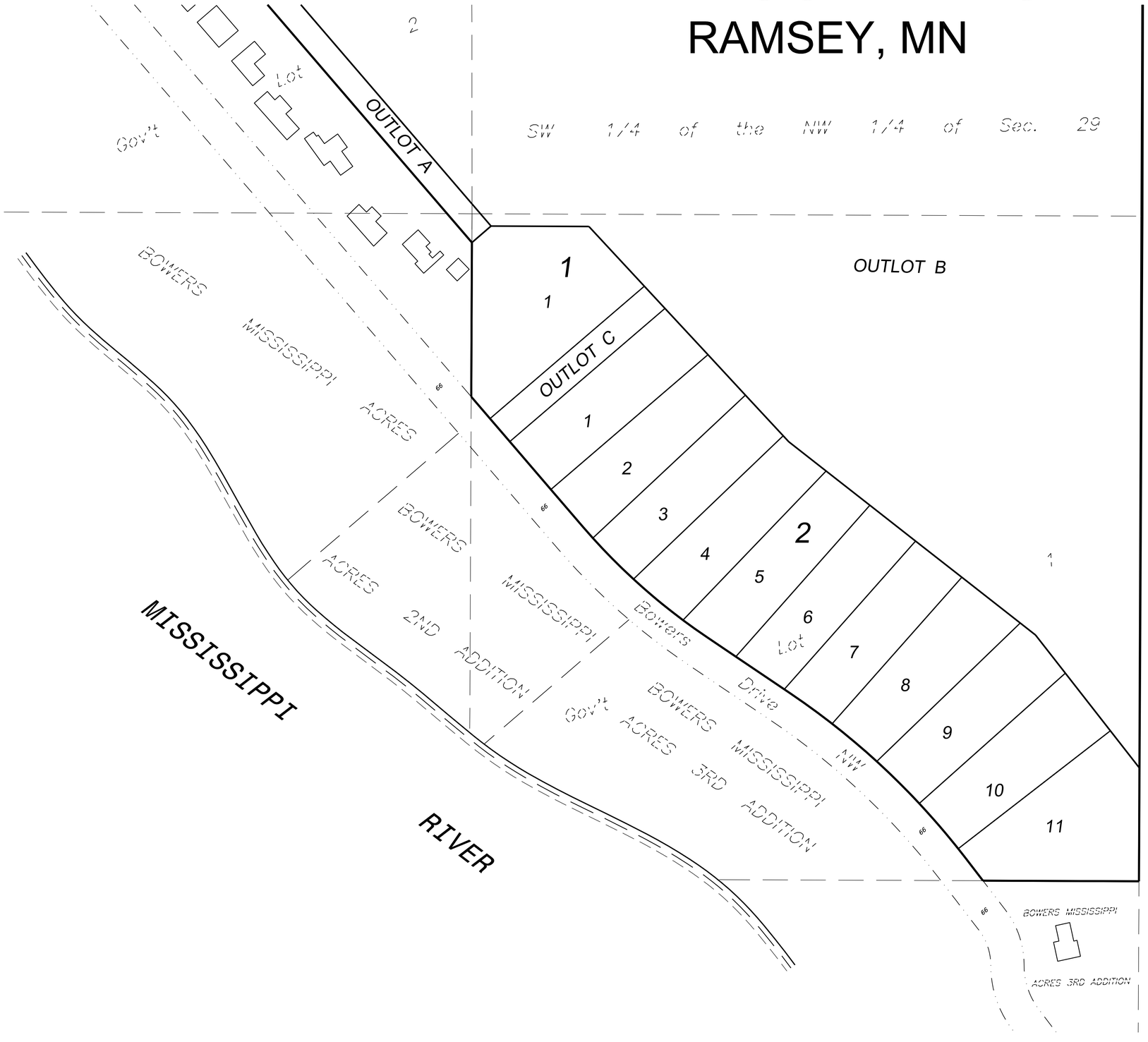
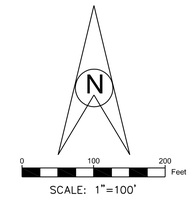
PEARSON PLACE

RAMSEY, MN





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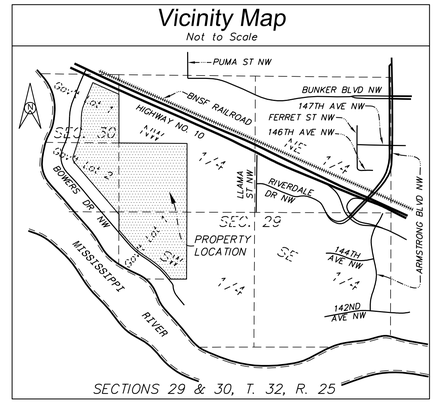

SHEET INDEX

SHEET NO.	DESCRIPTION
1	COVER SHEET
2	GRADING PLAN – WEST
3	GRADING PLAN – EAST
4	STORMWATER POLLUTION PREVENTION PLAN
5	STORMWATER POLLUTION PREVENTION PLAN NARRATIVE
6	DETAILS

REV. NO.	DATE	BY	DESCRIPTION

DESIGNED CSO DRAWN TJB

CHECKED CSO

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.

Cara M. Schwahn Otto
License # 40433 Date: 9-15-17

OTTO ASSOCIATES
Engineers & Land Surveyors, Inc.
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9 West Division Street
Buffalo, MN 55313
(763)682-4727
Fax: (763)682-3522

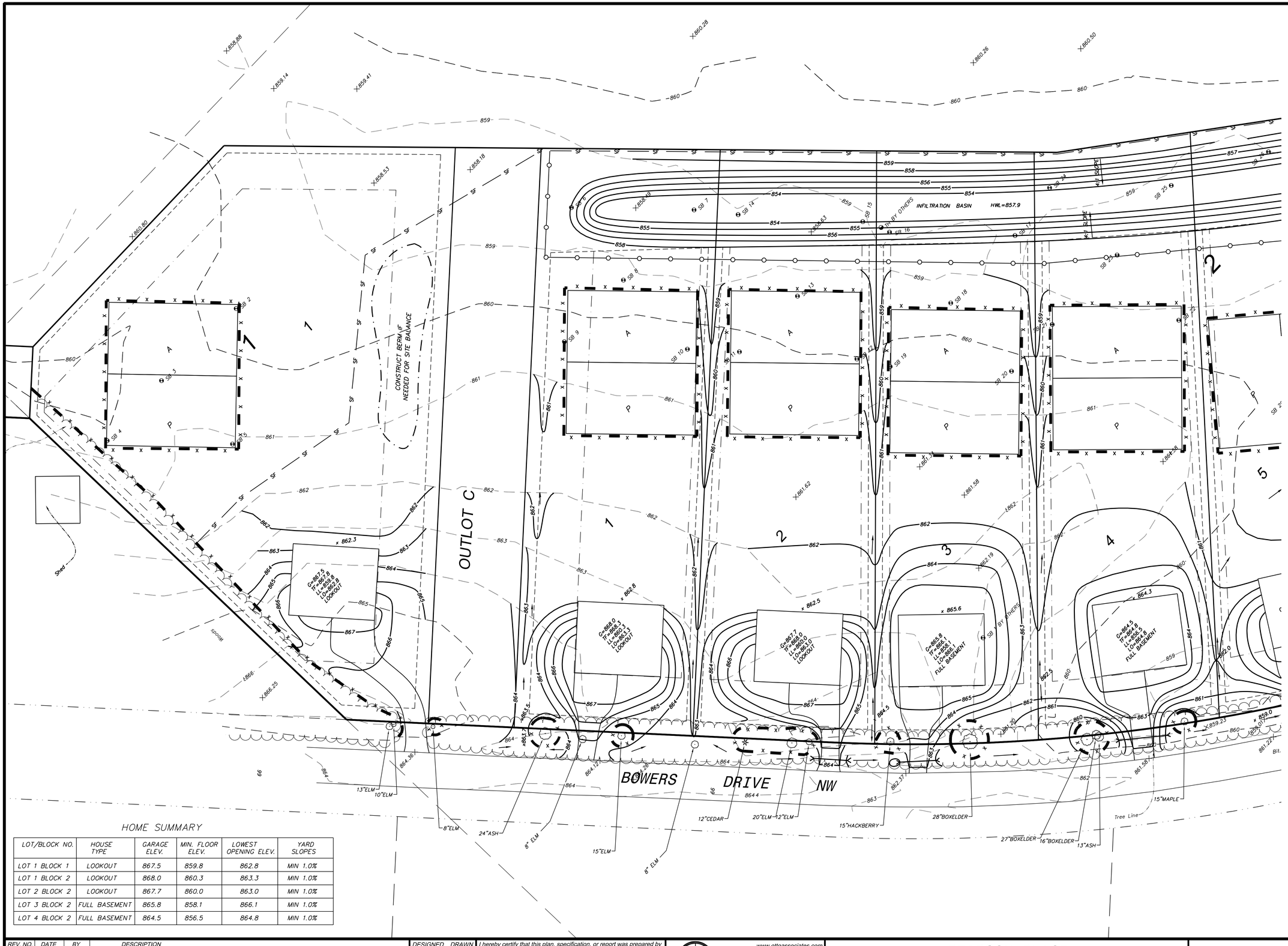
PEARSON PLACE
DEVELOPMENT CONSULTING SERVICES, LLC
RAMSEY, MN

COVER SHEET

SHEET NO. 1 OF 6 SHEETS

PROJECT NO: 17-0145

DATE: 9/15/17



0 30 60 Feet

LEGEND

- denotes proposed future driveway culvert
- 862 denotes Existing Contour
- 862.00 × denotes Existing Spot Elevation
- × 862.5 denotes Proposed Spot Elevation
- 862 denotes Proposed Contour
- ST denotes Proposed Storm Sewer
- x x denotes Proposed Construction Fencing
- SF denotes pre-grading silt fence
- denotes post-grading silt fence
- denotes Soil Boring
- denotes Test Hole
- denotes Building Setback Line (Front = 40' Side = 10' Side (Corner Lot) = 40' Rear = 30')
- denotes Drainage & Utility Easement
- P denotes Proposed 50' x 90' Primary Septic Area
- A denotes Proposed 50' x 90' Alternate Septic Area

OUTSIDE GRADE ELEV → ×855.8
GARAGE ELEV → G=861.0
TOP OF FOUNDATION ELEV → TF=861.3
LOW LEVEL ELEV → LL=853.3
LOW OPENING ELEV → LO=856.3
HOUSE TYPE → LOOKOUT

NOTE: 60'x50' HOUSE PAD AREA SHOWN

HOUSE PAD DETAIL

HOME SUMMARY

LOT/BLOCK NO.	HOUSE TYPE	GARAGE ELEV.	MIN. FLOOR ELEV.	LOWEST OPENING ELEV.	YARD SLOPES
LOT 1 BLOCK 1	LOOKOUT	867.5	859.8	862.8	MIN 1.0%
LOT 1 BLOCK 2	LOOKOUT	868.0	860.3	863.3	MIN 1.0%
LOT 2 BLOCK 2	LOOKOUT	867.7	860.0	863.0	MIN 1.0%
LOT 3 BLOCK 2	FULL BASEMENT	865.8	858.1	866.1	MIN 1.0%
LOT 4 BLOCK 2	FULL BASEMENT	864.5	856.5	864.8	MIN 1.0%

NOTES:
1. CONSTRUCTION FENCING SHALL BE INSTALLED AROUND SEPTIC SITES PRIOR TO ANY GRADING ACTIVITIES BY DEVELOPER OR HOMEBUILDER TO PREVENT DISTURBANCE.
2. ALL DISTURBED AREAS MUST BE SEEDED AND MULCHED WITHIN 7 DAYS AFTER SURFACE DISTURBANCE CEASES.

PRIOR TO ANY EXCAVATION THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL UNDERGROUND UTILITIES.
CALL 48 HOURS BEFORE DIGGING:
GOPHER STATE ONE CALL:
TWIN CITY AREA 651-454-0002
MN TOLL FREE 1-800-252-1166

REV. NO.	DATE	BY	DESCRIPTION

DESIGNED CSO DRAWN CSO CHECKED

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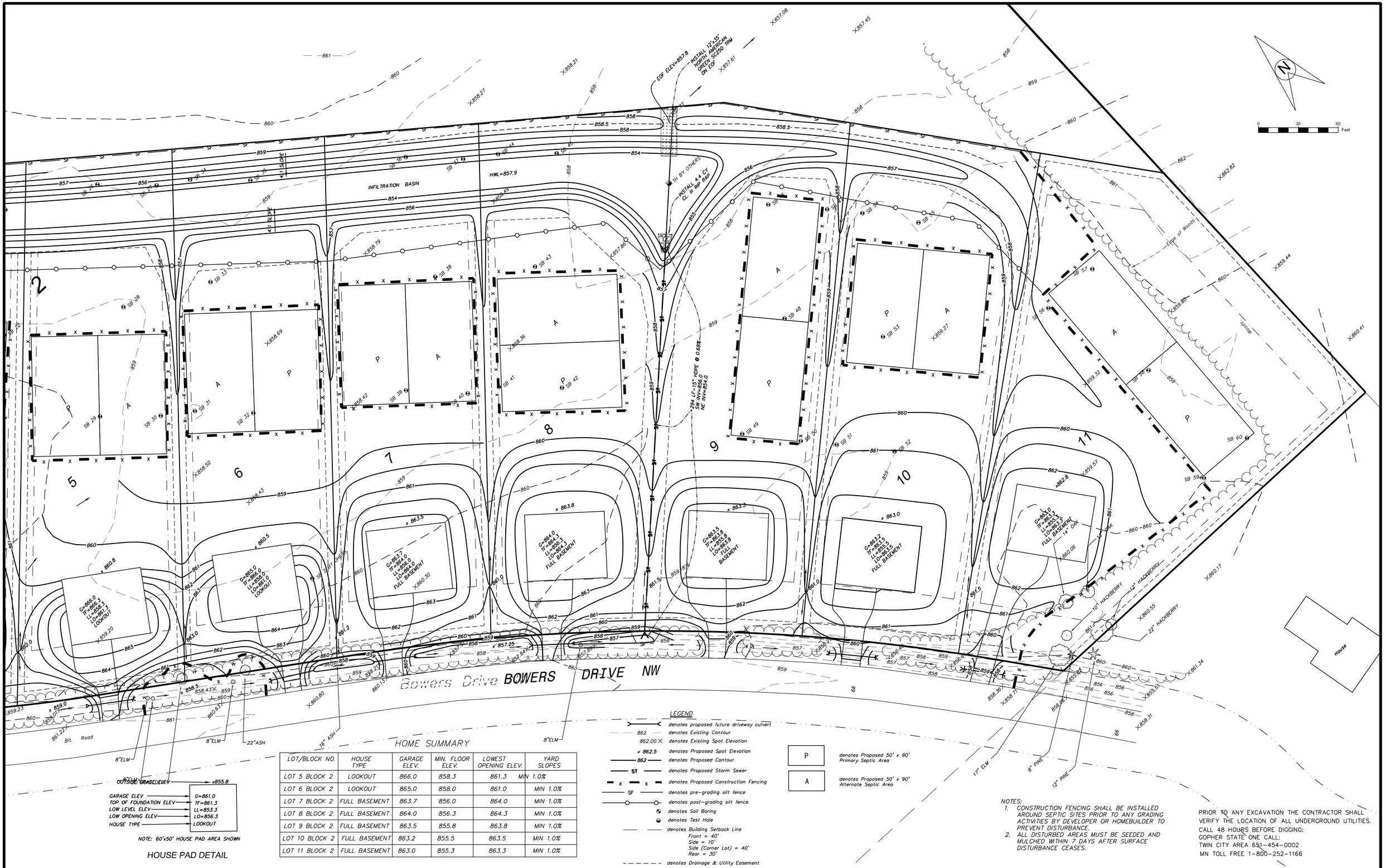
PEARSON PLACE
DEVELOPMENT CONSULTING SERVICES, LLC
RAMSEY, MN

GRADING PLAN - WEST

PROJECT NO: 17-0145

SHEET NO. 2 OF 6 SHEETS

DATE: 9/15/17



NOTE: 60'x50' HOUSE PAD AREA SHOWN

HOUSE PAD DETAIL

HOME SUMMARY

LOT/BLOCK NO.	HOUSE TYPE	GARAGE ELEV.	MIN. FLOOR ELEV.	LOWEST OPENING ELEV.	YARD SLOPES
LOT 5 BLOCK 2	LOOKOUT	866.0	858.3	861.3	MIN 1.0%
LOT 6 BLOCK 2	LOOKOUT	865.0	858.0	861.0	MIN 1.0%
LOT 7 BLOCK 2	FULL BASEMENT	863.7	856.0	864.0	MIN 1.0%
LOT 8 BLOCK 2	FULL BASEMENT	864.0	856.3	864.3	MIN 1.0%
LOT 9 BLOCK 2	FULL BASEMENT	863.5	855.8	863.8	MIN 1.0%
LOT 10 BLOCK 2	FULL BASEMENT	863.2	855.5	863.5	MIN 1.0%
LOT 11 BLOCK 2	FULL BASEMENT	863.0	855.3	863.3	MIN 1.0%

LEGEND

- denotes proposed future driveway culvert
- 862 — denotes Existing Contour
- 862.00 X — denotes Existing Spot Elevation
- x 862.5 — denotes Proposed Spot Elevation
- 862 — denotes Proposed Contour
- ST — denotes Proposed Storm Sewer
- x x — denotes Proposed Construction Fencing
- SF — denotes pre-grading silt fence
- denotes post-grading silt fence
- denotes Soil Boring
- denotes Test Hole
- denotes Building Setback Line
  - Front = 40'
  - Side = 10'
  - Side (Corner Lot) = 40'
  - Rear = 30'
- denotes Drainage & Utility Easement

P — denotes Proposed 50' x 90' Primary Septic Area

A — denotes Proposed 50' x 90' Alternate Septic Area

NOTES:
1. CONSTRUCTION FENCING SHALL BE INSTALLED AROUND SEPTIC SITES PRIOR TO ANY GRADING ACTIVITIES BY DEVELOPER OR HOMEBUILDER TO PREVENT DISTURBANCE.
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MN TOLL FREE 1-800-252-1166

REV. NO.	DATE	BY	DESCRIPTION

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Cara M. Schwahn Otto
License # 40433 Date: 9-15-17

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PEARSON PLACE

DEVELOPMENT CONSULTING SERVICES, LLC
RAMSEY, MN

GRADING PLAN - EAST

SHEET NO. 3 OF 6 SHEETS

PROJECT NO: 17-0145

DATE: 9/15/17

REV. NO.	DATE	BY	DESCRIPTION

DESIGNED CSO DRAWN CSO CHECKED

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Cara M. Schwahn Otto
License # 40433 Date: 9/15/17

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PEARSON PLACE
DEVELOPMENT CONSULTING SERVICES, LLC
RAMSEY, MN

STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

SHEET NO. 4 OF 6 SHEETS

PROJECT NO: 17-0145

DATE: 9/15/17

GENERAL PROJECT INFORMATION

PROJECT LOCATION AND NARRATIVE:

THIS PROJECT CONSISTS OF A 12 LARGE LOT SUBDIVISION IN RAMSEY, MN. THE CENTER OF THE SITE IS LOCATED NEAR LONGITUDE -93.4887, LATITUDE 45.2317. THE SITE IS ACCESSED FROM BOWERS DRIVE NW. NO ROAD CONSTRUCTION IS PROPOSED SINCE ALL LOTS WILL ACCESS OFF THE EXISTING BOWERS DRIVE.

SOILS CONSIST PRIMARILY OF BECKER FINE SANDY LOAM AND DICKMAN SANDY LOAM. THE SITE IS CURRENTLY FARMED AND DRAINS TO THE NORTHEAST.

CONSTRUCTION ACTIVITIES INCLUDE PAD GRADING, INFILTRATION BASIN CONSTRUCTION, STORM SEWER INSTALLATION AND BUILDING CONSTRUCTION.

EXISTING DRAINAGE RATES ARE TO BE REDUCED DUE TO THE CONSTRUCTION OF AN INFILTRATION BASIN.

CONSTRUCTION IS PLANNED TO BEGIN IN THE FALL OF 2017, WITH BUILDING CONSTRUCTION ANTICIPATED TO EXTEND INTO 2019.

RESPONSIBLE PARTIES:

CONTRACTOR AND OWNER ARE REQUIRED TO APPLY FOR A NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL STORMWATER PERMIT FOR CONSTRUCTION ACTIVITY AT LEAST 7 DAYS PRIOR TO BEGINNING WORK.

CONTRACTOR AND OWNER SHALL IDENTIFY A PERSON KNOWLEDGEABLE AND EXPERIENCED IN THE APPLICATION OF EROSION PREVENTION AND SEDIMENT CONTROL BMP'S WHO WILL OVERSEE THE IMPLEMENTATION OF THE SWPPP.

CONTRACTOR MUST BE TRAINED FOR BOTH CONSTRUCTION INSTALLER AND SITE MANAGEMENT PER REQUIREMENTS OF THE PERMIT, PART III.F.

DEVELOPMENT CONSULTING SERVICES, LLC	JOHN DOBBS	612-747-1463
OWNER	CONTACT PERSON	PHONE

OTTO ASSOCIATES, INC.	CARA SCHWAHN OTTO	763-682-4727
PLAN PREPARER	CONTACT PERSON	PHONE

TRAINING: 1/20/2016 (EXPIRES 2019) U OF MN CERTIFICATION - DESIGN OF CONSTRUCTION SWPPP
3/29/2017 (EXPIRES 2020) U OF MN CERTIFICATION - CONSTRUCTION SITE MANAGEMENT

TO BE DETERMINED		
CONTRACTOR (RESPONSIBLE FOR INSTALLATION & INSPECTION)	CONTACT PERSON	PHONE

PROJECT AREAS:

TOTAL PROJECT SIZE (DISTURBED AREA) = 14.5 ACRES

EXISTING AREA OF IMPERVIOUS SURFACE = 0.37 ACRES
POST-CONSTRUCTION AREA OF IMPERVIOUS SURFACE = 1.75 ACRES

STORMWATER MANAGEMENT:

WATER QUALITY VOLUME = 1.38 AC. X 1" = 5,009 CF
AN INFILTRATION BASIN IS PROPOSED ALONG THE NORTHERN PORTION OF THE SITE. THE PROPOSED INFILTRATION BASIN VOLUME IS 148,844 CF

RECEIVING WATERS:

SURFACE WATERS AND WETLANDS THAT WILL RECEIVE STORM WATER RUNOFF FROM THE SITE AND ARE WITHIN ONE (1) MILE OF THE SITE ARE INDICATED WITH DIRECTION ARROW ON THE SWPPP PLAN SHEET AND ARE LISTED BELOW:

NAME OF WATER BODY	TYPE OF IMPAIRMENT
MISSISSIPPI RIVER	NONE

THE OWNER SHALL SUBMIT A NOTICE OF TERMINATION (NOT) AFTER ONE OF THE FOLLOWING HAS BEEN COMPLETED, WHICHEVER OCCURS FIRST.

1. WITHIN 30 DAYS AFTER FINAL STABILIZATION IS COMPLETE.
2. WITHIN 30 DAYS AFTER SELLING OR OTHERWISE LEGALLY TRANSFERRING THE ENTIRE SITE.

ALTERNATIVELY, THE OWNER MAY SUBMIT A PERMIT MODIFICATION FORM FOR EACH LOT AS LOTS ARE SOLD. THE NEW OWNER/CONTRACTOR SHALL BE RESPONSIBLE FOR AMENDING THE SWPPP AS NECESSARY TO SPECIFICALLY ADDRESS THEIR WORK AND SUBMIT A NOTICE OF TERMINATION (NOT) ACCORDING TO THE SAME REQUIREMENTS ABOVE.

CONSTRUCTION ACTIVITY NOTES

ALL CONSTRUCTION ACTIVITIES MUST MEET THE REQUIREMENTS OF THE MPCA'S NPDES GENERAL STORMWATER PERMIT FOR CONSTRUCTION ACTIVITY.

EROSION PREVENTION:

ALL EXPOSED SOIL AREAS (INCL. STOCKPILES) MUST BE STABILIZED. STABILIZATION MUST BE INITIATED IMMEDIATELY TO LIMIT SOIL EROSION BUT COMPLETED NO CASE LATER THAN 7 DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE HAS TEMPORARILY OR PERMANENTLY CEASED.

TEMPORARY TURF RESTORATION SHALL BE MNDOT SEED MIX 25-131 @ 59 LB/ACRE WITH MNDOT TYPE 1 MULCH @ 2 TONS/ACRE (DISC ANCHORED) AND 22-5-10 TYPE 3 FERTILIZER (350 LBS/ACRE).

INFILTRATION BASIN SHALL BE SEEDED WITH MNDOT SEED MIX 33-262 (BANKS) & 34-262 (BOTTOM) WITH CAT 7 EROSION CONTROL BLANKET.

PERMANENT TURF RESTORATION AFTER HOME BUILDING SHALL BE MNDOT SEED MIX 25-151 OR SOD.

THE FOLLOWING SHALL BE INSTALLED WITHIN 24 HOURS OF CONNECTION TO SURFACE WATER:

1) ENERGY DISSIPATION (RIPRAP) AT ALL OUTLET APRONS

2) STABILIZATION OF THE NORMAL WETTED PERIMETER OF ANY TEMPORARY OR PERMANENT DRAINAGE SWALES WITHIN 200' OF EDGE OF SITE OR CONNECTION TO SURFACE WATER

SEDIMENT CONTROL PRACTICES:

THE CONTRACTOR SHALL BE RESPONSIBLE TO CONTROL SEDIMENT-LADEN SURFACE WATER FROM LEAVING THE CONSTRUCTION ZONE. ALL MOBILIZED SEDIMENT THAT HAS LEFT THE CONSTRUCTION ZONE SHALL BE COLLECTED BY THE CONTRACTOR AND PROPERLY DISPOSED OF AT NO ADDITIONAL COST TO THE OWNER.

ENTERING/EXITING THE SITE SHALL OCCUR ONLY AT ROCK CONSTRUCTION ENTRANCE TO LIMIT TRACKING OF SEDIMENT ONTO STREETS.

SEDIMENT TRACKED ONTO STREETS DURING WORKING HOURS MUST BE RECLAIMED VIA SCRAPING AND SWEEPING AT END OF EACH WORKING DAY.

TEMPORARY SOIL STOCKPILES SHALL HAVE SILT FENCE OR OTHER EFFECTIVE SEDIMENT CONTROLS INSTALLED AROUND THE PERIMETER.

CONSTRUCTION SEQUENCING:

1) PRECONSTRUCTION MEETING.
2) INSTALL PERIMETER SILT FENCE & ROCK ENTRANCE.
3) ROUGH GRADE SITE.
4) INSTALL POST-GRADING SILT FENCE TO PROTECT INFILTRATION BASIN.
5) INSTALL STORM SEWER PIPE.
6) STABILIZE THE SITE AS INDICATED ON THE PLANS & ACCORDING TO PERMIT TIMELINES.
7) PRIVATE UTILITY INSTALLATION.
8) AFTER 70% VEGETATIVE DENSITY, TRANSER PERMIT TO HOMEBUILDER OR SUBMIT NOTICE OF TERMINATION (NOT) TO MPCA.

EROSION & SEDIMENT CONTROL BMP ESTIMATED QUANTITIES:

QUANTITIES LISTED ARE APPROXIMATE.

BMP	QUANTITY
ROCK CONSTRUCTION ENTRANCE	1 EACH
MNDOT SEED MIX 25-131, TYPE 1 MULCH, 22-5-10 TYPE 3 FERTILIZER	9.0 AC
MNDOT SEED MIX 33-262 W/MNDOT 3885 CAT 7 BLANKET	5240 SY
MNDOT SEED MIX 34-262 W/MNDOT 3885 CAT 7 BLANKET	2345 SY
SILT FENCE	3000 SF
MNDOT 3885 CAT 3 EROSION CONTROL BLANKET	1412 SY
CL. III RIP RAP	4.4 CY
NORTH AMERICAN GREEN SC250 TRM	420 SF

CONSTRUCTION NOTES

INSPECTIONS AND MAINTENANCE:

THE CONTRACTOR MUST ROUTINELY INSPECT THE CONSTRUCTION SITE ONCE EVERY SEVEN (7) DAYS DURING ACTIVE CONSTRUCTION AND WITHIN 24 HOURS OF A RAINFALL EVENT GREATER THAN 0.5 INCHES IN A 24-HR PERIOD. INSPECTION LOGS SHALL INCLUDE ANY CORRECTIVE MEASURES TAKEN.

ALL INSPECTIONS MUST BE RECORDED AND RECORDS RETAINED WITH THE SWPPP ON SITE. THE SWPPP, ALONG WITH INSPECTIONS AND MAINTENANCE RECORDS, SHALL BE RETAINED FOR THREE YEARS AFTER SUBMITTAL OF THE NOTICE OF TERMINATION (NOT).

SILT FENCE MUST BE MAINTAINED WHEN ACCUMULATED SEDIMENT REACHES 1/3 OF THE DEVICE HEIGHT.

ROCK CONSTRUCTION ENTRANCE SHALL BE CLEANED AND REFRESHED AS NECESSARY TO CONFORM TO DETAIL.

OFF-SITE VEHICLE TRACKING SHALL BE REMOVED WITHIN 24 HOURS OF DISCOVERY.

ALL NON-FUNCTIONAL BMP'S MUST BE REPAIRED, REPLACED, OR SUPPLEMENTED WITH FUNCTIONAL BMP'S WITHIN 24 HOURS OF DISCOVERY, OR AS SOON AS FIELD CONDITIONS ALLOW ACCESS.

POLLUTION PREVENTION:

ALL SOLID WASTE GENERATED BY/COLLECTED FROM THE CONSTRUCTION SITE MUST BE DEPOSITED IN A DUMPSTER.

NO CONSTRUCTION MATERIAL SHALL BE BURIED OR BURNED ONSITE.

ALL HAZARDOUS MATERIALS (OIL, GASOLINE, FUEL, PAINT, ETC) MUST BE PROPERLY STORED/CONTAINED TO PREVENT SPILLS, LEAKS OR OTHER DISCHARGE. STORAGE AND DISPOSAL OF HAZARDOUS WASTE MUST BE IN COMPLIANCE WITH ALL APPLICABLE STATE AND FEDERAL REGULATIONS. ALL VEHICLES LEFT ONSITE SHALL BE MONITORED FOR LEAKS TO REDUCE THE CHANCE OF CONTAMINATION.

EXTERNAL WASHING OF TRUCKS OR OTHER CONSTRUCTION VEHICLES, ENGINE DEGREASING, NOR CONCRETE WASHOUTS ARE ALLOWED ON SITE. TRUCKS ARE TO USE SELF-CONTAINED WASHOUT SYSTEM.

THE CONTRACTOR SHALL MONITOR AND PROVIDE DUST CONTROL CORRECTION WHEN NEEDED.

ALL SPILLS SHALL BE CLEANED IMMEDIATELY UPON DISCOVERY. SPILLS LARGE ENOUGH TO REACH THE STORM CONVEYANCE SYSTEM SHALL BE REPORTED TO THE MPCA STATE DUTY OFFICER AT 1-800-422-0798.

FINAL STABILIZATION:

THE CONTRACTOR MUST ENSURE FINAL STABILIZATION OF THE SITE. THE PERMITEE MUST SUBMIT A NOTICE OF TERMINATION WITHIN 30 DAYS AFTER FINAL STABILIZATION IS COMPLETE OR SITE CONTROL HAS BEEN PASSED TO ANOTHER OWNER.

SUFFICIENT TOPSOIL (6") SHALL BE PLACED ON DISTURBED AREAS FOR RE-VEGETATION.

ALL TEMPORARY EROSION CONTROL MEASURES AND BMP'S MUST BE REMOVED AS PART OF THE FINAL SITE STABILIZATION.

TRAINING REQUIREMENTS:

CONTRACTOR MUST BE TRAINED FOR BOTH CONSTRUCTION INSTALLER AND SITE MANAGEMENT PER REQUIREMENTS OF THE PERMIT, PART III.F. DOCUMENTATION SHALL BE ADDED TO THE SWPPP DOCUMENTS LOCATED ONSITE.

REV. NO.	DATE	BY	DESCRIPTION

DESIGNED CSO DRAWN CSO
CHECKED

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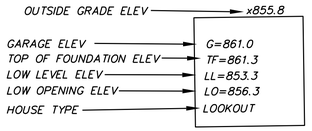
PEARSON PLACE
DEVELOPMENT CONSULTING SERVICES, LLC
RAMSEY, MN

STORMWATER POLLUTION PREVENTION PLAN NARRATIVE

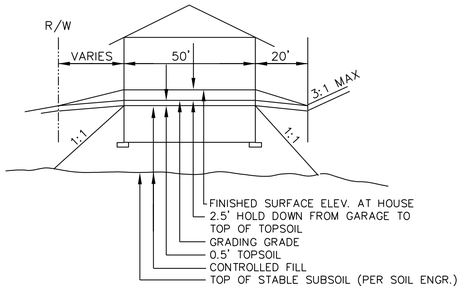
PROJECT NO: 17-0145

DATE: 9/15/17

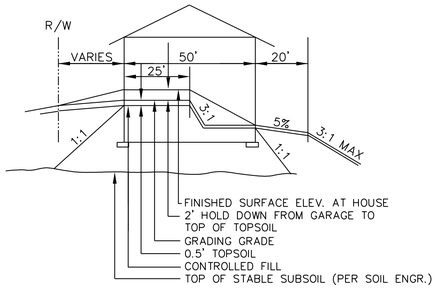


NOTE: 60'x50' HOUSE PAD AREA SHOWN

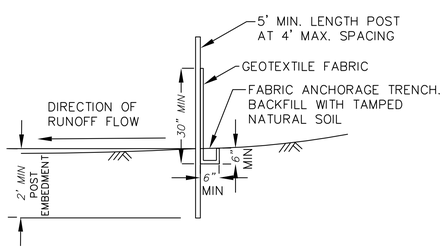
HOUSE PAD DETAIL



TYPICAL RAMBLER/FULL BASEMENT (FB)

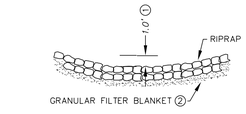


TYPICAL FULL BASEMENT
W/LOOKOUT WINDOWS (LO)

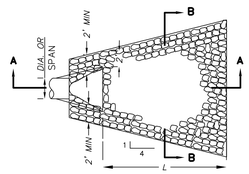


SILT FENCE DETAIL

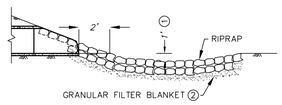
—SF—SF—SF— DENOTES SILT FENCE



SECTION B–B



PLAN



SECTION A–A

TABLE OF QUANTITIES

RIPRAP AT HDPE OUTLETS

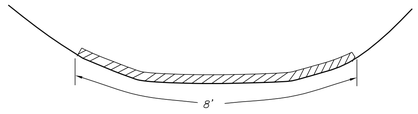
DIA. OF ROUND PIPE (IN.)	L (FT.)	CLASS II d_{50}= 6" 12" DEPTH RIPRAP (CU.YD.)	CLASS II d_{50}= 6" 6" DEPTH GRANULAR FILTER (CU.YD.)	CLASS III d_{50}= 9" 18" DEPTH RIPRAP (CU.YD.)	CLASS III d_{50}= 9" 9" DEPTH GRANULAR FILTER (CU.YD.)	CLASS VI d_{50}= 12" 24" DEPTH RIPRAP (CU.YD.)	CLASS VI d_{50}= 12" 12" DEPTH GRANULAR FILTER (CU.YD.)
12	8	2.8	1.4	4.1	2.1	5.5	2.8
15	8	2.9	1.5	4.4	2.2	5.8	2.9
18	10	3.9	2.0	5.9	3.0	7.8	3.9
21	10	4.2	2.1	6.3	3.2	8.4	4.2
24	12	5.5	2.8	8.3	4.2	11.0	5.5
27	12	5.8	2.9	8.7	4.4	11.6	5.8
30	14	7.3	3.7	10.9	5.5	14.5	7.3
36	16	9.2	4.6	13.8	6.9	18.3	9.2
42	18	10.9	5.5	16.3	8.2	21.7	10.9
48	20	12.9	6.5	19.4	9.7	25.8	12.9

NOTES:
REQUIREMENTS FOR RIPRAP SIZE AND THICKNESS AND FILTER BLANKET WILL BE DESIGNATED IN THE PLANS.

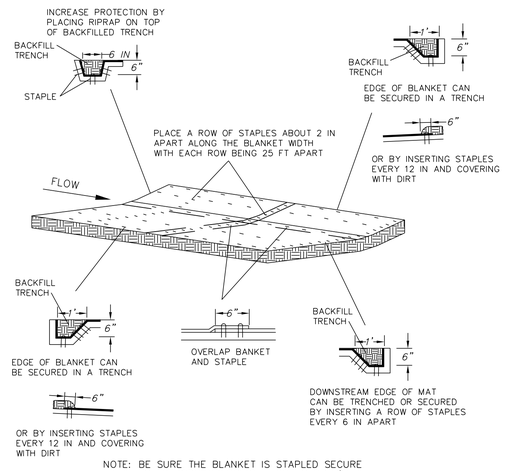
① FOR PIPES GREATER THAN OR EQUAL TO 30", USE 1.5'.

② THE CONTRACTOR, AT HIS OPTION, MAY SUBSTITUTE A GEOTEXTILE FABRIC, SPEC. 3601, FOR THE GRANULAR FILTER BLANKET UNLESS OTHERWISE SPECIFIED IN THE PLANS. THE FABRIC SHOULD COVER THE AREA OF THE RIPRAP AND EXTEND UNDER THE CULVERT APRON 3 FT.

RIPRAP AT HDPE OUTLETS

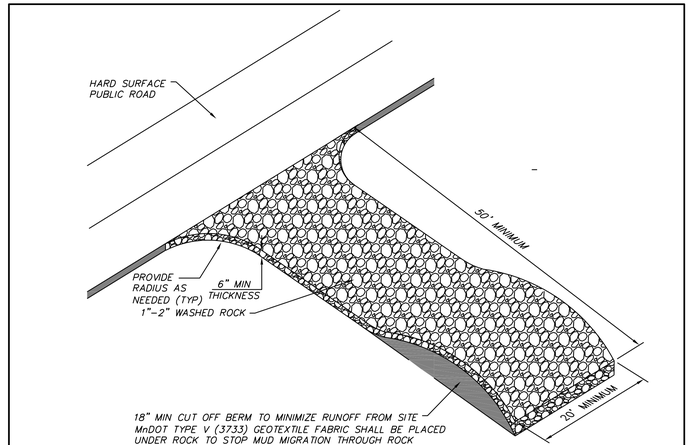


8' WIDE BLANKET IN DITCH BOTTOM

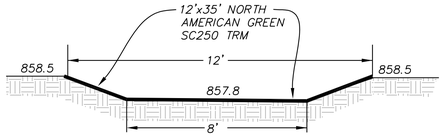


NOTE: BE SURE THE BLANKET IS STAPLED SECURE TO THE GROUND USING MANUFACTURER'S SPECIFICATIONS.

MN/DOT 3885 CAT. 3
EROSION CONTROL BLANKET
(DITCH INSTALLATION)



ROCK CONSTRUCTION ENTRANCE
NOT TO SCALE



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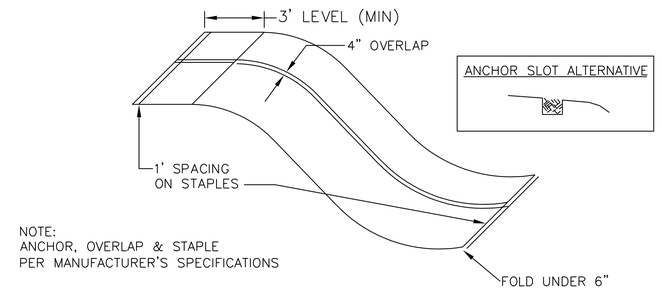


EROSION CONTROL BLANKET INSTALLATION
(SLOPE INSTALLATION)

REV. NO.	DATE	BY	DESCRIPTION

DESIGNED CSO DRAWN CSO
CHECKED

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.

Cara M. Schwahn Otto
License # 40433 Date: 9–15–17

OTTO ASSOCIATES
Engineers & Land Surveyors, Inc.
www.ottoassociates.com
9 West Division Street
Buffalo, MN 55313
(763)682-4727
Fax: (763)682-3522

PEARSON PLACE
DEVELOPMENT CONSULTING SERVICES, LLC
RAMSEY, MN

DETAILS

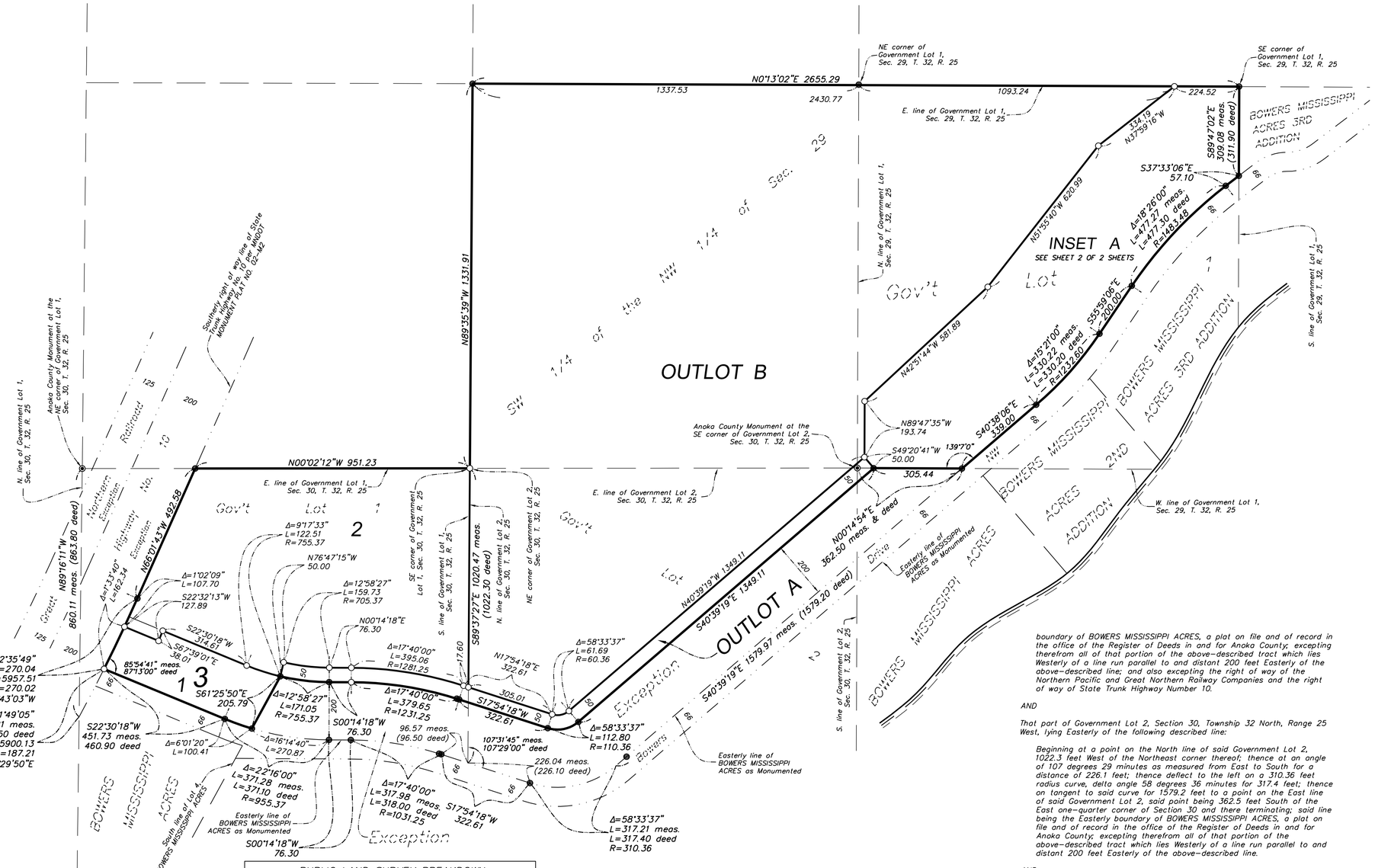
SHEET NO. 6 OF 6 SHEETS

PROJECT NO: 17-0145

DATE: 9/15/17

PEARSON PLACE

CITY OF RAMSEY
COUNTY OF ANOKA
SEC. 29 & 30, TWP. 32, RNG. 25



STATE OF MINNESOTA
COUNTY OF _____

This instrument was acknowledged before me this _____ day of _____, 20_____ by _____, _____ of Development Consulting Services, LLC, a limited liability company, on behalf of the company.

_____

_____

Notary Public, _____County, Minnesota.

My Commission Expires: _____

I Paul E. Otto 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_____.

_____
Paul E. Otto, Licensed Land Surveyor
Minnesota License Number 40062

STATE OF MINNESOTA
COUNTY OF WRIGHT

This instrument was acknowledged before me on this _____ day of _____, 20_____ by Paul E. Otto.

_____

_____

Notary Public, _____County, Minnesota

My commission expires _____

CITY COUNCIL, CITY OF RAMSEY, MINNESOTA

This plat of PEARSON PLACE was approved and accepted by the City Council of the City of Ramsey, 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.

City Council, City of Ramsey, Minnesota

By _____ Mayor By _____ Clerk

COUNTY SURVEYOR

I hereby certify that in accordance with Minnesota Statutes, Section 505.021, Subd. 11, this plat has been reviewed and approved this _____ day of _____, 20_____.

By: _____
Larry D. Hoium
Anoka County Surveyor

COUNTY AUDITOR/TREASURER

Pursuant to Minnesota Statutes, Section 505.021, Subd. 9, taxes payable in the year 20_____on the land hereinbefore described hove been paid. Also, pursuant to Minnesota Statutes, Section 272.12, there are no delinquent taxes and transfer entered this _____day of _____, 20_____.

_____
Property Tax Administrator

By: _____, Deputy

COUNTY RECORDER/REGISTRAR OF TITLES
COUNTY OF ANOKA, STATE OF MINNESOTA

I hereby certify that this plat of PEARSON PLACE was filed in the office of the County Recorder/Registrar of Titles for public record on this _____ day of _____, 20_____, at _____ o'clock __M. and was duly recorded as Document Number _____.

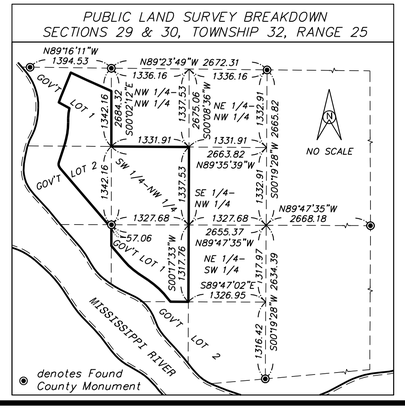
_____
County Recorder/Registrar of Titles

By _____, Deputy

Bearing Note:
The East line of Government Lot 1, Section 30, Township 32, Range 25, Anoka County, Minnesota, is assumed to bear N00°02'12"W.

- ● denotes iron monument found
- ○ denotes 1/2 inch by 14 inch iron pipe set and marked by License number 40062.
- ◉ denotes found Anoka County Cast Iron Monument unless otherwise noted.

PUBLIC LAND SURVEY BREAKDOWN
SECTIONS 29 & 30, TOWNSHIP 32, RANGE 25



KNOW ALL PERSONS BY THESE PRESENTS: That Development Consulting Services, LLC, a limited liability company, fee owner of the following described property, situated in the County of Anoka, to wit:

The Southwest Quarter of the Northwest Quarter of Section 29, Township 32 North, Range 25 West, Anoka County, Minnesota.

AND

That part of Government Lot 1, Section 30, Township 32 North, Range 25 West, lying Easterly of the following described line:

Beginning at a point on the North line of said Government Lot 1, 863.8 feet West of the Northeast corner thereof, said point being at the intersection of said North line and the Southerly right of way line of State Trunk Highway Number 10, the same as now located and established; thence Southeasterly along the said Southerly right of way line, same being on a 00 degrees 58 minutes 15 seconds curve, for 185.5 feet; thence run Southwesterly at an angle of 87 degrees 13 minutes with the tangent of said curve at said point, for 460.9 feet; thence deflect to the left on a 955.37 feet radius curve, delta angle 22 degrees 16 minutes, for 371.1 feet; thence on tangent to said curve for 76.3 feet; thence deflect to the right on a 1031.25 feet radius curve, delta angle 17 degrees 40 minutes, for 318.0 feet; thence on tangent to said curve for 96.5 feet to a point on the South line of Government Lot 1, said point being 1022.3 feet West of the Southeast corner thereof, and there terminating; said line being the Easterly boundary of BOWERS MISSISSIPPI ACRES, a plat on file and of record in the office of the Register of Deeds in and for Anoka County; excepting therefrom all of that portion of the above-described tract which lies Westerly of a line run parallel to and distant 200 feet Easterly of the above-described line; and also excepting the right of way of the Northern Pacific and Great Northern Railway Companies and the right of way of State Trunk Highway Number 10.

AND

That part of Government Lot 2, Section 30, Township 32 North, Range 25 West, lying Easterly of the following described line:

Beginning at a point on the North line of said Government Lot 2, 1022.3 feet West of the Northeast corner thereof; thence at an angle of 107 degrees 29 minutes as measured from East to South for a distance of 226.1 feet; thence deflect to the left on a 310.36 feet radius curve, delta angle 58 degrees 36 minutes for 317.4 feet; thence on tangent to said curve for 1579.2 feet to a point on the East line of said Government Lot 2, said point being 362.5 feet South of the East one-quarter corner of Section 30 and there terminating; said line being the Easterly boundary of BOWERS MISSISSIPPI ACRES, a plat on file and of record in the office of the Register of Deeds in and for Anoka County; excepting therefrom all of that portion of the above-described tract which lies Westerly of a line run parallel to and distant 200 feet Easterly of the above-described line.

AND

That part of Government lot 1, Section 29, Township 32 North, Range 25 West, lying Northerly and Easterly of the following described line:

Beginning at a point on the West line of said Government Lot 1, 362.5 feet South of the Northwest corner thereof; thence at an angle of 139 degrees 7 minutes measured from North to East for a distance of 339.0 feet; thence deflect to the left on a 1232.6 feet radius curve, delta angle 15 degrees 21 minutes, for 330.2 feet; thence on tangent to said curve for 200.0 feet; thence deflect to the right on a 1483.48 feet radius curve, delta angle 18 degrees 26 minutes, for 477.3 feet; thence on tangent to said curve for 57.1 feet to a point on the South line of said Government Lot 1, said point being 311.9 feet West of the Southeast corner thereof, and there terminating.

Has caused the same to be surveyed and platted as PEARSON PLACE and does hereby dedicate to the public for public use the public ways and the drainage and utility easements as shown on this plat. Also dedicating to the State of Minnesota the right of access onto Minnesota State Highway No. 10 as shown on this plat.

In witness whereof said Development Consulting Services, LLC, a limited liability company, has caused these presents to be signed by its proper officer this _____ day of _____, 20_____.

DEVELOPMENT CONSULTING SERVICES, LLC

_____

_____

_____, _____

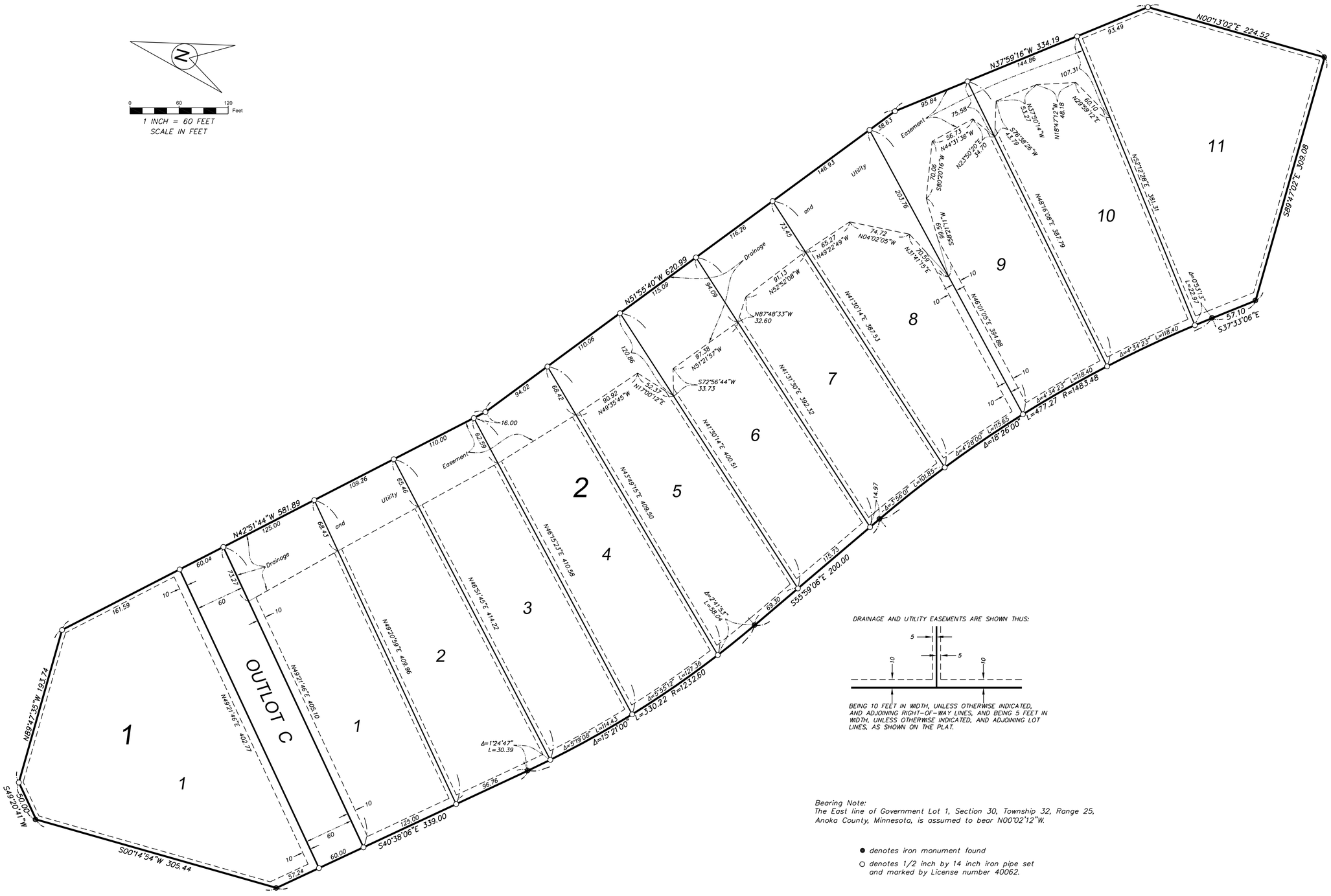
OTTO ASSOCIATES
Engineers & Land Surveyors, Inc.

PEARSON PLACE

INSET A

CITY OF RAMSEY
COUNTY OF ANOKA
SEC. 29 & 30, TWP. 32, RNG. 25

1 INCH = 60 FEET
SCALE IN FEET



DRAINAGE AND UTILITY EASEMENTS ARE SHOWN THUS:

BEING 10 FEET IN WIDTH, UNLESS OTHERWISE INDICATED, AND ADJOINING RIGHT-OF-WAY LINES, AND BEING 5 FEET IN WIDTH, UNLESS OTHERWISE INDICATED, AND ADJOINING LOT LINES, AS SHOWN ON THE PLAT.

Bearing Note:
The East line of Government Lot 1, Section 30, Township 32, Range 25, Anoka County, Minnesota, is assumed to bear N00°02'12"W.

● *denotes iron monument found*

○ *denotes 1/2 inch by 14 inch iron pipe set and marked by License number 40062.*

TTO ASSOCIATES
Engineers & Land Surveyors, Inc.

TREE PRESERVATION PLAN SUMMARY

TOTAL SIGNIFICANT TREES WITHIN CONSTRUCTION LIMITS (DBH)	431"
-SUB-TOTAL SIGNIFICANT TREES TO BE PRESERVED	423"
-SUB-TOTAL SIGNIFICANT TREES TO BE REMOVED	8"
-40% RETAINMENT THRESHHOLD (431" X 0.4)	172.4"
TOTAL TREE REPLACEMENT REQUIRED (DBH IN INCHES)	**0"**

EXISTING ON-SITE TREE SCHEDULE

Tree ID	Common Name	Scientific Name	Remove/Preserve*	Reason for Removal*	Size (DBH)	Condition (1)	Notes
1	American Elm	Ulmus americana	Preserve		13"	3	
2	American Elm	Ulmus americana	Preserve		10"	3	
3	American Elm	Ulmus americana	Preserve		8"	1	
4	Green Ash	Fraxinus pennsylvanica	Preserve		24"	5	
5	American Elm	Ulmus americana	Remove	Driveway Construction	8"	3	
6	American Elm	Ulmus americana	Preserve		15"	5	
7	American Elm	Ulmus americana	Preserve		8"	3	4 Trunks-8",5",4",3"
8	Eastern Red Cedar	Juniperus virginiana	Preserve		12"	5	
9	Siberian Elm	Ulmus siberica	Preserve		20"	3	
10	American Elm	Ulmus americana	Preserve		12"	4	
11	Common Hackberry	Celtis occidentallis	Preserve		15"	3	
12	Box Elder	Acer negundo	Preserve		28"	3	
13	Box Elder	Acer negundo	Preserve		27"	2	
14	Box Elder	Acer negundo	Preserve		16"	2	
15	Green Ash	Fraxinus pennsylvanica	Preserve		13"	2	
16	Silver Maple	Acer saccharinum	Preserve		15"	4	
17	Box Elder	Acer negundo	Preserve		19"	2	
18	Green Ash	Fraxinus pennsylvanica	Preserve		22"	4	
19	Green Ash	Fraxinus pennsylvanica	Preserve		16"	5	
20	American Elm	Ulmus americana	Preserve		8"	3	2 Trunks-8", 5"
21	Red Oak	Quercus rubra	Preserve		14"	3	
22	American Elm	Ulmus americana	Preserve		17"	3	
23	Jack Pine	Pinus banksiana	Preserve		8"	1	
24	Red Pine	Pinus resinosa	Preserve		12"	5	
25	Red Oak	Quercus rubra	Preserve		13"	4	
26	Common Hackberry	Celtis occidentallis	Preserve		12"	5	
27	Common Hackberry	Celtis occidentallis	Preserve		22"	2	
28	Common Hackberry	Celtis occidentallis	Preserve		10"	5	

(1) Tree Condition Classification Criteria

5 - Perfect Specimen. Excelllent form and vigor. No major injuries

4

3 - Average Condition and vigor. May show minor insect, disease, or physiological problems

2

1 - General state of decline. May show severe mechanical, insect, or disease injury, but death not iminent

OUTLOT C

INFILTRATION BASIN HWL=857.9

BOWERS DRIVE NW

Edge of Woods

Woods

#1-13" AMERICAN ELM
#2-10" AMERICAN ELM
#3-8" AMERICAN ELM
#4-24" GREEN ASH
#5-8" AMERICAN ELM
#6-15" AMERICAN ELM
#7-8" AMERICAN ELM
#8-12" EASTERN RED CEDAR
#9-20" SIBERIAN ELM
#10-12" AMERICAN ELM
#11-15" COMMON HACKBERRY
#12-28" BOX ELDER
#13-27" BOX ELDER
#14-16" BOX ELDER
#15-13" GREEN ASH
#16-15" SILVER MAPLE
#17-20" BOX ELDER
#18-22" GREEN ASH
#19-16" GREEN ASH
#20-8" AMERICAN ELM
TREE LINE (TYP.)
#21-14" RED OAK
#22-17" AMERICAN ELM
#23-8" JACK PINE
#24-12" RED PINE
#25-13" RED OAK
#26-12" COMMON HACKBERRY
#27-22" COMMON HACKBERRY
#28-10" COMMON HACKBERRY

LEGEND

- SIGNIFICANT DECIDUOUS TREE (OAKS > 4" DIA., ALL DECIDUOUS TREES > 8" DIA.)
- SIGNIFICANT EVERGREEN TREE (EVERGREENS > 4" DIA.)
- PROPOSED TREE PROTECTION LIMITS
- PROPOSED SIGNIFICANT TREE REMOVAL
- PROPOSED SILVER MAPLE (ACER SACCHARINUM) (TO BE PLANTED WITH HOMEBUILDING)
- PROPOSED BUR OAK (QUERCUS MACROCARPA) (TO BE PLANTED WITH HOMEBUILDING)
- PROPOSED CULVERT

PROPOSED TREE PLANTING SCHEDULE

QTY	SYM	SCIENTIFIC NAME	COMMON NAME	SIZE
12	AS	ACER SACCHARINUM	SILVER MAPLE	2.5" CAL. B&B
12	QM	QUERCUS MACROCARPA	BUR OAK	2.5" CAL. B&B

0 60 120
SCALE FEET

H:\DEVELCON_PR\A13114402\CAD\C3D\Tree Preservation Plan FINAL.dwg 9/18/2017 2:00 PM

BOLTON & MENK
12224 NICOLLET AVENUE
BURNSVILLE, MINNESOTA 55337
Phone: (952) 890-0509
Email: Burnsville@bolton-menk.com
www.bolton-menk.com

REV	ISSUED FOR	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 LANDSCAPE ARCHITECT UNDER THE LAWS OF THE STATE OF MINNESOTA.

JONATHAN D. NELSEN
LIC. NO. 53433 DATE 9-15-2017

DESIGNED JDN
DRAWN JDN
CHECKED JDN

TREE PRESERVATION PLAN

PEARSON PLACE SUBDIVISION

DEVELOPMENT CONSULTING SERVICES, LLC
RAMSEY, MN

SHEET 1 of 1

FACTUAL

GEOTECHNICAL EXPLORATION AND ENGINEERING REVIEW

Pearson Place

North of Bowers Drive

Ramsey

Minnesota

NTI Project No. 17.62064.100

***Prepared For**:*

Development Consulting Services
604 Bielenberg Drive
Woodbury, Minnesota 55125

NTI
NORTHERN TECHNOLOGIES, LLC

6160 Carmen Avenue East
Inver Grove Heights, MN 55076
P: 651.389.4191 F: 651.389.4190

www.NTIgeo.com

Unearthing confidence™

September 15, 2017

Development Consulting Services
604 Bielenberg Drive
Woodbury, Minnesota 55125

Attention: Mr. John Dobbs

Subject: Factual Geotechnical Exploration and Engineering Review
Pearson Place
Ramsey, Minnesota
NTI Project No. 17.62064.100

Dear Mr. Dobbs,

In accordance with your request and subsequent authorization, Northern Technologies, LLC (NTI) conducted a Geotechnical Exploration for the above referenced project. Our services included advancement of exploration hand auger probes, two (2) Double-Ring Infiltrometer tests, and the preparation of a factual engineering report with the results of our fieldwork. Our work was performed in general accordance with our proposal dated May 11, 2017.

Soil samples obtained at the site will be held for 60 days at which time they will be discarded. Please advise us in writing if you wish to have us retain them for a longer period. You will be assessed an additional fee if soil samples are retained beyond 60 days.

We appreciate the opportunity to have been of service on this project. If there are any questions regarding the soils explored or our review and recommendations, please contact us at your convenience at (651) 389-4191.

Northern Technologies, LLC

Richard Jett, E.I.T.
Graduate Engineer

Steven D. Gerber, P.E.
Senior Engineer

Contents

1.0 INTRODUCTION

1.1 Site / Project Description

The proposed project consisted of a site geotechnical investigation of the future Pearson Place development located north of Bowers Drive in Ramsey, Minnesota.

1.2 Scope of Services

The purpose of this factual report is to present a summary of our geotechnical exploration and provide the soil conditions encountered at the project area. Our "Scope of Services" was limited to the following:

1. Explore the project subsurface by means of two (2) hand auger probes extending to depths of approximately 12 and 14 feet below existing grade.
2. Conduct laboratory test(s) on representative samples for characterizing the index and engineering properties of soils strata.
3. Perform two (2) Double-Ring Infiltrometer (DRI) tests at the client selected location.
4. Provide a factual geotechnical report with the results of our field and laboratory tests results.

2.0 EXPLORATION PROGRAM RESULTS

2.1 Exploration Scope

Site geotechnical exploration began on May 25, 2017, with individual hand auger probes advanced to the water table at approximate locations as presented on the diagram within the appendices. Soil samples were taken at soil strata changes.

Probes were surveyed by Otto Associates, Engineers and Land Surveyors, Inc.

The probe holes were backfilled with auger cuttings. Minor settlement of the probe holes will occur. Owner is responsible for final closure of the probe holes.

2.2 Subsurface Conditions

Please refer to the probe logs within the appendices for a detailed description and depths of stratum at the probe locations. Additional comment on the evaluation of recovered soil samples is presented within the report attachments.

2.3 Groundwater Conditions

NTI field staff observed the probe holes for groundwater (if any) during and at the completion of hand auger activities. At the time of the field exploration, measurable groundwater was encountered at both SB-1 and SB-2 locations. At SB-1, groundwater was observed at an approximate elevation of 848.5 feet. At SB-2, groundwater was observed at an approximate elevation of 849.0 feet.

Redoximorphic soil features (soil staining) was obscured due to the heavy irrigation in the farm field. We anticipate that the seasonal high groundwater would be comparable to this level, however, due to the above average precipitation over the year as well as inputs from irrigation.

2.4 Laboratory Test Program

Our analysis and recommendations within this report are based upon our interpretation of the sampled soils, laboratory test results, and experience with similar soils from other sites near the project. The results of such tests are summarized on the boring logs or attached laboratory test reports.

2.5 Infiltration Test Results

In total, two (2) DRI tests were completed (see appendix for location). Test #1 was completed approximately 3 feet below existing grade, just below the agricultural till layer. In general accordance with the Minnesota Pollution Control Agency Stormwater Manual, and the results of our DRI test, the design infiltration rate for this test depth was found to be 0.25 inches per hour. Test #2 was completed approximately 5 feet below existing grade. In general accordance with the Minnesota Pollution Control Agency Stormwater Manual, and the results of our DRI test, the design infiltration rate for this test depth was found to be 1.5 inches per hour. NTI perform an additional test on September 1, 2017. The design infiltration rate for that test was found to be 2.75 inches per hour. The MPCA recommends using an average of values for tests in the same stratum. The average would be approximately 2 inches per hour.

2.6 Low Floor Elevation

As mentioned above, we encountered groundwater at elevations of 848.5 and 849. Redoximorphic features (soil staining) were obscured by the heavy irrigation that occurred during the farming process; however, due to the relatively wet year and regular irrigation, we anticipate that this elevation will be similar to the seasonal high water elevation. It is our opinion that a low floor elevation of 854 would provide a sufficient buffer (at least 5 feet) against transient groundwater conditions.

3.0 CLOSURE

This report has been prepared for the exclusive use of Development Consulting Services and their agents for specific application to the proposed Pearson Place project in Ramsey, Minnesota. Northern Technologies, LLC has endeavored to comply with generally accepted geotechnical engineering practice common to the local area. Northern Technologies, LLC makes no other warranty, express or implied.

Northern Technologies, LLC

Richard Jett, E.I.T.
Graduate Engineer

Steven D. Gerber, P.E.
Senior 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.

Steven D. Gerber
Date: 9-15-2017 Reg. No. 52743

APPENDIX A

GEOTECHNICAL EVALUATION OF RECOVERED SOIL SAMPLES

FIELD EXPLORATION PROCEDURES

GENERAL NOTES

WATER LEVEL SYMBOL

DESCRIPTIVE TERMINOLOGY

RELATIVE PROPORTIONS

PARTICLE SIZES

CLASSIFICATION OF SOILS FOR ENGINEERING PURPOSES

GEOTECHNICAL EVALUATION OF RECOVERED SOIL SAMPLES

We visually examined recovered soil samples to estimate distribution of grain sizes, plasticity, consistency, moisture condition, color, presence of lenses and seams, and apparent geologic origin. We then classified the soils according using the Unified Soil Classification System (ASTM D2488). A chart describing this classification system and general notes explaining soil sampling procedures are presented within appendices attachments.

The stratification depth lines between soil types on the logs are estimated based on the available data. In-situ, the transition between type(s) may be distinct or gradual in either the horizontal or vertical directions. The soil conditions have been established at our specific boring locations only. Variations in the soil stratigraphy may occur between and around the borings, with the nature and extent of such change not readily evident until exposed by excavation. These variations must be properly assessed when utilizing information presented on the boring logs.

We request that you, your design team or contractors contact NTI immediately if local conditions differ from those assumed by this report, as we would need to review how such changes impact our recommendations. Such contact would also allow us to revise our recommendations as necessary to account for the changed site conditions.

FIELD EXPLORATION PROCEDURES

Soil Sampling – Standard Penetration Boring:

Soil sampling was performed according to the procedures described by ASTM D-1586. Using this procedure, a 2 inch O.D. split barrel sampler is driven into the soil by a 140-pound weight falling 30 inches. After an initial set of six inches, the number of blows required to drive the sampler an additional 12 inches is recorded (known as the penetration resistance (i.e. “N-value”) of the soil at the point of sampling. The N-value is an index of the relative density of cohesionless soils and an approximation of the consistency of cohesive soils.

Soil Sampling – Power Auger Boring:

The boring(s) was/were advanced with a 6-inch nominal diameter continuous flight auger. As a result, samples recovered from the boring are disturbed, and our determination of the depth, extend of various stratum and layers, and relative density or consistency of the soils is approximate

Soil Classification:

Soil samples were visually and manually classified in general conformance with ASTM D-2488 as they were removed from the sampler(s). Representative fractions of soil samples were then sealed within respective containers and returned to the laboratory for further examination and verification of the field classification. In addition, select samples were submitted for laboratory tests. Individual sample information, identification of sampling methods, method of advancement of the samples and other pertinent information concerning the soil samples are presented on boring logs and related report attachments.

GENERAL NOTES

DRILLING and SAMPLING SYMBOLS		*LABORATORY TEST SYMBOLS*	
SYMBOL	**DEFINITION**	**SYMBOL**	**DEFINITION**
C.S.	Continuous Sampling	W	Moisture content-percent of dry weight
P.D.	2-3/8" Pipe Drill	D	Dry Density-pounds per cubic foot
C.O.	Cleanout Tube	LL, PL	Liquid and plastic limits determined in accordance with ASTM D 423 and D 424
3 HSA	3 ¼" I.D. Hollow Stem Auger	Q_U	Unconfined compressive strength-pounds per square foot in accordance with ASTM D 2166-66
4 FA	4" Diameter Flight Auger		
6 FA	6" Diameter Flight Auger		
2 ½ C	2 ½" Casing		
4 C	4" Casing		
D.M.	Drilling Mud	Pq	Penetrometer reading-tons/square foot
J.W.	Jet Water	S	Torvane reading-tons/square foot
H.A.	Hand Auger	G	Specific Gravity – ASTM D 854-58
NXC	Size NX Casing	SL	Shrinkage limit – ASTM 427-61
BXC	Size BX Casing	Ph	Hydrogen ion content-meter method
AXC	Size AX casing	O	Organic content-combustion method
SS	2" O.D. Split Spoon Sample	M.A.	Grain size analysis
2T	2" Thin Wall Tube Sample	C*	One dimensional consolidation
3T	3" Thin Wall Tube Sample	Q_C	Triaxial Compression
		* See attached data Sheet and/or graph	

WATER LEVEL SYMBOL

Water levels shown on the boring logs were determined at the time and under the conditions indicated. In sand, the indicated levels can be considered relatively reliable for most site conditions. In clay soils, it is not possible to determine the ground water level within the normal scope of a test boring investigation, except where lenses or layers of more pervious water bearing soil are present; and then a long period of time may be necessary to reach equilibrium. Therefore, the position of the water level symbol for cohesive or mixed soils may not indicate the true level of the ground water table. The available water level information is given at the bottom of the log sheet.

DESCRIPTIVE TERMINOLOGY

RELATIVE DENSITY		*CONSISTENCY*	
TERM	**N_{60} Value** (corrected)	**TERM**	**N_{60} Value** (corrected)
Very Loose	0 – 4	Soft	0-4
Loose	5 – 8	Medium	5-8
Medium Dense	9 – 16	Rather Stiff	9 – 15
Dense	16 – 30	Stiff	16 – 30
Very Dense	Over 30	Very Stiff	Over 30

RELATIVE PROPORTIONS

TERMS	**RANGE**
Trace	0 – 5%
A little	5 – 15%
Some	15 – 30%

PARTICLE SIZES

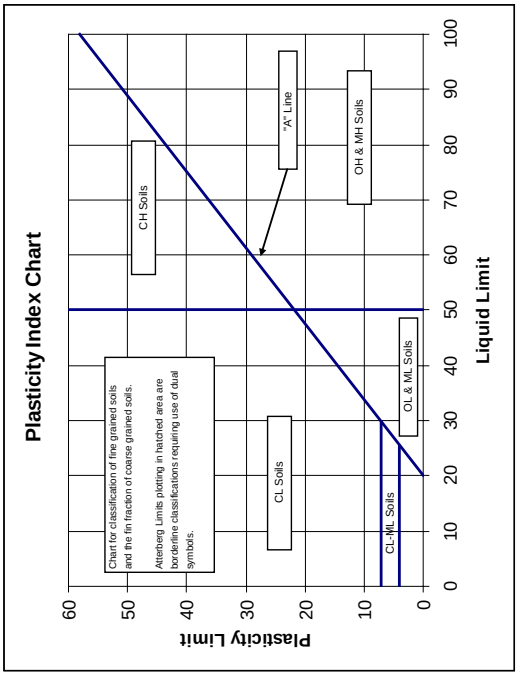
MATERIAL	**DESCRIPTION**	**U.S. SIEVE SIZE**
Boulders		Over 3"
Gravel	Coarse	3" to ¾"
	Medium	¾" to #4
Sand	Coarse	#4 to #10
	Medium	#10 to #40
	Fine	#40 to #200
Silt and Clay	Determined by Hydrometer Test	

CLASSIFICATION OF SOILS FOR ENGINEERING PURPOSES

ASTM Designation D-2487 and D2488 (Unified Soil Classification System)

Major Divisions			Group Symbol	Typical Name	Classification Criteria
Course Grained Soils: More than 50% retained on No. 200 sieve *	Gravels: 50% or more of coarse fraction retained on No. 4 sieve.	Clean Gravels	GW	Well –graded gravels and gravel-sand mixtures, little or no fines.	Cu = D60 / D10 greater than 4. Cz = (D30)2 / (D10 x D60) between 1 & 3.
			GP	Poorly graded gravels and gravel-sand mixtures, little or no fines.	Not meeting both criteria for GW materials.
		Gravels with Fines	GM	Silty gravels, gravel-sand-silt mixtures.	Atterberg limits below "A" line, or P.I. less than 4. / Atterberg limits above "A" line with P.I. greater than 7. — Atterberg limits plotting in hatched area are borderline classifications requiring use of dual symbols.
			GC	Clayey gravels, gravel-sand-clay mixtures.	
	Sands: More than 50% of coarse fraction passes No 4 sieve.	Clean Sands	SW	Well-graded sands and gravelly sands, little or no fines.	Cu = D60 / D10 greater than 6. Cz = (D30)2 / (D10 x D60) between 1 & 3.
			SP	Poorly-graded sands and gravelly sands, little or no fines.	Not meeting both criteria for SW materials.
		Sands with Fines	SM	Silty sands, sand-silt mixtures.	Atterberg limits below "A" line, or P.I. less than 4. / Atterberg limits above "A" line with P.I. > 7. — Atterberg limits plotting in hatched area are borderline classifications requiring use of dual symbols.
			SC	Clayey sands, sand-clay mixtures.	
Fine Grained Soils More than 50% passes No. 200 sieve *	Silts and Clays: Liquid Limit of 50% or less		ML	Inorganic silts, very fine sands, rock flour, silty or clayey fine sands.	
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.	
			OL	Organic silts and organic silty clays of low plasticity.	
	Silts and Clays: Liquid Limit greater than 50%.		MH	Inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts.	
			CH	Inorganic clays of high plasticity, fat clays.	
			OH	Organic clays of medium to high plasticity.	
	Highly Organic Soils		Pt	Peat, muck and other highly organic soils.	

Classification on basis of percentage of fines.
Less than 5% passing No. 200 Sieve: GW, GP, SW, SP
More than 12% passing No. 200 Sieve: GM, GC, SM, SC
From 5% to 12% passing No. 200 Sieve: Borderline Classification requiring use of duel symbols.



APPENDIX B

PROBE LOCATION DIAGRAM

SOIL PROBES

Probe Location Diagram
Pearson Place
Ramsey, Minnesota
NTI Project #: 17.62064.100
NOTE: Probe locations are approximate.

Completed Soil Probes:

Completed DRI Tests:

N

NTI NORTHERN TECHNOLOGIES, LLC

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BORING NUMBER SB-1

CLIENT Development Consulting Services
PROJECT NAME Pearson Place
PROJECT NUMBER 17.62064.100
PROJECT LOCATION Ramsey, Minnesota
DATE STARTED 5/25/17 **COMPLETED** 5/25/17
GROUND ELEVATION 861.9 ft **HOLE SIZE** 3 1/4 in.
DRILLING CONTRACTOR NTI
GROUND WATER LEVELS:
DRILLING METHOD HA
▽ **AT TIME OF DRILLING** 13.50 ft / Elev 848.40 ft
LOGGED BY Richard Jett **CHECKED BY** Deb Schroeder
AT END OF DRILLING ---
CAVE IN (ft) --- **FROST DEPTH (ft)** ---
AFTER DRILLING ---
NOTES Elevations determined by Otto Associates, Engineers and Land Surveyors, Inc.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES
0.0		POORLY GRADED SAND WITH CLAY, (SP-SC) dark brown, fine to medium grained, moist, trace gravel, trace organics (Agricultural Till)	HA 1									
1.5												
		SILTY SAND, (SM) dark brown, fine grained, moist (Agricultural Till)	HA 2									
2.5												
2.5		SILTY SAND, (SM) brown, fine grained, moist (Agricultural Till)	HA 3									
3.0												
		POORLY GRADED SAND, (SP) light brown to brown, fine to medium grained, moist (Glacial Outwash)	HA 4					5				1
4.5												
		POORLY GRADED SAND, (SP) light brown, fine to medium grained, moist to saturated, trace gravel (Glacial Outwash)	HA 5					4				2
5.0												
7.5												

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BORING NUMBER SB-1

CLIENT Development Consulting Services **PROJECT NAME** Pearson Place

PROJECT NUMBER 17.62064.100 **PROJECT LOCATION** Ramsey, Minnesota

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES
10.0		POORLY GRADED SAND, (SP) light brown, fine to medium grained, moist to saturated, trace gravel (Glacial Outwash) *(continued)*										
12.5		▽										
14.0		847.9										
		Bottom of borehole at 14.0 feet.										

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BORING NUMBER SB-2

CLIENT Development Consulting Services
PROJECT NAME Pearson Place
PROJECT NUMBER 17.62064.100
PROJECT LOCATION Ramsey, Minnesota
DATE STARTED 5/25/17 **COMPLETED** 5/25/17
GROUND ELEVATION 859.9 ft **HOLE SIZE** 3 1/4 in.
DRILLING CONTRACTOR NTI
GROUND WATER LEVELS:
DRILLING METHOD HA
AT TIME OF DRILLING 11.00 ft / Elev 848.90 ft
LOGGED BY Richard Jett **CHECKED BY** Deb Schroeder
AT END OF DRILLING ---
CAVE IN (ft) --- **FROST DEPTH (ft)** ---
AFTER DRILLING ---
NOTES Elevations determined by Otto Associates, Engineers and Land Surveyors, Inc.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES
0.0		CLAYEY SAND, (SC) dark brown to black, fine to medium grained, moist, trace organics (Agricultural Till)	HA 1									
1.5		858.4										
		CLAYEY SAND, (SC) brown, fine to medium grained, moist (Agricultural Till)	HA 2									
2.5												
3.0		856.9										
		POORLY GRADED SAND, (SP) light brown, fine to medium grained, moist, trace gravel (Glacial Outwash)	HA 3					3				2
5.0												
7.0		852.9										
		POORLY GRADED SAND WITH GRAVEL, (SP) brown, fine to coarse grained, moist (Glacial Outwash)	HA 4					4				3
7.5												

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BORING NUMBER SB-2

CLIENT Development Consulting Services **PROJECT NAME** Pearson Place

PROJECT NUMBER 17.62064.100 **PROJECT LOCATION** Ramsey, Minnesota

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES
		POORLY GRADED SAND WITH GRAVEL, (SP) brown, fine to coarse grained, moist (Glacial Outwash) *(continued)*										
9.5		850.4										
10.0		POORLY GRADED SAND, (SP) light brown, fine to coarse grained, moist to saturated, trace gravel (Glacial Outwash)	HA 5									
12.0		847.9										

Bottom of borehole at 12.0 feet.

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BORING NUMBER SB-3

CLIENT Development Consulting Services
PROJECT NAME Pearson Place
PROJECT NUMBER 17.62064.100
PROJECT LOCATION Ramsey, Minnesota
DATE STARTED 8/13/17 **COMPLETED** 8/13/17
GROUND ELEVATION 858.5 ft **HOLE SIZE** 6 1/2 in.
DRILLING CONTRACTOR NTI
GROUND WATER LEVELS:
DRILLING METHOD HA
▽ **AT TIME OF DRILLING** 11.00 ft / Elev 847.50 ft
LOGGED BY Richard Jett **CHECKED BY** Steve Gerber
AT END OF DRILLING ---
CAVE IN (ft) --- **FROST DEPTH (ft)** ---
AFTER DRILLING ---
NOTES Elevations estimated using MnTOPO contour lines

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES
0.0		SILTY SAND, (SM) dark brown, fine to medium grained, moist, trace gravel, trace organics (Agricultural Till)										
0.5		858.0										
		SILTY SAND, (SM) dark brown, fine to medium grained, moist, trace organics (Agricultural Till)	SS 1 DCP DCP		6/2" 6/2" 7/2"							
2.0		856.5										
		POORLY GRADED SAND WITH SILT, (SP-SM) brown, fine to medium grained, moist, trace gravel (Fill)	SS 2 DCP DCP		7/2" 6/2" 8/2"							
2.5												
3.0		855.5										
		POORLY GRADED SAND WITH SILT, (SP-SM) light brown, fine to medium grained, moist, occasional black silty sand (SM) balls (Fill)	SS 3 DCP DCP		5/2" 6/2" 10/2"							
4.0		854.5										
		POORLY GRADED SAND, (SP) brown, fine to medium grained, moist (Glacial Outwash)	SS 4 DCP DCP		8/2" 9/2" 8/2"							
5.0			SS 5 DCP DCP		7/2" 8/2" 7/2"							
6.0		852.5										
		POORLY GRADED SAND WITH SILT, (SP-SM) brown, fine to coarse grained, moist, trace gravel (Glacial Outwash)	SS 6 DCP DCP		10/2" 6/2" 9/2"							
7.5			SS 7 DCP DCP		10/2" 8/2" 9/2"							

(Continued Next Page)

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BORING NUMBER SB-3

CLIENT Development Consulting Services **PROJECT NAME** Pearson Place

PROJECT NUMBER 17.62064.100 **PROJECT LOCATION** Ramsey, Minnesota

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES
		POORLY GRADED SAND WITH SILT, (SP-SM) brown, fine to coarse grained, moist, trace gravel (Glacial Outwash) *(continued)*	SS 8		10/2"							
			DCP		5/2"							
			DCP		6/2"							
			SS 9		9/2"							
			DCP		9/2"							
			DCP		5/2"							
10.0		10.0 848.5										
		POORLY GRADED SAND WITH SILT, (SP-SM) brown, fine to medium grained, moist to saturated, trace gravel (Glacial Outwash)	SS 10		8/2"							
			DCP		9/2"							
			DCP		8/2"							
		▽	SS 11		7/2"							
			DCP		6/2"							
			DCP		7/2"							
		11.8 846.7										

Bottom of borehole at 11.8 feet.

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BORING NUMBER SB-4

CLIENT Development Consulting Services
PROJECT NAME Pearson Place
PROJECT NUMBER 17.62064.100
PROJECT LOCATION Ramsey, Minnesota
DATE STARTED 8/13/17 **COMPLETED** 8/13/17
GROUND ELEVATION 858.5 ft **HOLE SIZE** 6 1/2 in.
DRILLING CONTRACTOR NTI
GROUND WATER LEVELS:
DRILLING METHOD HA
▽ **AT TIME OF DRILLING** 11.50 ft / Elev 847.00 ft
LOGGED BY Richard Jett **CHECKED BY** Steve Gerber
AT END OF DRILLING ---
CAVE IN (ft) --- **FROST DEPTH (ft)** ---
AFTER DRILLING ---
NOTES Elevations estimated using MnTOPO contour lines

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES
0.0		SILTY SAND, (SM) dark brown, fine to medium grained, moist, trace organics (Agricultural Till)	SS 1 DCP DCP		13/2" 14/2" 13/2"							
2.0		856.5										
		SILTY SAND, (SM) brown to dark brown, fine grained, moist, trace organics (Agricultural Till)	SS 2 DCP DCP		13/2" 12/2" 13/2"							
2.5												
3.0		855.5										
		POORLY GRADED SAND WITH SILT, (SP-SM) light brown, fine to medium grained, moist to saturated, trace gravel (Glacial Outwash)	SS 3 DCP DCP		6/2" 5/2" 6/2"							
			SS 4 DCP DCP		7/2" 6/2" 7/2"							
5.0			SS 5 DCP DCP		7/2" 8/2" 7/2"							
			SS 6 DCP DCP		7/2" 8/2" 9/2"							
7.5			SS 7 DCP DCP		7/2" 7/2" 7/2"							

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BORING NUMBER SB-4

CLIENT Development Consulting Services **PROJECT NAME** Pearson Place

PROJECT NUMBER 17.62064.100 **PROJECT LOCATION** Ramsey, Minnesota

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES
		POORLY GRADED SAND WITH SILT, (SP-SM) light brown, fine to medium grained, moist to saturated, trace gravel (Glacial Outwash) *(continued)*	SS 8		6/2"							
			DCP		7/2"							
			DCP		6/2"							
			SS 9		7/2"							
			DCP		7/2"							
			DCP		6/2"							
10.0			SS 10		6/2"							
			DCP		5/2"							
			DCP		6/2"							
		▽	SS 11		6/2"							
			DCP		5/2"							
12.0			DCP		5/2"							
		Bottom of borehole at 12.0 feet.	846.5									