



MEMO

of pages: 3

DATE: July 25, 2024
TO: Edward Schenck, PG, CFM
City of Flagstaff Water Services, Stormwater Section
FROM: Michael Kearly, PE, CFM
RE: Park Site Sediment Basins
Recommended Operation and Maintenance Procedures



The purpose of this memorandum is to provide recommendations for Operation and Maintenance of the Park Site Sediments basins located at 1020 E Park Way in Flagstaff.

The sediment basins have been constructed by the Coconino County Flood Control District and were funded in part by the Natural Resources Conservation Service as part of an Emergency Watershed Protection (EWP) grant. The basins are constructed within the Spruce Wash floodplain with a primary purpose to capture sediment flowing from post-fire runoff following the 2019 Museum Fire. That fire burned over 1,900 acres, including 52 percent of the watershed of the Spruce Wash.

The basins are designed to store sediment below the elevation of the spill point for each basin with maximum storage depths of approximately 4 feet. Rock is only embedded in the bottom of the basins near the downstream ends of rock spillways. Otherwise the bottom of the basins are native earth.

The original channel alignment is approximated by a 16 foot wide maintenance access road that borders the west side of the basins. The road is constructed of a 48 inch thick section of D₅₀=24" riprap with the interstitial voids filled with soil. The road is intended to serve as access for excavators and haul trucks when sediment removal from the basins becomes necessary.

The riprap at the spill points between each basin is also constructed of 48" thick riprap, however the interstitial voids of this riprap have not been filled with soil so that the riprap may serve as a semi-pervious drain when water is captured within the basins.

The design sediment storage capacities of the basins (at full pool level) are as follows:

Basin ID	Bottom Elevation (feet)	Full Pool Elevation (feet)	Storage Volume (cubic yards)
Basin 1 (upper)	6985.6	6990.0	2000
Basin 2 (middle)	6980.0	6984.0	2200
Basin 3 (lower)	6971.0	6974.0	1420

Recommended Inspection and Maintenance:

Between significant runoff events that cause flow-through the three basins or annually at a minimum:

- a) Inspect sediment accumulation in basins and restore original storage volume as determined necessary by COF stormwater administration. The necessity of clearing sediment during a monsoon season will depend on the amount of accumulated sediment and the seasonal forecast outlook for additional significant storms on the watershed.
 - i) When sediment removal is deemed necessary, restore constructed bottom elevations per design plans.
 - ii) Minimize disturbance to established vegetation on the basin bank slopes above the static water/sediment impoundment elevation.
 - iii) Minimize disturbance to riprap slope protection.
- b) Inspect condition of riprap armor and repair/replace rock as necessary.
 - i) At spill points to downstream basins.
 - (1) Basins 1 & 2: Spill point is at downstream end of each basin at adjacent maintenance road grade.
 - (2) Basin 3: Spill point is at downstream end of the basin at outlet to downstream channel.
 - ii) Along edge of and within the maintenance road.
 - iii) At rock chutes entering sediment basins from the east (Adrienne and Appalachian)
 - iv) Riprap at outlet of each basin is designed to be porous to allow slow drainage. Riprap in these areas needs to be cleared of accumulated sediment on the face. Rinse the face of riprap clean of sediment after bulk sediment removal.
- c) Remove woody debris from within and adjacent to the sediment basins within the city-owned property.
 - i) Remove any fallen trees or large branches adjacent to the basins that may interfere with the flow of water through the basins or that may be washed into downstream stormdrain infrastructure.
 - ii) Remove any accumulated woody debris that has floated into the basin from flood flows.
- d) Inspect channel in the channel/drainage easement downstream of the sediment basins, upstream of Linda Vista Drive.
 - i) Remove any accumulated large woody debris from within the channel that may interfere with flood flows.
 - ii) Inspect channel riprap (immediately below lowest basin) and provide repairs and/or rock replacement if necessary.
 - iii) Inspect rock cross vane weir at downstream end of riprap and repair by restoring rock positions and/or replacement of lost riprap if necessary.
 - iv) Where side slopes do not have established native grasses and other vegetation, reseed side slopes and other disturbed areas with seed mix as specified within the plans, at end of monsoon season, before snow cover.
 - v) The bottoms of the basins are not intended to be reseeded during the first several years of operation as those areas are expected to hold sediment from the upstream watershed and be frequently disturbed by sediment clearing operations. However, over time and as the upstream watershed heals, sediment volumes may decrease. The city may elect to apply native seed to the bottoms of the basins following clean out if the intervals between inundation is reliably expected to be more than several years.
- e) After sediment removal is complete, restore Park Way and trails to pre-cleaning operations condition.
 - i) Inspect and remove any sediment tracked onto Park Way pavement resulting from basin equipment cleaning and sediment removal operations.

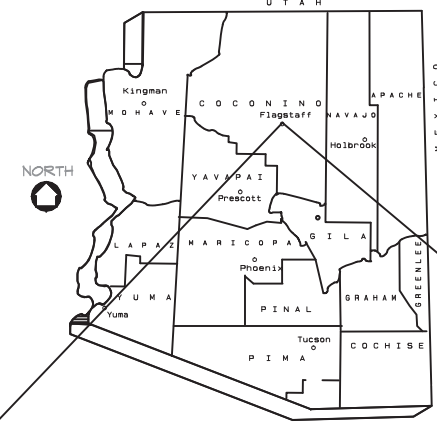
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- ii) Private driveways adjacent to the end of Park Way shall not be driven across and care should be taken to ensure the truck and equipment traffic remain within the right-of-way and city-owned property.
 - iii) When cleanout is complete, ensure that street and gutter flow from Park Way can drain into Basin 3. Removal of accumulated sediment or SWPPP trackout pads may be necessary to ensure proper drainage upon completion of the basin cleaning.
 - iv) Restore maintenance road surface to allow pedestrian and bicycle access to forest from Park Way. This may require the placement of a +/-3 inch thick layer of soil and gravel on top of the riprap and filling any voids between the rocks that have opened during storm runoff. Ensure that any soil placed to restore trails is not placed on the riprap between each of the detention basins as that should remain clear to allow flow-through of any standing water.
- f) Standing water in the basins for longer than 7 to 10 days during warm weather may create the need for insect abatement. High runoff conditions during spring time may create high groundwater which will express as standing surface water in the basins.
- i) Basins should be monitored for standing water in the spring and during periods of repeated runoff.
 - ii) Large diameter aggregate riprap with few smaller-sized gradation rocks was used to armor the basins to allow for a high volume of interstitial space between rocks. This construction allows for percolation of standing water through the riprap at the ends of each basin and into the next downstream basin and/or to the downstream channel. If woody debris has accumulated at the downstream ends of any of the basins, it should be removed, including clearing smaller debris that may be lodged within the near surface gaps of the riprap.
 - iii) If sediment has accumulated at the riprap at the downstream ends of the basins, high pressure water may be used to clear the surface and near surface voids of the riprap to reopen any blocked interstitial spaces and restore the flow-through function of the riprap. Water pressure should be applied until flow-through to the next downstream pond or downstream channel is observed.
 - iv) If cleaning cannot be immediately accomplished and standing water is expected to persist for longer than 10 days, treatment for nuisance insects is recommended within the first 3 to 5 days of inundation. Recommended treatment is a microbial larvicide which utilizes either *Bacillus thuringiensis israelensis* (Bti) or *Bacillus sphaericus* (Bs). Both are naturally occurring soil bacteria that are ingested by the larvae and affect only animals with alkaline gut systems (i.e. not mammals). Commercial products are available and should be applied as prescribed on the label. Products can be applied by either spraying or direct application of dry material to the water surface. Direct application via mosquito dunks or other form is recommended over spray application. Microbial larvacides also target other haematophagous dipteran larvae as well including biting midges.
 - v) The City may also contact Coconino County Health and Human Services Department at (928) 679-8760 to address any *documented* mosquito issues at the basins.

Attachments:

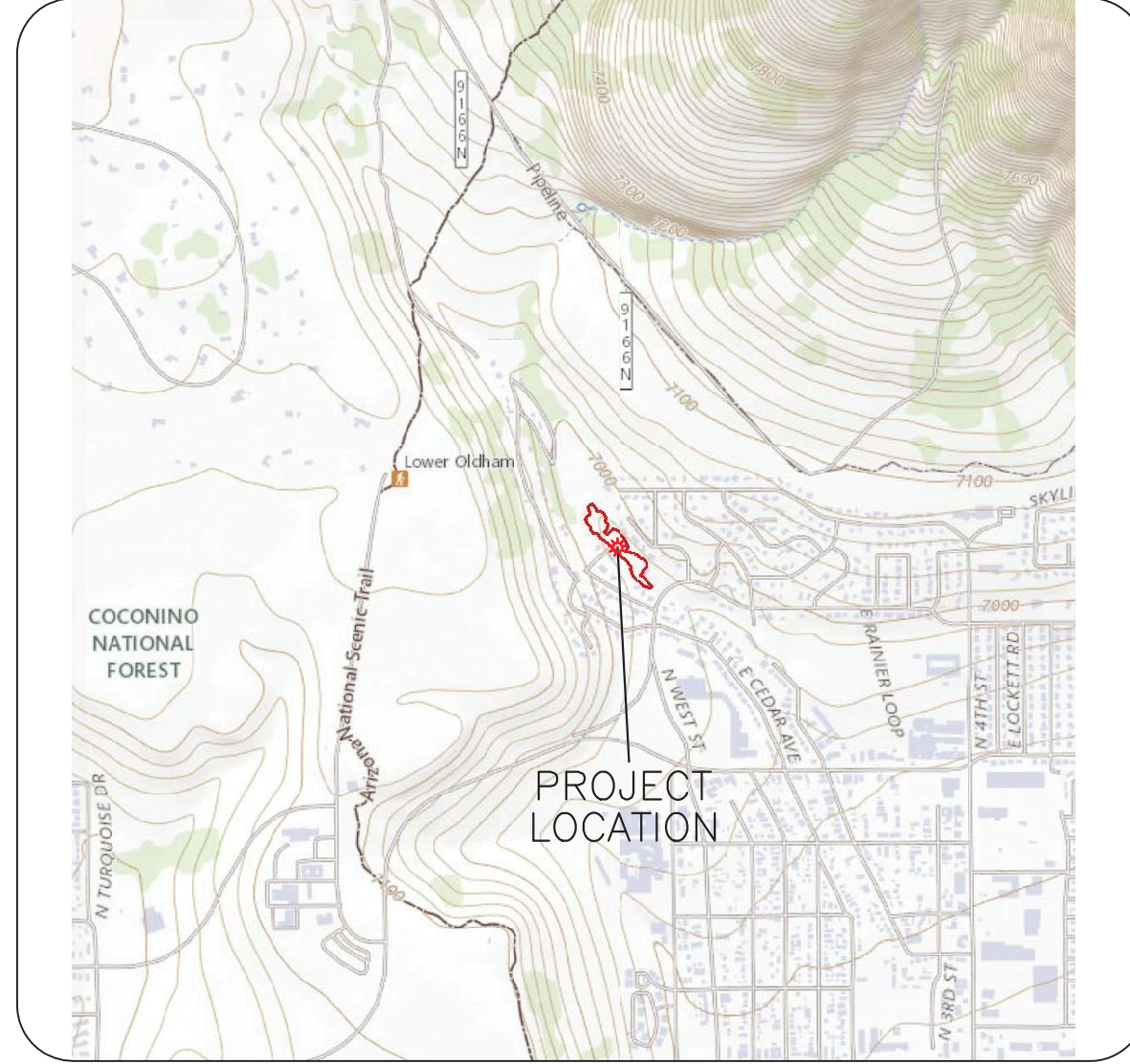
Design Drawings (Annotated for O&M)

MUSEUM FIRE NRCS EMERGENCY WATERSHED PROTECTION PROJECT

PARK SITE BASINS



VICINITY MAP:



FLAGSTAFF - COCONINO COUNTY - ARIZONA

PLAN LEGEND:

EXISTING FEATURES	
	PARCEL BOUNDARY (APPROX.)
	EXISTING MAJOR CONTOUR (5 FT)
	EXISTING MINOR CONTOUR (1 FT)
	EXISTING P.U.E./DRAINAGE EASEMENT
	FLOW LINE
	EXISTING GAS METER
	EXISTING POWER POLE
	EXISTING SEWER MANHOLE
	EXISTING OVERHEAD ELECTRIC LINE
	EXISTING UNDERGROUND ELECTRIC LINE
	EXISTING GAS LINE
	EXISTING BUILDING (APPROXIMATE)
NEW FEATURES	
	PROPOSED MAJOR CONTOUR (5 FT)
	PROPOSED MINOR CONTOUR (1 FT)
	LIMITS OF FILL
	LIMITS OF CUT
	NEW AGGREGATE SURFACE
	ROCK CHUTE/ARMOUR/RIPRAP
	CROSS VANE WEIR
	TEST PIT/POTHOLE

ABBREVIATIONS:

AB	APPROXIMATELY
AC	AT
AC	AGGREGATE BASE
AC	ACRE
APPROX	APPROXIMATELY
CL	CENTER LINE
CONC	CONCRETE
CP	CONTROL POINT
CY	CUBIC YARD
DBH	DIAMETER AT BREAST HEIGHT
DA	DIAMETER
DTL	DETAIL
DWG	DRAWING
EACH	EACH
ELEV	ELEVATION
EOP	EDGE OF PAVEMENT
EX	EXISTING
FG	FINISHED GRADE ELEVATION
FT	FEET
H	HEIGHT
IN	INCH
L	LENGTH
LBS	POUNDS
LF	LINEAR FEET
LS	LUMP SUM
MAX	MAXIMUM
M.E.	MATCH EXISTING
MIN	MINIMUM
MISC	MISCELLANEOUS
N/A	NOT APPLICABLE
NCD	NATURAL CHANNEL DESIGN, INC.
NO.	NUMBER
NPI	NON-PAY ITEM
NTS	NOT TO SCALE
OC	ON CENTER
PROP.	PROPOSED
PSI	POUNDS PER SQUARE INCH
PLS	PURE LIVE SEED
PP	POWER POLE
PT	POINT
REQD	REQUIRED
SCH	SCHEDULE
SFT	SQUARE FEET
STA	STATION
STD	STANDARD
SY	SQUARE YARD
TBD	TO BE DETERMINED
TN	TONS
TYP	TYPICAL
VLV	VALVE
W	WIDTH
W	WITH

NRCS NOTES (PHASE 1 CONSTRUCTION)

JOB CLASS IV	
CPS 326 - CLEARING AND SNAGGING	
Length of reach = 760 ft	Class I
CPS 560 - ACCESS ROAD	
Length = 440 ft	Class I
Material = Gravel	Class II
CPS 350 - SEDIMENT BASIN	
Effective Height = 6 ft	Class II
Drainage Area = 3.7 sq mi	Class II
Storage x Height = 9 ac-ft ²	Class I
CPS 410 - GRADE STABILIZATION STRUCTURE	
Effective height = 3.5 ft	Class I
Drainage area = 3.7 sq mi	Class II

COCONINO COUNTY GENERAL NOTES

- APPROVAL OF THESE PLANS BY THE COUNTY FLOOD CONTROL DISTRICT IS FOR A TWO-YEAR PERIOD, SUBSEQUENT TO THE DATE OF APPROVAL. IF CONSTRUCTION WORK IS NOT STARTED WITHIN THE TWO-YEAR PERIOD OR HAS BEEN DISCONTINUED FOR ANY REASON FOR LONGER THAN TWO YEARS, THE PLANS SHALL BE RESUBMITTED FOR REVIEW AND RE-APPROVAL IN ACCORDANCE WITH ARIZONA TECHNICAL BOARD OF REGISTRATION.
- PLAN REVIEW BY THE COUNTY DOES NOT EXTEND TO MATERIAL QUANTITIES SHOWN ON THE PLANS.
- AN ENCROACHMENT PERMIT, ISSUED BY THE COMMUNITY DEVELOPMENT DEPARTMENT, IS REQUIRED FOR ALL WORK IN COUNTY RIGHTS-OF-WAY OR EASEMENTS.
- THE COUNTY SHALL BE NOTIFIED FORTY-EIGHT (48) HOURS PRIOR TO BEGINNING DIFFERENT PHASES OF CONSTRUCTION SO THAT COUNTY INSPECTOR MAY BE SCHEDULED.
- FOR CONSTRUCTION PURPOSES, THE FOLLOWING PRECEDENCE OF STANDARDS WILL PREVAIL: CURRENT COCONINO COUNTY PUBLIC WORKS ENGINEERING DEPARTMENT STANDARDS; CURRENT MAG STANDARDS; INTERNATIONAL BUILDING CODE (IBC); PROJECT SPECIFIC PLANS AND SPECIFICATIONS; ADOT STANDARDS - OR OTHER SPECIFICATIONS APPROVED BY THE COUNTY ENGINEER AND WITH GENERALLY ACCEPTED GOOD CONSTRUCTION PRACTICE. ALL WORK AND MATERIALS WHICH DO NOT CONFORM TO THE STANDARDS AND SPECIFICATIONS ARE SUBJECT TO REMOVAL AND REPLACEMENT AT THE CONTRACTOR'S EXPENSE.
- ANY WORK PERFORMED WITHOUT THE KNOWLEDGE AND APPROVAL OF THE COUNTY ENGINEER, IS SUBJECT TO REMOVAL AND REPLACEMENT AT THE CONTRACTOR'S EXPENSE.
- THE COUNTY ENGINEER MAY SUSPEND THE WORK BY WRITTEN NOTICE WHEN, IN THEIR JUDGMENT, PROGRESS IS UNSATISFACTORY, WORK BEING DONE IS UNAUTHORIZED OR DEFECTIVE, WEATHER CONDITIONS ARE UNSUITABLE, OR THERE IS DANGER TO THE PUBLIC HEALTH OR SAFETY.
- THE COUNTY ENGINEER MAY ORDER ANY OR ALL MATERIALS USED IN THE WORK TO BE TESTED ACCORDING TO MAG OR ADOT MATERIAL TESTING REQUIREMENTS, AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) AND THE AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM) STANDARDS. THE CONTRACTOR SHALL, AT THEIR EXPENSE, HIRE A QUALIFIED TESTING LABORATORY TO PERFORM QUALITY CONTROL (QC) DURING ALL PHASES OF CONSTRUCTION, AS STATED IN COCONINO COUNTY STANDARDS, OR AS DIRECTED IN THE SPECIAL PROVISIONS.
- LOCAL FIRE DEPARTMENT, COUNTY ENGINEERING DIVISION AND OTHER EMERGENCY RESPONDER'S APPROVAL IS REQUIRED FOR OBSTRUCTION OF ACCESS OR WATER SYSTEM SHUTDOWN - SUBMISSION OF TRAFFIC CONTROL PLANS IS REQUIRED.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTENANCE OF THE STREETS AND OF PARTIALLY COMPLETED PORTIONS OF THE WORK UNTIL FINAL ACCEPTANCE OF THE WORK. ANY ROADS REQUIRED TO BE CLOSED FOR THE CONSTRUCTION ACTIVITY SHALL BE REOPENED WITHIN A REASONABLE TIME OR UPON ORDER OF COUNTY ENGINEER. THE REGULATION AND CONTROL OF THIS TRAFFIC SHALL BE AS DIRECTED BY THE COUNTY ENGINEER.
- APPROVAL OF A PORTION OF THE WORK IN PROGRESS DOES NOT GUARANTEE ITS FINAL ACCEPTANCE. TESTING AND EVALUATION MAY CONTINUE UNTIL WRITTEN FINAL ACCEPTANCE OF A COMPLETE WORKABLE UNIT. ANY DEFECTS WHICH APPEAR IN THE WORK WITHIN ONE YEAR FROM THE DATE OF ACCEPTANCE AND WHICH ARE DUE TO IMPROPER WORKMANSHIP OR INFERIOR MATERIALS SUPPLIED SHALL BE CORRECTED BY OR AT THE EXPENSE OF THE OWNER/DEVELOPER OR THE CONTRACTOR.
- ACCEPTANCE OF COMPLETED PUBLIC IMPROVEMENTS WILL NOT BE GIVEN UNTIL DEFECTIVE OR UNAUTHORIZED WORK IS REMOVED, AND FINAL CLEAN-UP IS COMPLETE.
- LOCATION OF UNDERGROUND UTILITIES BEFORE WORK IS BEGUN IS TO BE ACCOMPLISHED IN ACCORDANCE WITH ARS 40-360.22.
- IF WORK IS DONE ON PRIVATE PROPERTY IN RELATION TO A PROJECT CONSTRUCTED UNDER THESE STANDARDS, THE CONTRACTOR WILL PROVIDE THE COUNTY WITH WRITTEN AUTHORIZATION FROM THE PROPERTY OWNER TO DO SO.
- THE ESTABLISHMENT AND USE OF TEMPORARY CONSTRUCTION YARDS SHALL REQUIRE WRITTEN AUTHORIZATION FROM THE COUNTY PUBLIC WORKS DEPARTMENT.
- COUNTY APPROVAL OF THESE PLANS IS FOR CONCEPT ONLY. ALL LIABILITY RESULTING FROM ERRORS OR OMISSIONS IS THE RESPONSIBILITY OF THE PERMITTEE AND/OR HIS CONSULTANTS AND EMPLOYEES. COCONINO COUNTY DOES NOT VERIFY OR GUARANTEE THE MEASUREMENTS, CALCULATIONS, OWNERSHIP, OR CONCLUSIONS INDICATED BY THE CREATOR OF THESE PLANS.

PREPARED FOR:

COCONINO COUNTY FLOOD CONTROL DISTRICT
5600 E. COMMERCE AVE
FLAGSTAFF, AZ 86004

NATURAL RESOURCES CONSERVATION SERVICE
230 N. 1ST AVE
SUITE 509
PHOENIX, AZ 85003

CITY OF FLAGSTAFF WATER SERVICES
2323 N. WALGREENS ST.
SUITE 1
FLAGSTAFF, AZ 86004

PREPARED BY:

NATURAL CHANNEL DESIGN, INC.
2900 N. WEST ST. #5
FLAGSTAFF, AZ 86004
PHONE: (928) 774-2336

SHEET INDEX:

SHEET #	DESCRIPTION
1	TITLE, INDEX, ACKNOWLEDGEMENTS, GENERAL NOTES AND LEGEND
2	GENERAL NOTES AND ESTIMATED QUANTITIES
3	PROJECT OVERVIEW AND SURVEY NOTES
4	PLAN/PROFILE - ACCESS ROAD
5	PLAN BASIN 1
6	PLAN BASIN 2
7	PLAN BASIN 3
8	PLAN/PROFILE - CHANNEL TO LINDA VISTA DRIVE
9	PLAN/PROFILE - WOLFF PROPERTY FLOOD PROTECTION

UNDERGROUND UTILITIES LOCATIONS SHOWN ON THE PLANS ARE APPROXIMATE ONLY. THE UTILITY LOCATIONS WERE PLOTTED FROM A COMBINATION OF FIELD DATA, RECORD DATA, LANDOWNER INFORMATION, AND UTILITY MAPS PROVIDED BY OTHERS, AND MAY NOT REFLECT ALL EXISTING UTILITIES OR THE EXACT LOCATION. LOCATION OF ALL EXISTING UTILITIES SHALL BE CONFIRMED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION OF AND ANY DAMAGE TO EXISTING UTILITIES. CALL BEFORE YOU DIG (DIAL 811).

CONCEPT APPROVAL:

COCONINO COUNTY FLOOD CONTROL DISTRICT

SEE APPROVED PLANS RELEASED 3/27/23 FOR SIGNATURE BY LUCINDA ANDREANI

APPROVED BY _____ DATE _____
COCONINO COUNTY APPROVES THESE PLANS FOR CONCEPT ONLY. ALL LIABILITY FOR ERRORS OR OMISSIONS IS THE RESPONSIBILITY OF THE DESIGN ENGINEER.

NATURAL RESOURCES CONSERVATION SERVICES

BY LETTER (Dave Beyman, PE) 3/26/2023
DATE

NATURAL RESOURCES CONSERVATION SERVICE APPROVES THESE PLANS FOR CONCEPT ONLY. ALL LIABILITY FOR ERRORS OR OMISSIONS IS THE RESPONSIBILITY OF THE DESIGN ENGINEER.

CITY OF FLAGSTAFF, STORMWATER MANAGEMENT

SEE APPROVED PLANS RELEASED 3/27/23 FOR SIGNATURE BY ED SCHENK

APPROVED BY _____ DATE _____
CITY OF FLAGSTAFF STORMWATER MANAGEMENT APPROVES THESE PLANS FOR CONCEPT ONLY. ALL LIABILITY FOR ERRORS OR OMISSIONS IS THE RESPONSIBILITY OF THE DESIGN ENGINEER.

UTILITY ACKNOWLEDGEMENT:

ARIZONA PUBLIC SERVICE (ELECTRIC)

by letter - Chad Brooks 8/2/2022
ACKNOWLEDGED BY _____ DATE _____

LUMEN

by letter - Kevin Wagner (Terra-Tech) 8/16/2022
ACKNOWLEDGED BY _____ DATE _____

UNISOURCE

ACKNOWLEDGED BY _____ DATE _____

OPTIMUM

by letter - Sanford Yazzie 10/18/2022
ACKNOWLEDGED BY _____ DATE _____

UNAUTHORIZED CHANGES & USES: THE ENGINEER PREPARED THESE PLANS UNDER THE ASSUMPTION THAT THE USER WILL BE RESPONSIBLE FOR VERIFYING THE ACCURACY OF ALL INFORMATION AND DATA PROVIDED IN THESE PLANS.

DATE: 12/19/2022

NCD PROJECT NUMBER: 22-412AZ

SHEET NUMBER: 1 of 9

MUSEUM FIRE NRCS EMERGENCY WATERSHED PROTECTION PROJECT

PARK SITE BASINS

COCONINO COUNTY FLOOD CONTROL DISTRICT

TITLE, INDEX, ACKNOWLEDGEMENTS, GENERAL NOTES AND LEGEND

Drawn By: MK/M/DM
Designed By: MK
Checked By: MK

NO.	DATE	BY	REVISION
1	3/10/23	MK	ISSUED NRCS TABLE TO REFLECT PHASE 1 ONLY CONSTRUCTION
2	9/22/23	MK	UPDATED FOR PHASE 2

Natural Channel Design, Inc.
2900 N. West St. #5
Flagstaff, Arizona 86004
(928) 774-2336

Z:\Projects\Arizona\Coconino County\Museum Fire 2022\Drawings\Park Site Basins\Park Site Basins_City Only Basins_Revise for Phase2.dwg - 9/22/2023

TRAFFIC CONTROL

- 1. TRAFFIC CONTROL REQUIREMENTS ARE ANTICIPATED TO BE MINOR AND LIMITED TO CONSTRUCTION ENTRANCES ALONG PARK WAY AND LINDA VISTA. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PREPARING, SUBMITTING AND OBTAINING APPROVAL OF A COMPLETE TRAFFIC CONTROL PLAN IN ACCORDANCE WITH CURRENT EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), ADOT STANDARD SPECIFICATIONS FOR BRIDGE & ROAD CONSTRUCTION & ADOT CONSTRUCTION STANDARDS SATISFACTORY TO THE ENGINEER. A PERMIT SHALL NOT BE ISSUED UNTIL ACCEPTANCE IS GRANTED FROM A CITY REPRESENTATIVE.

EROSION CONTROL, SEDIMENT CONTROL AND SWPPP

- 1. TOTAL DISTURBANCE ASSOCIATED WITH THIS PROJECT IS ANTICIPATED TO BE APPROXIMATELY 3.7 ACRES WITHIN THE LIMITS OF DISTURBANCE IDENTIFIED BY THESE PLANS. A NOTICE OF INTENT FOR CONSTRUCTION ACTIVITY DISCHARGES TO ADEQ AND COMPLIANCE WITH ARIZONA STORMWATER CONSTRUCTION GENERAL PERMIT IS THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL EXERCISE BEST MANAGEMENT PRACTICES DURING CONSTRUCTION TO MINIMIZE THE GENERATION OF EROSION AND SEDIMENT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PREPARATION AND IMPLEMENTATION OF A JOB SITE EROSION & SEDIMENT CONTROL PLAN AND OBTAINING APPROVAL FROM THE COUNTY INSPECTOR PRIOR TO STARTING CONSTRUCTION.
2. CONTRACTOR WILL BE RESPONSIBLE FOR CONTACTING CITY INSPECTOR PRIOR TO INSTALLATION OF BMP'S TO REVIEW SITE LOGISTICS AND VERIFY CITY NEEDS ARE MET. AT START OF CONSTRUCTION CITY OF FLAGSTAFF INSPECTOR WILL VISIT THE SITE TO INSPECT BMP'S INSTALLED AND THE PLAN.

LOG AND WOODY DEBRIS REMOVAL

- 1. LOGS 12 INCHES IN DIAMETER AND SMALLER, SLASH AND WOODY DEBRIS RESULTING FROM TREE REMOVAL OPERATIONS SHALL BE REMOVED FROM THE SITE AND DISPOSED OF IN A LEGAL MANNER OF THE CONTRACTOR'S CHOOSING.
2. LOGS GREATER THAN 12 INCHES IN DIAMETER BECOME THE PROPERTY OF THE CONTRACTOR FOR REUSE, SALE OR DISPOSAL AT HIS OPTION AND SHALL BE REMOVED FROM THE SITE.

PROTECTION OF EXISTING VEGETATION

- 1. CONTRACTOR SHALL TAKE PRECAUTIONS TO PROTECT TREES AND OTHER VEGETATION THAT IS TO REMAIN, UNLESS SPECIFICALLY MARKED FOR REMOVAL. VEGETATION SHALL BE PROTECTED FROM DAMAGE THROUGHOUT THE ENTIRE CONSTRUCTION PERIOD. THE CONTRACTOR SHALL REPAIR ANY DAMAGE RESULTING FROM THE CONTRACTOR'S OPERATIONS OR NEGLIGENCE. THE CONTRACTOR IS REQUIRED TO NOTIFY AND COORDINATE WITH NCD AND COUNTY FLOOD CONTROL PERSONNEL PRIOR TO REMOVING EXCESS TREES OR VEGETATION AND ALL EFFORTS WILL BE MADE TO PRESERVE STANDING LIVE TREES NOT OTHERWISE WITHIN THE TREE CLEARING LIMITS.

REVEGETATION NOTES

SOIL PREPARATION:

- 1. PRIOR TO SEEDING, PREPARE THE SOIL BY SCARIFYING THE UPPER TWO INCHES OF THE FINISHED GRADE TO ENSURE THE SOIL IS IN ROUGHENED CONDITION FAVORABLE FOR SEED GERMINATION AND GROWTH. OVERLY COMPACTED EQUIPMENT ACCESS ROUTES MAY REQUIRE SCARIFICATION TO 6 INCHES FOLLOWED BY SMOOTHING TO ROUGHENED CONDITION FREE OF CLODS.
2. ALL EQUIPMENT USED ON-SITE SHALL BE PRESSURE WASHED TO REMOVE INVASIVE WEED SEEDS PRIOR TO MOBILIZATION TO THE SITE. EQUIPMENT SHALL BE INSPECTED AND APPROVED BY THE CITY INSPECTOR PRIOR TO MOBILIZATION TO THE SITE.

SEEDING:

- 1. RESEEDING OF ALL AREAS DISTURBED BY THE NEW CONSTRUCTION, INCLUDING NEW BASINS, CHANNELS, EMBANKMENTS, ETC., BUT EXCLUDING ROAD AND DRIVEWAY SURFACES, SHALL INCLUDE THE FOLLOWING SEED MIX. THE RESEEDED AREA SHALL INCLUDE STAGING AND CONSTRUCTION ACCESS AREA(S). THE TOTAL ESTIMATED AREAS TO BE RESEEDED IS APPROXIMATELY 3.7 ACRES. (2.4 ACRES IN PHASE 2)

Table with 3 columns: Common Name, Species Name, Lbs PLS/ac. Lists various seed types like Blue Grama, Mountain Muhly, Little Bluestem, etc.

- 2. NO SUBSTITUTION OF SPECIFIED SEED IS ALLOWED WITHOUT PRIOR APPROVAL FROM COUNTY OR ENGINEER.
3. SEED SHALL BE APPLIED UNIFORMLY AND SHALL OCCUR PRIOR TO INSTALLATION OF EROSION CONTROL BLANKETS.
4. SEEDING MAY BE PLACED BY BROADCAST SEEDING METHOD AND SHALL BE INCORPORATED INTO THE SOIL, BUT NOT MORE THAN 0.5" TO 1.0" DEEP.
5. SEED SHALL BE WEED FREE AND SHALL BE PURCHASED FROM A REPUTABLE SUPPLIER. SEED TAG LABELS SHALL BE PROVIDED TO THE COUNTY INSPECTOR PRIOR TO PLACEMENT.
6. ENOUGH TOPSOIL SHALL BE RESERVED BACK AND STOCKPILED DURING THE INITIAL EXCAVATION OPERATIONS TO ALLOW FOR PLACEMENT OF 1 TO 2 INCHES OF TOPSOIL OVER FINAL GRADES OF EXPOSED MINERAL SOIL PRIOR TO PLACING SEED AND EROSION CONTROL BLANKETS. TOTAL VOLUME OF TOPSOIL ESTIMATED AT 300CY.

QUANTITY SUMMARY

PARK SITE BASINS

Table with 5 columns: ITEM, KEYNOTE, DESCRIPTION, UNIT, QUANTITY. Lists items like 201/251 REMOVE & DISPOSE 12" + DBH TREES, 204/205 EARTHWORK (CUT) & HAUL OFF, etc.

QUANTITY SUMMARY NOTES

- 1. A PAY ITEM IS INCLUDED FOR CLEARING AND GRUBBING. THIS SHALL INCLUDE THE REMOVAL AND DISPOSAL OF ALL TREES SMALLER THAN 12 INCHES (MEASURED AT DBH) AND OTHER VEGETATION IN DIRECT CONFLICT WITH THE BASIN GRADING, INCLUDING ALL ROOT BALLS AND SLASH, ETC.
2. REMOVAL OF TREES 12" DBH AND GREATER ARE QUANTIFIED WITHIN THE BID SCHEDULE. REMOVAL OF TREES SMALLER THAN 12" DBH ARE CONSIDERED INCIDENTAL TO THE COST OF THE PROJECT CLEARING & GRUBBING. EXISTING VEGETATION ROOT MAT AND MISCELLANEOUS SURFACE ORGANICS MUST ALSO BE REMOVED PRIOR TO PLACEMENT OF NEW FILL AND/OR STRUCTURES. CONTRACTOR SHALL USE CAUTION TO MINIMIZE DISTURBANCE AS MUCH AS POSSIBLE TO THE ESTABLISHED VEGETATION NOT SCHEDULED FOR REMOVAL. GENERALLY, VEGETATION OUTSIDE OF THE CUT OR FILL LIMITS AS SHOWN ON THE PLAN SHALL BE PRESERVED.
3. COST OF ALL OTHER REMOVAL/DISPOSAL ITEMS NOT SPECIFICALLY LISTED SHALL INCLUDE TRANSPORTATION AND DISPOSAL AT AN ACCEPTED DISPOSAL FACILITY SUCH AS THE CINDER LAKE LANDFILL OR OTHER AS APPROVED.
4. EARTHWORK NOTES:
A. VOLUME OF CUT AND FILL HAS BEEN ESTIMATED HEREIN AND QUANTIFIED IN CUBIC YARDS.
B. NO SHRINK OR SWELL FACTORS APPLIED.
C. EXCAVATION RELATED TO PLACEMENT OF ROCK CHUTES, SLOPE ARMORING & STABILIZING THE ACCESS ROAD HAVE BEEN ACCOUNTED FOR WITHIN THE EARTHWORK ESTIMATE. EXCAVATION FOR ROCK WEIRS HAS NOT BEEN ACCOUNTED FOR IN EARTHWORK.
D. SITE DERIVED EXCAVATED MINERAL SOIL, FREE OF ORGANICS, ROOT MATS, ETC. AND CONTAINING PARTICLES NO GREATER THAN 3" IN SIZE MAY BE USED AS NEEDED FILL WITHIN THE PROJECT FOR SUBGRADE, BERM OR MISCELLANEOUS FILL PLACEMENT.
E. COBBLES AND BOULDERS LARGER THAN 3" SCREENED FROM EXCAVATED MATERIAL MAY BE USED AS RIPRAP AND/OR FEATURE ROCKS WHERE THE SIZE OR GRADATION MEETS THAT CALLED FOR WITHIN THE PLANS.
F. ANY EXCESS EXCAVATED SOILS, COBBLES, BOULDERS, TRASH OR OTHER DEBRIS ENCOUNTERED WITHIN THE PROJECT LIMITS DURING CONSTRUCTION SHALL BE REMOVED FROM THE SITE AT THE CONTRACTOR'S EXPENSE.
G. ALL FINISHED SURFACES SHALL BE SMOOTH, FREE OF DEBRIS AND GENERALLY PLEASING IN APPEARANCE, GIVING A 'FINISHED' LOOK TO THE PROJECT.
5. TRAFFIC CONTROL: THE CONTRACTOR SHALL SUBMIT A TRAFFIC CONTROL PLAN TO THE CITY OF FLAGSTAFF FOR APPROVAL THAT WILL BE COMPATIBLE HIS/HER MEANS AND METHODS OF CONSTRUCTION AND MEETS MUTCD REQUIREMENTS. UPON APPROVAL, THE CONTRACTOR SHALL IMPLEMENT AND MAINTAIN THAT TRAFFIC CONTROL PLAN, AS REQUIRED, THROUGH DURATION OF CONSTRUCTION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN A RIGHT-OF-WAY ENCROACHMENT PERMIT FROM THE CITY OF FLAGSTAFF. A PAY ITEM IS INCLUDED WITHIN THE QUANTITY SUMMARY FOR EACH WORK AREA WHERE TRAFFIC CONTROL IS ANTICIPATED TO BE NECESSARY.
6. RESEEDING SHALL INCLUDE PREPARING THE SEED BED AND SUPPLYING AND PLACING THE SEED AND MULCH PER THE SEEDING SPECIFICATIONS ON THIS SHEET.
7. CONTRACTOR SHALL PROTECT IN PLACE EXISTING FEATURES TO REMAIN AS NECESSARY TO ENSURE NO DAMAGE OCCURS DURING CONSTRUCTION. ITEMS TO BE PROTECTED IN PLACE MAY INCLUDE ELECTRICAL BOXES/TRANSFORMERS, TELCO PEDESTALS, TREES, UNDERGROUND UTILITIES, ETC. THE COST (IF ANY) OF PROVIDING PROTECTION AS NECESSARY SHALL BE CONSIDERED INCIDENTAL TO THE PROJECT AS A WHOLE. COCONINO COUNTY AND THE CITY OF FLAGSTAFF ARE COORDINATING WITH THE INDIVIDUAL UTILITIES PRIOR TO THE START OF CONSTRUCTION TO FACILITATE RELOCATIONS OF FRANCHISE UTILITIES IN CONFLICT WITH THE GRADING. IF THE UTILITIES HAVE NOT COMPLETED RELOCATION PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR WILL BE REQUIRED TO COORDINATE AS NECESSARY WITH THOSE UTILITY COMPANIES.
8. A PAY ITEM FOR SWPPP IS INCLUDED WITHIN THE QUANTITY SUMMARY.
9. A PAY ITEM FOR MOBE/DEMOBE IS INCLUDED WITHIN THE QUANTITY SUMMARY.
10. CONTRACTOR SHALL RETAIN A REGISTERED LAND SURVEYOR LICENSED IN THE STATE OF ARIZONA TO PROVIDE CONSTRUCTION STAKING & LAYOUT FOR IMPROVEMENTS SHOWN HEREIN. LIMITS OF DISTURBANCE SHALL BE CLEARLY IDENTIFIED WITH STAKING & FLAGGING AND MAINTAINED THROUGHOUT CONSTRUCTION AS TO ENSURE CONSTRUCTION ACTIVITY WILL REMAIN WITHIN THESE LIMITS AND NOT EXTEND ONTO ADJACENT PRIVATE PROPERTIES.

QUANTITY SUMMARY - PHASE 1

PARK SITE BASINS

Table with 5 columns: ITEM, KEYNOTE, DESCRIPTION, UNIT, QUANTITY. Lists items like 201/251 REMOVE & DISPOSE 12" + DBH TREES, 204/205 EARTHWORK (CUT) & HAUL OFF, etc.

QUANTITY SUMMARY - PHASE 2

PARK SITE BASINS

Table with 5 columns: ITEM, KEYNOTE, DESCRIPTION, UNIT, QUANTITY. Lists items like 201/251 REMOVE & DISPOSE 12" + DBH TREES, 204/205 EARTHWORK (CUT) & HAUL OFF, etc.

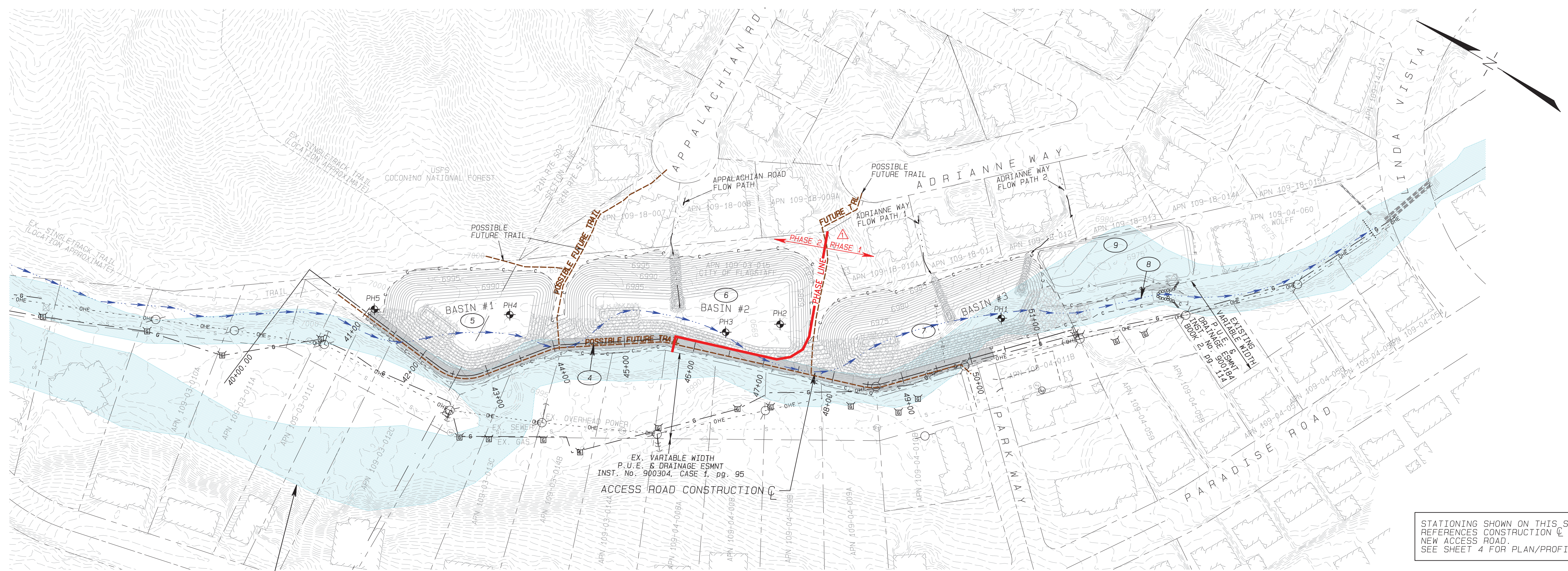
PHASING QUANTITY NOTES:

- 1. THE NUMBER OF 12"+ DBH TREES WITHIN EACH PHASE HAVE BEEN ESTIMATED FROM THE OVERALL TOTAL FOR THE SITE AND HAVE NOT BEEN SPECIFICALLY IDENTIFIED AND COUNTED WITH RESPECT TO THE PHASING LINE. PRIOR TO REMOVING TREES, THE CONTRACTOR SHALL IDENTIFY THE PAY ITEM TREES WITHIN THE PHASE OF CONSTRUCTION THAT ARE >12" DBH AND CONFIRM THE TOTAL NUMBER WITH THE ENGINEER PRIOR TO CUTTING AND REMOVING THOSE TREES.
2. THE PHASE 2 BID ALTERNATE SHALL INCLUDE REMOVAL AND REPLACEMENT OF A PORTION OF THE EXISTING PORTLAND CEMENT CONCRETE DRIVEWAY ON APN 108-04-0108 AND THE CONCRETE ROLL CURB FRONTING THAT PARCEL. THE INTENT IS TO ALLOW CONSTRUCTION ACCESS ACROSS THE SOUTHEAST PROPERTY CORNER OF THAT PARCEL TO FACILITATE LARGER HAUL TRUCKS IN AND OUT OF THE SITE. THE REMOVALS WOULD INCLUDE THE PCC DRIVEWAY CONCRETE TO THE NEAREST CONTROL JOINTS (ESTIMATED AT 4720SF) AND CONCRETE ROLL CURB (ESTIMATED AT 40 LF). REPLACEMENT OF THE DRIVEWAY AND ROLL CURB WOULD INCLUDE RECONSTRUCTION OF THE CONCRETE DRIVEWAY TO MATCH THE EXISTING THICKNESS AND REPLACING THE CURB TO MATCH. EXISTING CONCRETE AND CURB GRADES SHALL MATCHED. THE BID ALTERNATE COST SHOULD ACCOUNT FOR ANY POSSIBLE COST SAVINGS IN PROVIDING A BROADER CONSTRUCTION ACCESS INTO/OUT OF THE SITE, WHETHER THE BID ALTERNATE IS A CREDIT OR AN ADDITIONAL COST WILL DETERMINE IF THE DISTRICT PURSUES A TCE FROM THE PROPERTY OWNER.
3. THE SWPPP SHALL BE IN PLACE AND APPROVED BY THE CITY OF FLAGSTAFF STORMWATER MANAGER PRIOR TO THE START OF ANY EXCAVATION OPERATIONS. TOTAL DISTURBANCE AREA FOR PHASE 2 = 2.4 AC±.
AT A MINIMUM, THE SWPPP SHALL INCLUDE:
1. PREPARATION AND MAINTENANCE OF A JOB SITE SWPPP SCHEMATIC AND LOG BOOK OF THE SWPPP MAINTENANCE THAT HAS OCCURRED.
2. INSTALLATION OF A STONE TRACK-OUT PAD AT THE EAST END OF PARK WAY.
3. DAILY MAINTENANCE OF PARK WAY AND PARADISE ROAD TO REMOVE ANY MUD AND DEBRIS RESULTING FROM THE PROJECT.
4. FINAL REMOVAL OF ANY SEDIMENT THAT IS DEPOSITED INTO THE EXISTING SEDIMENT BASIN AT THE DOWNSTREAM END OF THE PROJECT RESULTING FROM THIS PROJECT.

Vertical sidebar containing project information: MUSEUM FIRE NRCS EMERGENCY WATERSHED PROTECTION PROJECT, PARK SITE BASINS, COCONINO COUNTY FLOOD CONTROL DISTRICT, GENERAL NOTES AND ESTIMATED QUANTITIES. Includes logos for Natural Channel Design, Inc. and project details like sheet number 2 of 9.

Z:\Projects\Arizona\Coconino County\Museum Fire 2022\Drawings\Park Site Basins\Park Way Basins Revised for Phase2.dwg 9/22/2023

Z:\Projects\Arizona\Coconino County\Museum Fire 2022\Drawings\Park Site Basins\Park Way Basins Revised for Phase2.dwg 9/22/2023



EFFECTIVE FEMA FLOODPLAIN IS SHOWN. FUTURE REMAPPING OF THE FLOODPLAIN TO REFLECT OFFICIAL CHANGES TO 100 YEAR FLOODPLAIN WILL BE PER EFFORTS/COORDINATION BY CITY OF FLAGSTAFF FLOODPLAIN MANAGEMENT.

OVERVIEW MAP
SPRUCE WASH - PARK SITE SEDIMENT BASINS



STATIONING SHOWN ON THIS SHEET REFERENCES CONSTRUCTION OF NEW ACCESS ROAD. SEE SHEET 4 FOR PLAN/PROFILE

OVERVIEW NOTES:

PROPERTY BOUNDARY SURVEY WAS PERFORMED FOR THIS DESIGN FOR THE AREA BETWEEN CITY PARCEL APN 109-03-015 AND WOLFF PROPERTY APN 109-04-060. PARCEL BOUNDARIES SHOWN OUTSIDE THE SURVEY AREA, WHICH INCLUDE PROPERTIES TO THE EAST OF THE CITY PARCEL AND BETWEEN WOLFF PROPERTY AND LINDA VISTA, ARE REPRESENTATIVE OF GIS DATA PROVIDED BY THE COUNTY. IT WILL BE THE RESPONSIBILITY OF THE COCONINO COUNTY FLOOD CONTROL DISTRICT AND/OR CITY OF FLAGSTAFF TO ENSURE THAT LEGAL ACCESS/COOPERATOR AGREEMENTS ARE OBTAINED FROM ANY AFFECTED PROPERTY OWNERS PRIOR TO CONSTRUCTION. ANY EXISTING BUILDINGS, FENCE LINES, EDGES OR ROADS OR OTHER EXISTING STRUCTURES SHOWN SHALL ALSO BE CONSIDERED AS APPROXIMATE AND BASED UPON GIS DATA. FUTURE TRAIL ALIGNMENTS SHOWN HEREIN ARE FOR REFERENCE ONLY. NO TRAIL CONSTRUCTION IS INCLUDED WITH THIS PROJECT. THE CITY OF FLAGSTAFF AT A LATER DATE MAY CONSTRUCT TRAIL CONNECTIONS FROM THE NEIGHBORHOOD AREAS TO THE USFS LAND TO THE NORTH AND EAST OF THIS PROJECT SITE. TEST PIT EXPLORATION OF THE NATIVE SOILS WAS CONDUCTED BY NCD DURING 1/20/2022. THE LOCATIONS OF THE TEST PITS IS NOTED HEREIN AS "PH#". NO BEDROCK WAS FOUND DURING THE TEST PIT EXPLORATION. THE TEST PIT LOGS ARE AVAILABLE AND INCLUDED WITHIN THE APPENDICES OF THE PROJECT "DESIGN REPORT" PREPARED BY NCD.

SURVEY INFORMATION

DATUM & COORDINATE GRID INFORMATION	
HORIZONTAL DATUM:	NAD1983 (2011)
COORDINATE PROJECTION:	STATE PLANE ARIZONA CENTRAL FIPS 0202
VERTICAL DATUM:	VERTICAL DATUM: NAVD83 (GEOID 18)
GEOID MODEL:	UNITS: INTERNATIONAL FEET

NCD CONTROL LIST					
NO.	NORTHING	EASTING	ELEVATION	STATION NAME	DESCRIPTION
1	1534327.11	784583.27	7116.38	DM7928	COCONINO COUNTY PUBLIC WORKS GEMINI DISK AT USGS BLDG.
2					
3					

EXISTING TOPOGRAPHY SHOWN IS BASED ON LIDAR DATA OBTAINED FROM COCONINO COUNTY. LIDAR PERFORMED BY NV5 GEOSPATIAL FOR JE FULLER HYDROLOGY AND GEOMORPHOLOGY FOR THE CCFCD FLIGHT DATE: NOVEMBER 26, 2021 PROVIDED TO NCD VIA EMAIL.

AN ORTHOIMAGERY AND LIDAR PROJECT REPORT WAS PREPARED BY NV5 GEOSPATIAL WITH LOCATIONS AND PHOTOS OF SPECIFIC CONTROL POINT COORDINATES LISTED THEREIN THAT REPORT WILL BE MADE AVAILABLE TO THE CONTRACTOR AND THE CONSTRUCTION LAYOUT SURVEYOR PRIOR TO THE START OF CONSTRUCTION.

ALL DESIGN AND LAYOUT CONTROL PROVIDED HEREIN IS BASED UPON THAT LIDAR DATA SET WITH SPECIFIC ON-THE-GROUND TOPOGRAPHIC SURVEY FOR EXISTING TREES, UTILITIES & FEATURES PERFORMED WITHIN THE WORK AREA PROVIDED BY NORTHLAND EXPLORATION SURVEYS (NLS) JOB No. 22-002. ALL REFERENCES TO FOUND (FD) MONUMENTATION, PROPERTY CORNERS ARE PER THE SURVEY PERFORMED BY NLS. REFER TO THE NLS COORDINATE TABLE ON THIS SHEET FOR LOCAL CONTROL.

NLS Coordinate Table				
Pt #	Northing	Easting	Elevation	Descriptor
1	1538649.56	785969.77	7034.81	CP 201 40D
2	1538233.45	786707.17	7013.11	CP 202 40D
3	1537465.30	786939.68	6998.23	CP-203 40D
4	1537125.64	787249.68	6994.27	CP-204 40D
5	1536755.81	787344.08	6981.53	CP-205 40D
6	1536842.52	787242.69	6981.25	CP-206 40D
7	1536913.84	787222.58	6985.43	CP-207 40D
8	1536611.24	787493.39	6972.95	CP-208 40D
9	1537146.57	786999.13	6989.20	CP-209 60D
10	1537742.86	786808.05	7003.58	CP-210 40D
11	1538173.36	786749.87	7016.21	CP-211 40D
12	1538507.36	786316.39	7028.00	CP-200 40D
13	1538351.66	786608.07	7015.45	FD BC 4476
14	1537871.35	786817.22	7006.88	FD PC 29884
15	1537843.79	786829.31	7006.01	FD BC 4476
16	1538090.37	786476.35	7015.87	FD AC ILLEG
17	1538573.24	785999.43	7032.89	FD BC 4476
18	1538569.46	786010.05	7031.92	FD 5/8" RBR
19	1537761.32	786885.28	7004.35	FD 1/2" RBR W/TAG ILLEG
20	1537440.70	787104.85	6998.94	FD BC USFS
21	1536581.72	787052.51	7000.10	FD AC 25083
22	1536757.88	786857.10	7015.35	FD AC 25083
23	1537300.19	786584.96	7040.77	FD AC 25083
24	1537451.42	786533.34	7041.19	FD AC 25083
25	1536811.05	787472.09	6981.25	FD 1/2" PIPE
26	1537009.47	787294.67	6991.80	FD 1/2" PIPE
27	1537156.75	787298.48	6997.40	FD AC ILLEG
28	1536207.08	787704.39	6966.65	FD AC ILLEG
29	1537156.47	787298.46	6997.59	FD 1/2" RBR
30	1538233.51	786707.38	7013.34	FD-202
31	1538351.73	786608.30	7016.47	FD BC 4476

ACCESS ROAD CONSTRUCTION COORDINATE TABLE

PT#	DESCRIPTION	STATION	CURVE DATA	NORTH	EAST
		BEARING		DISTANCE	
400	ACCESS RD	40+00.00	S74°3'06"W	1537692.10	786948.71
			229.03ft		
401	PC R62'	42+29.03	1537465.14	786917.95	
		RADIUS POINT: 402	1537456.81	786979.38	
		RADIUS: 62.00ft			
		DELTA: 57°44'05"	LEFT		
		ARC LENGTH: 62.47ft			
403	PT	42+91.51	1537409.31	786939.54	
		S50°00'58"E	100.94ft		
404	PC R58'	43+92.44	1537344.45	787016.89	
		RADIUS POINT: 405	1537300.01	786979.62	
		RADIUS: 58.00ft			
		DELTA: 17°35'52"	RIGHT		
		ARC LENGTH: 17.81ft			
406	PT	44+10.26	1537331.10	787028.58	
		S32°25'07"E	137.22ft		
407	PC R58'	45+47.48	1537215.26	787102.14	
		RADIUS POINT: 408	1537184.17	787053.18	
		RADIUS: 58.00ft			
		DELTA: 15°57'48"	RIGHT		
		ARC LENGTH: 16.16ft			
409	PT	45+63.64	1537200.60	787108.81	
		S16°27'19"E	279.27ft		
410	PC R62'	48+42.91	1536932.77	787187.91	
		RADIUS POINT: 411	1536950.33	787247.37	
		RADIUS: 62.00ft			
		DELTA: 28°32'32"	LEFT		
		ARC LENGTH: 30.89ft			
412	PT	48+73.79	1536906.49	787203.53	
		S44°59'51"E	278.14ft		
413	ACCESS RD	51+51.93	1536709.81	787400.20	

NOTE: SEE SHEET 4 FOR ACCESS ROAD PLAN/PROFILE.

SHEET INDEX

- 4 PLAN/PROFILE - ACCESS ROAD (SEE SHEET 4)
- 5 PLAN BASIN 1 (SEE SHEET 5)
- 6 PLAN BASIN 2 (SEE SHEET 6)
- 7 PLAN BASIN 3 (SEE SHEET 7)
- 8 PLAN/PROFILE - CHANNEL TO LINDA VISTA DRIVE (SEE SHEET 8)
- 9 PLAN/PROFILE - WOLFF PROPERTY FLOOD PROTECTION (SEE SHEET 9)

UNAUTHORIZED CHANGES & USES
THE ENGINEER DISCLAIMS THE PLAN'S LIABILITY FOR THE INFORMATION PROVIDED TO ANY OTHER PARTY. THE INFORMATION MUST BE APPROVED BY THE ENGINEER OF THESE PLANS.

DATE: 12/19/2022

NCD PROJECT NUMBER: 22-412AZ

SHEET NUMBER: 3 of 9

CONTACT: NCD 111 W. WASH. ST. SUITE 100
FLAGSTAFF, AZ 86004
(928) 774-2336

MUSEUM FIRE NRCS EMERGENCY WATERSHED PROTECTION PROJECT

PARK SITE BASINS

COCONINO COUNTY FLOOD CONTROL DISTRICT

PROJECT OVERVIEW AND SURVEY NOTES

DESIGNED BY: MK/DM

CHECKED BY: MK

NO. 1 DATE: 2/24/23

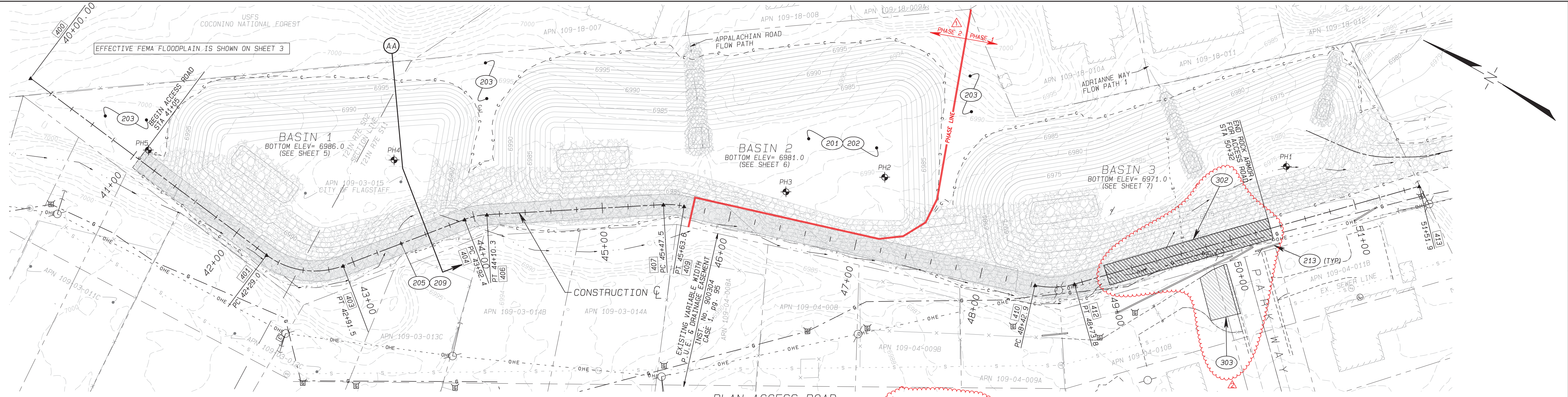
BY: MK

REVISION: NOTATIONS FOR PHASE CONSTRUCTION

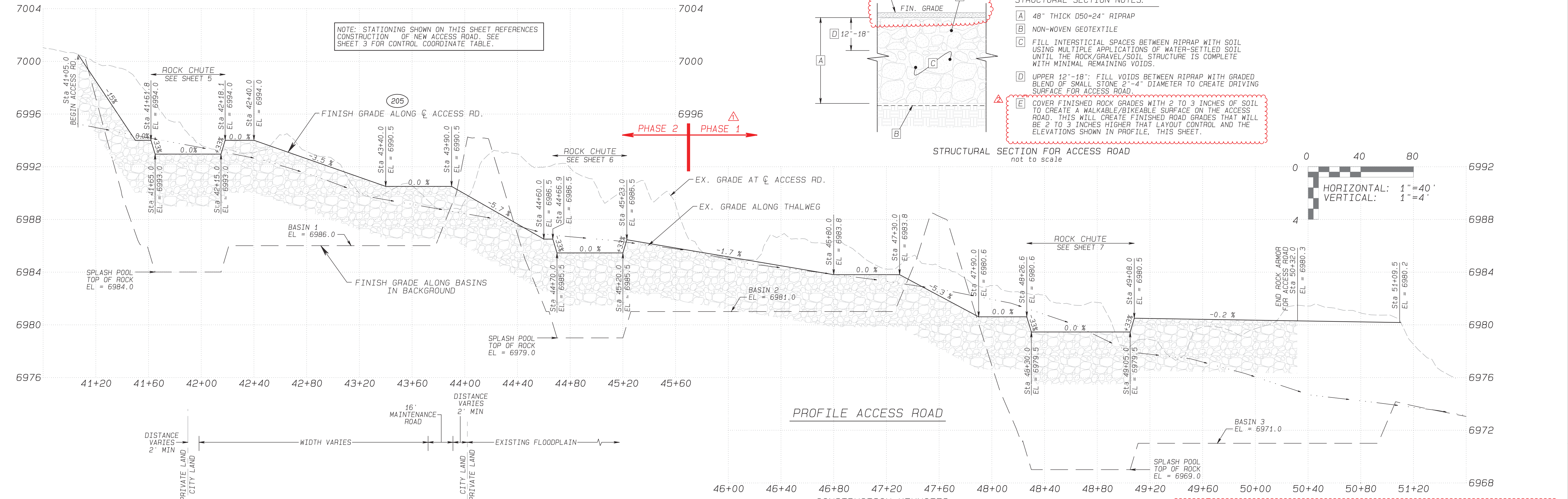
Natural Channel Design, Inc.

2900 N. West St. #5
Flagstaff, Arizona 86004
(928) 774-2336

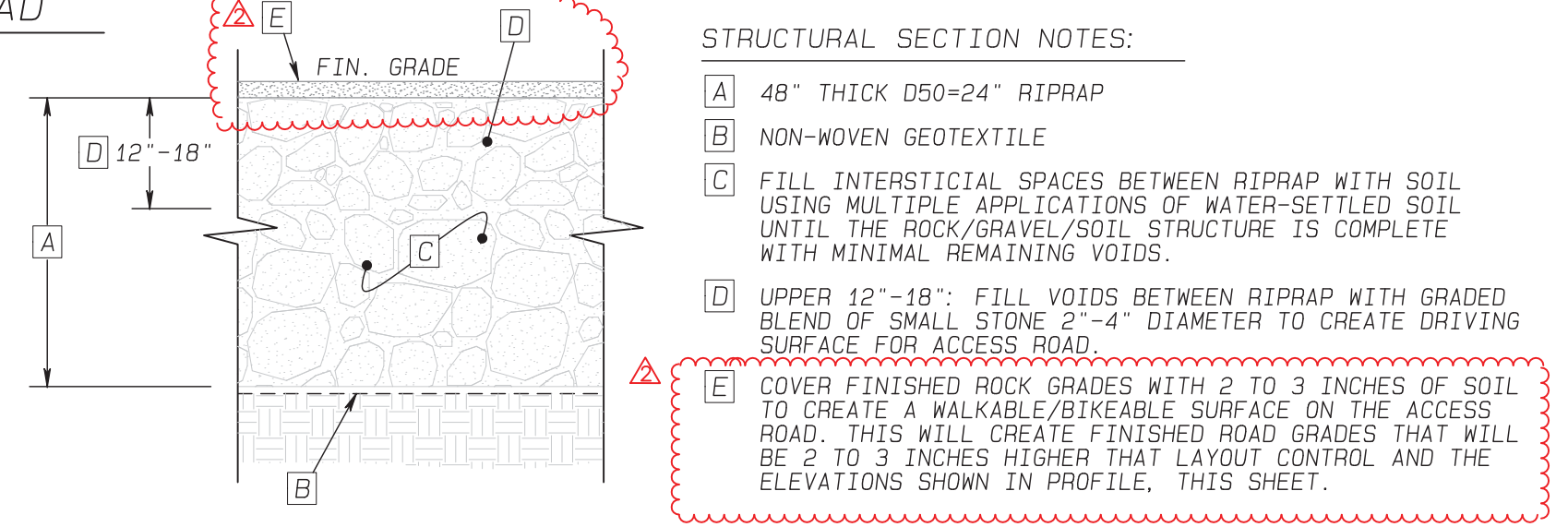
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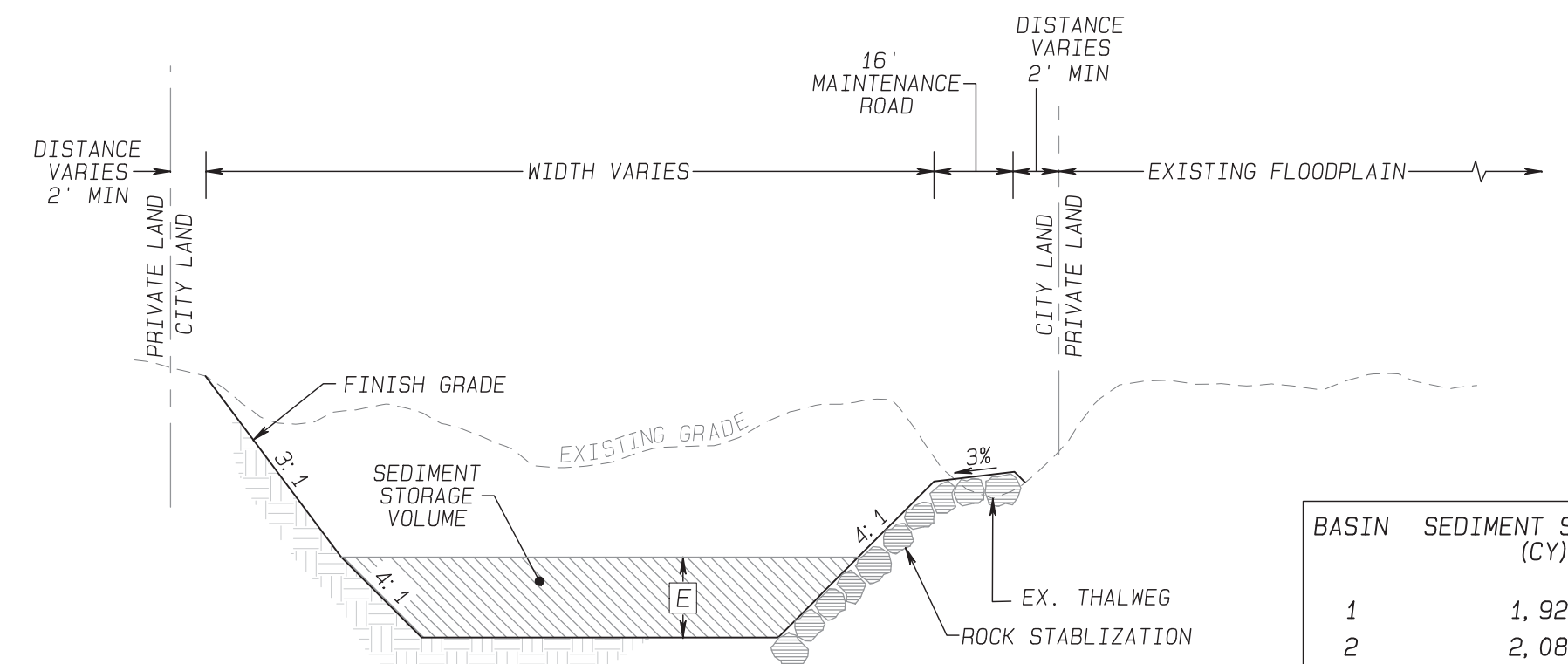
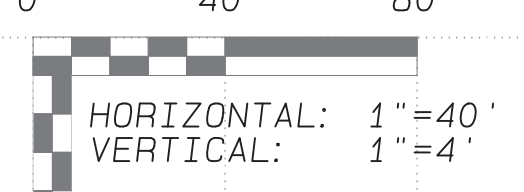
PLAN ACCESS ROAD



PROFILE ACCESS ROAD



- STRUCTURAL SECTION NOTES:
- A 48" THICK D50=24" RIPRAP
 - B NON-WOVEN GEOTEXTILE
 - C FILL INTERSTITIAL SPACES BETWEEN RIPRAP WITH SOIL USING MULTIPLE APPLICATIONS OF WATER-SETTLED SOIL UNTIL THE ROCK/GRAVEL/SOIL STRUCTURE IS COMPLETE WITH MINIMAL REMAINING VOIDS.
 - D UPPER 12"-18": FILL VOIDS BETWEEN RIPRAP WITH GRADED BLEND OF SMALL STONE 2"-4" DIAMETER TO CREATE DRIVING SURFACE FOR ACCESS ROAD.
 - E COVER FINISHED ROCK GRADES WITH 2 TO 3 INCHES OF SOIL TO CREATE A WALKABLE/BIKEABLE SURFACE ON THE ACCESS ROAD. THIS WILL CREATE FINISHED ROAD GRADES THAT WILL BE 2 TO 3 INCHES HIGHER THAN LAYOUT CONTROL AND THE ELEVATIONS SHOWN IN PROFILE. THIS SHEET.



TYPICAL GRADING CROSS SECTION AT BASIN
not to scale

BASIN	SEDIMENT STORAGE (CY)
1	1,926
2	2,088
3	1,313
	5,327

- CONSTRUCTION KEYNOTES:
- 201 ** REMOVE & DISPOSE OF EXISTING TREES GREATER THAN 12-INCH DBH. PRIOR TO CLEARING TREES CONTRACTOR & NCD SHALL WALK SITE TO DETERMINE TREES TO BE PRESERVED. CONTRACTOR SHALL HAVE THEIR SURVEYOR STAKE OUT LIMITS OF CUT PRIOR TO SITE WALKTHROUGH. ALL TREES IDENTIFIED TO BE SAVED SHALL BE PROTECTED FROM DAMAGE AS PRACTICABLE. ANY DAMAGE TO BARK OR PRUNED LIMBS SHALL BE REPAIRED WITH PRUNING SEALER AND GRAFTING COMPOUND AS APPROPRIATE.
 - 202 ** CLEAR & GRUB IN ADVANCE OF GRADING OPERATIONS
 - 203 NPI PRESERVE TREES & NATIVE VEGETATION IN AREA BETWEEN BASINS.
 - 205 ** CONSTRUCT NEW ACCESS MAINTENANCE ROAD PER PLAN & PROFILE. STRUCTURAL SECTION AND TYPICAL SECTIONS ON SHEETS 5-7. QUANTITIES FOR EARTHWORK ARE PROVIDED ON SHEET 2 'QUANTITY SUMMARY'.
 - 209 ** INSTALL NON-WOVEN GEOTEXTILE FABRIC. COMPLETELY UNDERLAY ALL ROCK WITH GEOTEXTILE FABRIC.
 - 213 1 LS REMOVE & RESET EXISTING CONCRETE BARRIERS AS NEEDED TO FACILITATE CONSTRUCTION ACCESS. RESET UPON DEMOBILIZATION.
 - 302 ** CONSTRUCT & MAINTAIN STABILIZED MAINTENANCE ACCESS ROAD SECTION BETWEEN STA. 49+00 TO PARK WAY (STA. 50+32) AT ONSET OF CONSTRUCTION TO SERVE AS EROSION & SEDIMENT CONTROL TRACKOUT PAD FOR PROJECT. MATERIAL QUANTITIES ARE ACCOUNTED FOR ON SHEET 2.
 - 303 ** BID ALTERNATE: CREATE TEMPORARY CONSTRUCTION ACCESS ACROSS THE SOUTHEAST CORNER OF APN 109-04-010B TO INCLUDE REMOVAL AND REPLACEMENT (TO NEAREST CONTROL JOINTS) OF THE EXISTING CONCRETE DRIVEWAY (±720SF) AND EXISTING ROLL CURB (±40LF) ALONG THE PARCEL FRONTAGE.

** SEE 'QUANTITY SUMMARY' ON SHEET 2 FOR ITEMIZED LIST OF QUANTITIES
NPI: NON-PAY ITEM

UNAUTHORIZED CHANGES & USES
THE ENGINEER PROVIDING THESE PLANS
WARRANTS THAT THE INFORMATION CONTAINED
HEREIN IS ACCURATE AND COMPLETE TO THE
BEST OF HIS KNOWLEDGE AND BELIEF AT THE
DATE OF THESE PLANS.

DATE: 12/19/2022
NCD PROJECT NUMBER: 22-412AZ
SHEET NUMBER: 4 of 9

MUSEUM FIRE NRCS EMERGENCY WATERSHED PROTECTION PROJECT

PARK SITE BASINS

COCONINO COUNTY FLOOD CONTROL DISTRICT

PLAN/PROFILE - ACCESS ROAD

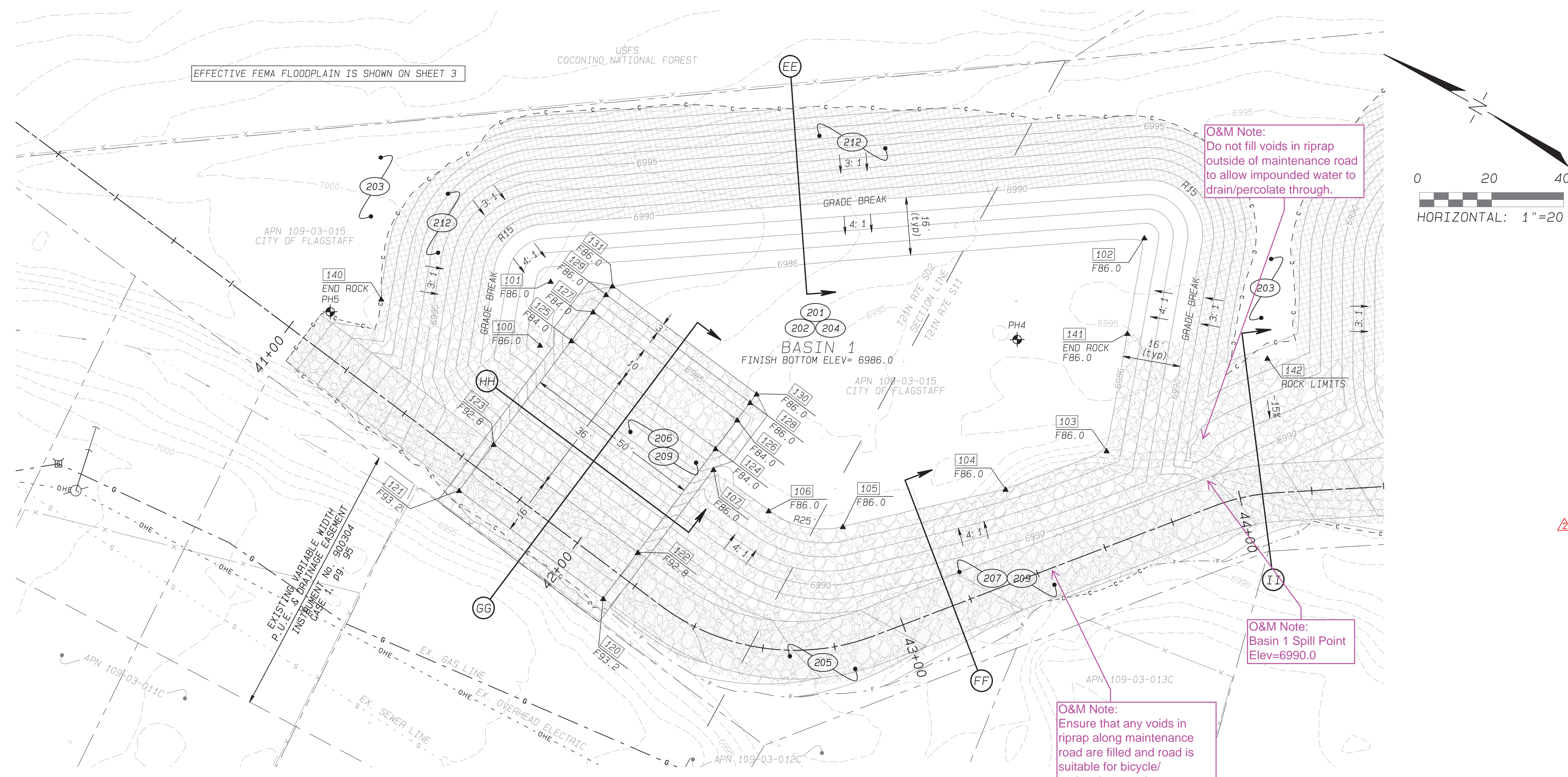
DESIGNED BY: MK
CHECKED BY: MK
NO. 1 DATE: 2/24/23
BY: MK
REVISION: NOTATIONS FOR PHASE CONSTRUCTION
EDITS TO CONSTRUCTION NOTES AND DRAWING FOR PHASE 2 BIDDING

Drawn by: MK/M/DM

Natural Channel Design, Inc.
2900 N West St. #5
Flagstaff, Arizona 86004
(928) 774-2336

** SEE 'QUANTITY SUMMARY' ON SHEET 2 FOR ITEMIZED LIST OF QUANTITIES
NPI: NON-PAY ITEM

Z:\Projects\Arizona\Coconino County\Museum Fire 2022\Drawings\Park Site Basins\Park Way Basins_City Only Basins_Revise for Phase2.dwg, 9/22/2023



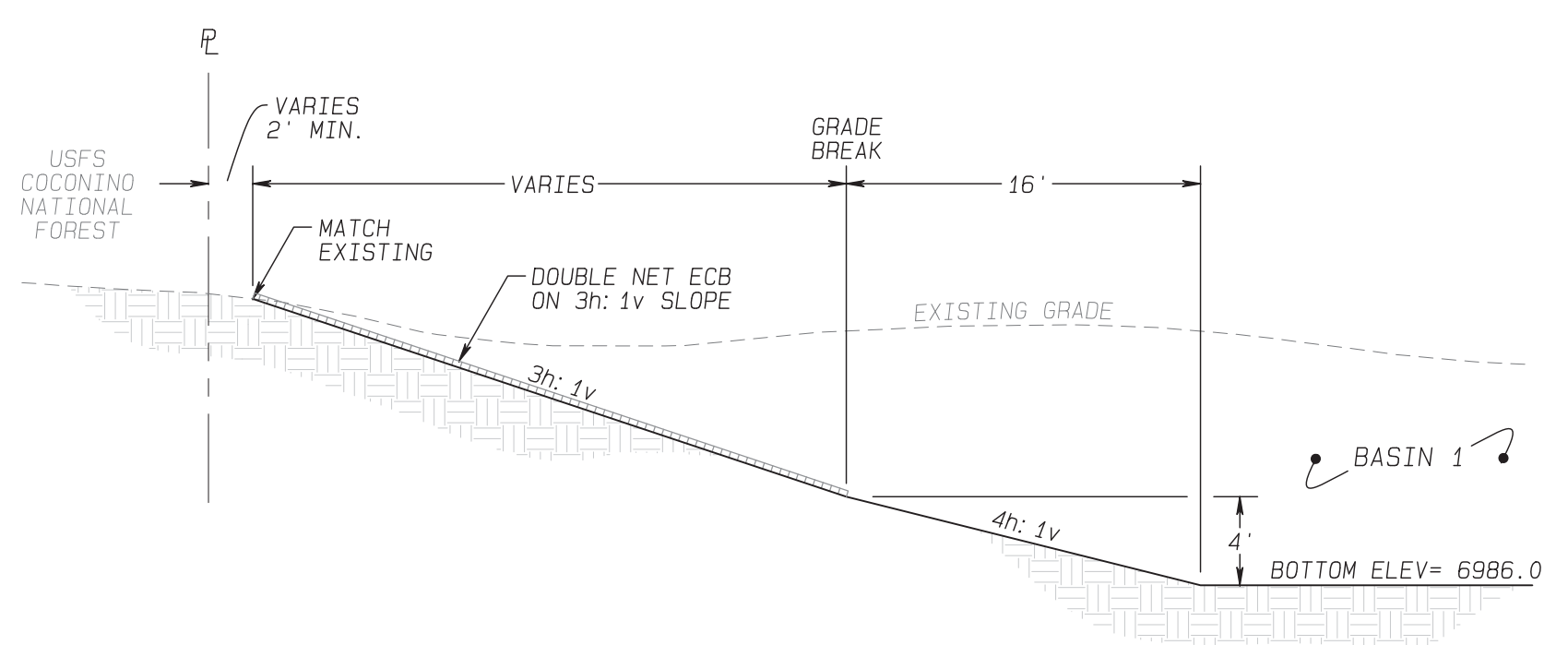
- CONSTRUCTION KEYNOTES:**
- (201) ** REMOVE & DISPOSE OF EXISTING TREES GREATER THAN 12-INCH DBH. PRIOR TO CLEARING TREES CONTRACTOR & NCD SHALL WALK SITE TO DETERMINE TREES TO BE PRESERVED. CONTRACTOR SHALL HAVE THEIR SURVEYOR STAKE OUT LIMITS OF CUT PRIOR TO SITE WALKTHROUGH. ALL TREES IDENTIFIED TO BE SAVED SHALL BE PROTECTED FROM DAMAGE AS PRACTICABLE. ANY DAMAGE TO BARK OR PRUNED LIMBS SHALL BE REPAIRED WITH PRUNING SEALER AND GRAFTING COMPOUND AS APPROPRIATE.
 - (202) ** CLEAR & GRUB IN ADVANCE OF GRADING OPERATIONS
 - (203) NPI PRESERVE TREES & NATIVE VEGETATION IN AREA BETWEEN BASINS.
 - (204) ** CONSTRUCT NEW SEDIMENT BASIN PER PLAN & THE CONTROL POINT COORDINATES PROVIDED. SEE SHEET 2 FOR ESTIMATED EARTHWORK QUANTITIES & NOTES.
 - (205) ** CONSTRUCT NEW ACCESS MAINTENANCE ROAD PER PLAN/PROFILE & STRUCTURAL SECTION ON SHEET 4.
 - (206) ** CONSTRUCT 48" MIN. THICK (D50=24") ROCK CHUTE PER PLAN & DETAILS ON THIS SHEET.
 - (207) ** CONSTRUCT 48" MIN. THICK (D50=24") ARMORED RIPRAP SLOPE & ROAD STABILIZATION PER PLAN & TYPICAL SECTIONS ON THIS SHEET.
 - (209) ** INSTALL NON-WOVEN GEOTEXTILE FABRIC COMPLETELY UNDERLAY ALL ROCK WITH NON-WOVEN GEOTEXTILE FABRIC. ITEM IS CONSIDERED INCIDENTAL TO INSTALLATION OF 48" THICK ROCK RIPRAP PER KEYNOTES 205-207.
 - (212) ** INSTALL WESTERN EXCELSIOR EXCEL CS-3 DOUBLE NET EROSION CONTROL BLANKET (ECB) ON 3:1 SLOPES. USE ALL NATURAL ECB (NO POLYESTER NETTING). INSTALL PER MANUFACTURER'S SPECIFICATIONS. NOTE: PLACEMENT OF ECB ON 4:1 SLOPE FABRIC IS SUBJECT TO GETTING RIPPED DURING SEDIMENT REMOVAL.
- ** SEE 'QUANTITY SUMMARY' ON SHEET 2 FOR ITEMIZED LIST OF QUANTITIES
NPI: NON-PAY ITEM

NOTE TO BIDDERS:
SEE THE QUANTITY SUMMARY, SHEET 2 AND PHASE 2 BID SCHEDULE FOR A DETAILED LIST OF THE REQUIRED QUANTITIES FOR A PHASED CONSTRUCTION PLAN.

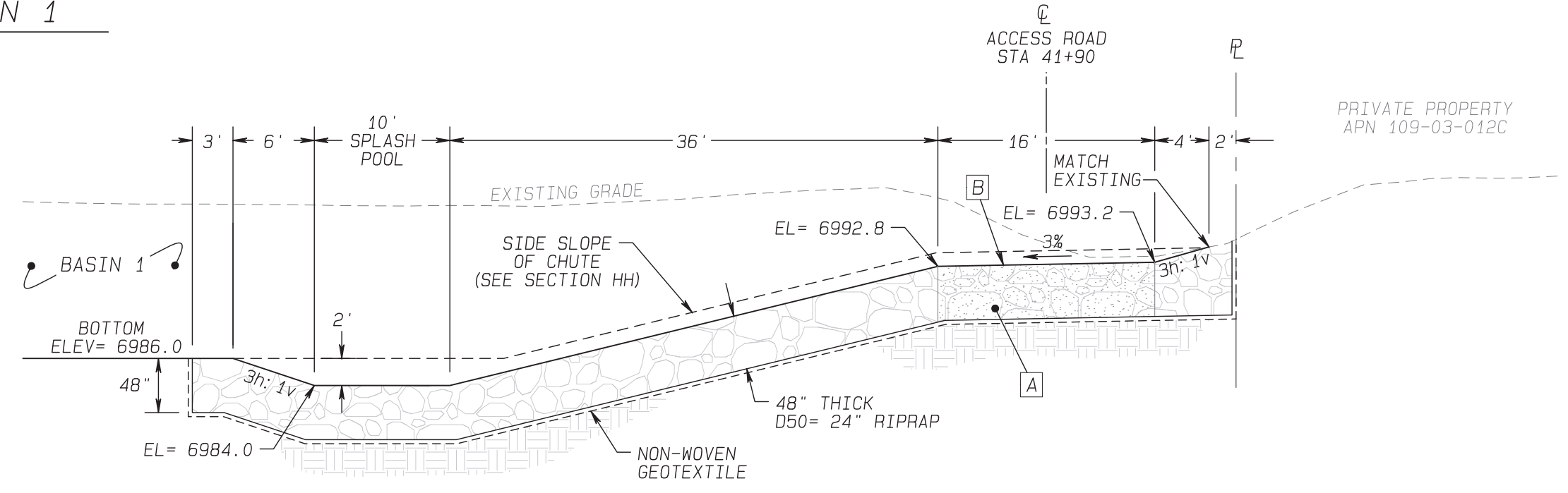
Coordinate Table - Basin 1

Pt #	Northing	Eastng	Elevation	Descriptor
100	1537529.70	786964.81	6986.00	BOT BASIN 1
101	1537536.76	786981.73	6986.00	BOT BASIN 1
102	1537397.66	787072.54	6986.00	BOT BASIN 1
103	1537378.05	787015.79	6986.00	BOT BASIN 1
104	1537397.33	786992.79	6986.00	BOT BASIN 1
105	1537431.75	786961.75	6986.00	BOT BASIN 1
106	1537451.89	786995.54	6986.00	BOT BASIN 1
107	1537470.83	786958.11	6986.00	BOT BASIN 1
120	1537480.12	786911.90	6993.20	EDGE OF ACCESS RD.
121	1537529.67	786918.62	6993.20	EDGE OF ACCESS RD.
122	1537477.97	786927.76	6992.80	TOP OF SLOPE
123	1537527.52	786934.47	6992.80	TOP OF SLOPE
124	1537473.14	786963.43	6984.00	BOTTOM OF SLOPE
125	1537522.68	786970.15	6984.00	BOTTOM OF SLOPE
126	1537471.79	786973.34	6984.00	END OF SPLASH POOL
127	1537521.34	786980.06	6984.00	END OF SPLASH POOL
128	1537470.99	786979.29	6986.00	TOP OF LIP
129	1537520.53	786986.00	6986.00	TOP OF LIP
130	1537470.58	786982.26	6986.00	END OF ROCK
131	1537520.13	786988.97	6986.00	END OF ROCK
140	1537574.44	786954.53	-	END OF ROCK
141	1537388.85	787047.06	6986.00	END OF ROCK
142	1537351.55	787059.95	-	LIMITS OF ROCK

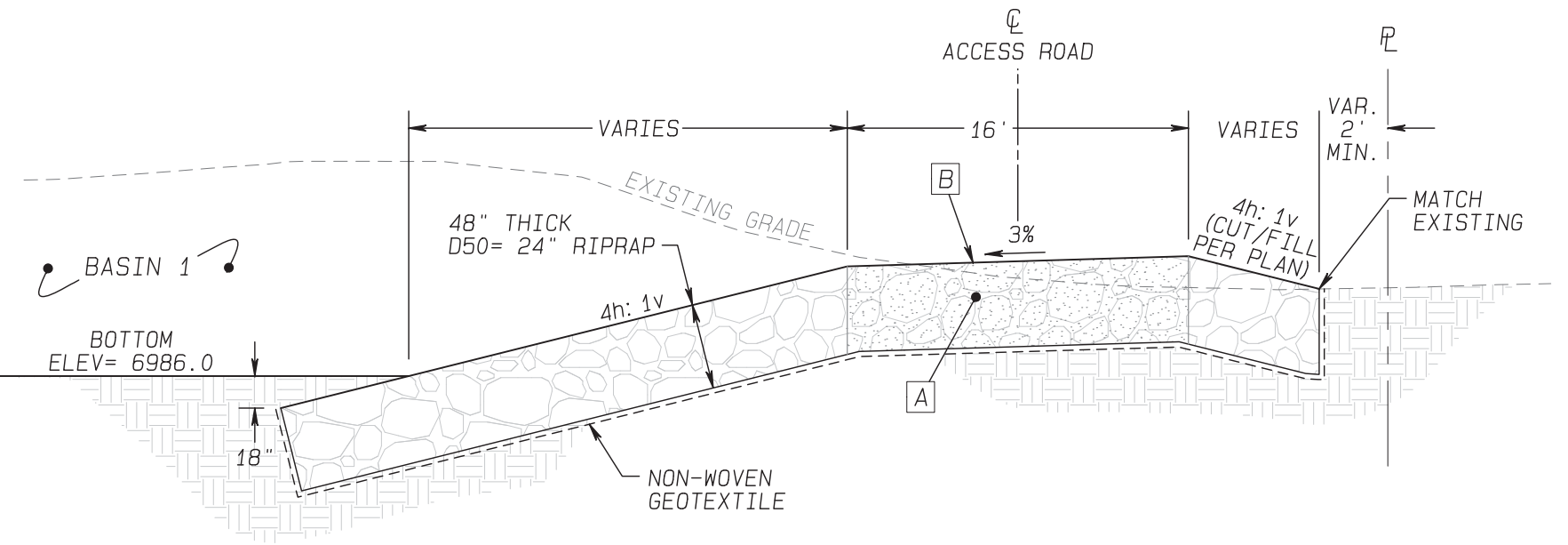
NOTE: SEE SHEET 3 FOR SURVEY INFORMATION



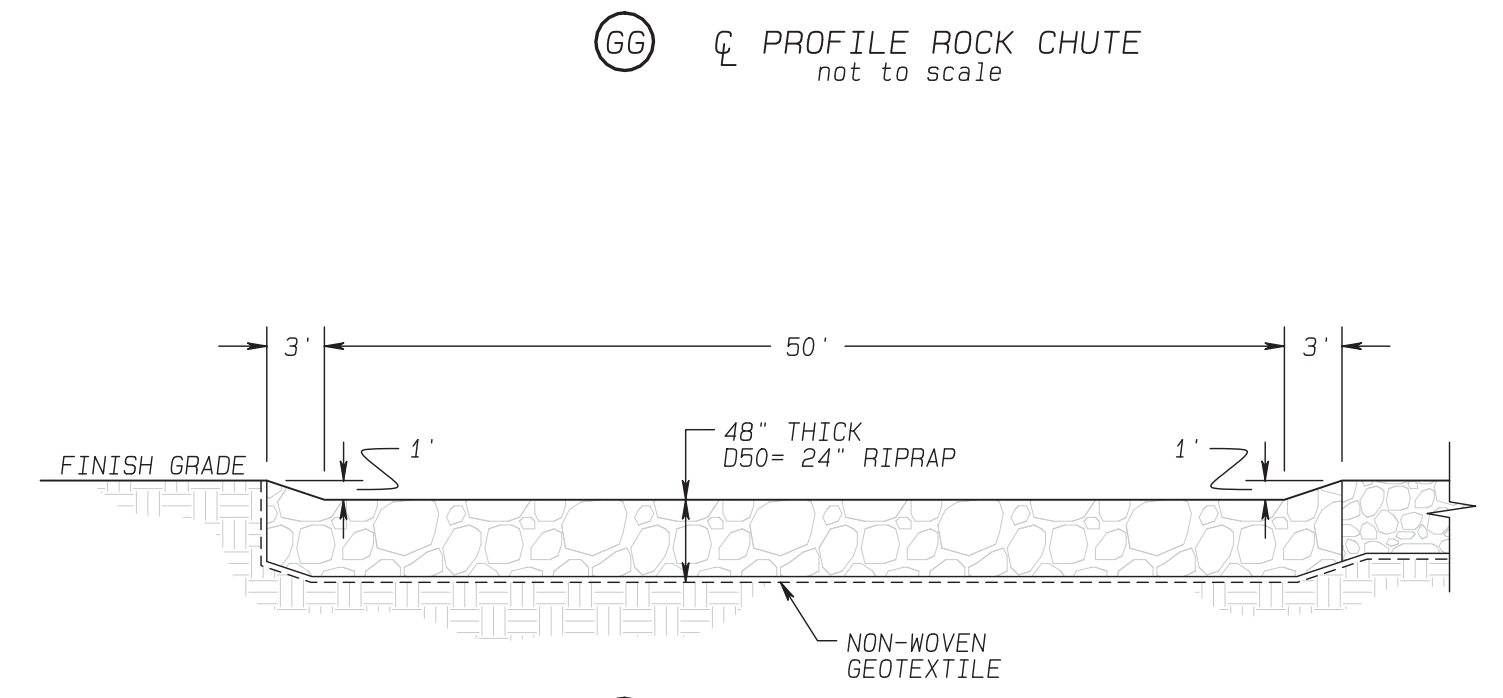
EE TYPICAL SECTION
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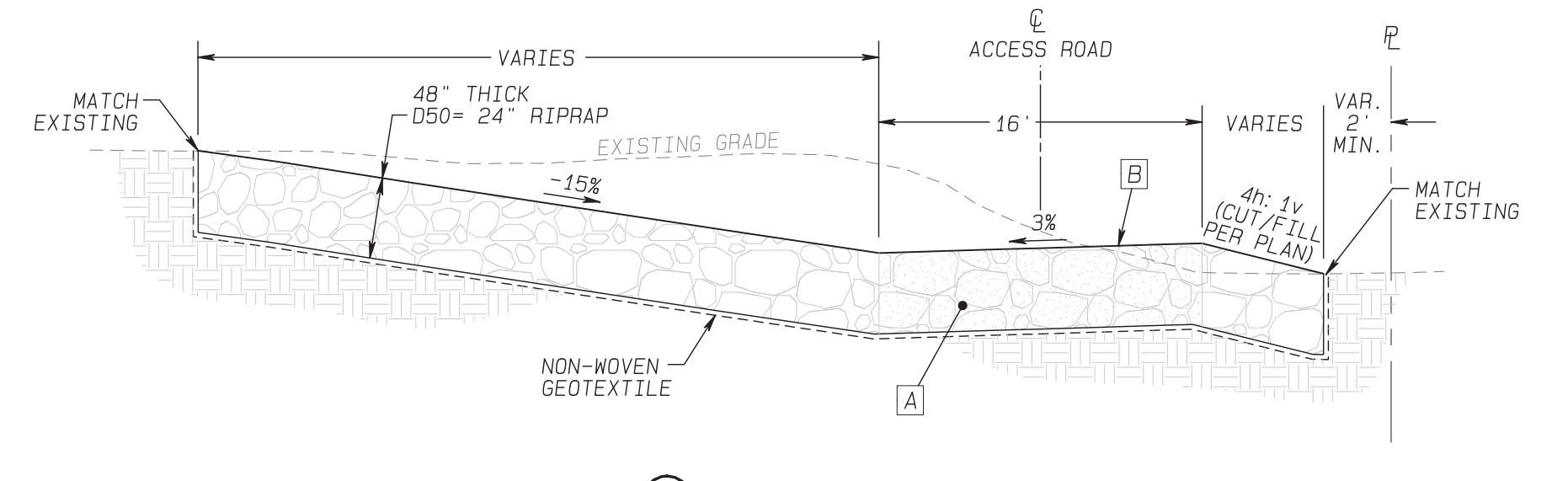
GG PROFILE ROCK CHUTE
not to scale



FF TYPICAL SECTION
not to scale



HH TYPICAL SECTION
not to scale



II TYPICAL SECTION
not to scale

- TYPICAL SECTION NOTES:**
- A FILL INTERSTITIAL SPACES BETWEEN RIPRAP WITH SOIL USING MULTIPLE APPLICATIONS OF WATER-SETTLED SOIL UNTIL THE ROCK/GRAVEL/SOIL STRUCTURE IS COMPLETE WITH MINIMAL REMAINING VOIDS. SEE STRUCTURAL SECTION ON SHEET 4.
 - B UPPER 12"-18": FILL VOIDS BETWEEN RIPRAP WITH GRADED BLEND OF SMALL STONE 2"-4" DIAMETER TO CREATE DRIVING SURFACE FOR ACCESS ROAD.

UNAUTHORIZED CHANGES & USES
 THE ENGINEER PREPARED THESE PLANS AND SPECIFICATIONS TO BE USED FOR THE PROJECT DESCRIBED HEREIN. ANY OTHER USES OR MODIFICATIONS TO THESE PLANS OR SPECIFICATIONS WITHOUT THE WRITTEN CONSENT OF THE ENGINEER ARE PROHIBITED.

CONTACT: 928.744.2336
 WWW.NATURALCHANNELDESIGN.COM

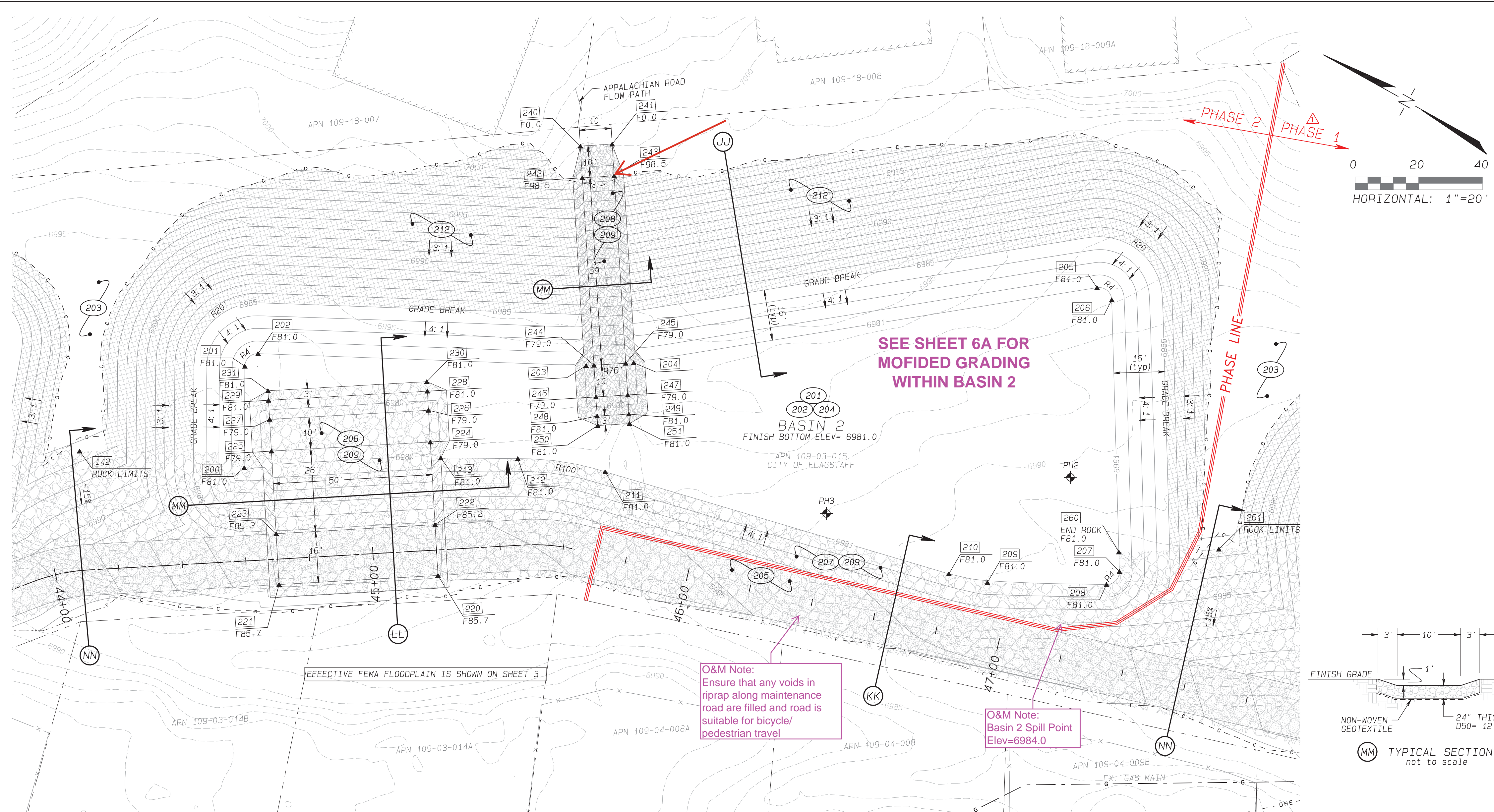
SHEET NUMBER: 5 of 9
 NCD PROJECT NUMBER: 22-412AZ
 DATE: 12/19/2022

MUSEUM FIRE NRCS EMERGENCY WATERSHED PROTECTION PROJECT
 PARK SITE BASINS
 COCONINO COUNTY FLOOD CONTROL DISTRICT
PLAN BASIN 1

DRAWN BY: MK/M/DM
 DESIGNED BY: MK
 CHECKED BY: MK
 NO. DATE BY REVISION
 9/22/23 MK UPDATED FOR PHASE 2 BIDDING

Natural Channel Design, Inc.
 2900 N West St. #5
 Flagstaff, Arizona 86004
 (928) 774-2336

Z:\Projects\Arizona\Coconino County\Museum Fire 2022\Drawings\Park Way Basins\Park Site Basins\Plan Basin 2.dwg 9/22/2023



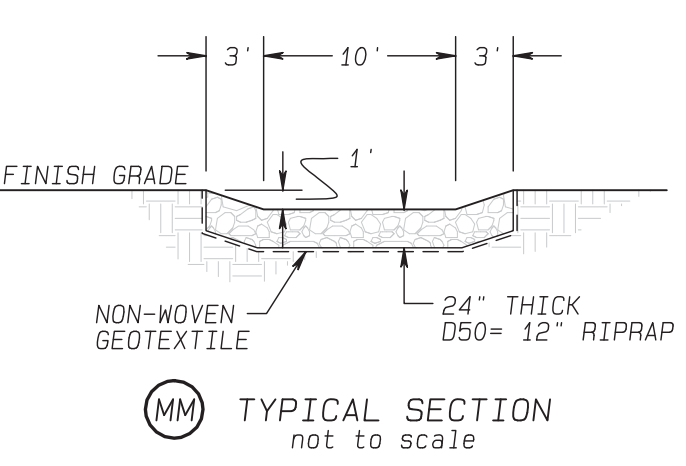
- CONSTRUCTION KEYNOTES:**
- (201) ** REMOVE & DISPOSE OF EXISTING TREES GREATER THAN 12-INCH DBH. PRIOR TO CLEARING TREES CONTRACTOR & NCD SHALL WALK SITE TO DETERMINE TREES TO BE PRESERVED. CONTRACTOR SHALL HAVE THEIR SURVEYOR STAKE OUT LIMITS OF CUT PRIOR TO SITE WALKTHROUGH. ALL TREES IDENTIFIED TO BE SAVED SHALL BE PROTECTED FROM DAMAGE AS PRACTICABLE. ANY DAMAGE TO BARK OR PRUNED LIMBS SHALL BE REPAIRED WITH PRUNING SEALER AND GRAFTING COMPOUND AS APPROPRIATE.
 - (202) ** CLEAR & GRUB IN ADVANCE OF GRADING OPERATIONS
 - (203) NPI PRESERVE TREES & NATIVE VEGETATION IN AREA BETWEEN BASINS.
 - (204) ** CONSTRUCT NEW SEDIMENT BASIN PER PLAN & THE CONTROL POINT COORDINATES PROVIDED. SEE SHEET 2 FOR ESTIMATED EARTHWORK QUANTITIES & NOTES.
 - (205) ** CONSTRUCT NEW ACCESS MAINTENANCE ROAD PER PLAN/PROFILE & STRUCTURAL SECTION ON SHEET 4.
 - (206) ** CONSTRUCT 48" MIN. THICK (D50=24") ROCK CHUTE PER PLAN & DETAILS ON THIS SHEET.
 - (207) ** CONSTRUCT 48" MIN. THICK (D50=24") ARMORED RIPRAP SLOPE & ROAD STABILIZATION PER PLAN & TYPICAL SECTIONS ON THIS SHEET.
 - (208) 113 CY CONSTRUCT 24" MIN. THICK (D50=12") ROCK CHUTE PER PLAN & TYPICAL SECTION.
 - (209) ** INSTALL NON-WOVEN GEOTEXTILE FABRIC. COMPLETELY UNDERLAY ALL ROCK WITH NON-WOVEN GEOTEXTILE FABRIC. ITEM IS CONSIDERED INCIDENTAL TO INSTALLATION OF ROCK RIPRAP PER KEYNOTES 205-208.
 - (212) ** INSTALL WESTERN EXCELSIOR EXCEL CS-3 DOUBLE NET EROSION CONTROL BLANKET (ECB) ON 3:1 SLOPES. USE ALL NATURAL ECB (NO DYE NETTING) INSTALL PER MANUFACTURER'S SPECIFICATIONS. NOTE: PLACEMENT OF ECB ON 4:1 SLOPE FABRIC IS SUBJECT TO GETTING RIPPED DURING SEDIMENT REMOVAL.

** SEE 'QUANTITY SUMMARY' ON SHEET 2 FOR ITEMIZED LIST OF QUANTITIES
NPI: NON-PAY ITEM

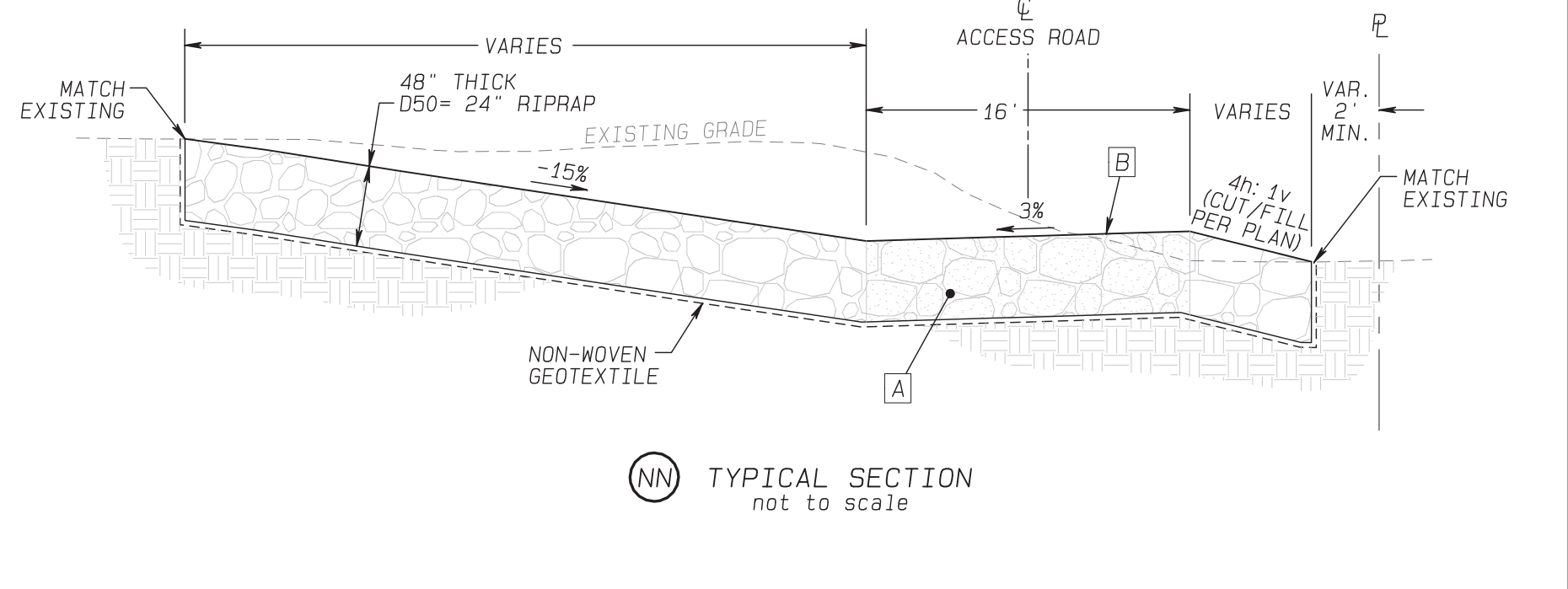
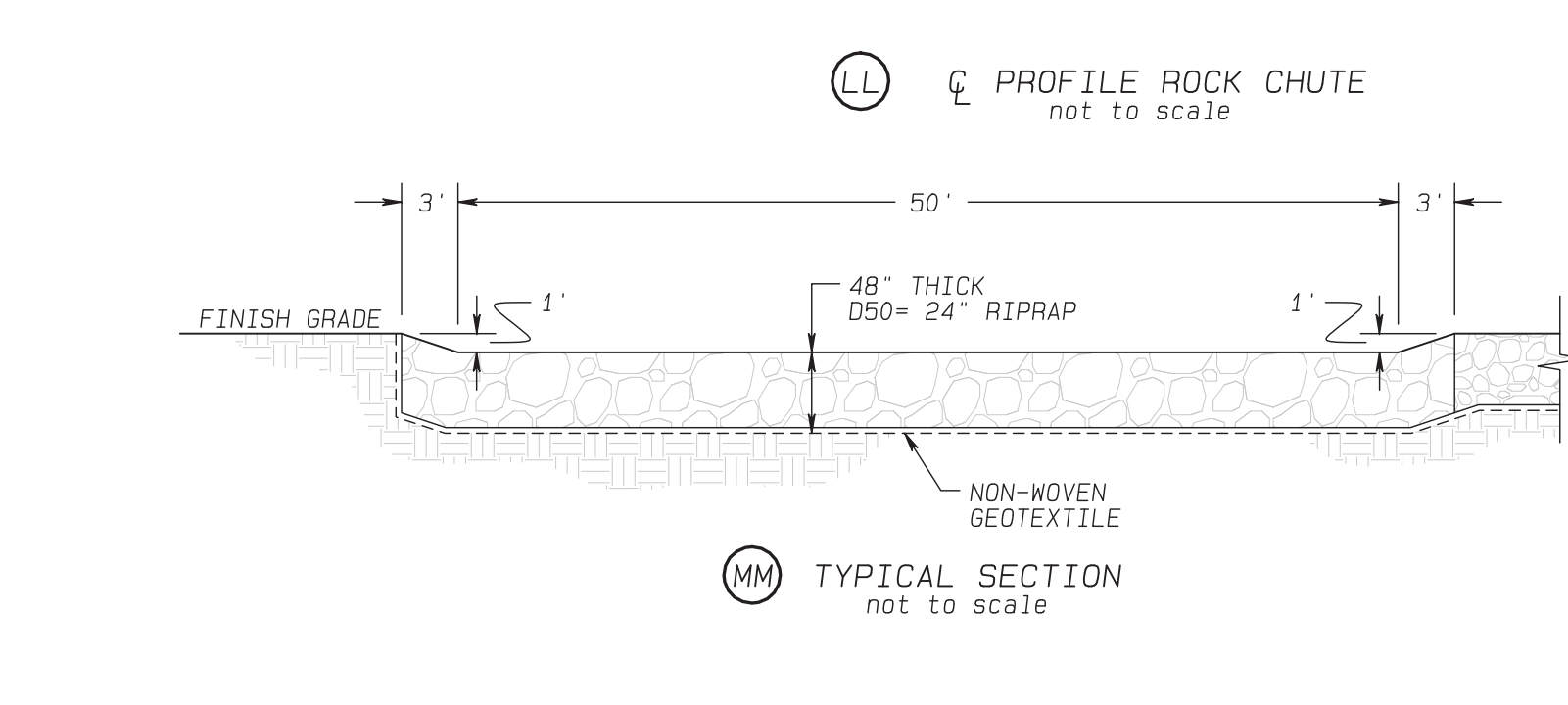
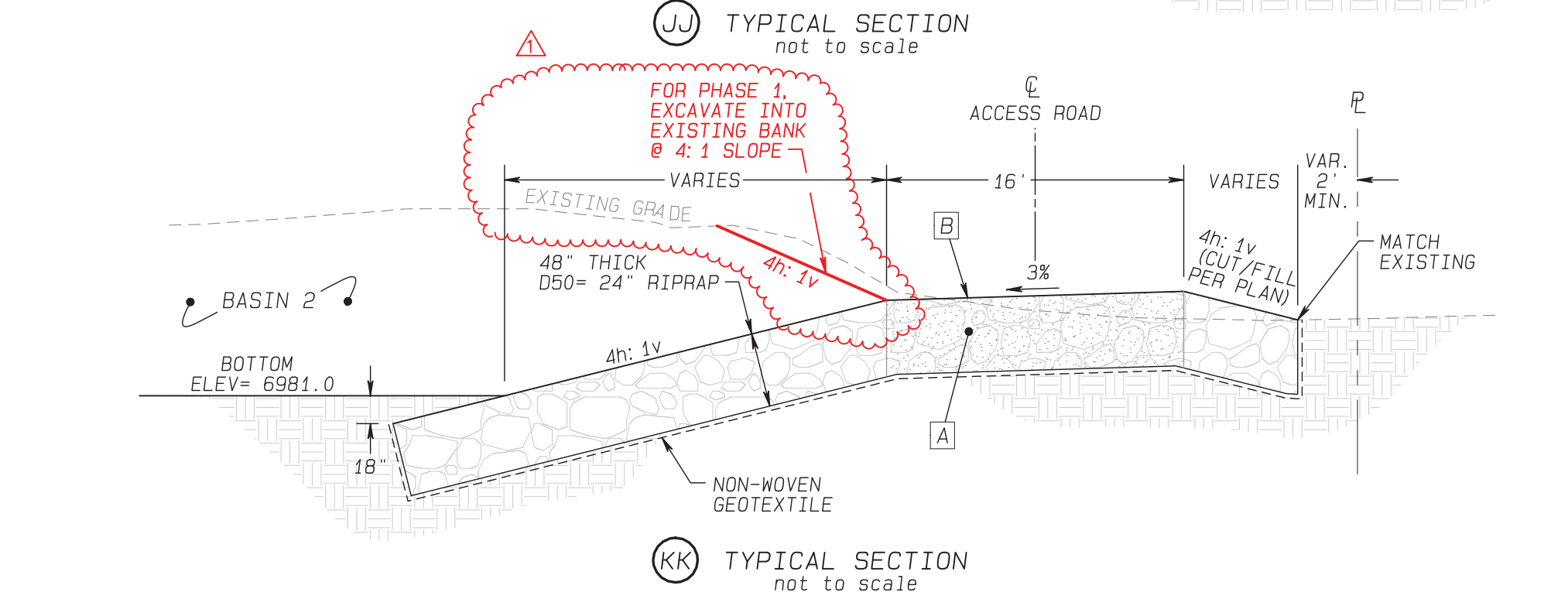
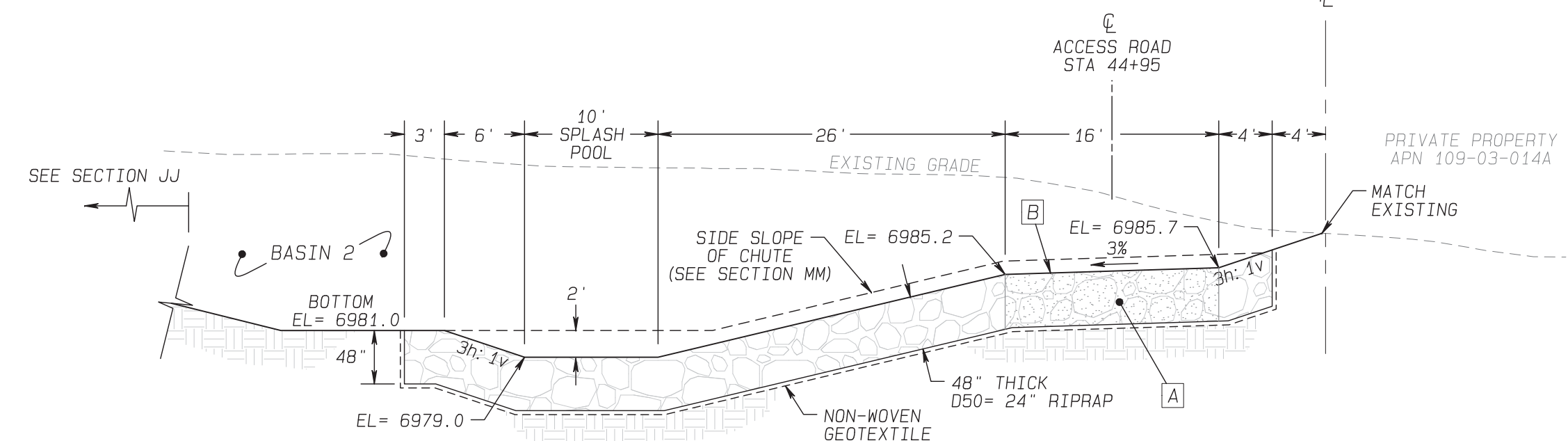
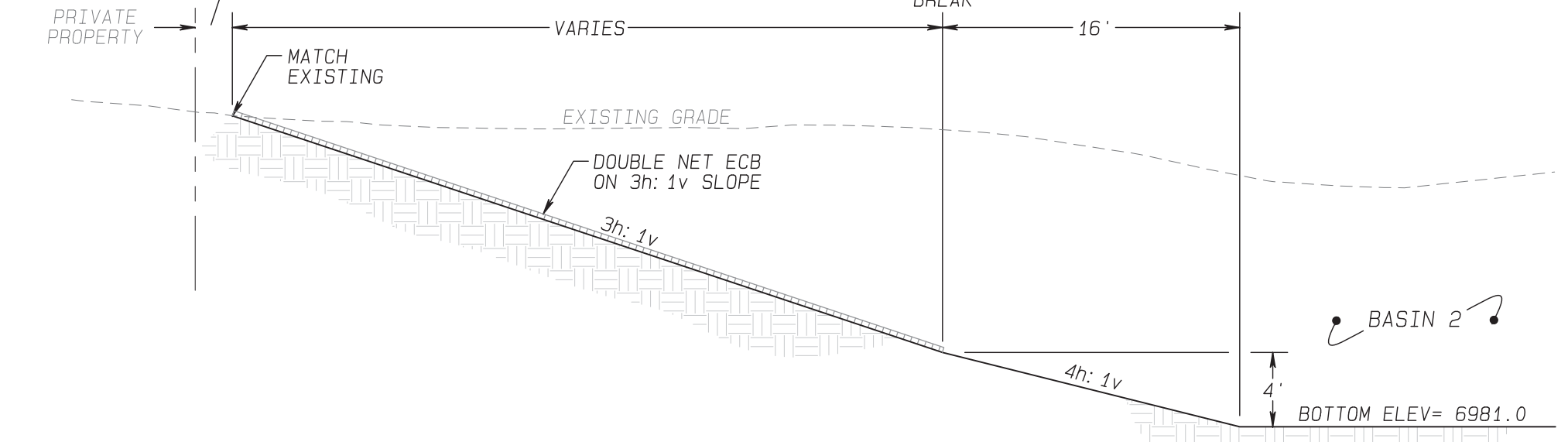
NOTE TO BIDDERS:
SEE THE QUANTITY SUMMARY, SHEET 2 AND PHASE 2 BID SCHEDULE FOR A DETAILED LIST OF THE REQUIRED QUANTITIES FOR A PHASED CONSTRUCTION PLAN.

Coordinate Table - Basin 2

Pt #	Northing	Easting	Elevation	Descriptor
200	1537303.82	787080.57	6981.00	BOT BASIN 2
201	1537319.19	787108.54	6981.00	BOT BASIN 2
202	1537317.50	787114.03	6981.00	BOT BASIN 2
203	1537225.62	787160.89	-	BOT BASIN 2
204	1537213.00	787168.99	-	BOT BASIN 2
205	1537097.92	787260.50	6981.00	BOT BASIN 2
206	1537091.40	787259.41	6981.00	BOT BASIN 2
207	1537047.74	787186.03	6981.00	BOT BASIN 2
208	1537049.29	787180.46	6981.00	BOT BASIN 2
209	1537086.27	787162.77	6981.00	BOT BASIN 2
210	1537094.17	787159.26	6981.00	BOT BASIN 2
211	1537204.12	787134.70	6981.00	BOT BASIN 2
212	1537230.12	787124.94	6981.00	BOT BASIN 2
213	1537251.39	787113.39	6981.00	BOT BASIN 2
220	1537234.17	787080.66	6985.70	TOP OF INLET
221	1537276.38	787053.85	6985.70	TOP OF INLET
222	1537242.75	787094.16	6985.20	TOP OF SLOPE
223	1537284.96	787067.36	6985.20	TOP OF SLOPE
224	1537256.69	787116.11	6979.00	BOTTOM OF SLOPE
225	1537298.90	787089.31	6979.00	BOTTOM OF SLOPE
226	1537262.05	787124.55	6979.00	END OF SPLASH POOL
227	1537304.26	787097.75	6979.00	END OF SPLASH POOL
228	1537265.27	787129.82	6981.00	TOP OF LIP
229	1537307.47	787102.81	6981.00	TOP OF LIP
230	1537266.87	787132.15	6981.00	END OF ROCK
231	1537309.08	787105.35	6981.00	END OF ROCK
240	1537260.78	787220.32	7000.00	TOP OF INLET
241	1537256.69	787226.28	7000.00	TOP OF INLET
242	1537255.38	787211.90	6998.50	TOP OF SLOPE
243	1537246.96	787217.30	6998.50	TOP OF SLOPE
244	1537223.52	787162.24	6979.00	BOTTOM OF SLOPE
245	1537215.10	787167.64	6979.00	BOTTOM OF SLOPE
246	1537218.12	787153.83	6979.00	END OF SPLASH POOL
247	1537209.70	787159.23	6979.00	END OF SPLASH POOL
248	1537214.88	787148.78	6981.00	TOP OF LIP
249	1537206.46	787154.18	6981.00	TOP OF LIP
250	1537213.26	787146.25	6981.00	END OF ROCK
251	1537204.84	787151.65	6981.00	END OF ROCK
260	1537050.87	787191.28	6981.00	END OF ROCK
261	1537023.85	787207.36	6981.00	LIMITS OF ROCK



PLAN BASIN 2



- TYPICAL SECTION NOTES:**
- [A] FILL INTERSTITIAL SPACES BETWEEN RIPRAP WITH SOIL USING MULTIPLE APPLICATIONS OF WATER-SETTLED SOIL UNTIL THE ROCK/GRAVEL/SOIL STRUCTURE IS COMPLETE WITH MINIMAL REMAINING VOIDS. SEE STRUCTURAL SECTION ON SHEET 4.
 - [B] UPPER 12"-18" FILL VOIDS BETWEEN RIPRAP WITH GRADED BLEND OF SMALL STONE 2"-4" DIAMETER TO CREATE DRIVING SURFACE FOR ACCESS ROAD.

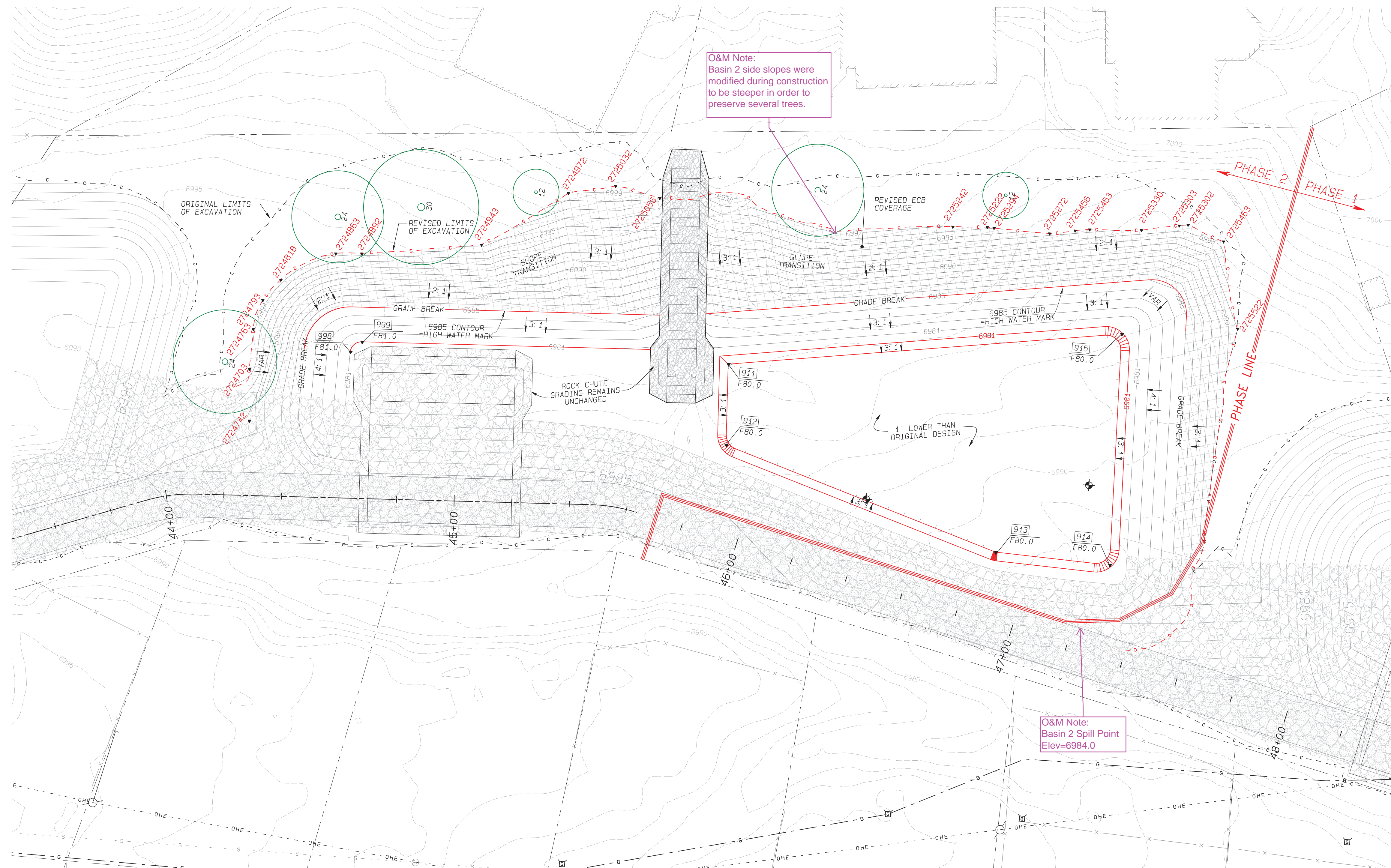
UNAUTHORIZED CHANGES & USES
THE ENGINEER PREPARED THESE PLANS AND SPECIFICATIONS TO BE USED FOR THE PROJECT AND SITE SHOWN HEREON. ANY CHANGES TO THESE PLANS SHALL BE MADE BY THE ENGINEER OR HIS DESIGNATED REPRESENTATIVE.

DATE: 12/19/2022
NCD PROJECT NUMBER: 22-412AZ
SHEET NUMBER: 6 of 9

MUSEUM FIRE NRCS EMERGENCY WATERSHED PROTECTION PROJECT
PARK SITE BASINS
COCONINO COUNTY FLOOD CONTROL DISTRICT
PLAN BASIN 2

DESIGNED BY: MK
CHECKED BY: MK
NO. DATE BY REVISION
1 2/24/23 MK NOTATIONS FOR PHASED CONSTRUCTION
2 9/22/23 MK UPDATED FOR PHASE 2 BIDDING

Natural Channel Design, Inc.
2900 N West St. #5
Flagstaff, Arizona 86004
(928) 774-2336



O&M Note:
Basin 2 side slopes were modified during construction to be steeper in order to preserve several trees.

O&M Note:
Basin 2 Spill Point
Elev=6984.0

Pt #	Revisions/Additions	Coordinate Table - Bottom of Basin		
Pt #	Northing	Easting	Elevation	Descriptor
911	1537202.96	787169.28	6980.00	BOTTOM - ADD'L EXCAVATION
912	1537187.89	787145.56	6980.00	BOTTOM - ADD'L EXCAVATION
913	1537089.51	787166.96	6980.00	BOTTOM - ADD'L EXCAVATION
914	1537054.10	787185.37	6980.00	BOTTOM - ADD'L EXCAVATION
915	1537095.48	787254.28	6980.00	BOTTOM - ADD'L EXCAVATION
998	1537314.24	787039.53	6981.00	BOT BASIN 2 (REVISE PT 201)
999	1537312.80	787104.69	6981.00	BOT BASIN 2 (REVISE PT 202)

ALL OTHER LAYOUT CONTROL AS PRESENTED ON SHEET 6 OF THE APPROVED PLANS REMAINS UNCHANGED.

Pt #	Northing	Easting	Elevation	Descriptor
2724742	1537329.95	787060.00	6993.40	TOP OF SLOPE
2724703	1537339.99	787075.00	6994.19	TOP OF SLOPE
2724763	1537346.63	787087.21	6994.33	TOP OF SLOPE
2724973	1537229.84	787125.09	6981.00	TOE OF SLOPE
2724819	1537348.25	787106.75	6994.53	TOP OF SLOPE
2724863	1537337.53	787125.00	6994.48	TOP OF SLOPE
2724892	1537330.00	787130.06	6994.32	TOP OF SLOPE
2724972	1537282.23	787187.48	6998.83	TOP OF SLOPE
2725032	1537270.00	787198.70	6999.81	TOP OF SLOPE
2725056	1537255.00	787203.81	6999.56	TOP OF SLOPE
2725242	1537165.00	787252.39	6996.81	TOP OF SLOPE
2725222	1537155.00	787258.94	6996.28	TOP OF SLOPE
2725294	1537152.86	787260.00	6996.03	TOP OF SLOPE
2725272	1537135.78	787269.22	6994.35	TOP OF SLOPE
2725456	1537129.01	787275.00	6994.51	TOP OF SLOPE
2725453	1537125.00	787278.17	6994.51	TOP OF SLOPE
2725330	1537110.00	787287.98	6993.71	TOP OF SLOPE
2725303	1537100.00	787296.64	6994.00	TOP OF SLOPE
2725302	1537087.59	787298.55	6994.00	TOP OF SLOPE
2725463	1537084.15	787300.65	6993.52	TOP OF SLOPE
2725522	1537063.19	787278.24	6990.96	TOP OF SLOPE

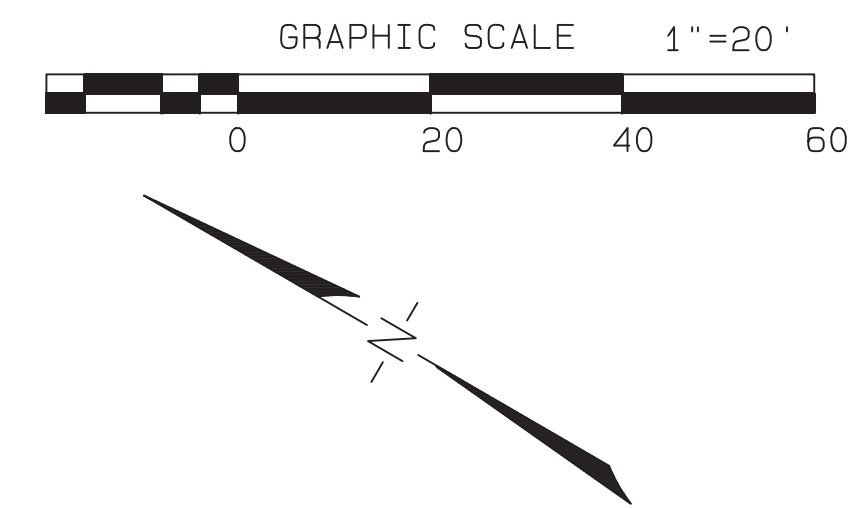
THE ABOVE CONTROL POINTS ARE AS STAKED IN THE FIELD BY NCDE ON 11/30/2023 TO MARK THE NEW CUT LIMITS ALONG THE EAST SIDE OF BASIN 2

SUMMARY OF REVISIONS
 -RED LINES INDICATE REVISED GRADE LINES OF BASIN.
 -TREES TO BE SAVED ARE INDICATED IN GREEN. ADDITIONAL TREES (NOT SHOWN) MAY ALSO BE SAVED BY THESE MODIFICATIONS.
 -SLOPE ALONG EAST SIDE OF BASIN CHANGED FROM FULLY 3:1 IN ORIGINAL DESIGN TO NOW INCLUDE SEGMENTS OF 2:1 SLOPE TO SAVE SOME LARGE DIAMETER TREES ADJACENT TO PRIVATE PROPERTIES.
 -BOTTOM 4' OF SLOPE IN BASIN (BELOW HIGH WATER MARK) CHANGED FROM 4:1 IN ORIGINAL DESIGN TO 3:1.
 -BASIN TOE OF SLOPE ADJUSTED WESTWARD ALONG NORTH HALF OF EAST SIDE OF BASIN TO BE NEARLY ADJACENT RIPRAP APRON IN BOTTOM OF BASIN.
 -ADDITIONAL 1' OF EXCAVATION ADDED TO SOUTHERN HALF OF BASIN TO COMPENSATE FOR LOST VOLUME RESULTING FROM EAST SIDE SLOPE AND GEOMETRY ADJUSTMENTS.
 -TOP OF SLOPE, TIE TO EXISTING GRADES ALONG EAST SIDE OF BASIN ARE PUSHED FURTHER AWAY FROM PROPERTY LINE.

ADJUSTMENT TO BID QUANTITIES:

ITEM	QUANTITY
NET REDUCTION TO EARTHWORK (CUT)	1,368 CY
TREE REMOVALS (>12" DBH)	FIELD DETERMINE
EROSION CONTROL BLANKET REDUCTION	545 SY

BID QUANTITY ADJUSTMENT NOTES:
 - BASIN GEOMETRY ADJUSTMENT RESULTS IN 1,680 CY LESS EXCAVATION.
 - 1' DEEP ADDITIONAL DEPRESSION WITHIN BASIN RESULTS IN 312 CY MORE EXCAVATION
 - NET RESULT = 1,368 CY LESS EXCAVATION & HAUL OFF
 - ORIGINAL DESIGN QUANTITIES WERE 1654 SY OF ECB FOR BASIN 2
 - THIS REVISED DESIGN OF EASTERN SLOPE OF BASIN 2 REQUIRES 1109 SY OF ECB.
 - NET RESULT = 545 SY LESS ECB
 - AS WITH THE ORIGINAL BID QUANTITIES, THESE AMOUNTS DO NOT ACCOUNT FOR ANCHOR TRENCHES OR OVERLAP AREAS.
 REVISED FINISHED CONTOURS ARE SHOWN



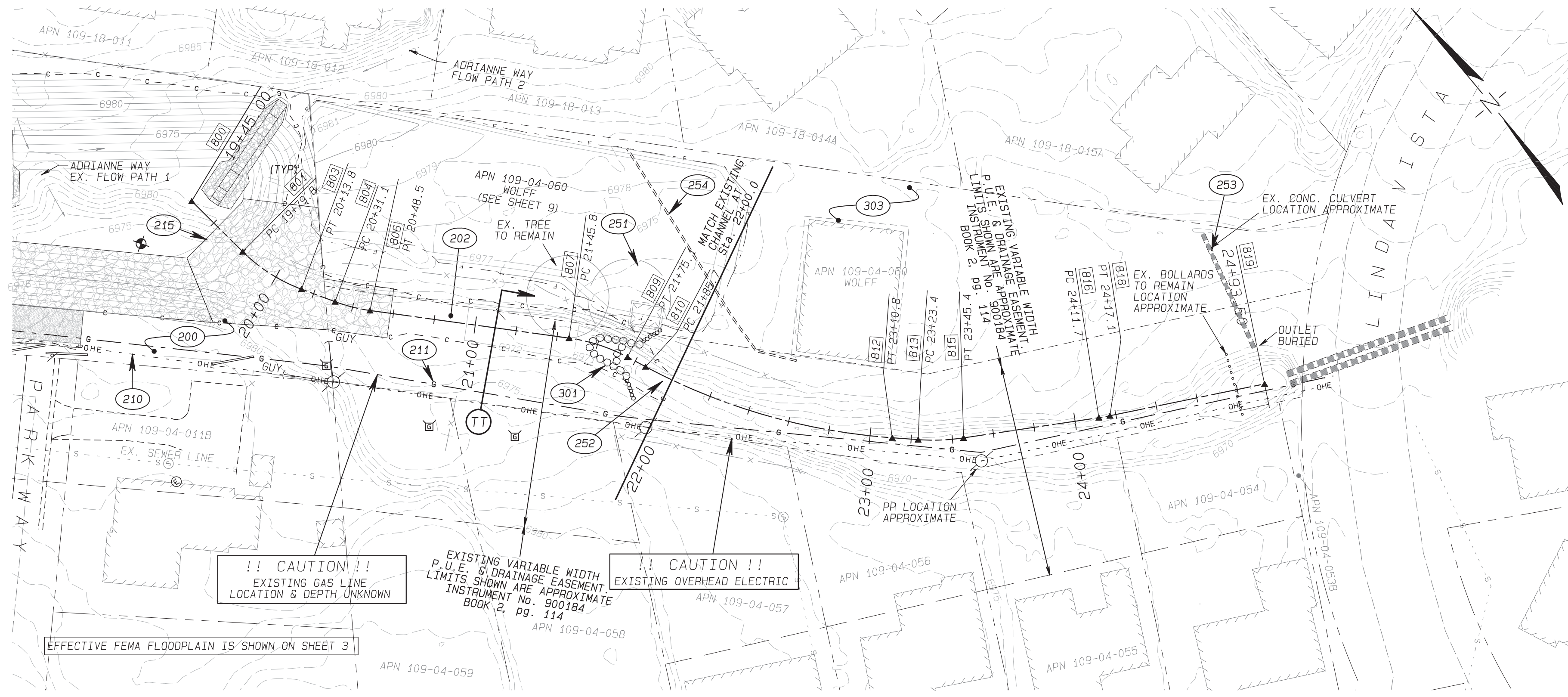
UNAUTHORIZED CHANGES & USES
 THE ENGINEER OR ARCHITECT ASSUMES NO LIABILITY FOR ANY CHANGES OR USES OF THESE PLANS THAT ARE NOT APPROVED BY THE PREPARED BY THESE PLANS.
 DATE: 12/01/2023
 NCD PROJECT NUMBER: 22-412AZ
 SHEET NUMBER: 6A OF 9

MUSEUM FIRE NRCS EMERGENCY WATERSHED PROTECTION PROJECT
 PARK SITE BASINS - PHASE 2 CONSTRUCTION
 COCONINO COUNTY FLOOD CONTROL DISTRICT
 REVISION#2 - ADDITIONAL REVISIONS TO BASIN #2

NO.	DATE	BY	REVISION

Natural Channel Design, Inc.
 2900 N. West St. #5
 Flagstaff, Arizona 86004
 (928) 774-2336

Z:\Projects\Arizona\Coconino County\Museum Fire 2022\Drawings\Park Site Basins\Park Way Basins Revised for Phase2.dwg 9/22/2023



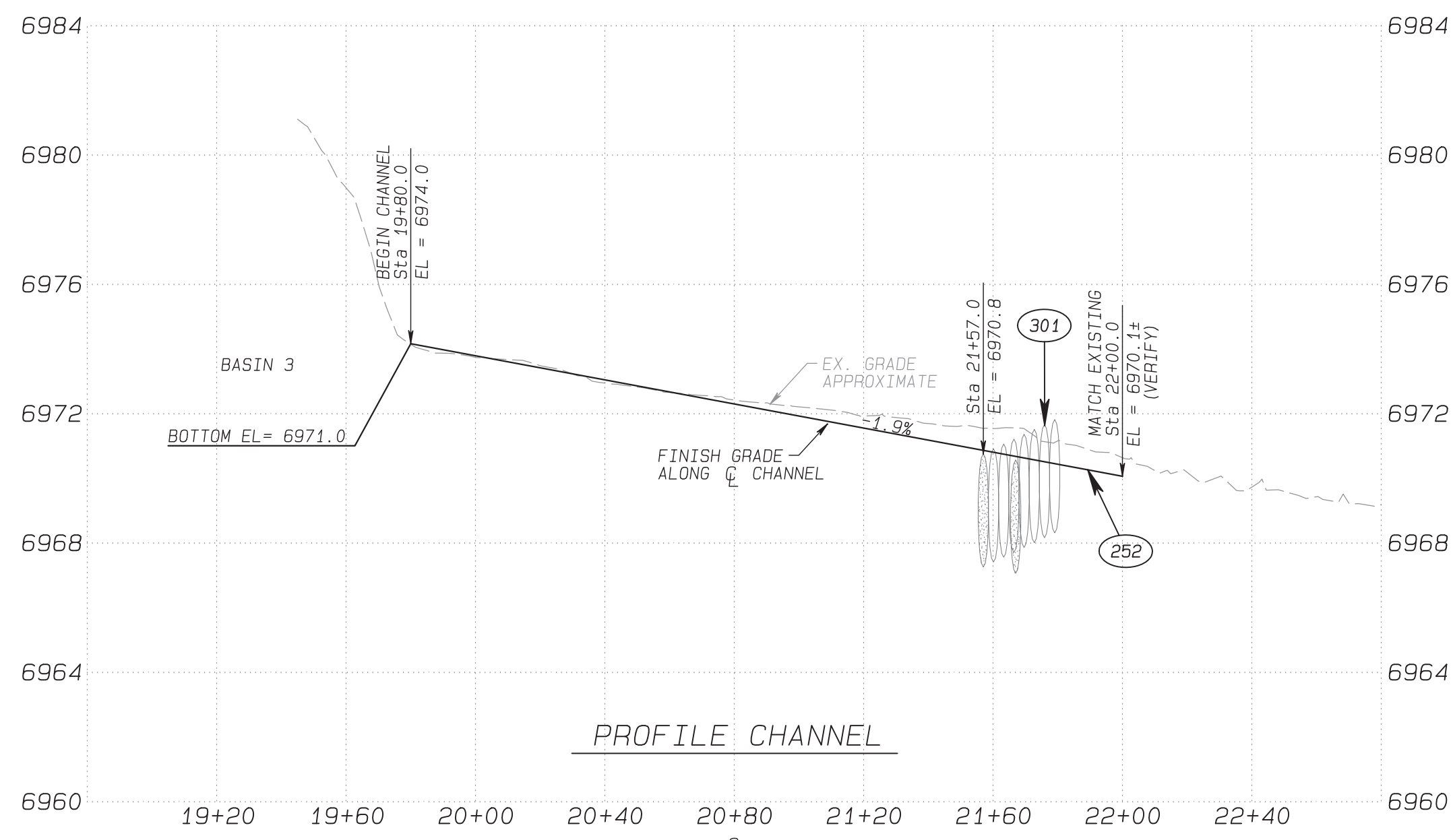
PLAN CHANNEL

CHANNEL CONSTRUCTION \bar{C} COORDINATE TABLE

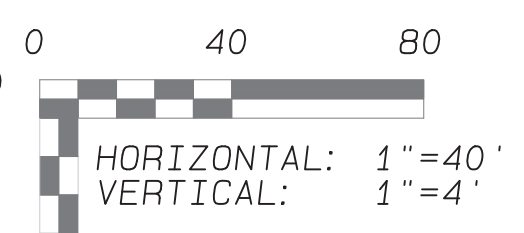
PT#	DESCRIPTION	STATION	NORTH	EAST
800	CL CHANNEL	19+45.00	1536807.43	787395.36
801	PC R80'	19+45.00 55 24' 10"E 19+79.77	1536772.82	787398.64
	RADIUS POINT:	802	1536780.35	787478.28
	RADIUS:	80.00ft		
	DELTA:	24 20' 32" LEFT		
	ARC LENGTH:	33.99ft		
803	PT	20+13.75	1536740.66	787408.82
804	PC R80'	20+13.75 529 44' 41"E 20+31.09	1536725.60	787417.42
	RADIUS POINT:	805	1536765.29	787486.88
	RADIUS:	80.00ft		
	DELTA:	12 29' 46" LEFT		
	ARC LENGTH:	17.45ft		
806	PT	20+48.54	1536711.51	787427.66
807	PC R85'	20+48.54 542 14' 28"E 21+45.84	1536639.48	787493.07
	RADIUS POINT:	808	1536582.34	787430.14
	RADIUS:	85.00ft		
	DELTA:	20 07' 48" RIGHT		
	ARC LENGTH:	29.86ft		
809	PT	21+75.71	1536614.33	787508.89
810	PC R300'	21+75.71 522 06' 39"E 21+85.66	1536605.11	787512.64
	RADIUS POINT:	811	1536718.03	787790.57
	RADIUS:	300.00ft		
	DELTA:	23 54' 02" LEFT		
	ARC LENGTH:	125.14ft		
812	PT	23+10.80	1536502.19	787582.22
813	PC R100'	23+10.80 546 00' 41"E 23+23.38	1536493.45	787591.27
	RADIUS POINT:	814	1536565.40	787660.72
	RADIUS:	100.00ft		
	DELTA:	12 37' 23" LEFT		
	ARC LENGTH:	22.03ft		
815	PT	23+45.41	1536480.01	787608.67
816	PC R100'	23+45.41 558 38' 04"E 24+11.66	1536445.53	787665.23
	RADIUS POINT:	817	1536530.92	787717.28
	RADIUS:	100.00ft		
	DELTA:	3 06' 42" LEFT		
	ARC LENGTH:	5.43ft		
818	PT	24+17.09	1536442.83	787669.95
819	CL CHANNEL	24+17.09 561 44' 46"E 24+93.50	1536406.66	787737.25

NOTE: SEE SHEET 3 FOR SURVEY INFORMATION

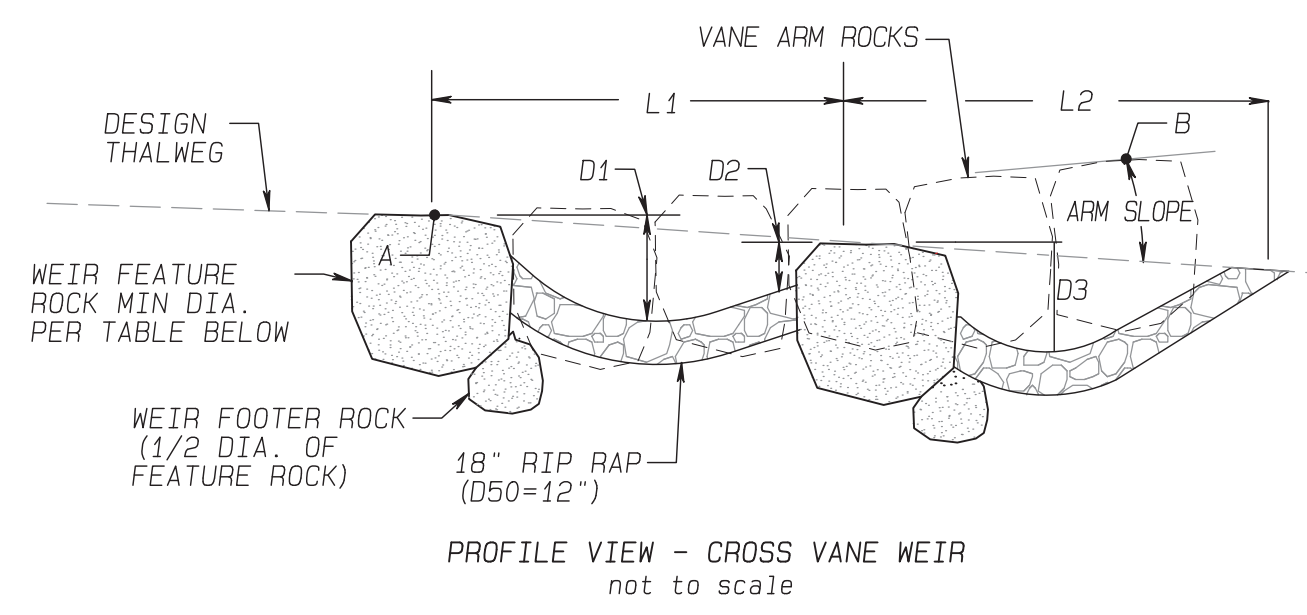
- CONSTRUCTION KEYNOTES:
- (200) NPI CONTRACTOR SHALL PRESERVE AND PROTECT EXISTING TREES ON WEST SIDE OF LOWER BASIN 3/CHANNEL. NEW RIP-RAP EDGE SHALL BE MODIFIED AS NECESSARY TO MINIMIZE DISTURBANCE TO ROOT BALLS OF TREES AND NOT CUT ROOTS CLOSER THAN 5' AWAY FROM THE EDGE THE TREE TRUNK. SEE SHEET 7 FOR RIPRAP LAYOUT & CONTROL COORDINATES.
 - (201) ** REMOVE & DISPOSE OF EXISTING TREES GREATER THAN 12-INCH DBH. PRIOR TO CLEARING TREES CONTRACTOR & NCD SHALL WALK SITE TO DETERMINE TREES TO BE PRESERVED. CONTRACTOR SHALL HAVE THEIR SURVEYOR STAKE OUT LIMITS OF CUT PRIOR TO SITE WALKTHROUGH. ALL TREES IDENTIFIED TO BE SAVED SHALL BE PROTECTED FROM DAMAGE AS PRACTICABLE. ANY DAMAGE TO BARK OR PRUNED LIMBS SHALL BE REPAIRED WITH PRUNING SEALER AND GRAFTING COMPOUND AS APPROPRIATE.
 - (202) ** CLEAR & GRUB IN ADVANCE OF GRADING OPERATIONS
 - (210) NPI COORDINATE RELOCATION OF OVERHEAD ELECTRIC FACILITIES WITH ARIZONA PUBLIC SERVICE (APS).
 - (211) NPI COORDINATE RELOCATION OF GAS FACILITY WITH UNISOURCE.
 - (215) ** SEE SHEET 7 FOR LIMITS OF RIPRAP INSTALLATION & LAYOUT CONTROL.
 - (251) ** CONTRACTOR TO COORDINATE WITH OWNER FOR REMOVAL OF EXISTING DOUBLE TRUNK TREE ON WOLFF PROPERTY. SALVAGE WOOD TO OWNER IN APPROXIMATE 10-FOOT LOG LENGTHS - TO USE FOR FIREWOOD. TREE LOCATION SHOWN IN PLAN IS APPROXIMATE. ITEM ACCOUNTED FOR ON SHEET 9.
 - (252) ** TRANSITION NEW CHANNEL TO MATCH EXISTING CHANNEL CONFIGURATION
 - (253) 1 EA LOCATE & RESTORE FUNCTION OF EXISTING DRIVEWAY CONCRETE CULVERT (WOLFF PROPERTY). FLUSH PIPE TO REMOVE SEDIMENT & DEBRIS. GRADE AS NEEDED TO ENSURE POSITIVE FLOW FROM PIPE OUTLET TO WASH. LOCATION SHOWN IN PLAN IS APPROXIMATE.
 - (254) 1 LS REMOVE & RETURN EXISTING CONCRETE BARRIER TO COCONINO COUNTY PUBLIC WORKS - APPROXIMATELY 130-140 FEET (WOLFF PROPERTY).
 - (301) 1 EA CONSTRUCT ROCK CROSS VANE WEIR STRUCTURE PER PLAN/PROFILE & DETAILS PROVIDED ON THIS SHEET.
 - (303) PROPERTY OWNER TO REMOVE EXISTING PAVEMENT AND MODIFY SIDE YARD DRAINAGE TO IMPROVE INCIDENTAL DRAINAGE PATTERNS AWAY FROM STRUCTURE.
- ** SEE 'QUANTITY SUMMARY' ON SHEET 2 FOR ITEMIZED LIST OF QUANTITIES
NPI: NON-PAY ITEM



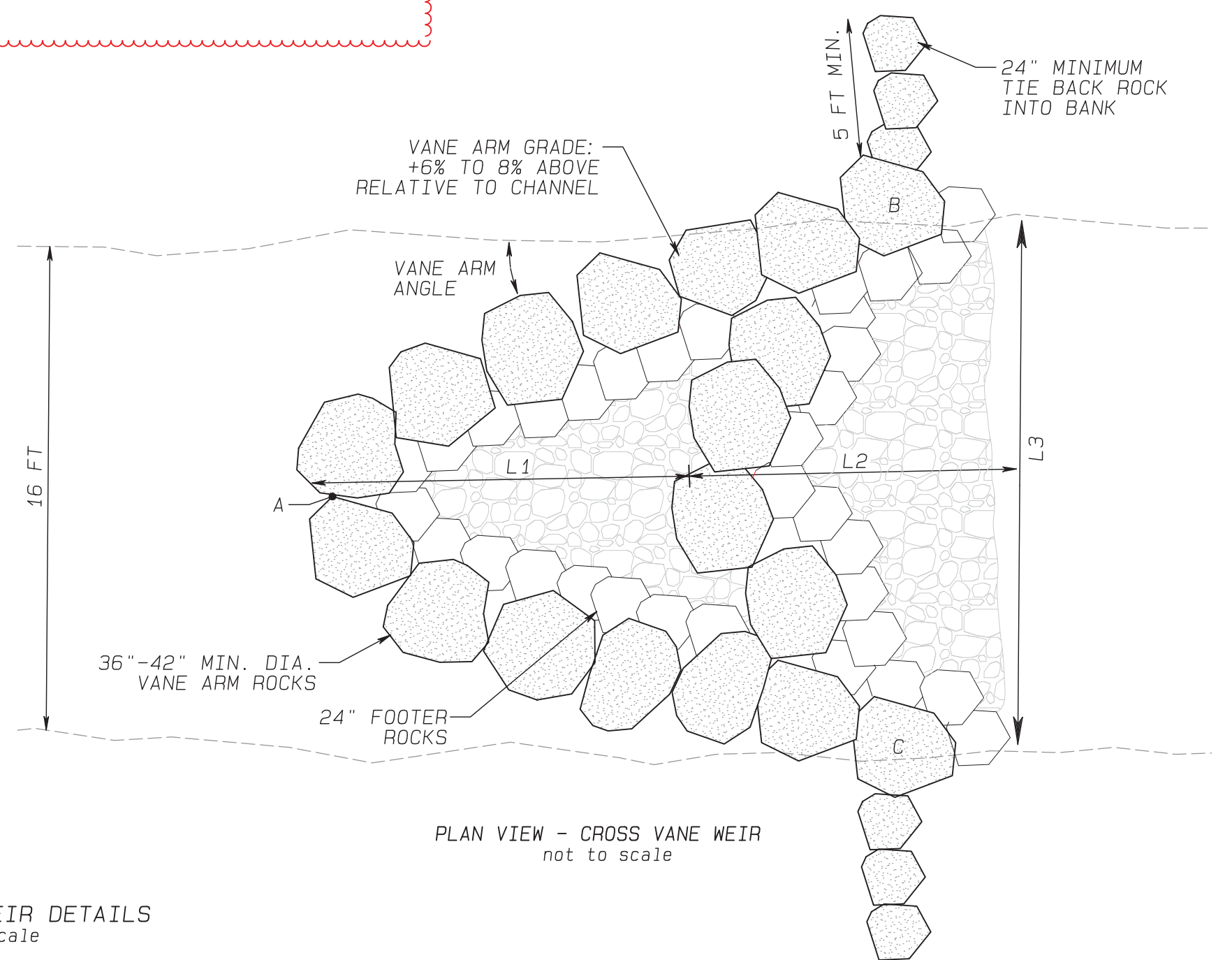
PROFILE CHANNEL



NO PHASE 2 ITEMS, THIS SHEET



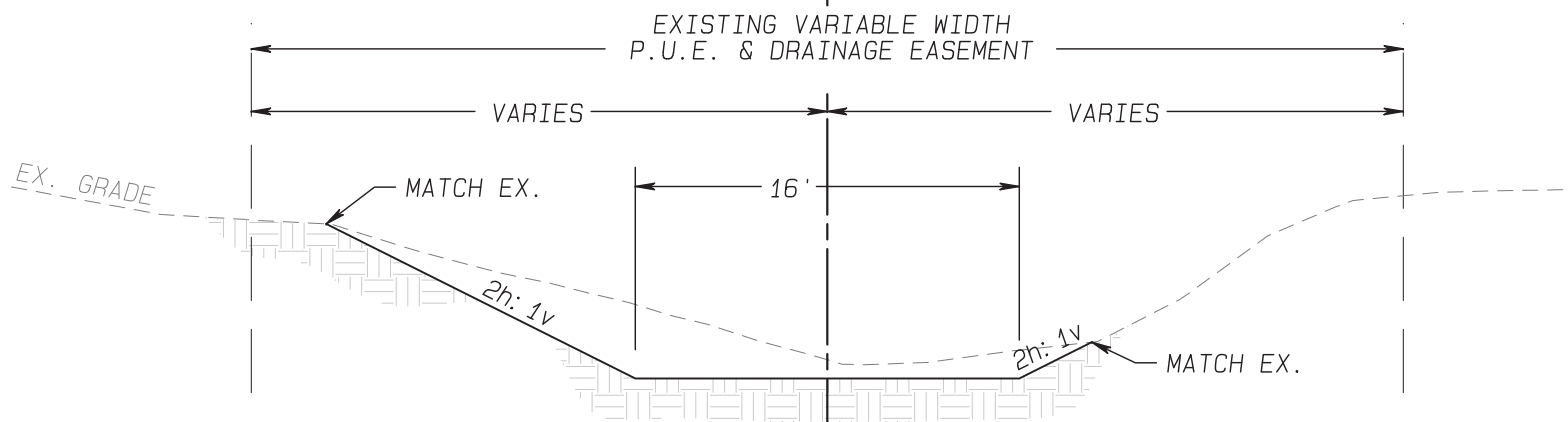
PROFILE VIEW - CROSS VANE WEIR not to scale



CROSS VANE WEIR DETAILS not to scale

WEIR DIMENSION TABLE

Structure Location	Feature Rock Size (in.)	Footer Rock Size (in)	Left Vane Arm Angle (deg)	Right Vane Arm Angle (deg)	Vane Arm Slope Relative to Horiz. (%) (L/R)	Vane Arm Height (ft) (A to B & A to C)	L1 (ft)	L2 (ft)	L3 (ft)	D1 (ft)	D2 (ft)	Approx. D3 (ft)
Sta. 21+57	36"-42"	24"	25	15	5, 5	1.1	10	10	22±	1.5	0.5	1



(TT) TYPICAL SECTION not to scale

8 of 9
SHEET NUMBER: 22-412AZ
NCD PROJECT NUMBER: 12/19/2022

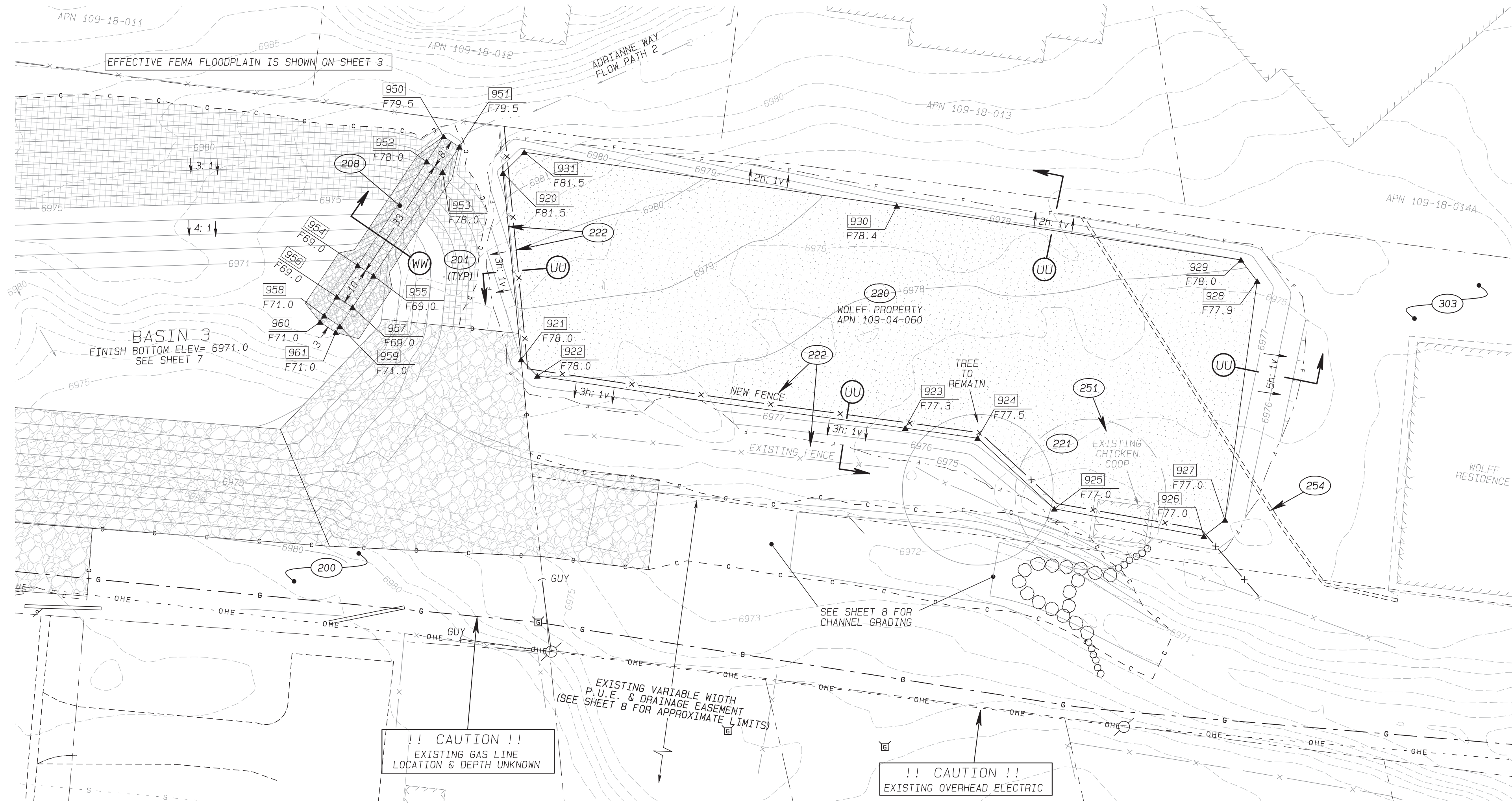
MUSEUM FIRE NRCS EMERGENCY WATERSHED PROTECTION PROJECT
PARK SITE BASINS
COCONINO COUNTY FLOOD CONTROL DISTRICT
PLAN/PROFILE - CHANNEL TO LINDA VISTA DRIVE

DESIGNED BY: MK	CHECKED BY: MK	DATE: 9/22/23	BY: MK	REVISION: UPDATED FOR PHASE 2 BIDDING
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DRAWN BY: MK/LM/DM
DESIGNED BY: MK
CHECKED BY: MK
DATE: 9/22/23
BY: MK
REVISION: UPDATED FOR PHASE 2 BIDDING

Natural Channel Design, Inc.
2900 N West St. #5
Flagstaff, Arizona 86004
(928) 774-2336

Z:\Projects\Arizona\Coconino County\Museum Fire 2022\Drawings\Park Site Basins\Park Way Basins Only Basins Revised for Phase2.prd_9/22/2023

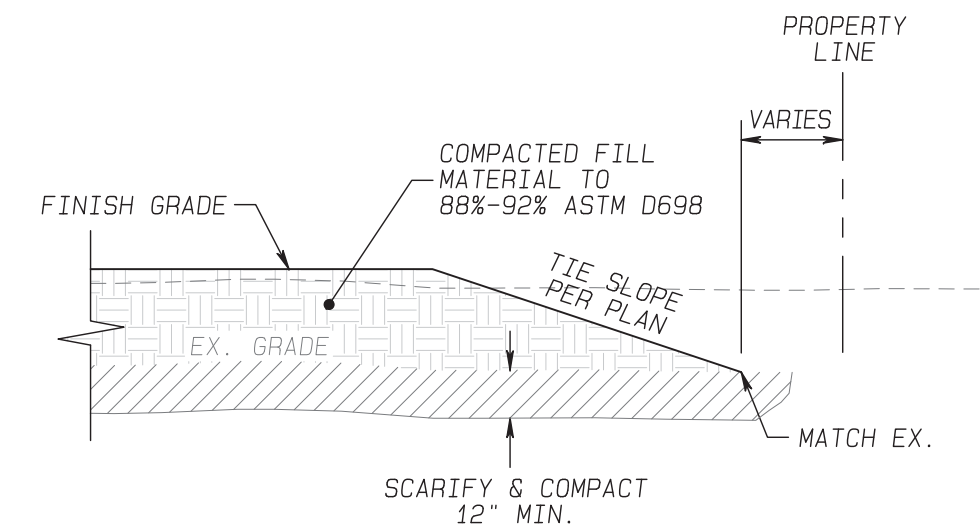
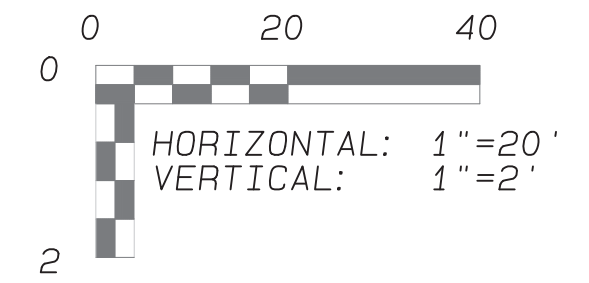


PLAN VIEW - WOLFF PROPERTY

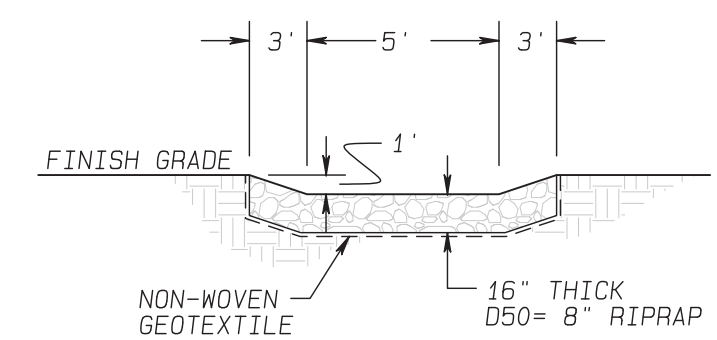
CONSTRUCTION KEYNOTES:

- (200) NPI CONTRACTOR SHALL PRESERVE AND PROTECT EXISTING TREES ON WEST SIDE OF LOWER BASIN 3/CHANNEL. NEW RIP-RAP EDGE SHALL BE MODIFIED AS NECESSARY TO MINIMIZE DISTURBANCE TO ROOT BALLS OF TREES AND NOT CUT ROOTS CLOSER THAN 5' AWAY FROM THE EDGE OF THE TREE TRUNK. SEE SHEET 7 FOR RIPRAP LAYOUT & CONTROL COORDINATES.
- (201) ** REMOVE & DISPOSE OF EXISTING TREES GREATER THAN 12-INCH DBH. PRIOR TO CLEARING TREES CONTRACTOR & NCD SHALL WALK SITE TO DETERMINE TREES TO BE PRESERVED. CONTRACTOR SHALL HAVE THEIR SURVEYOR STAKE OUT LIMITS OF CUT PRIOR TO SITE WALKTHROUGH. ALL TREES IDENTIFIED TO BE SAVED SHALL BE PROTECTED FROM DAMAGE AS PRACTICABLE. ANY DAMAGE TO BARK OR PRUNED LIMBS SHALL BE REPAIRED WITH PRUNING SEALER AND GRAFTING COMPOUND AS APPROPRIATE.
- (208) 41 CY CONSTRUCT 16" MIN. THICK (D50=8") ROCK CHUTE PER PLAN & DETAILS ON THIS SHEET.
- (220) ** CONSTRUCT COMPACTED FILL PER PLAN. DETAIL & CONTROL COORDINATES PROVIDED. SCARIFY & COMPACT 12" MIN. DEPTH BENEATH FILL PAD FOOTPRINT. COMPACT TO 88%-92% MIN. ASTM D698
- (221) 1 LS REMOVE & DISPOSE EXISTING CHICKEN COOP.
- (222) 1 LS REMOVE & REPLACE EXISTING FENCE & POSTS IN KIND. LOCATION OF NEW FENCE SHOWN IN PLAN IS APPROXIMATE. INSTALL NEW FENCE ATOP FILL PAD. APPROXIMATE LENGTH OF NEW FENCE EQUAL TO 250 LINEAL FEET.
- (251) 1 EA CONTRACTOR TO COORDINATE WITH OWNER FOR REMOVAL OF EXISTING DOUBLE TRUNK TREE ON WOLFF PROPERTY. SALVAGE WOOD TO OWNER IN APPROXIMATE 10-FOOT LOGS LENGTHS - TO USE FOR FIREWOOD. TREE LOCATION SHOWN IN PLAN IS APPROXIMATE.
- (254) 1 LS REMOVE & RETURN EXISTING CONCRETE BARRIER TO COCONINO COUNTY PUBLIC WORKS - APPROXIMATELY 130-140 FEET (WOLFF PROPERTY).
- (303) PROPERTY OWNER TO REMOVE EXISTING PAVEMENT AND MODIFY SIDE YARD DRAINAGE TO IMPROVE INCIDENTAL DRAINAGE PATTERNS AWAY FROM STRUCTURE.

** SEE 'QUANTITY SUMMARY' ON SHEET 2 FOR ITEMIZED LIST OF QUANTITIES
NPI: NON-PAY ITEM



(UU) TYPICAL SECTION
not to scale



(WW) TYPICAL SECTION
not to scale

Pt #	Northing	Eastng	Elevation	Descriptor
920	1536900.71	787464.80	6981.50	WOLFF PAD
921	1536760.18	787436.27	6978.00	WOLFF PAD
922	1536754.07	787436.69	6978.00	WOLFF PAD
923	1536680.14	787501.48	6977.34	WOLFF PAD
924	1536665.63	787514.27	6977.50	WOLFF PAD
925	1536638.20	787517.47	6977.00	WOLFF PAD
926	1536606.94	787542.73	6977.00	WOLFF PAD
927	1536606.53	787549.78	6977.01	WOLFF PAD
928	1536648.92	787597.46	6977.93	WOLFF PAD
929	1536655.97	787597.88	6978.04	WOLFF PAD
930	1536726.19	787538.14	6978.40	WOLFF PAD
931	1536801.24	787472.68	6981.50	WOLFF PAD
950	1536818.34	787459.20	6979.50	TOP OF INLET
951	1536813.52	787460.55	6979.50	TOP OF INLET
952	1536816.17	787451.49	6978.00	TOP OF SLOPE
953	1536811.36	787452.84	6978.00	TOP OF SLOPE
954	1536807.26	787419.72	6969.00	BOT OF SLOPE
955	1536802.44	787421.07	6969.00	BOT OF SLOPE
956	1536804.55	787410.09	6969.00	END OF SPLASH POOL
957	1536799.74	787411.44	6969.00	END OF SPLASH POOL
958	1536802.93	787404.32	6971.00	TOP OF LIP
959	1536798.12	787405.67	6971.00	TOP OF LIP
960	1536802.39	787402.39	6971.00	END OF ROCK
961	1536797.58	787403.74	6971.00	END OF ROCK

NOTE: SEE SHEET 3 FOR SURVEY INFORMATION

NO PHASE 2 ITEMS, THIS SHEET

UNAUTHORIZED CHANGES & USES
THE ENGINEER OR ARCHITECT SHALL BE RESPONSIBLE FOR THE ACCURACY OF THE INFORMATION CONTAINED HEREIN. ANY CHANGES TO THE ORIGINAL DESIGN SHALL BE MADE BY THE ENGINEER OR ARCHITECT AND SHALL BE APPROVED BY THE ENGINEER OR ARCHITECT.

DATE: 12/19/2022
NCD PROJECT NUMBER: 22-412AZ
SHEET NUMBER: 9 OF 9

MUSEUM FIRE NRCS EMERGENCY WATERSHED PROTECTION PROJECT

PARK SITE BASINS

COCONINO COUNTY FLOOD CONTROL DISTRICT

PLAN/PROFILE - WOLFF PROPERTY FLOOD PROTECTION

COCONINO COUNTY FLOOD CONTROL DISTRICT

DRAWN BY: MK/M/DM
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NO. 1 DATE: 9/22/23
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