

LETTER OF TRANSMITTAL

TO: U.S. Army Corps of Engineers
St. Louis Regulatory Branch
1222 Spruce Street
St. Louis, MO 63103

DATE: April 8, 2014

PROJECT: Creve Coeur Dam and Channel

RE: USACE 404 Permit Submittal

Please find attached and/or enclosed:

For approval For your use As requested
 For review and comment Amend and resubmit

Quantity	Dated	Description
1	12/30/2013	Half size Preliminary Plan Set
1	04/08/2014	USACE 404 Engineering Form 4345 and attachment

COMMENTS:

Sir or Madam,

Please find the above listed items enclosed for your review and comment. Please contact me at (636) 777-3000 or mark@ilincworld.com if you have any questions.

Thank you,
Mark

From: Mark Meyer, PE
Intuition & Logic

cc: File



16253 Swingley Ridge Rd, Suite 100 St. Louis, MO 63017

636-777-3000  314.432.5812 

April 8, 2014

U.S. Army Corps of Engineers
St. Louis Regulatory Branch
1222 Spruce Street
St. Louis, MO 63103

Re: Creve Coeur Dam and Channel

Dear Sir or Madam:

Intuition & Logic is pleased to present the USACE 404 Permit Application and supporting information for the Creve Coeur Dam and Channel Project. Enclosed please find the 404 permit application and preliminary plan set.

The Creve Coeur Dam and Channel project is intended to correct the Dielman Dam which has been breached near the overflow structure and the failing concrete lined receiving channel at 11400 Olde Cabin Road in Creve Coeur, MO.

Proposed improvements will consist improving the earth dam, creating a new outlet structure with a boulder lined stilling basin at the outfall, boulder retaining walls on either side of the existing reinforced concrete pipe, removing the existing concrete and gabion east channel and realigning it to the south, installing a rock grade control for the lower end of the east channel, dredging the pond, installing a solar powered bubbler system, installing aquatic shelves around the pond edge along with a boulder edge in selected locations along the pond.

Natural stream morphology is incorporated into the design of all the proposed channel improvements. No wetlands will be impacted by these proposed channel improvements.

If you have any questions or comments please feel free to contact me at (636) 777-3000.

Best regards,

Mark Meyer, PE
President

It is by LOGIC that we prove
but by INTUITION that we discover

17. DIRECTIONS TO THE SITE

Heading south on Interstate 270, take exit for MO 340 east. From here, take a left onto Olive Blvd followed by a right onto North New Ballas Road. Finally, the second left will be Old Ballas Rd which will turn into Olde Cabin Rd. The project area is to the right in the golf course at the southern most pond.

18. Nature of Activity (Description of project, include all features)

Please See Exhibit A

19. Project Purpose (Describe the reason or purpose of the project, see instructions)

Please See Exhibit A

USE BLOCKS 20-23 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. Reason(s) for Discharge

Please See Attached Exhibit A

21. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards:

Type	Type	Type
Amount in Cubic Yards	Amount in Cubic Yards	Amount in Cubic Yards

Please See Attached Exhibit A

22. Surface Area in Acres of Wetlands or Other Waters Filled (see instructions)

Acres Please See Attached Exhibit A

or

Linear Feet

23. Description of Avoidance, Minimization, and Compensation (see instructions)

Please See Attached Exhibit A

24. Is Any Portion of the Work Already Complete? Yes No IF YES, DESCRIBE THE COMPLETED WORK

25. Addresses of Adjoining Property Owners, Lessees, Etc., Whose Property Adjoins the Waterbody (if more than can be entered here, please attach a supplemental list).

a. Address- Please See Attached Exhibit A

City - State - Zip -

b. Address-

City - State - Zip -

c. Address-

City - State - Zip -

d. Address-

City - State - Zip -

e. Address-

City - State - Zip -

26. List of Other Certificates or Approvals/Denials received from other Federal, State, or Local Agencies for Work Described in This Application.

AGENCY	TYPE APPROVAL*	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED

* Would include but is not restricted to zoning, building, and flood plain permits

27. Application is hereby made for permit or permits to authorize the work described in this application. I certify that this information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

SIGN HERE

SIGNATURE OF APPLICANT

DATE

SIGNATURE OF AGENT

DATE

The Application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than \$10,000 or imprisoned not more than five years or both.

Exhibit A

To: Application for Department of the Army Permit Section 404
By: Mark Meyer
Date: April 8, 2014
Re: USACE 404 Permit Application Supplemental Information for
Creve Coeur – Dam and Channel Project

Below is a continuation of the 404 Permit Application block numbers 18, 19, 20, 21, 22, 23, and 25.

Block 18. Nature of Activity:

Natural stream morphology is incorporated into the design of all the proposed channel improvements. The project consists of replacing an existing breached dam and over flow structure and associated improvements. The proposed work includes improving the earth dam, creating a new outlet structure with a boulder lined stilling basin at the outfall, boulder retaining walls on either side of the existing reinforced concrete pipe, removing the existing concrete and gabion east channel and realigning it to the south, installing a vegetated rock lined channel with a rock grade control at the upper and lower end of the new channel, dredging the pond, installing a solar powered bubbler system, installing aquatic shelves around the pond edge along with a boulder edge in selected locations along the pond.

Excavation in the channel will be limited to that necessary to construct the proposed slopes and grade controls. Rock grade controls will typically be 3 to 4 ft deep.

Block 19. Project Purpose

Dielman Dam has been breached in the vicinity of the existing overflow structure, and the concrete lined receiving channel is failing. The project is being constructed to replace these failing structures. The concrete and gabion lined east channel will be restored. Additionally, the city intends to dredge the south pond and make aesthetic improvements concurrently with the dam and channel repair work.



Existing Overflow Structure at Dielman Dam



Piping through earthen dam at the existing overflow on Dielman Dam



Piping through earthen dam at the existing overflow on Dielman Dam



Piping through earthen dam at the existing overflow on Dielman Dam



Silted in lower portion of the lake above Dielman Dam



Piping through earthen dam at the existing overflow on Dielman Dam



Concrete and Rock Gabion Lined Channel below Dielman Dam



Concrete and Rock Gabion Lined East Channel



Failing concrete lined overflow
channel downstream of Dielman Dam

Block 20. Reason(s) for Discharge:

Material will be discharged due to construction of earth dam and channel restoration activities. The dam and channel restoration is intended to restore the dam and overflow structure as well as control erosion. The bank stabilization, stilling basin, and grade controls are intended to protect the bed and banks from scour and erosion, as well as preventing channel incision. Pond dredging is an ongoing maintenance item intended to restore the pond to its intended dimensions.

Block 21. Type(s) of Material being discharged and the amount of each type in cubic yards:

Proposed improvements will have the following impacts to the existing natural resources:

Channel

- 100 LF of Concrete and Gabion Channel Impacts to construct grade control channel
- 360 LF of Concrete and Gabion Bank Impacts (Total length of both banks)

Proposed mitigation and restoration activities include:

- 180 LF of vegetated rock channel armoring, rock grade control within proposed east channel and stilling basin
- 100 LF of Bank Stabilization in stilling basin
- 220 LF of Bank Stabilization in channel

Proposed Cut and Fill volume totals are as follows:

- | | |
|---|--|
| <ul style="list-style-type: none"> • 1000 cubic yards of cut material for entire project • 900 cubic yards of pond dredging <hr style="border: 0.5px solid black;"/> <p style="margin-left: 20px;">1900 cubic yards of cut</p> | |
| <ul style="list-style-type: none"> • 650 cubic yards of soil used for fill material for entire project • 50 cubic yards of limestone used for fill material in stilling basin bed • 200 cubic yards of limestone used for fill material in east channel bed and banks <hr style="border: 0.5px solid black;"/> <p style="margin-left: 20px;">900 cubic yards of fill</p> | |

Block 22. Surface area in acres of wetlands or other waters filled:

0.11 acres of pond will be affected by the project. Downstream of the pond, 0.04 acres of concrete channel bed and stilling basin considered to be Waters of the US will be removed and restored. No wetland impacts are anticipated during the construction of this project.

Block 23. Description of Avoidance, Minimization and Compensation:

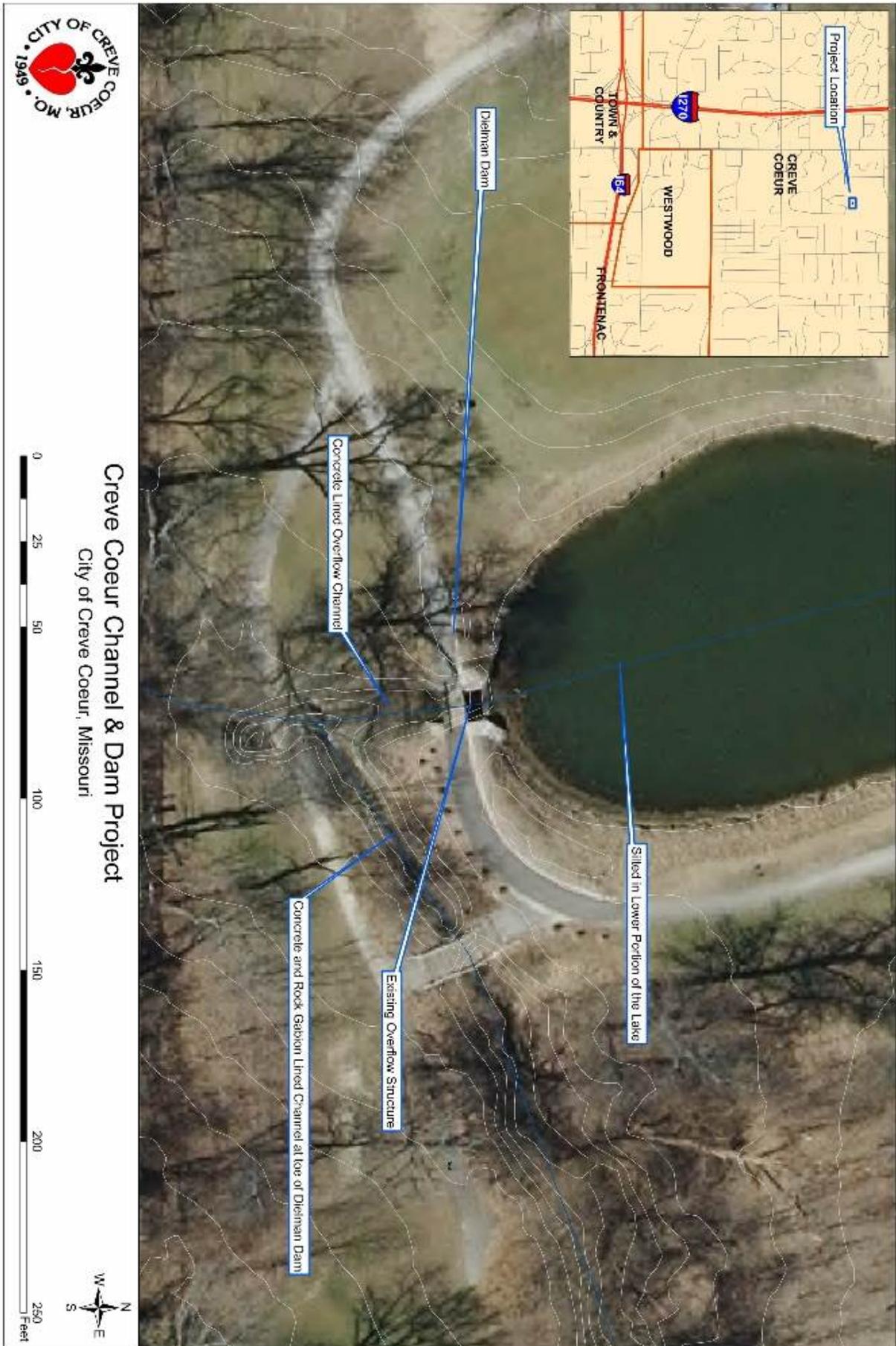
A Do Nothing option is not feasible due to the existing dam breach and failure of the concrete in the receiving channel. Alternative corrections were considered, however, these were not considered viable. Removal and replacement of the existing structure was considered. This alternative was not considered viable as the existing maintenance issues and failure mechanism are not addressed.

An enclose and cover option was considered. This alternative was not considered viable due to the frequent overtopping of the existing spillway which drains into the east channel. Enclosing the channel will eliminate the condition whereby flow that overtops the spillway would be able to reconverge and enter the downstream enclosed stormwater system. The proposed plan minimizes the impact to the existing stream.

A SWPPP or erosion control plan will be included as part of the construction plans for avoidance of impacts to Water of the US during construction. The proposed dam and channel improvements will include bank restoration of the adjacent banks along the pond and the channel. The proposed bank restoration provides native planting appropriate for a riparian corridor.

Block 25. Addresses of adjoining property owners, lessees, etc. whose property adjoins the water body:

Creve Coeur Golf Club
 11400 Olde Cabin Rd
 Creve Coeur, MO 63141



CREVE COEUR DAM AND CHANNEL

CREVE COEUR, MISSOURI

PROJECT TEAM
OWNER:



CITY OF CREVE COEUR
300 N. New Ballas Road
Creve Coeur, Missouri 63141
(314) 432-6000

CIVIL ENGINEER:



INTUITION & LOGIC
16253 Swingley Ridge Road-Suite 100
St. Louis, MO 63017
(636) 777-3000
License No. 2000152987

SURVEYOR:



SABUR, INC.
1751 Ashby Road
St. Louis, Missouri 63114
(314) 428-1414

LANDSCAPE ARCHITECT:

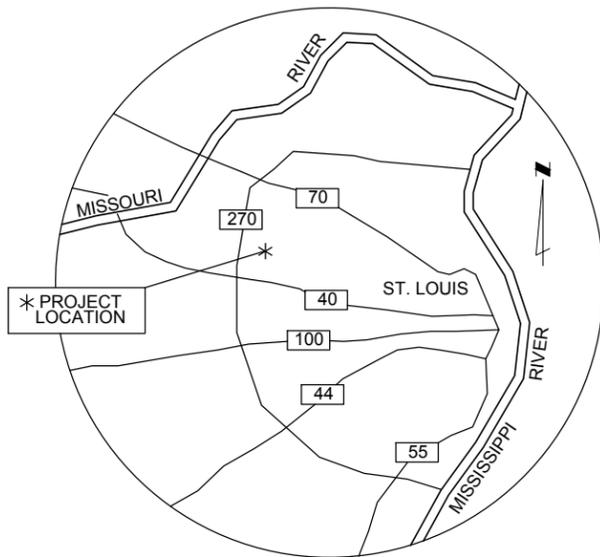


SWT DESIGN
1751 Ashby Road
St. Louis, Missouri 63114
(314) 428-1414

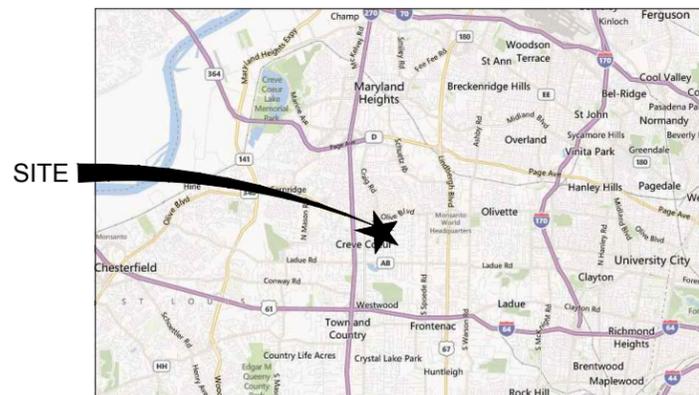
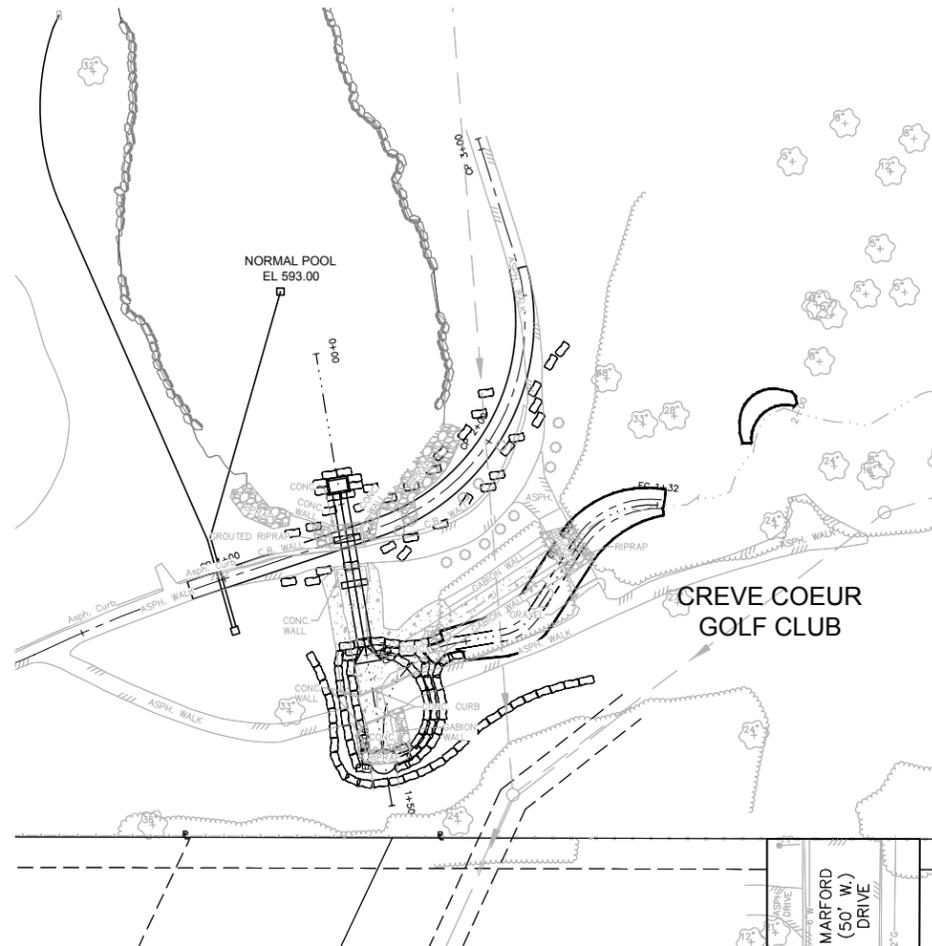
GEOTECHNICAL ENGINEER:



GEOTECHNOLOGY, INC.
11816 Lackland Road-Suite 150
St. Louis, MO 63146
314-997-7440



VICINITY MAP
NOT TO SCALE



LOCATION MAP
NOT TO SCALE

INDEX

SHEET NO.	DESCRIPTION
	COVER
C-1.0	NOTES & ABBREVIATIONS
C-1.1	EASEMENTS AND ACCESS PLAN
C-1.2	DEMOLITION PLAN
C-2.0	PLAN AND PROFILE
C-3.0	DETAILS
C-4.0	WALL DETAILS
C-4.1	WALL DETAILS
C-5.0	CART PATH CROSS SECTIONS
C-5.1	PIPE CROSS SECTIONS
C-6.0	EROSION AND SEDIMENT CONTROL PLAN
C-6.1	EROSION AND SEDIMENT CONTROL DETAILS

GENERAL NOTE:

STORMWATER MANAGEMENT NOTES:
LAND AREA DISTURBED = 0.995 ACRES
ANY FUTURE LAND DISTURBANCE AND/OR INCREASE IN IMPERVIOUS AREA ON THIS SITE MAY REQUIRE ADDITIONAL STORM WATER MANAGEMENT PER MSD REGULATIONS IN PLACE AT THAT TIME (INCLUDING TOTAL LAND DISTURBANCE AND/OR IMPERVIOUSNESS ADDED ON THIS PLAN)

PRIOR TO OBTAINING A CONSTRUCTION PERMIT FROM THE METROPOLITAN ST. LOUIS SEWER DISTRICT, THE CONTRACTOR SHALL BE REQUIRED TO PROVIDE THE DISTRICT WITH A COPY OF AN EXECUTED CERTIFICATE OF INSURANCE INDICATING THAT THE PERMITTEE HAS OBTAINED AND WILL CONTINUE TO CARRY COMMERCIAL GENERAL LIABILITY AND COMPREHENSIVE AUTO LIABILITY INSURANCE. THE REQUIREMENTS AND LIMITS SHALL BE AS STATED IN THE "RULES AND REGULATIONS AND ENGINEERING DESIGN REQUIREMENTS FOR SANITARY AND STORMWATER DRAINAGE FACILITY", SECTION 10.090 (ADDENDUM).

BENCHMARK:

PROJECT BENCHMARK 01:
RAILROAD SPIKE SET IN A 36" DIAMETER TREE LOCATED APPROXIMATELY 5.5 FEET NORTH OF A 72" CHAIN LINK FENCE BUILT ALONG THE SOUTHERN PROPERTY LINE OF "CREVE COEUR GOLF COURSE"; ALSO LOCATED APPROXIMATELY 225 FEET WEST OF THE INTERSECTION OF THE CENTERLINE OF MARFORD DRIVE AND THE SOUTHERN PROPERTY LINE OF "CREVE COEUR GOLF COURSE". ELEV.=594.91.

PRELIMINARY

Professional Engineer Seal
Mark Edward Meyer, P.E. - Engineer
MO# E-2000150043

THE PROFESSIONAL WHOSE SIGNATURE AND PERSONAL SEAL APPEAR HEREON, ASSUMES RESPONSIBILITY ONLY FOR WHAT APPEARS ON THIS PAGE, AND DISCLAIMS (PURSUANT TO SECTION 327.411 RSMO) ANY RESPONSIBILITY FOR ALL OTHER PLANS, SPECIFICATIONS, ESTIMATES, REPORTS, OR OTHER DOCUMENTS OR INSTRUMENTS NOT SEALED BY THE UNDERSIGNED PROFESSIONAL RELATING TO OR INTENDED TO BE USED FOR ANY PART OR PARTS OF THE PROJECT TO WHICH THIS PAGE REFERS.

Expiration Date: Dec. 31, 2014

CONSTRUCTION & GRADING NOTES

1. THE CONTRACTOR IS RESPONSIBLE FOR HAVING A SET OF "APPROVED" ENGINEERING PLANS WITH THE LATEST REVISION DATE ON THE JOB SITE PRIOR TO THE START OF CONSTRUCTION.
2. ANY DEVIATION FROM THESE DESIGN PLANS MAY CAUSE THE WORK TO BE UNACCEPTABLE.
3. ANY UNANTICIPATED CONDITIONS ENCOUNTERED DURING THE CONSTRUCTION PROCESS SHALL BE IDENTIFIED IN WRITING TO THE OWNER/ENGINEER IMMEDIATELY.
4. THE STREETS SURROUNDING THESE PROJECT SITES AND ANY STREET USED FOR CONSTRUCTION ACCESS THERETO SHALL BE KEPT FREE FROM MUD AND CONSTRUCTION DEBRIS AND SHALL BE CLEANED THROUGHOUT THE DAY.
5. ALL TRASH AND DEBRIS ON SITE, EITHER EXISTING OR FROM CONSTRUCTION, MUST BE REMOVED AND PROPERLY DISPOSED OF OFF SITE.
6. NO EXCAVATION SHALL BE MADE SO CLOSE TO THE PROPERTY LINE AS TO ENDANGER ANY ADJOINING PROPERTY OR ANY PUBLIC OR PRIVATE STREET WITHOUT SUPPORTING AND PROTECTING SUCH PUBLIC OR PRIVATE STREET OR PROPERTY FROM SETTLING, CRACKING, OR OTHER DAMAGE.
7. ALL GRADES SHALL BE WITHIN 0.2 FEET, PLUS OR MINUS, OF THOSE SHOWN ON THE PLAN. GRADING TO BE REVIEWED AND APPROVED BY OWNERS REPRESENTATIVE.
8. CONTRACTOR IS RESPONSIBLE FOR MONITORING GRADING OPERATION AND ACCURACY OF FINAL ROUGH GRADES. CONTACT ENGINEER OF ANY DISCREPANCIES AFFECTING FINAL GRADING BALANCE.
9. SITE CONDITIONS MAY HAVE CHANGED SINCE THE SURVEY WAS PREPARED. CONTRACTOR SHALL VISIT SITE TO FAMILIARIZE THEMSELVES WITH THE CURRENT CONDITIONS.
10. ALL PROJECT COORDINATES AND ELEVATIONS ARE BASED ON PROJECT BENCHMARKS AS LISTED BELOW.

PROJECT BENCHMARK 01:
RAILROAD SPIKE SET IN A 36" DIAMETER TREE LOCATED APPROXIMATELY 5.5 FEET NORTH OF A 72" CHAIN LINK FENCE BUILT ALONG THE SOUTHERN PROPERTY LINE OF "CREVE COEUR GOLF COURSE"; ALSO LOCATED APPROXIMATELY 225 FEET WEST OF THE INTERSECTION OF THE CENTERLINE OF MARFORD DRIVE AND THE SOUTHERN PROPERTY LINE OF "CREVE COEUR GOLF COURSE".
ELEV.=594.91.
11. ALL EXISTING TOPOGRAPHY, UNDERGROUND UTILITIES, STRUCTURES AND ASSOCIATED FACILITIES SHOWN ON THESE DRAWINGS HAVE BEEN PLOTTED FROM AVAILABLE SURVEYS AND RECORDS. THEREFORE, THEIR LOCATIONS AND ELEVATIONS MUST BE CONSIDERED APPROXIMATE ONLY. THERE MAY BE OTHER FACILITIES, THE EXISTENCE OF WHICH ARE NOT PRESENTLY KNOWN.
12. CONTRACTOR IS TO VERIFY ALL EXISTING STRUCTURES AND FACILITIES AND NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL AND STARTING WORK.

20. THE CONTRACTOR SHALL PROVIDE FOR THE SAFE AND ORDERLY PASSAGE OF TRAFFIC AND PEDESTRIANS WHERE HIS/HER OPERATIONS ABUT PUBLIC THOROUGHFARES AND ADJACENT PROPERTY IN ACCORDANCE WITH LOCAL ORDINANCE AND ST LOUIS COUNTY REQUIREMENTS.
21. AREAS OUTSIDE THE R.O.W. LINE OR CONSTRUCTION LIMIT LINE IMPACTED BY OPERATIONS OF THE CONTRACTOR SHALL BE RETURNED TO THE STATE IT WAS FOUND PRIOR TO NEW CONSTRUCTION, EXCEPT WHERE NEW WORK IS SHOWN.
22. STREET PAVING AND CURBS TO REMAIN SHALL BE PROTECTED FROM DAMAGE AND IF DAMAGED, SHALL BE REPLACED PROMPTLY IN CONFORMANCE WITH THE MUNICIPALITY OR ST LOUIS COUNTY STANDARD.
23. ANY DAMAGE TO EXISTING UTILITIES SHALL BE REPAIRED BY THE UTILITY COMPANY AT THE CONTRACTOR'S EXPENSE.
24. ALL EXISTING PAVEMENT OR CONCRETE TO BE REMOVED SHALL BE SAWCUT ALONG LIMITS OF PROPOSED REMOVAL BEFORE COMMENCEMENT OF PAVEMENT REMOVAL.
25. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL REQUIRED PERMITS FOR CONSTRUCTION ALONG OR ACROSS EXISTING STREETS OR HIGHWAYS. CONTRACTOR SHALL MAKE ARRANGEMENTS FOR THE PROPER BRACING, SHORING AND OTHER REQUIRED PROTECTION OF ALL ROADWAYS BEFORE CONSTRUCTION BEGINS AND SHALL BE RESPONSIBLE FOR ANY DAMAGE TO THE STREETS OR ROADWAYS AND ASSOCIATED STRUCTURES AND SHALL MAKE REPAIRS AS NECESSARY TO THE SATISFACTION OF THE OWNER OF THE ROADWAY.
26. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION AND MAINTENANCE OF ADEQUATE SIGNS, TRAFFIC CONTROL DEVICES AND WARNING DEVICES TO INFORM AND PROTECT THE PUBLIC DURING ALL PHASES OF CONSTRUCTION. BARRICADES AND WARNING SIGNS SHALL BE PROVIDED IN ACCORDANCE WITH ST. LOUIS COUNTY STANDARD SPECIFICATIONS. ALL TRAFFIC CONTROL WORK SHALL BE DONE IN ACCORDANCE WITH MUTCD AND CREVE COEUR.
27. THE ENGINEER AND OWNER ARE NOT RESPONSIBLE FOR THE CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES OR PROCEDURES, TIME OF PERFORMANCE, PROGRAMS OR FOR ANY SAFETY PRECAUTIONS USED BY THE CONTRACTOR. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR EXECUTION OF HIS/HER WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND SPECIFICATIONS.
28. CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS BEFORE CONSTRUCTION BEGINS.
29. MAINTENANCE OF THE SEWERS DESIGNATED "PUBLIC" SHALL BE THE RESPONSIBILITY OF THE METROPOLITAN ST. LOUIS SEWER DISTRICT UPON DEDICATION OF THE SEWERS TO THE DISTRICT.

EXISTING	NEW

LEGEND CONTINUED	
	RECORD CALCULATED
	SURVEY POINTS ESTABLISHED
	SURVEY MONUMENTATION FOUND
	CROSS FOUND
	CONCRETE MONUMENT FOUND
	IRON PIPE FOUND
	IRON BAR FOUND
	R.O.W. MONUMENT FOUND
	STONE FOUND
	RAILROAD SPIKE FOUND
	LARGE NAIL (TRAVERSE)
	IRON BAR (TRAVERSE)
	CROSS (TRAVERSE)
	PK NAIL (TRAVERSE)
	INDIVIDUAL OWNERSHIP PARCEL (IOP)
	SUBDIVISION LOT NUMBER
	GUARD RAIL
	UTILITY METER OR VALVE
	SPRINKLER HEAD
	SPRINKLER VALVE
	POWER POLE
	POWER POLE & GUY
	STREET SIGN
	FIRE HYDRANT
	LIGHT STANDARD
	MAIL BOX
	HOUSE VENT
	TRAFFIC SIGNAL
	UTILITY BOX
	LOW SILL LOCATION

ABBREVIATIONS	
AI	AREA INLET
ATG	ADJUST TO GRADE
B.M.	BENCH MARK
B&B	BALL & BURLAP
BMP	BEST MANAGEMENT PRACTICES
C	CENTER LINE
CFS	CUBIC FEET PER SECOND
CLCW	COIR LOG CONTOUR WATTLING
CONC.	CONCRETE
CPP	CORRUGATED PLASTIC PIPE
CR	COMPOSITE REVETMENT
CTV	CABLE TELEVISION
DIP	DUCTILE IRON PIPE
DND	DON NOT DISTURB
E	ELECTRIC
EGL	ENERGY GRADE LINE
EL	ELEVATION
EP	EXPOSED PIPE
ESMT	EASEMENT
EXIST	EXISTING
F	FLOW LINE
FES	FLARED END SECTION
FH	FIRE HYDRANT
FO	FIBER OPTIC
FT	FEET
G	GAS
GC	GRADE CONTROL
GCI	GRATED CURB INLET
HGL	HYDRAULIC GRADE LINE
I.D.	INNER DIAMETER
IN	INCHES
IP	IRON PIN
LDB	LEFT DESCENDING BANK
MAX	MAXIMUM
MH	MANHOLE
MIN	MINIMUM
O&M	OPERATION AND MAINTENANCE
OTP	OPEN TOP PIPE
P	PROPERTY LINE
PCB	PHONE CABLE BOX
PCR	PARTIAL COMPOSITE REVETMENT
PDE	PERMANENT DRAINAGE EASEMENT
PED	PEDESTAL
PPED	POWER PEDESTAL
PROP	PROPOSED
PVC	POLYVINYL CHLORIDE
RCP	REINFORCED CONCRETE PIPE
RDB	RIGHT DESCENDING BANK
RR	RAILROAD
SAN	SANITARY
SHLDR	SHOULDER
SMH	SANITARY MANHOLE
SS	STORM SEWER
SSMH	STORM SEWER MANHOLE
STA	STATION
T	TELEPHONE
TBR	TO BE REMOVED
TBR&R	TO BE REMOVED AND REPLACED
TBR&RBO	TO BE REMOVED AND REPLACED BY OTHERS
TBR&REL	TO BE REMOVED AND RELOCATED
TPED	TELEPHONE PEDESTAL
TSCL	TEMPORARY SLOPE CONSTRUCTION LIMIT
TVPED	TELEVISION PEDESTAL
TYP	TYPICAL
UIP	USE IN PLACE
VCP	VITRIFIED CLAY PIPE
W	WATER
YR	YEAR

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13. THE GENERAL CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANIES TO PROVIDE CABLE TV, PHONE, ELECTRIC, GAS AND IRRIGATION SERVICES. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR SECURING SITE LAYOUTS FOR THESE UTILITIES AND SHALL COORDINATE AND PROVIDE CONDUIT CROSSINGS AS REQUIRED. THIS COORDINATION SHALL BE CONSIDERED INCIDENTAL TO GENERAL CONTRACTOR WITH OWNER. ANY CONFLICTS IN UTILITIES SHALL BE CORRECTED BY THE GENERAL CONTRACTOR AT NO ADDITIONAL COST TO OWNER.
14. BEFORE EXCAVATING OVER OR ADJACENT TO ANY EXISTING UTILITIES, CONTRACTOR SHALL NOTIFY THE OWNER OF SUCH UTILITIES TO ENSURE THAT PROTECTIVE WORK WILL BE COORDINATED AND PERFORMED BY THE CONTRACTOR IN ACCORDANCE WITH THE REQUIREMENTS OF THE OWNER OF THE UTILITY INVOLVED. IF ANY EXISTING SERVICE LINES, UTILITIES AND UTILITY STRUCTURES WHICH ARE TO REMAIN IN SERVICE ARE UNCOVERED OR ENCOUNTERED DURING THIS OPERATION, THEY SHALL BE SAFEGUARDED, PROTECTED FROM DAMAGE AND SUPPORTED IF NECESSARY.
15. CONTRACTOR SHALL COORDINATE WITH PROPERTY OWNERS REGARDING PRIVATE UTILITIES ON THE PREMESIS, INCLUDING BUT NOT LIMITED TO IRRIGATION SYSTEM AND LIGHTING FACILITIES.
16. CONTRACTOR SHALL NOT REMOVE ANY TREE OR FENCE, UNLESS MARKED FOR REMOVAL ON THE PLANS WITHOUT PRIOR APPROVAL.
17. ALL APPLICABLE PROVISIONS OF THE CURRENT OCCUPATIONAL SAFETY AND HEALTH ACT ARE HEREIN INCORPORATED BY REFERENCE.
18. THE CONTRACTOR, BY USING THESE PLANS FOR THEIR WORK, AGREE TO HOLD HARMLESS ILINC ENGINEERING, INC. THE CITY OF CREVE COEUR, MISSOURI, THEIR EMPLOYEES AND AGENTS AND THE OWNER WHILE ACTING WITHIN THE SCOPE OF THEIR DUTIES FROM AND AGAINST ANY AND ALL LIABILITY, CLAIMS, DAMAGES, AND THE COST OF DEFENSE ARISING OUT OF CONTRACTOR(S) PERFORMANCE OF THE WORK DESCRIBED HEREIN, BUT NOT INCLUDING THE SOLE NEGLIGENCE OF THE OWNER, HIS AGENTS, THE ENGINEER, HIS EMPLOYEES AND AGENTS.

STANDARD CONSTRUCTION:

ALL STORM AND SANITARY SEWER STRUCTURES AND APPURTENANCES TO BE DEDICATED TO MSD, OR TO BE PRIVATE UNDER MSD INSPECTION, SHALL CONFORM TO THE METROPOLITAN ST. LOUIS SEWER DISTRICT, STANDARD CONSTRUCTION SPECIFICATIONS FOR SEWER AND DRAINAGE FACILITIES, 2009. THAT WILL INCLUDE STANDARD DETAILS SHOWN THEREIN, AND SHALL INCLUDE ALL SUBSEQUENT CHANGES MADE THERETO.

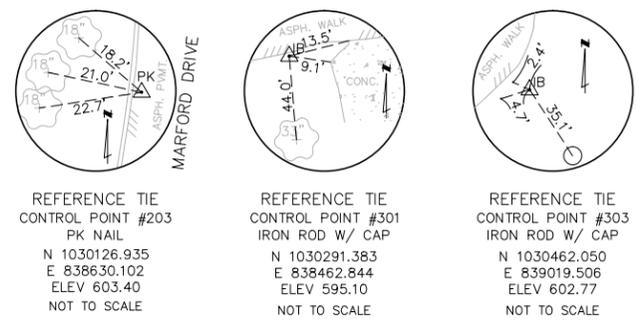
PART 4 - PIPE SEWER CONSTRUCTION
SECTION B, PIPE FIELD TESTS, PARAGRAPH 2, REACH INTEGRITY TESTING - DELETE THE FIRST SENTENCE AND THE FOLLOWING REPLACEMENT APPLIES:
ALL SANITARY AND COMBINED SEWERS SHALL SUSTAIN A MAXIMUM LEAKAGE LIMIT OF 100 GALLONS/INCH OF PIPE DIAMETER/MILE OF LINE/DAY, AS REQUIRED BY THE MISSOURI DEPARTMENT OF NATURAL RESOURCES SPECIFICATIONS.

SECTION B, PIPE FIELD TESTS, PARAGRAPH 2, REACH INTEGRITY TESTING, SUBPARAGRAPH C, INFILTRATION/EXFILTRATION TESTING - DELETE THE SIXTH SENTENCE, CONCERNING LEAKAGE LIMITS, AND THE FOLLOWING REPLACEMENT APPLIES:
THE MEASUREMENT OF LEAKAGE SHALL NOT EXCEED 100 GALLONS/INCH OF PIPE DIAMETER/MILE OF LINE/DAY, AS REQUIRED BY THE MISSOURI DEPARTMENT OF NATURAL RESOURCES SPECIFICATIONS.

SECTION B, PIPE FIELD TESTS, PARAGRAPH 4, MANHOLE TESTING, SUBPARAGRAPH A, VACUUM TESTING - AFTER THE FIRST SENTENCE, THE FOLLOWING ADDITION APPLIES:
THE VACUUM TEST MUST BE PERFORMED PRIOR TO BACKFILLING AROUND THE MANHOLE UNLESS THE CONTRACTOR PROVIDES DOCUMENTATION FROM THE PRECAST MANHOLE MANUFACTURER STATING THAT THE MANHOLE MAY BE VACUUM TESTED AFTER BACKFILLING HAS TAKEN PLACE. THE CONTRACTOR MUST SUBMIT THIS DOCUMENTATION PRIOR TO BACKFILLING AROUND ANY MANHOLE.

SECTION B, PIPE FIELD TESTS, PARAGRAPH 4, MANHOLE TESTING, SUBPARAGRAPH B, EXFILTRATION TESTING -DELETE THE SECOND SENTENCE, CONCERNING LEAKAGE LIMITS, AND THE FOLLOWING ADDITION APPLIES:
FOR EXFILTRATION TESTING, THE ALLOWABLE LEAKAGE LIMIT IS 100 GALLONS/INCH OF PIPE DIAMETER/MILE OF LINE/DAY WHEN THE AVERAGE HEAD ON THE TEST SECTION IS THREE FEET (3') OR LESS.

REFERENCE TIES - CREVE COEUR



INTUITION LOGIC
ILINC Engineering Incorporated
MO Certificate of Authority
2000152987
16253 Swingley Ridge Rd.
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Creve Coeur, St. Louis County, Missouri

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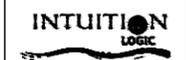
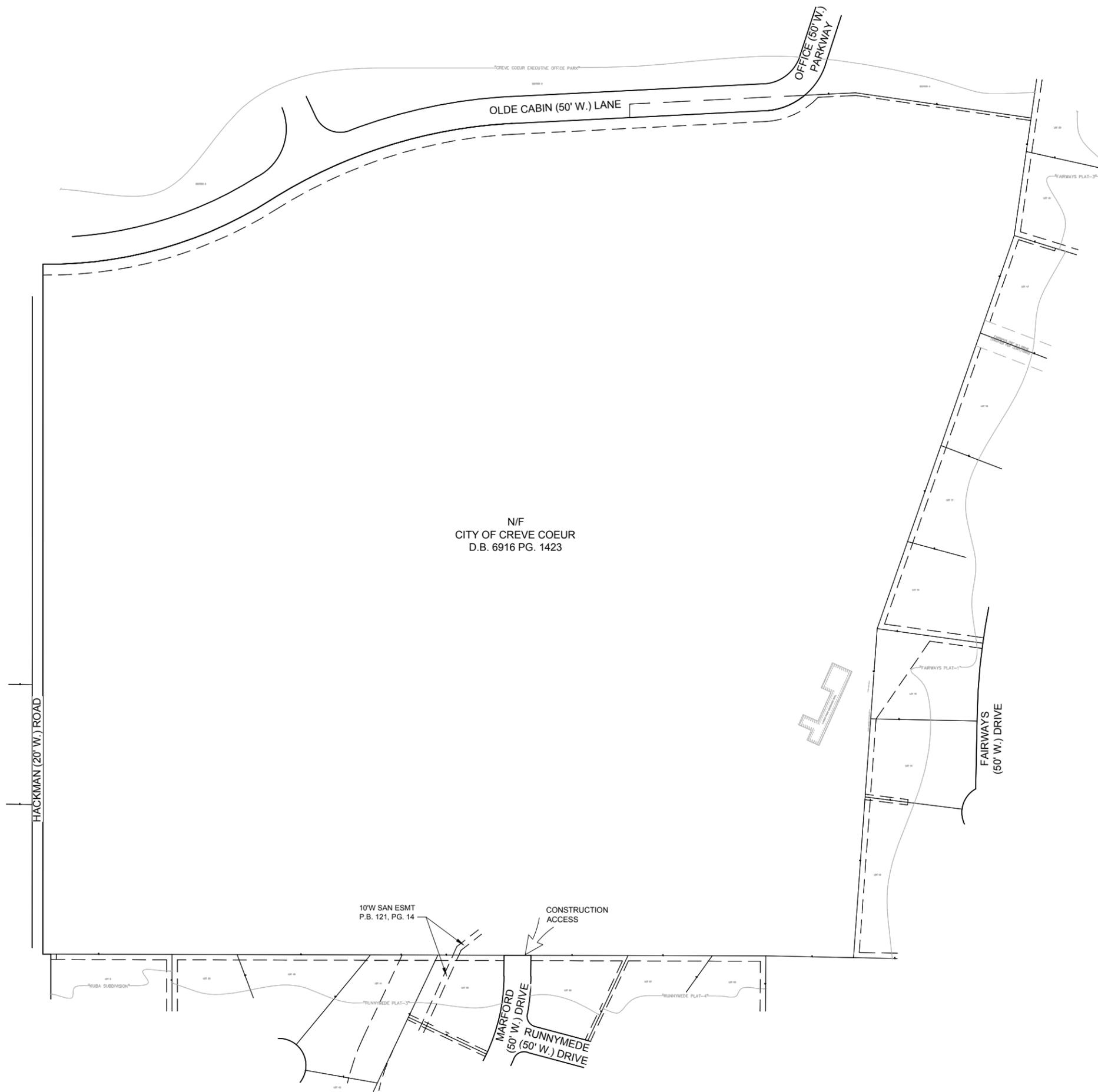
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Mark Edward Meyer
2000150043
Expiration Date: Dec. 31, 2014

Rev	Date	Description

Project No. 1311
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Drawn: JDF
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NOTES AND ABBREVIATIONS

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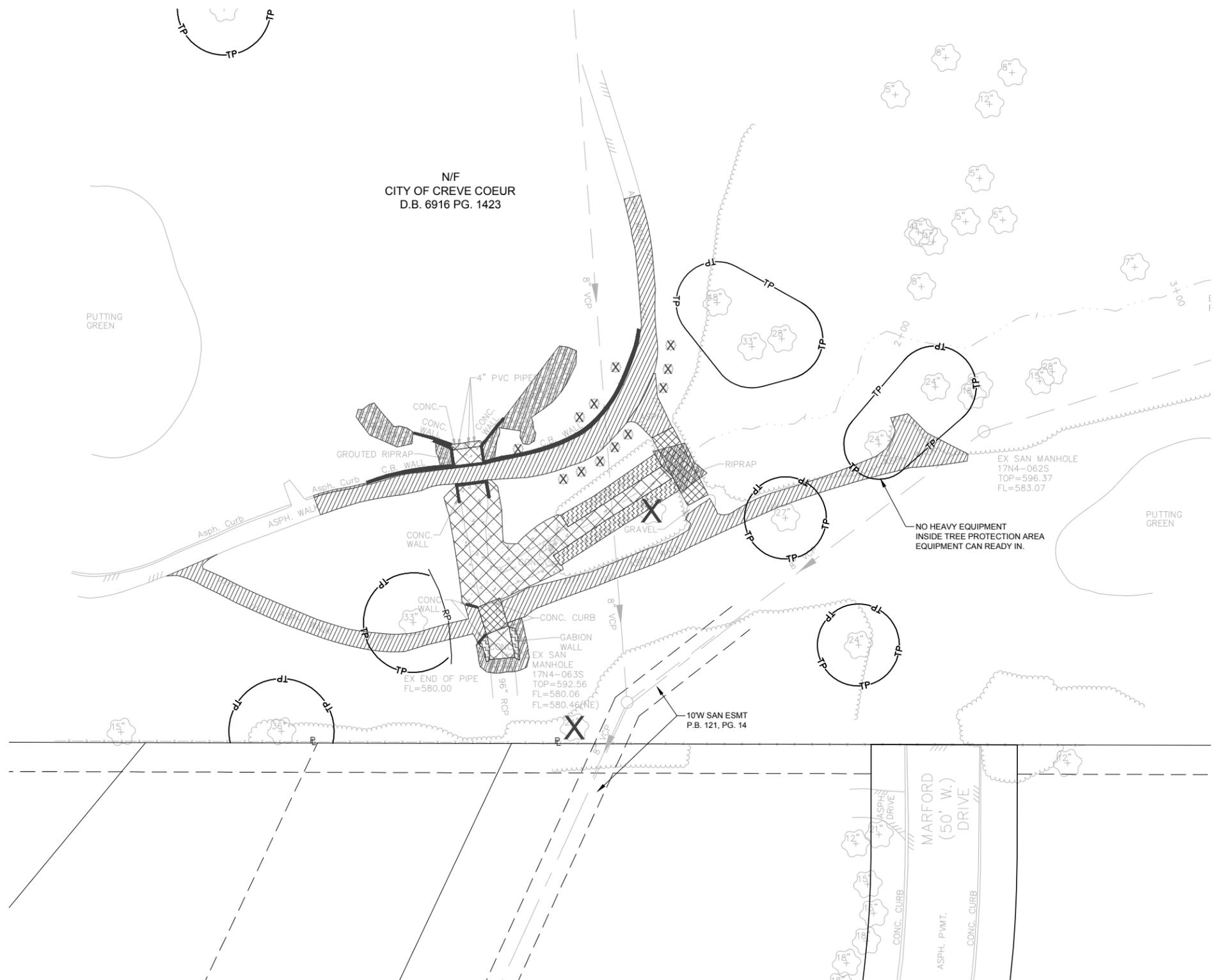
EASEMENTS AND ACCESS PLAN

Sheet Number:

C-1.1



N/F
CITY OF CREVE COEUR
D.B. 6916 PG. 1423



LEGEND	
	ASPHALT
	BRIDGE
	CONCRETE
	GABIONS
	RIPRAP
	RETAINING WALLS
	TREE/BUSH REMOVAL

BASEMAP 17N4



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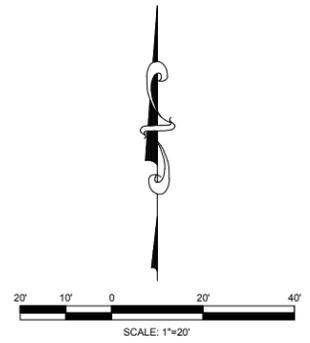
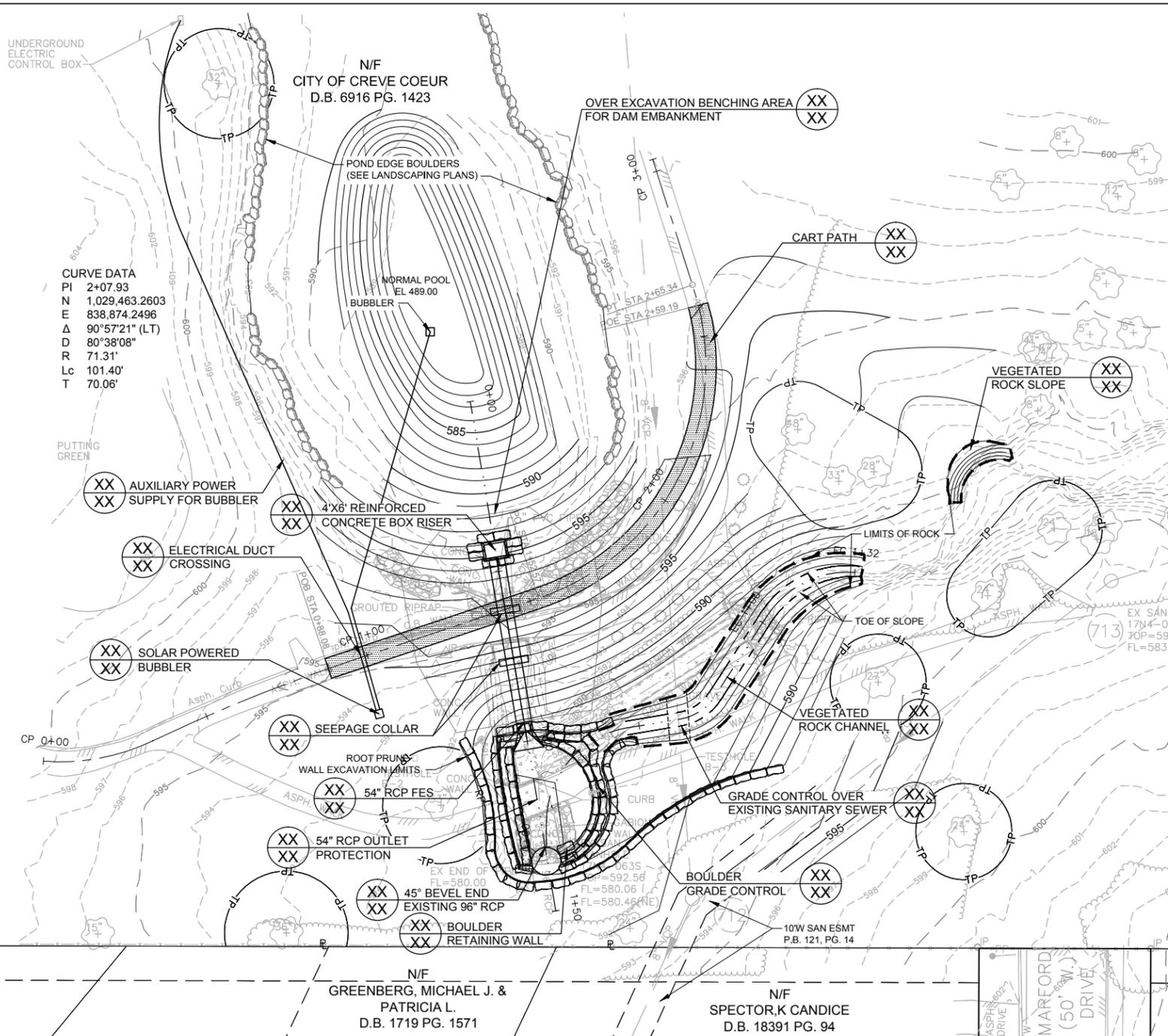
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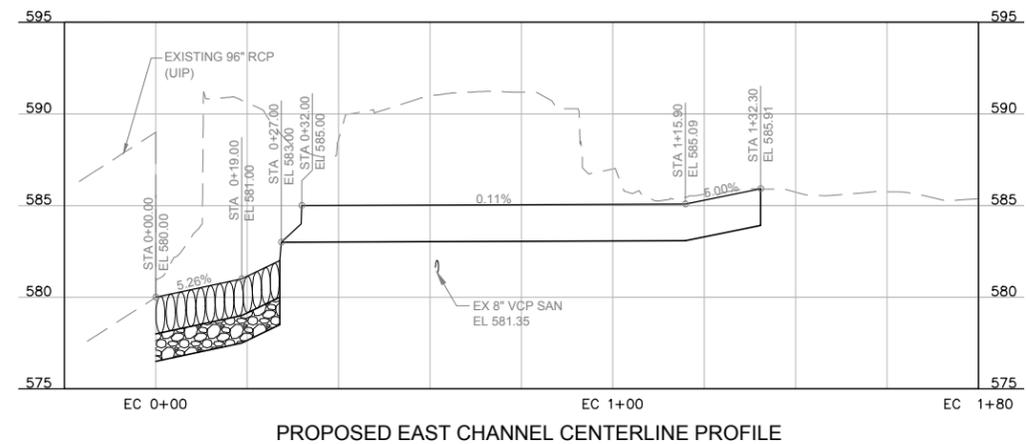
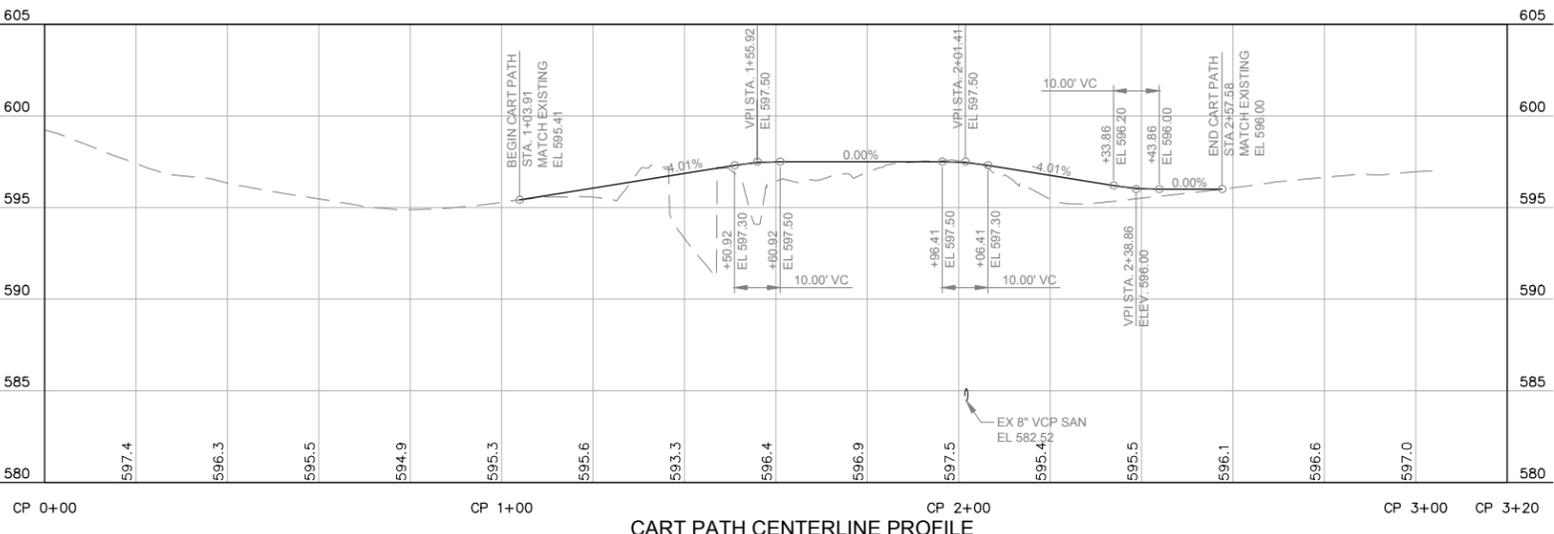
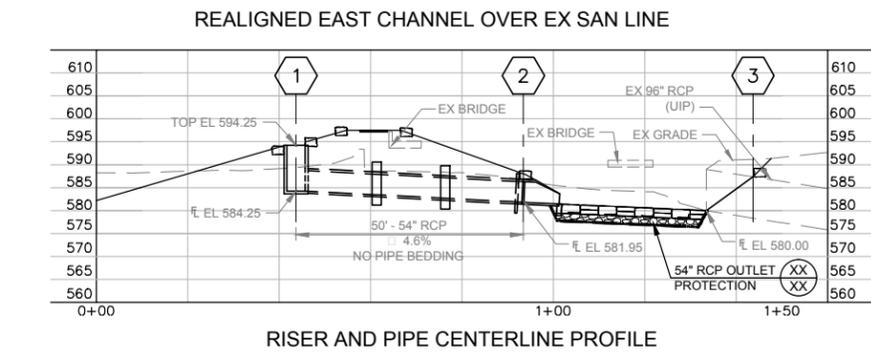
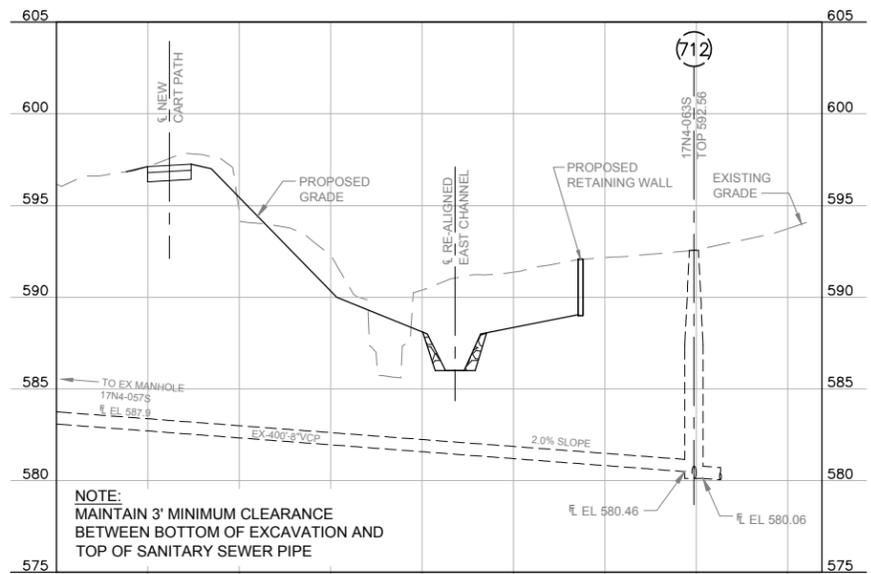
DEMOLITION PLAN

Sheet Number:

C-1.2



- NOTES:
1. DRAIN POND BEFORE DREDGING.
 2. GRADE TO DIRECT FLOW TO VEGETATED ROCK SLOPE.



CITY OF CREVE COEUR, MO. 1949

INTUITION LOGIC

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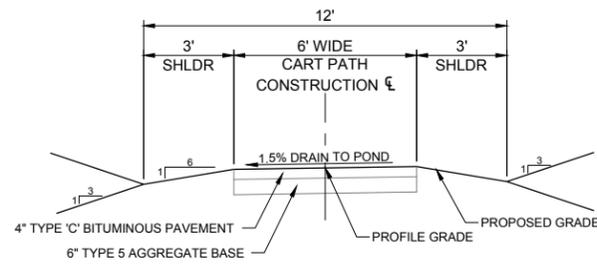
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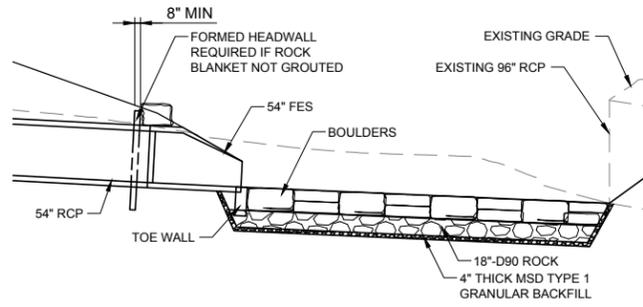
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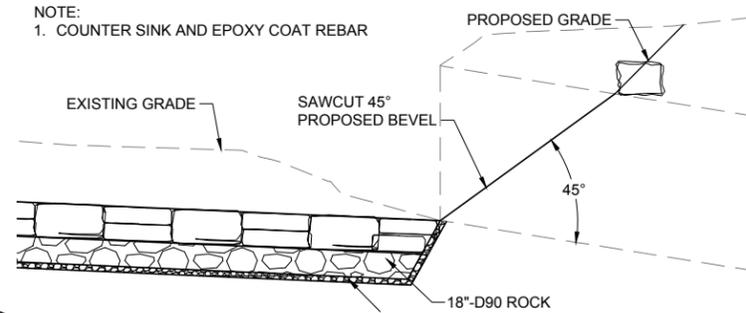
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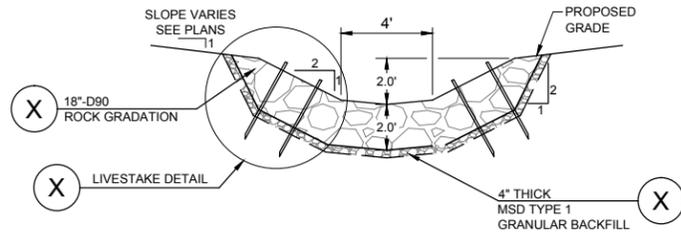
X 6' ASPHALT CART PATH NTS



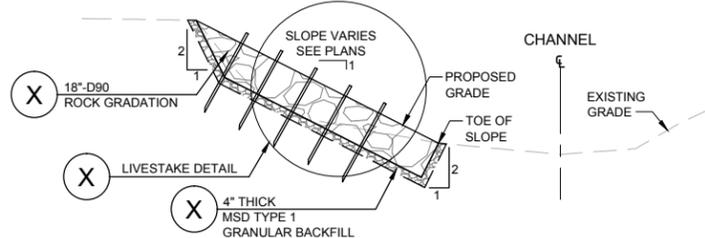
X 54\"/>



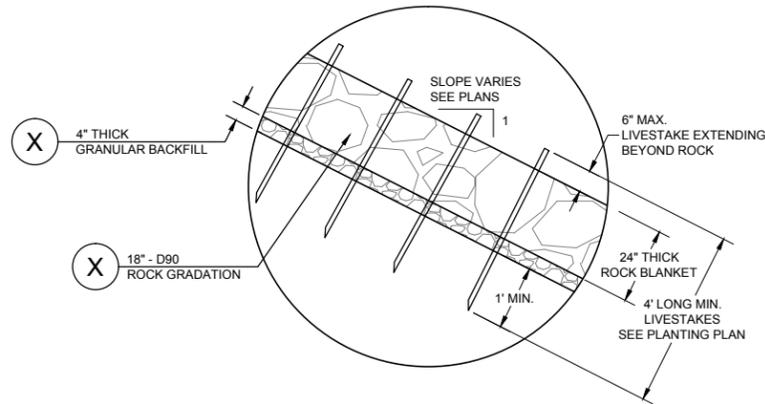
X 96\"/>



X VEGETATED ROCK CHANNEL NTS



X VEGETATED ROCK CHANNEL NTS



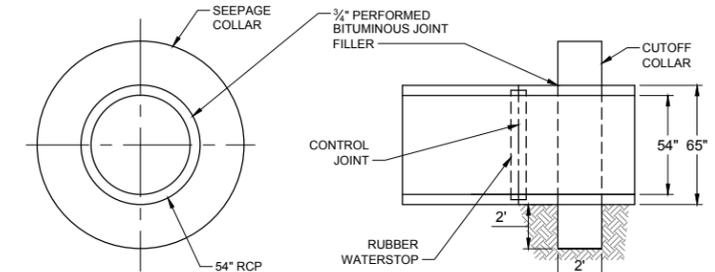
X LIVESTAKE DETAIL NTS

NOTES:

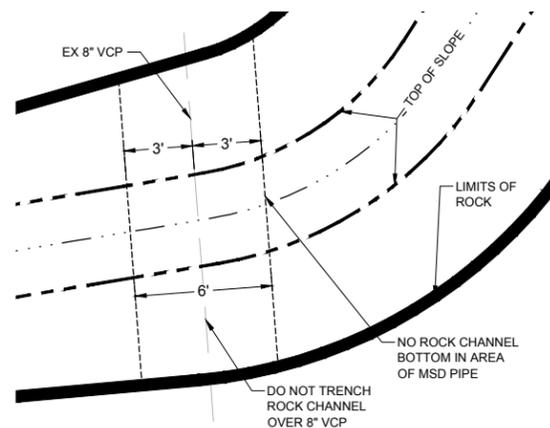
- Rock shall be hard, durable, angular in shape and resist weathering. Rock shall not contain shale. Neither breadth nor thickness of a single stone shall be less than 1/3 its length. Rock shall be well graded. The rock shall contain fines in sufficient quantities to fill voids while allowing point-to-point contact between rocks. Rock suspended in a matrix of fines shall not be allowed. THERE SHALL BE NO VISIBLE VOIDS IN ROCK STRUCTURES.
- FOR 18\"/>
 - 70% of rock shall be 6\"/>
- GRANULAR BACKFILL
MSD Type 1 bedding shall be used for the designated granular backfill.

ROCK GRADATION TABLE	
D ₉₀ = 18"	
RIPRAP ROCK SIZE (inches)	PERCENT PASSING
0.001	5
0.4	10
2.5	15
6.0	30
10.5	50
15.0	70
17.5	85
18.0	90

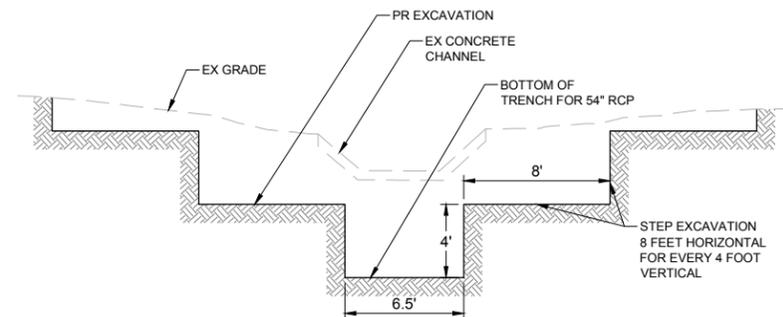
X ROCK GRADATIONS NTS



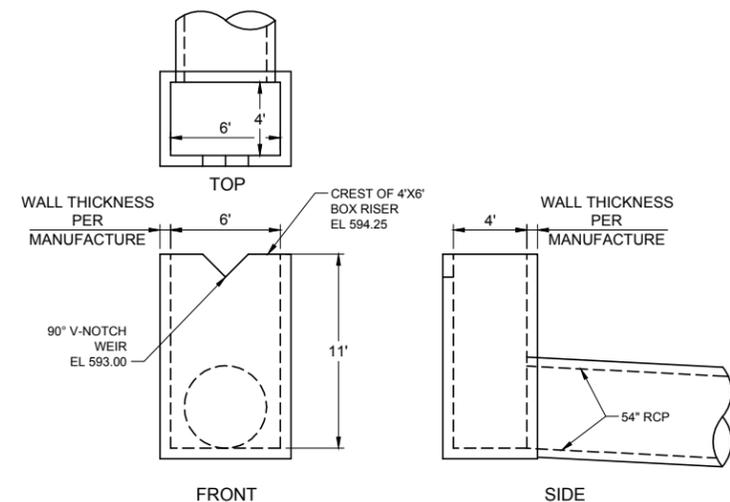
X SEEPAGE COLLAR DETAIL NTS



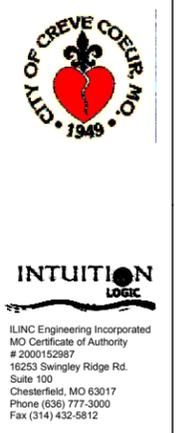
X GRADE CONTROL OVER EXISTING SANITARY SEWER NTS



X OVER EXCAVATION BENCHING FOR DAM EMBANKMENT NTS



X 4'X6' REINFORCED CONCRETE BOX RISER NTS



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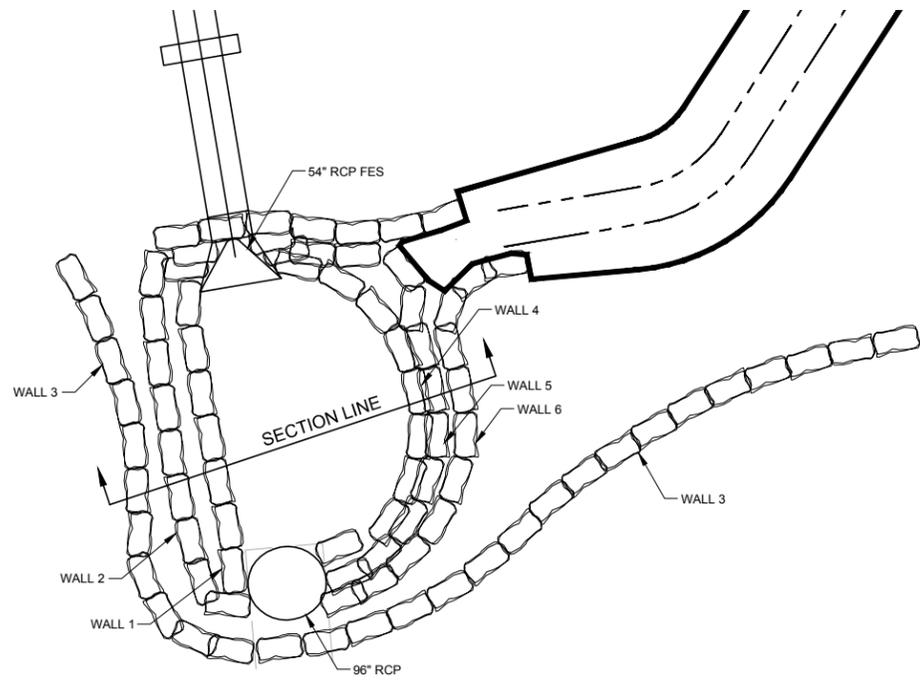
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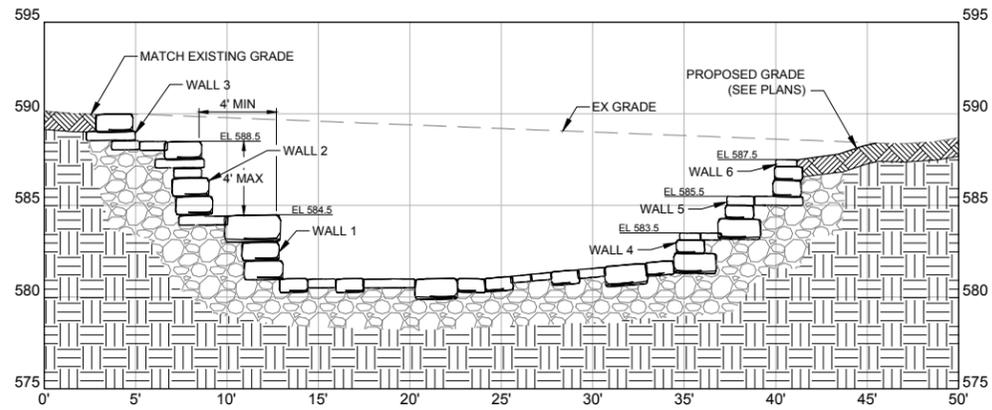
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DETAILS
 Sheet Number:
C-3.0



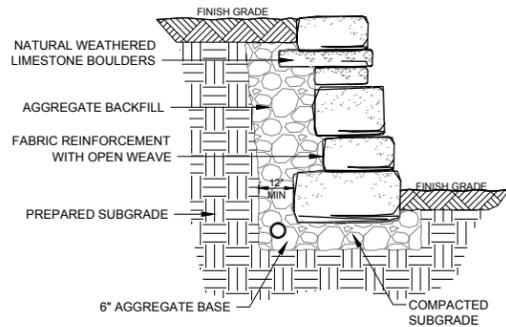
X PLAN VIEW OF WALLS

NTS



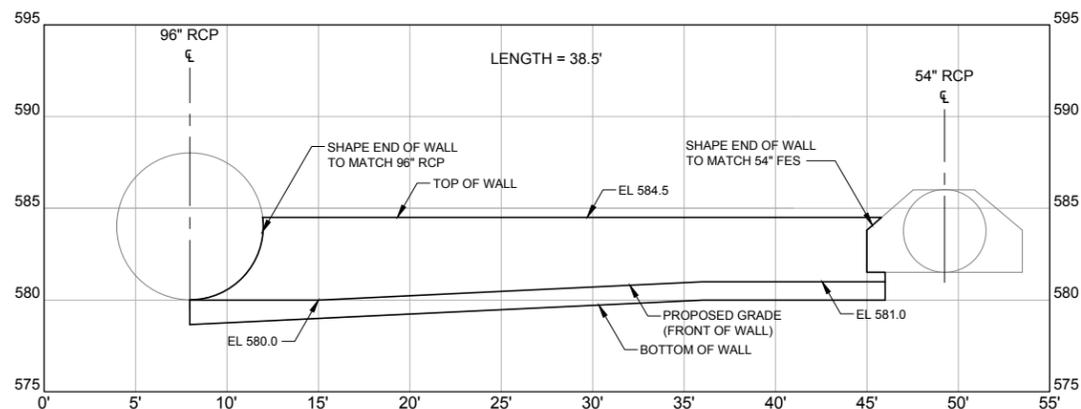
X SECTION VIEW

NTS



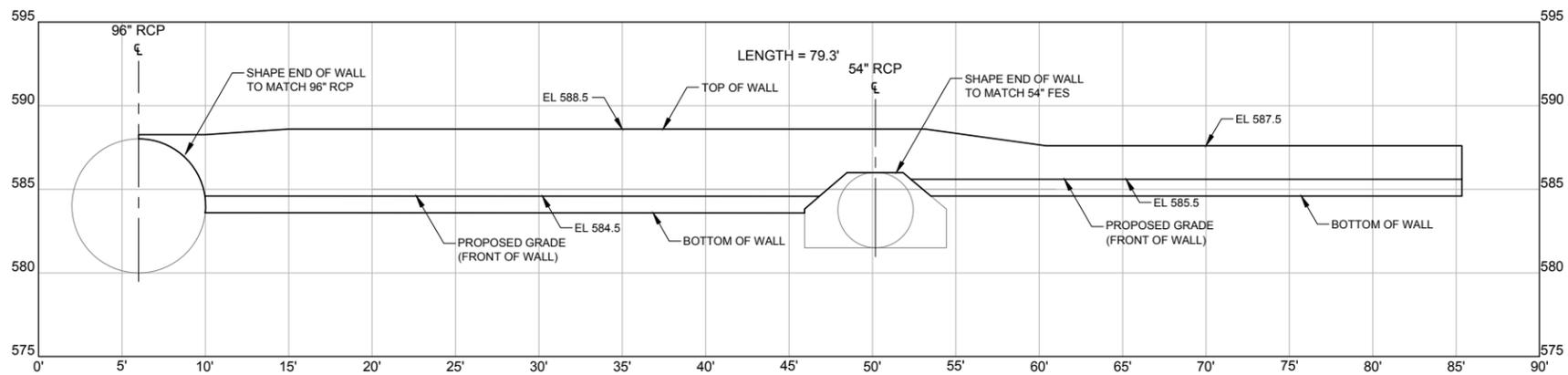
X TYPICAL SECTION FOR WALL

NTS



X WALL 1

NTS



X WALL 2

NTS



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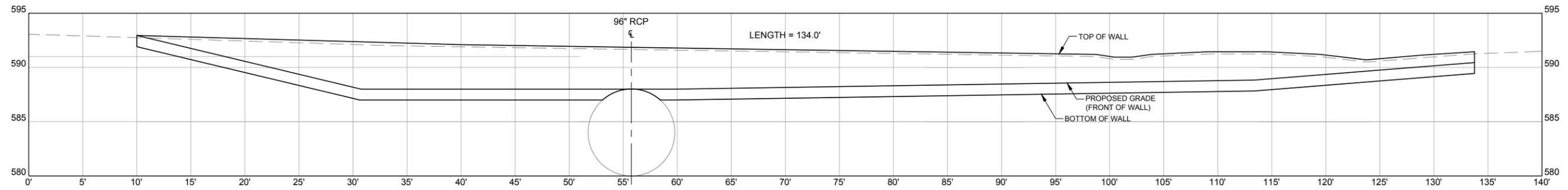
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WALL DETAILS

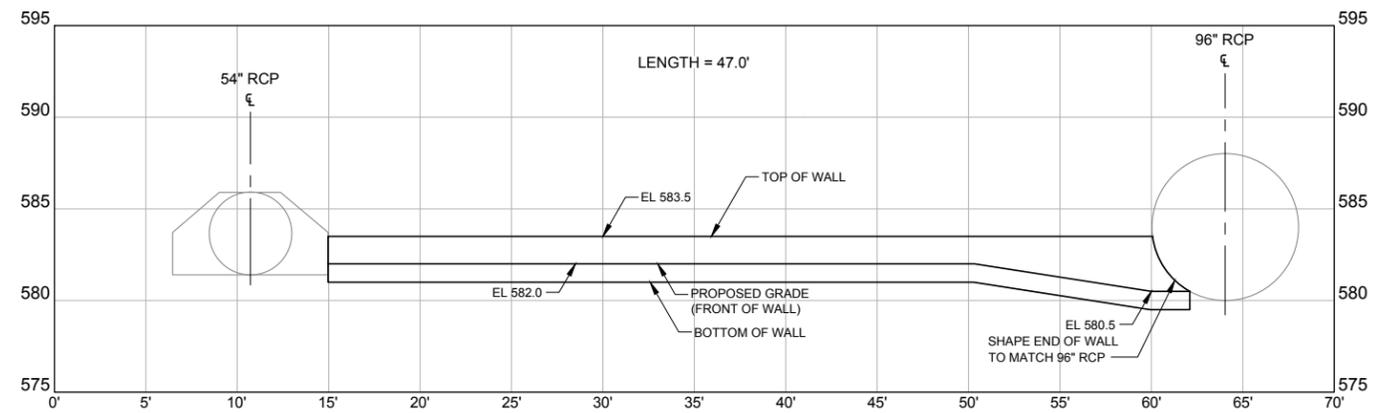
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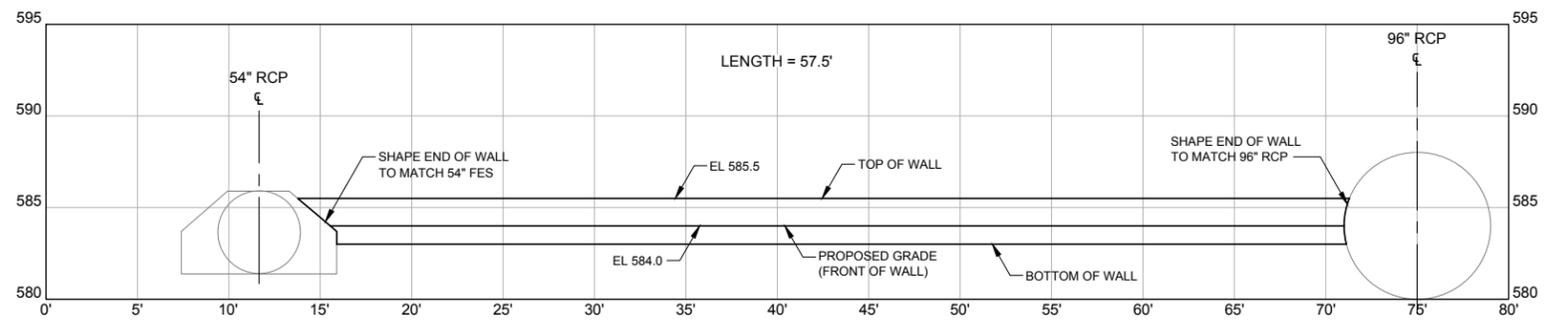
(X) WALL 3

NTS



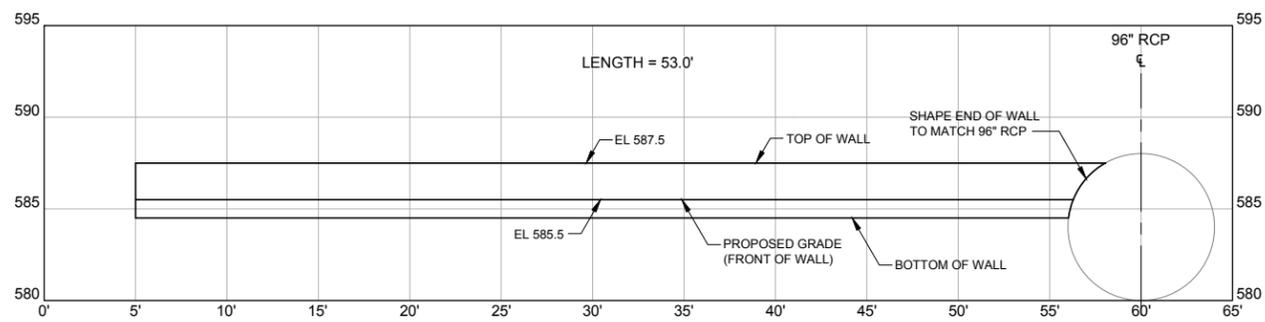
(X) WALL 4

NTS



(X) WALL 5

NTS



(X) WALL 6

NTS



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WALL DETAILS

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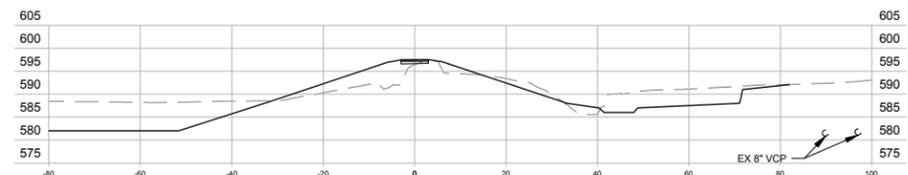
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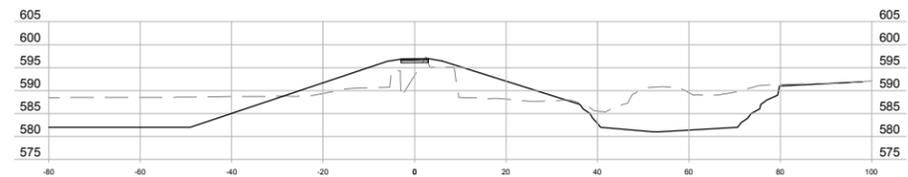
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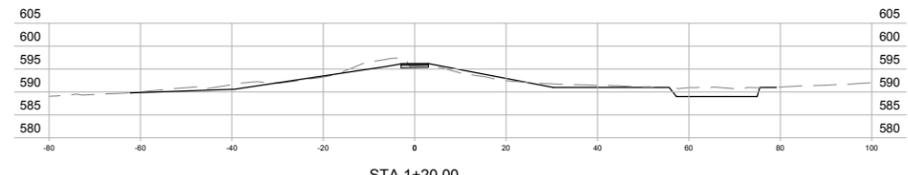
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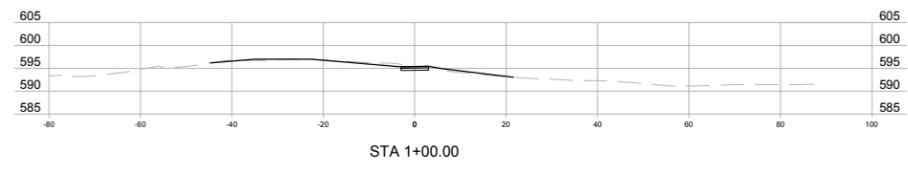
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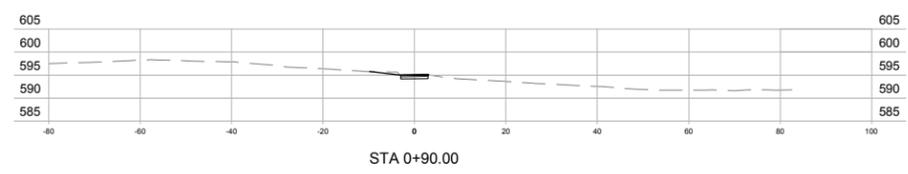
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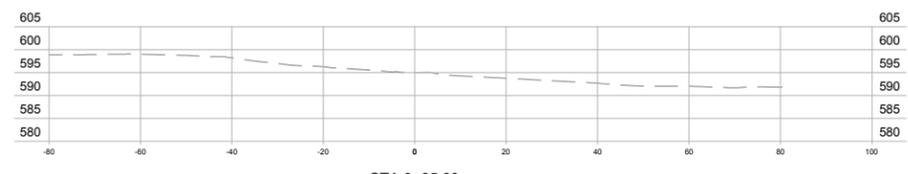
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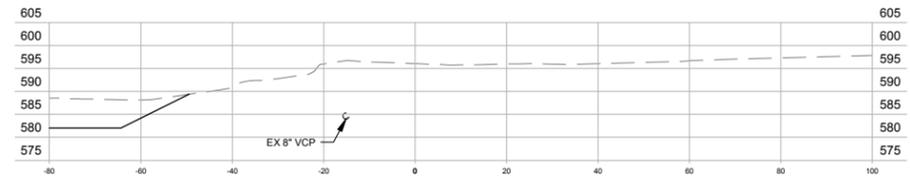
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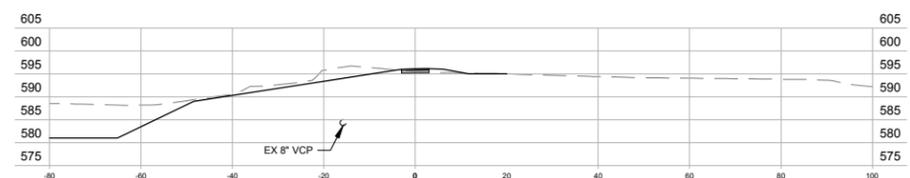
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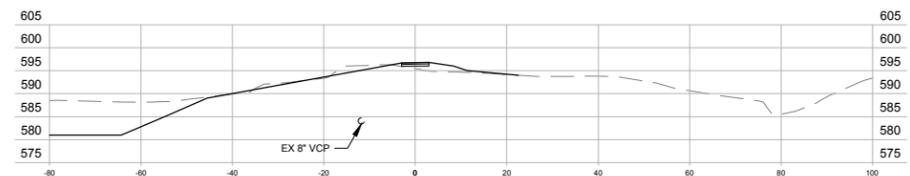
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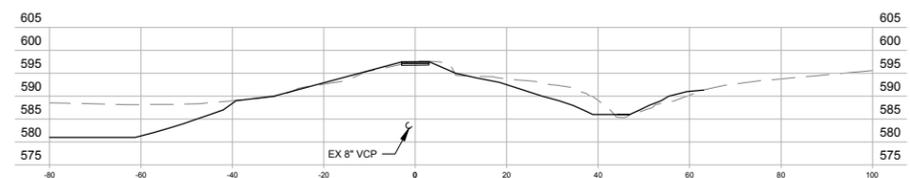
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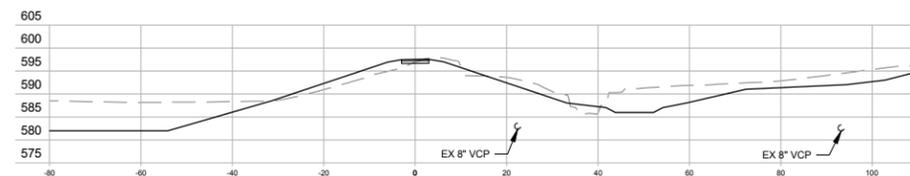
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STA 2+00.00



STA 1+80.00



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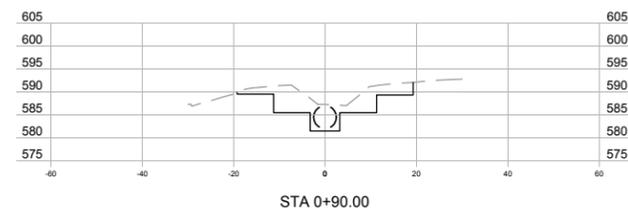
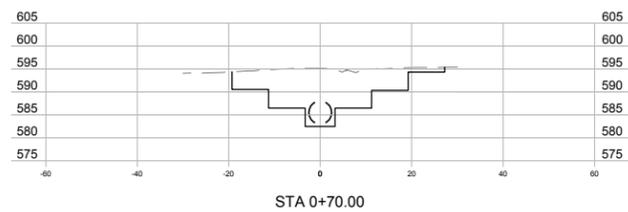
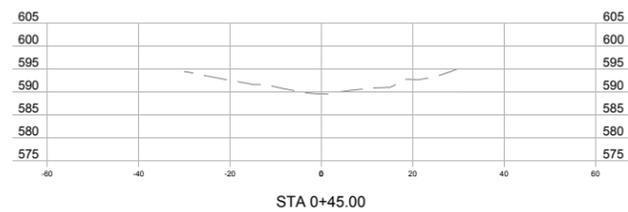
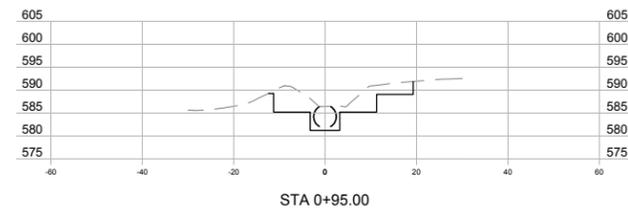
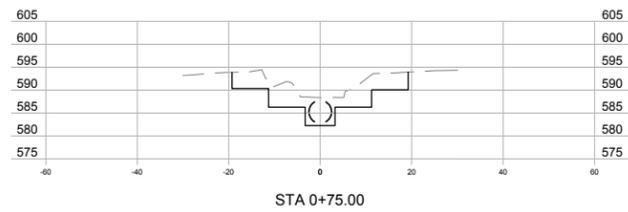
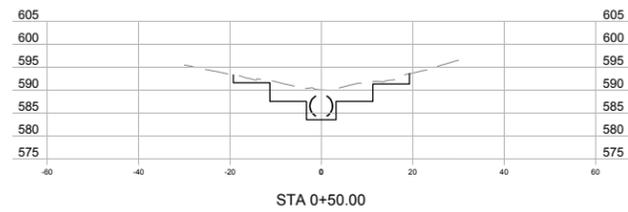
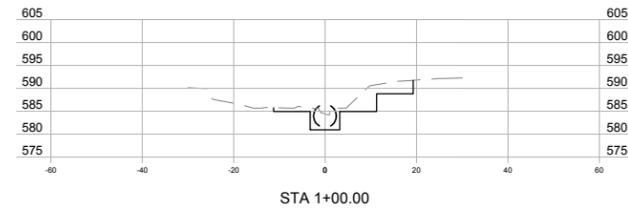
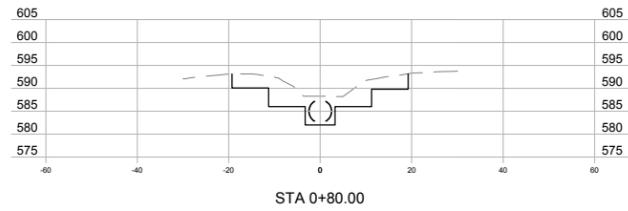
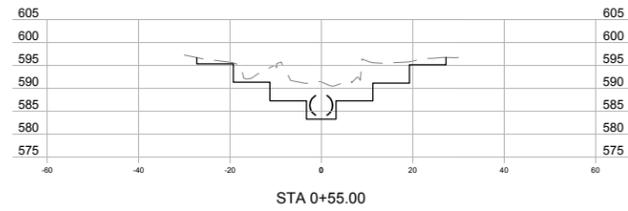
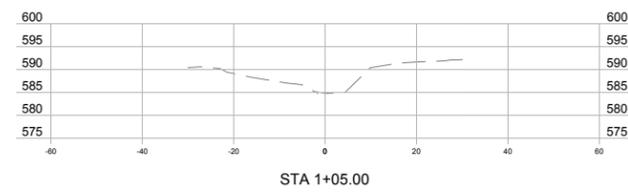
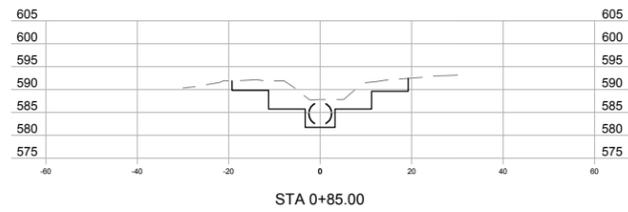
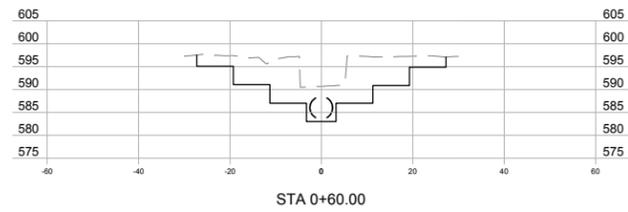
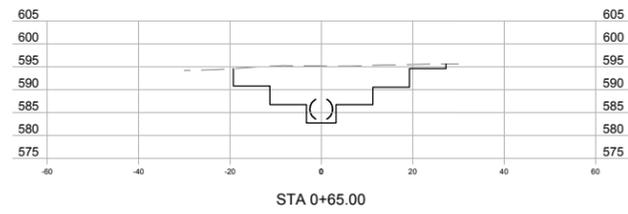
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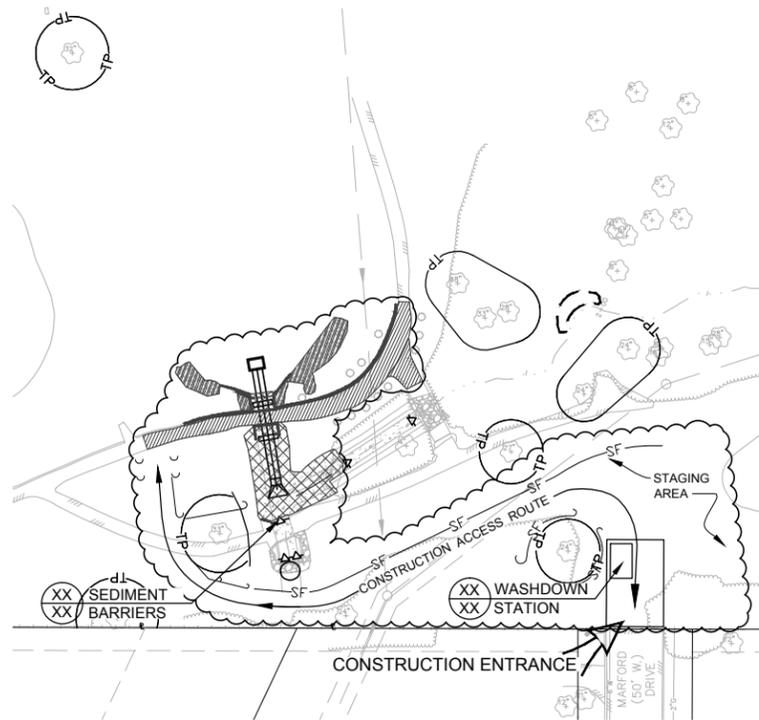
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PIPE
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Sheet Number:

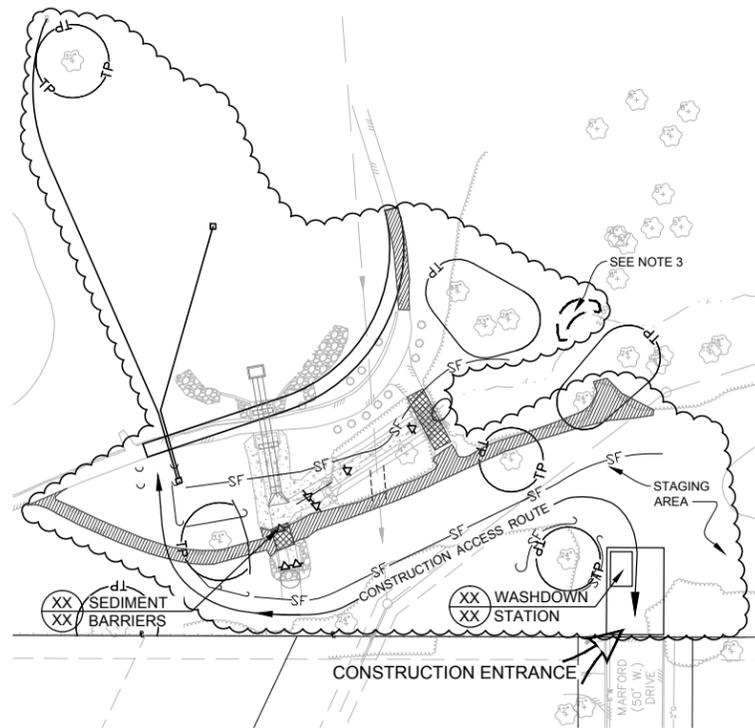
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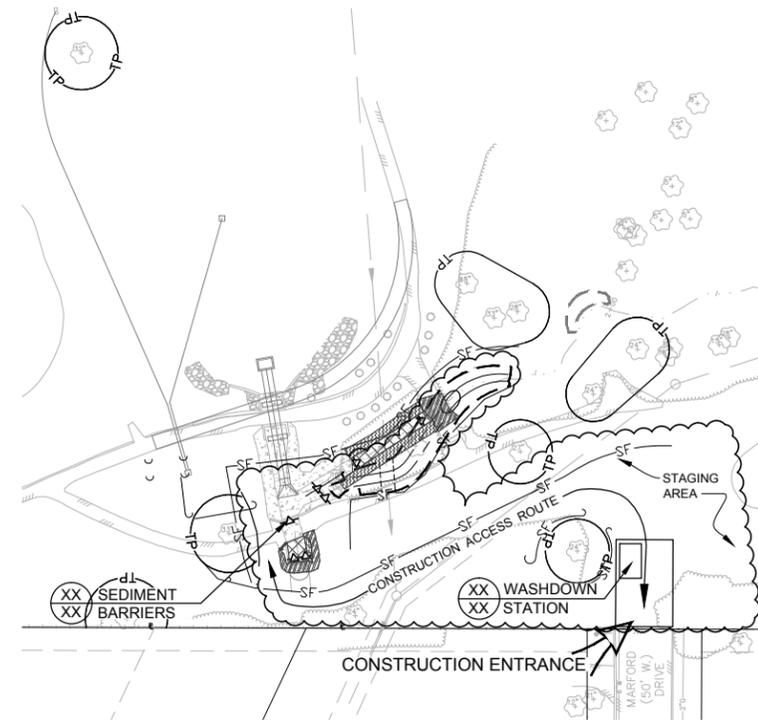
POSSIBLE PHASE 1

1. DEMOLISH PARTIAL CART PATH WITH WALL, CONCRETE SPILLWAY AND CONCRETE CHANNEL (STOPPING AT GABON CHANNEL)
2. DRAIN POND
3. EXCAVATE AND BENCH FOR CONDUIT
4. CONSTRUCT CONDUIT, RISER, AND SEEPAGE COLLARS
5. BACKFILL AND STABILIZE FILL SLOPE



POSSIBLE PHASE 2

1. DEMOLISH REMAINING CART PATH AND BRIDGES
2. DREDGE POND
3. CONSTRUCT VEGETATED ROCK SLOPE
4. CONSTRUCT NEW CART PATH
5. INSTALL PUMP DISCHARGE
6. INSTALL AUXILIARY POWER SUPPLY AND SOLAR BUBBLER



POSSIBLE PHASE 3

1. COMPLETE REMAINING DEMOLITION
2. CONSTRUCT EAST CHANNEL
3. STILLING AND LOWER CHANNEL CONSTRUCTION

NOTES:

1. READ THE PROJECT SPECIFICATIONS AND SPECIAL PROVISIONS FOR DETAILS REGARDING EROSION AND SEDIMENT CONTROL.
2. THIS EROSION AND SEDIMENT CONTROL PLAN INDICATES SUGGESTED MEASURES FOR EROSION AND SEDIMENT CONTROL. CONTRACTOR IS NOT BOUND TO THIS PLAN BUT IS BOUND TO THE PROJECT SPECIFICATIONS AND SPECIAL PROVISIONS.
3. THE CONTRACTOR'S FINAL PHASED EROSION AND SEDIMENT CONTROL PLAN MUST BE APPROVED IN WRITING BY THE OWNER'S REPRESENTATIVE PRIOR TO THE BEGINNING OF CONSTRUCTION.
4. STOCKPILES SHALL BE STABILIZED OR COVERED AT THE END OF EACH WORKDAY.
5. SITE DISTURBANCE FOR PROPOSED IMPROVEMENTS AND OR STRUCTURES SHALL NOT BEGIN UNTIL ALL MATERIALS TO COMPLETE THE IMPROVEMENT AND OR STRUCTURE ARE ON SITE AND READY FOR INSTALLATION. SUCH IMPROVEMENTS AND OR STRUCTURES INCLUDE, BUT NOT LIMITED TO, CULVERTS.
6. THERE SHALL BE NO DELAY BETWEEN EXCAVATION AND PLACING THE FINISHED MATERIAL FOR STRUCTURES ALONG THE LAKE OR ANY DRAINAGE CHANNEL. SUCH STRUCTURES INCLUDE, BUT ARE NOT LIMITED TO ROCK LINED CHANNELS, ROCK SLOPES, CULVERTS, HEADWALLS AND RETAINING WALLS. EXCAVATION FOR THESE STRUCTURES SHALL BEGIN ONLY IF THERE IS ENOUGH TIME IN THE WORKDAY TO FINISH PLACING THE MATERIAL. THESE STRUCTURES SHALL NOT BE LEFT UNFINISHED OVERNIGHT.
7. THE CONTRACTOR MAY PUMP GROUND WATER TO DITCHES FROM WORK AREAS DURING INSTALLATION OF SEWER AND DRAINAGE STRUCTURES. PRIOR TO PUMPING, ALL DITCH CHECKS AND EROSION CONTROL MEASURES SHALL BE INSPECTED AND SUITABLE TO HANDLE THE CONCENTRATED FLOW FROM PUMPING. SUCH PUMPING AND DEWATERING IS CONSIDERED INCIDENTAL TO THE INSTALLATION OF EACH STRUCTURE.
8. THE SURFACE AREA OF ERODIBLE EARTH MATERIAL EXPOSED BY CONSTRUCTION ACTIVITIES SHALL BE LIMITED DURING CONSTRUCTION. THE CONTRACTOR MAY ONLY EXPOSE ERODIBLE EARTH MATERIAL IN ONE CONSTRUCTION AREA AT A TIME. GRADING, PLACEMENT OF FINAL STRUCTURES AND STABILIZATION MUST BE COMPLETE ON ONE CONSTRUCTION AREA BEFORE THE CONTRACTOR CAN BEGIN WORK ON ANOTHER CONSTRUCTION AREA. CONTRACTOR SHALL SPECIFY CONSTRUCTION AREAS IN THE EROSION AND SEDIMENT CONTROL PLAN SUBMITTED FOR APPROVAL.
9. CONTRACTOR SHALL INSTALL AND IMPLEMENT WASHDOWN STATIONS AT ALL CONSTRUCTION ACCESS POINTS TO PREVENT MUD, DIRT OR OTHER DEBRIS FROM BEING TRACKED UPON ANY SIDEWALKS OR STREETS OR OUTSIDE OF PROJECT LIMITS.
10. CONTRACTOR SHALL ALLOW ONLY RUBBER-TIRED EQUIPMENT ON THE SIDEWALKS OR STREETS.
11. WASHDOWN STATIONS AND STAGING AREAS SHALL BE PER ST. LOUIS COUNTY "SEDIMENT AND EROSION CONTROL STANDARDS".



LEGEND	
— SF —	SILT FENCE
—▲▲▲▲▲▲▲▲—	SILT DIKE
— — — — —	LIMITS OF DISTURBANCE
— TP —	TREE PROTECTION
— RP —	PRUNE TREE ROOTS
☁	ANTICIPATED WORK AREA
○	PUMP DISCHARGE



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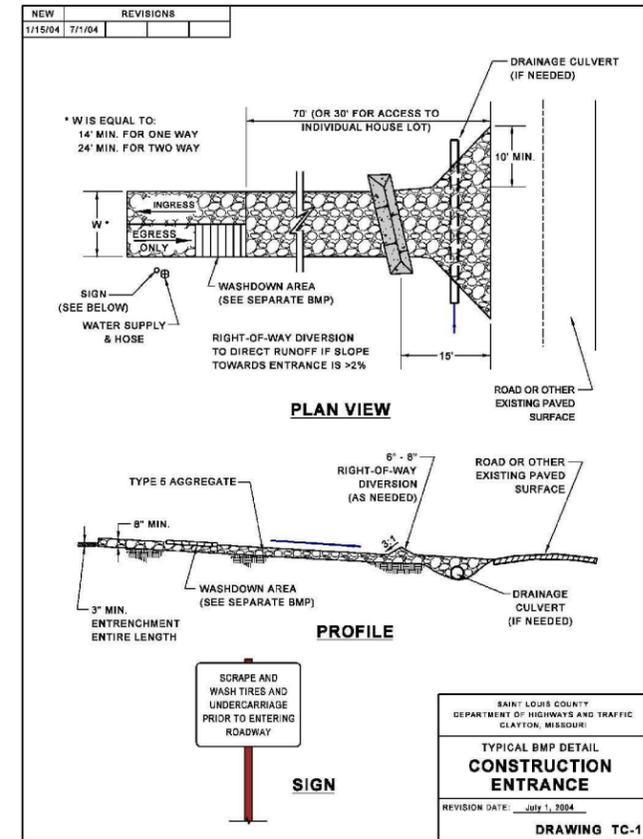
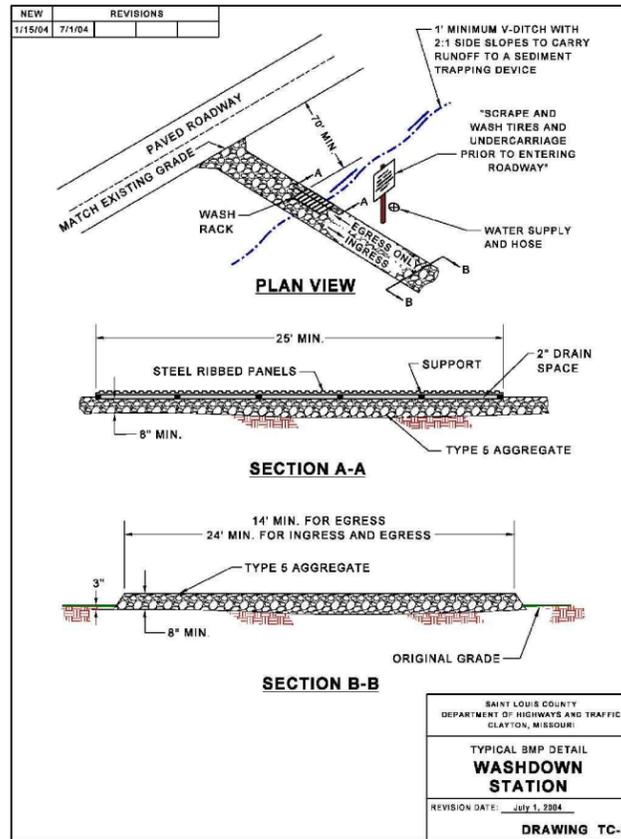
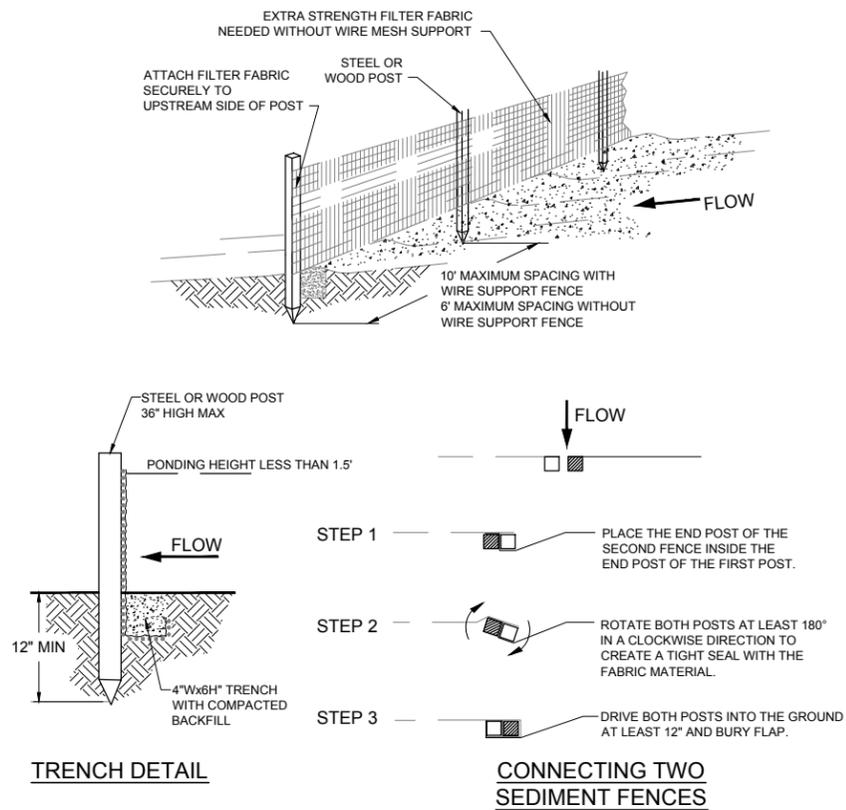
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EROSION AND SEDIMENT CONTROL PLAN

Sheet Number:

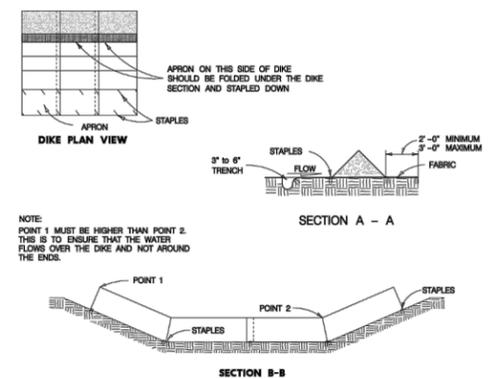
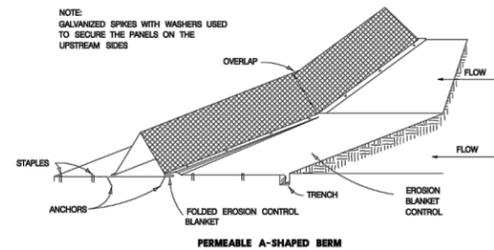
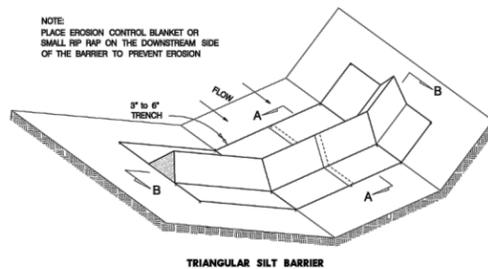
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X SILT FENCE NTS

X WASHDOWN STATION NTS

X CONSTRUCTION ENTRANCE NTS



NOTE: SEDIMENT BARRIERS SHOULD BE PLACED PERPENDICULAR TO THE FLOWLINE OF THE DITCH. THE SEDIMENT BARRIERS SHOULD EXTEND FAR ENOUGH SO THAT THE BOTTOMS OF THE END DICES ARE HIGHER THAN THE TOP OF THE LONGEST DIKE. THIS PREVENTS WATER FROM FLOWING AROUND THE SEDIMENT BARRIER. SEDIMENT BARRIERS SHOULD NOT BE PLACED IN DITCHES WHERE HIGH FLOWS ARE EXPECTED. ROCK CHECKS SHOULD BE USED INSTEAD. SEDIMENT BARRIERS SHOULD BE PLACED IN DITCHES WITH A SLOPE OF 8 PERCENT OR LESS. FOR SLOPES GREATER THAN 8 PERCENT, ROCK CHECKS SHOULD BE USED.

CHECK SPACING	
PERCENT OF GRADE	SPACING PER FT.
1.0	200
2.0	100
3.0	66
4.0	50
5.0	40
6.0	33
8.0	25

NOTE: REFER TO CHAPTER 8 AND 9 OF THE CITY OF LINCOLN DRAINAGE CRITERIA MANUAL FOR MORE INFORMATION ON SEDIMENT AND EROSION CONTROL MEASURES

X SEDIMENT BARRIERS NTS



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EROSION AND SEDIMENT CONTROL DETAILS

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