
774.31	10.33	4.86
774.32	10.43	5.04
774.33	10.53	5.21
774.34	10.62	5.39
774.35	10.71	5.57
774.36	10.80	5.75
774.37	10.89	5.94
774.38	10.98	6.12
774.39	11.06	6.30
774.40	11.14	6.49
774.41	11.22	6.68
774.42	11.30	6.87
774.43	11.38	7.05
774.44	11.46	7.24
774.45	11.53	7.43
774.46	11.60	7.63
774.47	11.67	7.82
774.48	11.74	8.01
774.49	11.80	8.20
774.50	11.87	8.39
774.51	11.93	8.59
774.52	11.99	8.78
774.53	12.05	8.97
774.54	12.11	9.16
774.55	12.16	9.35
774.56	12.22	9.54
774.57	12.27	9.73
774.58	12.32	9.92
774.59	12.37	10.11
774.60	12.41	10.30
774.61	12.46	10.48
774.62	12.50	10.67
774.63	12.54	10.85
774.64	12.58	11.03
774.65	12.62	11.21
774.66	12.65	11.39
774.67	12.69	11.57
774.68	12.72	11.74
774.69	12.75	11.91
774.70	12.77	12.08
774.71	12.80	12.25
774.72	12.82	12.41
774.73	12.84	12.57
774.74	12.86	12.73
774.75	12.88	12.89
774.76	12.89	13.04
774.77	12.90	13.19
774.78	12.91	13.33
774.79	12.92	13.47
774.80	12.93	13.61
774.81	12.93	13.74
774.82	**12.93**	13.86
774.83	12.93	13.98
774.84	12.92	14.10
774.85	12.92	14.21
774.86	12.90	14.32
774.87	12.89	14.42
774.88	12.87	14.51
774.89	12.85	14.59
774.90	12.83	14.67
774.91	12.80	14.74
774.92	12.77	14.81
774.93	12.73	14.86
774.94	12.69	14.90
774.95	12.65	14.94
774.96	12.60	14.96
774.97	12.54	**14.97**
774.98	12.47	14.97
774.99	12.40	14.95
775.00	12.32	14.91
775.01	12.22	14.85
775.02	12.10	14.76
775.03	11.96	14.63
775.04	11.74	14.39
775.05	11.34	13.92

Stage-Area-Storage for Reach S FLOWS: 15-in RCP

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
773.80	0.0	0
773.82	0.0	0
773.84	0.0	0
773.86	0.0	1
773.88	0.0	1
773.90	0.0	1
773.92	0.1	2
773.94	0.1	2
773.96	0.1	3
773.98	0.1	3
774.00	0.1	3
774.02	0.1	4
774.04	0.2	5
774.06	0.2	5
774.08	0.2	6
774.10	0.2	6
774.12	0.2	7
774.14	0.3	7
774.16	0.3	8
774.18	0.3	9
774.20	0.3	9
774.22	0.4	10
774.24	0.4	11
774.26	0.4	11
774.28	0.4	12
774.30	0.5	13
774.32	0.5	13
774.34	0.5	14
774.36	0.5	15
774.38	0.6	15
774.40	0.6	16
774.42	0.6	17
774.44	0.6	17
774.46	0.7	18
774.48	0.7	19
774.50	0.7	19
774.52	0.7	20
774.54	0.8	21
774.56	0.8	21
774.58	0.8	22
774.60	0.8	23
774.62	0.9	23
774.64	0.9	24
774.66	0.9	25
774.68	0.9	25
774.70	0.9	26
774.72	1.0	27
774.74	1.0	27
774.76	1.0	28
774.78	1.0	28
774.80	1.1	29
774.82	1.1	29
774.84	1.1	30
774.86	1.1	31
774.88	1.1	31
774.90	1.1	31
774.92	1.2	32
774.94	1.2	32
774.96	1.2	33
774.98	1.2	33
775.00	1.2	33
775.02	1.2	34
775.04	**1.2**	**34**

Summary for Pond NADS: North ADS MC-3500

Inflow Area = 1.033 ac, 99.03% Impervious, Inflow Depth = 8.27" for 100-yr event
Inflow = 15.43 cfs @ 12.17 hrs, Volume= 0.712 af
Outflow = 8.95 cfs @ 12.28 hrs, Volume= 0.711 af, Atten= 42%, Lag= 6.4 min
Primary = 8.95 cfs @ 12.28 hrs, Volume= 0.711 af
Routed to Reach N FLOWS : 108-in RCP

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs / 2
Peak Elev= 773.95' @ 12.28 hrs Surf.Area= 0.044 ac Storage= 0.179 af

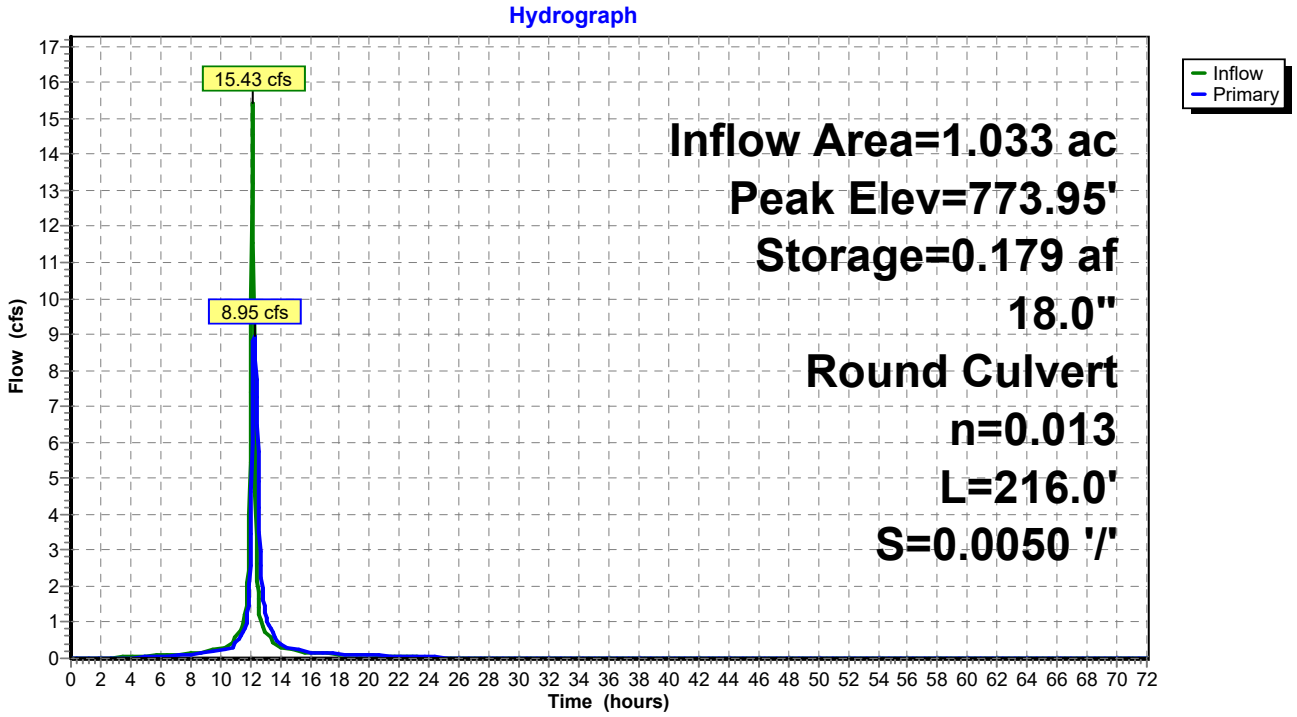
Plug-Flow detention time= 35.6 min calculated for 0.711 af (100% of inflow)
Center-of-Mass det. time= 36.1 min (779.5 - 743.4)

Volume	Invert	Avail.Storage	Storage Description
#1	771.20'	0.201 af	**ADS_StormTech MC-3500 d +Cap @ 112.50' L**x 5 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 112.50'L = 1,725.2 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 5 Chambers in 5 Rows Cap Storage= 14.9 cf x 2 x 5 rows = 149.0 cf

Device	Routing	Invert	Outlet Devices
#1	Primary	771.20'	**18.0" Round Culvert** L= 216.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 771.20' / 770.12' S= 0.0050 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf

Primary OutFlow Max=8.93 cfs @ 12.28 hrs HW=773.94' TW=763.34' (Dynamic Tailwater)
↑**1=Culvert** (Barrel Controls 8.93 cfs @ 5.05 fps)

Pond NADS: North ADS MC-3500



Hydrograph for Pond NADS: North ADS MC-3500

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.000	771.20	0.00
2.00	0.00	0.000	771.20	0.00
4.00	0.04	0.004	771.25	0.01
6.00	0.09	0.010	771.33	0.06
8.00	0.12	0.013	771.37	0.11
10.00	0.26	0.018	771.44	0.22
12.00	**5.43**	**0.064**	**772.06**	**2.59**
14.00	**0.28**	**0.024**	**771.52**	**0.39**
16.00	0.14	0.016	771.41	0.17
18.00	0.11	0.014	771.38	0.12
20.00	0.08	0.012	771.36	0.09
22.00	0.05	0.010	771.33	0.06
24.00	0.02	0.008	771.30	0.04
26.00	0.00	0.005	771.26	0.01
28.00	0.00	0.003	771.24	0.01
30.00	0.00	0.003	771.23	0.00
32.00	0.00	0.002	771.23	0.00
34.00	0.00	0.002	771.22	0.00
36.00	0.00	0.002	771.22	0.00
38.00	0.00	0.001	771.22	0.00
40.00	0.00	0.001	771.22	0.00
42.00	0.00	0.001	771.22	0.00
44.00	0.00	0.001	771.21	0.00
46.00	0.00	0.001	771.21	0.00
48.00	0.00	0.001	771.21	0.00
50.00	0.00	0.001	771.21	0.00
52.00	0.00	0.001	771.21	0.00
54.00	0.00	0.001	771.21	0.00
56.00	0.00	0.001	771.21	0.00
58.00	0.00	0.001	771.21	0.00
60.00	0.00	0.001	771.21	0.00
62.00	0.00	0.001	771.21	0.00
64.00	0.00	0.001	771.21	0.00
66.00	0.00	0.001	771.21	0.00
68.00	0.00	0.001	771.21	0.00
70.00	0.00	0.001	771.21	0.00
72.00	0.00	0.001	771.21	0.00

Stage-Discharge for Pond NADS: North ADS MC-3500

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
771.20	0.00	772.24	3.58	773.28	7.55	774.32	9.63
771.22	0.00	772.26	3.69	773.30	7.60	774.34	9.67
771.24	0.00	772.28	3.80	773.32	7.64	774.36	9.71
771.26	0.01	772.30	3.92	773.34	7.69	774.38	9.74
771.28	0.02	772.32	4.03	773.36	7.73	774.40	9.78
771.30	0.04	772.34	4.14	773.38	7.78	774.42	9.81
771.32	0.05	772.36	4.25	773.40	7.82	774.44	9.85
771.34	0.07	772.38	4.35	773.42	7.87	774.46	9.88
771.36	0.10	772.40	4.46	773.44	7.91	774.48	9.92
771.38	0.12	772.42	4.57	773.46	7.95	774.50	9.95
771.40	0.15	772.44	4.68	773.48	8.00	774.52	9.98
771.42	0.19	772.46	4.78	773.50	8.04	774.54	10.02
771.44	0.22	772.48	4.88	773.52	8.08	774.56	10.05
771.46	0.26	772.50	4.99	773.54	8.12	774.58	10.09
771.48	0.31	772.52	5.09	773.56	8.17	774.60	10.12
771.50	0.35	772.54	5.18	773.58	8.21	774.62	10.16
771.52	0.40	772.56	5.28	773.60	8.25	774.64	10.19
771.54	0.45	772.58	5.37	773.62	8.29	774.66	10.22
771.56	0.51	772.60	5.46	773.64	8.33	774.68	10.26
771.58	0.56	772.62	5.54	773.66	8.37	774.70	10.29
771.60	0.62	772.64	5.62	773.68	8.42	774.72	10.32
771.62	0.69	772.66	5.70	773.70	8.46	774.74	10.36
771.64	0.75	772.68	5.76	773.72	8.50	774.76	10.39
771.66	0.82	772.70	5.82	773.74	8.54	774.78	10.42
771.68	0.89	772.72	5.89	773.76	8.58	774.80	10.46
771.70	0.97	772.74	5.97	773.78	8.62	774.82	10.49
771.72	1.04	772.76	6.05	773.80	8.66	774.84	10.52
771.74	1.12	772.78	6.12	773.82	8.70	774.86	10.55
771.76	1.20	772.80	6.19	773.84	8.74	774.88	10.59
771.78	1.28	772.82	6.27	773.86	8.78	774.90	10.62
771.80	1.36	772.84	6.34	773.88	8.81	774.92	10.65
771.82	1.45	772.86	6.41	773.90	8.85	774.94	**10.68**
771.84	1.54	772.88	6.48	773.92	8.89		
771.86	1.63	772.90	6.55	773.94	8.93		
771.88	1.72	772.92	6.62	773.96	8.97		
771.90	1.81	772.94	6.68	773.98	9.01		
771.92	1.91	772.96	6.75	774.00	9.05		
771.94	2.01	772.98	6.82	774.02	9.08		
771.96	2.11	773.00	6.88	774.04	9.12		
771.98	2.20	773.02	6.95	774.06	9.16		
772.00	2.30	773.04	7.01	774.08	9.20		
772.02	2.41	773.06	7.08	774.10	9.23		
772.04	2.51	773.08	7.14	774.12	9.27		
772.06	2.61	773.10	7.20	774.14	9.31		
772.08	2.72	773.12	7.27	774.16	9.34		
772.10	2.82	773.14	7.33	774.18	9.38		
772.12	2.93	773.16	7.39	774.20	9.42		
772.14	3.04	773.18	7.45	774.22	9.45		
772.16	3.15	773.20	7.37	774.24	9.49		
772.18	3.25	773.22	7.42	774.26	9.53		
772.20	3.36	773.24	7.46	774.28	9.56		
772.22	3.47	773.26	7.51	774.30	9.60		

Stage-Area-Storage for Pond NADS: North ADS MC-3500

Elevation (feet)	Storage (acre-feet)
771.20	0.000
771.25	0.004
771.30	0.008
771.35	0.012
771.40	0.015
771.45	0.019
771.50	0.023
771.55	0.027
771.60	0.030
771.65	0.034
771.70	0.038
771.75	0.042
771.80	0.045
771.85	0.049
771.90	0.053
771.95	0.056
772.00	0.060
772.05	0.064
772.10	0.067
772.15	0.071
772.20	0.074
772.25	0.078
772.30	0.081
772.35	0.085
772.40	0.088
772.45	0.092
772.50	0.095
772.55	0.098
772.60	0.102
772.65	0.105
772.70	0.108
772.75	0.112
772.80	0.115
772.85	0.118
772.90	0.121
772.95	0.124
773.00	0.128
773.05	0.131
773.10	0.134
773.15	0.137
773.20	0.140
773.25	0.143
773.30	0.146
773.35	0.148
773.40	0.151
773.45	0.154
773.50	0.157
773.55	0.159
773.60	0.162
773.65	0.165
773.70	0.167
773.75	0.170
773.80	0.172
773.85	0.174
773.90	0.177
773.95	0.179
774.00	0.181
774.05	0.183
774.10	0.185
774.15	0.187
774.20	0.189
774.25	0.191
774.30	0.192
774.35	0.194
774.40	0.195
774.45	0.197
774.50	0.198
774.55	0.199
774.60	0.199
774.65	0.200
774.70	0.200
774.75	0.201
774.80	0.201
774.85	0.201
774.90	0.201
774.95	**0.201**

Summary for Pond SADS: South ADS MC-3500

Inflow Area = 1.280 ac, 99.06% Impervious, Inflow Depth = 5.86" for 100-yr event
Inflow = 5.59 cfs @ 12.17 hrs, Volume= 0.625 af
Outflow = 4.31 cfs @ 12.27 hrs, Volume= 0.625 af, Atten= 23%, Lag= 6.2 min
Primary = 4.31 cfs @ 12.27 hrs, Volume= 0.625 af
Routed to Pond SOCS : South OCS

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs / 2
Peak Elev= 776.04' @ 12.27 hrs Surf.Area= 0.031 ac Storage= 0.077 af

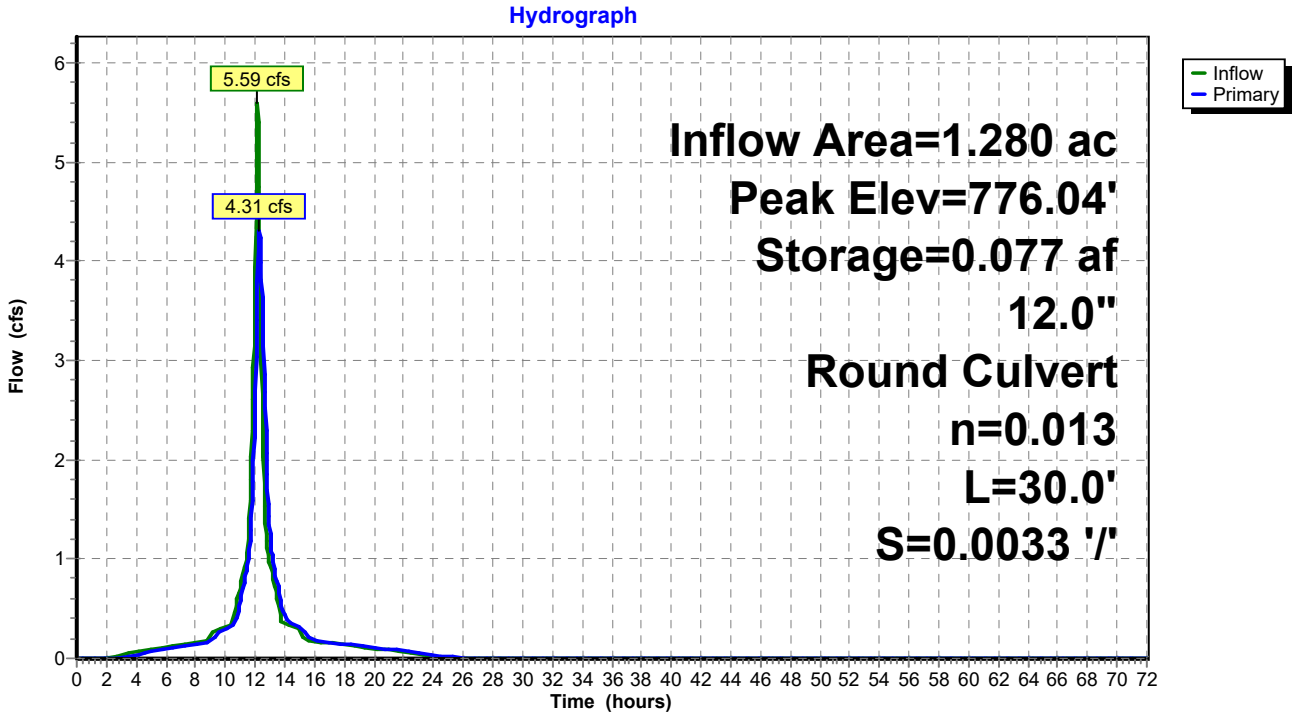
Plug-Flow detention time= 27.6 min calculated for 0.625 af (100% of inflow)
Center-of-Mass det. time= 28.2 min (775.3 - 747.1)

Volume	Invert	Avail.Storage	Storage Description
#1	774.00'	0.108 af	**ADS_StormTech MC-3500 d +Cap @ 75.00' L**x 4 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 75.00'L = 1,150.1 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 4 Chambers in 4 Rows Cap Storage= 14.9 cf x 2 x 4 rows = 119.2 cf

Device	Routing	Invert	Outlet Devices
#1	Primary	774.00'	**12.0" Round Culvert** L= 30.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 774.00' / 773.90' S= 0.0033 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.27 hrs HW=776.04' TW=776.46' (Dynamic Tailwater)
↑**1=Culvert** (Controls 0.00 cfs)

Pond SADS: South ADS MC-3500



Hydrograph for Pond SADS: South ADS MC-3500

Time (hours)	Inflow (cfs)	Storage (acre-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0.000	774.00	0.00
2.00	0.01	0.000	774.00	0.00
4.00	0.06	0.004	774.11	0.03
6.00	0.11	0.008	774.20	0.10
8.00	0.15	0.010	774.24	0.15
10.00	0.32	0.014	774.34	0.30
12.00	**3.62**	**0.049**	**775.25**	**2.61**
14.00	**0.35**	**0.017**	**774.41**	**0.42**
16.00	0.17	0.011	774.27	0.19
18.00	0.14	0.010	774.24	0.14
20.00	0.10	0.008	774.21	0.11
22.00	0.06	0.007	774.17	0.07
24.00	0.03	0.005	774.13	0.04
26.00	0.00	0.002	774.06	0.01
28.00	0.00	0.002	774.04	0.00
30.00	0.00	0.001	774.03	0.00
32.00	0.00	0.001	774.02	0.00
34.00	0.00	0.001	774.02	0.00
36.00	0.00	0.001	774.02	0.00
38.00	0.00	0.001	774.02	0.00
40.00	0.00	0.001	774.01	0.00
42.00	0.00	0.001	774.01	0.00
44.00	0.00	0.000	774.01	0.00
46.00	0.00	0.000	774.01	0.00
48.00	0.00	0.000	774.01	0.00
50.00	0.00	0.000	774.01	0.00
52.00	0.00	0.000	774.01	0.00
54.00	0.00	0.000	774.01	0.00
56.00	0.00	0.000	774.01	0.00
58.00	0.00	0.000	774.01	0.00
60.00	0.00	0.000	774.01	0.00
62.00	0.00	0.000	774.01	0.00
64.00	0.00	0.000	774.01	0.00
66.00	0.00	0.000	774.01	0.00
68.00	0.00	0.000	774.01	0.00
70.00	0.00	0.000	774.01	0.00
72.00	0.00	0.000	774.01	0.00

Stage-Discharge for Pond SADS: South ADS MC-3500

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
774.00	0.00	775.04	2.12	776.08	4.38	777.12	6.01
774.02	0.00	775.06	2.18	776.10	4.42	777.14	6.04
774.04	0.00	775.08	2.23	776.12	4.45	777.16	6.06
774.06	0.01	775.10	2.28	776.14	4.49	777.18	6.09
774.08	0.01	775.12	2.33	776.16	4.53	777.20	6.12
774.10	0.02	775.14	2.38	776.18	4.56	777.22	6.14
774.12	0.04	775.16	2.43	776.20	4.60	777.24	6.17
774.14	0.05	775.18	2.48	776.22	4.63	777.26	6.20
774.16	0.06	775.20	2.52	776.24	4.67	777.28	6.22
774.18	0.08	775.22	2.56	776.26	4.70	777.30	6.25
774.20	0.10	775.24	2.60	776.28	4.74	777.32	6.27
774.22	0.12	775.26	2.63	776.30	4.77	777.34	6.30
774.24	0.15	775.28	2.66	776.32	4.81	777.36	6.33
774.26	0.17	775.30	2.68	776.34	4.84	777.38	6.35
774.28	0.20	775.32	2.68	776.36	4.87	777.40	6.38
774.30	0.23	775.34	2.68	776.38	4.91	777.42	6.40
774.32	0.26	775.36	2.74	776.40	4.94	777.44	6.43
774.34	0.30	775.38	2.79	776.42	4.97	777.46	6.45
774.36	0.33	775.40	2.85	776.44	5.01	777.48	6.48
774.38	0.37	775.42	2.91	776.46	5.04	777.50	6.50
774.40	0.41	775.44	2.96	776.48	5.07	777.52	6.53
774.42	0.45	775.46	3.02	776.50	5.10	777.54	6.55
774.44	0.49	775.48	3.07	776.52	5.13	777.56	6.58
774.46	0.53	775.50	3.12	776.54	5.17	777.58	6.60
774.48	0.57	775.52	3.18	776.56	5.20	777.60	6.63
774.50	0.62	775.54	3.23	776.58	5.23	777.62	6.65
774.52	0.67	775.56	3.28	776.60	5.26	777.64	6.68
774.54	0.71	775.58	3.33	776.62	5.29	777.66	6.70
774.56	0.76	775.60	3.37	776.64	5.32	777.68	6.72
774.58	0.81	775.62	3.42	776.66	5.35	777.70	6.75
774.60	0.86	775.64	3.47	776.68	5.38	777.72	6.77
774.62	0.92	775.66	3.52	776.70	5.41	777.74	**6.80**
774.64	0.97	775.68	3.56	776.72	5.44		
774.66	1.02	775.70	3.61	776.74	5.47		
774.68	1.08	775.72	3.65	776.76	5.50		
774.70	1.13	775.74	3.70	776.78	5.53		
774.72	1.19	775.76	3.74	776.80	5.56		
774.74	1.25	775.78	3.78	776.82	5.59		
774.76	1.30	775.80	3.83	776.84	5.62		
774.78	1.36	775.82	3.87	776.86	5.65		
774.80	1.42	775.84	3.91	776.88	5.68		
774.82	1.48	775.86	3.95	776.90	5.70		
774.84	1.54	775.88	3.99	776.92	5.73		
774.86	1.60	775.90	4.03	776.94	5.76		
774.88	1.66	775.92	4.07	776.96	5.79		
774.90	1.72	775.94	4.11	776.98	5.82		
774.92	1.77	775.96	4.15	777.00	5.84		
774.94	1.83	775.98	4.19	777.02	5.87		
774.96	1.89	776.00	4.23	777.04	5.90		
774.98	1.95	776.02	4.27	777.06	5.93		
775.00	2.01	776.04	4.31	777.08	5.96		
775.02	2.06	776.06	4.34	777.10	5.98		

Stage-Area-Storage for Pond SADS: South ADS MC-3500

Elevation (feet)	Storage (acre-feet)
774.00	0.000
774.05	0.002
774.10	0.004
774.15	0.006
774.20	0.008
774.25	0.010
774.30	0.012
774.35	0.014
774.40	0.016
774.45	0.018
774.50	0.020
774.55	0.022
774.60	0.024
774.65	0.026
774.70	0.028
774.75	0.030
774.80	0.032
774.85	0.034
774.90	0.036
774.95	0.038
775.00	0.040
775.05	0.042
775.10	0.044
775.15	0.046
775.20	0.047
775.25	0.049
775.30	0.051
775.35	0.053
775.40	0.055
775.45	0.057
775.50	0.058
775.55	0.060
775.60	0.062
775.65	0.064
775.70	0.065
775.75	0.067
775.80	0.069
775.85	0.070
775.90	0.072
775.95	0.074
776.00	0.075
776.05	0.077
776.10	0.078
776.15	0.080
776.20	0.081
776.25	0.083
776.30	0.084
776.35	0.086
776.40	0.087
776.45	0.088
776.50	0.090
776.55	0.091
776.60	0.092
776.65	0.094
776.70	0.095
776.75	0.096
776.80	0.097
776.85	0.098
776.90	0.100
776.95	0.101
777.00	0.102
777.05	0.102
777.10	0.103
777.15	0.104
777.20	0.105
777.25	0.106
777.30	0.106
777.35	0.107
777.40	0.107
777.45	0.108
777.50	0.108
777.55	0.108
777.60	0.108
777.65	0.108
777.70	0.108
777.75	**0.108**

Summary for Pond SEP: SEPARATOR

Inflow Area = 1.280 ac, 99.06% Impervious, Inflow Depth = 6.95" for 100-yr event
Inflow = 11.64 cfs @ 12.17 hrs, Volume= 0.741 af
Outflow = 11.64 cfs @ 12.17 hrs, Volume= 0.741 af, Atten= 0%, Lag= 0.0 min
Primary = 5.59 cfs @ 12.17 hrs, Volume= 0.625 af
Routed to Pond SADS : South ADS MC-3500
Secondary = 6.04 cfs @ 12.17 hrs, Volume= 0.116 af
Routed to Pond NADS : North ADS MC-3500

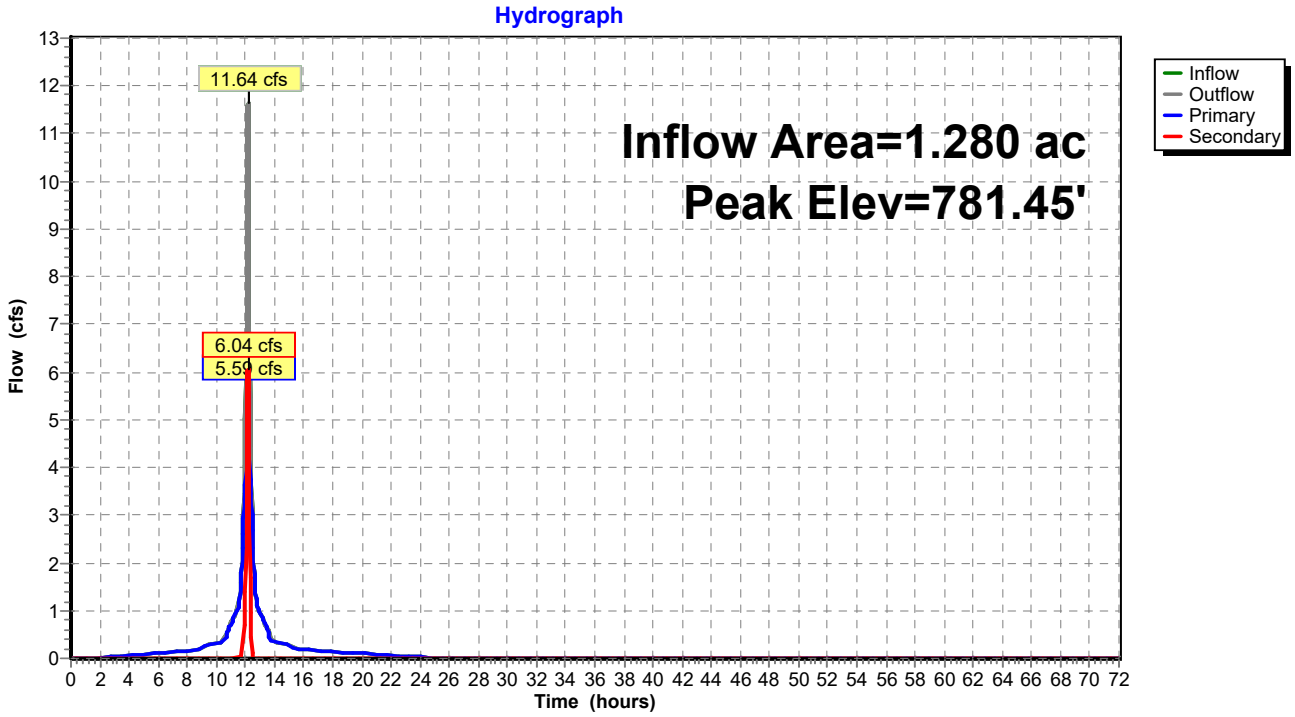
Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs / 2
Peak Elev= 781.45' @ 12.17 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	776.50'	**10.0" Round SADS** L= 18.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 776.50' / 774.90' S= 0.0889 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.55 sf
#2	Secondary	778.00'	**12.0" Round NADS** L= 57.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 778.00' / 777.90' S= 0.0018 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=5.54 cfs @ 12.17 hrs HW=781.36' TW=775.82' (Dynamic Tailwater)
↑—**1=SADS** (Inlet Controls 5.54 cfs @ 10.15 fps)

Secondary OutFlow Max=5.92 cfs @ 12.17 hrs HW=781.36' TW=773.24' (Dynamic Tailwater)
↑—**2=NADS** (Barrel Controls 5.92 cfs @ 7.54 fps)

Pond SEP: SEPARATOR



Hydrograph for Pond SEP: SEPARATOR

Time (hours)	Inflow (cfs)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	776.50	0.00	0.00	0.00
2.00	0.01	776.55	0.01	0.01	0.00
4.00	0.06	776.62	0.06	0.06	0.00
6.00	0.11	776.67	0.11	0.11	0.00
8.00	0.15	776.70	0.15	0.15	0.00
10.00	0.32	776.80	0.32	0.32	0.00
12.00	**5.02**	**778.82**	**5.02**	**3.62**	**1.39**
14.00	**0.35**	**776.81**	**0.35**	**0.35**	**0.00**
16.00	0.17	776.71	0.17	0.17	0.00
18.00	0.14	776.69	0.14	0.14	0.00
20.00	0.10	776.66	0.10	0.10	0.00
22.00	0.06	776.63	0.06	0.06	0.00
24.00	0.03	776.58	0.03	0.03	0.00
26.00	0.00	776.50	0.00	0.00	0.00
28.00	0.00	776.50	0.00	0.00	0.00
30.00	0.00	776.50	0.00	0.00	0.00
32.00	0.00	776.50	0.00	0.00	0.00
34.00	0.00	776.50	0.00	0.00	0.00
36.00	0.00	776.50	0.00	0.00	0.00
38.00	0.00	776.50	0.00	0.00	0.00
40.00	0.00	776.50	0.00	0.00	0.00
42.00	0.00	776.50	0.00	0.00	0.00
44.00	0.00	776.50	0.00	0.00	0.00
46.00	0.00	776.50	0.00	0.00	0.00
48.00	0.00	776.50	0.00	0.00	0.00
50.00	0.00	776.50	0.00	0.00	0.00
52.00	0.00	776.50	0.00	0.00	0.00
54.00	0.00	776.50	0.00	0.00	0.00
56.00	0.00	776.50	0.00	0.00	0.00
58.00	0.00	776.50	0.00	0.00	0.00
60.00	0.00	776.50	0.00	0.00	0.00
62.00	0.00	776.50	0.00	0.00	0.00
64.00	0.00	776.50	0.00	0.00	0.00
66.00	0.00	776.50	0.00	0.00	0.00
68.00	0.00	776.50	0.00	0.00	0.00
70.00	0.00	776.50	0.00	0.00	0.00
72.00	0.00	776.50	0.00	0.00	0.00

Stage-Discharge for Pond SEP: SEPARATOR

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)
776.50	0.00	0.00	0.00
776.55	0.01	0.01	0.00
776.60	0.04	0.04	0.00
776.65	0.09	0.09	0.00
776.70	0.15	0.15	0.00
776.75	0.23	0.23	0.00
776.80	0.33	0.33	0.00
776.85	0.44	0.44	0.00
776.90	0.56	0.56	0.00
776.95	0.69	0.69	0.00
777.00	0.82	0.82	0.00
777.05	0.96	0.96	0.00
777.10	1.11	1.11	0.00
777.15	1.25	1.25	0.00
777.20	1.39	1.39	0.00
777.25	1.52	1.52	0.00
777.30	1.64	1.64	0.00
777.35	1.73	1.73	0.00
777.40	1.83	1.83	0.00
777.45	1.92	1.92	0.00
777.50	2.01	2.01	0.00
777.55	2.09	2.09	0.00
777.60	2.17	2.17	0.00
777.65	2.25	2.25	0.00
777.70	2.32	2.32	0.00
777.75	2.40	2.40	0.00
777.80	2.47	2.47	0.00
777.85	2.54	2.54	0.00
777.90	2.60	2.60	0.00
777.95	2.67	2.67	0.00
778.00	2.73	2.73	0.00
778.05	2.80	2.80	0.00
778.10	2.88	2.86	0.02
778.15	2.97	2.92	0.05
778.20	3.07	2.98	0.09
778.25	3.18	3.03	0.15
778.30	3.30	3.09	0.21
778.35	3.43	3.14	0.29
778.40	3.57	3.20	0.37
778.45	3.72	3.25	0.47
778.50	3.88	3.30	0.57
778.55	4.04	3.36	0.69
778.60	4.21	3.41	0.81
778.65	4.39	3.46	0.93
778.70	4.57	3.51	1.06
778.75	4.75	3.56	1.20
778.80	4.94	3.60	1.34
778.85	5.13	3.65	1.48
778.90	5.32	3.70	1.62
778.95	5.50	3.74	1.76
779.00	5.69	3.79	1.90
779.05	5.87	3.84	2.03
779.10	6.04	3.88	2.16
779.15	6.20	3.92	2.28
779.20	6.35	3.97	2.38
779.25	6.48	4.01	2.47
779.30	6.58	4.05	2.52
779.35	6.63	4.10	2.54
779.40	6.81	4.14	2.67
779.45	6.98	4.18	2.80
779.50	7.15	4.22	2.93
779.55	7.31	4.26	3.05
779.60	7.46	4.30	3.16
779.65	7.61	4.34	3.27
779.70	7.76	4.38	3.38
779.75	7.90	4.42	3.48
779.80	8.04	4.46	3.59
779.85	8.18	4.50	3.68
779.90	8.32	4.54	3.78
779.95	8.45	4.57	3.87
780.00	8.58	4.61	3.96
780.05	8.70	4.65	4.05
780.10	8.83	4.69	4.14
780.15	8.95	4.72	4.23
780.20	9.07	4.76	4.31
780.25	9.19	4.79	4.39
780.30	9.30	4.83	4.47
780.35	9.42	4.87	4.55
780.40	9.53	4.90	4.63
780.45	9.64	4.94	4.71
780.50	9.75	4.97	4.78
780.55	9.86	5.01	4.85
780.60	9.97	5.04	4.93
780.65	10.07	5.07	5.00
780.70	10.18	5.11	5.07
780.75	10.28	5.14	5.14
780.80	10.38	5.18	5.21
780.85	10.49	5.21	5.28
780.90	10.59	5.24	5.34
780.95	10.69	5.27	5.41
781.00	10.78	5.31	5.48
781.05	10.88	5.34	5.54
781.10	10.98	5.37	5.61
781.15	11.07	5.40	5.67
781.20	11.17	5.44	5.73
781.25	11.26	5.47	5.79
781.30	11.35	5.50	5.85
781.35	11.44	5.53	5.92
781.40	11.54	5.56	5.98
781.45	**11.63**	**5.59**	**6.03**

Stage-Area-Storage for Pond SEP: SEPARATOR

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
776.50	**0.000**	779.10	0.000
776.55	0.000	779.15	0.000
776.60	0.000	779.20	0.000
776.65	0.000	779.25	0.000
776.70	0.000	779.30	0.000
776.75	0.000	779.35	0.000
776.80	0.000	779.40	0.000
776.85	0.000	779.45	0.000
776.90	0.000	779.50	0.000
776.95	0.000	779.55	0.000
777.00	0.000	779.60	0.000
777.05	0.000	779.65	0.000
777.10	0.000	779.70	0.000
777.15	0.000	779.75	0.000
777.20	0.000	779.80	0.000
777.25	0.000	779.85	0.000
777.30	0.000	779.90	0.000
777.35	0.000	779.95	0.000
777.40	0.000	780.00	0.000
777.45	0.000	780.05	0.000
777.50	0.000	780.10	0.000
777.55	0.000	780.15	0.000
777.60	0.000	780.20	0.000
777.65	0.000	780.25	0.000
777.70	0.000	780.30	0.000
777.75	0.000	780.35	0.000
777.80	0.000	780.40	0.000
777.85	0.000	780.45	0.000
777.90	0.000	780.50	0.000
777.95	0.000	780.55	0.000
778.00	0.000	780.60	0.000
778.05	0.000	780.65	0.000
778.10	0.000	780.70	0.000
778.15	0.000	780.75	0.000
778.20	0.000	780.80	0.000
778.25	0.000	780.85	0.000
778.30	0.000	780.90	0.000
778.35	0.000	780.95	0.000
778.40	0.000	781.00	0.000
778.45	0.000	781.05	0.000
778.50	0.000	781.10	0.000
778.55	0.000	781.15	0.000
778.60	0.000	781.20	0.000
778.65	0.000	781.25	0.000
778.70	0.000	781.30	0.000
778.75	0.000	781.35	0.000
778.80	0.000	781.40	0.000
778.85	0.000	781.45	0.000
778.90	0.000		
778.95	0.000		
779.00	0.000		
779.05	0.000		

Summary for Pond SOCS: South OCS

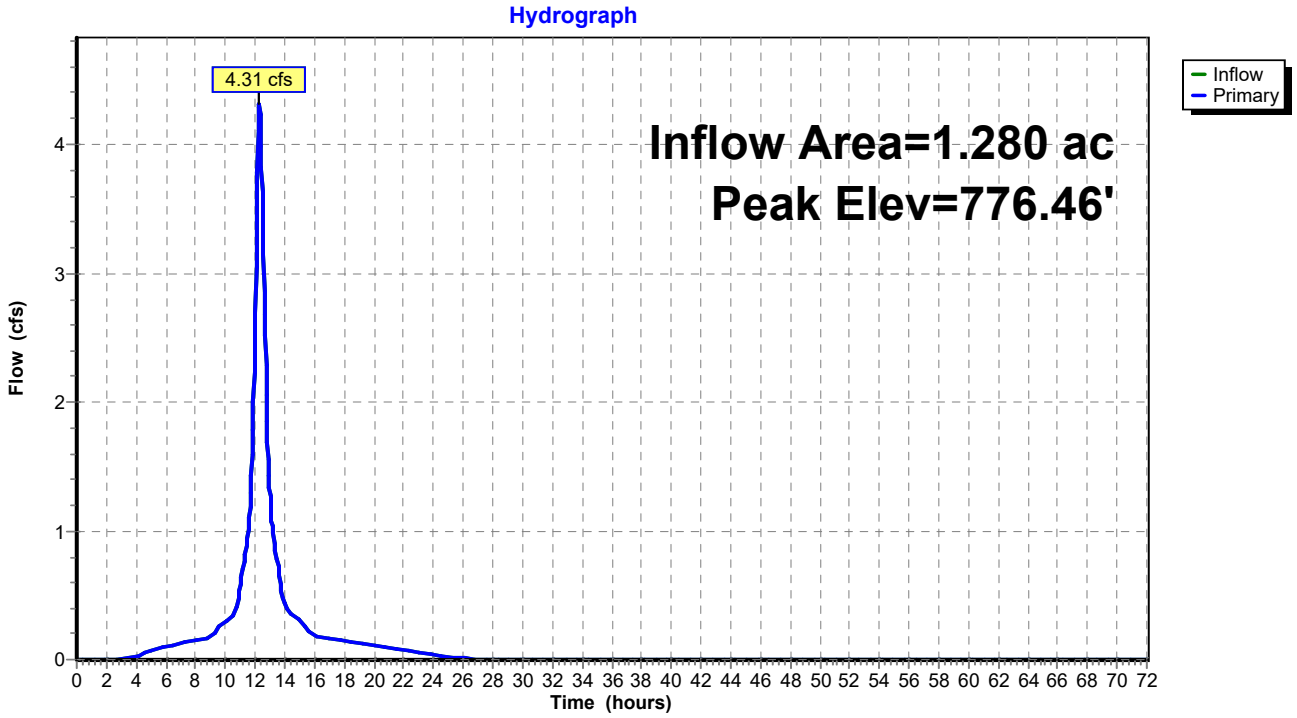
Inflow Area = 1.280 ac, 99.06% Impervious, Inflow Depth = 5.86" for 100-yr event
Inflow = 4.31 cfs @ 12.27 hrs, Volume= 0.625 af
Outflow = 4.31 cfs @ 12.27 hrs, Volume= 0.625 af, Atten= 0%, Lag= 0.0 min
Primary = 4.31 cfs @ 12.27 hrs, Volume= 0.625 af
Routed to Reach S FLOWS : 15-in RCP

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.04 hrs / 2
Peak Elev= 776.46' @ 12.27 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	776.00'	**OCS Weir, Cv= 2.62 (C= 3.28)** Head (feet) 2.30 6.80 Width (feet) 4.00 4.00
#2	Primary	773.80'	**2.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=4.29 cfs @ 12.27 hrs HW=776.46' TW=774.28' (Dynamic Tailwater)
1=OCS Weir (Weir Controls 4.14 cfs @ 2.23 fps)
2=Orifice/Grate (Orifice Controls 0.16 cfs @ 7.12 fps)

Pond SOCS: South OCS



Hydrograph for Pond SOCS: South OCS

Time (hours)	Inflow (cfs)	Elevation (feet)	Primary (cfs)
0.00	0.00	773.80	0.00
0.80	0.00	773.80	0.00
1.60	0.00	773.80	0.00
2.40	0.00	773.81	0.00
3.20	0.01	773.87	0.01
4.00	0.03	773.96	0.03
4.80	0.07	774.30	0.07
5.60	0.09	774.58	0.09
6.40	0.11	774.94	0.11
7.20	0.13	775.36	0.13
8.00	0.15	775.81	0.15
8.80	0.16	776.01	0.16
9.60	0.26	776.04	0.26
10.40	0.33	776.06	0.33
11.20	0.72	776.12	0.72
12.00	**2.61**	**776.33**	**2.61**
12.80	**1.86**	**776.26**	**1.86**
13.60	0.67	776.12	0.67
14.40	0.35	776.06	0.35
15.20	0.29	776.05	0.29
16.00	0.19	776.02	0.19
16.80	0.17	776.01	0.17
17.60	0.15	775.95	0.15
18.40	0.14	775.57	0.14
19.20	0.12	775.24	0.12
20.00	0.11	774.94	0.11
20.80	0.09	774.68	0.09
21.60	0.08	774.46	0.08
22.40	0.07	774.28	0.07
23.20	0.05	774.13	0.05
24.00	0.04	774.02	0.04
24.80	0.02	773.92	0.02
25.60	0.01	773.88	0.01
26.40	0.01	773.86	0.01
27.20	0.00	773.85	0.00
28.00	0.00	773.84	0.00
28.80	0.00	773.84	0.00
29.60	0.00	773.83	0.00
30.40	0.00	773.83	0.00
31.20	0.00	773.83	0.00
32.00	0.00	773.83	0.00
32.80	0.00	773.82	0.00
33.60	0.00	773.82	0.00
34.40	0.00	773.82	0.00
35.20	0.00	773.82	0.00
36.00	0.00	773.82	0.00
36.80	0.00	773.82	0.00
37.60	0.00	773.82	0.00
38.40	0.00	773.82	0.00
39.20	0.00	773.81	0.00
40.00	0.00	773.81	0.00
40.80	0.00	773.81	0.00
41.60	0.00	773.81	0.00
42.40	0.00	773.81	0.00
43.20	0.00	773.81	0.00
44.00	0.00	773.81	0.00
44.80	0.00	773.81	0.00
45.60	0.00	773.81	0.00
46.40	0.00	773.81	0.00
47.20	0.00	773.81	0.00
48.00	0.00	773.81	0.00
48.80	0.00	773.81	0.00
49.60	0.00	773.81	0.00
50.40	0.00	773.81	0.00
51.20	0.00	773.81	0.00
52.00	0.00	773.81	0.00
52.80	0.00	773.81	0.00
53.60	0.00	773.81	0.00
54.40	0.00	773.81	0.00
55.20	0.00	773.81	0.00
56.00	0.00	773.81	0.00
56.80	0.00	773.81	0.00
57.60	0.00	773.81	0.00
58.40	0.00	773.81	0.00
59.20	0.00	773.81	0.00
60.00	0.00	773.81	0.00
60.80	0.00	773.81	0.00
61.60	0.00	773.81	0.00
62.40	0.00	773.81	0.00
63.20	0.00	773.81	0.00
64.00	0.00	773.81	0.00
64.80	0.00	773.81	0.00
65.60	0.00	773.81	0.00
66.40	0.00	773.81	0.00
67.20	0.00	773.81	0.00
68.00	0.00	773.81	0.00
68.80	0.00	773.81	0.00
69.60	0.00	773.81	0.00
70.40	0.00	773.81	0.00
71.20	0.00	773.81	0.00
72.00	0.00	773.81	0.00

Stage-Discharge for Pond SOCS: South OCS

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
773.80	0.00	776.40	3.48	779.00	68.31
773.85	0.00	776.45	4.12	779.05	70.02
773.90	0.01	776.50	4.80	779.10	71.74
773.95	0.03	776.55	5.51	779.15	73.48
774.00	0.04	776.60	6.26	779.20	75.23
774.05	0.04	776.65	7.04	779.25	77.00
774.10	0.05	776.70	7.85	779.30	78.78
774.15	0.05	776.75	8.69	779.35	80.57
774.20	0.06	776.80	9.55	779.40	82.37
774.25	0.06	776.85	10.45	779.45	84.19
774.30	0.07	776.90	11.37	779.50	86.03
774.35	0.07	776.95	12.31	779.55	87.87
774.40	0.08	777.00	13.29	779.60	89.73
774.45	0.08	777.05	14.28	779.65	91.60
774.50	0.08	777.10	15.30	779.70	93.49
774.55	0.09	777.15	16.35	779.75	95.38
774.60	0.09	777.20	17.41	779.80	97.29
774.65	0.09	777.25	18.50	779.85	99.22
774.70	0.09	777.30	19.61	779.90	101.15
774.75	0.10	777.35	20.74	779.95	103.10
774.80	0.10	777.40	21.90	780.00	105.06
774.85	0.10	777.45	23.07	780.05	107.03
774.90	0.11	777.50	24.27	780.10	109.02
774.95	0.11	777.55	25.48	780.15	111.01
775.00	0.11	777.60	26.72	780.20	113.02
775.05	0.11	777.65	27.97	780.25	115.04
775.10	0.12	777.70	29.24	780.30	117.07
775.15	0.12	777.75	30.53	780.35	119.12
775.20	0.12	777.80	31.84	780.40	121.17
775.25	0.12	777.85	33.17	780.45	123.24
775.30	0.13	777.90	34.52	780.50	**125.32**
775.35	0.13	777.95	35.88		
775.40	0.13	778.00	37.27		
775.45	0.13	778.05	38.66		
775.50	0.13	778.10	40.08		
775.55	0.14	778.15	41.51		
775.60	0.14	778.20	42.97		
775.65	0.14	778.25	44.43		
775.70	0.14	778.30	45.92		
775.75	0.14	778.35	47.41		
775.80	0.15	778.40	48.93		
775.85	0.15	778.45	50.46		
775.90	0.15	778.50	52.01		
775.95	0.15	778.55	53.57		
776.00	0.15	778.60	55.15		
776.05	0.30	778.65	56.74		
776.10	0.57	778.70	58.35		
776.15	0.92	778.75	59.97		
776.20	1.33	778.80	61.61		
776.25	1.80	778.85	63.26		
776.30	2.32	778.90	64.93		
776.35	2.88	778.95	66.61		

Stage-Area-Storage for Pond SOCS: South OCS

Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)	Elevation (feet)	Storage (acre-feet)
773.80	**0.000**	776.40	0.000	779.00	0.000
773.85	0.000	776.45	0.000	779.05	0.000
773.90	0.000	776.50	0.000	779.10	0.000
773.95	0.000	776.55	0.000	779.15	0.000
774.00	0.000	776.60	0.000	779.20	0.000
774.05	0.000	776.65	0.000	779.25	0.000
774.10	0.000	776.70	0.000	779.30	0.000
774.15	0.000	776.75	0.000	779.35	0.000
774.20	0.000	776.80	0.000	779.40	0.000
774.25	0.000	776.85	0.000	779.45	0.000
774.30	0.000	776.90	0.000	779.50	0.000
774.35	0.000	776.95	0.000	779.55	0.000
774.40	0.000	777.00	0.000	779.60	0.000
774.45	0.000	777.05	0.000	779.65	0.000
774.50	0.000	777.10	0.000	779.70	0.000
774.55	0.000	777.15	0.000	779.75	0.000
774.60	0.000	777.20	0.000	779.80	0.000
774.65	0.000	777.25	0.000	779.85	0.000
774.70	0.000	777.30	0.000	779.90	0.000
774.75	0.000	777.35	0.000	779.95	0.000
774.80	0.000	777.40	0.000	780.00	0.000
774.85	0.000	777.45	0.000	780.05	0.000
774.90	0.000	777.50	0.000	780.10	0.000
774.95	0.000	777.55	0.000	780.15	0.000
775.00	0.000	777.60	0.000	780.20	0.000
775.05	0.000	777.65	0.000	780.25	0.000
775.10	0.000	777.70	0.000	780.30	0.000
775.15	0.000	777.75	0.000	780.35	0.000
775.20	0.000	777.80	0.000	780.40	0.000
775.25	0.000	777.85	0.000	780.45	0.000
775.30	0.000	777.90	0.000	780.50	0.000
775.35	0.000	777.95	0.000		
775.40	0.000	778.00	0.000		
775.45	0.000	778.05	0.000		
775.50	0.000	778.10	0.000		
775.55	0.000	778.15	0.000		
775.60	0.000	778.20	0.000		
775.65	0.000	778.25	0.000		
775.70	0.000	778.30	0.000		
775.75	0.000	778.35	0.000		
775.80	0.000	778.40	0.000		
775.85	0.000	778.45	0.000		
775.90	0.000	778.50	0.000		
775.95	0.000	778.55	0.000		
776.00	0.000	778.60	0.000		
776.05	0.000	778.65	0.000		
776.10	0.000	778.70	0.000		
776.15	0.000	778.75	0.000		
776.20	0.000	778.80	0.000		
776.25	0.000	778.85	0.000		
776.30	0.000	778.90	0.000		
776.35	0.000	778.95	0.000		

Events for Subcatchment DA1: SW Half Parking Lot & Residential Building

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
2-yr	2.87	4.58	0.281	2.64
10-yr	4.28	6.89	0.431	4.04
10-yrb2b	4.28	6.94	**0.887**	**8.32**
100-yr	**7.19**	**11.64**	0.741	6.95

Events for Subcatchment DA2: Central Parking Lot

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
2-yr	2.87	0.21	0.013	2.64
10-yr	4.28	0.31	0.020	4.04
10-yrb2b	4.28	0.31	**0.040**	**8.32**
100-yr	**7.19**	**0.53**	0.034	6.95

Events for Subcatchment DA3: Parking Ramp

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
2-yr	2.87	2.39	0.147	2.64
10-yr	4.28	3.60	0.225	4.04
10-yrb2b	4.28	3.62	**0.463**	**8.32**
100-yr	**7.19**	**6.07**	0.387	6.95

Events for Subcatchment DA4: North half of Parking and Office Tower

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
2-yr	2.87	1.08	0.065	2.53
10-yr	4.28	1.64	0.101	3.93
10-yrb2b	4.28	1.66	**0.210**	**8.20**
100-yr	**7.19**	**2.78**	0.175	6.83

Events for Subcatchment DA5: N and W Edges

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
2-yr	2.87	0.98	0.056	2.22
10-yr	4.28	1.54	0.090	3.60
10-yrb2b	4.28	1.61	**0.196**	**7.84**
100-yr	**7.19**	**2.67**	0.162	6.48

Events for Reach 5.1: 12-in Catch Basin

Event	Inflow (cfs)	Outflow (cfs)	Elevation (feet)	Storage (cubic-feet)
2-yr	0.98	0.98	772.94	13
10-yr	1.54	1.53	773.05	18
10-yrb2b	1.61	1.61	773.07	19
100-yr	**2.67**	**2.67**	**773.28**	**28**

Events for Reach N FLOWS: 108-in RCP

Event	Inflow (cfs)	Outflow (cfs)	Elevation (feet)	Storage (cubic-feet)
2-yr	3.56	2.18	762.31	2,929
10-yr	6.50	4.23	762.81	4,667
10-yrb2b	6.62	4.35	762.83	4,760
100-yr	**10.90**	**8.33**	**763.54**	**7,556**

Events for Reach S FLOWS: 15-in RCP

Event	Inflow (cfs)	Outflow (cfs)	Elevation (feet)	Storage (cubic-feet)
2-yr	2.67	2.67	774.17	8
10-yr	3.29	3.29	774.21	10
10-yrb2b	3.30	3.30	774.21	10
100-yr	**4.31**	**4.32**	**774.28**	**12**

Events for Pond NADS: North ADS MC-3500

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (acre-feet)
2-yr	4.75	2.80	772.10	0.067
10-yr	8.28	5.31	772.57	0.100
10-yrb2b	8.37	5.38	772.58	0.100
100-yr	**15.43**	**8.95**	**773.95**	**0.179**

Events for Pond SADS: South ADS MC-3500

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (acre-feet)
2-yr	3.51	2.67	775.29	0.051
10-yr	4.16	3.29	775.56	0.061
10-yrb2b	4.17	3.30	775.57	0.061
100-yr	**5.59**	**4.31**	**776.04**	**0.077**

Events for Pond SEP: SEPARATOR

Event	Inflow (cfs)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)	Elevation (feet)	Storage (acre-feet)
2-yr	4.58	4.58	3.51	1.07	778.70	**0.000**
10-yr	6.89	6.89	4.16	2.73	779.42	0.000
10-yrb2b	6.94	6.94	4.17	2.77	779.44	0.000
100-yr	**11.64**	**11.64**	**5.59**	**6.04**	**781.45**	0.000

Events for Pond SOCS: South OCS

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (acre-feet)
2-yr	2.67	2.67	776.33	**0.000**
10-yr	3.29	3.29	776.38	0.000
10-yrb2b	3.30	3.30	776.39	0.000
100-yr	**4.31**	**4.31**	**776.46**	0.000

602 South Front Street
Traffic Impact Review

Prepared by: ISG

Submitted to: City of Mankato

Project No. 25-33587

November 16, 2026

ISG

Architecture
Engineering
Environmental
Planning

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SIGNATURE SHEET

I HEREBY CERTIFY THAT THESE CALCULATIONS WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PROFESSIONAL ENGINEER
I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota

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Signature: William A. Kratt

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Engineer's Project Number: 25-33587

Dated this 16th day of November 2026

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INTRODUCTION

Purpose of Report

The purpose of this report is to document the methodologies, findings, recommendations, and conclusions of the proposed 602 South Front Street development project in the City of Mankato, Blue Earth County, Minnesota. The study includes the basis for all assumptions, traffic parameters, and conclusions. This report presents data in a logical format including tables and figures to convey the data and its meaning accurately and clearly.

Study Objectives

The objectives of this study include the following:

1. Identify the impacts to the transportation system and immediate area due to the proposed reconstruction project
2. Recommend necessary improvements to the transportation system to minimize crash risk and maintain a safe and efficient system
3. Protect the safety and functionality of the transportation system while providing sufficient access along the proposed reconstruction project

ANALYSIS OF EXISTING CONDITIONS

Location, Zoning, and Land Use

This report evaluates the projected impacts of the proposed 602 South Front Street development project in the City of Mankato, Blue Earth County, Minnesota. Preliminary site plans and conceptual designs are provided in **Appendix A**, and a project location map is included in **Appendix B.**

The existing project is located within the block bordered by Warren Street to the north, Front Street to the east, Liberty Street to the south, and Riverfront Drive to the west. The existing site has a small 8-unit apartment building, a Walgreens pharmacy, retail shops and a local coffee shop. The Walgreens and retail shops are closed and vacant and the coffee shop has agreed to move into the new development once it is completed.

The study evaluates the following intersections:

- Intersection 1: S Riverfront Drive and Poplar Street/Warren Street
- Intersection 2: S Riverfront Drive and W Liberty Street
- Intersection 3: S Front Street and W Liberty Street
- Intersection 4: S Front Street and Warren Street

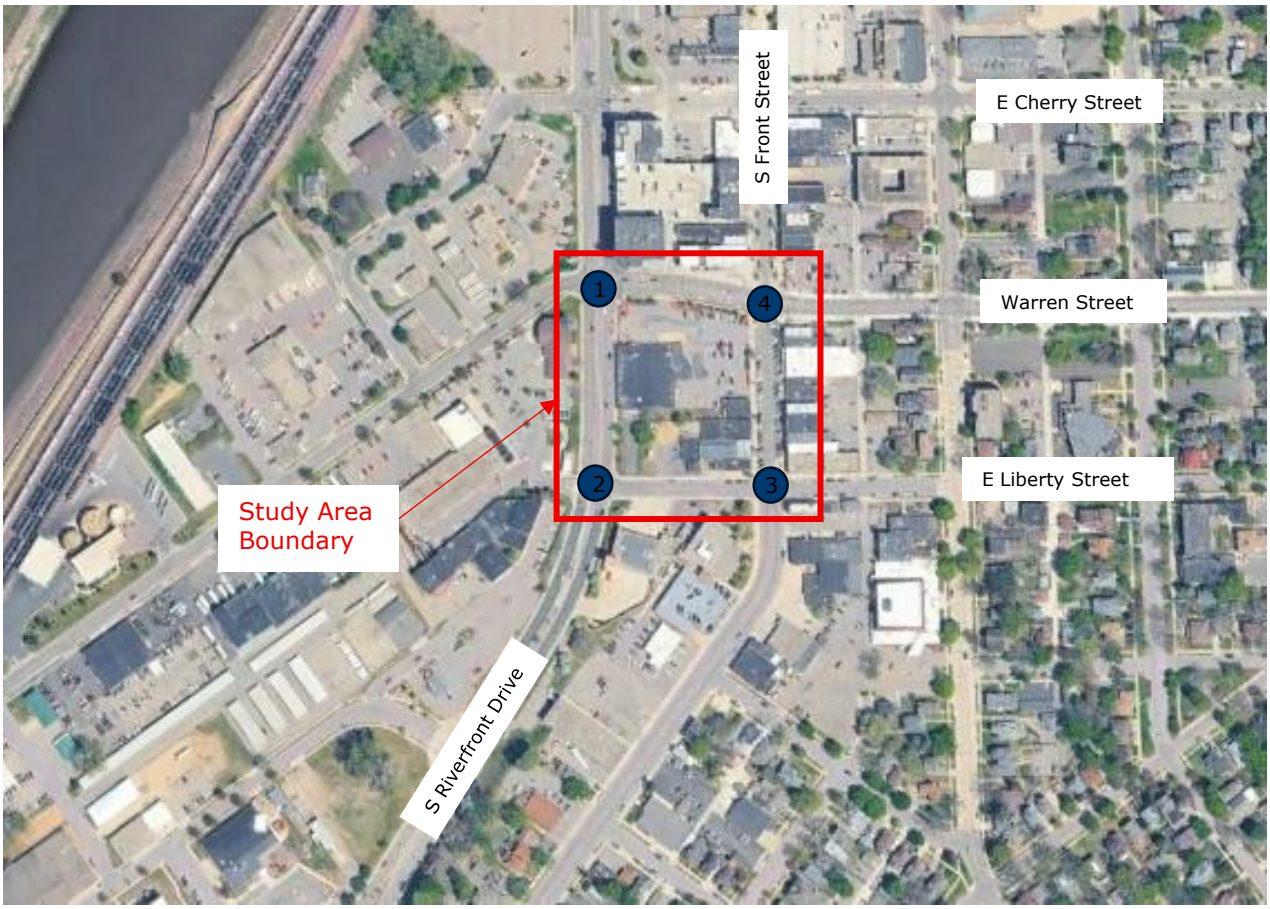


Figure 1: Study Area Overview

Roadway Geometry

Riverfront Drive runs north–south through the city, providing access and connectivity to downtown Mankato as well as primary connections to other parts of the city and the surrounding region. Within the study area, Riverfront Drive is a four-lane divided roadway, and it transitions to a four-lane undivided roadway further south. S Riverfront Drive has a signalized intersection with Warren Street. The intersection with Liberty Street is unsignalized and has emergency signal control, with stop signs on both minor approaches. The roadway is approximately 60 feet wide and includes curb and gutter with 6-foot sidewalks on both sides. At both intersections, each approach consists of a dedicated left-turn lane, a through lane, and a shared through-right turn lane. Posted traffic speeds transition from 30 mph to 35 mph along the corridor.

S Front Street is one of the main commercial corridors near downtown Mankato, with shops, restaurants, and mixed-use buildings closer to downtown. The corridor provides direct connectivity to downtown and experiences higher pedestrian activity. The roadway is approximately 20 feet wide and includes on-street angle parking on both sides, with a two-hour parking limit from Monday to Friday. Front Street has stop-controlled intersections at both Warren Street and Liberty Street, with posted speed limits of less than 30 mph.

Warren Street and Liberty Street are local east–west roadways that provide access to adjacent residential and mixed-use properties within the study area. Liberty Street functions as a low-volume access roadway connecting to the surrounding street network. It is approximately 35 feet wide, includes curb and gutter on both sides, and operates under stop control at its intersections with Riverfront Drive and Front Street and supports parallel parking on both sides.

Warren Street is approximately 45 feet wide and includes a dedicated left-turn lane at its intersections with both Riverfront Drive and Front Street. The intersection with Riverfront Drive is signalized, while the intersection with Front Street is stop-controlled. East of the study area, Warren Street transitions to a two-lane undivided roadway with a center two-way left-turn lane.

See **Appendix C** for the existing control at intersections studied in this report.

Existing Traffic Volumes

COLLECTED DATA

The turning-movement data was collected using video equipment at all 4 intersections for 2 hours in the morning, from 7:00 AM to 9:00 AM, and 2 hours in the evening, from 4:00 PM to 6:00 PM, during peak traffic hours on Tuesday, April 7th, 2026. The actual high and low temperatures during the collection day were 45°F and 20°F, respectively, with all roads observed to be clean and dry. See **Appendix D** for existing turning movement diagrams, and **Appendix E** for analysis worksheets of existing traffic volumes.

It is observed that the AM peak hour traffic at Intersections 1, 2 and 4 occurred between 7:15 - 8:15 AM, while Intersection 3 exhibited its AM peak hour between 7:30 - 8:30 AM. During the PM period, Intersections 1 and 2 recorded peak hour traffic between 4:15 - 5:15 PM, and Intersections 3 and 4 recorded peak hour traffic between 4:00 - 5:00 PM.

Since the intersections experienced different peak-hour volumes at different times, the overall study peak hours were selected to represent the highest combined traffic activity. The periods 7:15–8:15 AM and 4:15–5:15 PM were chosen as the study peak hours.

DATA ANALYSIS

Traffic operations were analyzed using Synchro Version 12.3.1.19. Signalized intersections were evaluated using Synchro analysis methodologies in accordance with Minnesota guidance for the use of Synchro analysis outputs (non-HCM). Level of Service (LOS), delay, and volume-to-capacity (v/c) ratios were determined using Synchro, while queue lengths were evaluated using SimTraffic. Stop-controlled intersections were evaluated using the Highway Capacity Manual (HCM) 7th Edition methodology. **Tables 1** and **2** illustrate the LOS criteria for signalized and unsignalized intersections, respectively.

Signal timing information for Study Intersections 1 and 4 was provided by the City of Mankato. Operational analyses were conducted for the weekday AM and PM peak hours under Existing, 2027 Opening Year No-Build, 2027 Opening Year Build, 2047 Design Year No-Build, and 2047 Design Year Build conditions. The resulting analysis worksheets are provided in **Appendix K** through **Appendix N**. **Tables 8** through **27** summarize the corresponding Level of Service (LOS) and control delay results for the study intersections.

IMPACT OF VETERAN'S MEMORIAL BRIDGE ON EXISTING TRAFFIC CONDITIONS

The ongoing closure of the Veteran's Memorial Bridge, which began in February 2026 and is expected to continue through 2027, has contributed to increased traffic volumes within the study area during traffic counts. Traffic that previously utilized the bridge is currently being rerouted via U.S. Highway 169 on south and U.S. Highway 14 on north, directing additional volumes onto Riverfront Drive. For purposes of this traffic impact study, the November 2025 traffic counts were selected as the baseline condition because they are representative of typical traffic patterns prior to the temporary bridge closure. The proposed development and the Mulberry Street bridge project are expected to be completed within a similar timeframe. Therefore, the November 2025 traffic volumes are considered the more appropriate basis for evaluating long-term traffic conditions and the

development's anticipated impact under post-construction roadway conditions, when normal travel patterns are expected to resume. The April 2026 counts were used to assess the temporary effects of the bridge closure and were not used as the baseline for the long-term operational analysis.

This shift in travel patterns is creating noticeable impacts at key study intersections, including S Riverfront Drive at Warren Street, S Riverfront Drive at Liberty Street, and Warren Street at S Front Street. A comparison of the traffic counts collected on April 7, 2026, with those collected on November 12, 2025, for intersection 1 indicates a 42% increase in volume during AM peak hour, and 37% increase during the PM peak hour. The counts provided by the City of Mankato showed an AM peak hour from 7:30 – 8:30, and a PM peak hour from 4:15 to 5:15. The peak hour from the November 2025 counts is consistent with the peak hour from the April 2026 counts.

The differences in traffic volumes between the November 2025 and the April 2026 counts, were calculated and assigned to the appropriate movements expected to be affected by the bridge closure.

Table 1: Signalized Intersection Level of Service Criteria

Control Delay Per Vehicle (s)	LOS
≤10	A
10 to 20	B
20 to 35	C
35 to 55	D
55 to 80	E
>80	F

Table 2: TWSC, AWSC and Roundabout Level of Service Criteria

Control Delay Per Vehicle (s)	LOS
≤10	A
10 to 15	B
15 to 25	C
25 to 35	D
35 to 50	E
>50	F

Table 3: Existing (2026) LOS and Delay for Intersection 1

INTERSECTION 1	WEEKDAY AM PEAK												
	2026 EXISTING												
S Riverfront Drive & Polar Street/Warren Street	Overall	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)		80	27	9	48	41	40	22	442	53	43	272	63
Queue (ft)		84			72	86		27	105	90	44	81	80
Storage Length (ft)								140			120		
Mvmt Delay (sec)					19.1	13.5		13.2	12.6		11.3	9.3	
Mvmt LOS					B	B		B	B		B	A	
Delay (sec)	12.9	22.2			15.6			12.7			9.5		
LOS	B	C			B			B			A		

Source: Data was analyzed using Synchro and Sim Traffic (queue).

INTERSECTION 1	WEEKDAY PM PEAK												
	2026 EXISTING												
S Riverfront Drive & Polar Street/Warren Street	Overall	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)		87	42	30	69	42	55	30	402	64	60	575	76
Queue (ft)		106			82	77		37	112	109	50	130	97
Storage Length (ft)								140			120		
Mvmt Delay (sec)					19.1	10.9		13.5	12.4		10.8	10.9	
Mvmt LOS					B	B		B	B		B	B	
Delay (sec)	12.9	21.7			14.3			12.4			10.9		
LOS	B	C			B			B			B		

Source: Data was analyzed using Synchro and Sim Traffic (queue).

Table 4: Existing (2026) LOS and Delay for Intersection 2

INTERSECTION 2	WEEKDAY AM PEAK												
	2026 EXISTING												
S Riverfront Drive & W Liberty Street	Overall	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)				31	14	3	24	29	510	16	14	312	10
Queue (ft)				37	46			23			23		
Mvmt Delay (sec)								8.2			9.2		
Mvmt LOS								A			A		
Delay (sec)	1.5	9.7			18.6			0.4			0.3		
LOS	N/A	A			C			N/A			N/A		

Source: Data was analyzed using Synchro (HCM 7th Edition) and Sim Traffic (queue).

INTERSECTION 2	WEEKDAY PM PEAK												
	2026 EXISTING												
S Riverfront Drive & W Liberty Street	Overall	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)				10	22	2	36	9	460	13	40	649	3
Queue (ft)				32	49			19			35		
Mvmt Delay (sec)								8.9			8.4		
Mvmt LOS								A			A		
Delay (sec)	1.2	10.5			16.6			0.2			0.5		
LOS	N/A	B			C			N/A			N/A		

Source: Data was analyzed using Synchro (HCM 7th Edition) and Sim Traffic (queue).

Table 5: Existing (2026) LOS and Delay for Intersection 3

INTERSECTION 3	WEEKDAY AM PEAK													
	2026 EXISTING													
S Front Street & W Liberty Street	Overall	Eastbound			Westbound			Northbound			Southbound			
		L	T	R	L	T	R	L	T	R	L	T	R	
Volume (veh)		4	10	15	16	21	2	18	71	56	4	29	3	
Queue (ft)		41			46			61			44			
Mvmt Delay (sec)														
Mvmt LOS														
Delay (sec)	8.1	7.5			8.0			8.3			7.6			
LOS	A	A			A			A			A			

Source: Data was analyzed using Synchro (HCM 7th Edition) and Sim Traffic (queue).

INTERSECTION 3	WEEKDAY PM PEAK													
	2026 EXISTING													
S Front Street & W Liberty Street	Overall	Eastbound			Westbound			Northbound			Southbound			
		L	T	R	L	T	R	L	T	R	L	T	R	
Volume (veh)		3	23	29	18	27	3	20	81	65	13	63	12	
Queue (ft)		40			39			67			64			
Mvmt Delay (sec)														
Mvmt LOS														
Delay (sec)	8.1	7.6			8.0			8.3			7.9			
LOS	A	A			A			A			A			

Source: Data was analyzed using Synchro (HCM 7th Edition) and Sim Traffic (queue).

Table 6: Existing (2026) LOS and Delay for Intersection 4

INTERSECTION 4	WEEKDAY AM PEAK													
	2026 EXISTING													
S Front Street & Warren Street	Overall	Eastbound			Westbound			Northbound			Southbound			
		L	T	R	L	T	R	L	T	R	L	T	R	
Volume (veh)		1	116	5	28	137	3	6	21	45	3	12	3	
Queue (ft)			51		42	62			69			27		
Storage Length (ft)					70									
Mvmt Delay (sec)		6.0	6.8		6.3	6.9								
Mvmt LOS		A	A		A	A								
Delay (sec)	6.7	6.8			6.8			5.7			8.5			
LOS	A	A			A			A			A			

Source: Data was analyzed using Synchro and Sim Traffic (queue).

INTERSECTION 4	WEEKDAY PM PEAK													
	2026 EXISTING													
S Front Street & Warren Street	Overall	Eastbound			Westbound			Northbound			Southbound			
		L	T	R	L	T	R	L	T	R	L	T	R	
Volume (veh)		13	149	8	47	141	17	7	20	58	16	40	12	
Queue (ft)		29	60		71	69			65			50		
Storage Length (ft)					70									
Mvmt Delay (sec)		6.0	6.9		6.6	6.7								
Mvmt LOS		A	A		A	A								
Delay (sec)	6.7	6.8			6.6			5.3			8.6			
LOS	A	A			A			A			A			

Source: Data was analyzed using Synchro and Sim Traffic (queue).

Crash Analysis

Crash history was analyzed using MnCMAT2 website. The number of crashes at each study intersection over the last 10 years, along with the corresponding crash rate per million entering vehicles is summarized below. The statewide average for crashes per million entering vehicles in Minnesota is 0.5 and all of these intersections fall below that rate and therefore do not represent a significant safety concern. Detailed crash diagrams from MnCMAT2 are included in **Appendix F.**

- S. Riverfront Drive & Warren Street – 33 Crashes (0.45 Crash Rate)
- Warren Street & S. Front Street – 13 Crashes (0.43 Crash Rate)
- S. Front Street & W. Liberty Street – 4 Crashes (0.29 Crash Rate)
- S. Riverfront Drive & W. Liberty Street – 12 Crashes (0.18 Crash Rate)

PROPOSED DEVELOPMENT

Site Traffic

TRIP GENERATION + SITE ACCESS

Construction of the proposed development is anticipated to be completed and operational in 2027. Access to the development will be provided via angle in parking on Front Street and primary access to an on-site parking structure from Warren Street. Access to the parking structure will be directly across from the alley on the north side of Warren Street. Secondary access to the parking structure will be from W. Liberty Street.

The proposed mixed-use development will consist of two buildings with building one being a multi-story building containing space for retail shops and a coffee shop on the first floor and 165 residential units, providing up to 306 beds on the upper floors. The unit mix includes one-bedroom and two-bedroom units. The second building is a multi-story office building with over 39,000 sf of space. The parking garage will have 297 parking spaces.

Based on the proposed development configuration and access, trip generation for the proposed development was estimated using the *ITE Trip Generation Manual, 12th Edition*.

The proposed mixed-use development will include the following land uses:

- Land Use Code 221 – Multifamily Apartments (Mid-Rise): 165 units
- Land Use Code 710 – General Office Building: 39,338 SF GFA
- Land Use Code 822 – Strip Retail Plaza: 29,550 SF GLA
- Land Use Code 936 – Coffee/Donut Shop without Drive-Thru Window: 5,107 SF GFA

INTERNAL CAPTURE

Because the proposed development includes a mix of residential, retail, office, and restaurant uses, an internal capture analysis was completed to account for trips occurring between on-site land uses rather than on the surrounding roadway network. The analysis resulted in 82 internal trips in the AM peak hour (41 entering and 41 exiting) and 154 in the PM peak hour (77 entering and 77 exiting). Internal trip-making primarily occurs between the office, retail, and restaurant uses during the AM peak hour, while the PM peak hour reflects increased interaction between the residential component and the site's commercial uses. These trips remain within the development and therefore do not contribute traffic to the external roadway system. The internal capture analysis is provided in **Appendix G**.

PASS-BY RATES

The pass-by rate of 40% was used for the Coffee/Donut Shop without Drive-Thru Window which is consistent with the ITE published pass-by rates for similar land uses. Wisconsin DOT allows the pass-by rates for Coffee/Donut Shop without Drive-Thru Window to use the same pass-by rates for Coffee/Donut Shop with Drive-Thru Window as long as it has indoor seating which this proposed coffee shop will have. This pass-by rate is considered conservative for traffic studies.

The pass-by rate of 20% was chosen for the strip retail which is lower than the published rate for this land use. The reason for this is because this site is located in an urban downtown setting. Parking for this development will share street parking and the attached parking garage which could limit the number of pass-by trips if there is not an open spot on the street and patrons would need to enter the garage.

Gross trips generated by the proposed development were adjusted for internal capture, pass-by trips, and existing-site trip credits. **Table 7** summarizes the application of these adjustments and the resulting net-new AM and PM peak-hour trips.

Table 7: Gross-to-Net Trip Generation Summary

	AM Peak			PM Peak		
	In	**Out**	**Total**	**In**	**Out**	**Total**
Gross Trips	250	221	471	171	202	373
Internal Capture Reduction	41	41	82	77	77	154
Pass-By Reduction	49	48	97	19	17	36
Existing Site Credit	105	99	204	106	105	211
Net New Trips	**55**	**33**	**88**	**-31**	**3**	**-28**

TRIP DISTRIBUTION AND ASSIGNMENT

The trip distribution used in assigning the site traffic for the proposed development was estimated based on a combination of existing traffic patterns, population centers in the vicinity of the study area, and engineering judgment. Trip distribution exhibits are shown in **Appendix H.**

It was assumed that the site trips will be regionally distributed as follows:

- 35% to/from the north via S Riverfront Drive
- 35% to/from the south via S Riverfront Drive
- 15% to/from the east via Warren Street
- 10% to/from the west via Poplar Street
- 5% to/from the north/south via Front Street

The site traffic along S Riverfront Drive is expected to utilize W Liberty Street, and Warren Street to access the proposed development. The trip distribution was applied to the anticipated trip generation to assign trips to the network. Refer to the attachments for an illustration of the site's trip assignment.

Growth Rate

ROADWAY TRAFFIC GROWTH RATE

Traffic growth rates for the study area roadways were obtained from the Mankato/North Mankato Area Planning Organization (MAPO) 2050 Metropolitan Transportation Plan. These growth rates were developed using MnDOT Annual Average Daily Traffic (AADT) data collected between 2000 and 2022 and incorporated into the regional travel demand forecasting model. Rather than applying a single growth rate to all approaches at an intersection, individual approach-specific growth rates were used where applicable to better reflect the anticipated differences in future traffic growth by roadway direction.

- Intersection 1: 1.3% for NB and SB approaches, 1.0% for EB and WB approaches
- Intersection 2: 1.3% for NB and SB approaches, 0.0% for EB and WB approaches
- Intersection 3: 0.0% for all approaches
- Intersection 4: 1.0% for EB and WB approaches, and 0.0% for NB and SB approaches

The proposed mixed-use development is anticipated to be operational in 2027. Accordingly, existing traffic counts collected in 2026 were projected to the 2027 opening year using the applicable annual growth rates to establish the Opening Year No-Build traffic volumes. Traffic generated by the proposed development was then assigned to the surrounding roadway network and added to the Opening Year No-Build volumes to establish the Opening Year Build traffic volumes. Trip assignment exhibits are provided in **Appendix I**.

ANALYSIS OF FUTURE CONDITIONS

Capacity and Level of Service at Studied Intersections – AM and PM Peak Hours

Analysis of signalized intersections were completed for both the opening year (2027) and design year (2047) using existing signal timings provided by the city. LOS was deemed to be acceptable for all movements and intersections, so no adjustments were made. All queue lengths reported are 95% and do not extend into adjacent intersections.

INTERSECTION 1

Intersection 1 is projected to operate at Level of Service (LOS) B under all analyzed scenarios during the AM and PM peak hours. The eastbound approach represents the critical movement, with operations reported at LOS C. Intersection delays increase slightly under future traffic conditions; however, the addition of site-generated traffic under the Build scenario results in minimal changes to intersection operations. Based on the analysis results, no significant operational concerns are anticipated at this intersection during the analysis period.

INTERSECTION 2

Intersection 2 is projected to maintain low overall intersection delays under all analyzed scenarios. The westbound approach experiences the highest delays and is projected to operate at LOS D during the 2047 Build AM peak hour. Despite this approach-level performance, the proposed development results in only minor changes to intersection operations, and overall intersection performance is projected to remain acceptable through the 2047 design year. The westbound approach should be recognized as the critical movement when evaluating future operating conditions.

INTERSECTION 3

Intersection 3 is projected to operate at LOS A under all analyzed scenarios during the AM and PM peak hours, with all approaches operating at LOS A. The addition of site-generated traffic is anticipated to have little to no effect on intersection operations. The reported results remain unchanged across the analysis scenarios because no background traffic growth was applied to the study approaches. Based on the analyzed conditions, no operational concerns are anticipated at this intersection.

INTERSECTION 4

Intersection 4 is projected to operate at LOS A under all analyzed scenarios during the AM and PM peak hours. Intersection delays remain low and relatively consistent throughout the analysis period. Although PM peak-hour traffic volumes are slightly higher than AM peak-hour volumes, intersection operations remain comparable during both peak periods. The proposed development is anticipated to have little to no effect on intersection performance, and no significant operational concerns are identified under the analyzed conditions.

Table 8: Opening Year No Build (2027) LOS and Delay for Intersection 1

INTERSECTION 1	WEEKDAY AM PEAK													
	2027 Opening Year No Build													
S Riverfront Drive & Polar Street/Warren Street	Overall	Eastbound			Westbound			Northbound			Southbound			
		L	T	R	L	T	R	L	T	R	L	T	R	
Volume (veh)		81	27	9	48	41	40	22	448	54	44	276	64	
Queue (ft)		81			57	78		30	113	85	46	82	52	
Storage Length (ft)								140			120			
Mvmt Delay (sec)					19.3	13.6		13.3	12.7		11.3	9.4		
Mvmt LOS					B	B		B	B		B	A		
Delay (sec)	13.0	22.3			15.7			12.7			9.6			
LOS	B	C			B			B			A			

Source: Data was analyzed using Synchro and Sim Traffic (queue).

INTERSECTION 1	WEEKDAY PM PEAK													
	2027 Opening Year No Build													
S Riverfront Drive & Polar Street/Warren Street	Overall	Eastbound			Westbound			Northbound			Southbound			
		L	T	R	L	T	R	L	T	R	L	T	R	
Volume (veh)		88	42	30	70	42	56	30	407	65	61	582	77	
Queue (ft)		108			64	71		39	98	64	47	157	91	
Storage Length (ft)								140			120			
Mvmt Delay (sec)					19.1	10.8		13.7	12.5		10.6	10.7		
Mvmt LOS					B	B		B	B		B	B		
Delay (sec)	12.9	21.8			14.3			12.6			10.7			
LOS	B	C			B			B			B			

Source: Data was analyzed using Synchro and Sim Traffic (queue).

Table 9: Opening Year No Build (2027) LOS and Delay for Intersection 2

INTERSECTION 2	WEEKDAY AM PEAK												
	2027 Opening Year No Build												
S Riverfront Drive & W Liberty Street	Overall	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)				31	14	3	24	29	515	16	14	315	10
Queue (ft)				40	40			33			25		
Mvmt Delay (sec)								8.2			9.2		
Mvmt LOS								A			A		
Delay (sec)	1.5	9.7			18.8			0.4			0.4		
LOS	N/A	A			C			N/A			N/A		

Source: Data was analyzed using Synchro (HCM 7th Edition) and Sim Traffic (queue).

INTERSECTION 2	WEEKDAY PM PEAK												
	2027 Opening Year No Build												
S Riverfront Drive & W Liberty Street	Overall	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)				10	22	2	36	9	484	14	42	682	3
Queue (ft)				28	47			26			34		
Mvmt Delay (sec)								9			8.5		
Mvmt LOS								A			A		
Delay (sec)	1.2	10.6			17.5			0.2			0.5		
LOS	N/A	B			C			N/A			N/A		

Source: Data was analyzed using Synchro (HCM 7th Edition) and Sim Traffic (queue).

Table 10: Opening Year No Build (2027) LOS and Delay for Intersection 3

INTERSECTION 3	WEEKDAY AM PEAK												
	2027 Opening Year No Build												
S Front Street & W Liberty Street	Overall	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)		4	10	15	16	21	2	18	71	56	4	29	3
Queue (ft)		39			45			55			46		
Mvmt Delay (sec)													
Mvmt LOS													
Delay (sec)	8.1	7.5			8.0			8.3			7.6		
LOS	A	A			A			A			A		

Source: Data was analyzed using Synchro (HCM 7th Edition) and Sim Traffic (queue).

INTERSECTION 3	WEEKDAY PM PEAK												
	2027 Opening Year No Build												
S Front Street & W Liberty Street	Overall	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)		3	23	29	18	27	3	20	81	65	13	63	12
Queue (ft)		44			43			55			50		
Mvmt Delay (sec)													
Mvmt LOS													
Delay (sec)	8.1	7.6			8.0			8.3			7.9		
LOS	A	A			A			A			A		

Source: Data was analyzed using Synchro (HCM 7th Edition) and Sim Traffic (queue).

Table 11: Opening Year No Build (2027) LOS and Delay for Intersection 4

INTERSECTION 4	WEEKDAY AM PEAK													
	2027 Opening Year No Build													
S Front Street & Warren Street	Overall	Eastbound			Westbound			Northbound			Southbound			
		L	T	R	L	T	R	L	T	R	L	T	R	
Volume (veh)		1	118	5	28	138	3	6	21	45	3	12	3	
Queue (ft)			55		36	69			63			34		
Storage Length (ft)					70									
Mvmt Delay (sec)		6.0	6.8		6.3	6.9								
Mvmt LOS		A	A		A	A								
Delay (sec)	6.7	6.8			6.8			5.7			8.5			
LOS	A	A			A			A			A			

Source: Data was analyzed using Synchro and Sim Traffic (queue).

INTERSECTION 4	WEEKDAY PM PEAK													
	2027 Opening Year No Build													
S Front Street & Warren Street	Overall	Eastbound			Westbound			Northbound			Southbound			
		L	T	R	L	T	R	L	T	R	L	T	R	
Volume (veh)		13	151	8	47	143	17	7	20	58	16	40	12	
Queue (ft)		24	68		39	73			43			68		
Storage Length (ft)					70									
Mvmt Delay (sec)		6.0	6.9		6.6	6.7								
Mvmt LOS		A	A		A	A								
Delay (sec)	6.8	6.8			6.7			5.3			8.6			
LOS	A	A			A			A			A			

Source: Data was analyzed using Synchro and Sim Traffic (queue).

OPENING YEAR BUILD (2027) CONDITION

Table 12: Opening Year Build (2027) LOS and Delay for Intersection 1

INTERSECTION 1	WEEKDAY AM PEAK													
	2027 Opening Year Build													
S Riverfront Drive & Polar Street/Warren Street	Overall	Eastbound			Westbound			Northbound			Southbound			
		L	T	R	L	T	R	L	T	R	L	T	R	
Volume (veh)		81	32	9	48	44	51	22	448	54	63	276	64	
Queue (ft)		91			64	62		21	104	74	52	68	62	
Storage Length (ft)								140			120			
Mvmt Delay (sec)					20.4	14.3		14.2	14.4		11.8	9.6		
Mvmt LOS					C	B		B	B		B	A		
Delay (sec)	**14.1**	24.3			16.4			14.3			9.9			
LOS	**B**	C			B			B			A			

Source: Data was analyzed using Synchro and Sim Traffic (queue).

INTERSECTION 1	WEEKDAY PM PEAK													
	2027 Opening Year Build													
S Riverfront Drive & Polar Street/Warren Street	Overall	Eastbound			Westbound			Northbound			Southbound			
		L	T	R	L	T	R	L	T	R	L	T	R	
Volume (veh)		88	42	30	70	42	56	30	407	65	61	582	77	
Queue (ft)		134			92	83		43	95	82	51	148	83	
Storage Length (ft)								140			120			
Mvmt Delay (sec)					19.2	10.9		13.7	12.4		10.5	10.7		
Mvmt LOS					B	B		B	B		B	B		
Delay (sec)	**12.8**	21.8			14.3			12.5			10.7			
LOS	**B**	C			B			B			B			

Source: Data was analyzed using Synchro and Sim Traffic (queue).

Table 13: Opening Year Build (2027) LOS and Delay for Intersection 2

INTERSECTION 2	WEEKDAY AM PEAK												
	2027 Opening Year Build												
S Riverfront Drive & W Liberty Street	Overall	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)				31	25	3	24	29	515	35	14	315	10
Queue (ft)				44	51			34			16		
Mvmt Delay (sec)								8.2			9.3		
Mvmt LOS								A			A		
Delay (sec)	1.9	9.7			23.1			0.4			0.4		
LOS	N/A	A			C			N/A			N/A		

Source: Data was analyzed using Synchro (HCM 7th Edition) and Sim Traffic (queue).

INTERSECTION 2	WEEKDAY PM PEAK												
	2027 Opening Year Build												
S Riverfront Drive & W Liberty Street	Overall	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)				10	22	2	36	9	484	14	42	682	3
Queue (ft)				34	47			10			35		
Mvmt Delay (sec)								8.9			8.5		
Mvmt LOS								A			A		
Delay (sec)	1.2	10.5			16.8			0.2			0.5		
LOS	N/A	B			C			N/A			N/A		

Source: Data was analyzed using Synchro (HCM 7th Edition) and Sim Traffic (queue).

Table 14: Opening Year Build (2027) LOS and Delay for Intersection 3

INTERSECTION 3	WEEKDAY AM PEAK												
	2027 Opening Year Build												
S Front Street & W Liberty Street	Overall	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)		4	10	17	16	21	2	21	71	56	4	29	3
Queue (ft)		35			43			60			43		
Mvmt Delay (sec)													
Mvmt LOS													
Delay (sec)	8.1	7.5			8.0			8.4			7.6		
LOS	A	A			A			A			A		

Source: Data was analyzed using Synchro (HCM 7th Edition) and Sim Traffic (queue).

INTERSECTION 3	WEEKDAY PM PEAK												
	2027 Opening Year Build												
S Front Street & W Liberty Street	Overall	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)		3	23	29	18	27	3	20	81	65	13	63	12
Queue (ft)		43			55			71			43		
Mvmt Delay (sec)													
Mvmt LOS													
Delay (sec)	8.1	7.6			8.1			8.3			7.9		
LOS	A	A			A			A			A		

Source: Data was analyzed using Synchro (HCM 7th Edition) and Sim Traffic (queue).

Table 15: Opening Year Build (2027) LOS and Delay for Intersection 4

INTERSECTION 4	WEEKDAY AM PEAK													
	2027 Opening Year Build													
S Front Street & Warren Street	Overall	Eastbound			Westbound			Northbound			Southbound			
		L	T	R	L	T	R	L	T	R	L	T	R	
Volume (veh)		1	123	5	28	146	3	6	21	45	3	12	3	
Queue (ft)		9	60		34	69		46			29			
Storage Length (ft)					70									
Mvmt Delay (sec)		6.0	6.8		6.3	6.9								
Mvmt LOS		A	A		A	A								
Delay (sec)	6.7	6.8			6.8			5.7			8.5			
LOS	A	A			A			A			A			

Source: Data was analyzed using Synchro and Sim Traffic (queue).

INTERSECTION 4	WEEKDAY PM PEAK													
	2027 Opening Year Build													
S Front Street & Warren Street	Overall	Eastbound			Westbound			Northbound			Southbound			
		L	T	R	L	T	R	L	T	R	L	T	R	
Volume (veh)		13	151	8	47	143	17	7	20	58	16	40	12	
Queue (ft)		23	63		44	87		74			62			
Storage Length (ft)					70									
Mvmt Delay (sec)		6.0	6.9		6.6	6.7								
Mvmt LOS		A	A		A	A								
Delay (sec)	6.7	6.8			6.6			5.3			8.6			
LOS	A	A			A			A			A			

Source: Data was analyzed using Synchro and Sim Traffic (queue).

Table 16: Design Year No Build (2047) LOS and Delay for Intersection 1

INTERSECTION 1	WEEKDAY AM PEAK												
	2047 Design Year No Build												
S Riverfront Drive & Polar Street/Warren Street	Overall	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)		99	33	11	59	51	49	29	580	70	56	357	83
Queue (ft)		127			76	86		36	124	1226	56	104	88
Storage Length (ft)								140			120		
Mvmt Delay (sec)					24.0	17.8		15	17.3		17.7	15.2	
Mvmt LOS					C	B		B	B		B	B	
Delay (sec)	18.1	29.5			20.1			17.2			15.5		
LOS	B	C			C			B			B		

Source: Data was analyzed using Synchro and Sim Traffic (queue).

INTERSECTION 1	WEEKDAY PM PEAK												
	2047 Design Year No Build												
S Riverfront Drive & Polar Street/Warren Street	Overall	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)		107	52	37	85	52	68	39	527	84	79	754	100
Queue (ft)		130			83	80		45	167	130	100	181	151
Storage Length (ft)								140			120		
Mvmt Delay (sec)					23.2	14.2		15.6	15.4		12.7	13.8	
Mvmt LOS					C	B		B	B		B	B	
Delay (sec)	16.0	26.8			17.9			15.4			13.7		
LOS	B	C			B			B			B		

Source: Data was analyzed using Synchro and Sim Traffic (queue).

Table 17: Design Year No Build (2047) LOS and Delay for Intersection 2

INTERSECTION 2	WEEKDAY AM PEAK												
	2047 Design Year No Build												
S Riverfront Drive & W Liberty Street	Overall	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)				31	14	3	24	36	629	20	17	385	12
Queue (ft)				40	48			28	20	19	36		
Mvmt Delay (sec)								8.6			9.9		
Mvmt LOS								A			A		
Delay (sec)	1.6	10.1			25.8			0.5			0.4		
LOS	N/A	B			D			N/A			N/A		

Source: Data was analyzed using Synchro (HCM 7th Edition) and Sim Traffic (queue).

INTERSECTION 2	WEEKDAY PM PEAK												
	2047 Design Year No Build												
S Riverfront Drive & W Liberty Street	Overall	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)				10	22	2	36	11	567	16	49	800	4
Queue (ft)				23	64			28			53		
Mvmt Delay (sec)								9.5			8.8		
Mvmt LOS								A			A		
Delay (sec)	1.3	11.2			21.9			0.2			0.5		
LOS	N/A	B			C			N/A			N/A		

Source: Data was analyzed using Synchro (HCM 7th Edition) and Sim Traffic (queue).

Table 18: Design Year No Build (2047) LOS and Delay for Intersection 3

INTERSECTION 3	WEEKDAY AM PEAK													
	2047 Design Year No Build													
S Front Street & W Liberty Street	Overall	Eastbound			Westbound			Northbound			Southbound			
		L	T	R	L	T	R	L	T	R	L	T	R	
Volume (veh)		4	10	15	16	21	2	18	71	56	4	29	3	
Queue (ft)		39			52			61			41			
Mvmt Delay (sec)														
Mvmt LOS														
Delay (sec)	8.1	7.5			8.0			8.3			7.6			
LOS	A	A			A			A			A			

Source: Data was analyzed using Synchro (HCM 7th Edition) and Sim Traffic (queue).

INTERSECTION 3	WEEKDAY PM PEAK													
	2047 Design Year No Build													
S Front Street & W Liberty Street	Overall	Eastbound			Westbound			Northbound			Southbound			
		L	T	R	L	T	R	L	T	R	L	T	R	
Volume (veh)		3	23	29	18	27	3	20	81	65	13	63	12	
Queue (ft)		52			49			64			56			
Mvmt Delay (sec)														
Mvmt LOS														
Delay (sec)	8.1	7.6			8.0			8.3			7.9			
LOS	A	A			A			A			A			

Source: Data was analyzed using Synchro (HCM 7th Edition) and Sim Traffic (queue).

Table 19: Design Year No Build (2047) LOS and Delay for Intersection 4

INTERSECTION 4	WEEKDAY AM PEAK													
	2047 Design Year No Build													
S Front Street & Warren Street	Overall	Eastbound			Westbound			Northbound			Southbound			
		L	T	R	L	T	R	L	T	R	L	T	R	
Volume (veh)		1	143	6	35	169	4	6	21	45	3	12	3	
Queue (ft)			70		41	67			64			23		
Storage Length (ft)					70									
Mvmt Delay (sec)		6.0	6.8		6.3	7.0								
Mvmt LOS		A	A		A	A								
Delay (sec)	6.7	6.8			6.9			5.7			8.5			
LOS	A	A			A			A			A			

Source: Data was analyzed using Synchro and Sim Traffic (queue).

INTERSECTION 4	WEEKDAY PM PEAK													
	2047 Design Year No Build													
S Front Street & Warren Street	Overall	Eastbound			Westbound			Northbound			Southbound			
		L	T	R	L	T	R	L	T	R	L	T	R	
Volume (veh)		16	184	10	58	174	21	7	20	58	16	40	12	
Queue (ft)		21	92		48	72			64			44		
Storage Length (ft)					70									
Mvmt Delay (sec)		6.1	6.9		6.7	6.8								
Mvmt LOS		A	A		A	A								
Delay (sec)	6.8	6.9			6.8			5.3			8.7			
LOS	A	A			A			A			A			

Source: Data was analyzed using Synchro and Sim Traffic (queue).

Table 20: Design Year Build (2047) LOS and Delay for Intersection 1

INTERSECTION 1	WEEKDAY AM PEAK												
	2047 Design Year Build												
S Riverfront Drive & Polar Street/Warren Street	Overall	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)		99	38	11	59	54	60	29	580	70	75	357	83
Queue (ft)		109			60	80		32	189	162	60	103	82
Storage Length (ft)								140			120		
Mvmt Delay (sec)					24.8	18.5		16.1	18.5		19.3	16.2	
Mvmt LOS					C	B		B	B		B	B	
Delay (sec)	19.2	30.3			20.6			18.4			16.7		
LOS	B	C			C			B			B		

Source: Data was analyzed using Synchro and Sim Traffic (queue).

INTERSECTION 1	WEEKDAY PM PEAK												
	2047 Design Year Build												
S Riverfront Drive & Polar Street/Warren Street	Overall	Eastbound			Westbound			Northbound			Southbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Volume (veh)		107	52	37	85	52	68	39	527	84	79	754	100
Queue (ft)		115			72	71		47	146	119	93	177	146
Storage Length (ft)								140			120		
Mvmt Delay (sec)					23.2	14.2		15.6	15.4		12.6	13.9	
Mvmt LOS					C	B		B	B		B	B	
Delay (sec)	16.0	26.8			17.9			15.4			13.8		
LOS	B	C			B			B			B		

Source: Data was analyzed using Synchro and Sim Traffic (queue).

Table 21: Design Year Build (2047) LOS and Delay for Intersection 2

INTERSECTION 2	WEEKDAY AM PEAK													
	2047 Design Year Build													
S Riverfront Drive & W Liberty Street	Overall	Eastbound			Westbound			Northbound			Southbound			
		L	T	R	L	T	R	L	T	R	L	T	R	
Volume (veh)				31	25	3	24	36	629	39	17	385	12	
Queue (ft)				44	56			35			36	18		
Mvmt Delay (sec)								8.6			10.0			
Mvmt LOS								A			B			
Delay (sec)	2.2	10.1			34.6			0.4			0.4			
LOS	N/A	B			D			N/A			N/A			

Source: Data was analyzed using Synchro (HCM 7th Edition) and Sim Traffic (queue).

INTERSECTION 2	WEEKDAY PM PEAK													
	2047 Design Year Build													
S Riverfront Drive & W Liberty Street	Overall	Eastbound			Westbound			Northbound			Southbound			
		L	T	R	L	T	R	L	T	R	L	T	R	
Volume (veh)				10	22	2	36	11	567	16	49	800	4	
Queue (ft)				36	42			26			44			
Mvmt Delay (sec)								9.5			8.8			
Mvmt LOS								A			A			
Delay (sec)	1.3	11.2			21.9			0.2			0.5			
LOS	N/A	B			C			N/A			N/A			

Source: Data was analyzed using Synchro (HCM 7th Edition) and Sim Traffic (queue).

Table 22: Design Year Build (2047) LOS and Delay for Intersection 3

INTERSECTION 3	WEEKDAY AM PEAK													
	2047 Design Year Build													
S Front Street & W Liberty Street	Overall	Eastbound			Westbound			Northbound			Southbound			
		L	T	R	L	T	R	L	T	R	L	T	R	
Volume (veh)		4	10	17	16	21	2	21	71	56	4	29	3	
Queue (ft)		40			51			54			42			
Mvmt Delay (sec)														
Mvmt LOS														
Delay (sec)	8.1	7.5			8.0			8.4			7.6			
LOS	A	A			A			A			A			

Source: Data was analyzed using Synchro (HCM 7th Edition) and Sim Traffic (queue).

INTERSECTION 3	WEEKDAY PM PEAK													
	2047 Design Year Build													
S Front Street & W Liberty Street	Overall	Eastbound			Westbound			Northbound			Southbound			
		L	T	R	L	T	R	L	T	R	L	T	R	
Volume (veh)		3	23	29	18	27	3	20	81	65	13	63	12	
Queue (ft)		41			53			62			52			
Mvmt Delay (sec)														
Mvmt LOS														
Delay (sec)	8.1	7.6			8.1			8.3			7.9			
LOS	A	A			A			A			A			

Source: Data was analyzed using Synchro (HCM 7th Edition) and Sim Traffic (queue).

Table 23: Design Year Build (2047) LOS and Delay for Intersection 4

INTERSECTION 4	WEEKDAY AM PEAK													
	2047 Design Year Build													
S Front Street & Warren Street	Overall	Eastbound			Westbound			Northbound			Southbound			
		L	T	R	L	T	R	L	T	R	L	T	R	
Volume (veh)		1	148	6	35	177	4	6	21	45	3	12	3	
Queue (ft)			71		45	70			59			25		
Storage Length (ft)					70									
Mvmt Delay (sec)		6.0	6.9		6.4	7.0								
Mvmt LOS		A	A		A	A								
Delay (sec)	6.8	6.8			6.9			5.7			8.5			
LOS	A	A			A			A			A			

Source: Data was analyzed using Synchro and Sim Traffic (queue).

INTERSECTION 4	WEEKDAY PM PEAK													
	2047 Design Year Build													
S Front Street & Warren Street	Overall	Eastbound			Westbound			Northbound			Southbound			
		L	T	R	L	T	R	L	T	R	L	T	R	
Volume (veh)		16	184	10	58	174	21	7	20	58	16	40	12	
Queue (ft)		29	65		54	57			68			46		
Storage Length (ft)					70									
Mvmt Delay (sec)		6.1	6.9		6.7	6.8								
Mvmt LOS		A	A		A	A								
Delay (sec)	6.8	6.9			6.8			5.3			8.7			
LOS	A	A			A			A			A			

Source: Data was analyzed using Synchro and Sim Traffic (queue).

Table 24: Intersection 1 Scenario Comparison

	Intersection 1	WEEKDAY AM PEAK												
	S Riverfront Drive & Polar Street/Warren Street	Overall	Eastbound			Westbound			Northbound			Southbound		
			L	T	R	L	T	R	L	T	R	L	T	R
Existing (2026)	**Delay (sec)**	**12.9**		22.2			15.6			12.7			9.5	
	LOS	**B**		C			B			B			A	
2027 Opening Year No Build	**Delay (sec)**	**13.0**		22.3			15.7			12.7			9.6	
	LOS	**B**		C			B			B			A	
2027 Opening Year Build	**Delay (sec)**	**14.1**		24.3			16.4			14.3			9.9	
	LOS	**B**		C			B			B			A	
2047 Design Year No Build	**Delay (sec)**	**18.1**		29.5			20.1			17.2			15.5	
	LOS	**B**		C			C			B			B	
2047 Design Year Build	**Delay (sec)**	**19.2**		30.3			20.6			18.4			16.7	
	LOS	**B**		C			C			B			B	

	Intersection 1	WEEKDAY PM PEAK												
	S Riverfront Drive & Polar Street/Warren Street	Overall	Eastbound			Westbound			Northbound			Southbound		
			L	T	R	L	T	R	L	T	R	L	T	R
Existing (2026)	**Delay (sec)**	**12.9**		21.7			14.3			12.4			10.9	
	LOS	**B**		C			B			B			B	
2027 Opening Year No Build	**Delay (sec)**	**12.9**		21.8			14.3			12.6			10.7	
	LOS	**B**		C			B			B			B	
2027 Opening Year Build	**Delay (sec)**	**12.8**		21.8			14.3			12.5			10.7	
	LOS	**B**		C			B			B			B	
2047 Design Year No Build	**Delay (sec)**	**16.0**		26.8			17.9			15.4			13.7	
	LOS	**B**		C			B			B			B	
2047 Design Year Build	**Delay (sec)**	**16.0**		26.8			17.9			15.4			13.8	
	LOS	**B**		C			B			B			B	

Table 25: Intersection 2 Scenario Comparison

	Intersection 2	WEEKDAY AM PEAK												
	S Riverfront Drive & W Liberty Street	Overall	Eastbound			Westbound			Northbound			Southbound		
			L	T	R	L	T	R	L	T	R	L	T	R
Existing (2026)	Delay (sec)	1.5		9.7			18.6			0.4			0.3	
	LOS	N/A		A			C			N/A			N/A	
2027 Opening Year No Build	Delay (sec)	1.5		9.7			18.8			0.4			0.4	
	LOS	N/A		A			C			N/A			N/A	
2027 Opening Year Build	Delay (sec)	1.9		9.7			23.1			0.4			0.4	
	LOS	N/A		A			C			N/A			N/A	
2047 Design Year No Build	Delay (sec)	1.6		10.1			25.8			0.5			0.4	
	LOS	N/A		B			D			N/A			N/A	
2047 Design Year Build	Delay (sec)	2.2		10.1			34.6			0.4			0.4	
	LOS	N/A		B			D			N/A			N/A	

	Intersection 2	WEEKDAY PM PEAK												
	S Riverfront Drive & W Liberty Street	Overall	Eastbound			Westbound			Northbound			Southbound		
			L	T	R	L	T	R	L	T	R	L	T	R
Existing (2026)	Delay (sec)	1.2		10.5			16.6			0.2			0.5	
	LOS	N/A		B			C			N/A			N/A	
2027 Opening Year No Build	Delay (sec)	1.2		10.6			17.5			0.2			0.5	
	LOS	N/A		B			C			N/A			N/A	
2027 Opening Year Build	Delay (sec)	1.2		10.5			16.8			0.2			0.5	
	LOS	N/A		B			C			N/A			N/A	
2047 Design Year No Build	Delay (sec)	1.3		11.2			21.9			0.2			0.5	
	LOS	N/A		B			C			N/A			N/A	
2047 Design Year Build	Delay (sec)	1.3		11.2			21.9			0.2			0.5	
	LOS	N/A		B			C			N/A			N/A	

Table 26: Intersection 3 Scenario Comparison

	Intersection 3	WEEKDAY AM PEAK												
	S Front Street & W Liberty Street	Overall	Eastbound			Westbound			Northbound			Southbound		
			L	T	R	L	T	R	L	T	R	L	T	R
Existing (2026)	**Delay (sec)**	**8.1**		7.5			8.0			8.3			7.6	
	LOS	**A**		A			A			A			A	
2027 Opening Year No Build	**Delay (sec)**	**8.1**		7.5			8.0			8.3			7.6	
	LOS	**A**		A			A			A			A	
2027 Opening Year Build	**Delay (sec)**	**8.1**		7.5			8.0			8.4			7.6	
	LOS	**A**		A			A			A			A	
2047 Design Year No Build	**Delay (sec)**	**8.1**		7.5			8.0			8.3			7.6	
	LOS	**A**		A			A			A			A	
2047 Design Year Build	**Delay (sec)**	**8.1**		7.5			8.0			8.4			7.6	
	LOS	**A**		A			A			A			A	

	Intersection 3	WEEKDAY PM PEAK												
	S Front Street & W Liberty Street	Overall	Eastbound			Westbound			Northbound			Southbound		
			L	T	R	L	T	R	L	T	R	L	T	R
Existing (2026)	**Delay (sec)**	**8.1**		7.6			8.0			8.3			7.9	
	LOS	**A**		A			A			A			A	
2027 Opening Year No Build	**Delay (sec)**	**8.1**		7.6			8.0			8.3			7.9	
	LOS	**A**		A			A			A			A	
2027 Opening Year Build	**Delay (sec)**	**8.1**		7.6			8.1			8.3			7.9	
	LOS	**A**		A			A			A			A	
2047 Design Year No Build	**Delay (sec)**	**8.1**		7.6			8.0			8.3			7.9	
	LOS	**A**		A			A			A			A	
2047 Design Year Build	**Delay (sec)**	**8.1**		7.6			8.1			8.3			7.9	
	LOS	**A**		A			A			A			A	

Table 27: Intersection 4 Scenario Comparison

	Intersection 4	WEEKDAY AM PEAK												
	S Front Street & Warren Street	Overall	Eastbound			Westbound			Northbound			Southbound		
			L	T	R	L	T	R	L	T	R	L	T	R
Existing (2026)	Delay (sec)	6.7		6.8			6.8			5.7			8.5	
	LOS	A		A			A			A			A	
2027 Opening Year No Build	Delay (sec)	6.7		6.8			6.7			5.3			8.6	
	LOS	A		A			A			A			A	
2027 Opening Year Build	Delay (sec)	6.7		6.8			6.8			5.7			8.5	
	LOS	A		A			A			A			A	
2047 Design Year No Build	Delay (sec)	6.7		6.8			6.9			5.7			8.5	
	LOS	A		A			A			A			A	
2047 Design Year Build	Delay (sec)	6.8		6.8			6.9			5.7			8.5	
	LOS	A		A			A			A			A	

	Intersection 4	WEEKDAY PM PEAK												
	S Front Street & Warren Street	Overall	Eastbound			Westbound			Northbound			Southbound		
			L	T	R	L	T	R	L	T	R	L	T	R
Existing (2026)	Delay (sec)	6.7		6.8			6.6			5.3			8.6	
	LOS	A		A			A			A			A	
2027 Opening Year No Build	Delay (sec)	6.8		6.8			6.7			5.3			8.6	
	LOS	A		A			A			A			A	
2027 Opening Year Build	Delay (sec)	6.7		6.8			6.6			5.3			8.6	
	LOS	A		A			A			A			A	
2047 Design Year No Build	Delay (sec)	6.8		6.9			6.8			5.3			8.7	
	LOS	A		A			A			A			A	
2047 Design Year Build	Delay (sec)	6.8		6.9			6.8			5.3			8.7	
	LOS	A		A			A			A			A	

Principal Findings

TURN LANE WARRANT ANALYSIS

Per NCHRP 457 Figure 2-6 (determining the need for a major-road right-turn lane at a two-way stop-controlled intersection), a right-turn lane is not warranted at the intersection of S. Riverfront Drive and W. Liberty Street, using the anticipated generated trips and assuming the following:

- speed limit of 30 MPH
- daily existing traffic volume of 11,500 vehicles per day (draft 2024 AADT is 11,503 per MnDOT Traffic Mapping Application),
- 55% of traffic is traveling NE during AM or PM peak hour of traffic
- 10% of daily traffic occurs during the peak hours

Refer to the attachments for a visual of anticipated traffic numbers plotted on Figure 2-6.

Additionally, MnDOT's turn lane policy at urban intersections is that turn lanes should be considered whenever construction is economically feasible, considering the amount of right-of-way needed, type of terrain, and environmentally or culturally sensitive areas. Constrained right-of-way limits space for turn lanes and right-of-way acquisition would be required to construct a right-turn

lane, assuming the existing sidewalk widths and neutral offset left-turn lanes are maintained. MnDOT also provides turn lane warrants for undivided roadways, several of which are not applicable to low-speed roadways (less than 45 MPH). Of those that are applicable to S Riverfront Drive, adverse road grades, limited sight distance, and nearby railroad crossings are not present to warrant a right-turn lane.

Therefore, turn lanes are not warranted for the development due to the low (30 MPH) travel speeds and low proposed volumes (135 vehicles, one-way, during peak hour) on S Riverfront Drive.

CONCLUSIONS & RECOMMENDATIONS

The proposed 602 South Front Street development was reviewed to determine the trip generation potential and the potential traffic impacts from the proposed development. Based on the estimated trip generation potential and alternative routes provided to access the site, it is expected that the existing roadway links would be able to accommodate the new trips generated by the development.

As traffic conditions change, it is recommended that the city periodically update signal timings to optimize the flow of traffic on streets that carry moderate to heavy traffic like S. Riverfront Drive.

Appendix A: Proposed Site Plan

PAVEMENT LEGEND

SYMBOL	DESCRIPTION
	BITUMINOUS PAVEMENT
	CONCRETE PAVEMENT
	PARKING STRUCTURE (REFER TO STRUCTURAL)
	CONCRETE WALK

S RIVERFRONT DRIVE

W LIBERTY STREET

S FRONT STREET

WARREN STREET

B618 CURB AND GUTTER (TYP)

30'x90'
UNDER GROUND STORMWATER
TREATMENT SYSTEM

30'x111'
UNDER GROUND STORMWATER
TREATMENT SYSTEM

PROPOSED PARKING STRUCTURE
(REFER TO STRUCTURE)

BIKE RACKS
(6 BIKES)

TRASH ROOM

LOADING DOCK

COVERED SURFACE PARKING
(REFER TO OFFICE ARCHITECTURAL)

BIKE RACKS
(2 BIKES)

PROPOSED
OFFICE
FFE = 778.00

ABOVE GRADE BUILDING OVERHANG (TYP)

BENCHMARK HYDRANT
TNFH = 779.68

PROPOSED
GROCERY
FFE = 784.70

PROPOSED
LOBBY
FFE = 784.70

PROPOSED
CAFE
FFE = 784.25

PROPOSED
UTILITY ROOM
FFE = 782.25

PRIVATE PATIO

15' MAX BUILDING SETBACK

BENCHMARK HYDRANT
TNFH = 785.78

0 20 40
SCALE IN FEET

PRELIMINARY NOT FOR CONSTRUCTION

ISG

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

DATE _____ LIC. NO. _____

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED LANDSCAPE ARCHITECT UNDER THE LAWS OF THE STATE OF MINNESOTA.

DATE _____ LIC. NO. _____

SHEET NOT VALID UNLESS THIS TEXT IS COLOR.

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PROJECT

FRONT STREET PLACE

MIXED USE DEVELOPMENT

MANKATO MINNESOTA

REVISION SCHEDULE

DATE	DESCRIPTION	BY

PROJECT NO.	25-33587
FILE NAME	33587-C3-SITE
DRAWN BY	SMW
DESIGNED BY	SMW, NJH
REVIEWED BY	NJH
ORIGINAL ISSUE DATE	--/--/--
CLIENT PROJECT NO.	-

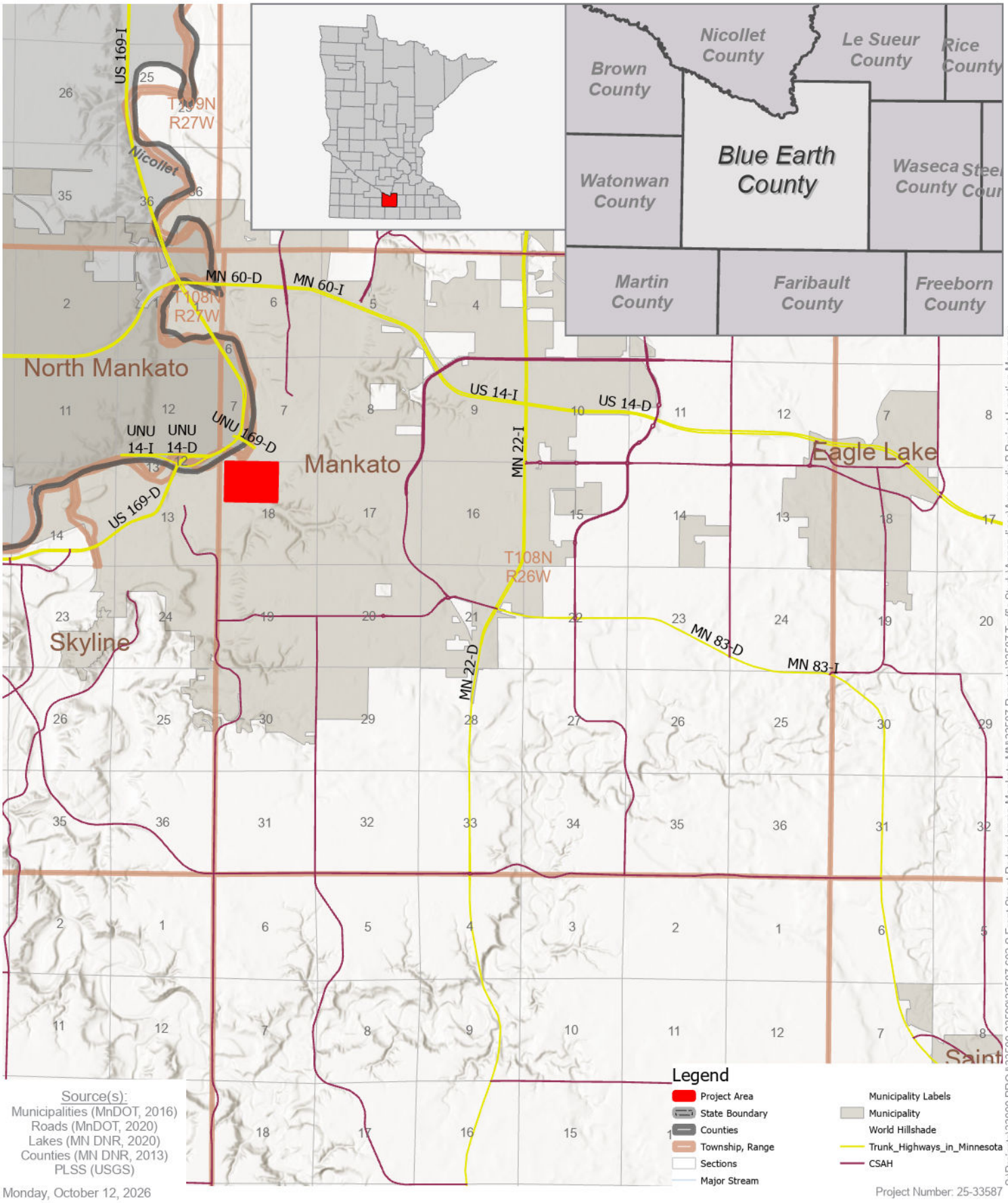
TITLE

SITE PLAN

SHEET

C3-10

Appendix B: Project Location Map



Source(s):
Municipalities (MnDOT, 2016)
Roads (MnDOT, 2020)
Lakes (MN DNR, 2020)
Counties (MN DNR, 2013)
PLSS (USGS)

Monday, October 12, 2026

Project Number: 25-33587

S:\Projects\33000 PROJ\33500-33599\33587 602 S Front Street Redevelopme-Mankato MN\33587 Reports\33587 Traffic Study\Appendices\Appendix B Project Location Map.aprx

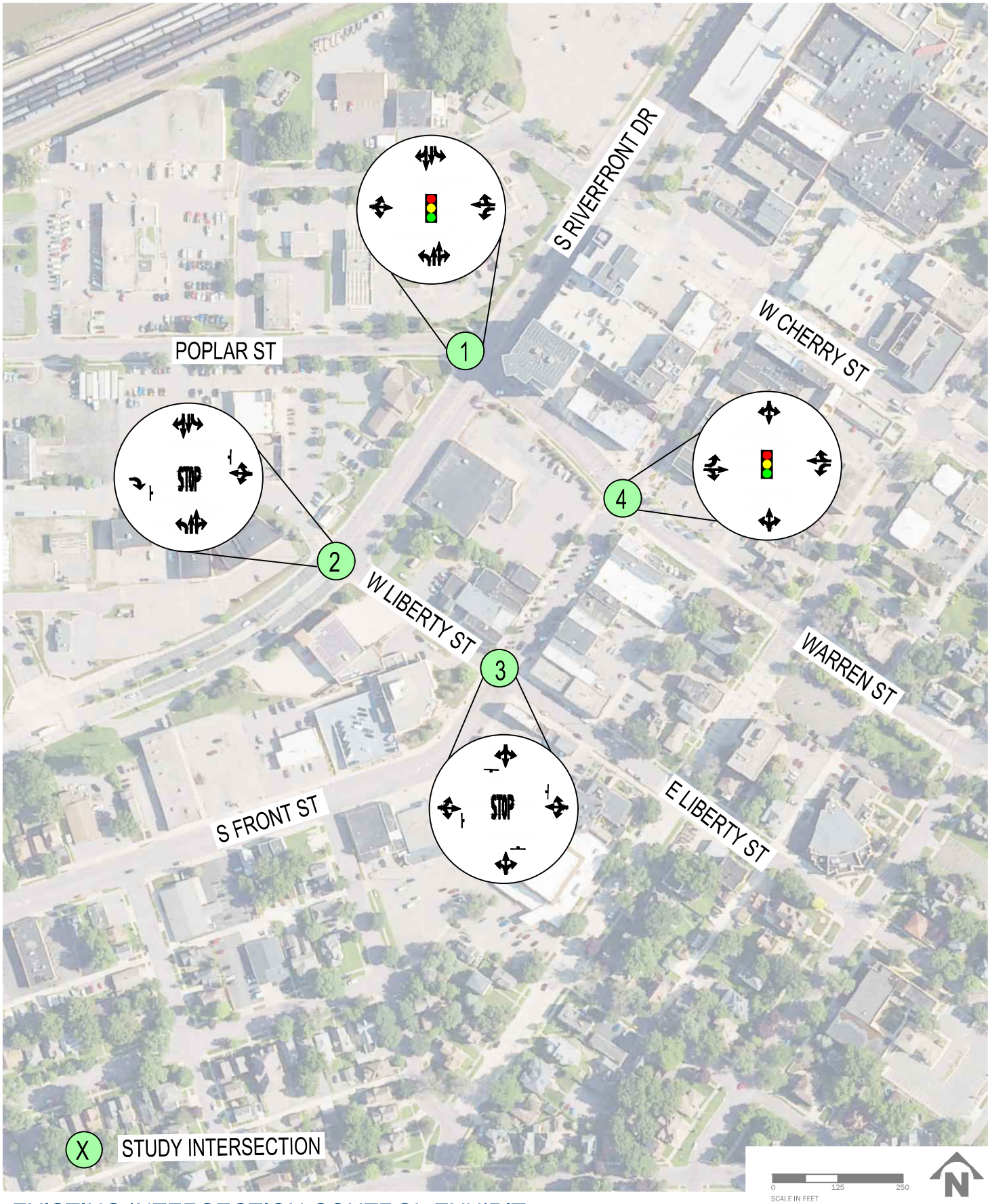
0 0.5 1 Miles
1 inch = 1 miles

Project Location Map
602 South Front Street Redevelopment
Mankato, Blue Earth, Minnesota

N

ISG

Appendix C: Existing Intersection Control



EXISTING INTERSECTION CONTROL EXHIBIT

ISG

Architecture + Engineering + Environmental + Planning

ISGInc.com

602 SOUTH FRONT STREET

MANKATO, MINNESOTA - 10/15/2026

ISG PROJECT NO. 25-33587

CAD FILE NAME 33587 APPENDICES

Appendix D: Existing (2026) Peak Hour Turning Movement Volumes and Diagrams

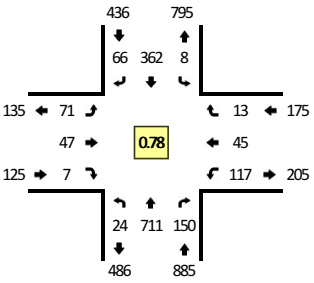
Type of peak hour being reported: Intersection Peak

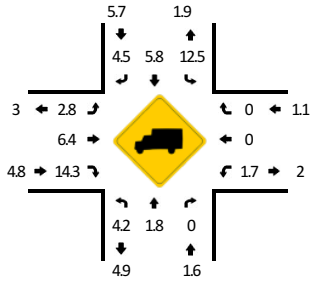
Method for determining peak hour: Total Entering Volume

LOCATION: S Riverfront Dr -- Poplar St/Warren St
CITY/STATE: Mankato, MN

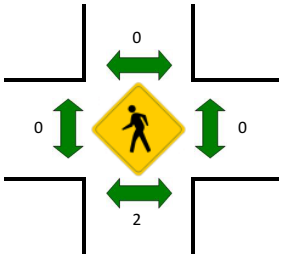
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DATE: Tue, Apr 7 2026

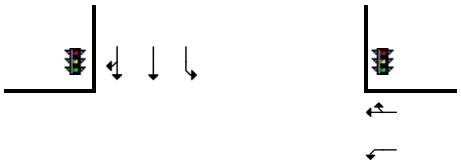
Peak-Hour: 7:15 AM -- 8:15 AM
Peak 15-Min: 7:45 AM -- 8:00 AM

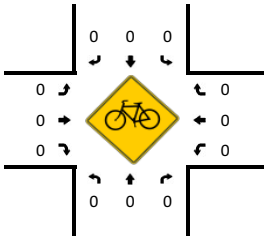


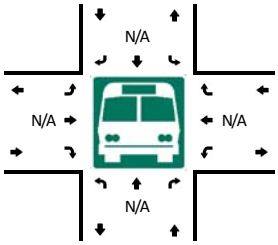


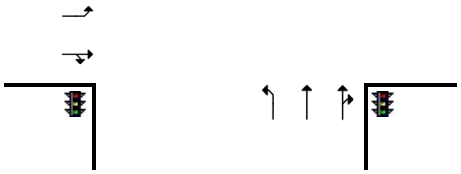
TRUE DATA TO IMPROVE MOBILITY

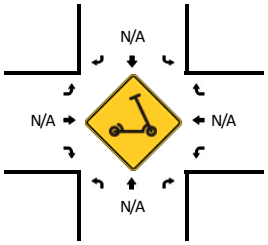












15-Min Count Period Beginning At	S Riverfront Dr (Northbound)				S Riverfront Dr (Southbound)				Poplar St/Warren St (Eastbound)				Poplar St/Warren St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	99	11	0	1	73	5	0	14	4	0	0	16	9	2	0	234	
7:15 AM	4	136	36	0	2	68	10	0	8	13	0	0	32	6	3	0	318	
7:30 AM	6	196	34	0	4	84	16	0	16	11	4	0	23	11	2	0	407	
7:45 AM	9	226	43	0	1	122	20	0	28	12	2	0	39	13	3	0	518	1477
8:00 AM	5	153	37	0	1	88	20	0	19	11	1	0	23	15	5	0	378	1621
8:15 AM	4	110	34	0	3	70	12	0	15	9	0	0	18	8	2	0	285	1588
8:30 AM	5	136	29	0	2	80	11	0	6	12	2	0	20	11	2	0	316	1497
8:45 AM	6	125	25	0	0	70	16	0	15	8	6	0	20	3	3	0	297	1276

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	36	904	172	0	4	488	80	0	112	48	8	0	156	52	12	0	2072
Heavy Trucks	0	28	0		0	28	0		0	0	4		8	0	0		68
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 4/14/2026 11:05 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

LOCATION: S Riverfront Dr -- Poplar St/Warren St

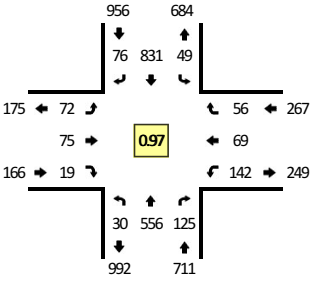
CITY/STATE: Mankato, MN

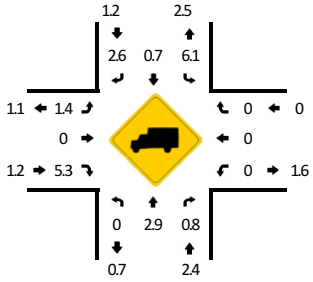
QC JOB #: 17538202

DATE: Tue, Apr 7 2026

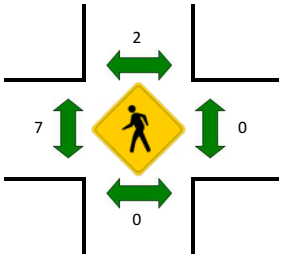
Peak-Hour: 4:15 PM -- 5:15 PM

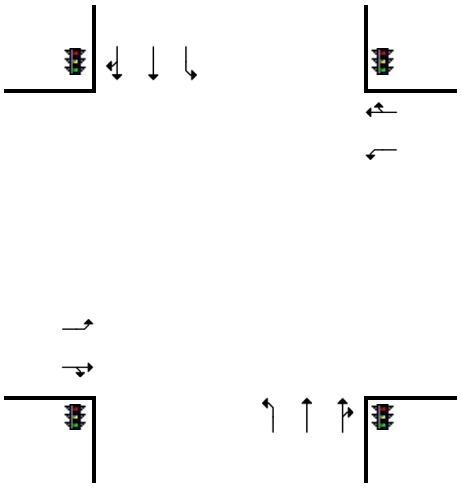
Peak 15-Min: 5:00 PM -- 5:15 PM

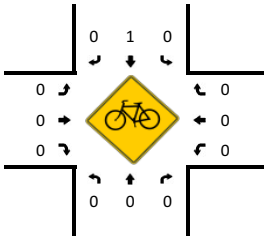


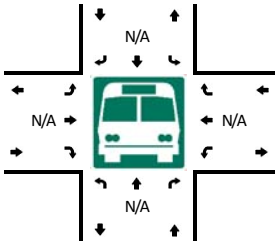


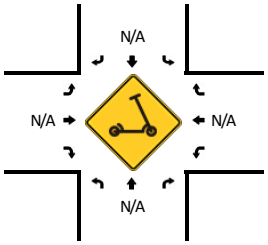
TRUE DATA TO IMPROVE MOBILITY











15-Min Count Period Beginning At	S Riverfront Dr (Northbound)				S Riverfront Dr (Southbound)				Poplar St/Warren St (Eastbound)				Poplar St/Warren St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	2	132	36	0	17	182	21	0	18	19	5	0	38	16	5	0	491	
4:15 PM	6	161	33	0	13	201	21	0	20	22	3	0	35	12	14	0	541	
4:30 PM	7	132	36	0	7	208	14	0	20	20	4	0	38	25	9	0	520	
4:45 PM	6	143	27	0	12	184	20	0	13	13	6	0	36	17	19	0	496	2048
5:00 PM	11	120	29	0	17	238	21	0	19	20	6	0	33	15	14	0	543	2100
5:15 PM	8	142	25	0	8	189	14	0	16	10	13	0	34	21	14	0	494	2053
5:30 PM	10	129	40	0	11	146	17	0	14	6	4	0	40	19	5	0	441	1974
5:45 PM	10	110	42	0	6	147	24	0	18	13	6	0	28	16	13	0	433	1911

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	44	480	116	0	68	952	84	0	76	80	24	0	132	60	56	0	2172
Heavy Trucks	0	24	0		4	8	4		0	0	0		0	0	0		40
Buses																	
Pedestrians		0				4				0				0			4
Bicycles	0	0	0		0	4	0		0	0	0		0	0	0		4
Scooters																	

Comments:

Report generated on 4/14/2026 11:05 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

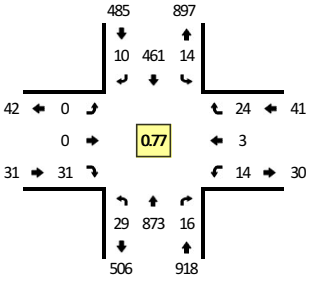
Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

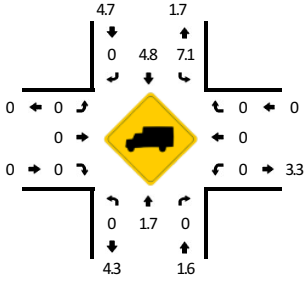
LOCATION: S Riverfront Dr -- W Liberty St
CITY/STATE: Mankato, MN

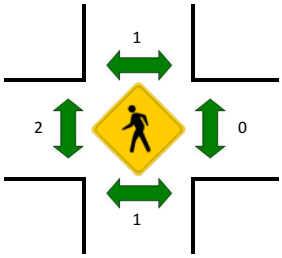
QC JOB #: 17538203
DATE: Tue, Apr 7 2026

Peak-Hour: 7:15 AM -- 8:15 AM
Peak 15-Min: 7:45 AM -- 8:00 AM

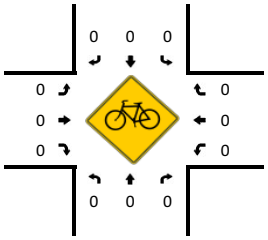


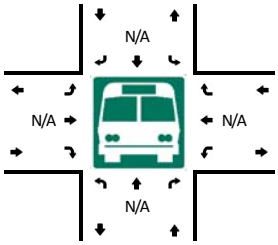


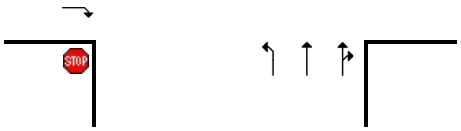


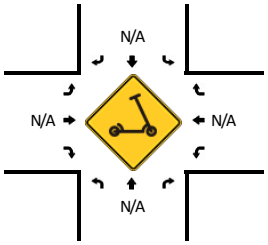












15-Min Count Period Beginning At	S Riverfront Dr (Northbound)				S Riverfront Dr (Southbound)				W Liberty St (Eastbound)				W Liberty St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	6	108	0	0	2	84	1	0	0	0	4	0	5	2	1	0	213	
7:15 AM	3	173	4	0	0	100	0	0	0	0	6	0	2	1	5	0	294	
7:30 AM	9	231	1	0	4	108	2	0	0	0	4	0	2	2	9	0	372	
7:45 AM	10	279	7	0	5	150	7	0	0	0	14	0	5	0	5	0	482	1361
8:00 AM	7	190	4	0	5	103	1	0	0	0	7	0	5	0	5	0	327	1475
8:15 AM	7	147	5	0	1	87	4	0	0	0	9	0	5	1	1	0	267	1448
8:30 AM	4	167	5	0	2	100	0	0	0	0	3	0	2	1	3	0	287	1363
8:45 AM	5	149	2	0	2	87	2	0	0	0	10	0	7	0	6	0	270	1151

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	40	1116	28	0	20	600	28	0	0	0	56	0	20	0	20	0	1928
Heavy Trucks	0	32	0		4	28	0		0	0	0		0	0	0		64
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

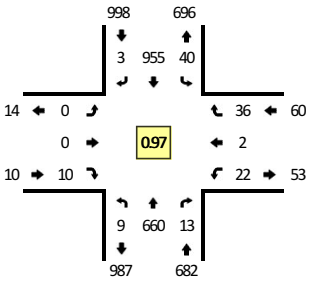
Report generated on 4/14/2026 11:05 AM

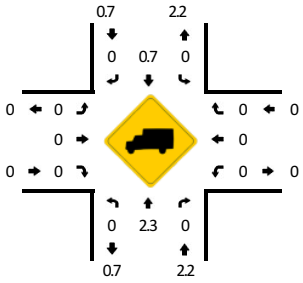
SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

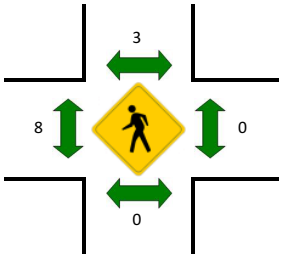
LOCATION: S Riverfront Dr -- W Liberty St | **QC JOB #:** 17538204
CITY/STATE: Mankato, MN | **DATE:** Tue, Apr 7 2026

Peak-Hour: 4:15 PM -- 5:15 PM
Peak 15-Min: 5:00 PM -- 5:15 PM

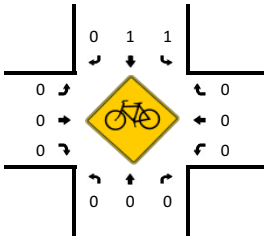


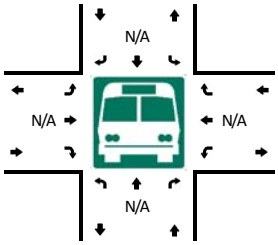


TRUE DATA TO IMPROVE MOBILITY

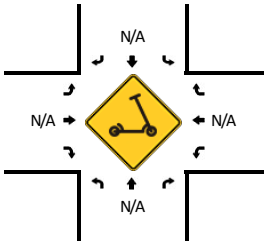












15-Min Count Period Beginning At	S Riverfront Dr (Northbound)				S Riverfront Dr (Southbound)				W Liberty St (Eastbound)				W Liberty St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	1	170	7	0	12	206	0	0	0	0	0	0	4	0	9	0	409	
4:15 PM	3	174	5	0	14	230	2	0	0	0	2	0	2	0	13	0	445	
4:30 PM	1	167	2	0	13	235	0	0	0	0	3	0	8	2	8	0	439	
4:45 PM	2	174	3	0	8	218	0	0	0	0	1	0	3	0	4	0	413	1706
5:00 PM	3	145	3	0	5	272	1	0	0	0	4	0	9	0	11	0	453	1750
5:15 PM	3	170	7	0	8	228	2	0	0	0	5	0	3	0	7	0	433	1738
5:30 PM	1	168	4	0	9	181	0	0	0	0	3	0	2	0	10	0	378	1677
5:45 PM	0	155	2	0	6	171	0	0	0	0	4	0	3	0	10	0	351	1615

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	12	580	12	0	20	1088	4	0	0	0	16	0	36	0	44	0	1812
Heavy Trucks	0	24	0		0	8	0		0	0	0		0	0	0		32
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		4	0	0		0	0	0		0	0	0		4
Scooters																	

Comments:

Report generated on 4/14/2026 11:05 AM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

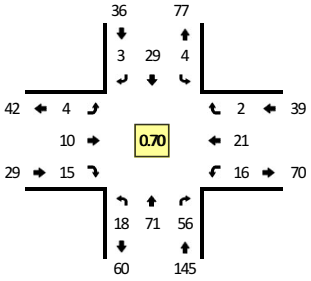
Type of peak hour being reported: User-Defined

Method for determining peak hour: Total Entering Volume

LOCATION: S Front St -- W Liberty St
CITY/STATE: Mankato, MN

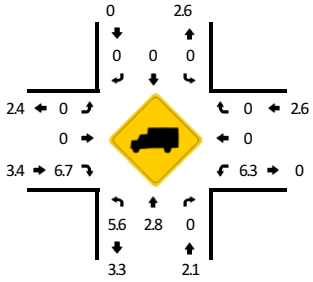
QC JOB #: 17538205
DATE: Tue, Apr 7 2026

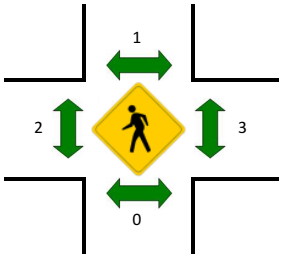
Peak-Hour: 7:15 AM -- 8:15 AM
Peak 15-Min: 7:50 AM -- 8:05 AM

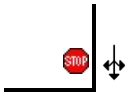


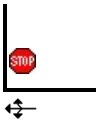


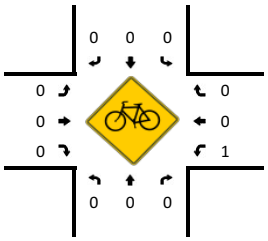
TRUE DATA TO IMPROVE MOBILITY

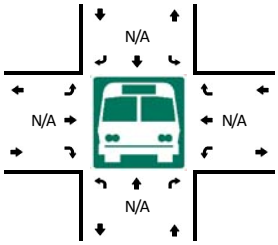


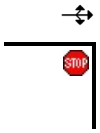


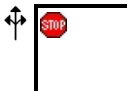


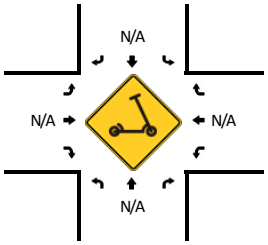












5-Min Count Period Beginning At	S Front St (Northbound)				S Front St (Southbound)				W Liberty St (Eastbound)				W Liberty St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	1	1	2	0	0	0	0	0	0	0	0	0	2	2	0	0	8	
7:05 AM	1	3	0	0	0	1	0	0	0	1	1	0	1	1	0	0	9	
7:10 AM	2	2	0	0	0	0	0	0	0	1	0	0	0	1	2	0	8	
7:15 AM	0	8	4	0	0	0	1	0	0	0	0	0	1	1	0	0	15	
7:20 AM	1	1	2	0	0	0	0	0	2	0	0	0	0	2	0	0	8	
7:25 AM	2	5	0	0	0	1	0	0	0	2	0	0	1	2	1	0	14	
7:30 AM	4	5	4	0	0	1	1	0	0	0	2	0	3	0	0	0	20	
7:35 AM	5	3	4	0	1	3	0	0	0	0	0	0	0	1	0	0	17	
7:40 AM	0	5	7	0	0	2	0	0	0	1	2	0	1	2	0	0	20	
7:45 AM	0	4	5	0	0	4	0	0	1	2	3	0	2	2	0	0	23	
7:50 AM	1	11	7	0	0	5	0	0	1	1	2	0	0	2	0	0	30	
7:55 AM	0	8	6	0	1	5	0	0	0	1	0	0	2	5	0	0	28	200
8:00 AM	1	8	10	0	2	2	0	0	0	3	2	0	2	0	1	0	31	223
8:05 AM	3	8	6	0	0	3	0	0	0	0	2	0	1	2	0	0	25	239
8:10 AM	1	5	1	0	0	3	1	0	0	0	2	0	3	2	0	0	18	249
8:15 AM	0	5	1	0	1	0	0	0	0	1	0	0	1	5	0	0	14	248
8:20 AM	0	2	4	0	1	1	2	0	0	1	0	0	1	0	0	0	12	252
8:25 AM	0	3	4	0	2	2	0	0	0	3	2	0	2	1	0	0	19	257
8:30 AM	2	4	5	0	0	2	1	0	1	2	0	0	1	0	1	0	19	256
8:35 AM	0	3	6	0	1	3	0	0	0	0	0	0	3	3	0	0	19	258
8:40 AM	0	1	5	0	0	3	0	0	1	1	0	0	3	0	0	0	14	252
8:45 AM	0	1	8	0	2	3	1	0	0	3	0	0	1	1	0	0	20	249
8:50 AM	2	4	3	0	1	4	0	0	0	0	0	0	5	5	2	0	26	245
8:55 AM	0	2	5	0	1	1	3	0	0	0	0	0	2	1	0	0	15	232

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	8	108	92	0	12	48	0	0	4	20	16	0	16	28	4	0	356
Heavy Trucks	0	4	0		0	0	0		0	0	0		4	0	0		8
Buses																	
Pedestrians		0				0				8				0			8
Bicycles	0	0	0		0	0	0		0	0	0		4	0	0		4
Scooters																	

Comments:

Report generated on 4/28/2026 7:06 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

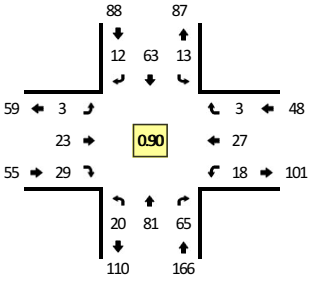
Type of peak hour being reported: User-Defined

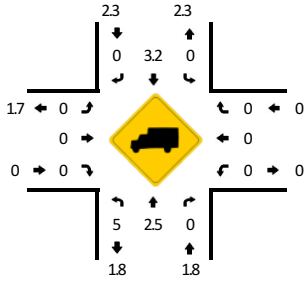
Method for determining peak hour: Total Entering Volume

LOCATION: S Front St -- W Liberty St
CITY/STATE: Mankato, MN

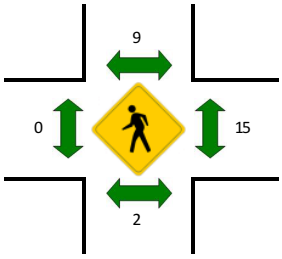
QC JOB #: 17538206
DATE: Tue, Apr 7 2026

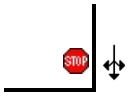
Peak-Hour: 4:15 PM -- 5:15 PM
Peak 15-Min: 4:30 PM -- 4:45 PM

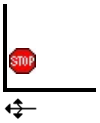


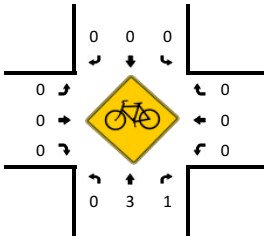


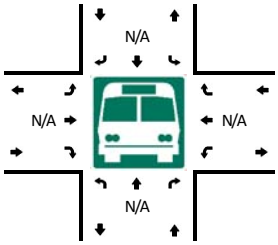
TRUE DATA TO IMPROVE MOBILITY

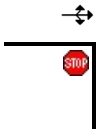


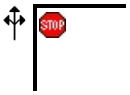


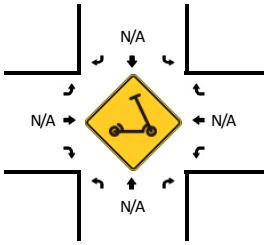












5-Min Count Period Beginning At	S Front St (Northbound)				S Front St (Southbound)				W Liberty St (Eastbound)				W Liberty St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	2	7	3	0	0	6	1	0	1	1	3	0	4	2	0	0	30	
4:05 PM	2	5	3	0	0	4	2	0	0	3	7	0	3	1	0	0	30	
4:10 PM	4	8	5	0	0	5	1	0	0	4	2	0	2	0	1	0	32	
4:15 PM	1	6	5	0	0	6	1	0	0	5	3	0	2	3	0	0	32	
4:20 PM	2	7	9	0	0	3	2	0	1	4	2	0	1	1	0	0	32	
4:25 PM	1	3	5	0	0	2	1	0	0	1	3	0	2	2	1	0	21	
4:30 PM	3	13	8	0	0	2	0	0	0	3	3	0	3	4	1	0	40	
4:35 PM	1	7	3	0	2	16	1	0	0	0	2	0	1	2	0	0	35	
4:40 PM	1	7	0	0	0	2	1	0	1	4	2	0	1	5	0	0	24	
4:45 PM	1	5	4	0	1	4	1	0	0	1	4	0	0	2	0	0	23	
4:50 PM	0	6	5	0	3	4	2	0	1	1	3	0	0	0	1	0	26	
4:55 PM	1	7	10	0	0	10	0	0	0	0	2	0	2	2	0	0	34	359
5:00 PM	2	8	4	0	2	5	1	0	0	0	2	0	2	3	0	0	29	358
5:05 PM	3	4	5	0	3	6	1	0	0	2	1	0	1	2	0	0	28	356
5:10 PM	4	8	7	0	2	3	1	0	0	2	2	0	3	1	0	0	33	357
5:15 PM	3	5	2	0	1	8	0	0	1	4	2	0	3	1	0	0	30	355
5:20 PM	1	4	2	0	0	6	1	0	1	1	3	0	1	0	0	0	20	343
5:25 PM	2	6	2	0	1	4	1	0	0	0	3	0	3	1	1	0	24	346
5:30 PM	2	4	8	0	1	7	3	0	0	2	3	0	0	0	0	0	30	336
5:35 PM	2	3	2	0	1	3	0	0	1	0	0	0	0	2	0	0	14	315
5:40 PM	1	3	2	0	0	4	0	0	0	2	5	0	2	1	0	0	20	311
5:45 PM	1	3	3	0	0	4	1	0	0	0	3	0	2	1	0	0	18	306
5:50 PM	5	9	3	0	0	3	1	0	1	0	1	0	3	3	1	0	30	310
5:55 PM	2	5	5	0	0	4	0	0	1	1	1	0	2	0	0	0	21	297

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	20	108	44	0	8	80	8	0	4	28	28	0	20	44	4	0	396
Heavy Trucks	0	4	0		0	0	0		0	0	0		0	0	0		4
Buses																	
Pedestrians		0				4				0				24			28
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 4/28/2026 7:10 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

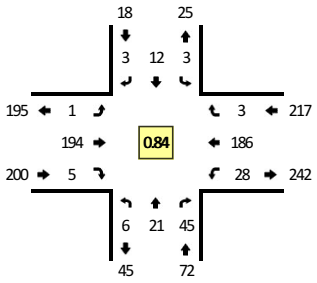
Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

LOCATION: S Front St -- Warren St
CITY/STATE: Mankato, MN

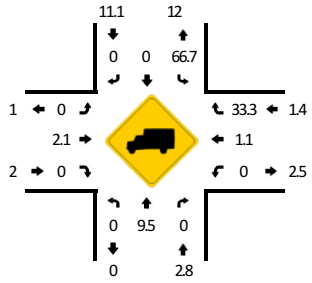
QC JOB #: 17538207
DATE: Tue, Apr 7 2026

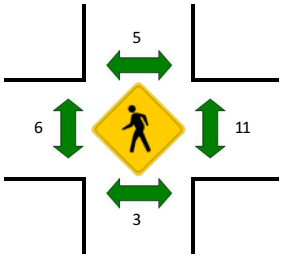
Peak-Hour: 7:15 AM -- 8:15 AM
Peak 15-Min: 7:45 AM -- 8:00 AM

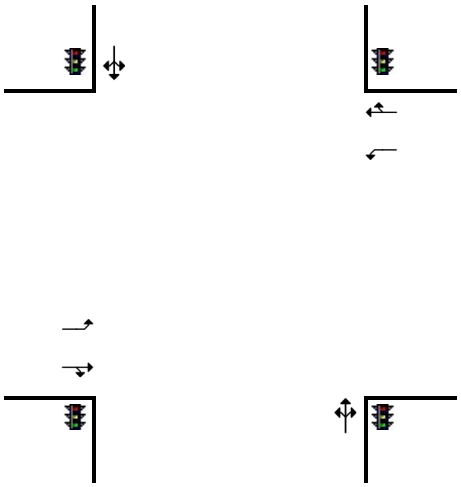


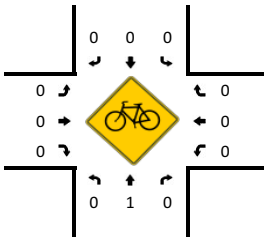


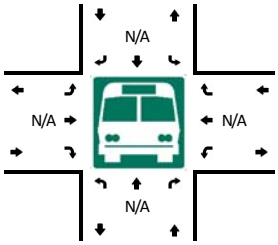
TRUE DATA TO IMPROVE MOBILITY

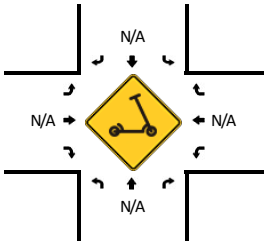












15-Min Count Period Beginning At	S Front St (Northbound)				S Front St (Southbound)				Warren St (Eastbound)				Warren St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	1	0	6	0	1	0	0	0	0	15	0	0	2	27	0	0	52	
7:15 AM	0	2	10	0	0	2	1	0	0	50	0	0	3	42	0	0	110	
7:30 AM	2	7	9	0	1	2	2	0	0	44	0	0	6	39	1	0	113	
7:45 AM	2	8	11	0	0	5	0	0	1	53	3	0	10	57	1	0	151	426
8:00 AM	2	4	15	0	2	3	0	0	0	47	2	0	9	48	1	0	133	507
8:15 AM	2	2	7	0	0	2	2	0	2	40	2	0	6	24	0	0	89	486
8:30 AM	2	4	6	0	2	5	1	0	1	39	0	0	8	28	2	0	98	471
8:45 AM	3	4	4	0	0	8	0	0	1	31	1	0	9	23	0	0	84	404

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	8	32	44	0	0	20	0	0	4	212	12	0	40	228	4	0	604
Heavy Trucks	0	0	0		0	0	0		0	0	0		0	8	0		8
Buses																	
Pedestrians		4				12				8				32			56
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 4/14/2026 11:05 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

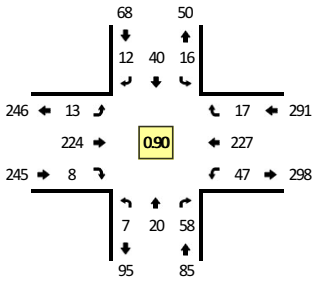
Type of peak hour being reported: User-Defined

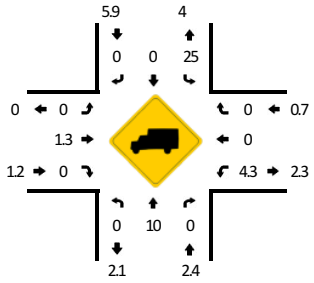
Method for determining peak hour: Total Entering Volume

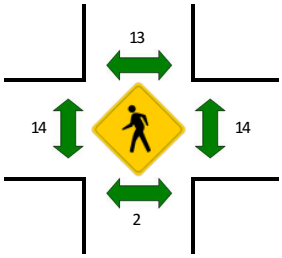
LOCATION: S Front St -- Warren St
CITY/STATE: Mankato, MN

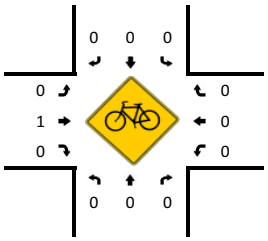
QC JOB #: 17538208
DATE: Tue, Apr 7 2026

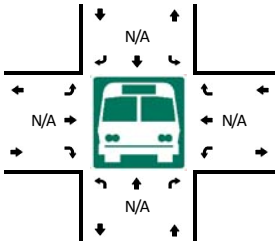
Peak-Hour: 4:15 PM -- 5:15 PM
Peak 15-Min: 4:50 PM -- 5:05 PM

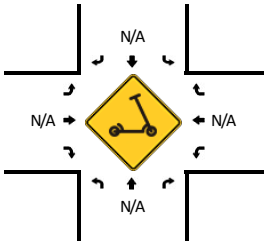












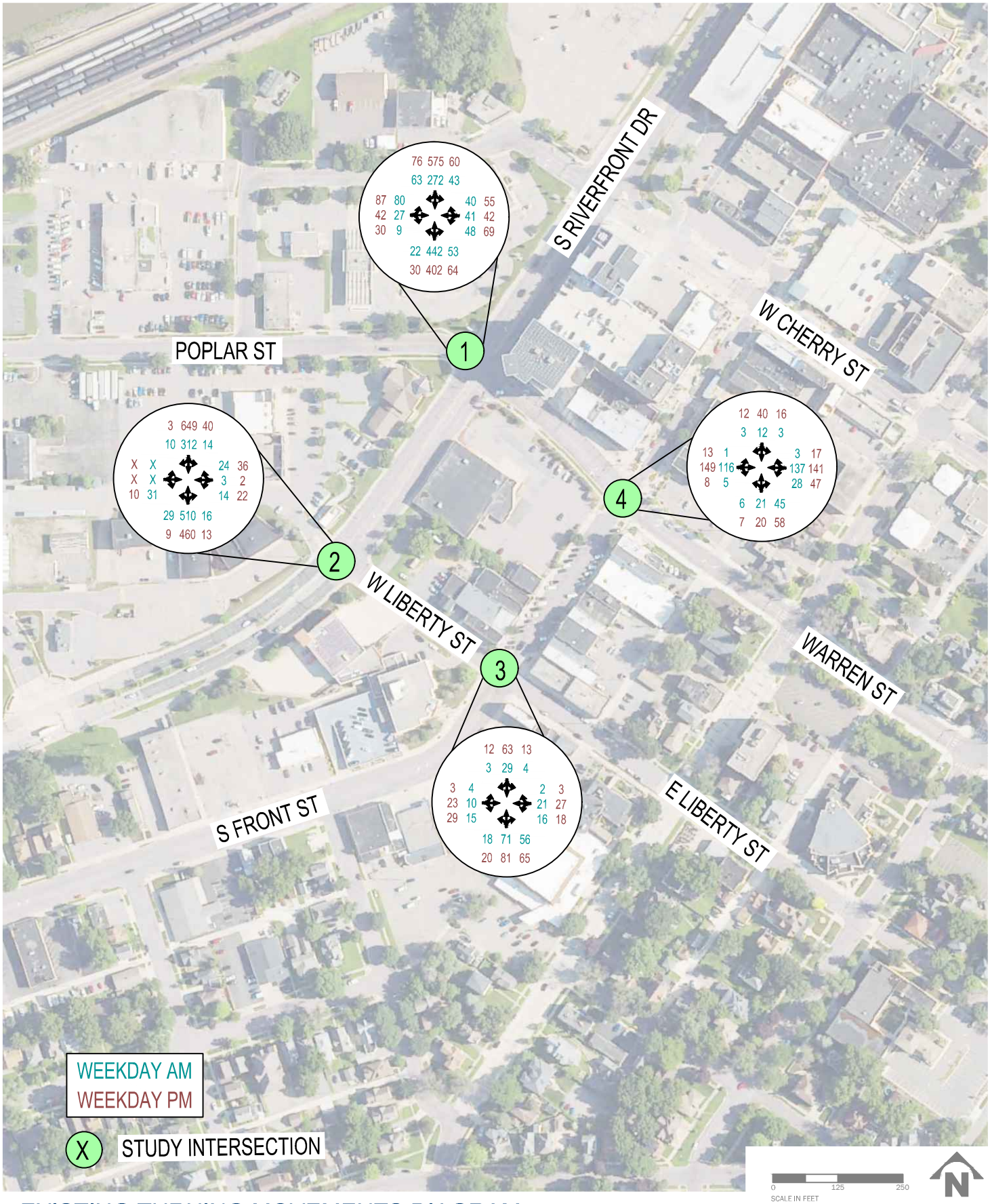
5-Min Count Period Beginning At	S Front St (Northbound)				S Front St (Southbound)				Warren St (Eastbound)				Warren St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	2	5	0	2	3	1	0	1	14	0	0	8	21	2	0	59	
4:05 PM	0	1	2	0	2	2	2	0	0	28	0	0	3	18	1	0	59	
4:10 PM	1	2	5	0	0	0	1	0	0	20	4	0	3	18	0	0	54	
4:15 PM	1	2	3	0	2	2	1	0	1	20	1	0	4	17	4	0	58	
4:20 PM	0	2	5	0	1	1	0	0	2	16	1	0	4	19	2	0	53	
4:25 PM	0	1	4	0	0	1	2	0	1	23	0	0	2	17	1	0	52	
4:30 PM	0	2	10	0	0	1	0	0	0	20	0	0	3	14	0	0	50	
4:35 PM	1	3	7	0	3	7	1	0	0	20	0	0	10	30	3	0	85	
4:40 PM	0	2	5	0	1	1	0	0	2	13	1	0	4	23	0	0	52	
4:45 PM	1	0	3	0	1	5	0	0	0	15	2	0	2	19	0	0	48	
4:50 PM	1	3	5	0	0	5	3	0	1	16	0	0	5	23	3	0	65	
4:55 PM	0	2	4	0	2	7	1	0	2	20	1	0	4	15	1	0	59	694
5:00 PM	0	3	3	0	1	4	2	0	0	26	1	0	5	20	2	0	67	702
5:05 PM	2	0	3	0	2	3	1	0	4	25	0	0	2	19	1	0	62	705
5:10 PM	1	0	6	0	3	3	1	0	0	10	1	0	2	11	0	0	38	689
5:15 PM	2	2	4	0	2	4	1	0	1	9	1	0	7	23	0	0	56	687
5:20 PM	0	2	4	0	5	3	1	0	1	15	3	0	3	18	1	0	56	690
5:25 PM	2	1	5	0	3	1	2	0	0	14	1	0	1	23	2	0	55	693
5:30 PM	0	1	1	0	1	4	1	0	2	15	1	0	11	20	0	0	57	700
5:35 PM	1	1	5	0	3	1	3	0	1	14	0	0	4	13	1	0	47	662
5:40 PM	1	1	3	0	0	3	0	0	1	20	1	0	2	21	0	0	53	663
5:45 PM	0	1	3	0	1	4	3	0	2	19	1	0	5	16	0	0	55	670
5:50 PM	1	6	5	0	1	1	0	0	1	13	0	0	5	11	0	0	44	649
5:55 PM	2	1	4	0	2	1	0	0	2	17	1	0	5	23	2	0	60	650

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	4	32	48	0	12	64	24	0	12	248	8	0	56	232	24	0	764
Heavy Trucks	0	4	0		0	0	0		0	4	0		0	0	0		8
Buses																	
Pedestrians		0				8				4				12			24
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 4/28/2026 7:10 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212



EXISTING TURNING MOVEMENTS DIAGRAM

ISG
Architecture + Engineering + Environmental + Planning
ISGInc.com

602 SOUTH FRONT STREET
MANKATO, MINNESOTA - 10/15/2026
ISG PROJECT NO. 25-33587

CAD FILE NAME 33587 APPENDICES

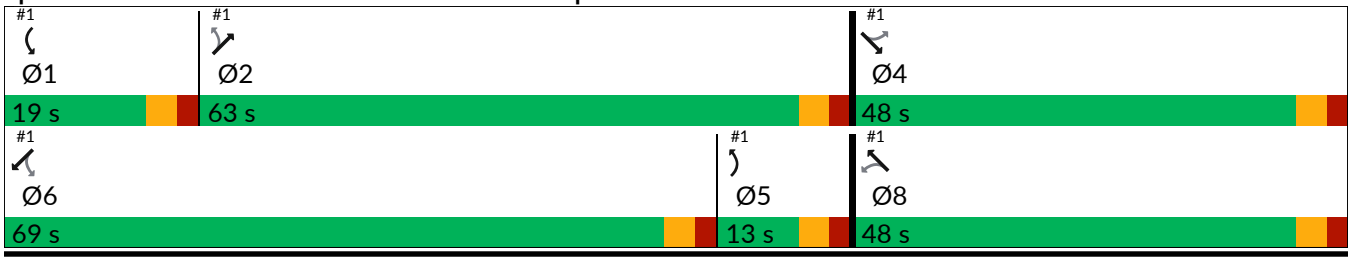
Appendix E: Existing (2026) Synchro Analysis Worksheets

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	80	27	9	48	41	40	22	442	53	43	272	63
Future Volume (vph)	80	27	9	48	41	40	22	442	53	43	272	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	140		0	120		0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (ft)	25		25	0		25	80		25	80		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.989			0.926			0.984			0.972	
Flt Protected		0.967		0.950			0.950			0.950		
Satd. Flow (prot)	0	1805	0	1805	1717	0	1805	3491	0	1770	3407	0
Flt Permitted		0.731		0.722			0.502			0.294		
Satd. Flow (perm)	0	1364	0	1372	1717	0	954	3491	0	548	3407	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			40			13			30	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		429			368			444			419	
Travel Time (s)		9.8			8.4			10.1			9.5	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	0%	0%	0%	0%	5%	0%	1%	8%	2%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	103	35	12	62	53	51	28	567	68	55	349	81
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	150	0	62	104	0	28	635	0	55	430	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2		1	2		1	2		1	2	
Detector Template		Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)		100		20	100		20	100		20	100	
Trailing Detector (ft)		0		0	0		0	0		0	0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Minimum Initial (s)	7.0	7.0		7.0	7.0		4.0	20.0		4.0	20.0	
Minimum Split (s)	25.0	25.0		25.0	25.0		9.0	25.0		9.0	25.0	
Total Split (s)	48.0	48.0		48.0	48.0		13.0	63.0		19.0	69.0	
Total Split (%)	36.9%	36.9%		36.9%	36.9%		10.0%	48.5%		14.6%	53.1%	
Maximum Green (s)	43.0	43.0		43.0	43.0		8.0	58.0		14.0	64.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag							Lag	Lag		Lead	Lead	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	4.0	4.0		4.0	4.0		3.0	4.0		3.0	4.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Flash Don't Walk (s)	16.0	16.0		16.0	16.0			16.0			16.0	
Pedestrian Calls (#/hr)	0	0		0	0			0			0	
Act Effct Green (s)		13.1		12.7	12.7		25.0	25.6		27.2	29.1	
Actuated g/C Ratio		0.27		0.26	0.26		0.51	0.52		0.55	0.59	
v/c Ratio		0.41		0.18	0.22		0.05	0.35		0.11	0.21	
Control Delay (s/veh)		22.2		19.1	13.5		13.2	12.6		11.3	9.3	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)		22.2		19.1	13.5		13.2	12.6		11.3	9.3	
LOS		C		B	B		B	B		B	A	
Approach Delay (s/veh)		22.2			15.6			12.7			9.5	
Approach LOS		C			B			B			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 49.3			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.41			
Intersection Signal Delay (s/veh): 12.9		Intersection LOS: B	
Intersection Capacity Utilization 45.6%		ICU Level of Service A	
Analysis Period (min) 15			
Description: Intersection 1			

Splits and Phases: 1: S Riverfront Dr & Warren St/Poplar St



Intersection	
Int Delay, s/veh	1.5

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	0	0	31	14	3	24	29	510	16	14	312	10
Future Vol, veh/h	0	0	31	14	3	24	29	510	16	14	312	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	95	-	-	160	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	77	77	77	77	77	77	77	77	77	77	77	77
Heavy Vehicles, %	0	0	0	0	0	0	0	2	0	7	5	0
Mvmt Flow	0	0	40	18	4	31	38	662	21	18	405	13

Major/Minor	Minor2		Minor1			Major1				Major2		
Conflicting Flow All	-	-	209	987	1203	342	418	0	0	683	0	0
Stage 1	-	-	-	748	748	-	-	-	-	-	-	-
Stage 2	-	-	-	239	455	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.9	7.5	6.5	6.9	4.1	-	-	4.24	-	-
Critical Hdwy Stg 1	-	-	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3	3.5	4	3.3	2.2	-	-	2.27	-	-
Pot Cap-1 Maneuver	0	0	803	205	186	660	1152	-	-	873	-	-
Stage 1	0	0	-	375	423	-	-	-	-	-	-	-
Stage 2	0	0	-	749	572	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	803	184	176	660	1152	-	-	873	-	-
Mov Cap-2 Maneuver	-	-	-	184	176	-	-	-	-	-	-	-
Stage 1	-	-	-	363	409	-	-	-	-	-	-	-
Stage 2	-	-	-	696	560	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Ctrl Dly, s/v	9.72	18.64	0.43	0.38
HCM LOS	A	C		

Minor Lane/Major Mvmt	NEL	NET	NER	NWLn1	SELn1	SWL	SWT	SWR
Capacity (veh/h)	1152	-	-	317	803	873	-	-
HCM Lane V/C Ratio	0.033	-	-	0.168	0.05	0.021	-	-
HCM Ctrl Dly (s/v)	8.2	-	-	18.6	9.7	9.2	-	-
HCM Lane LOS	A	-	-	C	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.6	0.2	0.1	-	-

Intersection	
Intersection Delay, s/veh	8.1
Intersection LOS	A

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Vol, veh/h	18	71	56	4	29	3	4	10	15	16	21	2
Future Vol, veh/h	18	71	56	4	29	3	4	10	15	16	21	2
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Heavy Vehicles, %	6	3	0	0	0	0	0	0	7	6	0	0
Mvmt Flow	26	101	80	6	41	4	6	14	21	23	30	3
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	NB	SB	SE	NW
Opposing Approach	SB	NB	NW	SE
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SE	NW	SB	NB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NW	SE	NB	SB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay, s/veh	8.3	7.6	7.5	8
HCM LOS	A	A	A	A

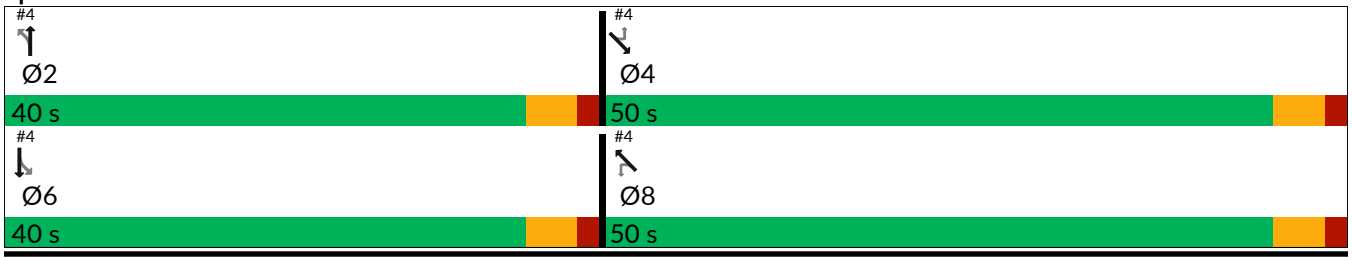
Lane	NBLn1	NWLn1	SELn1	SBLn1
Vol Left, %	12%	41%	14%	11%
Vol Thru, %	49%	54%	34%	81%
Vol Right, %	39%	5%	52%	8%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	145	39	29	36
LT Vol	18	16	4	4
Through Vol	71	21	10	29
RT Vol	56	2	15	3
Lane Flow Rate	207	56	41	51
Geometry Grp	1	1	1	1
Degree of Util (X)	0.23	0.072	0.049	0.061
Departure Headway (Hd)	4.004	4.659	4.243	4.303
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	884	773	848	836
Service Time	2.084	2.662	2.246	2.311
HCM Lane V/C Ratio	0.234	0.072	0.048	0.061
HCM Control Delay, s/veh	8.3	8	7.5	7.6
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.9	0.2	0.2	0.2

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	6	21	45	3	12	3	1	116	5	28	137	3
Future Volume (vph)	6	21	45	3	12	3	1	116	5	28	137	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	70		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25		25	25		25	0		25	50		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.915			0.975			0.994			0.996	
Flt Protected		0.996			0.991		0.950			0.950		
Satd. Flow (prot)	0	1687	0	0	1836	0	1805	1853	0	1805	1874	0
Flt Permitted		0.983			0.958		0.651			0.665		
Satd. Flow (perm)	0	1665	0	0	1775	0	1237	1853	0	1264	1874	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		54			4			3			2	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		442			459			368			421	
Travel Time (s)		10.0			10.4			8.4			9.6	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	9%	0%	0%	0%	0%	0%	2%	0%	0%	1%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	7	25	54	4	14	4	1	138	6	33	163	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	86	0	0	22	0	1	144	0	33	167	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane											Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2			2		1	2		1	2	
Detector Template		Thru			Thru		Left	Thru		Left	Thru	
Leading Detector (ft)		100			100		20	100		20	100	
Trailing Detector (ft)		0			0		0	0		0	0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0		15.0	15.0	
Minimum Split (s)	32.0	32.0		32.0	32.0		32.0	32.0		32.0	32.0	
Total Split (s)	40.0	40.0		40.0	40.0		50.0	50.0		50.0	50.0	
Total Split (%)	44.4%	44.4%		44.4%	44.4%		55.6%	55.6%		55.6%	55.6%	
Maximum Green (s)	35.0	35.0		35.0	35.0		45.0	45.0		45.0	45.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	Min	Min		Min	Min		None	None		None	None	
Walk Time (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Flash Don't Walk (s)	17.0	17.0		17.0	17.0		17.0	17.0		17.0	17.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		14.2			14.2		15.3	15.3		15.3	15.3	
Actuated g/C Ratio		0.43			0.43		0.46	0.46		0.46	0.46	
v/c Ratio		0.12			0.03		0.00	0.17		0.06	0.19	
Control Delay (s/veh)		5.7			8.5		6.0	6.8		6.3	6.9	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)		5.7			8.5		6.0	6.8		6.3	6.9	
LOS		A			A		A	A		A	A	
Approach Delay (s/veh)		5.7			8.5			6.8			6.8	
Approach LOS		A			A			A			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 33.1			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.19			
Intersection Signal Delay (s/veh): 6.7		Intersection LOS: A	
Intersection Capacity Utilization 39.9%		ICU Level of Service A	
Analysis Period (min) 15			
Description: Intersection 4			

Splits and Phases: 4: S Front St & Warren St



Intersection: 1: S Riverfront Dr & Warren St/Poplar St

Movement	SE	NW	NW	NE	NE	NE	SW	SW	SW
Directions Served	LTR	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	75	66	78	23	95	78	33	71	62
Average Queue (ft)	52	32	43	9	69	53	19	44	36
95th Queue (ft)	84	72	86	27	105	90	44	81	80
Link Distance (ft)	381	289	289		367	367		382	382
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)				140			120		
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 2: S Riverfront Dr & W Liberty St/ Dunkin Driveway

Movement	SE	NW	NE	SW
Directions Served	R	LTR	L	L
Maximum Queue (ft)	30	39	18	24
Average Queue (ft)	13	17	5	5
95th Queue (ft)	37	46	23	23
Link Distance (ft)	238	315		
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			95	160
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: S Front St & E Liberty St/W Liberty St

Movement	NB	SB	SE	NW
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	58	30	32	34
Average Queue (ft)	40	24	16	21
95th Queue (ft)	61	44	41	46
Link Distance (ft)	598	374	315	400
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: S Front St & Warren St

Movement	NB	SB	SE	NW	NW
Directions Served	LTR	LTR	TR	L	TR
Maximum Queue (ft)	56	21	43	34	51
Average Queue (ft)	28	8	26	16	31
95th Queue (ft)	69	27	51	42	62
Link Distance (ft)	374	408	289		390
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)				70	
Storage Blk Time (%)					0
Queuing Penalty (veh)					0

Network Summary

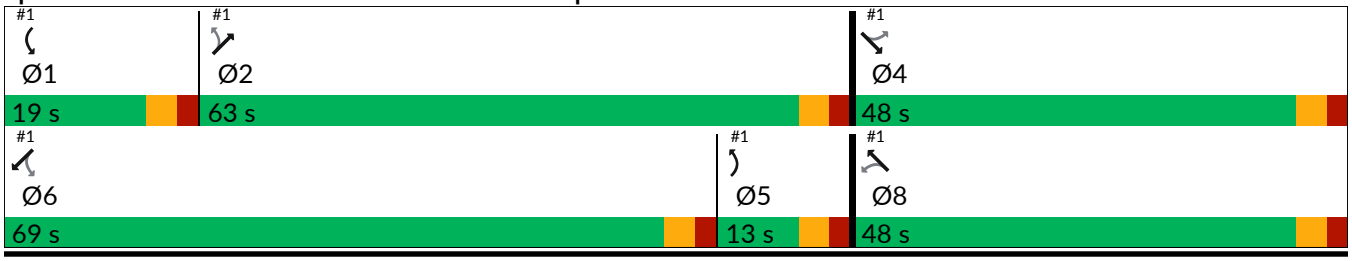
Network wide Queuing Penalty: 0

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	87	42	30	69	42	55	30	402	64	60	575	76
Future Volume (vph)	87	42	30	69	42	55	30	402	64	60	575	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	140		0	120		0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (ft)	25		25	0		25	80		25	80		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.974			0.914			0.979			0.983	
Flt Protected		0.973		0.950			0.950			0.950		
Satd. Flow (prot)	0	1791	0	1805	1737	0	1805	3490	0	1752	3518	0
Flt Permitted		0.775		0.700			0.397			0.356		
Satd. Flow (perm)	0	1426	0	1330	1737	0	754	3490	0	657	3518	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			55			18			15	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		429			368			444			406	
Travel Time (s)		9.8			8.4			10.1			9.2	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	0%	1%	3%	3%	1%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	90	43	31	71	43	57	31	414	66	62	593	78
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	164	0	71	100	0	31	480	0	62	671	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2		1	2		1	2		1	2	
Detector Template		Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)		100		20	100		20	100		20	100	
Trailing Detector (ft)		0		0	0		0	0		0	0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Minimum Initial (s)	7.0	7.0		7.0	7.0		4.0	20.0		4.0	20.0	
Minimum Split (s)	25.0	25.0		25.0	25.0		9.0	25.0		9.0	25.0	
Total Split (s)	48.0	48.0		48.0	48.0		13.0	63.0		19.0	69.0	
Total Split (%)	36.9%	36.9%		36.9%	36.9%		10.0%	48.5%		14.6%	53.1%	
Maximum Green (s)	43.0	43.0		43.0	43.0		8.0	58.0		14.0	64.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag							Lag	Lag		Lead	Lead	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	4.0	4.0		4.0	4.0		3.0	4.0		3.0	4.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Flash Don't Walk (s)	16.0	16.0		16.0	16.0			16.0			16.0	
Pedestrian Calls (#/hr)	0	0		0	0			0			0	
Act Effct Green (s)		12.4		12.4	12.4		24.2	21.3		24.1	24.1	
Actuated g/C Ratio		0.24		0.24	0.24		0.48	0.42		0.48	0.48	
v/c Ratio		0.46		0.22	0.22		0.06	0.32		0.13	0.40	
Control Delay (s/veh)		21.7		19.1	10.9		13.5	12.4		10.8	10.9	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)		21.7		19.1	10.9		13.5	12.4		10.8	10.9	
LOS		C		B	B		B	B		B	B	
Approach Delay (s/veh)		21.7			14.3			12.4			10.9	
Approach LOS		C			B			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 50.7			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.46			
Intersection Signal Delay (s/veh): 12.9		Intersection LOS: B	
Intersection Capacity Utilization 49.7%		ICU Level of Service A	
Analysis Period (min) 15			
Description: Intersection 1			

Splits and Phases: 1: S Riverfront Dr & Warren St/Poplar St



Intersection	
Int Delay, s/veh	1.2

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	0	0	10	22	2	36	9	460	13	40	649	3
Future Vol, veh/h	0	0	10	22	2	36	9	460	13	40	649	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	95	-	-	160	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	0	0	0	0	2	0	0	1	0
Mvmt Flow	0	0	10	23	2	37	9	474	13	41	669	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	336	916	1254	244	672	0	0	488	0	0
Stage 1	-	-	-	499	499	-	-	-	-	-	-	-
Stage 2	-	-	-	417	755	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.9	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	-	-	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	0	0	666	230	173	763	928	-	-	1086	-	-
Stage 1	0	0	-	527	547	-	-	-	-	-	-	-
Stage 2	0	0	-	589	420	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	666	216	165	763	928	-	-	1086	-	-
Mov Cap-2 Maneuver	-	-	-	216	165	-	-	-	-	-	-	-
Stage 1	-	-	-	522	541	-	-	-	-	-	-	-
Stage 2	-	-	-	558	404	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Ctrl Dly, s/v	10.49	16.59	0.17	0.49
HCM LOS	B	C		

Minor Lane/Major Mvmt	NEL	NET	NER	NWLn1	SELn1	SWL	SWT	SWR
Capacity (veh/h)	928	-	-	372	666	1086	-	-
HCM Lane V/C Ratio	0.01	-	-	0.166	0.015	0.038	-	-
HCM Ctrl Dly (s/v)	8.9	-	-	16.6	10.5	8.4	-	-
HCM Lane LOS	A	-	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.6	0	0.1	-	-

Intersection	
Intersection Delay, s/veh	8.1
Intersection LOS	A

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Vol, veh/h	20	81	65	13	63	12	3	23	29	18	27	3
Future Vol, veh/h	20	81	65	13	63	12	3	23	29	18	27	3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	5	2	0	0	3	0	0	0	0	0	0	0
Mvmt Flow	22	90	72	14	70	13	3	26	32	20	30	3
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	NB	SB	SE	NW
Opposing Approach	SB	NB	NW	SE
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SE	NW	SB	NB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NW	SE	NB	SB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay, s/veh	8.3	7.9	7.6	8
HCM LOS	A	A	A	A

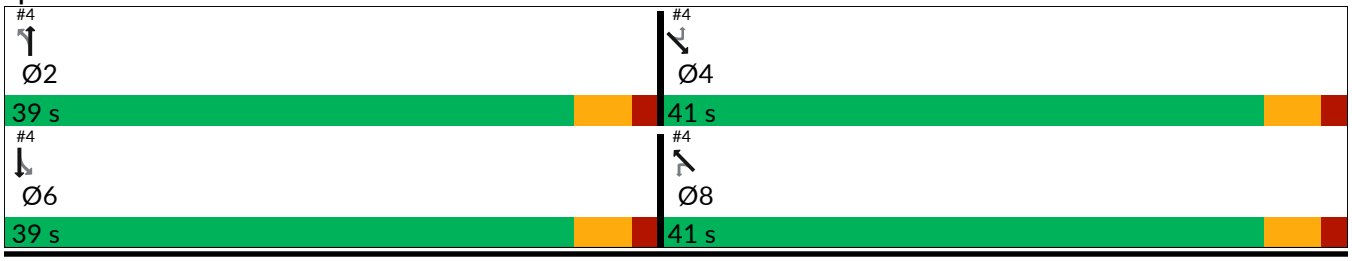
Lane	NBLn1	NWLn1	SELn1	SBLn1
Vol Left, %	12%	38%	5%	15%
Vol Thru, %	49%	56%	42%	72%
Vol Right, %	39%	6%	53%	14%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	166	48	55	88
LT Vol	20	18	3	13
Through Vol	81	27	23	63
RT Vol	65	3	29	12
Lane Flow Rate	184	53	61	98
Geometry Grp	1	1	1	1
Degree of Util (X)	0.213	0.068	0.073	0.117
Departure Headway (Hd)	4.152	4.62	4.271	4.296
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	871	777	840	836
Service Time	2.152	2.64	2.29	2.312
HCM Lane V/C Ratio	0.211	0.068	0.073	0.117
HCM Control Delay, s/veh	8.3	8	7.6	7.9
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.8	0.2	0.2	0.4

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	7	20	58	16	40	12	13	149	8	47	141	17
Future Volume (vph)	7	20	58	16	40	12	13	149	8	47	141	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	70		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25		25	25		25	0		25	50		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.908			0.977			0.992			0.984	
Flt Protected		0.996			0.988		0.950			0.950		
Satd. Flow (prot)	0	1679	0	0	1834	0	1805	1867	0	1736	1870	0
Flt Permitted		0.978			0.928		0.646			0.647		
Satd. Flow (perm)	0	1649	0	0	1723	0	1227	1867	0	1182	1870	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		64			13			4			10	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		442			459			368			421	
Travel Time (s)		10.0			10.4			8.4			9.6	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	10%	0%	0%	0%	0%	0%	1%	0%	4%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	8	22	64	18	44	13	14	166	9	52	157	19
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	94	0	0	75	0	14	175	0	52	176	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane											Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2			2		1	2		1	2	
Detector Template		Thru			Thru		Left	Thru		Left	Thru	
Leading Detector (ft)		100			100		20	100		20	100	
Trailing Detector (ft)		0			0		0	0		0	0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0		15.0	15.0	
Minimum Split (s)	32.0	32.0		32.0	32.0		32.0	32.0		32.0	32.0	
Total Split (s)	39.0	39.0		39.0	39.0		41.0	41.0		41.0	41.0	
Total Split (%)	48.8%	48.8%		48.8%	48.8%		51.3%	51.3%		51.3%	51.3%	
Maximum Green (s)	34.0	34.0		34.0	34.0		36.0	36.0		36.0	36.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	Min	Min		Min	Min		None	None		None	None	
Walk Time (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Flash Don't Walk (s)	17.0	17.0		17.0	17.0		17.0	17.0		17.0	17.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		14.0			14.0		15.5	15.5		15.5	15.5	
Actuated g/C Ratio		0.43			0.43		0.48	0.48		0.48	0.48	
v/c Ratio		0.13			0.10		0.02	0.20		0.09	0.20	
Control Delay (s/veh)		5.3			8.6		6.0	6.9		6.6	6.7	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)		5.3			8.6		6.0	6.9		6.6	6.7	
LOS		A			A		A	A		A	A	
Approach Delay (s/veh)		5.3			8.6			6.8			6.6	
Approach LOS		A			A			A			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 32.6			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.20			
Intersection Signal Delay (s/veh): 6.7		Intersection LOS: A	
Intersection Capacity Utilization 45.8%		ICU Level of Service A	
Analysis Period (min) 15			
Description: Intersection 4			

Splits and Phases: 4: S Front St & Warren St



Intersection: 1: S Riverfront Dr & Warren St/Poplar St

Movement	SE	NW	NW	NE	NE	NE	SW	SW	SW
Directions Served	LTR	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	92	70	65	32	104	95	43	115	78
Average Queue (ft)	61	34	40	14	65	49	26	77	51
95th Queue (ft)	106	82	77	37	112	109	50	130	97
Link Distance (ft)	380	289	289		367	367		369	369
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)				140			120		
Storage Blk Time (%)					0			1	
Queuing Penalty (veh)					0			1	

Intersection: 2: S Riverfront Dr & W Liberty St/ Dunkin Driveway

Movement	SE	NW	NE	SW
Directions Served	R	LTR	L	L
Maximum Queue (ft)	24	39	18	30
Average Queue (ft)	10	27	4	12
95th Queue (ft)	32	49	19	35
Link Distance (ft)	238	315		
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			95	160
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: S Front St & E Liberty St/W Liberty St

Movement	NB	SB	SE	NW
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	62	50	28	35
Average Queue (ft)	44	35	22	31
95th Queue (ft)	67	64	40	39
Link Distance (ft)	598	374	315	400
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: S Front St & Warren St

Movement	NB	SB	SE	SE	NW	NW
Directions Served	LTR	LTR	L	TR	L	TR
Maximum Queue (ft)	58	40	22	44	63	61
Average Queue (ft)	32	24	8	35	29	36
95th Queue (ft)	65	50	29	60	71	69
Link Distance (ft)	374	408	289	289		390
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)					70	
Storage Blk Time (%)					1	0
Queuing Penalty (veh)					1	0

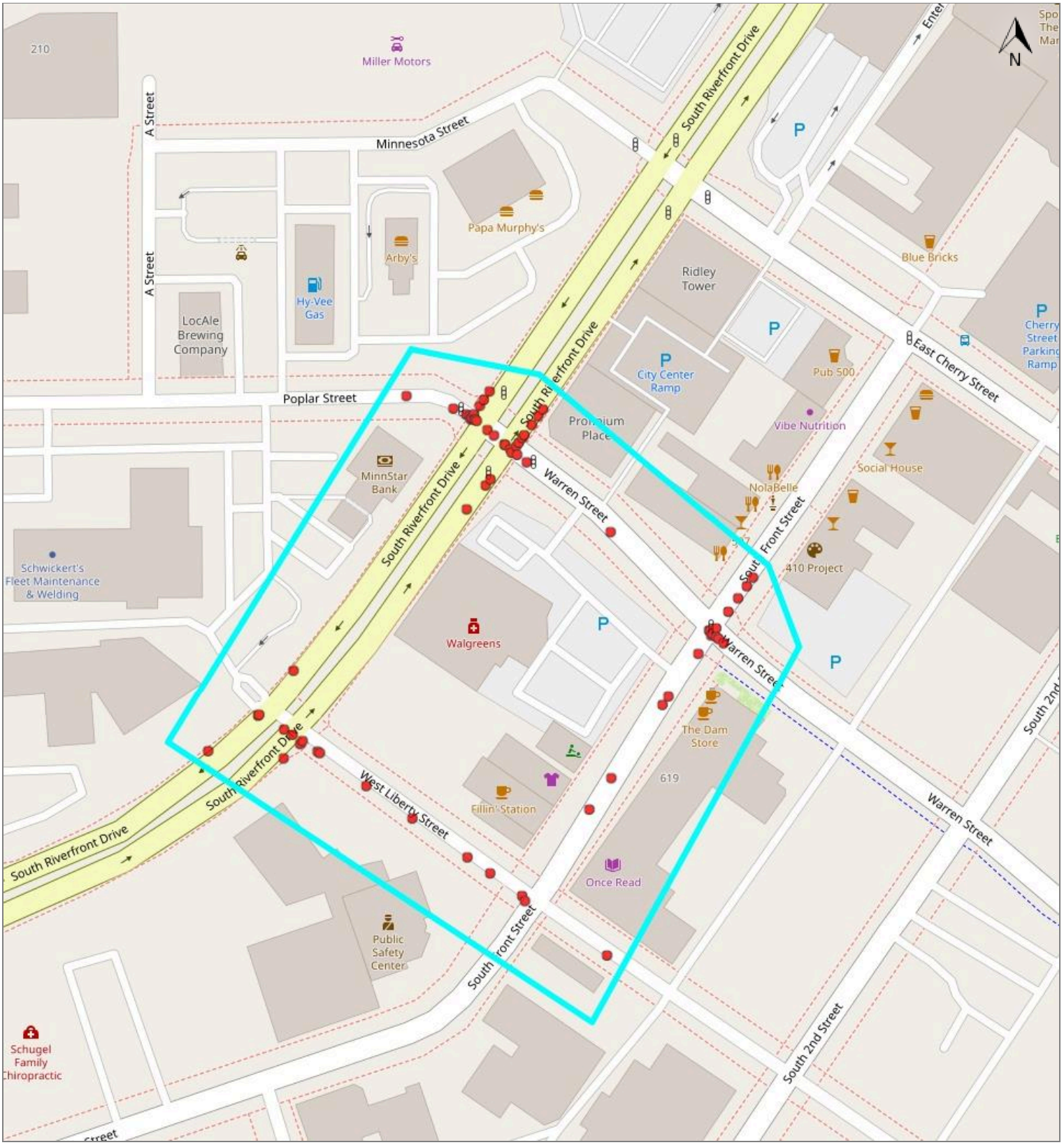
Network Summary

Network wide Queuing Penalty: 2

Appendix F: Crash Report

602 South Front Street

Map Version 1.0
October 2026



Notes:

10/14/2026MnCMAT 2.0.0

Crash Summary

Crash Severity/Crash Year

Crash Severity	Total	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
K - Fatal	0	0	0	0	0	0	0	0	0	0	0	0
A - Serious Injury	4	0	0	1	0	0	0	1	1	0	1	0
B - Minor Injury	8	1	0	2	1	0	1	1	0	0	1	1
C - Possible Injury	5	0	0	0	2	1	0	0	1	0	0	1
N - Prop Dmg Only	53	0	6	3	4	3	10	3	7	5	11	1
Total	70	1	6	6	7	4	11	5	9	5	13	3

Crash Severity/Number of Vehicles

Crash Severity	Total	0	1	2	3+
K - Fatal	0	0	0	0	0
A - Serious Injury	4	0	3	1	0
B - Minor Injury	8	0	4	4	0
C - Possible Injury	5	0	2	3	0
N - Prop Dmg Only	53	0	15	35	3
Total	70	0	24	43	3

Basic Type Summary

Basic Type Summary	Total	%
Pedestrian	3	4.3
Bike	3	4.3
Single Vehicle Run Off Road	18	25.7
Single Vehicle Other	0	0.0
Sideswipe Same Direction	2	2.9
Sideswipe Opposing	1	1.4
Rear End	11	15.7
Head On	0	0.0
Left Turn	3	4.3
Angle	16	22.9
Other	13	18.6
Total	70	100.0

First Harmful Event Summary

First Harmful Event Summary	Total	%
Pedestrian	3	4.3
Bicyclist	3	4.3
Motor Vehicle In Transport	35	50.0
Parked Motor Vehicle	10	14.3
Train	0	0.0
Deer/Animal	0	0.0
Other - Non Fixed Object	0	0.0
Collision Fixed Object	18	25.7
Non-Collision Harmful Events	1	1.4
Other/Unknown	0	0.0
Total	70	100.0

Relationship to Intersection Summary

Relationship to Intersection Summary	Total	%
Not at Intersection/Interchange	18	25.7
Four-Way Intersection	42	60.0
T or Y Intersection	5	7.1
Five-Way Intersection or More	0	0.0
Roundabout	0	0.0
Intersection Related	2	2.9
Driveway Access Related	1	1.4
At School Crossing	0	0.0
Railway Grade Crossing	0	0.0
Shared Use Path or Trail	0	0.0
Interchange on Ramp	0	0.0
Interchange off Ramp	0	0.0
Interchange Other Areas	0	0.0
Crossover Related	0	0.0
Acceleration/Deceleration Lane	0	0.0
Other/Unknown	2	2.9
Total	70	100.0

Weather 1 Summary

Weather 1 Summary	Total	%
Clear	46	65.7
Cloudy	11	15.7
Rain	5	7.1
Snow	3	4.3
Sleet, Hail (Freezing Rain/Drizzle)	0	0.0
Fog/Smog/Smoke	0	0.0
Blowing Sand/Soil/Dirt/Snow	1	1.4
Severe Crosswinds	0	0.0
Other/Unknown	4	5.7
Total	70	100.0

Light Condition Summary

Light Condition Summary	Total	%
Daylight	44	62.9
Sunrise	2	2.9
Sunset	1	1.4
Dark (Str Lights On)	19	27.1
Dark (Str Lights Off)	0	0.0
Dark (No Str Lights)	0	0.0
Dark (Unknown Light)	0	0.0
Other/Unknown	4	5.7
Total	70	100.0

Crash Summary

Time of Day/Day of Week

From To	00:00 01:59	02:00 03:59	04:00 05:59	06:00 07:59	08:00 09:59	10:00 11:59	12:00 13:59	14:00 15:59	16:00 17:59	18:00 19:59	20:00 21:59	22:00 23:59	Total	%
SUN	3	1	0	1	0	1	0	1	1	1	1	0	10	14.3
MON	1	1	0	0	1	1	1	2	2	3	0	0	12	17.1
TUE	0	0	0	1	2	0	1	1	2	2	0	0	9	12.9
WED	1	0	0	0	1	3	2	3	1	1	1	1	14	20.0
THU	0	0	0	0	0	1	1	0	1	0	0	3	6	8.6
FRI	1	0	0	0	3	1	0	0	3	1	1	0	10	14.3
SAT	1	1	0	1	2	1	1	0	1	0	1	0	9	12.9
Total	7	3	0	3	9	8	6	7	11	8	4	4	70	100.0
%	10.0	4.3	0.0	4.3	12.9	11.4	8.6	10.0	15.7	11.4	5.7	5.7	100.0	100.0

Driver & Non-Motorist Age/Gender Summary

Age	M	F	NR	No Value	Total	%
<14	1	0	0	0	1	0.9
14	0	0	0	0	0	0.0
15	0	0	0	0	0	0.0
16	1	0	0	0	1	0.9
17	1	2	0	0	3	2.8
18	0	1	0	0	1	0.9
19	2	2	0	0	4	3.7
20	0	2	0	0	2	1.9
21-24	12	8	0	0	20	18.7
25-29	2	5	0	0	7	6.5
30-34	4	3	0	0	7	6.5
35-39	9	5	0	0	14	13.1
40-44	2	7	0	0	9	8.4
45-49	3	4	0	0	7	6.5
50-54	4	4	0	0	8	7.5
55-59	6	2	0	0	8	7.5
60-64	2	4	0	0	6	5.6
65-69	2	0	0	0	2	1.9
70-74	1	0	0	0	1	0.9
75-79	1	1	0	0	2	1.9
80-84	0	1	0	0	1	0.9
85-89	0	0	0	0	0	0.0
90-94	0	0	0	0	0	0.0
95+	0	0	0	0	0	0.0
Unknown or Blank	0	0	0	3	3	2.8
Total	53	51	0	3	107	100.0
%	49.5	47.7	0.0	2.8	100.0	100.0

Month Summary

Month Summary	Total	%
January	5	7.1
February	5	7.1
March	6	8.6
April	6	8.6
May	10	14.3
June	11	15.7
July	2	2.9
August	4	5.7
September	7	10.0
October	4	5.7
November	3	4.3
December	7	10.0
Total	70	100.0

Physical Condition Summary

Physical Condition Summary	Total	%
Apparently Normal (Including No Drugs/Alcohol)	83	66.4
Physical Disability (Short Term or Long Term)	0	0.0
Medical Issue (Ill, Sick or Fainted)	1	0.8
Emotional (Depression, Angry, Disturbed, etc.)	0	0.0
Asleep or Fatigued	2	1.6
Has Been Drinking Alcohol	10	8.0
Has Been Taking Illicit Drugs	1	0.8
Has Been Taking Medications	0	0.0
Other/Unknown	28	22.4
Total	125	100.0

Selection Filter:

WORK AREA: County('7') - SPATIAL FILTER APPLIED

Analyst: Haritha Gurrala

Notes:

Intersection: MSAS 101 (Poplar St) and MSAS 118 (Warren St)

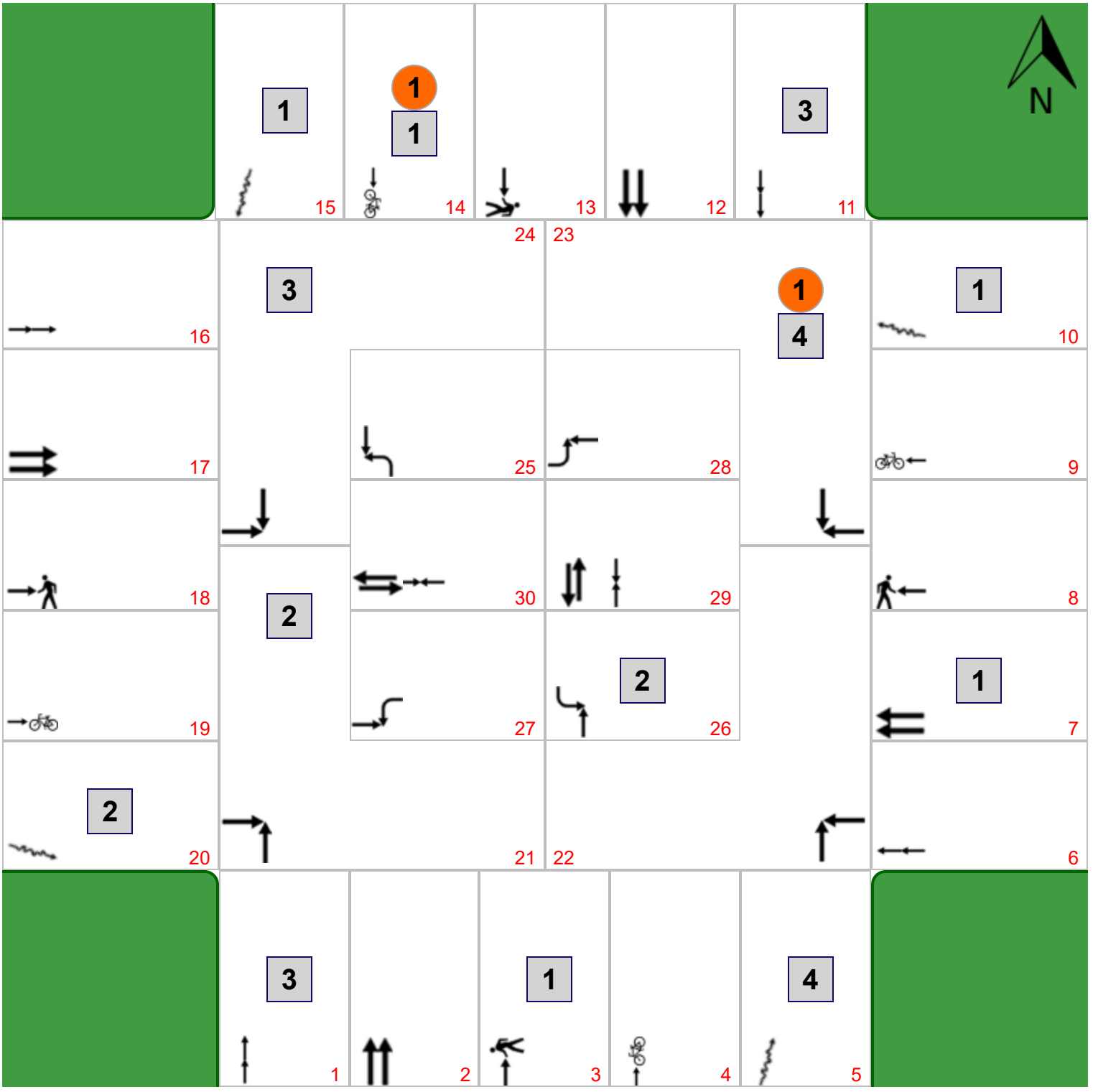
K Fatal (K)

A Incapacitating Injury (A)

T Total

Route System Municipal State Aid Street - MSAS
Route Number 0500023958310101-D
Measure 0.530
County Blue Earth
City Mankato

	K	A	B	C	N	Total
Rear End	0	0	0	0	6	6
SSS	0	0	0	0	1	1
SSO	0	0	0	0	0	0
Head On	0	0	0	0	0	0
Left Turn	0	0	0	0	2	2
Ped	0	0	1	0	0	1
Bike	0	1	0	0	0	1
Angle	0	1	2	2	7	12
SVROR	0	0	1	0	8	9
Other	0	0	0	0	1	1
Total	0	2	4	2	25	33



Summary of Crash Incidents

Fatal (K)
Incapacitating Injury (A)
Non-Incapacitating Injury (B)
Possible Injury (C)
Property Damage - No Apparent Injury (N)

Box	Basic	Sev	Date	Time	Incident Id	RdSurf	Light	Weather
	Angle		03/05/21	1700	00894450	Dry	Daylight	Clear
	Angle		03/05/25	2100	01237694	Ice/Frost	Dark (Str Lights On)	Clear
	Angle		09/02/22	1102	01043754	Dry	Daylight	Clear
	Other		06/12/21	0800	00911574	Dry	Daylight	Clear
	SVROR		05/14/26	2334	01330170	Dry	Dark (Str Lights On)	Clear
1			05/18/21	1650	00907088	Dry	Daylight	Cloudy
1			06/04/21	0905	00909742	Dry	Daylight	Clear
1			07/07/21	1514	00916844	Dry	Daylight	Clear
3			02/13/26	0823	01314744	Dry	Sunrise	Clear
5			05/26/23	1825	01101040	Dry	Daylight	Clear
5			09/18/23	1355	01132263	Dry	Daylight	Clear
5			09/22/18	0102	00636599	Dry	Dark (Str Lights On)	Clear
5			10/14/25	1243	01289451	Wet	Daylight	Rain
7			08/09/25	0830	01275628	Dry	Daylight	Cloudy
10			02/11/25	1716	01235272	Snow	Daylight	Clear
11			04/05/21	1945	00900467	Unknown	Sunset	Unknown
11			05/12/19	0221	00719334	Dry	Dark (Str Lights On)	Clear
11			06/19/21	0700	00913059	Dry	Daylight	Clear
14			06/28/25	2100	01268034	Dry	Dark (Str Lights On)	Clear
15			06/09/25	0259	01265431	Dry	Dark (Str Lights On)	Clear
20			12/29/16	2340	00409692	Dry	Dark (Str Lights On)	Clear
20			03/01/20	1920	00801738	Dry	Dark (Str Lights On)	Clear
21			03/05/25	0920	01237447	Snow	Daylight	Cloudy
21			06/20/21	1437	00913834	Dry	Daylight	Cloudy
23			05/11/22	1105	01021973	Dry	Daylight	Cloudy
23			12/13/23	1615	01149731	Dry	Daylight	Clear
23			01/13/22	1747	00998559	Dry	Dark (Str Lights On)	Clear
23			03/31/23	0154	01090786	Wet	Dark (Str Lights On)	Rain
24			03/23/20	1845	00805075	Dry	Daylight	Cloudy

24			05/27/25	0645	01261833	Wet	Daylight	Cloudy
24			06/01/24	1627	01180469	Dry	Daylight	Clear
26			04/21/17	2015	00446770	Dry	Sunrise	Clear
26			09/10/23	0117	01130751	Dry	Dark (Str Lights On)	Clear

Selection Filter:

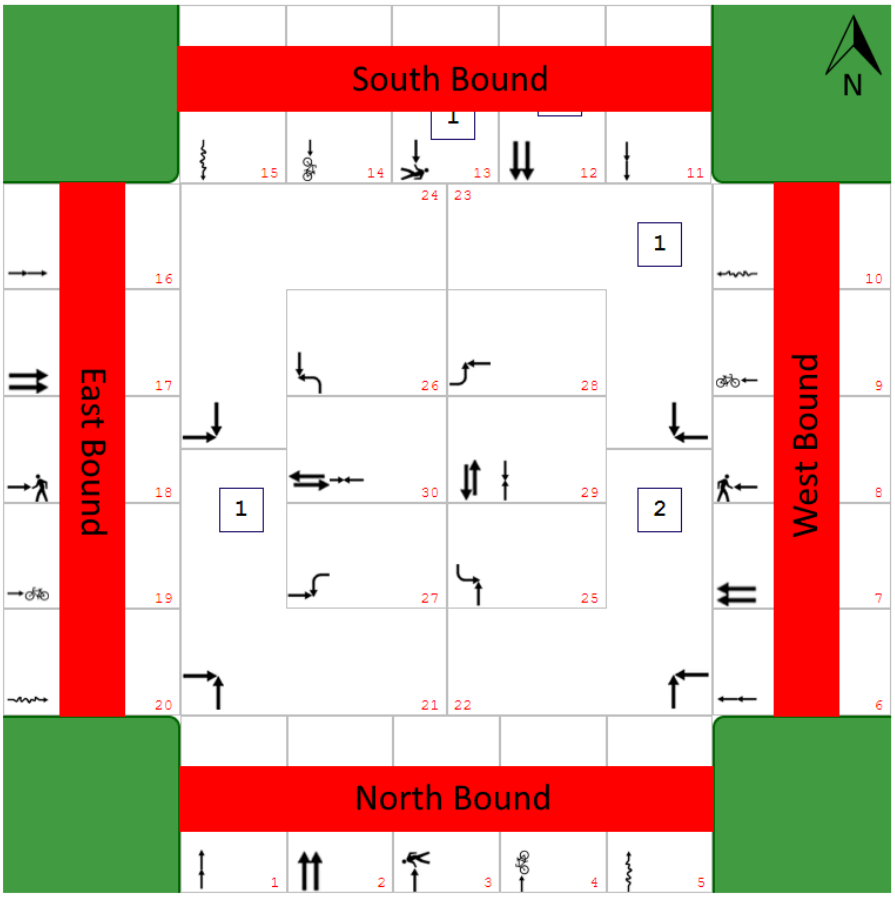
WORK AREA: County('7') - SPATIAL FILTER APPLIED

Legend Sheet

Basic Type Symbols

Read End		Sideswipe Same Direction	
Pedestrian		Bike	
Run Off Road		Sideswipe Opposing	
Angle		Left Turn	
Head On			

Each box shows the Crash Symbol AND the direction of the vehicles.
Examples: Boxes 1 through 5 are for Northbound only vehicles
Box 22 is for an angle crash of a Westbound and a Northbound vehicle.



Notes:

- Only the first 2 vehicles are considered in this assignment.
- The placement of the crash box is NOT indicative of the actual crash location within the intersection.
- Crashes not plotted did not have data to determine Basic Type or Vehicle Direction.

Intersection: MSAS 119 (Riverfront Dr) and M 228 (Liberty St)

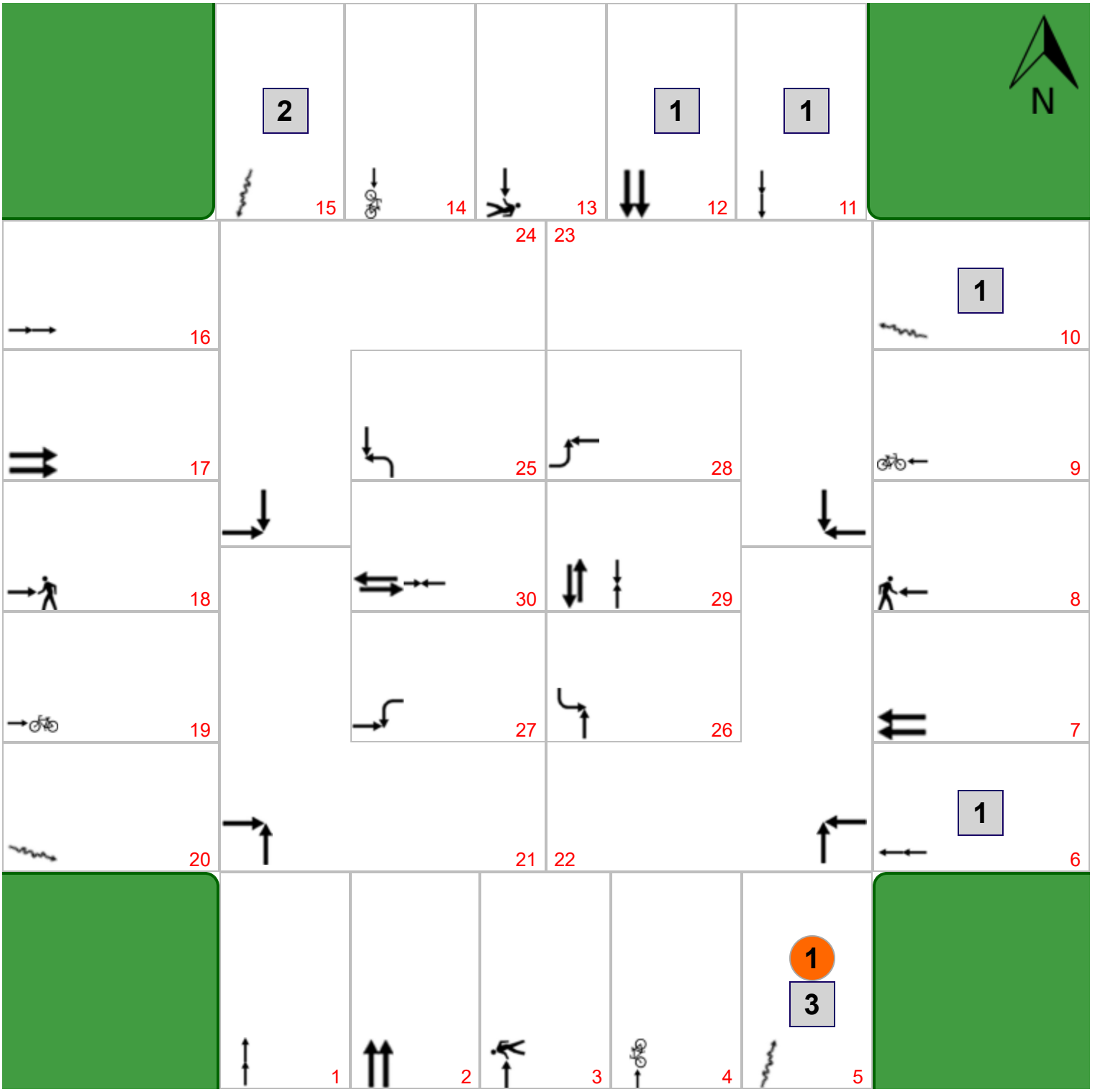
K Fatal (K)

A Incapacitating Injury (A)

T Total

Route System Municipal State Aid Street - MSAS
Route Number 0500023958310119-D
Measure 0.261
County Blue Earth
City Mankato

	K	A	B	C	N	Total
Rear End	0	0	0	0	2	2
SSS	0	0	0	0	1	1
SSO	0	0	0	0	0	0
Head On	0	0	0	0	0	0
Left Turn	0	0	0	0	0	0
Ped	0	0	0	0	0	0
Bike	0	0	0	0	0	0
Angle	0	0	0	1	0	1
SVROR	0	1	0	1	5	7
Other	0	0	0	0	1	1
Total	0	1	0	2	9	12



Summary of Crash Incidents

Fatal (K)
Incapacitating Injury (A)
Non-Incapacitating Injury (B)
Possible Injury (C)
Property Damage - No Apparent Injury (N)

Box	Basic	Sev	Date	Time	Incident Id	RdSurf	Light	Weather
	Angle		02/17/26	0918	01315414	Dry	Daylight	Clear
	Other		12/22/25	1149	01303800	Ice/Frost	Unknown	Clear
	SVROR		05/11/24	1040	01176190	Dry	Daylight	Clear
5			09/09/18	0102	00633427	Dry	Dark (Str Lights On)	Clear
5			05/06/19	1717	00708150	Mud/Dirt/Gravel	Daylight	Clear
5			06/19/24	0030	01184103	Wet	Dark (Str Lights On)	Rain
6			04/03/17	1824	00433096	Wet	Daylight	Rain
10			04/25/25	0830	01256002	Dry	Dark (Str Lights On)	Clear
11			11/01/21	1615	00970714	Dry	Daylight	Cloudy
12			12/08/19	0009	00769078	Dry	Dark (Str Lights On)	Clear
15			02/20/25	2346	01235330	Dry	Dark (Str Lights On)	Clear
15			06/18/23	0748	01115292	Wet	Daylight	Rain

Selection Filter:

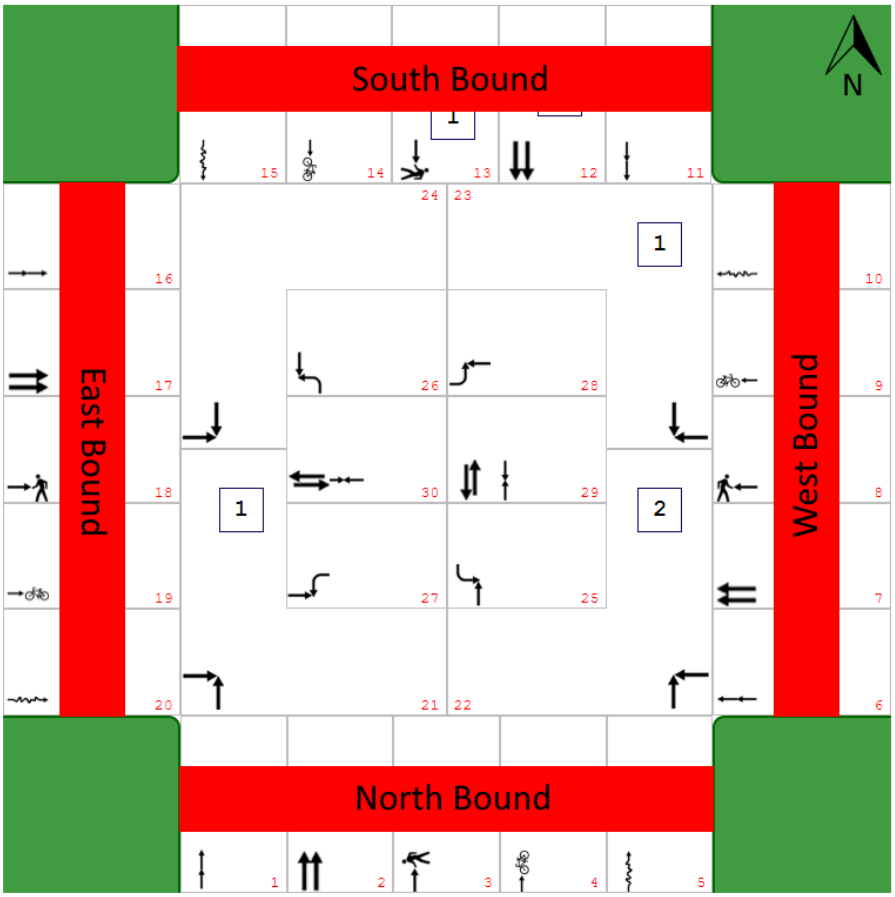
WORK AREA: County('7') - SPATIAL FILTER APPLIED

Legend Sheet

Basic Type Symbols

Read End		Sideswipe Same Direction	
Pedestrian		Bike	
Run Off Road		Sideswipe Opposing	
Angle		Left Turn	
Head On			

Each box shows the Crash Symbol AND the direction of the vehicles.
Examples: Boxes 1 through 5 are for Northbound only vehicles
Box 22 is for an angle crash of a Westbound and a Northbound vehicle.



Notes:

- Only the first 2 vehicles are considered in this assignment.
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- Crashes not plotted did not have data to determine Basic Type or Vehicle Direction.

Intersection: MSAS 120 (Front ST) and M 228 (Liberty St)

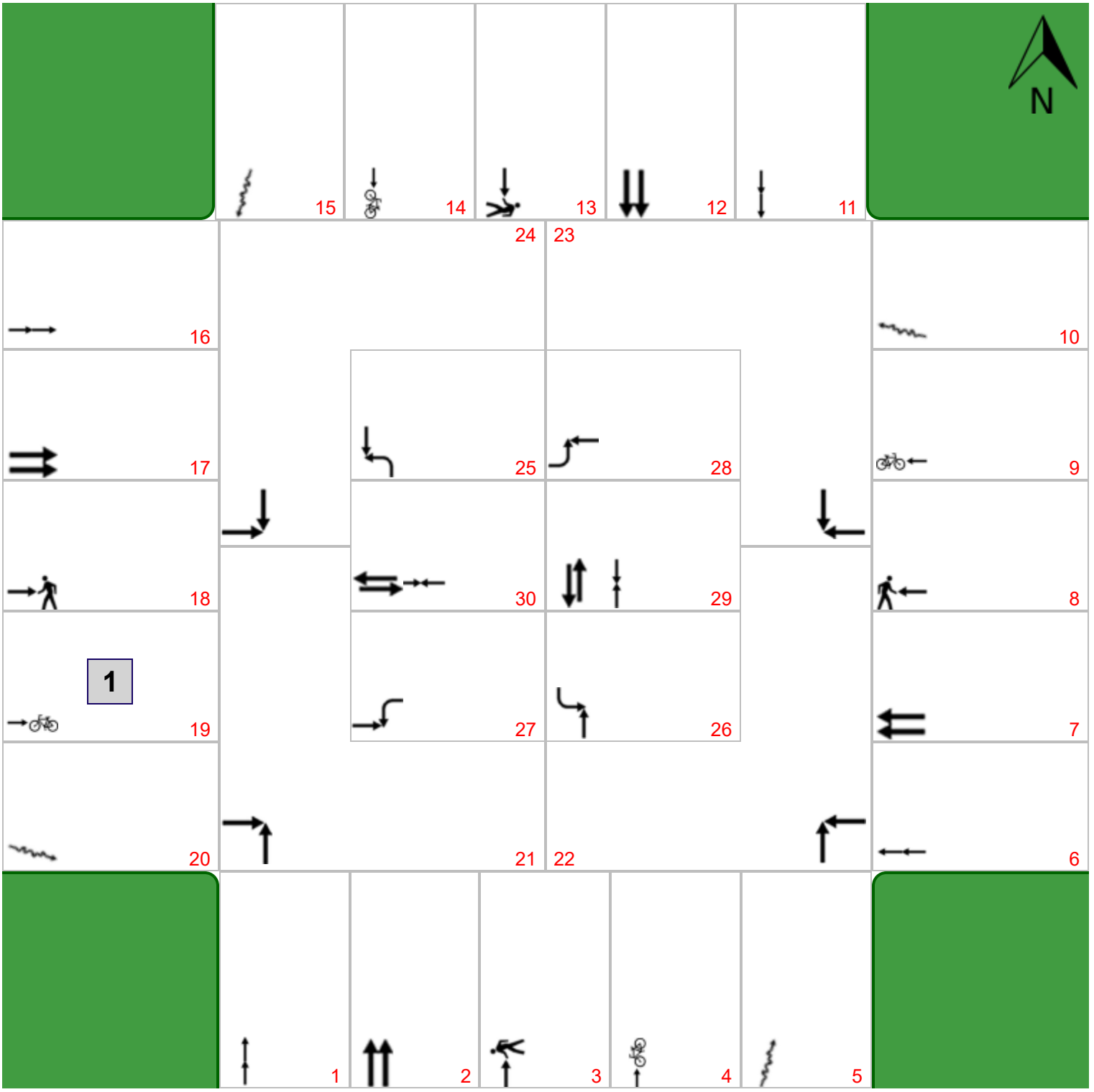
K Fatal (K)

A Incapacitating Injury (A)

T Total

Route System Municipal State Aid Street - MSAS
Route Number 0500023958310120-D
Measure 0.584
County Blue Earth
City Mankato

	K	A	B	C	N	Total
Rear End	0	0	0	0	0	0
SSS	0	0	0	0	0	0
SSO	0	0	0	0	0	0
Head On	0	0	0	0	0	0
Left Turn	0	0	0	0	0	0
Ped	0	0	0	0	0	0
Bike	0	0	1	0	0	1
Angle	0	0	0	0	0	0
SVROR	0	0	0	0	0	0
Other	0	0	0	0	3	3
Total	0	0	1	0	3	4



Summary of Crash Incidents

Fatal (K)
Incapacitating Injury (A)
Non-Incapacitating Injury (B)
Possible Injury (C)
Property Damage - No Apparent Injury (N)

Box	Basic	Sev	Date	Time	Incident Id	RdSurf	Light	Weather
	Other		01/29/19	1400	00680793	Snow	Daylight	Blowing Sand/Soil/I
	Other		08/13/20	1133	00835051	Dry	Daylight	Cloudy
	Other		11/01/23	1800	01141408	Unknown	Unknown	Unknown
19	→🚲		08/03/22	1505	01037806	Dry	Daylight	Clear

Selection Filter:

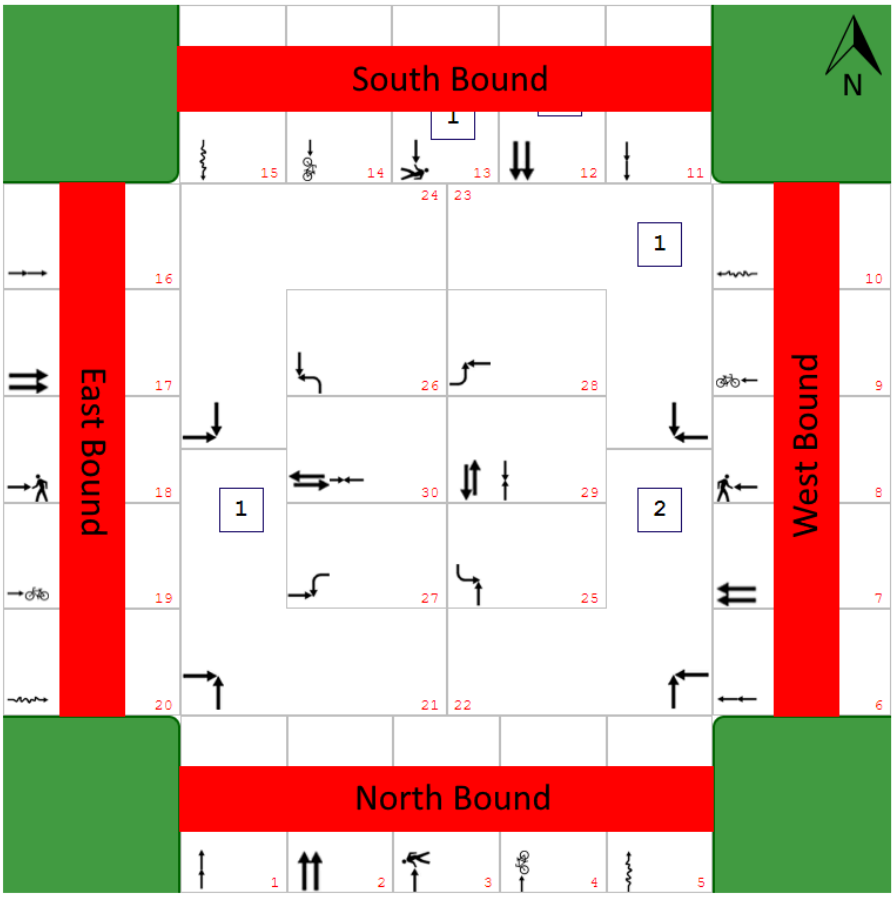
WORK AREA: County('7') - SPATIAL FILTER APPLIED

Legend Sheet

Basic Type Symbols

Read End		Sideswipe Same Direction	
Pedestrian		Bike	
Run Off Road		Sideswipe Opposing	
Angle		Left Turn	
Head On			

Each box shows the Crash Symbol AND the direction of the vehicles.
Examples: Boxes 1 through 5 are for Northbound only vehicles
Box 22 is for an angle crash of a Westbound and a Northbound vehicle.



Notes:

- Only the first 2 vehicles are considered in this assignment.
- The placement of the crash box is NOT indicative of the actual crash location within the intersection.
- Crashes not plotted did not have data to determine Basic Type or Vehicle Direction.

Intersection: MSAS 118 (Warren St) and MSAS 120 (Front ST)

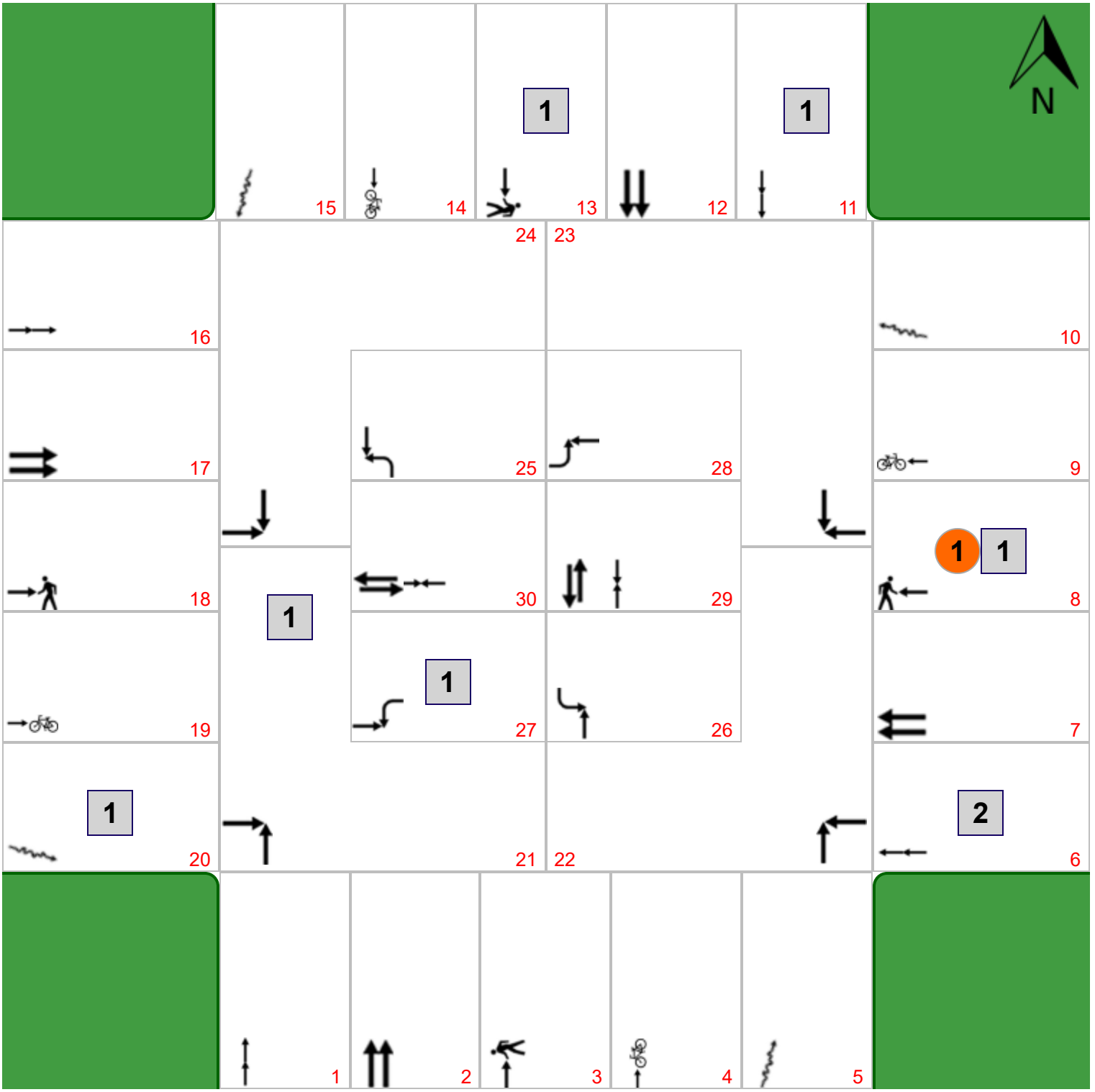
K Fatal (K)

A Incapacitating Injury (A)

T Total

Route System Municipal State Aid Street - MSAS
Route Number 0500023958310118-I
Measure 0.047
County Blue Earth
City Mankato

	K	A	B	C	N	Total
Rear End	0	0	0	0	3	3
SSS	0	0	0	0	0	0
SSO	0	0	0	0	0	0
Head On	0	0	0	0	0	0
Left Turn	0	0	1	0	0	1
Ped	0	1	1	0	0	2
Bike	0	0	0	1	0	1
Angle	0	0	0	0	2	2
SVROR	0	0	0	0	1	1
Other	0	0	1	0	2	3
Total	0	1	3	1	8	13



Summary of Crash Incidents

Fatal (K)
Incapacitating Injury (A)
Non-Incapacitating Injury (B)
Possible Injury (C)
Property Damage - No Apparent Injury (N)

Box	Basic	Sev	Date	Time	Incident Id	RdSurf	Light	Weather
	Angle		10/02/17	1405	00505657	Dry	Daylight	Cloudy
	Bike		04/10/19	1026	00702758	Snow	Daylight	Snow
	Other		09/02/18	2110	00632042	Dry	Dark (Str Lights On)	Clear
	Other		08/16/21	1430	00936217	Dry	Daylight	Clear
	Other		09/25/17	0947	00505510	Dry	Daylight	Clear
6			04/10/19	1211	00702709	Snow	Daylight	Snow
6			10/18/24	1657	01208683	Dry	Daylight	Clear
8			12/26/23	1800	01152057	Dry	Dark (Str Lights On)	Clear
11			06/11/24	1842	01182572	Dry	Daylight	Clear
13			01/06/18	1230	00540680	Ice/Frost	Daylight	Clear
20			05/17/25	0250	01260135	Dry	Dark (Str Lights On)	Clear
21			11/15/22	0821	01058999	Wet	Daylight	Snow
27			01/30/19	1214	00681404	Ice/Frost	Daylight	Clear

Selection Filter:

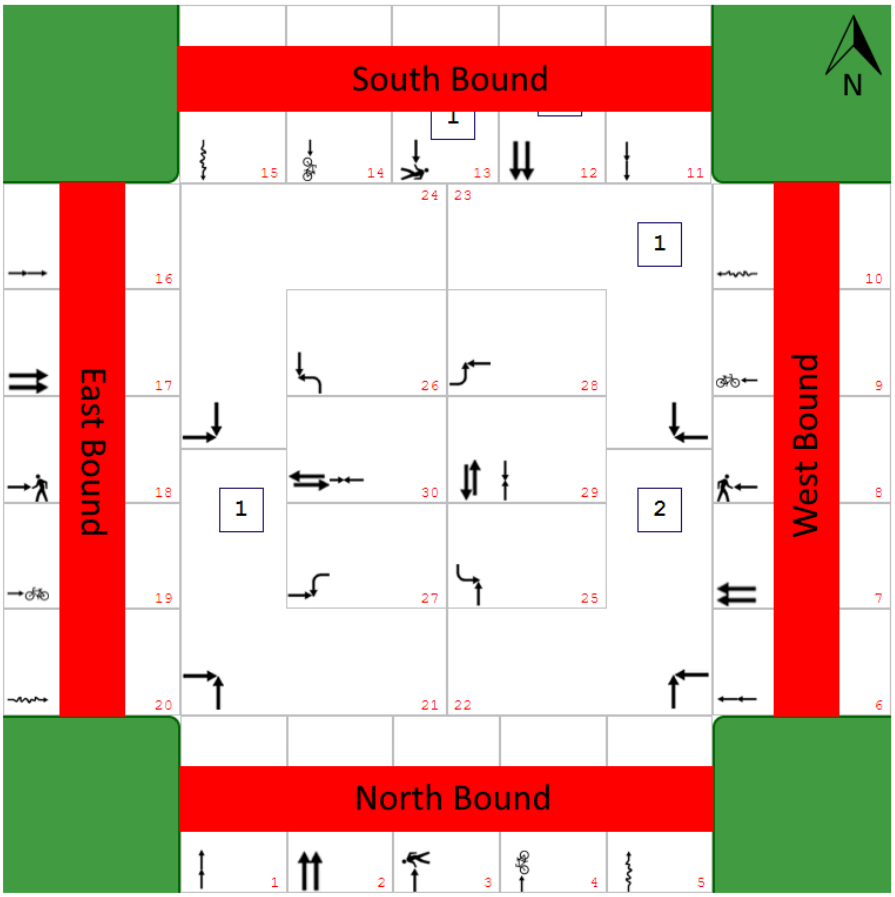
WORK AREA: County('7') - SPATIAL FILTER APPLIED

Legend Sheet

Basic Type Symbols

Read End		Sideswipe Same Direction	
Pedestrian		Bike	
Run Off Road		Sideswipe Opposing	
Angle		Left Turn	
Head On			

Each box shows the Crash Symbol AND the direction of the vehicles.
Examples: Boxes 1 through 5 are for Northbound only vehicles
Box 22 is for an angle crash of a Westbound and a Northbound vehicle.



Notes:

- Only the first 2 vehicles are considered in this assignment.
- The placement of the crash box is NOT indicative of the actual crash location within the intersection.
- Crashes not plotted did not have data to determine Basic Type or Vehicle Direction.

Appendix G: Trip Generation and Internal Capture

TRIP GENERATION AND INTERNAL CAPTURE

EXISTING DEVELOPMENT

Existing Development

ITE Code	221	Multifamily Housing (Mid-Rise)												8	Units		
	Average Rate / Fitted Curve Equation	# of Generated Trips	% Entering	% Exiting	# of Generated Trips Entering	# of Generated Trips Exiting	% Pass-by Trips	% Diverted Trips	% New Trips	# of Pass-by Trips Entering	# of Pass-by Trips Exiting	# of Diverted Trips Entering	# of Diverted Trips Exiting	# of New Trips Entering	# of New Trips Exiting	R^2 / Standard Deviation	# of Studies
Weekday AM (AM Peak Hour of Adj Street Traffic)	0.38	3	23%	77%	1	2	0%	0%	100%	0	0	0	0	1	2	0.87	20
Weekday AM (AM Peak Hour of Generator)	0.34	3	20%	80%	1	2	0%	0%	100%	0	0	0	0	1	2	0.80	11
Weekday PM (PM Peak Hour of Adj Street Traffic)	0.38	3	64%	36%	2	1	0%	0%	100%	0	0	0	0	2	1	0.92	21
Weekday PM (PM Peak Hour of Generator)	0.39	3	63%	37%	2	1	0%	0%	100%	0	0	0	0	2	1	0.95	11
Weekday	4.46	36	50%	50%	18	18	0%	0%	100%	0	0	0	0	18	18	0.90	7

Note: Sums may not add as expected due to rounding. Utilized Trip Generation Manual, 12th Edition.

ITE Code	936	Coffee/Donut Shop without Drive-Through Window												2.5	1000 Sq Ft GFA		
	Average Rate / Fitted Curve Equation	# of Generated Trips	% Entering	% Exiting	# of Generated Trips Entering	# of Generated Trips Exiting	% Pass-by Trips	% Diverted Trips	% New Trips	# of Pass-by Trips Entering	# of Pass-by Trips Exiting	# of Diverted Trips Entering	# of Diverted Trips Exiting	# of New Trips Entering	# of New Trips Exiting	R^2 / Standard Deviation	# of Studies
Weekday AM (AM Peak Hour of Adj Street Traffic)	91.02	228	51%	49%	116	112	40%	0%	60%	46	45	0	0	70	67	-	26
Weekday AM (AM Peak Hour of Generator)	94.06	235	51%	49%	120	115	40%	0%	60%	48	46	0	0	72	69	-	24
Weekday PM (PM Peak Hour of Adj Street Traffic)	31.53	79	50%	50%	40	40	40%	0%	60%	16	16	0	0	24	24	-	17
Weekday PM (PM Peak Hour of Generator)	32.67	82	50%	50%	41	41	40%	0%	60%	16	16	0	0	25	25	-	16
Saturday (Peak Hour of Generator)	55.64	139	49%	51%	68	71	26%	0%	60%	18	18	0	0	50	53	-	8

Note: Sums may not add as expected due to rounding. Utilized Trip Generation Manual, 12th Edition.

ITE Code	881	Pharmacy/Drugstore with Drivethru												19.5	1000 Sq Ft		
	Average Rate / Fitted Curve Equation	# of Generated Trips	% Entering	% Exiting	# of Generated Trips Entering	# of Generated Trips Exiting	% Pass-by Trips	% Diverted Trips	% New Trips	# of Pass-by Trips Entering	# of Pass-by Trips Exiting	# of Diverted Trips Entering	# of Diverted Trips Exiting	# of New Trips Entering	# of New Trips Exiting	R^2 / Standard Deviation	# of Studies
Weekday AM (AM Peak Hour of Adj Street Traffic)	3.83	75	52%	48%	39	36	40%	0%	60%	16	14	0	0	23	22	1.63	23
Weekday AM (AM Peak Hour of Generator)	9.17	179	50%	50%	90	90	40%	0%	60%	36	36	0	0	54	54	3.21	25
Weekday PM (PM Peak Hour of Adj Street Traffic)	10.24	200	50%	50%	100	100	40%	0%	60%	40	40	0	0	60	60	3.91	41
Weekday PM (PM Peak Hour of Generator)	11.23	219	50%	50%	110	110	40%	0%	60%	44	44	0	0	66	66	3.61	17
Weekday	Ln(T) = 0.73 Ln(X) + 5.33	1805	50%	50%	903	903	40%	0%	60%	361	361	0	0	542	542	0.5	17
Saturday (Peak Hour of Generator)	8.92	174	49%	51%	85	89	26%	0%	60%	22	23	0	0	63	66	3.32	17
Saturday	114.89	2240	50%	50%	1120	1120	26%	0%	60%	291	291	0	0	829	829	-	2

Note: Sums may not add as expected due to rounding. Utilized Trip Generation Manual, 12th Edition.

ITE Code	822	Strip Retail												8.1	1000 Sq Ft		
	Average Rate / Fitted Curve Equation	# of Generated Trips	% Entering	% Exiting	# of Generated Trips Entering	# of Generated Trips Exiting	% Pass-by Trips	% Diverted Trips	% New Trips	# of Pass-by Trips Entering	# of Pass-by Trips Exiting	# of Diverted Trips Entering	# of Diverted Trips Exiting	# of New Trips Entering	# of New Trips Exiting	R^2 / Standard Deviation	# of Studies
Weekday AM (AM Peak Hour of Adj Street Traffic)	3.93	32	55%	45%	18	14	40%	0%	60%	7	6	0	0	11	8	5.12	6
Weekday AM (AM Peak Hour of Generator)	5.40	44	48%	52%	21	23	40%	0%	60%	8	9	0	0	13	14	-	1
Weekday PM (PM Peak Hour of Adj Street Traffic)	Ln(T) = 0.68 Ln(X) + 2.77	66	50%	50%	33	33	40%	0%	60%	13	13	0	0	20	20	0.54	24
Weekday PM (PM Peak Hour of Generator)	6.27	51	56%	44%	29	22	40%	0%	60%	12	9	0	0	17	13	-	1
Weekday	T = 42.20(X) + 229.68	572	50%	50%	286	286	40%	0%	60%	114	114	0	0	172	172	0.96	4
Saturday (Peak Hour of Generator)	6.63	54	51%	49%	28	26	26%	0%	74%	7	7	0	0	21	19	3.99	14

Note: Sums may not add as expected due to rounding. Utilized Trip Generation Manual, 12th Edition.

PROPOSED DEVELOPMENT

Proposed Development

ITE Code	221	Multifamily Housing (Mid-Rise)														165	Units		
	Average Rate / Fitted Curve Equation	# of Generated Trips	% Entering	% Exiting	# of Generated Trips Entering	# of Generated Trips Exiting	# of External Trips Entering	# of External Trips Exiting	% Pass-by Trips	% Diverted Trips	% New Trips	# of Pass-by Trips Entering	# of Pass-by Trips Exiting	# of Diverted Trips Entering	# of Diverted Trips Exiting	# of New Trips Entering	# of New Trips Exiting	R^2 / Standard Deviation	# of Studies
Weekday AM (AM Peak Hour of Adj Street Traffic)	0.38	63	23%	77%	14	49	13	38	0%	0%	100%	0	0	0	0	13	38	0.87	20
Weekday AM (AM Peak Hour of Generator)	0.34	56	20%	80%	11	45			0%	0%	100%	0	0	0	0	11	45	0.80	11
Weekday PM (PM Peak Hour of Adj Street Traffic)	0.38	63	64%	36%	40	23	15	9	0%	0%	100%	0	0	0	0	15	9	0.92	21
Weekday PM (PM Peak Hour of Generator)	0.39	64	63%	37%	40	24			0%	0%	100%	0	0	0	0	40	24	0.95	11
Weekday	4.46	736	50%	50%	368	368			0%	0%	100%	0	0	0	0	368	368	0.90	7

Note: Sums may not add as expected due to rounding. Utilized Trip Generation Manual, 12th Edition.

ITE Code	936	Coffee/Donut Shop without Drive-Through Window														2.5	1000 Sq Ft GFA		
	Average Rate / Fitted Curve Equation	# of Generated Trips	% Entering	% Exiting	# of Generated Trips Entering	# of Generated Trips Exiting	# of External Trips Entering	# of External Trips Exiting	% Pass-by Trips	% Diverted Trips	% New Trips	# of Pass-by Trips Entering	# of Pass-by Trips Exiting	# of Diverted Trips Entering	# of Diverted Trips Exiting	# of New Trips Entering	# of New Trips Exiting	R^2 / Standard Deviation	# of Studies
Weekday AM (AM Peak Hour of Adj Street Traffic)	91.02	228	51%	49%	116	112	94	98	40%	0%	60%	38	39	0	0	56	59	-	26
Weekday AM (AM Peak Hour of Generator)	94.06	235	51%	49%	120	115			40%	0%	60%	48	46	0	0	72	69	-	24
Weekday PM (PM Peak Hour of Adj Street Traffic)	31.53	79	50%	50%	40	40	22	17	40%	0%	60%	9	7	0	0	13	10	-	17
Weekday PM (PM Peak Hour of Generator)	32.67	82	50%	50%	41	41			40%	0%	60%	16	16	0	0	25	25	-	16
Saturday (Peak Hour of Generator)	55.64	139	49%	51%	68	71			26%	0%	74%	18	18	0	0	50	53	-	8

Note: Sums may not add as expected due to rounding. Utilized Trip Generation Manual, 12th Edition.

ITE Code	822	Strip Retail														29.5	1000 Sq Ft		
	Average Rate / Fitted Curve Equation	# of Generated Trips	% Entering	% Exiting	# of Generated Trips Entering	# of Generated Trips Exiting	# of External Trips Entering	# of External Trips Exiting	% Pass-by Trips	% Diverted Trips	% New Trips	# of Pass-by Trips Entering	# of Pass-by Trips Exiting	# of Diverted Trips Entering	# of Diverted Trips Exiting	# of New Trips Entering	# of New Trips Exiting	R^2 / Standard Deviation	# of Studies
Weekday AM (AM Peak Hour of Adj Street Traffic)	3.93	116	55%	45%	64	52	57	43	20%	0%	80%	11	9	0	0	46	34	5.12	6
Weekday AM (AM Peak Hour of Generator)	5.40	159	48%	52%	76	83			20%	0%	80%	15	17	0	0	61	66	-	1
Weekday PM (PM Peak Hour of Adj Street Traffic)	Ln(T) = 0.68 Ln(X) + 2.77	159	50%	50%	80	80	50	48	20%	0%	80%	10	10	0	0	40	38	0.54	24
Weekday PM (PM Peak Hour of Generator)	6.27	185	56%	44%	104	81			20%	0%	80%	21	16	0	0	83	65	-	1
Weekday	T = 42.20(X) + 229.68	1475	50%	50%	738	738			20%	0%	80%	148	148	0	0	590	590	0.96	4
Saturday (Peak Hour of Generator)	6.63	196	51%	49%	100	96			26%	0%	74%	26	25	0	0	74	71	3.99	14

Note: Sums may not add as expected due to rounding. Utilized Trip Generation Manual, 12th Edition.

ITE Code	710	General Office Building														39.3	1000 Sq Ft		
	Average Rate / Fitted Curve Equation	# of Generated Trips	% Entering	% Exiting	# of Generated Trips Entering	# of Generated Trips Exiting	# of External Trips Entering	# of External Trips Exiting	% Pass-by Trips	% Diverted Trips	% New Trips	# of Pass-by Trips Entering	# of Pass-by Trips Exiting	# of Diverted Trips Entering	# of Diverted Trips Exiting	# of New Trips Entering	# of New Trips Exiting	R^2 / Standard Deviation	# of Studies
Weekday AM (AM Peak Hour of Adj Street Traffic)	T = 1.12(X) + 19.95	64	88%	12%	56	8	45	1	0%	0%	100%	0	0	0	0	45	1	0.89	54
Weekday PM (PM Peak Hour of Adj Street Traffic)	T = 0.99(X) + 31.14	70	16%	84%	11	59	7	51	0%	0%	100%	0	0	0	0	7	51	0.89	53
Weekday	T = 6.18(X) + 207.96	451	50%	50%	226	226			0%	0%	100%	0	0	0	0	226	226	0.86	22
Saturday (Peak Hour of Generator)	0.88	35	54%	46%	19	16			0%	0%	100%	0	0	0	0	19	16	-	1
Saturday	4.39	173	50%	50%	87	87			0%	0%	100%	0	0	0	0	87	87	-	1

Note: Sums may not add as expected due to rounding. Utilized Trip Generation Manual, 12th Edition.

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	602 South Front Street	**Organization:**	ISG
Project Location:	Mankato, MN	**Performed By:**	Haritha Gurrala
Scenario Description:	Mixed-Use Development	**Date:**	10/14/2026
Analysis Year:	2026	**Checked By:**	Will Kratt
Analysis Period:	**AM Street Peak Hour**	**Date:**	10/14/2026

Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips[3]		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office	710	39,300	Sq Ft	64	56	8
Retail	822	29,500	Sq Ft	116	64	52
Restaurant	936	2,500	Sq Ft	228	116	112
Cinema/Entertainment						
Residential	221	165	Units	63	14	49
Hotel						
All Other Land Uses[2]						
				471	250	221

Table 2-A: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.[4]	% Transit	% Non-Motorized	Veh. Occ.[4]	% Transit	% Non-Motorized
Office	1.00	0%	0%	1.00	0%	0%
Retail	1.00	0%	0%	1.00	0%	0%
Restaurant	1.00	0%	0%	1.00	0%	0%
Cinema/Entertainment						
Residential	1.00	0%	0%	1.00	0%	0%
Hotel						
All Other Land Uses[2]						

Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-A: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		2	5	0	0	0
Retail	2		7	0	0	0
Restaurant	8	5		0	1	0
Cinema/Entertainment	0	0	0		0	0
Residential	1	0	10	0		0
Hotel	0	0	0	0	0	

Table 5-A: Computations Summary

	Total	Entering	Exiting
All Person-Trips	471	250	221
Internal Capture Percentage	17%	16%	19%
External Vehicle-Trips[5]	389	209	180
External Transit-Trips[6]	0	0	0
External Non-Motorized Trips[6]	0	0	0

Table 6-A: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	20%	88%
Retail	11%	17%
Restaurant	19%	13%
Cinema/Entertainment	N/A	N/A
Residential	7%	22%
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

[3]Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

[4]Enter vehicle occupancy assumed in Table 1-A vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made to Tables 5-A, 9-A (O and D). Enter transit, non-motorized percentages that will result with proposed mixed-use project complete.

[5]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A.

[6]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas A&M Transportation Institute - Version 2013.1

Project Name:	602 South Front Street
Analysis Period:	**AM Street Peak Hour**

Table 7-A: Conversion of Vehicle-Trip Ends to Person-Trip Ends

Land Use	Table 7-A (D): Entering Trips			Table 7-A (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	56	56	1.00	8	8
Retail	1.00	64	64	1.00	52	52
Restaurant	1.00	116	116	1.00	112	112
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	14	14	1.00	49	49
Hotel	1.00	0	0	1.00	0	0

Table 8-A (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		2	5	0	0	0
Retail	15		7	0	7	0
Restaurant	35	16		0	4	3
Cinema/Entertainment	0	0	0		0	0
Residential	1	0	10	0		0
Hotel	0	0	0	0	0	

Table 8-A (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		20	27	0	0	0
Retail	2		58	0	0	0
Restaurant	8	5		0	1	0
Cinema/Entertainment	0	0	0		0	0
Residential	2	11	23	0		0
Hotel	2	3	7	0	0	

Table 9-A (D): Internal and External Trips Summary (Entering Trips)

Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	11	45	56	45	0	0
Retail	7	57	64	57	0	0
Restaurant	22	94	116	94	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	1	13	14	13	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

Table 9-A (O): Internal and External Trips Summary (Exiting Trips)

Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	7	1	8	1	0	0
Retail	9	43	52	43	0	0
Restaurant	14	98	112	98	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	11	38	49	38	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

[1]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A

[2]Person-Trips

[3]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	602 South Front Street	**Organization:**	ISG
Project Location:	Mankato, MN	**Performed By:**	Haritha Gurrala
Scenario Description:	Mixed-Use Development	**Date:**	10/14/2026
Analysis Year:	2026	**Checked By:**	Will Kratt
Analysis Period:	**PM Street Peak Hour**	**Date:**	10/14/2026

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips[3]		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office	710	39,300	Sq Ft	70	11	59
Retail	822	29,500	Sq Ft	159	80	80
Restaurant	936	2,500	Sq Ft	79	40	40
Cinema/Entertainment						
Residential	221	165	Units	63	40	23
Hotel						
All Other Land Uses[2]						
				371	171	202

Table 2-P: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.[4]	% Transit	% Non-Motorized	Veh. Occ.[4]	% Transit	% Non-Motorized
Office	1.00	0%	0%	1.00	0%	0%
Retail	1.00	0%	0%	1.00	0%	0%
Restaurant	1.00	0%	0%	1.00	0%	0%
Cinema/Entertainment						
Residential	1.00	0%	0%	1.00	0%	0%
Hotel						
All Other Land Uses[2]						

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-P: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		6	1	0	1	0
Retail	2		12	0	18	0
Restaurant	1	16		0	6	0
Cinema/Entertainment	0	0	0		0	0
Residential	1	8	5	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary

	Total	Entering	Exiting
All Person-Trips	373	171	202
Internal Capture Percentage	41%	45%	38%
External Vehicle-Trips[5]	219	94	125
External Transit-Trips[6]	0	0	0
External Non-Motorized Trips[6]	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	36%	14%
Retail	38%	40%
Restaurant	45%	58%
Cinema/Entertainment	N/A	N/A
Residential	63%	61%
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

[3]Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

[4]Enter vehicle occupancy assumed in Table 1-P vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made

[5]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P.

[6]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas A&M Transportation Institute - Version 2013.1

Project Name:	602 South Front Street
Analysis Period:	**PM Street Peak Hour**

Table 7-P: Conversion of Vehicle-Trip Ends to Person-Trip Ends

Land Use	Table 7-P (D): Entering Trips			Table 7-P (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	11	11	1.00	59	59
Retail	1.00	80	80	1.00	80	80
Restaurant	1.00	40	40	1.00	40	40
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	40	40	1.00	23	23
Hotel	1.00	0	0	1.00	0	0

Table 8-P (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		12	2	0	1	0
Retail	2		23	3	21	4
Restaurant	1	16		3	7	3
Cinema/Entertainment	0	0	0		0	0
Residential	1	10	5	0		1
Hotel	0	0	0	0	0	

Table 8-P (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		6	1	0	2	0
Retail	3		12	0	18	0
Restaurant	3	40		0	6	0
Cinema/Entertainment	1	3	1		2	0
Residential	6	8	6	0		0
Hotel	0	2	2	0	0	

Table 9-P (D): Internal and External Trips Summary (Entering Trips)

Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	4	7	11	7	0	0
Retail	30	50	80	50	0	0
Restaurant	18	22	40	22	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	25	15	40	15	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

Table 9-P (O): Internal and External Trips Summary (Exiting Trips)

Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	8	51	59	51	0	0
Retail	32	48	80	48	0	0
Restaurant	23	17	40	17	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	14	9	23	9	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

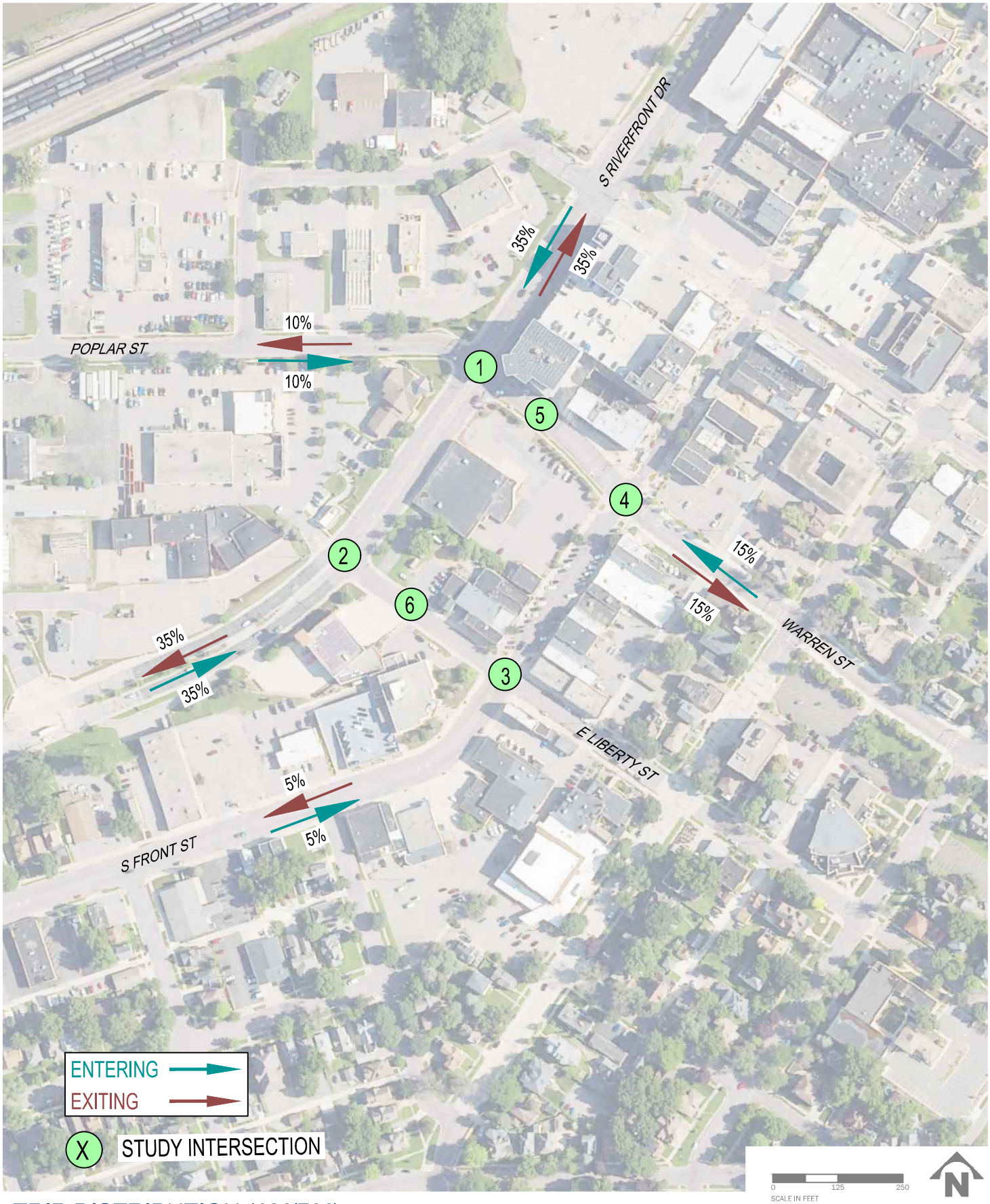
[1]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

[2]Person-Trips

[3]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.

Appendix H: Trip Distribution



TRIP DISTRIBUTION (AM/PM)

ISG

Architecture + Engineering + Environmental + Planning

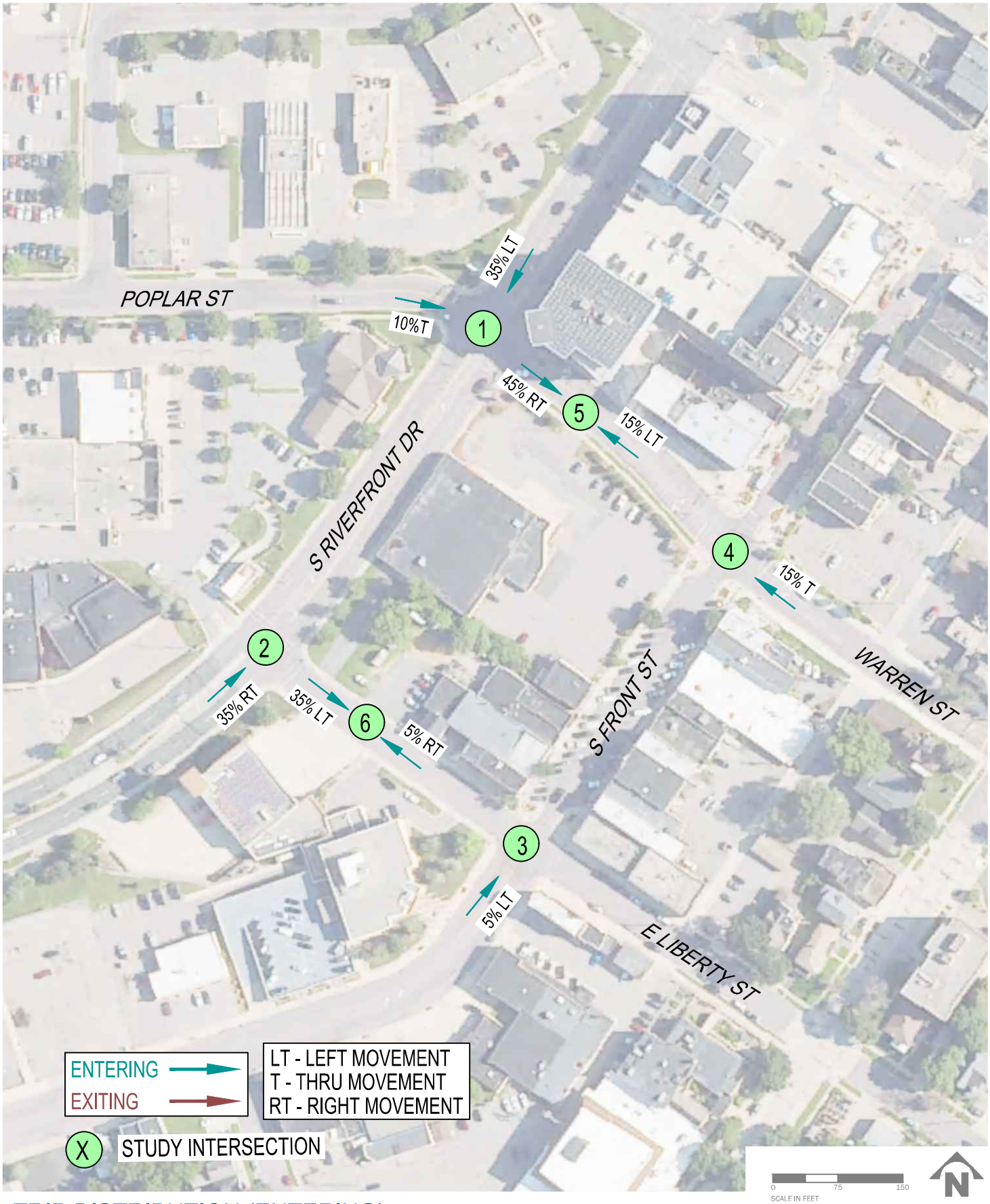
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TRIP DISTRIBUTION (ENTERING)

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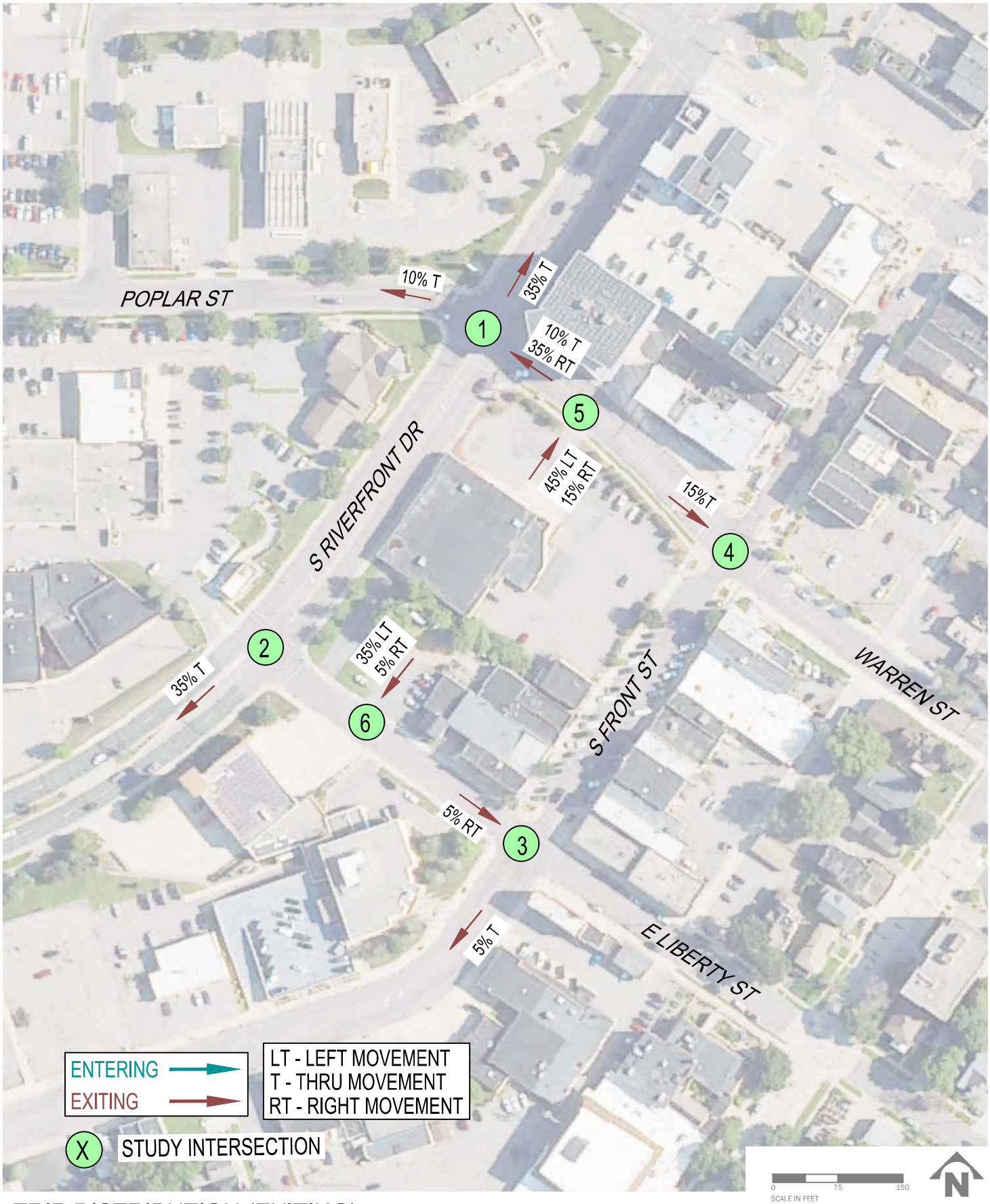
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TRIP DISTRIBUTION (EXITING)

ISG

Architecture + Engineering + Environmental + Planning

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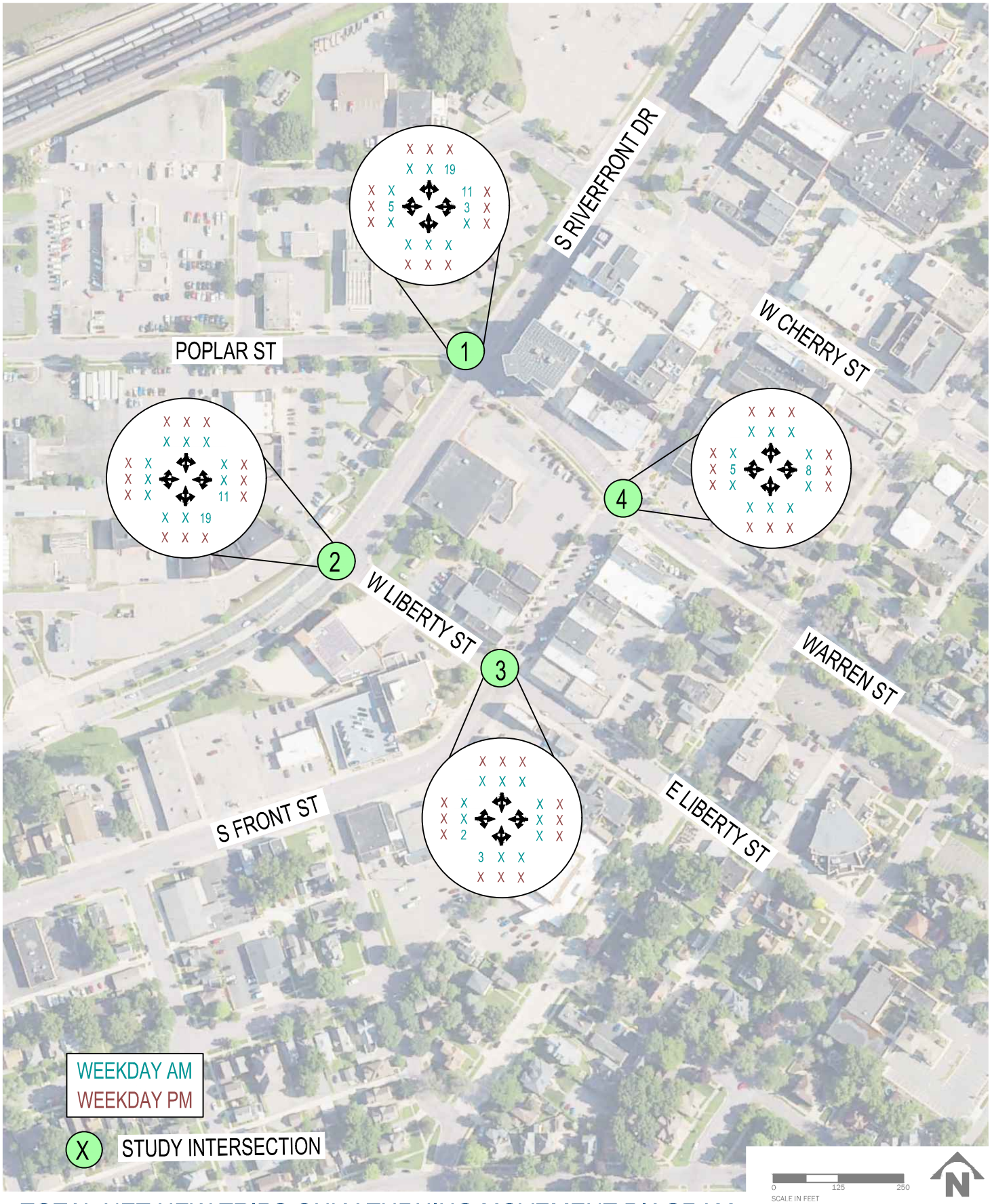
602 SOUTH FRONT STREET

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ISG PROJECT NO. 25-33587

CAD FILE NAME 33587 APPENDICES

Appendix I: Trip Assignment



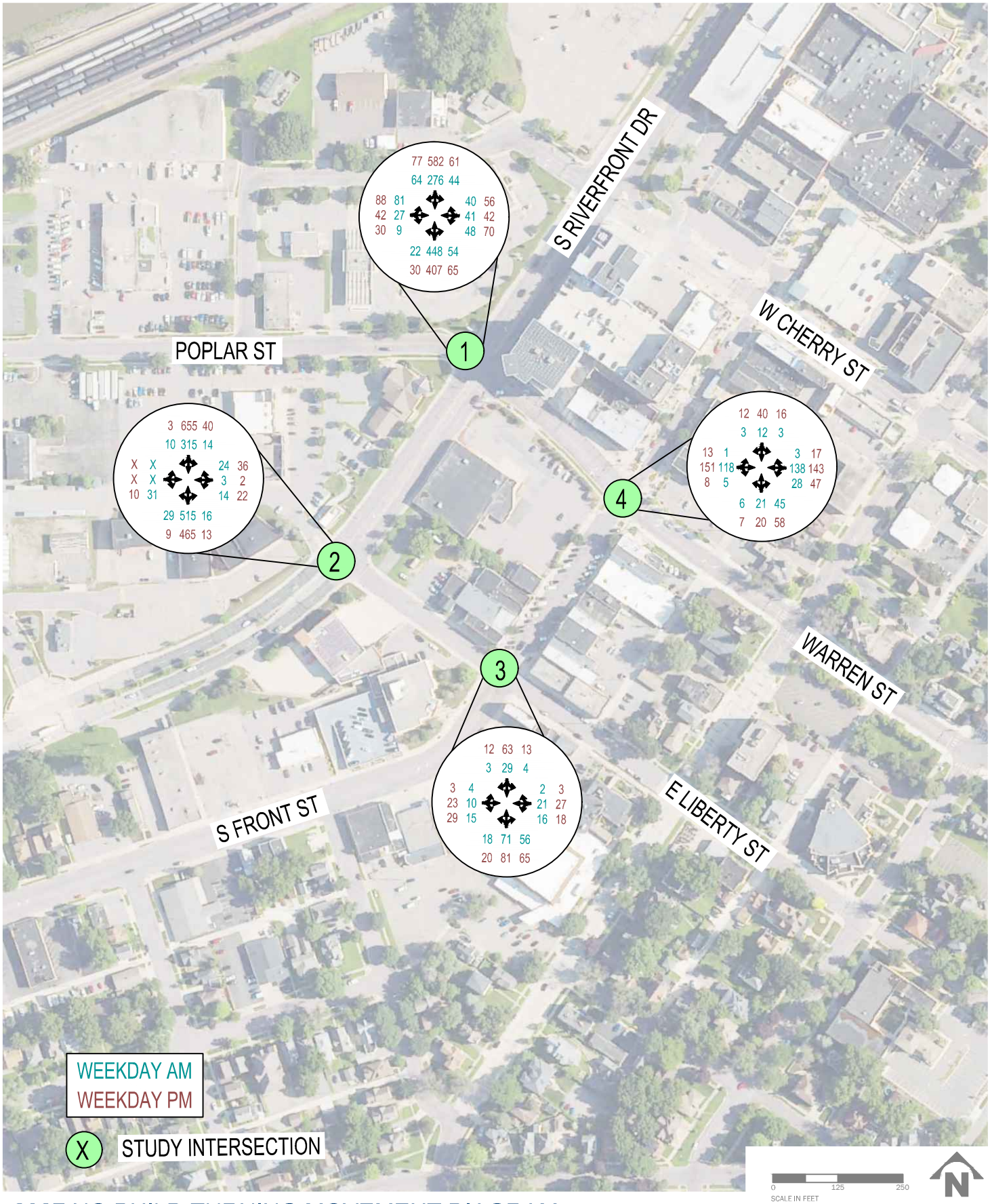
TOTAL NET NEW TRIPS ONLY TURNING MOVEMENT DIAGRAM

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Appendix J: Future Scenario Peak Hour Turning Movement Volume Diagrams

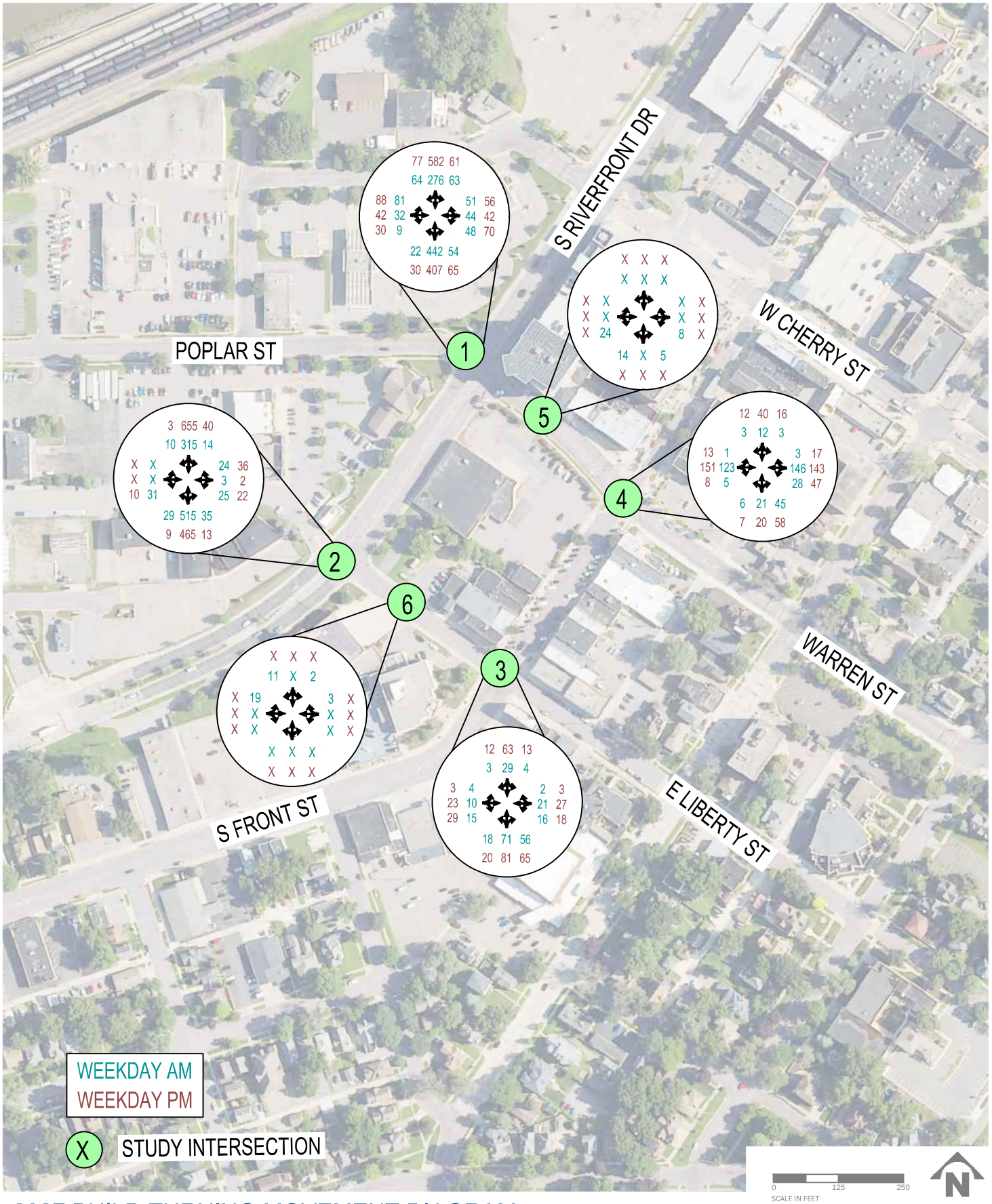


2027 NO BUILD TURNING MOVEMENT DIAGRAM

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2027 BUILD TURNING MOVEMENT DIAGRAM

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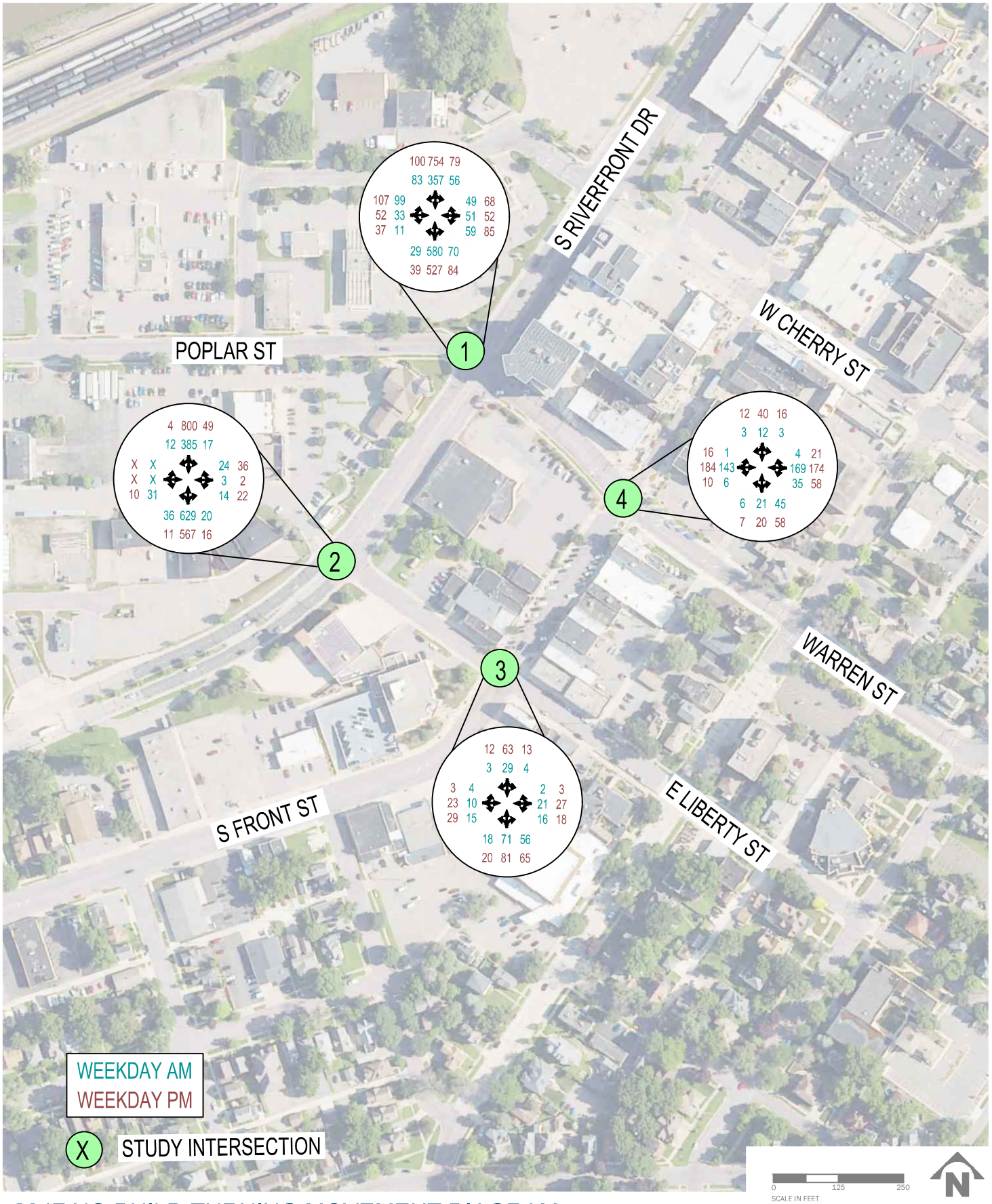
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2047 NO BUILD TURNING MOVEMENT DIAGRAM

ISG

Architecture + Engineering + Environmental + Planning

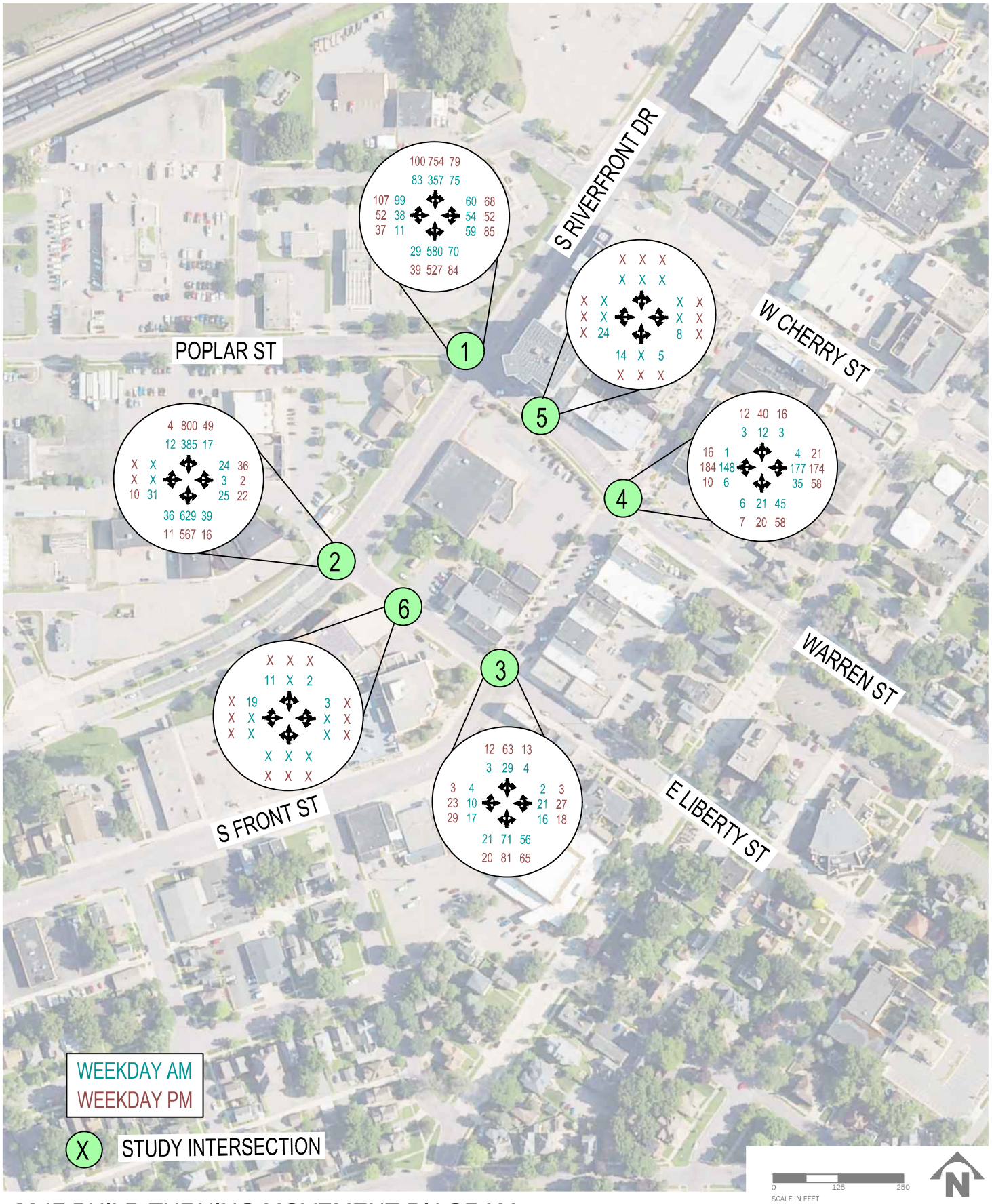
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602 SOUTH FRONT STREET

MANKATO, MINNESOTA - 10/15/2026

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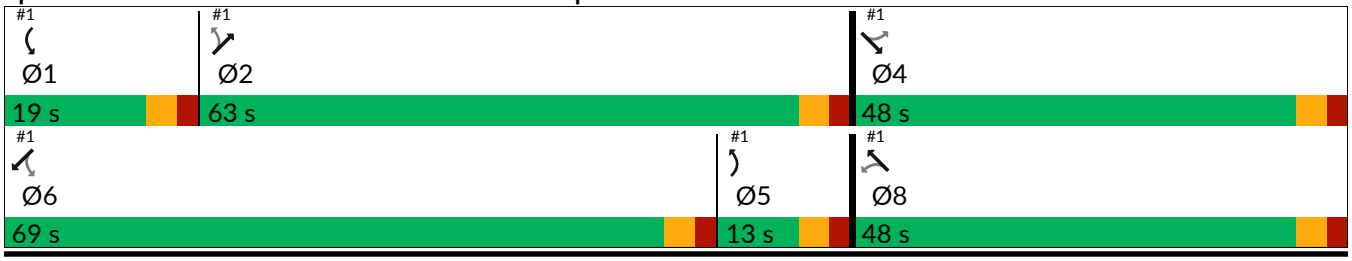
Appendix K: Opening Year No-Build (2027) Synchro Analysis Worksheets

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	81	27	9	48	41	40	22	448	54	44	276	64
Future Volume (vph)	81	27	9	48	41	40	22	448	54	44	276	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	140		0	120		0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (ft)	25		25	0		25	80		25	80		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.989			0.926			0.984			0.972	
Flt Protected		0.967		0.950			0.950			0.950		
Satd. Flow (prot)	0	1805	0	1805	1717	0	1805	3491	0	1770	3407	0
Flt Permitted		0.730		0.721			0.499			0.291		
Satd. Flow (perm)	0	1362	0	1370	1717	0	948	3491	0	542	3407	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			40			13			30	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		429			368			444			392	
Travel Time (s)		9.8			8.4			10.1			8.9	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Heavy Vehicles (%)	1%	0%	0%	0%	0%	5%	0%	1%	8%	2%	3%	3%
Adj. Flow (vph)	104	35	12	62	53	51	28	574	69	56	354	82
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	151	0	62	104	0	28	643	0	56	436	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2		1	2		1	2		1	2	
Detector Template		Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)		100		20	100		20	100		20	100	
Trailing Detector (ft)		0		0	0		0	0		0	0	
Detector 1 Position(ft)		0		0	0		0	0		0	0	
Detector 1 Size(ft)		6		20	6		20	6		20	6	
Detector 1 Type		Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		4.0	20.0		4.0	20.0	
Minimum Split (s)	25.0	25.0		25.0	25.0		9.0	25.0		9.0	25.0	
Total Split (s)	48.0	48.0		48.0	48.0		13.0	63.0		19.0	69.0	
Total Split (%)	36.9%	36.9%		36.9%	36.9%		10.0%	48.5%		14.6%	53.1%	
Maximum Green (s)	43.0	43.0		43.0	43.0		8.0	58.0		14.0	64.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag							Lag	Lag		Lead	Lead	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	4.0	4.0		4.0	4.0		3.0	4.0		3.0	4.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Flash Don't Walk (s)	16.0	16.0		16.0	16.0			16.0			16.0	
Pedestrian Calls (#/hr)	0	0		0	0			0			0	
Act Effct Green (s)		13.2		12.8	12.8		25.1	25.7		27.3	29.3	
Actuated g/C Ratio		0.27		0.26	0.26		0.51	0.52		0.55	0.59	
v/c Ratio		0.41		0.18	0.22		0.05	0.35		0.12	0.22	
Control Delay (s/veh)		22.3		19.3	13.6		13.3	12.7		11.3	9.4	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)		22.3		19.3	13.6		13.3	12.7		11.3	9.4	
LOS		C		B	B		B	B		B	A	
Approach Delay (s/veh)		22.3			15.7			12.7			9.6	
Approach LOS		C			B			B			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 49.5			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.41			
Intersection Signal Delay (s/veh): 13.0		Intersection LOS: B	
Intersection Capacity Utilization 45.6%		ICU Level of Service A	
Analysis Period (min) 15			
Description: Intersection 1			

Splits and Phases: 1: S Riverfront Dr & Warren St/Poplar St



Intersection	
Int Delay, s/veh	1.5

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	0	0	31	14	3	24	29	515	16	14	315	10
Future Vol, veh/h	0	0	31	14	3	24	29	515	16	14	315	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	95	-	-	160	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	77	77	77	77	77	77	77	77	77	77	77	77
Heavy Vehicles, %	0	0	0	0	0	0	0	2	0	7	5	0
Mvmt Flow	0	0	40	18	4	31	38	669	21	18	409	13

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	211	995	1213	345	422	0	0	690	0	0
Stage 1	-	-	-	755	755	-	-	-	-	-	-	-
Stage 2	-	-	-	241	458	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.9	7.5	6.5	6.9	4.1	-	-	4.24	-	-
Critical Hdwy Stg 1	-	-	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3	3.5	4	3.3	2.2	-	-	2.27	-	-
Pot Cap-1 Maneuver	0	0	801	202	183	657	1148	-	-	868	-	-
Stage 1	0	0	-	372	420	-	-	-	-	-	-	-
Stage 2	0	0	-	747	570	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	801	181	174	657	1148	-	-	868	-	-
Mov Cap-2 Maneuver	-	-	-	181	174	-	-	-	-	-	-	-
Stage 1	-	-	-	359	406	-	-	-	-	-	-	-
Stage 2	-	-	-	694	558	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Ctrl Dly, s/v	9.73	18.84	0.43	0.38
HCM LOS	A	C		

Minor Lane/Major Mvmt	NEL	NET	NER	NWLn1	SELn1	SWL	SWT	SWR
Capacity (veh/h)	1148	-	-	313	801	868	-	-
HCM Lane V/C Ratio	0.033	-	-	0.17	0.05	0.021	-	-
HCM Ctrl Dly (s/v)	8.2	-	-	18.8	9.7	9.2	-	-
HCM Lane LOS	A	-	-	C	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.6	0.2	0.1	-	-

Intersection	
Intersection Delay, s/veh	8.1
Intersection LOS	A

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Vol, veh/h	18	71	56	4	29	3	4	10	15	16	21	2
Future Vol, veh/h	18	71	56	4	29	3	4	10	15	16	21	2
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Heavy Vehicles, %	6	3	0	0	0	0	0	0	7	6	0	0
Mvmt Flow	26	101	80	6	41	4	6	14	21	23	30	3
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	NB	SB	SE	NW
Opposing Approach	SB	NB	NW	SE
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SE	NW	SB	NB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NW	SE	NB	SB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay, s/veh	8.3	7.6	7.5	8
HCM LOS	A	A	A	A

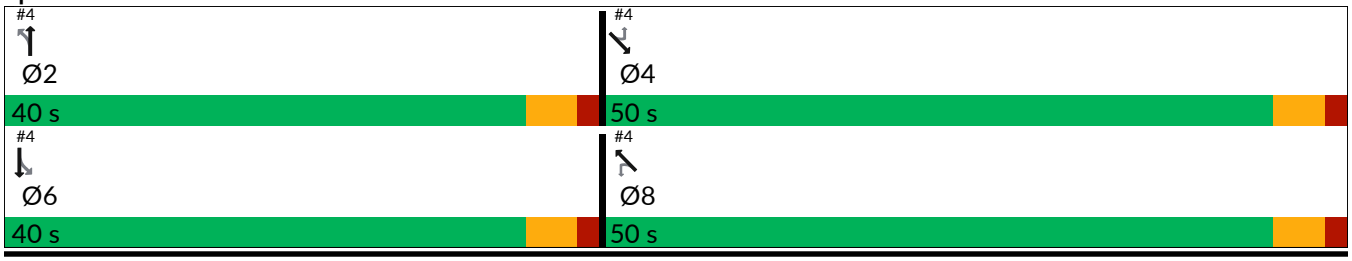
Lane	NBLn1	NWLn1	SELn1	SBLn1
Vol Left, %	12%	41%	14%	11%
Vol Thru, %	49%	54%	34%	81%
Vol Right, %	39%	5%	52%	8%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	145	39	29	36
LT Vol	18	16	4	4
Through Vol	71	21	10	29
RT Vol	56	2	15	3
Lane Flow Rate	207	56	41	51
Geometry Grp	1	1	1	1
Degree of Util (X)	0.23	0.072	0.049	0.061
Departure Headway (Hd)	4.004	4.659	4.243	4.303
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	884	773	848	836
Service Time	2.084	2.662	2.246	2.311
HCM Lane V/C Ratio	0.234	0.072	0.048	0.061
HCM Control Delay, s/veh	8.3	8	7.5	7.6
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.9	0.2	0.2	0.2

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	6	21	45	3	12	3	1	118	5	28	138	3
Future Volume (vph)	6	21	45	3	12	3	1	118	5	28	138	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	70		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25		25	25		25	0		25	50		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.915			0.975			0.994			0.996	
Flt Protected		0.996			0.991		0.950			0.950		
Satd. Flow (prot)	0	1687	0	0	1836	0	1805	1853	0	1805	1874	0
Flt Permitted		0.983			0.958		0.651			0.664		
Satd. Flow (perm)	0	1665	0	0	1775	0	1237	1853	0	1262	1874	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		54			4			3			2	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		442			459			368			421	
Travel Time (s)		10.0			10.4			8.4			9.6	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	0%	9%	0%	0%	0%	0%	0%	2%	0%	0%	1%	0%
Adj. Flow (vph)	7	25	54	4	14	4	1	140	6	33	164	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	86	0	0	22	0	1	146	0	33	168	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane											Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2			2		1	2		1	2	
Detector Template		Thru			Thru		Left	Thru		Left	Thru	
Leading Detector (ft)		100			100		20	100		20	100	
Trailing Detector (ft)		0			0		0	0		0	0	
Detector 1 Position(ft)		0			0		0	0		0	0	
Detector 1 Size(ft)		6			6		20	6		20	6	
Detector 1 Type		Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0		15.0	15.0	
Minimum Split (s)	32.0	32.0		32.0	32.0		32.0	32.0		32.0	32.0	
Total Split (s)	40.0	40.0		40.0	40.0		50.0	50.0		50.0	50.0	
Total Split (%)	44.4%	44.4%		44.4%	44.4%		55.6%	55.6%		55.6%	55.6%	
Maximum Green (s)	35.0	35.0		35.0	35.0		45.0	45.0		45.0	45.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Min	Min		Min	Min		None	None		None	None	
Walk Time (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Flash Don't Walk (s)	17.0	17.0		17.0	17.0		17.0	17.0		17.0	17.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		14.1			14.1		15.3	15.3		15.3	15.3	
Actuated g/C Ratio		0.43			0.43		0.46	0.46		0.46	0.46	
v/c Ratio		0.12			0.03		0.00	0.17		0.06	0.19	
Control Delay (s/veh)		5.7			8.5		6.0	6.8		6.3	6.9	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)		5.7			8.5		6.0	6.8		6.3	6.9	
LOS		A			A		A	A		A	A	
Approach Delay (s/veh)		5.7			8.5			6.8			6.8	
Approach LOS		A			A			A			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 33			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.19			
Intersection Signal Delay (s/veh): 6.7		Intersection LOS: A	
Intersection Capacity Utilization 39.9%		ICU Level of Service A	
Analysis Period (min) 15			
Description: Intersection 4			

Splits and Phases: 4: S Front St & Warren St



Intersection: 1: S Riverfront Dr & Warren St/Poplar St

Movement	SE	NW	NW	NE	NE	NE	SW	SW	SW
Directions Served	LTR	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	67	50	69	28	103	74	38	73	45
Average Queue (ft)	44	27	45	9	70	43	25	42	31
95th Queue (ft)	81	57	78	30	113	85	46	82	52
Link Distance (ft)	381	289	289		367	367		355	355
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)				140			120		
Storage Blk Time (%)					0			0	
Queuing Penalty (veh)					0			0	

Intersection: 2: S Riverfront Dr & W Liberty St/ Dunkin Driveway

Movement	SE	NW	NE	SW
Directions Served	R	LTR	L	L
Maximum Queue (ft)	31	31	24	18
Average Queue (ft)	16	16	10	6
95th Queue (ft)	40	40	33	25
Link Distance (ft)	238	315		
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			95	160
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: S Front St & E Liberty St/W Liberty St

Movement	NB	SB	SE	NW
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	53	35	28	35
Average Queue (ft)	36	20	17	20
95th Queue (ft)	55	46	39	45
Link Distance (ft)	598	374	315	400
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: S Front St & Warren St

Movement	NB	SB	SE	NW	NW
Directions Served	LTR	LTR	TR	L	TR
Maximum Queue (ft)	56	26	44	29	59
Average Queue (ft)	27	10	31	13	39
95th Queue (ft)	63	34	55	36	69
Link Distance (ft)	374	408	289		390
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)				70	
Storage Blk Time (%)					1
Queuing Penalty (veh)					0

Network Summary

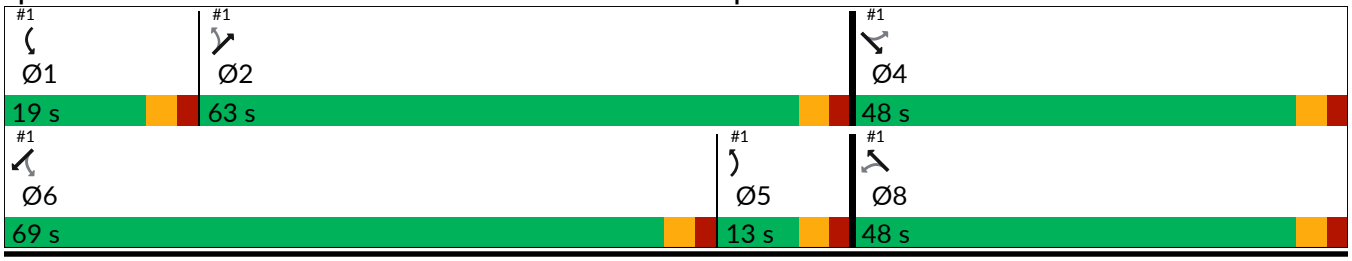
Network wide Queuing Penalty: 0

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	88	42	30	70	42	56	30	407	65	61	582	77
Future Volume (vph)	88	42	30	70	42	56	30	407	65	61	582	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	140		0	120		0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (ft)	25		25	0		25	80		25	80		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.975			0.914			0.979			0.983	
Flt Protected		0.973		0.950			0.950			0.950		
Satd. Flow (prot)	0	1793	0	1805	1737	0	1805	3490	0	1752	3518	0
Flt Permitted		0.773		0.698			0.393			0.353		
Satd. Flow (perm)	0	1424	0	1326	1737	0	747	3490	0	651	3518	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			56			18			16	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		429			368			444			405	
Travel Time (s)		9.8			8.4			10.1			9.2	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	0%	1%	3%	3%	1%	0%
Adj. Flow (vph)	91	43	31	72	43	58	31	420	67	63	600	79
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	165	0	72	101	0	31	487	0	63	679	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2		1	2		1	2		1	2	
Detector Template		Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)		100		20	100		20	100		20	100	
Trailing Detector (ft)		0		0	0		0	0		0	0	
Detector 1 Position(ft)		0		0	0		0	0		0	0	
Detector 1 Size(ft)		6		20	6		20	6		20	6	
Detector 1 Type		Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		4.0	20.0		4.0	20.0	
Minimum Split (s)	25.0	25.0		25.0	25.0		9.0	25.0		9.0	25.0	
Total Split (s)	48.0	48.0		48.0	48.0		13.0	63.0		19.0	69.0	
Total Split (%)	36.9%	36.9%		36.9%	36.9%		10.0%	48.5%		14.6%	53.1%	
Maximum Green (s)	43.0	43.0		43.0	43.0		8.0	58.0		14.0	64.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag							Lag	Lag		Lead	Lead	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	4.0	4.0		4.0	4.0		3.0	4.0		3.0	4.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Flash Don't Walk (s)	16.0	16.0		16.0	16.0			16.0			16.0	
Pedestrian Calls (#/hr)	0	0		0	0			0			0	
Act Effct Green (s)		12.5		12.5	12.5		24.2	21.4		24.4	24.4	
Actuated g/C Ratio		0.25		0.25	0.25		0.48	0.42		0.48	0.48	
v/c Ratio		0.46		0.22	0.22		0.07	0.33		0.14	0.40	
Control Delay (s/veh)		21.8		19.1	10.8		13.7	12.5		10.6	10.7	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)		21.8		19.1	10.8		13.7	12.5		10.6	10.7	
LOS		C		B	B		B	B		B	B	
Approach Delay (s/veh)		21.8			14.3			12.6			10.7	
Approach LOS		C			B			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 50.9			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.46			
Intersection Signal Delay (s/veh): 12.9		Intersection LOS: B	
Intersection Capacity Utilization 50.0%		ICU Level of Service A	
Analysis Period (min) 15			
Description: Intersection 1			

Splits and Phases: 1: S Riverfront Dr/S Riverfront St & Warren St/Poplar St



Intersection	
Int Delay, s/veh	1.2

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	0	0	10	22	2	36	9	465	13	40	655	3
Future Vol, veh/h	0	0	10	22	2	36	9	465	13	40	655	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	95	-	-	160	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	0	0	0	0	2	0	0	1	0
Mvmt Flow	0	0	10	23	2	37	9	479	13	41	675	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	339	925	1265	246	678	0	0	493	0	0
Stage 1	-	-	-	505	505	-	-	-	-	-	-	-
Stage 2	-	-	-	420	761	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.9	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	-	-	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	0	0	663	227	171	760	923	-	-	1081	-	-
Stage 1	0	0	-	523	544	-	-	-	-	-	-	-
Stage 2	0	0	-	587	417	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	663	213	162	760	923	-	-	1081	-	-
Mov Cap-2 Maneuver	-	-	-	213	162	-	-	-	-	-	-	-
Stage 1	-	-	-	518	538	-	-	-	-	-	-	-
Stage 2	-	-	-	556	401	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Ctrl Dly, s/v	10.52	16.75	0.17	0.48
HCM LOS	B	C		

Minor Lane/Major Mvmt	NEL	NET	NER	NWLn1	SELn1	SWL	SWT	SWR
Capacity (veh/h)	923	-	-	368	663	1081	-	-
HCM Lane V/C Ratio	0.01	-	-	0.168	0.016	0.038	-	-
HCM Ctrl Dly (s/v)	8.9	-	-	16.7	10.5	8.5	-	-
HCM Lane LOS	A	-	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.6	0	0.1	-	-

Intersection	
Intersection Delay, s/veh	8.1
Intersection LOS	A

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Vol, veh/h	20	81	65	13	63	12	3	23	29	18	27	3
Future Vol, veh/h	20	81	65	13	63	12	3	23	29	18	27	3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	5	2	0	0	3	0	0	0	0	0	0	0
Mvmt Flow	22	90	72	14	70	13	3	26	32	20	30	3
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	NB	SB	SE	NW
Opposing Approach	SB	NB	NW	SE
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SE	NW	SB	NB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NW	SE	NB	SB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay, s/veh	8.3	7.9	7.6	8
HCM LOS	A	A	A	A

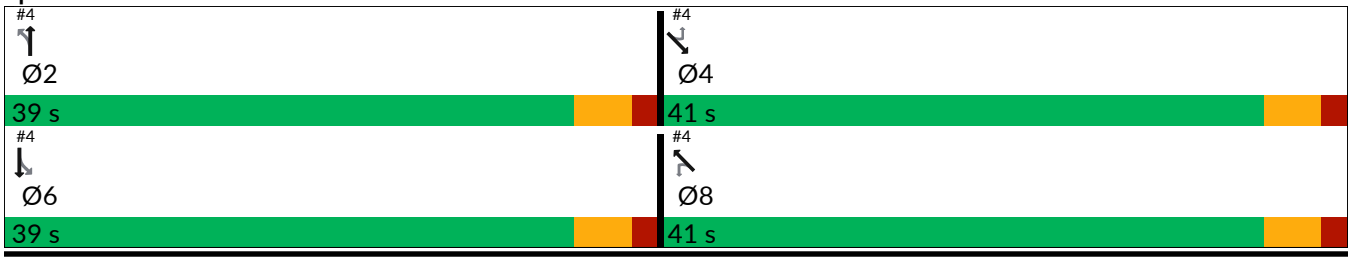
Lane	NBLn1	NWLn1	SELn1	SBLn1
Vol Left, %	12%	38%	5%	15%
Vol Thru, %	49%	56%	42%	72%
Vol Right, %	39%	6%	53%	14%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	166	48	55	88
LT Vol	20	18	3	13
Through Vol	81	27	23	63
RT Vol	65	3	29	12
Lane Flow Rate	184	53	61	98
Geometry Grp	1	1	1	1
Degree of Util (X)	0.213	0.068	0.073	0.117
Departure Headway (Hd)	4.152	4.62	4.271	4.296
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	871	777	840	836
Service Time	2.152	2.64	2.29	2.312
HCM Lane V/C Ratio	0.211	0.068	0.073	0.117
HCM Control Delay, s/veh	8.3	8	7.6	7.9
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.8	0.2	0.2	0.4

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	7	20	58	16	40	12	13	151	8	47	143	17
Future Volume (vph)	7	20	58	16	40	12	13	151	8	47	143	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		0	70		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25		25	25		25	0		25	50		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.908			0.977			0.992			0.984	
Flt Protected		0.996			0.988		0.950			0.950		
Satd. Flow (prot)	0	1679	0	0	1834	0	1805	1867	0	1736	1870	0
Flt Permitted		0.978			0.928		0.645			0.646		
Satd. Flow (perm)	0	1649	0	0	1723	0	1226	1867	0	1180	1870	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		64			13			4			10	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		442			459			368			421	
Travel Time (s)		10.0			10.4			8.4			9.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	10%	0%	0%	0%	0%	0%	1%	0%	4%	0%	0%
Adj. Flow (vph)	8	22	64	18	44	13	14	168	9	52	159	19
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	94	0	0	75	0	14	177	0	52	178	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane											Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2			2		1	2		1	2	
Detector Template		Thru			Thru		Left	Thru		Left	Thru	
Leading Detector (ft)		100			100		20	100		20	100	
Trailing Detector (ft)		0			0		0	0		0	0	
Detector 1 Position(ft)		0			0		0	0		0	0	
Detector 1 Size(ft)		6			6		20	6		20	6	
Detector 1 Type		Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0		15.0	15.0	
Minimum Split (s)	32.0	32.0		32.0	32.0		32.0	32.0		32.0	32.0	
Total Split (s)	39.0	39.0		39.0	39.0		41.0	41.0		41.0	41.0	
Total Split (%)	48.8%	48.8%		48.8%	48.8%		51.3%	51.3%		51.3%	51.3%	
Maximum Green (s)	34.0	34.0		34.0	34.0		36.0	36.0		36.0	36.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Min	Min		Min	Min		None	None		None	None	
Walk Time (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Flash Don't Walk (s)	17.0	17.0		17.0	17.0		17.0	17.0		17.0	17.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		13.9			13.9		15.5	15.5		15.5	15.5	
Actuated g/C Ratio		0.43			0.43		0.48	0.48		0.48	0.48	
v/c Ratio		0.13			0.10		0.02	0.20		0.09	0.20	
Control Delay (s/veh)		5.3			8.6		6.0	6.9		6.6	6.7	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)		5.3			8.6		6.0	6.9		6.6	6.7	
LOS		A			A		A	A		A	A	
Approach Delay (s/veh)		5.3			8.6			6.8			6.6	
Approach LOS		A			A			A			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 32.5			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.20			
Intersection Signal Delay (s/veh): 6.7		Intersection LOS: A	
Intersection Capacity Utilization 45.8%		ICU Level of Service A	
Analysis Period (min) 15			
Description: Intersection 4			

Splits and Phases: 4: S Front St & Warren St



Intersection: 1: S Riverfront Dr/S Riverfront St & Warren St/Poplar St

Movement	SE	NW	NW	NE	NE	NE	SW	SW	SW
Directions Served	LTR	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	98	55	60	33	94	60	34	150	81
Average Queue (ft)	62	31	38	15	60	37	22	93	45
95th Queue (ft)	108	64	71	39	98	64	47	157	91
Link Distance (ft)	381	289	289		367	367		369	369
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)				140			120		
Storage Blk Time (%)								3	
Queuing Penalty (veh)								2	

Intersection: 2: S Riverfront Dr & W Liberty St/ Dunkin Driveway

Movement	SE	NW	NE	SW
Directions Served	R	LTR	L	L
Maximum Queue (ft)	24	35	21	29
Average Queue (ft)	7	23	5	10
95th Queue (ft)	28	47	26	34
Link Distance (ft)	238	315		
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			95	160
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: S Front St & E Liberty St/W Liberty St

Movement	NB	SB	SE	NW
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	45	41	37	30
Average Queue (ft)	38	29	27	25
95th Queue (ft)	55	50	44	43
Link Distance (ft)	598	374	315	400
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: S Front St & Warren St

Movement	NB	SB	SE	SE	NW	NW
Directions Served	LTR	LTR	L	TR	L	TR
Maximum Queue (ft)	30	59	17	53	30	62
Average Queue (ft)	22	34	6	32	15	36
95th Queue (ft)	43	68	24	68	39	73
Link Distance (ft)	374	408	289	289		390
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)					70	
Storage Blk Time (%)						1
Queuing Penalty (veh)						0

Network Summary

Network wide Queuing Penalty: 2

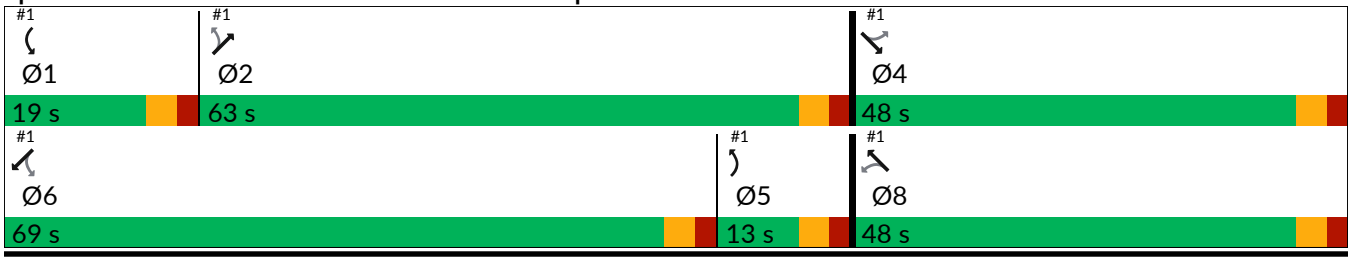
Appendix L: Opening Year Build (2027) Synchro Analysis Worksheets

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	81	32	9	48	44	51	22	448	54	63	276	64
Future Volume (vph)	81	32	9	48	44	51	22	448	54	63	276	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	140		0	120		0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (ft)	25		25	0		25	80		25	80		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.990			0.919			0.984			0.972	
Flt Protected		0.968		0.950			0.950			0.950		
Satd. Flow (prot)	0	1809	0	1805	1700	0	1805	3491	0	1770	3407	0
Flt Permitted		0.728		0.703			0.499			0.287		
Satd. Flow (perm)	0	1360	0	1336	1700	0	948	3491	0	535	3407	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			48			13			30	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		429			160			444			414	
Travel Time (s)		9.8			3.6			10.1			9.4	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	0%	0%	0%	0%	5%	0%	1%	8%	2%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	104	41	12	62	56	65	28	574	69	81	354	82
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	157	0	62	121	0	28	643	0	81	436	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2		1	2		1	2		1	2	
Detector Template		Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)		100		20	100		20	100		20	100	
Trailing Detector (ft)		0		0	0		0	0		0	0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Minimum Initial (s)	7.0	7.0		7.0	7.0		4.0	20.0		4.0	20.0	
Minimum Split (s)	25.0	25.0		25.0	25.0		9.0	25.0		9.0	25.0	
Total Split (s)	48.0	48.0		48.0	48.0		13.0	63.0		19.0	69.0	
Total Split (%)	36.9%	36.9%		36.9%	36.9%		10.0%	48.5%		14.6%	53.1%	
Maximum Green (s)	43.0	43.0		43.0	43.0		8.0	58.0		14.0	64.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag							Lag	Lag		Lead	Lead	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	4.0	4.0		4.0	4.0		3.0	4.0		3.0	4.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Flash Don't Walk (s)	16.0	16.0		16.0	16.0			16.0			16.0	
Pedestrian Calls (#/hr)	0	0		0	0			0			0	
Act Effct Green (s)		13.8		13.3	13.3		24.1	26.2		30.4	32.6	
Actuated g/C Ratio		0.26		0.25	0.25		0.45	0.49		0.57	0.61	
v/c Ratio		0.44		0.19	0.26		0.05	0.37		0.16	0.21	
Control Delay (s/veh)		24.3		20.4	14.3		14.2	14.4		11.8	9.6	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)		24.3		20.4	14.3		14.2	14.4		11.8	9.6	
LOS		C		C	B		B	B		B	A	
Approach Delay (s/veh)		24.3			16.4			14.3			9.9	
Approach LOS		C			B			B			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 53.2			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.44			
Intersection Signal Delay (s/veh): 14.1		Intersection LOS: B	
Intersection Capacity Utilization 46.0%		ICU Level of Service A	
Analysis Period (min) 15			
Description: Intersection 1			

Splits and Phases: 1: S Riverfront Dr & Warren St/Poplar St



Intersection	
Int Delay, s/veh	1.9

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	0	0	31	25	3	24	29	515	35	14	315	10
Future Vol, veh/h	0	0	31	25	3	24	29	515	35	14	315	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	95	-	-	160	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	77	77	77	77	77	77	77	77	77	77	77	77
Heavy Vehicles, %	0	0	0	0	0	0	0	2	0	7	5	0
Mvmt Flow	0	0	40	32	4	31	38	669	45	18	409	13

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	211	1008	1225	357	422	0	0	714	0	0
Stage 1	-	-	-	767	767	-	-	-	-	-	-	-
Stage 2	-	-	-	241	458	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.9	7.5	6.5	6.9	4.1	-	-	4.24	-	-
Critical Hdwy Stg 1	-	-	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3	3.5	4	3.3	2.2	-	-	2.27	-	-
Pot Cap-1 Maneuver	0	0	801	198	180	645	1148	-	-	849	-	-
Stage 1	0	0	-	365	414	-	-	-	-	-	-	-
Stage 2	0	0	-	747	570	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	801	178	171	645	1148	-	-	849	-	-
Mov Cap-2 Maneuver	-	-	-	178	171	-	-	-	-	-	-	-
Stage 1	-	-	-	353	401	-	-	-	-	-	-	-
Stage 2	-	-	-	694	558	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Ctrl Dly, s/v	9.73	23.08	0.41	0.39
HCM LOS	A	C		

Minor Lane/Major Mvmt	NEL	NET	NER	NWLn1	SELn1	SWL	SWT	SWR
Capacity (veh/h)	1148	-	-	266	801	849	-	-
HCM Lane V/C Ratio	0.033	-	-	0.254	0.05	0.021	-	-
HCM Ctrl Dly (s/v)	8.2	-	-	23.1	9.7	9.3	-	-
HCM Lane LOS	A	-	-	C	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	1	0.2	0.1	-	-

Intersection	
Intersection Delay, s/veh	8.1
Intersection LOS	A

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Vol, veh/h	21	71	56	4	29	3	4	10	17	16	21	2
Future Vol, veh/h	21	71	56	4	29	3	4	10	17	16	21	2
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Heavy Vehicles, %	6	3	0	0	0	0	0	0	7	6	0	0
Mvmt Flow	30	101	80	6	41	4	6	14	24	23	30	3
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	NB	SB	SE	NW
Opposing Approach	SB	NB	NW	SE
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SE	NW	SB	NB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NW	SE	NB	SB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay, s/veh	8.4	7.6	7.5	8
HCM LOS	A	A	A	A

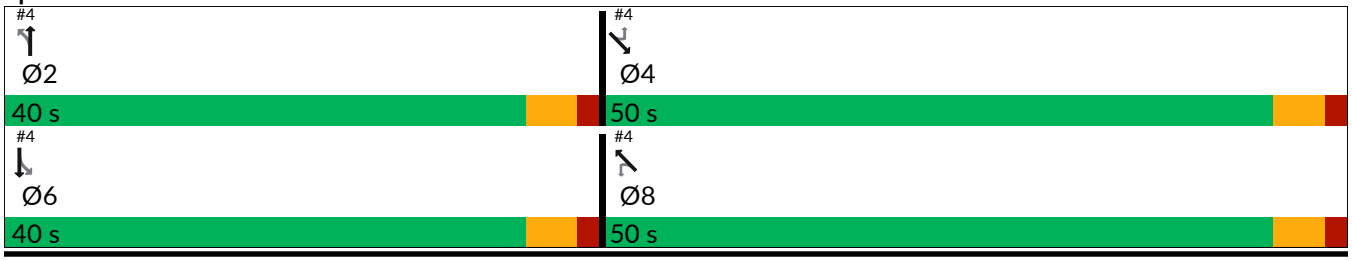
Lane	NBLn1	NWLn1	SELn1	SBLn1
Vol Left, %	14%	41%	13%	11%
Vol Thru, %	48%	54%	32%	81%
Vol Right, %	38%	5%	55%	8%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	148	39	31	36
LT Vol	21	16	4	4
Through Vol	71	21	10	29
RT Vol	56	2	17	3
Lane Flow Rate	211	56	44	51
Geometry Grp	1	1	1	1
Degree of Util (X)	0.236	0.072	0.052	0.062
Departure Headway (Hd)	4.016	4.673	4.234	4.314
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	882	770	850	834
Service Time	2.099	2.679	2.239	2.323
HCM Lane V/C Ratio	0.239	0.073	0.052	0.061
HCM Control Delay, s/veh	8.4	8	7.5	7.6
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.9	0.2	0.2	0.2

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	6	21	45	3	12	3	1	123	5	28	146	3
Future Volume (vph)	6	21	45	3	12	3	1	123	5	28	146	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	70		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25		25	25		25	0		25	50		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.915			0.975			0.994			0.997	
Flt Protected		0.996			0.991		0.950			0.950		
Satd. Flow (prot)	0	1687	0	0	1836	0	1805	1853	0	1805	1876	0
Flt Permitted		0.983			0.958		0.645			0.660		
Satd. Flow (perm)	0	1665	0	0	1775	0	1226	1853	0	1254	1876	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		54			4			3			2	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		442			459			209			421	
Travel Time (s)		10.0			10.4			4.8			9.6	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	9%	0%	0%	0%	0%	0%	2%	0%	0%	1%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	7	25	54	4	14	4	1	146	6	33	174	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	86	0	0	22	0	1	152	0	33	178	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane											Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2			2		1	2		1	2	
Detector Template		Thru			Thru		Left	Thru		Left	Thru	
Leading Detector (ft)		100			100		20	100		20	100	
Trailing Detector (ft)		0			0		0	0		0	0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0		15.0	15.0	
Minimum Split (s)	32.0	32.0		32.0	32.0		32.0	32.0		32.0	32.0	
Total Split (s)	40.0	40.0		40.0	40.0		50.0	50.0		50.0	50.0	
Total Split (%)	44.4%	44.4%		44.4%	44.4%		55.6%	55.6%		55.6%	55.6%	
Maximum Green (s)	35.0	35.0		35.0	35.0		45.0	45.0		45.0	45.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	Min	Min		Min	Min		None	None		None	None	
Walk Time (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Flash Don't Walk (s)	17.0	17.0		17.0	17.0		17.0	17.0		17.0	17.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		14.0			14.0		15.4	15.4		15.4	15.4	
Actuated g/C Ratio		0.43			0.43		0.47	0.47		0.47	0.47	
v/c Ratio		0.12			0.03		0.00	0.17		0.06	0.20	
Control Delay (s/veh)		5.7			8.5		6.0	6.8		6.3	6.9	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)		5.7			8.5		6.0	6.8		6.3	6.9	
LOS		A			A		A	A		A	A	
Approach Delay (s/veh)		5.7			8.5			6.8			6.8	
Approach LOS		A			A			A			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 32.6			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.20			
Intersection Signal Delay (s/veh): 6.7		Intersection LOS: A	
Intersection Capacity Utilization 39.9%		ICU Level of Service A	
Analysis Period (min) 15			
Description: Intersection 4			

Splits and Phases: 4: S Front St & Warren St



Intersection: 1: S Riverfront Dr & Warren St/Poplar St

Movement	SE	NW	NW	NE	NE	NE	SW	SW	SW
Directions Served	LTR	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	84	52	54	19	91	61	47	56	57
Average Queue (ft)	46	30	39	5	63	38	27	35	29
95th Queue (ft)	91	64	62	21	104	74	52	68	62
Link Distance (ft)	381	77	77		368	368		378	378
Upstream Blk Time (%)		2							
Queuing Penalty (veh)		1							
Storage Bay Dist (ft)				140			120		
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 2: S Riverfront Dr & W Liberty St/ Dunkin Driveway

Movement	SE	NW	NE	SW
Directions Served	R	LTR	L	L
Maximum Queue (ft)	31	41	30	12
Average Queue (ft)	22	26	10	2
95th Queue (ft)	44	51	34	16
Link Distance (ft)	238	63		
Upstream Blk Time (%)		1		
Queuing Penalty (veh)		0		
Storage Bay Dist (ft)			95	160
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: S Front St & E Liberty St/W Liberty St

Movement	NB	SB	SE	NW
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	60	30	28	30
Average Queue (ft)	39	19	12	20
95th Queue (ft)	60	43	35	43
Link Distance (ft)	598	374	194	400
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: S Front St & Warren St

Movement	NB	SB	SE	SE	NW	NW
Directions Served	LTR	LTR	L	TR	L	TR
Maximum Queue (ft)	35	21	5	57	29	66
Average Queue (ft)	24	9	1	30	10	33
95th Queue (ft)	46	29	9	60	34	69
Link Distance (ft)	374	408	155	155		390
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)					70	
Storage Blk Time (%)						1
Queuing Penalty (veh)						0

Intersection: 14: Development Access 1 & Warren St

Movement	NE
Directions Served	LR
Maximum Queue (ft)	35
Average Queue (ft)	17
95th Queue (ft)	44
Link Distance (ft)	108
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 15: W Liberty St & Development Access 2

Movement	NW	SW
Directions Served	TR	LR
Maximum Queue (ft)	14	24
Average Queue (ft)	3	8
95th Queue (ft)	25	30
Link Distance (ft)	194	125
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

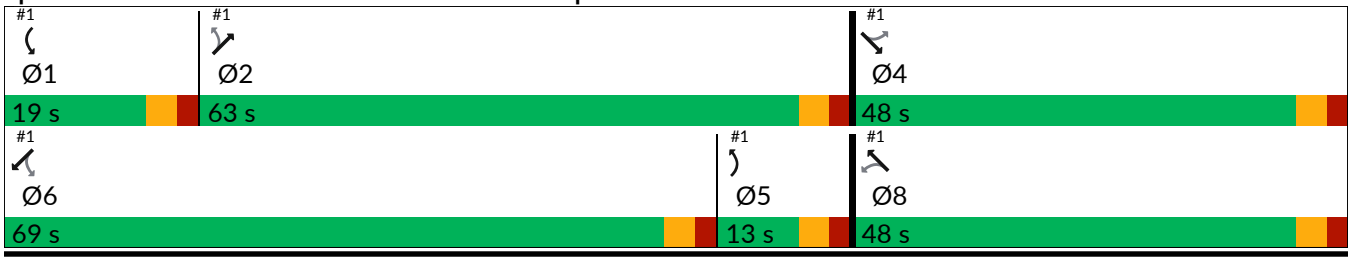
Network wide Queuing Penalty: 2

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	88	42	30	70	42	56	30	407	65	61	582	77
Future Volume (vph)	88	42	30	70	42	56	30	407	65	61	582	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	140		0	120		0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (ft)	25		25	0		25	80		25	80		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.975			0.914			0.979			0.983	
Flt Protected		0.973		0.950			0.950			0.950		
Satd. Flow (prot)	0	1793	0	1805	1737	0	1752	3504	0	1805	3505	0
Flt Permitted		0.773		0.698			0.393			0.353		
Satd. Flow (perm)	0	1424	0	1326	1737	0	725	3504	0	671	3505	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			56			18			16	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		429			160			444			414	
Travel Time (s)		9.8			3.6			10.1			9.4	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	3%	1%	0%	0%	1%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	91	43	31	72	43	58	31	420	67	63	600	79
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	165	0	72	101	0	31	487	0	63	679	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2		1	2		1	2		1	2	
Detector Template		Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)		100		20	100		20	100		20	100	
Trailing Detector (ft)		0		0	0		0	0		0	0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Minimum Initial (s)	7.0	7.0		7.0	7.0		4.0	20.0		4.0	20.0	
Minimum Split (s)	25.0	25.0		25.0	25.0		9.0	25.0		9.0	25.0	
Total Split (s)	48.0	48.0		48.0	48.0		13.0	63.0		19.0	69.0	
Total Split (%)	36.9%	36.9%		36.9%	36.9%		10.0%	48.5%		14.6%	53.1%	
Maximum Green (s)	43.0	43.0		43.0	43.0		8.0	58.0		14.0	64.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag							Lag	Lag		Lead	Lead	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	4.0	4.0		4.0	4.0		3.0	4.0		3.0	4.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Flash Don't Walk (s)	16.0	16.0		16.0	16.0			16.0			16.0	
Pedestrian Calls (#/hr)	0	0		0	0			0			0	
Act Effct Green (s)		12.5		12.5	12.5		24.2	21.4		24.5	24.5	
Actuated g/C Ratio		0.25		0.25	0.25		0.48	0.42		0.48	0.48	
v/c Ratio		0.46		0.22	0.22		0.07	0.33		0.13	0.40	
Control Delay (s/veh)		21.8		19.2	10.9		13.7	12.4		10.5	10.7	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)		21.8		19.2	10.9		13.7	12.4		10.5	10.7	
LOS		C		B	B		B	B		B	B	
Approach Delay (s/veh)		21.8			14.3			12.5			10.7	
Approach LOS		C			B			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 50.9			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.46			
Intersection Signal Delay (s/veh): 12.8		Intersection LOS: B	
Intersection Capacity Utilization 50.0%		ICU Level of Service A	
Analysis Period (min) 15			
Description: Intersection 1			

Splits and Phases: 1: S Riverfront Dr & Warren St/Poplar St



Intersection	
Int Delay, s/veh	1.2

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	0	0	10	22	2	36	9	465	13	40	655	3
Future Vol, veh/h	0	0	10	22	2	36	9	465	13	40	655	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	95	-	-	160	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	0	0	0	0	2	0	0	1	0
Mvmt Flow	0	0	10	23	2	37	9	479	13	41	675	3

Major/Minor	Minor2		Minor1			Major1				Major2		
Conflicting Flow All	-	-	339	925	1265	246	678	0	0	493	0	0
Stage 1	-	-	-	505	505	-	-	-	-	-	-	-
Stage 2	-	-	-	420	761	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.9	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	-	-	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	0	0	663	227	171	760	923	-	-	1081	-	-
Stage 1	0	0	-	523	544	-	-	-	-	-	-	-
Stage 2	0	0	-	587	417	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	663	213	162	760	923	-	-	1081	-	-
Mov Cap-2 Maneuver	-	-	-	213	162	-	-	-	-	-	-	-
Stage 1	-	-	-	518	538	-	-	-	-	-	-	-
Stage 2	-	-	-	556	401	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Ctrl Dly, s/v	10.52	16.75	0.17	0.48
HCM LOS	B	C		

Minor Lane/Major Mvmt	NEL	NET	NER	NWLn1	SELn1	SWL	SWT	SWR
Capacity (veh/h)	923	-	-	368	663	1081	-	-
HCM Lane V/C Ratio	0.01	-	-	0.168	0.016	0.038	-	-
HCM Ctrl Dly (s/v)	8.9	-	-	16.7	10.5	8.5	-	-
HCM Lane LOS	A	-	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.6	0	0.1	-	-

Intersection	
Intersection Delay, s/veh	8.1
Intersection LOS	A

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Vol, veh/h	20	81	65	13	63	12	3	23	29	18	27	3
Future Vol, veh/h	20	81	65	13	63	12	3	23	29	18	27	3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	5	2	0	0	3	0	0	0	0	5	2	0
Mvmt Flow	22	90	72	14	70	13	3	26	32	20	30	3
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	NB	SB	SE	NW
Opposing Approach	SB	NB	NW	SE
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SE	NW	SB	NB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NW	SE	NB	SB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay, s/veh	8.3	7.9	7.6	8.1
HCM LOS	A	A	A	A

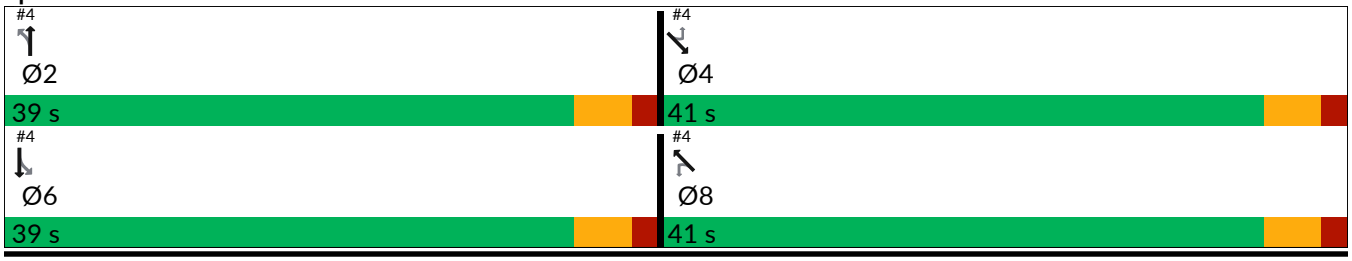
Lane	NBLn1	NWLn1	SELn1	SBLn1
Vol Left, %	12%	38%	5%	15%
Vol Thru, %	49%	56%	42%	72%
Vol Right, %	39%	6%	53%	14%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	166	48	55	88
LT Vol	20	18	3	13
Through Vol	81	27	23	63
RT Vol	65	3	29	12
Lane Flow Rate	184	53	61	98
Geometry Grp	1	1	1	1
Degree of Util (X)	0.213	0.07	0.073	0.117
Departure Headway (Hd)	4.156	4.706	4.273	4.3
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	869	763	840	836
Service Time	2.156	2.726	2.292	2.316
HCM Lane V/C Ratio	0.212	0.069	0.073	0.117
HCM Control Delay, s/veh	8.3	8.1	7.6	7.9
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.8	0.2	0.2	0.4

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	7	20	58	16	40	12	13	151	8	47	143	17
Future Volume (vph)	7	20	58	16	40	12	13	151	8	47	143	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	70		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25		25	25		25	0		25	50		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.908			0.977			0.992			0.984	
Flt Protected		0.996			0.988		0.950			0.950		
Satd. Flow (prot)	0	1679	0	0	1834	0	1805	1867	0	1736	1870	0
Flt Permitted		0.978			0.928		0.645			0.646		
Satd. Flow (perm)	0	1649	0	0	1723	0	1226	1867	0	1180	1870	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		64			13			4			10	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		442			459			209			421	
Travel Time (s)		10.0			10.4			4.8			9.6	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	10%	0%	0%	0%	0%	0%	1%	0%	4%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	8	22	64	18	44	13	14	168	9	52	159	19
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	94	0	0	75	0	14	177	0	52	178	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane											Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2			2		1	2		1	2	
Detector Template		Thru			Thru		Left	Thru		Left	Thru	
Leading Detector (ft)		100			100		20	100		20	100	
Trailing Detector (ft)		0			0		0	0		0	0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0		15.0	15.0	
Minimum Split (s)	32.0	32.0		32.0	32.0		32.0	32.0		32.0	32.0	
Total Split (s)	39.0	39.0		39.0	39.0		41.0	41.0		41.0	41.0	
Total Split (%)	48.8%	48.8%		48.8%	48.8%		51.3%	51.3%		51.3%	51.3%	
Maximum Green (s)	34.0	34.0		34.0	34.0		36.0	36.0		36.0	36.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	Min	Min		Min	Min		None	None		None	None	
Walk Time (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Flash Don't Walk (s)	17.0	17.0		17.0	17.0		17.0	17.0		17.0	17.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		13.9			13.9		15.5	15.5		15.5	15.5	
Actuated g/C Ratio		0.43			0.43		0.48	0.48		0.48	0.48	
v/c Ratio		0.13			0.10		0.02	0.20		0.09	0.20	
Control Delay (s/veh)		5.3			8.6		6.0	6.9		6.6	6.7	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)		5.3			8.6		6.0	6.9		6.6	6.7	
LOS		A			A		A	A		A	A	
Approach Delay (s/veh)		5.3			8.6			6.8			6.6	
Approach LOS		A			A			A			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 32.5			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.20			
Intersection Signal Delay (s/veh): 6.7		Intersection LOS: A	
Intersection Capacity Utilization 45.8%		ICU Level of Service A	
Analysis Period (min) 15			
Description: Intersection 4			

Splits and Phases: 4: S Front St & Warren St



Intersection: 1: S Riverfront Dr & Warren St/Poplar St

Movement	SE	NW	NW	NE	NE	NE	SW	SW	SW
Directions Served	LTR	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	120	73	71	33	78	74	39	128	76
Average Queue (ft)	71	46	44	19	55	42	29	87	45
95th Queue (ft)	134	92	83	43	95	82	51	148	83
Link Distance (ft)	381	77	77		368	368		378	378
Upstream Blk Time (%)		5	2						
Queuing Penalty (veh)		4	2						
Storage Bay Dist (ft)				140			120		
Storage Blk Time (%)								2	
Queuing Penalty (veh)								1	

Intersection: 2: S Riverfront Dr & W Liberty St/ Dunkin Driveway

Movement	SE	NW	NE	SW
Directions Served	R	LTR	L	L
Maximum Queue (ft)	19	35	6	30
Average Queue (ft)	11	23	1	12
95th Queue (ft)	34	47	10	35
Link Distance (ft)	238	63		
Upstream Blk Time (%)		0		
Queuing Penalty (veh)		0		
Storage Bay Dist (ft)			95	160
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: S Front St & E Liberty St/W Liberty St

Movement	NB	SB	SE	NW
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	69	36	32	44
Average Queue (ft)	44	30	23	26
95th Queue (ft)	71	43	43	55
Link Distance (ft)	598	374	194	400
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: S Front St & Warren St

Movement	NB	SB	SE	SE	NW	NW
Directions Served	LTR	LTR	L	TR	L	TR
Maximum Queue (ft)	68	53	16	56	34	76
Average Queue (ft)	34	27	5	31	19	45
95th Queue (ft)	74	62	23	63	44	87
Link Distance (ft)	374	408	155	155		390
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)					70	
Storage Blk Time (%)						1
Queuing Penalty (veh)						1

Intersection: 14: Development Access 1 & Warren St

Movement	NW	NW
Directions Served	LT	T
Maximum Queue (ft)	6	17
Average Queue (ft)	2	3
95th Queue (ft)	16	23
Link Distance (ft)	155	155
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 15: W Liberty St & Development Access 2

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 8

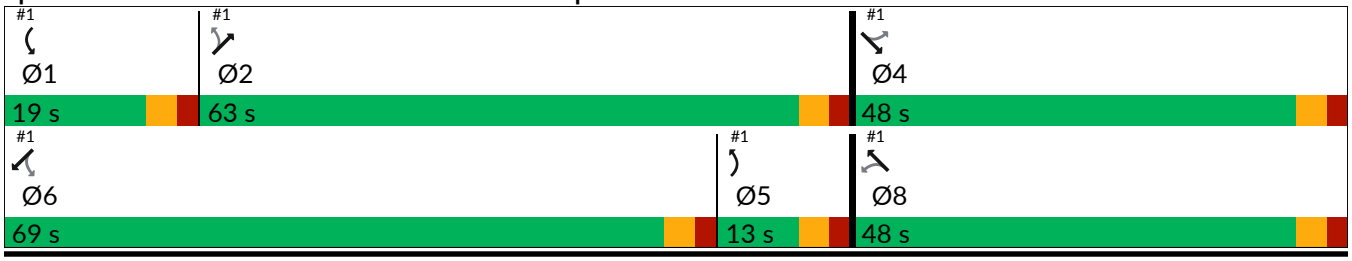
Appendix M: Design Year No-Build (2047) Synchro Analysis Worksheets

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	99	33	11	59	51	49	29	580	70	56	357	83
Future Volume (vph)	99	33	11	59	51	49	29	580	70	56	357	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	140		0	120		0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (ft)	25		25	0		25	80		25	80		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.990			0.926			0.984			0.972	
Flt Protected		0.966		0.950			0.950			0.950		
Satd. Flow (prot)	0	1805	0	1805	1717	0	1805	3491	0	1770	3407	0
Flt Permitted		0.715		0.671			0.440			0.167		
Satd. Flow (perm)	0	1336	0	1275	1717	0	836	3491	0	311	3407	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			40			13			30	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		429			368			444			407	
Travel Time (s)		9.8			8.4			10.1			9.3	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	0%	0%	0%	0%	5%	0%	1%	8%	2%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	127	42	14	76	65	63	37	744	90	72	458	106
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	183	0	76	128	0	37	834	0	72	564	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2		1	2		1	2		1	2	
Detector Template		Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)		100		20	100		20	100		20	100	
Trailing Detector (ft)		0		0	0		0	0		0	0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Minimum Initial (s)	7.0	7.0		7.0	7.0		4.0	20.0		4.0	20.0	
Minimum Split (s)	25.0	25.0		25.0	25.0		9.0	25.0		9.0	25.0	
Total Split (s)	48.0	48.0		48.0	48.0		13.0	63.0		19.0	69.0	
Total Split (%)	36.9%	36.9%		36.9%	36.9%		10.0%	48.5%		14.6%	53.1%	
Maximum Green (s)	43.0	43.0		43.0	43.0		8.0	58.0		14.0	64.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag							Lag	Lag		Lead	Lead	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	4.0	4.0		4.0	4.0		3.0	4.0		3.0	4.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Flash Don't Walk (s)	16.0	16.0		16.0	16.0			16.0			16.0	
Pedestrian Calls (#/hr)	0	0		0	0			0			0	
Act Effct Green (s)		16.6		16.6	16.6		29.4	27.6		30.2	30.2	
Actuated g/C Ratio		0.26		0.26	0.26		0.45	0.42		0.46	0.46	
v/c Ratio		0.53		0.23	0.27		0.07	0.56		0.22	0.35	
Control Delay (s/veh)		29.5		24.0	17.8		15.0	17.3		17.7	15.2	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)		29.5		24.0	17.8		15.0	17.3		17.7	15.2	
LOS		C		C	B		B	B		B	B	
Approach Delay (s/veh)		29.5			20.1			17.2			15.5	
Approach LOS		C			C			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 65			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.56			
Intersection Signal Delay (s/veh): 18.1		Intersection LOS: B	
Intersection Capacity Utilization 48.6%		ICU Level of Service A	
Analysis Period (min) 15			
Description: Intersection 1			

Splits and Phases: 1: S Riverfront Dr & Warren St/Poplar St



Intersection	
Int Delay, s/veh	1.6

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	0	0	31	14	3	24	36	629	20	17	385	12
Future Vol, veh/h	0	0	31	14	3	24	36	629	20	17	385	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	95	-	-	160	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	77	77	77	77	77	77	77	77	77	77	77	77
Heavy Vehicles, %	0	0	0	0	0	0	0	2	0	7	5	0
Mvmt Flow	0	0	40	18	4	31	47	817	26	22	500	16

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	258	1218	1483	421	516	0	0	843	0	0
Stage 1	-	-	-	923	923	-	-	-	-	-	-	-
Stage 2	-	-	-	294	560	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.9	7.5	6.5	6.9	4.1	-	-	4.24	-	-
Critical Hdwy Stg 1	-	-	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3	3.5	4	3.3	2.2	-	-	2.27	-	-
Pot Cap-1 Maneuver	0	0	747	139	126	586	1060	-	-	758	-	-
Stage 1	0	0	-	294	351	-	-	-	-	-	-	-
Stage 2	0	0	-	695	514	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	747	122	117	586	1060	-	-	758	-	-
Mov Cap-2 Maneuver	-	-	-	122	117	-	-	-	-	-	-	-
Stage 1	-	-	-	281	336	-	-	-	-	-	-	-
Stage 2	-	-	-	639	499	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Ctrl Dly, s/v	10.09	25.76	0.45	0.41
HCM LOS	B	D		

Minor Lane/Major Mvmt	NEL	NET	NER	NWLn1	SELn1	SWL	SWT	SWR
Capacity (veh/h)	1060	-	-	226	747	758	-	-
HCM Lane V/C Ratio	0.044	-	-	0.236	0.054	0.029	-	-
HCM Ctrl Dly (s/v)	8.6	-	-	25.8	10.1	9.9	-	-
HCM Lane LOS	A	-	-	D	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.9	0.2	0.1	-	-

Intersection	
Intersection Delay, s/veh	8.1
Intersection LOS	A

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Vol, veh/h	18	71	56	4	29	3	4	10	15	16	21	2
Future Vol, veh/h	18	71	56	4	29	3	4	10	15	16	21	2
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Heavy Vehicles, %	6	3	0	0	0	0	0	0	7	6	0	0
Mvmt Flow	26	101	80	6	41	4	6	14	21	23	30	3
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	NB	SB	SE	NW
Opposing Approach	SB	NB	NW	SE
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SE	NW	SB	NB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NW	SE	NB	SB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay, s/veh	8.3	7.6	7.5	8
HCM LOS	A	A	A	A

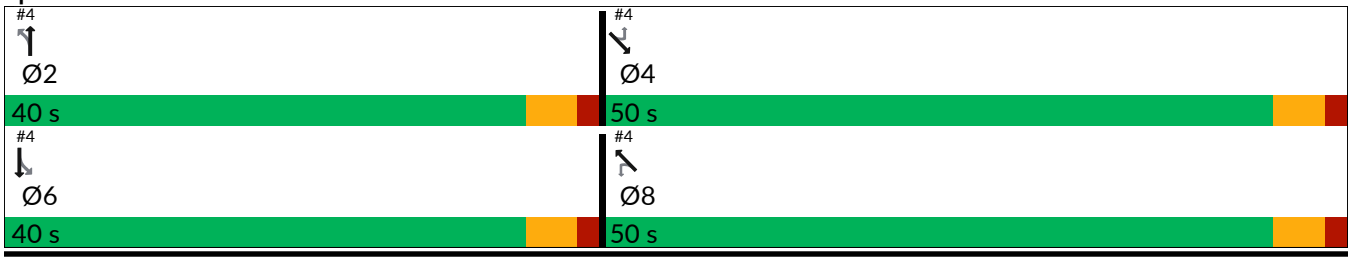
Lane	NBLn1	NWLn1	SELn1	SBLn1
Vol Left, %	12%	41%	14%	11%
Vol Thru, %	49%	54%	34%	81%
Vol Right, %	39%	5%	52%	8%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	145	39	29	36
LT Vol	18	16	4	4
Through Vol	71	21	10	29
RT Vol	56	2	15	3
Lane Flow Rate	207	56	41	51
Geometry Grp	1	1	1	1
Degree of Util (X)	0.23	0.072	0.049	0.061
Departure Headway (Hd)	4.004	4.659	4.243	4.303
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	884	773	848	836
Service Time	2.084	2.662	2.246	2.311
HCM Lane V/C Ratio	0.234	0.072	0.048	0.061
HCM Control Delay, s/veh	8.3	8	7.5	7.6
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.9	0.2	0.2	0.2

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	6	21	45	3	12	3	1	143	6	35	169	4
Future Volume (vph)	6	21	45	3	12	3	1	143	6	35	169	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	70		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25		25	25		25	0		25	50		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.915			0.975			0.994			0.996	
Flt Protected		0.996			0.991		0.950			0.950		
Satd. Flow (prot)	0	1687	0	0	1836	0	1805	1853	0	1805	1874	0
Flt Permitted		0.982			0.956		0.629			0.646		
Satd. Flow (perm)	0	1664	0	0	1771	0	1195	1853	0	1227	1874	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		54			4			3			2	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		442			459			368			421	
Travel Time (s)		10.0			10.4			8.4			9.6	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	9%	0%	0%	0%	0%	0%	2%	0%	0%	1%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	7	25	54	4	14	4	1	170	7	42	201	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	86	0	0	22	0	1	177	0	42	206	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane											Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2			2		1	2		1	2	
Detector Template		Thru			Thru		Left	Thru		Left	Thru	
Leading Detector (ft)		100			100		20	100		20	100	
Trailing Detector (ft)		0			0		0	0		0	0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0		15.0	15.0	
Minimum Split (s)	32.0	32.0		32.0	32.0		32.0	32.0		32.0	32.0	
Total Split (s)	40.0	40.0		40.0	40.0		50.0	50.0		50.0	50.0	
Total Split (%)	44.4%	44.4%		44.4%	44.4%		55.6%	55.6%		55.6%	55.6%	
Maximum Green (s)	35.0	35.0		35.0	35.0		45.0	45.0		45.0	45.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	Min	Min		Min	Min		None	None		None	None	
Walk Time (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Flash Don't Walk (s)	17.0	17.0		17.0	17.0		17.0	17.0		17.0	17.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		13.6			13.6		16.1	16.1		16.1	16.1	
Actuated g/C Ratio		0.43			0.43		0.51	0.51		0.51	0.51	
v/c Ratio		0.12			0.03		0.00	0.19		0.07	0.22	
Control Delay (s/veh)		5.7			8.5		6.0	6.8		6.3	7.0	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)		5.7			8.5		6.0	6.8		6.3	7.0	
LOS		A			A		A	A		A	A	
Approach Delay (s/veh)		5.7			8.5			6.8			6.9	
Approach LOS		A			A			A			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 31.7			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.22			
Intersection Signal Delay (s/veh): 6.7		Intersection LOS: A	
Intersection Capacity Utilization 45.8%		ICU Level of Service A	
Analysis Period (min) 15			
Description: Intersection 4			

Splits and Phases: 4: S Front St & Warren St



Intersection: 1: S Riverfront Dr & Warren St/Poplar St

Movement	SE	NW	NW	NE	NE	NE	SW	SW	SW
Directions Served	LTR	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	102	72	72	28	113	117	46	82	72
Average Queue (ft)	68	35	43	12	75	62	26	57	32
95th Queue (ft)	127	76	86	36	124	126	56	104	88
Link Distance (ft)	381	289	289		367	367		370	370
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)				140			120		
Storage Blk Time (%)					1			0	
Queuing Penalty (veh)					0			0	

Intersection: 2: S Riverfront Dr & W Liberty St/ Dunkin Driveway

Movement	SE	NW	NE	NE	NE	SW
Directions Served	R	LTR	L	T	TR	L
Maximum Queue (ft)	31	38	18	11	10	28
Average Queue (ft)	16	24	7	2	2	10
95th Queue (ft)	40	48	28	20	19	36
Link Distance (ft)	238	315		658	658	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			95			160
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 3: S Front St & E Liberty St/W Liberty St

Movement	NB	SB	SE	NW
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	54	30	28	42
Average Queue (ft)	40	18	19	21
95th Queue (ft)	61	41	39	52
Link Distance (ft)	598	374	315	400
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: S Front St & Warren St

Movement	NB	SB	SE	NW	NW
Directions Served	LTR	LTR	TR	L	TR
Maximum Queue (ft)	55	17	62	33	62
Average Queue (ft)	30	5	39	16	42
95th Queue (ft)	64	23	70	41	67
Link Distance (ft)	374	408	289		390
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)				70	
Storage Blk Time (%)					1
Queuing Penalty (veh)					0

Network Summary

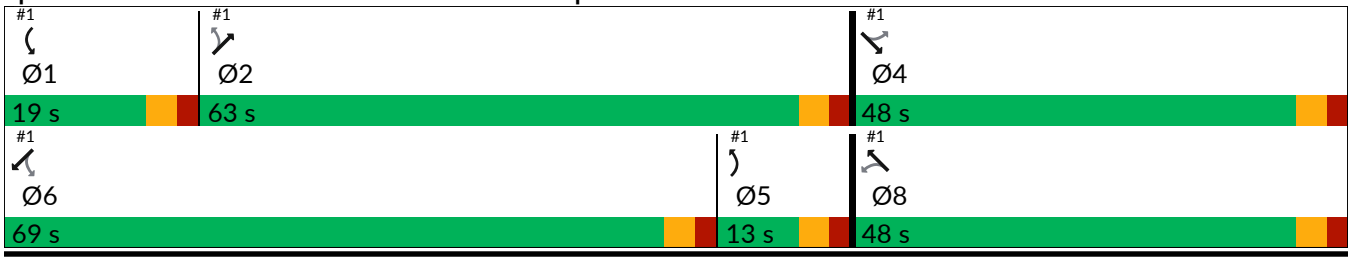
Network wide Queuing Penalty: 0

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	107	52	37	85	52	68	39	527	84	79	754	100
Future Volume (vph)	107	52	37	85	52	68	39	527	84	79	754	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	140		0	120		0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (ft)	25		25	0		25	80		25	80		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.975			0.915			0.979			0.982	
Flt Protected		0.973		0.950			0.950			0.950		
Satd. Flow (prot)	0	1793	0	1805	1738	0	1805	3490	0	1752	3514	0
Flt Permitted		0.763		0.638			0.323			0.267		
Satd. Flow (perm)	0	1406	0	1212	1738	0	614	3490	0	493	3514	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			54			18			16	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		429			368			444			419	
Travel Time (s)		9.8			8.4			10.1			9.5	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	0%	1%	3%	3%	1%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	110	54	38	88	54	70	40	543	87	81	777	103
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	202	0	88	124	0	40	630	0	81	880	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2		1	2		1	2		1	2	
Detector Template		Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)		100		20	100		20	100		20	100	
Trailing Detector (ft)		0		0	0		0	0		0	0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Minimum Initial (s)	7.0	7.0		7.0	7.0		4.0	20.0		4.0	20.0	
Minimum Split (s)	25.0	25.0		25.0	25.0		9.0	25.0		9.0	25.0	
Total Split (s)	48.0	48.0		48.0	48.0		13.0	63.0		19.0	69.0	
Total Split (%)	36.9%	36.9%		36.9%	36.9%		10.0%	48.5%		14.6%	53.1%	
Maximum Green (s)	43.0	43.0		43.0	43.0		8.0	58.0		14.0	64.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag							Lag	Lag		Lead	Lead	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	4.0	4.0		4.0	4.0		3.0	4.0		3.0	4.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Flash Don't Walk (s)	16.0	16.0		16.0	16.0			16.0			16.0	
Pedestrian Calls (#/hr)	0	0		0	0			0			0	
Act Effct Green (s)		15.9		15.9	15.9		27.3	25.3		29.5	29.5	
Actuated g/C Ratio		0.26		0.26	0.26		0.44	0.41		0.48	0.48	
v/c Ratio		0.55		0.28	0.25		0.10	0.44		0.21	0.52	
Control Delay (s/veh)		26.8		23.2	14.2		15.6	15.4		12.7	13.8	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)		26.8		23.2	14.2		15.6	15.4		12.7	13.8	
LOS		C		C	B		B	B		B	B	
Approach Delay (s/veh)		26.8			17.9			15.4			13.7	
Approach LOS		C			B			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 61.6			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.55			
Intersection Signal Delay (s/veh): 16.0		Intersection LOS: B	
Intersection Capacity Utilization 57.4%		ICU Level of Service B	
Analysis Period (min) 15			
Description: Intersection 1			

Splits and Phases: 1: S Riverfront Dr & Warren St/Poplar St



Intersection	
Int Delay, s/veh	1.3

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	0	0	10	22	2	36	11	567	16	49	800	4
Future Vol, veh/h	0	0	10	22	2	36	11	567	16	49	800	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	95	-	-	160	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	0	0	0	0	2	0	0	1	0
Mvmt Flow	0	0	10	23	2	37	11	585	16	51	825	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	414	1129	1545	301	829	0	0	601	0	0
Stage 1	-	-	-	615	615	-	-	-	-	-	-	-
Stage 2	-	-	-	513	930	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.9	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	-	-	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	0	0	593	161	116	702	811	-	-	986	-	-
Stage 1	0	0	-	450	485	-	-	-	-	-	-	-
Stage 2	0	0	-	517	349	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	593	148	108	702	811	-	-	986	-	-
Mov Cap-2 Maneuver	-	-	-	148	108	-	-	-	-	-	-	-
Stage 1	-	-	-	444	478	-	-	-	-	-	-	-
Stage 2	-	-	-	482	331	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Ctrl Dly, s/v	11.18	21.85	0.18	0.51
HCM LOS	B	C		

Minor Lane/Major Mvmt	NEL	NET	NER	NWLn1	SELn1	SWL	SWT	SWR
Capacity (veh/h)	811	-	-	275	593	986	-	-
HCM Lane V/C Ratio	0.014	-	-	0.225	0.017	0.051	-	-
HCM Ctrl Dly (s/v)	9.5	-	-	21.8	11.2	8.8	-	-
HCM Lane LOS	A	-	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.8	0.1	0.2	-	-

Intersection	
Intersection Delay, s/veh	8.1
Intersection LOS	A

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Vol, veh/h	20	81	65	13	63	12	3	23	29	18	27	3
Future Vol, veh/h	20	81	65	13	63	12	3	23	29	18	27	3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	5	2	0	0	3	0	0	0	0	0	0	0
Mvmt Flow	22	90	72	14	70	13	3	26	32	20	30	3
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	NB	SB	SE	NW
Opposing Approach	SB	NB	NW	SE
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SE	NW	SB	NB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NW	SE	NB	SB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay, s/veh	8.3	7.9	7.6	8
HCM LOS	A	A	A	A

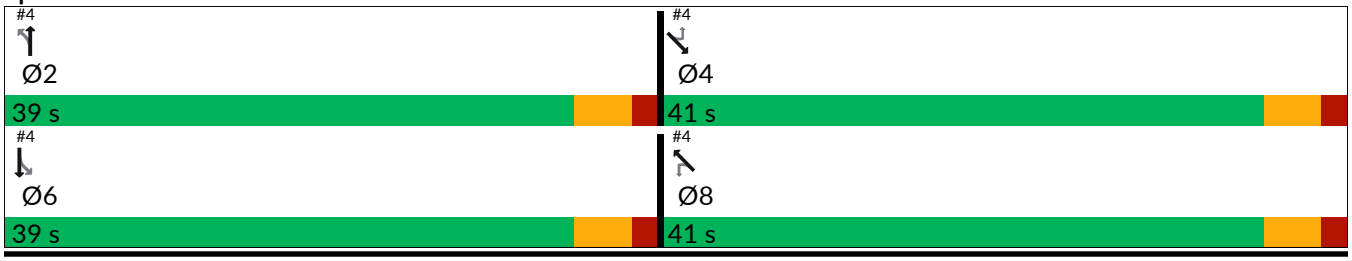
Lane	NBLn1	NWLn1	SELn1	SBLn1
Vol Left, %	12%	38%	5%	15%
Vol Thru, %	49%	56%	42%	72%
Vol Right, %	39%	6%	53%	14%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	166	48	55	88
LT Vol	20	18	3	13
Through Vol	81	27	23	63
RT Vol	65	3	29	12
Lane Flow Rate	184	53	61	98
Geometry Grp	1	1	1	1
Degree of Util (X)	0.213	0.068	0.073	0.117
Departure Headway (Hd)	4.152	4.62	4.271	4.296
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	871	777	840	836
Service Time	2.152	2.64	2.29	2.312
HCM Lane V/C Ratio	0.211	0.068	0.073	0.117
HCM Control Delay, s/veh	8.3	8	7.6	7.9
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.8	0.2	0.2	0.4

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	7	20	58	16	40	12	16	184	10	58	174	21
Future Volume (vph)	7	20	58	16	40	12	16	184	10	58	174	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	70		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25		25	25		25	0		25	50		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.908			0.977			0.992			0.984	
Flt Protected		0.996			0.988		0.950			0.950		
Satd. Flow (prot)	0	1679	0	0	1834	0	1805	1867	0	1736	1870	0
Flt Permitted		0.977			0.925		0.623			0.624		
Satd. Flow (perm)	0	1647	0	0	1717	0	1184	1867	0	1140	1870	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		64			13			4			10	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		442			459			368			421	
Travel Time (s)		10.0			10.4			8.4			9.6	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	10%	0%	0%	0%	0%	0%	1%	0%	4%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	8	22	64	18	44	13	18	204	11	64	193	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	94	0	0	75	0	18	215	0	64	216	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane											Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2			2		1	2		1	2	
Detector Template		Thru			Thru		Left	Thru		Left	Thru	
Leading Detector (ft)		100			100		20	100		20	100	
Trailing Detector (ft)		0			0		0	0		0	0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0		15.0	15.0	
Minimum Split (s)	32.0	32.0		32.0	32.0		32.0	32.0		32.0	32.0	
Total Split (s)	39.0	39.0		39.0	39.0		41.0	41.0		41.0	41.0	
Total Split (%)	48.8%	48.8%		48.8%	48.8%		51.3%	51.3%		51.3%	51.3%	
Maximum Green (s)	34.0	34.0		34.0	34.0		36.0	36.0		36.0	36.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	Min	Min		Min	Min		None	None		None	None	
Walk Time (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Flash Don't Walk (s)	17.0	17.0		17.0	17.0		17.0	17.0		17.0	17.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		13.4			13.4		16.4	16.4		16.4	16.4	
Actuated g/C Ratio		0.43			0.43		0.52	0.52		0.52	0.52	
v/c Ratio		0.13			0.10		0.03	0.22		0.11	0.22	
Control Delay (s/veh)		5.3			8.7		6.1	6.9		6.7	6.8	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)		5.3			8.7		6.1	6.9		6.7	6.8	
LOS		A			A		A	A		A	A	
Approach Delay (s/veh)		5.3			8.7			6.9			6.8	
Approach LOS		A			A			A			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 31.3			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.22			
Intersection Signal Delay (s/veh): 6.8		Intersection LOS: A	
Intersection Capacity Utilization 45.8%		ICU Level of Service A	
Analysis Period (min) 15			
Description: Intersection 4			

Splits and Phases: 4: S Front St & Warren St



Intersection: 1: S Riverfront Dr & Warren St/Poplar St

Movement	SE	NW	NW	NE	NE	NE	SW	SW	SW
Directions Served	LTR	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	124	73	70	36	142	111	80	154	131
Average Queue (ft)	79	44	42	18	100	80	43	106	80
95th Queue (ft)	130	83	80	45	167	130	100	181	151
Link Distance (ft)	381	289	289		367	367		382	382
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)				140			120		
Storage Blk Time (%)					2		1	6	
Queuing Penalty (veh)					1		5	5	

Intersection: 2: S Riverfront Dr & W Liberty St/ Dunkin Driveway

Movement	SE	NW	NE	SW
Directions Served	R	LTR	L	L
Maximum Queue (ft)	18	56	24	47
Average Queue (ft)	5	28	7	20
95th Queue (ft)	23	64	28	53
Link Distance (ft)	238	315		
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			95	160
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: S Front St & E Liberty St/W Liberty St

Movement	NB	SB	SE	NW
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	60	47	45	39
Average Queue (ft)	41	31	26	22
95th Queue (ft)	64	56	52	49
Link Distance (ft)	598	374	315	400
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: S Front St & Warren St

Movement	NB	SB	SE	SE	NW	NW
Directions Served	LTR	LTR	L	TR	L	TR
Maximum Queue (ft)	55	32	17	78	38	67
Average Queue (ft)	35	22	4	39	18	38
95th Queue (ft)	64	44	21	92	48	72
Link Distance (ft)	374	408	289	289		390
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)					70	
Storage Blk Time (%)					0	1
Queuing Penalty (veh)					0	1

Network Summary

Network wide Queuing Penalty: 11

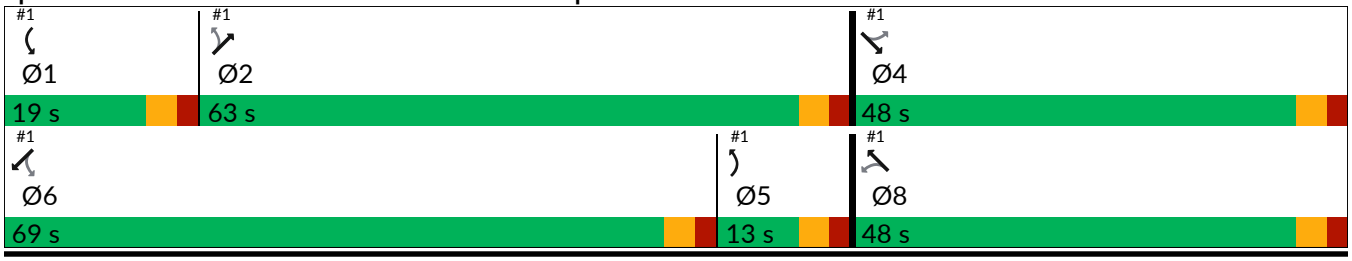
Appendix N: Design Year Build (2047) Synchro Analysis Worksheets

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	99	38	11	59	54	60	29	580	70	75	357	83
Future Volume (vph)	99	38	11	59	54	60	29	580	70	75	357	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	140		0	120		0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (ft)	25		25	0		25	80		25	80		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.990			0.921			0.984			0.972	
Flt Protected		0.968		0.950			0.950			0.950		
Satd. Flow (prot)	0	1809	0	1805	1705	0	1805	3491	0	1770	3407	0
Flt Permitted		0.712		0.660			0.440			0.166		
Satd. Flow (perm)	0	1330	0	1254	1705	0	836	3491	0	309	3407	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			46			13			30	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		429			160			444			414	
Travel Time (s)		9.8			3.6			10.1			9.4	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	0%	0%	0%	0%	5%	0%	1%	8%	2%	3%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	127	49	14	76	69	77	37	744	90	96	458	106
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	190	0	76	146	0	37	834	0	96	564	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2		1	2		1	2		1	2	
Detector Template		Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)		100		20	100		20	100		20	100	
Trailing Detector (ft)		0		0	0		0	0		0	0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Minimum Initial (s)	7.0	7.0		7.0	7.0		4.0	20.0		4.0	20.0	
Minimum Split (s)	25.0	25.0		25.0	25.0		9.0	25.0		9.0	25.0	
Total Split (s)	48.0	48.0		48.0	48.0		13.0	63.0		19.0	69.0	
Total Split (%)	36.9%	36.9%		36.9%	36.9%		10.0%	48.5%		14.6%	53.1%	
Maximum Green (s)	43.0	43.0		43.0	43.0		8.0	58.0		14.0	64.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag							Lag	Lag		Lead	Lead	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	4.0	4.0		4.0	4.0		3.0	4.0		3.0	4.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Flash Don't Walk (s)	16.0	16.0		16.0	16.0			16.0			16.0	
Pedestrian Calls (#/hr)	0	0		0	0			0			0	
Act Effct Green (s)		17.9		17.9	17.9		30.2	28.3		31.1	31.1	
Actuated g/C Ratio		0.26		0.26	0.26		0.44	0.42		0.46	0.46	
v/c Ratio		0.54		0.23	0.30		0.07	0.57		0.29	0.36	
Control Delay (s/veh)		30.3		24.8	18.5		16.1	18.5		19.3	16.2	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)		30.3		24.8	18.5		16.1	18.5		19.3	16.2	
LOS		C		C	B		B	B		B	B	
Approach Delay (s/veh)		30.3			20.6			18.4			16.7	
Approach LOS		C			C			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 67.9			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.57			
Intersection Signal Delay (s/veh): 19.2		Intersection LOS: B	
Intersection Capacity Utilization 49.7%		ICU Level of Service A	
Analysis Period (min) 15			
Description: Intersection 1			

Splits and Phases: 1: S Riverfront Dr & Warren St/Poplar St



Intersection	
Int Delay, s/veh	2.2

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	0	0	31	25	3	24	36	629	39	17	385	12
Future Vol, veh/h	0	0	31	25	3	24	36	629	39	17	385	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	95	-	-	160	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	77	77	77	77	77	77	77	77	77	77	77	77
Heavy Vehicles, %	0	0	0	0	0	0	0	2	0	7	5	0
Mvmt Flow	0	0	40	32	4	31	47	817	51	22	500	16

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	258	1230	1495	434	516	0	0	868	0	0
Stage 1	-	-	-	936	936	-	-	-	-	-	-	-
Stage 2	-	-	-	294	560	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.9	7.5	6.5	6.9	4.1	-	-	4.24	-	-
Critical Hdwy Stg 1	-	-	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3	3.5	4	3.3	2.2	-	-	2.27	-	-
Pot Cap-1 Maneuver	0	0	747	136	124	576	1060	-	-	741	-	-
Stage 1	0	0	-	289	347	-	-	-	-	-	-	-
Stage 2	0	0	-	695	514	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	747	119	115	576	1060	-	-	741	-	-
Mov Cap-2 Maneuver	-	-	-	119	115	-	-	-	-	-	-	-
Stage 1	-	-	-	276	331	-	-	-	-	-	-	-
Stage 2	-	-	-	638	499	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Ctrl Dly, s/v	10.09	34.62	0.44	0.41
HCM LOS	B	D		

Minor Lane/Major Mvmt	NEL	NET	NER	NWLn1	SELn1	SWL	SWT	SWR
Capacity (veh/h)	1060	-	-	188	747	741	-	-
HCM Lane V/C Ratio	0.044	-	-	0.36	0.054	0.03	-	-
HCM Ctrl Dly (s/v)	8.6	-	-	34.6	10.1	10	-	-
HCM Lane LOS	A	-	-	D	B	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	1.5	0.2	0.1	-	-

Intersection	
Intersection Delay, s/veh	8.1
Intersection LOS	A

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Vol, veh/h	21	71	56	4	29	3	4	10	17	16	21	2
Future Vol, veh/h	21	71	56	4	29	3	4	10	17	16	21	2
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Heavy Vehicles, %	6	3	0	0	0	0	0	0	7	6	0	0
Mvmt Flow	30	101	80	6	41	4	6	14	24	23	30	3
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	NB	SB	SE	NW
Opposing Approach	SB	NB	NW	SE
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SE	NW	SB	NB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NW	SE	NB	SB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay, s/veh	8.4	7.6	7.5	8
HCM LOS	A	A	A	A

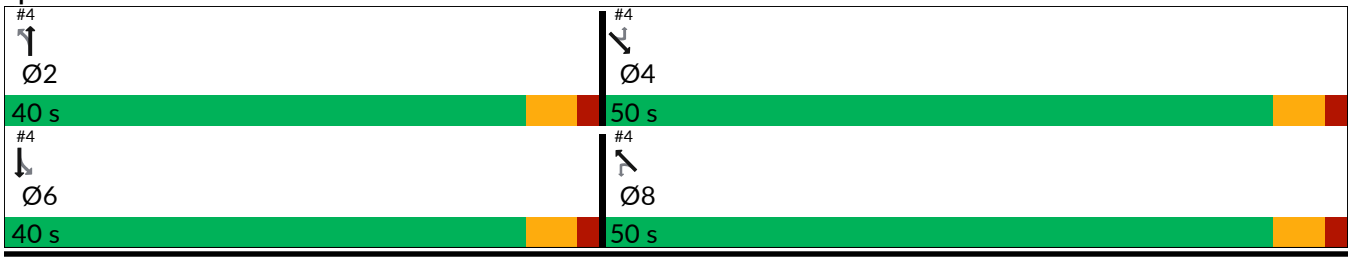
Lane	NBLn1	NWLn1	SELn1	SBLn1
Vol Left, %	14%	41%	13%	11%
Vol Thru, %	48%	54%	32%	81%
Vol Right, %	38%	5%	55%	8%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	148	39	31	36
LT Vol	21	16	4	4
Through Vol	71	21	10	29
RT Vol	56	2	17	3
Lane Flow Rate	211	56	44	51
Geometry Grp	1	1	1	1
Degree of Util (X)	0.236	0.072	0.052	0.062
Departure Headway (Hd)	4.016	4.673	4.234	4.314
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	882	770	850	834
Service Time	2.099	2.679	2.239	2.323
HCM Lane V/C Ratio	0.239	0.073	0.052	0.061
HCM Control Delay, s/veh	8.4	8	7.5	7.6
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.9	0.2	0.2	0.2

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	6	21	45	3	12	3	1	148	6	35	177	4
Future Volume (vph)	6	21	45	3	12	3	1	148	6	35	177	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	70		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25		25	25		25	0		25	50		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.915			0.975			0.994			0.997	
Flt Protected		0.996			0.991		0.950			0.950		
Satd. Flow (prot)	0	1687	0	0	1836	0	1805	1853	0	1805	1876	0
Flt Permitted		0.982			0.955		0.623			0.642		
Satd. Flow (perm)	0	1664	0	0	1769	0	1184	1853	0	1220	1876	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		54			4			3			2	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		442			459			209			421	
Travel Time (s)		10.0			10.4			4.8			9.6	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	9%	0%	0%	0%	0%	0%	2%	0%	0%	1%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	7	25	54	4	14	4	1	176	7	42	211	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	86	0	0	22	0	1	183	0	42	216	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane											Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2			2		1	2		1	2	
Detector Template		Thru			Thru		Left	Thru		Left	Thru	
Leading Detector (ft)		100			100		20	100		20	100	
Trailing Detector (ft)		0			0		0	0		0	0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0		15.0	15.0	
Minimum Split (s)	32.0	32.0		32.0	32.0		32.0	32.0		32.0	32.0	
Total Split (s)	40.0	40.0		40.0	40.0		50.0	50.0		50.0	50.0	
Total Split (%)	44.4%	44.4%		44.4%	44.4%		55.6%	55.6%		55.6%	55.6%	
Maximum Green (s)	35.0	35.0		35.0	35.0		45.0	45.0		45.0	45.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	Min	Min		Min	Min		None	None		None	None	
Walk Time (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Flash Don't Walk (s)	17.0	17.0		17.0	17.0		17.0	17.0		17.0	17.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		13.5			13.5		16.3	16.3		16.3	16.3	
Actuated g/C Ratio		0.43			0.43		0.52	0.52		0.52	0.52	
v/c Ratio		0.12			0.03		0.00	0.19		0.07	0.22	
Control Delay (s/veh)		5.7			8.5		6.0	6.9		6.4	7.0	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)		5.7			8.5		6.0	6.9		6.4	7.0	
LOS		A			A		A	A		A	A	
Approach Delay (s/veh)		5.7			8.5			6.8			6.9	
Approach LOS		A			A			A			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 31.5			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.22			
Intersection Signal Delay (s/veh): 6.8		Intersection LOS: A	
Intersection Capacity Utilization 45.8%		ICU Level of Service A	
Analysis Period (min) 15			
Description: Intersection 4			

Splits and Phases: 4: S Front St & Warren St



Intersection: 1: S Riverfront Dr & Warren St/Poplar St

Movement	SE	NW	NW	NE	NE	NE	SW	SW	SW
Directions Served	LTR	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	92	52	70	28	146	122	52	83	70
Average Queue (ft)	71	27	38	10	101	80	31	57	37
95th Queue (ft)	109	60	80	32	189	162	60	103	82
Link Distance (ft)	381	77	77		368	368		378	378
Upstream Blk Time (%)		0	3						
Queuing Penalty (veh)		0	3						
Storage Bay Dist (ft)				140			120		
Storage Blk Time (%)					2			1	
Queuing Penalty (veh)					0			0	

Intersection: 2: S Riverfront Dr & W Liberty St/ Dunkin Driveway

Movement	SE	NW	NE	SW	SW
Directions Served	R	LTR	L	L	TR
Maximum Queue (ft)	31	45	30	32	10
Average Queue (ft)	24	32	11	9	2
95th Queue (ft)	44	56	35	36	18
Link Distance (ft)	238	63			368
Upstream Blk Time (%)		0			
Queuing Penalty (veh)		0			
Storage Bay Dist (ft)			95	160	
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 3: S Front St & E Liberty St/W Liberty St

Movement	NB	SB	SE	NW
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	50	30	28	39
Average Queue (ft)	36	19	18	25
95th Queue (ft)	54	42	40	51
Link Distance (ft)	598	374	194	400
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: S Front St & Warren St

Movement	NB	SB	SE	NW	NW
Directions Served	LTR	LTR	TR	L	TR
Maximum Queue (ft)	47	16	61	38	62
Average Queue (ft)	26	7	34	17	29
95th Queue (ft)	59	25	71	45	70
Link Distance (ft)	374	408	155		390
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)				70	
Storage Blk Time (%)					0
Queuing Penalty (veh)					0

Intersection: 14: Development Access 1 & Warren St

Movement	NW	NW	NE
Directions Served	LT	T	LR
Maximum Queue (ft)	6	12	30
Average Queue (ft)	1	2	13
95th Queue (ft)	11	16	37
Link Distance (ft)	155	155	108
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 15: W Liberty St & Development Access 2

Movement	SE	SW
Directions Served	LT	LR
Maximum Queue (ft)	6	24
Average Queue (ft)	1	10
95th Queue (ft)	11	33
Link Distance (ft)	63	125
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

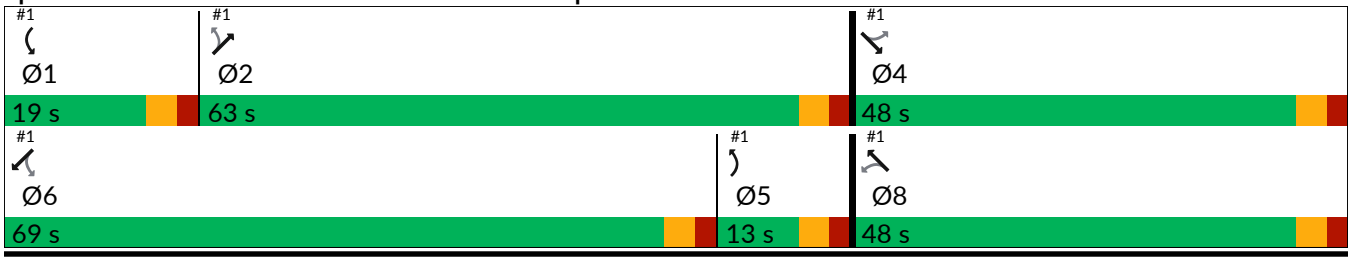
Network wide Queuing Penalty: 4

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	107	52	37	85	52	68	39	527	84	79	754	100
Future Volume (vph)	107	52	37	85	52	68	39	527	84	79	754	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	140		0	120		0
Storage Lanes	0		0	1		0	1		0	1		0
Taper Length (ft)	25		25	0		25	80		25	80		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.975			0.915			0.979			0.982	
Flt Protected		0.973		0.950			0.950			0.950		
Satd. Flow (prot)	0	1793	0	1805	1738	0	1752	3504	0	1805	3502	0
Flt Permitted		0.763		0.638			0.323			0.267		
Satd. Flow (perm)	0	1406	0	1212	1738	0	596	3504	0	507	3502	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			54			18			16	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		429			160			444			414	
Travel Time (s)		9.8			3.6			10.1			9.4	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	3%	1%	0%	0%	1%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	110	54	38	88	54	70	40	543	87	81	777	103
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	202	0	88	124	0	40	630	0	81	880	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2		1	2		1	2		1	2	
Detector Template		Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)		100		20	100		20	100		20	100	
Trailing Detector (ft)		0		0	0		0	0		0	0	
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		5	2		1	6	
Switch Phase												

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Minimum Initial (s)	7.0	7.0		7.0	7.0		4.0	20.0		4.0	20.0	
Minimum Split (s)	25.0	25.0		25.0	25.0		9.0	25.0		9.0	25.0	
Total Split (s)	48.0	48.0		48.0	48.0		13.0	63.0		19.0	69.0	
Total Split (%)	36.9%	36.9%		36.9%	36.9%		10.0%	48.5%		14.6%	53.1%	
Maximum Green (s)	43.0	43.0		43.0	43.0		8.0	58.0		14.0	64.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lead/Lag							Lag	Lag		Lead	Lead	
Lead-Lag Optimize?							Yes	Yes		Yes	Yes	
Vehicle Extension (s)	4.0	4.0		4.0	4.0		3.0	4.0		3.0	4.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	None	None		None	None		None	Min		None	Min	
Walk Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Flash Don't Walk (s)	16.0	16.0		16.0	16.0			16.0			16.0	
Pedestrian Calls (#/hr)	0	0		0	0			0			0	
Act Effct Green (s)		16.0		16.0	16.0		27.4	25.4		29.6	29.6	
Actuated g/C Ratio		0.26		0.26	0.26		0.44	0.41		0.48	0.48	
v/c Ratio		0.54		0.28	0.25		0.11	0.43		0.20	0.52	
Control Delay (s/veh)		26.8		23.2	14.2		15.6	15.4		12.6	13.9	
Queue Delay		0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)		26.8		23.2	14.2		15.6	15.4		12.6	13.9	
LOS		C		C	B		B	B		B	B	
Approach Delay (s/veh)		26.8			17.9			15.4			13.8	
Approach LOS		C			B			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 61.7			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.54			
Intersection Signal Delay (s/veh): 16.0		Intersection LOS: B	
Intersection Capacity Utilization 57.4%		ICU Level of Service B	
Analysis Period (min) 15			
Description: Intersection 1			

Splits and Phases: 1: S Riverfront Dr & Warren St/Poplar St



Intersection	
Int Delay, s/veh	1.3

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	0	0	10	22	2	36	11	567	16	49	800	4
Future Vol, veh/h	0	0	10	22	2	36	11	567	16	49	800	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	-	95	-	-	160	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	0	0	0	0	0	0	0	2	0	0	1	0
Mvmt Flow	0	0	10	23	2	37	11	585	16	51	825	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	-	-	414	1129	1545	301	829	0	0	601	0	0
Stage 1	-	-	-	615	615	-	-	-	-	-	-	-
Stage 2	-	-	-	513	930	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.9	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	-	-	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	0	0	593	161	116	702	811	-	-	986	-	-
Stage 1	0	0	-	450	485	-	-	-	-	-	-	-
Stage 2	0	0	-	517	349	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	-	593	148	108	702	811	-	-	986	-	-
Mov Cap-2 Maneuver	-	-	-	148	108	-	-	-	-	-	-	-
Stage 1	-	-	-	444	478	-	-	-	-	-	-	-
Stage 2	-	-	-	482	331	-	-	-	-	-	-	-

Approach	SE	NW	NE	SW
HCM Ctrl Dly, s/v	11.18	21.85	0.18	0.51
HCM LOS	B	C		

Minor Lane/Major Mvmt	NEL	NET	NER	NWLn1	SELn1	SWL	SWT	SWR
Capacity (veh/h)	811	-	-	275	593	986	-	-
HCM Lane V/C Ratio	0.014	-	-	0.225	0.017	0.051	-	-
HCM Ctrl Dly (s/v)	9.5	-	-	21.8	11.2	8.8	-	-
HCM Lane LOS	A	-	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.8	0.1	0.2	-	-

Intersection	
Intersection Delay, s/veh	8.1
Intersection LOS	A

Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Vol, veh/h	20	81	65	13	63	12	3	23	29	18	27	3
Future Vol, veh/h	20	81	65	13	63	12	3	23	29	18	27	3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	5	2	0	0	3	0	0	0	0	5	2	0
Mvmt Flow	22	90	72	14	70	13	3	26	32	20	30	3
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	NB	SB	SE	NW
Opposing Approach	SB	NB	NW	SE
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SE	NW	SB	NB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NW	SE	NB	SB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay, s/veh	8.3	7.9	7.6	8.1
HCM LOS	A	A	A	A

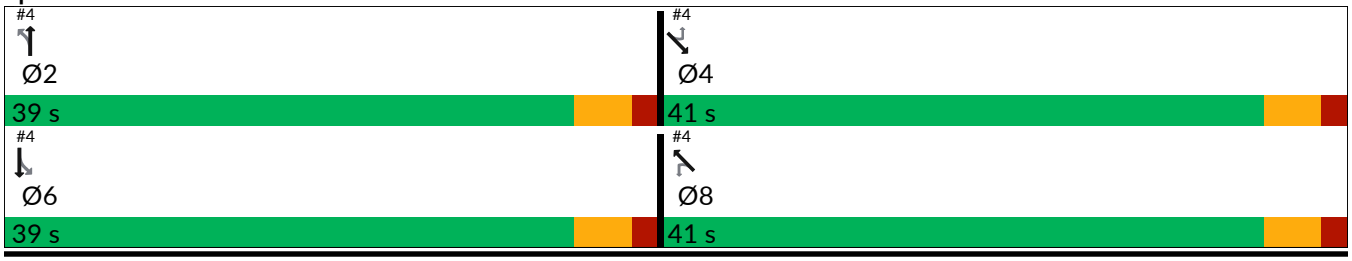
Lane	NBLn1	NWLn1	SELn1	SBLn1
Vol Left, %	12%	38%	5%	15%
Vol Thru, %	49%	56%	42%	72%
Vol Right, %	39%	6%	53%	14%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	166	48	55	88
LT Vol	20	18	3	13
Through Vol	81	27	23	63
RT Vol	65	3	29	12
Lane Flow Rate	184	53	61	98
Geometry Grp	1	1	1	1
Degree of Util (X)	0.213	0.07	0.073	0.117
Departure Headway (Hd)	4.156	4.706	4.273	4.3
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	869	763	840	836
Service Time	2.156	2.726	2.292	2.316
HCM Lane V/C Ratio	0.212	0.069	0.073	0.117
HCM Control Delay, s/veh	8.3	8.1	7.6	7.9
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.8	0.2	0.2	0.4

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	7	20	58	16	40	12	16	184	10	58	174	21
Future Volume (vph)	7	20	58	16	40	12	16	184	10	58	174	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	70		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25		25	25		25	0		25	50		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.908			0.977			0.992			0.984	
Flt Protected		0.996			0.988		0.950			0.950		
Satd. Flow (prot)	0	1679	0	0	1834	0	1805	1867	0	1736	1870	0
Flt Permitted		0.977			0.925		0.623			0.624		
Satd. Flow (perm)	0	1647	0	0	1717	0	1184	1867	0	1140	1870	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		64			13			4			10	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		442			459			209			421	
Travel Time (s)		10.0			10.4			4.8			9.6	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	10%	0%	0%	0%	0%	0%	1%	0%	4%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	8	22	64	18	44	13	18	204	11	64	193	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	94	0	0	75	0	18	215	0	64	216	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane											Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2			2		1	2		1	2	
Detector Template		Thru			Thru		Left	Thru		Left	Thru	
Leading Detector (ft)		100			100		20	100		20	100	
Trailing Detector (ft)		0			0		0	0		0	0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												

Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Minimum Initial (s)	10.0	10.0		10.0	10.0		15.0	15.0		15.0	15.0	
Minimum Split (s)	32.0	32.0		32.0	32.0		32.0	32.0		32.0	32.0	
Total Split (s)	39.0	39.0		39.0	39.0		41.0	41.0		41.0	41.0	
Total Split (%)	48.8%	48.8%		48.8%	48.8%		51.3%	51.3%		51.3%	51.3%	
Maximum Green (s)	34.0	34.0		34.0	34.0		36.0	36.0		36.0	36.0	
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	Min	Min		Min	Min		None	None		None	None	
Walk Time (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Flash Don't Walk (s)	17.0	17.0		17.0	17.0		17.0	17.0		17.0	17.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		13.4			13.4		16.4	16.4		16.4	16.4	
Actuated g/C Ratio		0.43			0.43		0.52	0.52		0.52	0.52	
v/c Ratio		0.13			0.10		0.03	0.22		0.11	0.22	
Control Delay (s/veh)		5.3			8.7		6.1	6.9		6.7	6.8	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay (s/veh)		5.3			8.7		6.1	6.9		6.7	6.8	
LOS		A			A		A	A		A	A	
Approach Delay (s/veh)		5.3			8.7			6.9			6.8	
Approach LOS		A			A			A			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 31.3			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.22			
Intersection Signal Delay (s/veh): 6.8		Intersection LOS: A	
Intersection Capacity Utilization 45.8%		ICU Level of Service A	
Analysis Period (min) 15			
Description: Intersection 4			

Splits and Phases: 4: S Front St & Warren St



Intersection: 1: S Riverfront Dr & Warren St/Poplar St

Movement	SE	NW	NW	NE	NE	NE	SW	SW	SW
Directions Served	LTR	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	107	72	66	40	125	95	72	151	134
Average Queue (ft)	71	37	42	19	90	62	33	108	77
95th Queue (ft)	115	72	71	47	146	119	93	177	146
Link Distance (ft)	381	77	77		368	368		378	378
Upstream Blk Time (%)		1	2						
Queuing Penalty (veh)		1	2						
Storage Bay Dist (ft)				140			120		
Storage Blk Time (%)					1			5	
Queuing Penalty (veh)					0			4	

Intersection: 2: S Riverfront Dr & W Liberty St/ Dunkin Driveway

Movement	SE	NW	NE	SW
Directions Served	R	LTR	L	L
Maximum Queue (ft)	31	31	18	34
Average Queue (ft)	12	28	6	15
95th Queue (ft)	36	42	26	44
Link Distance (ft)	238	63		
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			95	160
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: S Front St & E Liberty St/W Liberty St

Movement	NB	SB	SE	NW
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	58	44	32	39
Average Queue (ft)	41	30	26	24
95th Queue (ft)	62	52	41	53
Link Distance (ft)	598	374	194	400
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: S Front St & Warren St

Movement	NB	SB	SE	SE	NW	NW
Directions Served	LTR	LTR	L	TR	L	TR
Maximum Queue (ft)	59	40	22	56	47	49
Average Queue (ft)	38	25	9	36	24	34
95th Queue (ft)	68	46	29	65	54	57
Link Distance (ft)	374	408	155	155		390
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)					70	
Storage Blk Time (%)					0	0
Queuing Penalty (veh)					1	0

Intersection: 14: Development Access 1 & Warren St

Movement	NW	NW
Directions Served	LT	T
Maximum Queue (ft)	10	6
Average Queue (ft)	2	1
95th Queue (ft)	19	11
Link Distance (ft)	155	155
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 15: W Liberty St & Development Access 2

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 9