

ESTIMATED QUANTITIES			
ITEM	UNITS	PLAN	AS-BUILT
Earthwork (22,552 CUT, 34,755 FILL)	CY	12203	
6" Type 1 Asphaltic Concrete	SY	7549	
2" Type 3 Asphaltic Concrete	SY	7549	
CG-2 Curb	LF	4466	
CG-1 Curb	LF	235	
Curb Inlet (6' X 5.5')	EA	2	
Curb Inlet (5.5' X 5')	EA	1	
Curb Inlet (5' X 4.5')	EA	2	
Curb Inlet (5' X 3.5')	EA	1	
Curb Inlet (7' X 3')	EA	1	
Curb Inlet (6' X 3')	EA	1	
Curb Inlet (5' X 3')	EA	5	
Junction Box (5' X 5')	EA	3	
Junction Box (5.5' X 6')	EA	1	
Field Inlet (4' X 4')	EA	2	
Riser Box (5' X 5')	EA	1	
18" RCP	LF	258	
24" RCP	LF	156	
42" RCP	LF	36	
18" HDPE	LF	128	
24" HDPE	LF	432	
30" HDPE	LF	50	
36" HDPE	LF	444	
42" HDPE	LF	89	
48" HDPE	LF	393	
SPECIAL END SECTION	EA	1	
18" FES	EA	1	
30" FES	EA	1	
42" FES	EA	1	
48" FES	EA	1	
8' X 6' Box Culvert	LF	86	
Detention Outlet Structure	EA	1	
ADA Curb Ramps	EA	11	
Inlet Protection	EA	19	
Silt Fence	LF	5349	
Erosion Control Mat	SY	9271	
Temporary Construction Entrance	EA	2	
Rip-Rap	SY	420	
Temporary Cul-de-sac	EA	1	
R1-1 Stop Signs	EA	5	
Street Name Signs	EA	5	
Concrete MH Collar/Adjustment	EA	2	
Forebay Wall	EA	1	

PRIVATE SCHOOL ENTRANCE QUANTITIES		
ITEM	UNITS	PLAN
Install Curb Inlet	EA	1
Remove Curb	LF	76
Remove Curb Inlet	EA	2
Remove Storm Pipe	LF	133
Install Curb	LF	85
Remove Asphalt	SY	670
Asphalt	SY	569

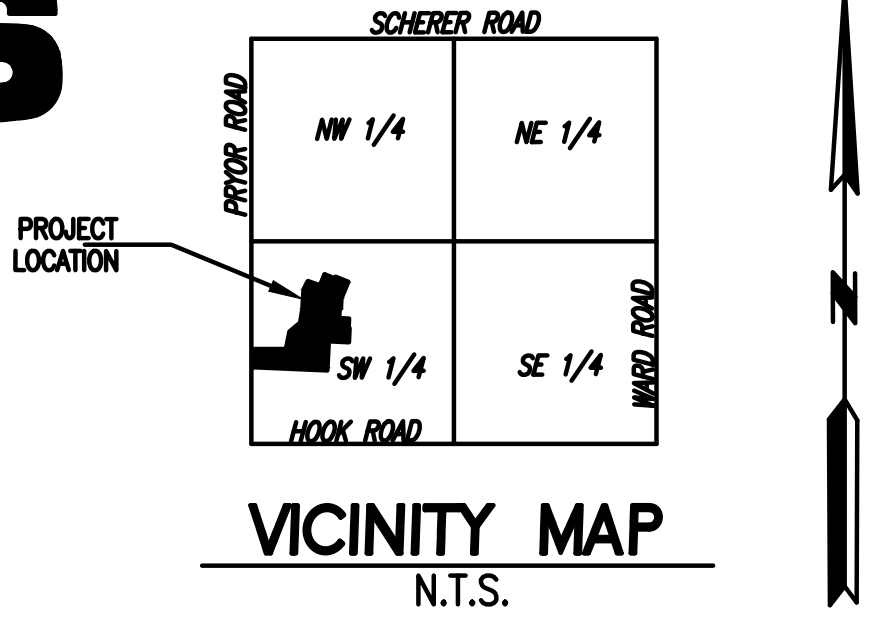
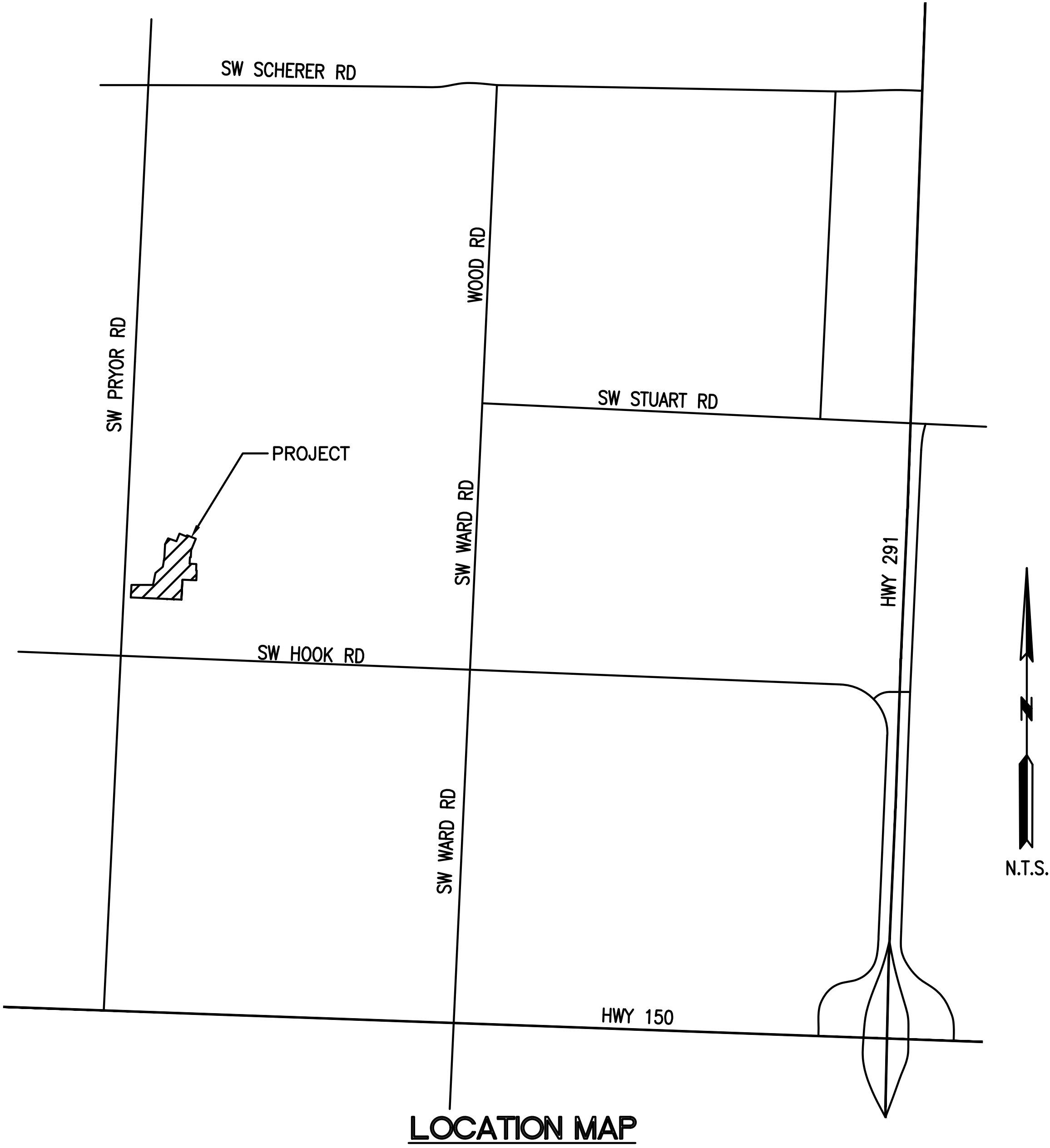
UTILITY CONTACTS

SOUTHWESTERN BELL TELEPHONE	(816) 871-9900
MISSOURI ONE-CALL SYSTEM	(800) DIG-RITE
KPL GAS SERVICE COMPANY	(816) 221-2200
KANSAS CITY POWER & LIGHT	(816) 471-0060
PUBLIC WORKS	(816) 969-1800
AMERICAN CABLEVISION	(816) 231-1444
WATER POLLUTION CONTROL DEPT	(816) 513-0303
CITY PLANNING & DEVELOPMENT	(816) 969-1600
FIRE DEPARTMENT	(816) 969-1300

WHISPERING WOODS
LOTS 1 THRU 33

A SUBDIVISION IN LEE'S SUMMIT, JACKSON COUNTY, MISSOURI
PUBLIC IMPROVEMENTS & PRIVATE SCHOOL ENTRANCE

STREET, STORM, MASTER
DRAINAGE, EROSION & SEDIMENT
CONTROL, AND PRIVATE SCHOOL
ENTRANCE PLANS



LEGAL DESCRIPTION

WHISPERING WOODS LOTS 1 THRU 33, TRACTS A, B, C & D
PART OF THE SW ¼ SECTION 24, T 47 N, R 32 W OF THE 5TH P.M.
LEE'S SUMMIT, JACKSON COUNTY, MISSOURI

PROJECT BENCH MARK

ELEV. 1006.89 (NAVD 1988 DATUM)

MISSOURI DEPARTMENT OF NATURAL RESOURCES GRS ALUMINUM
DISK STAMPED "JA-47" LOCATED NEAR THE INTERSECTION OF HWY
150 WITH REGGATA DRIVE AND HWY 291

INDEX OF SHEETS

SHEET NUMBER	SHEET TITLE
1	COVER
2	GENERAL NOTES
3	TYPICAL SECTION
4	SITE LAYOUT
5	GRADING PLAN
6	MASTER DRAINAGE PLAN
7	ESC - PLAN
8	ESC DETAILS
9	ESC DETAILS
10	PRYOR LAYOUT
11	STRIPING PLAN
12	STRIPING PLAN DETAILS
13	TEMPORARY TRAFFIC CONTROL PLAN
14	TEMPORARY TRAFFIC CONTROL DETAILS
15	SCHOOL ENTRANCE DEMO PLAN
16	SCHOOL LAYOUT
17	STREET PLAN & PROFILE
18	STREET PLAN & PROFILE
19	STREET PLAN & PROFILE
20	INTERSECTION DETAILS
21	ADA RAMP DETAILS
22	ADA RAMP DETAILS
23	ADA RAMP DETAILS
24	ADA RAMP DETAILS
25	STORM PLAN & PROFILE
26	STORM PLAN & PROFILE
27	STORM PLAN & PROFILE
28	STORM PLAN & PROFILE
29	STORM PLAN & PROFILE
30	STORM PLAN & PROFILE
31	POND OUTLET DETAIL
32	POND OUTLET DETAIL
33	DRAINAGE AREAS
34	DRAINAGE CALCS
35	STRUCTURE A-1 DETAILS
36	STREET & STORM DETAILS
37	STREET & STORM DETAILS
38	IN PAVEMENT MANHOLE DETAIL
39	UNDERDRAIN DETAILS
40	STRIPING PLAN DETAILS

DEVELOPER:

WHISPERING WOODS LAND, L.L.C.
803 P.C.A. ROAD
WARRENSBURG, MO 64093
AGENT: RICK FRYE
PHONE: 816-564-2230
FAX: 660-429-1801

APPROVED

CITY ENGINEER

DATE

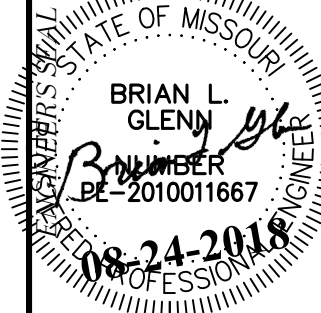
PHOENIX ENGINEERING
& SURVEYING, LLC

WHISPERING WOODS
LEE'S SUMMIT, JACKSON COUNTY, MO
STREET & STORM SEWER PLANS
COVER

DESIGNED
BLG
DRAWN
JRT
SCALE
Noted
DATE
09-01-2017
JOB NO.
04078
SHEET

1 OF 40

REVISION
Δ REVISED ON 08-24-18: SHEETS 3, 13 & 15 UPDATED
DUE TO COMMENTS RECEIVED ON 08-21-18



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AND EXPRESSLY DISCLAIM ANY RESPONSIBILITY FOR ALL OTHER PLANS, SPECIFICATIONS,
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BE USED FOR ANY PART OR PARTS OF THE ENGINEERING OR SURVEYING PROJECT.

BRIAN L. GLENN
MO PE 2010011667
AS AGENT OF
PHOENIX ENGINEERING
& SURVEYING, LLC
3833 S. NORTHERN BLVD.
INDEPENDENCE, MO 64062
(816) 749-9000 FAX: (816) 743-9700
ENGINEERING CERTIFICATE NO.: MO E-2000151302-D
SURVEYING CERTIFICATE NO.: MO LS-2000151303-D
KS: E-853
KS: LS-138

PROJECT NOTES

- 1. Grading Contractor shall be responsible for the control of erosion and siltation during all phases of construction.
- 2. Prior to Ordering Precast Structures: Shop drawings shall be submitted to the design engineer for approval. Upon approval these shall be sub-mitted to the City of Lee's Summit for review.
- 3. Manhole top elevations designated as "Field Verify" (F.V.) are located outside the street right-of-way or in areas of undetermined grading. Contractors ordering precast manholes shall be responsible for adjustment required in the field at no additional cost to the owner. The contractor shall field verify the top elevations prior to ordering precast manholes.
- 4. All water lines, sanitary sewer lines, and storm water drainage crossings shall be in place or a casing pipe provided for future installation prior to base and surface asphalt courses.
- 5. Sidewalks are shown for informational purposes only unless otherwise noted. However, the contractor shall be responsible for handicap ramp construction in curbs.

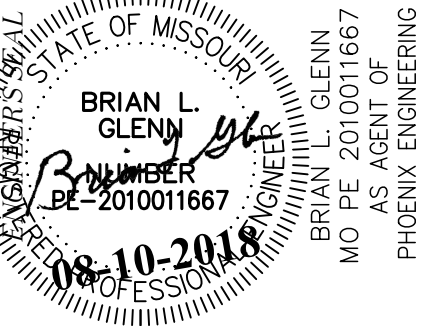
GENERAL NOTES

- 1. Refer to the current version of the City of Lee's Summit Design and Construction (D&C) Manual for construction of these plans.
- 2. All workmanship and materials shall be subject to the inspection and approval of the Engineering Department of the City of Lee's Summit, Missouri.
- 3. Lineal foot measurements shown on these plans are horizontal measurements, not slope measurements. All payments shall be made on horizontal measurements.
- 4. No Geological Investigation was performed on this project.
- 5. The Utility locations shown on these plans are taken from Utility Company records and are approximate only. They do not constitute actual field locations. The Contractor shall verify the location and depth of all utilities prior to construction.
- 6. Clearing and Grubbing operations and disposal of all debris therefrom shall be performed by the contractor in strict accordance with all state and local codes and ordinances.
- 7. All waste material shall be disposed of at a location to be selected by the owner or his authorized representative, such location to be on the site.
- 8. The Contractor shall control the erosion and siltation during all phases of construction, he shall keep the streets clean of mud and debris and follow the erosion control plan prepared by the design engineer.
- 9. All existing manholes, catch basins, utility valves and meter pits to be adjusted or rebuilt to grade as required.
- 10. Subgrade soil for all concrete structures, regardless of the type or location, shall be firm, dense and thoroughly compacted and consolidated; shall be free from muck and mud; and shall be sufficiently stable to remain firm and intact under the feet of the workman or machinery engaged in subgrade, laying reinforcing steel, and depositing concrete thereon. In all cases where subsoil is mucky or works into mud or muck during such operation, a seal course of either concrete or rock shall be placed below subgrade to provide a firm base for working and for placing the floor slab.
- 11. A minimum horizontal distance of ten (10') shall be maintained between parallel water and sanitary sewer lines. At any point where sanitary sewer lines cross water main, the sanitary sewer shall be constructed of cast iron pipe or pipe encased in concrete for a distance of ten feet (10') in each direction from the crossing unless the water is a minimum of eighteen inches (18") above the top of the sanitary sewer line.
- 12. Contractor shall provide testing and inspection per SECTION 2200 – PAVING MAINS CITY OF LEE'S SUMMIT, MISSOURI STANDARD SPECIFICATIONS.
- 13. Development plans are approved initially for one (1) year, after which they automatically become void and must be updated and approved by the City Engineer before any construction will be permitted.
- 14. All sanitary sewer stubs shall be surveyed and staked on site before the construction of sanitary service stubs.

- 15. The City of Lee's Summit plan review is only for general conformance with the City of Lee's Summit Design Criteria and the City Code. The City is not responsible for the accuracy and adequacy of the design, or dimensions and elevations which shall be confirmed and correlated at the job site. The City of Lee's Summit through approval of this document assumes no responsibility other than as stated above for the completeness and/or accuracy of this document.
- 16. The Contractor shall have one (1) signed copy of the plans (approved by the City of Lee's Summit) and one (1) copy of the appropriate Construction Standards and Specifications at the job site at all times.
- 17. Construction of the improvements shown or implied by this set of drawings shall not be initiated or any part thereof undertaken until the City Engineer is notified of such intent and all required and properly executed bonds and permit fees are received and approved by the City Engineer.
- 18. All stub lines shall be laid on 2.00% minimum grade unless approved otherwise.
- 19. Contractor shall not be allowed to work on Saturdays, Sundays, or Holidays without prior approval of the City Engineer.
- 20. Relocation of any water line, sewer line or service line thereof required for the construction of this project shall be the responsibility of the contractor and shall be at his expense.
- 21. The Contractor shall install and properly maintain a mechanical plug at all connection points with existing lines until such time that the new line is tested and approved.
- 22. The Contractor shall construct manholes placing eccentric cone section in such a manner that manhole covers are adjacent to the proposed sidewalks. In locations where manholes are not near proposed sidewalks the manhole covers shall generally be placed on the upstream side of the manholes whenever possible.
- 23. Stub lines, locations, and minimum basement floor elevations are located in the table labeled "Table of Service Locations".
- 24. Construction permits will not be issued until the City of Lee's Summit receives a sewer extension permit from MDNR.
- 25. All areas where utilities are to be installed in fill shall be compacted to 95% to 18 inches above the line then excavated for construction of the line.
- 26. The Contractor will be responsible for testing of manholes and pipes to the City of Lee's Summit Design & Construction Manual requirements.
- 27. The Developer will be responsible for performing pressure testing on every section of the sanitary sewer lines, pressure testing on every manhole, and running a mandrel through every section of sanitary sewer line to test for alignment. Testing criteria will be in accordance with City of Lee's Summit Design & Construction Manual specifications.
- 28. All utility street crossings shall be backfilled with flowable fill, or AB-3. If contractor chooses to use other suitable materials, extensive soil testing requirements will be required.
- 29. The Special Flow Hazard Area (SFHA) and regulatory floodway depicted in these plans are per FEMA's Natural Flood Hazard Layer (NFHL) obtained from www.fema.gov. NFIP information shown are representative of FEMA's Flood Insurance Rate Map (FIRM) Map Number 29095C0531G; effective date January 20, 2017.
- 30. No fill material shall be placed within the FEMA identified Floodway. No consturction shall be performed within the Floodway unless depicted on these plans or other plans approved by the City of Lee's Summit, MO.

WHISPERING WOODS
LEE'S SUMMIT, JACKSON COUNTY, MO
STREET & STORM SEWER PLANS
GENERAL NOTES

DESIGNED
BLG
DRAWN
BLG
SCALE
Noted
DATE
09-01-2017
JOB NO.
04078
SHEET



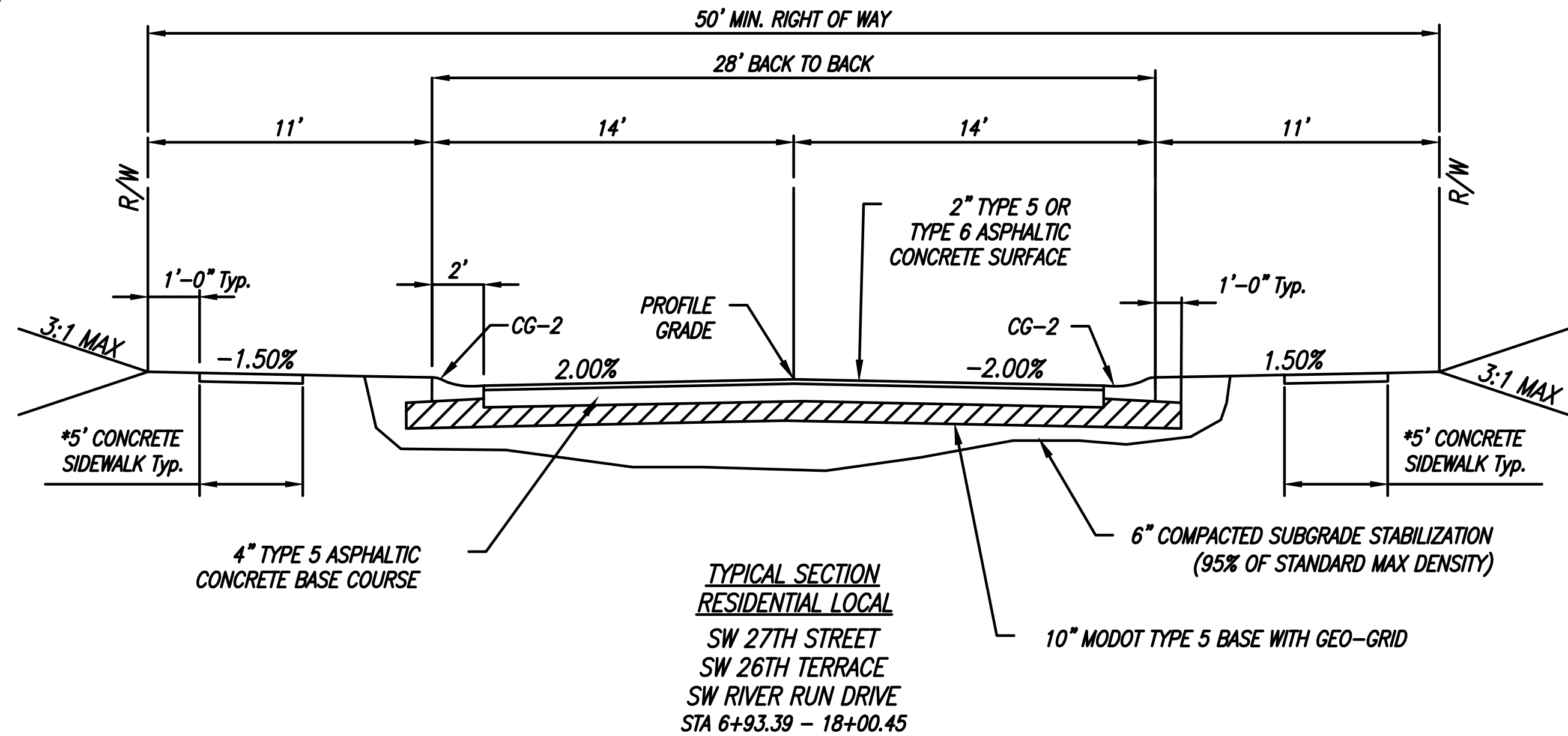
PHOENIX ENGINEERING & SURVEYING, LLC

3833 S. NORTHERN BLVD.
INDEPENDENCE, MO 64062
(816) 749-9000 FAX: (816) 743-9700
ENGINEERING CERTIFICATE NO: MO E-2000151302-D
SURVEYING CERTIFICATE NO: MO LS-2000151303-D

KS: E-853
KS: LS-138

REVISION

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NOTE:
TRANSITION FROM RESIDENTIAL COLLECTOR TO LOCAL STREET
SECTION BEGINS AT STA 4+12.81 AND ENDS AT STA 6+93.39.

TRANSITION FROM CG-1 TO CG-2 SHALL OCCUR AT STA 6+93.39.

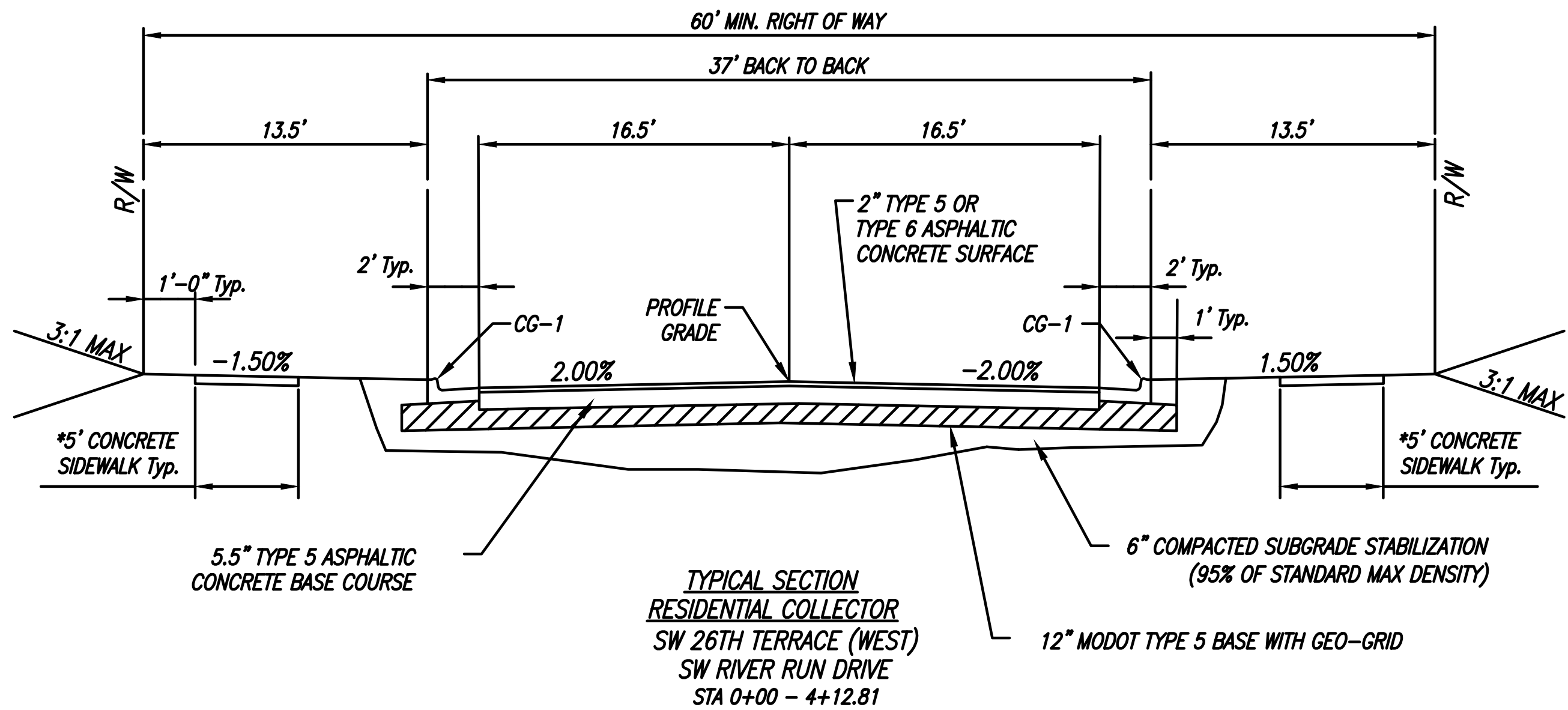
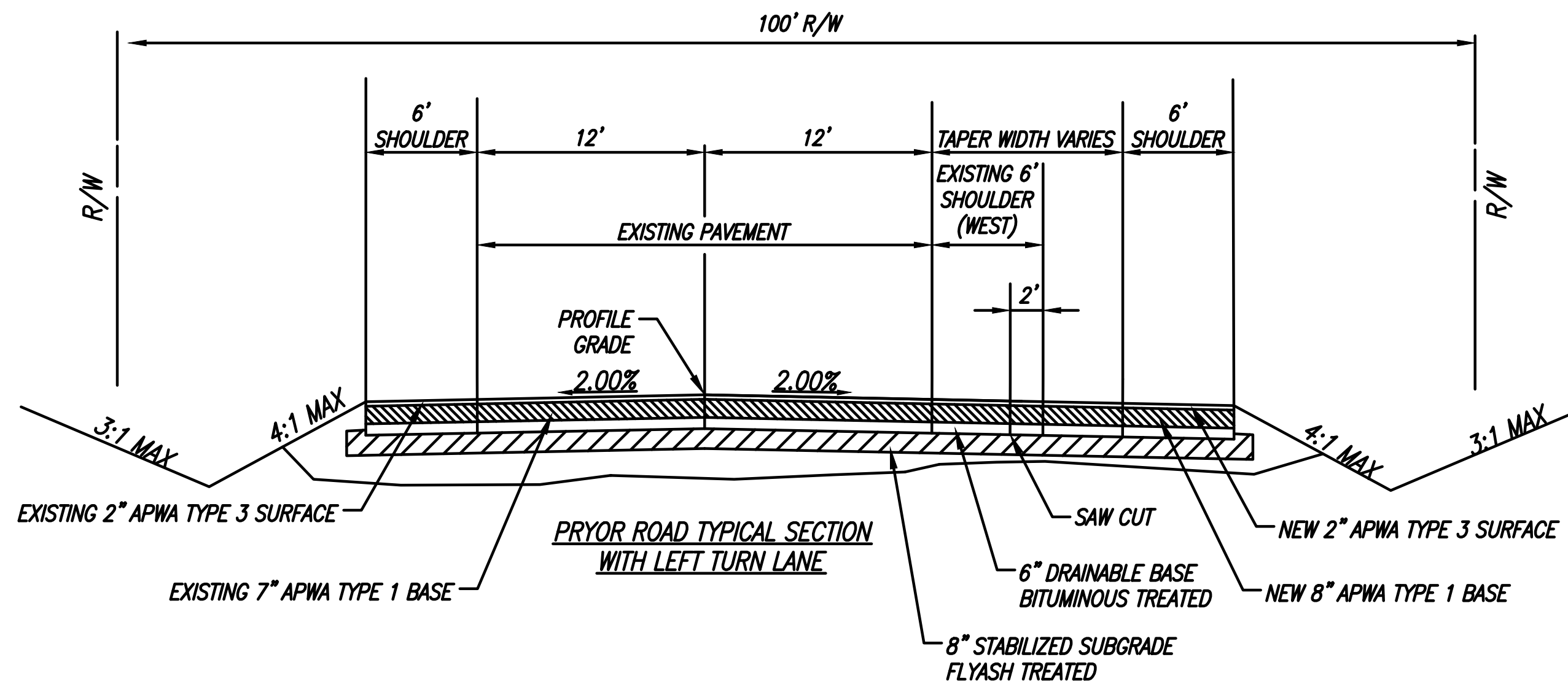
NOTE:
*IN SOME INSTANCES SHOWN IN PLAN VIEW, SIDEWALK MAY NOT BE
NECESSARY ON BOTH SIDES OF STREET

NOTE:
CONTRACTOR SHALL SUBMIT TEST RESULTS TO THE CITY PRIOR TO
INSTALLING CURB AND PAVEMENT. SUBGRADE MATERIAL NOT MEETING
THESE LIMITS SHALL BE STABILIZED AS PER THE RECOMMENDATIONS
OF A QUALIFIED GEOTECHNICAL LABORATORY AND APPROVED BY THE
CITY. TESTING AND STABILIZATION WILL BE PAID FOR BY THE
CONTRACTOR.

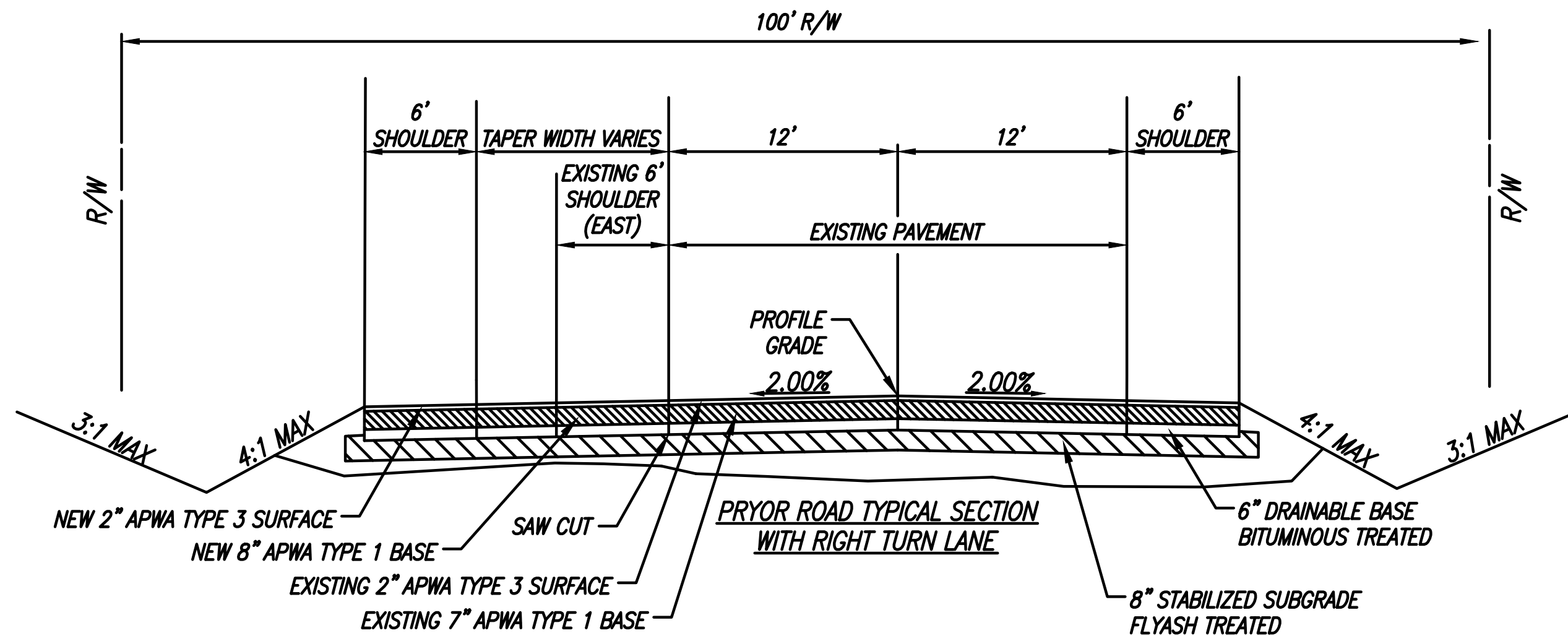
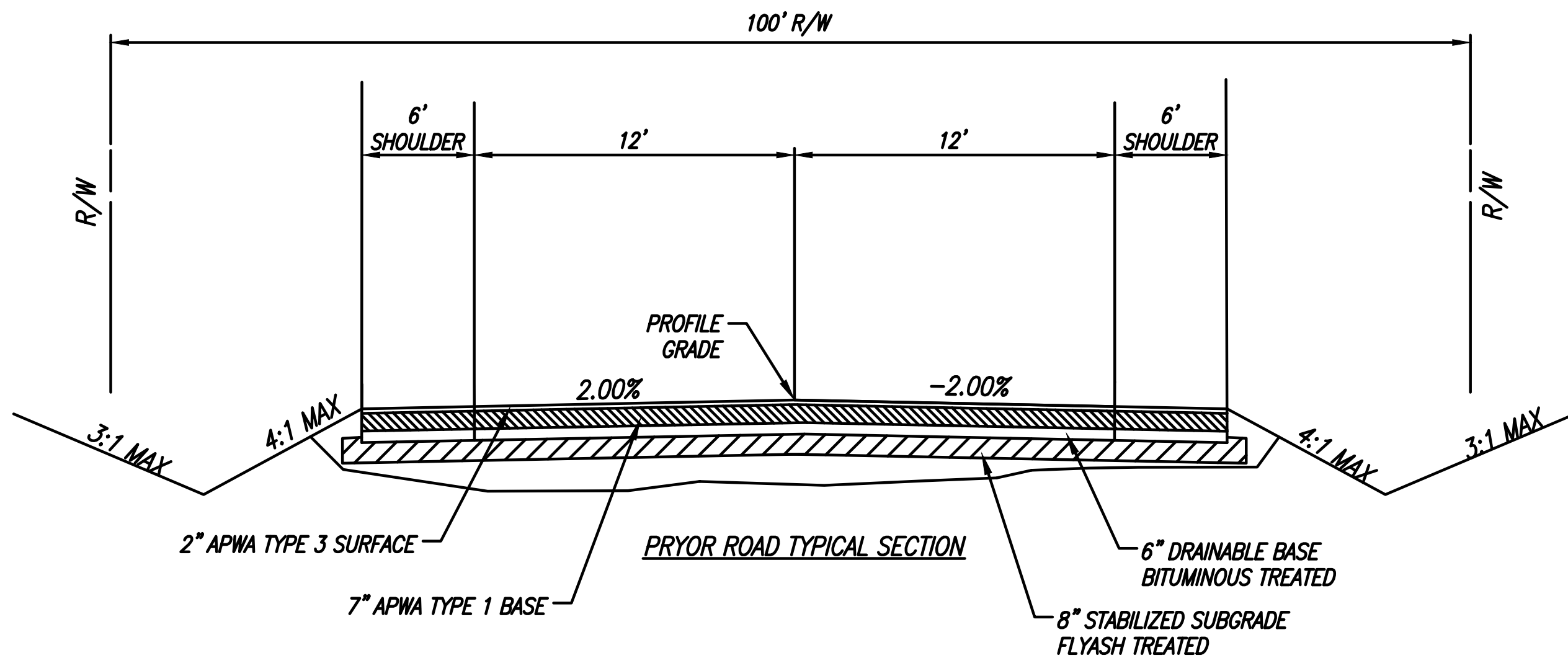
NOTE:
PROPOSED PRYOR ROAD IMPROVEMENTS PAVEMENT SHALL MATCH THE
EXISTING PAVEMENT.

TEMPORARY PAVEMENT SECTION

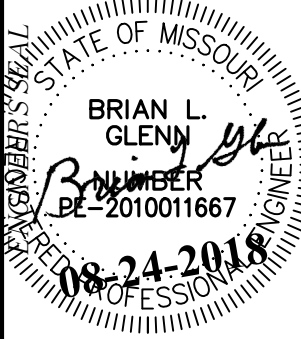
TEMPORARY CUL-DE-SAC PAVEMENT SECTION SHALL
BE 6" ASPHALT BASE COURSE WITH A 2" ASPHALT
SURFACE OVERLAY WITH A RADIUS OF 35'



NOTE:
TRANSITION FROM RESIDENTIAL COLLECTOR TO LOCAL STREET
SECTION BEGINS AT STA 4+12.81 AND ENDS AT STA 6+93.39.



REVISION

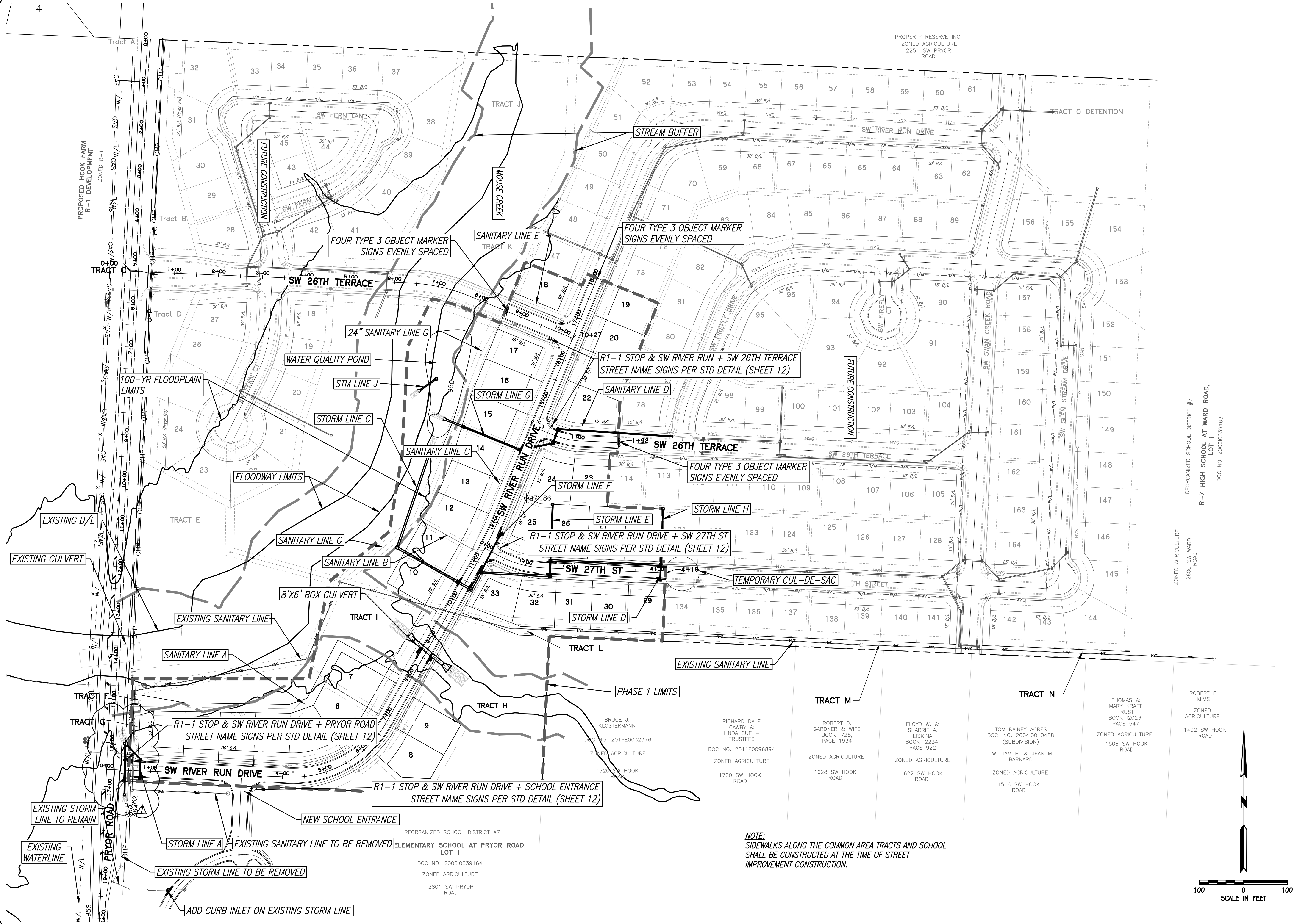


PHOENIX ENGINEERING & SURVEYING, LLC

3833 S. NORTHERN BLVD.
INDEPENDENCE, MO 64662
(816) 743-9000 FAX: (816) 743-9700
ENGINEERING CERTIFICATE NO. MO E-2000151302-D
SURVEYING CERTIFICATE NO. MO LS-2000151303-D

WHISPERING WOODS
LEE'S SUMMIT, JACKSON COUNTY, MO
STREET & STORM SEWER PLANS
TYPICAL SECTION

DESIGNED
BLG
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BLG
SCALE
Noted
DATE
09-01-2017
JOB NO.
04078
SHEET



WHISPERING WOODS
+
LEE'S SUMMIT, JACKSON COUNTY, MO
STREET & STORM SEWER PLANS
SITE LAYOUT

PHOENIX ENGINEERING
& SURVEYING, LLC

STATE OF MISSOURI
 BRIAN L. GLENN
 LICENSE NUMBER
 PE-2010011667
 COMMISSION EXPIRES
 08-10-2018
 PROFESSIONAL ENGINEER

BRIAN L. GLENN
 MO PE 2010011667
 AS AGENT OF
 PHOENIX ENGINEERING

Δ *REVISED ON 4-19-18: ADDED STORM LINE A1*

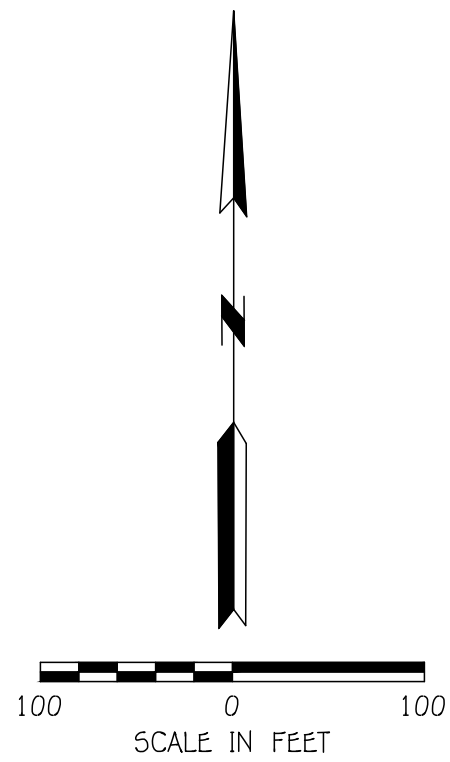
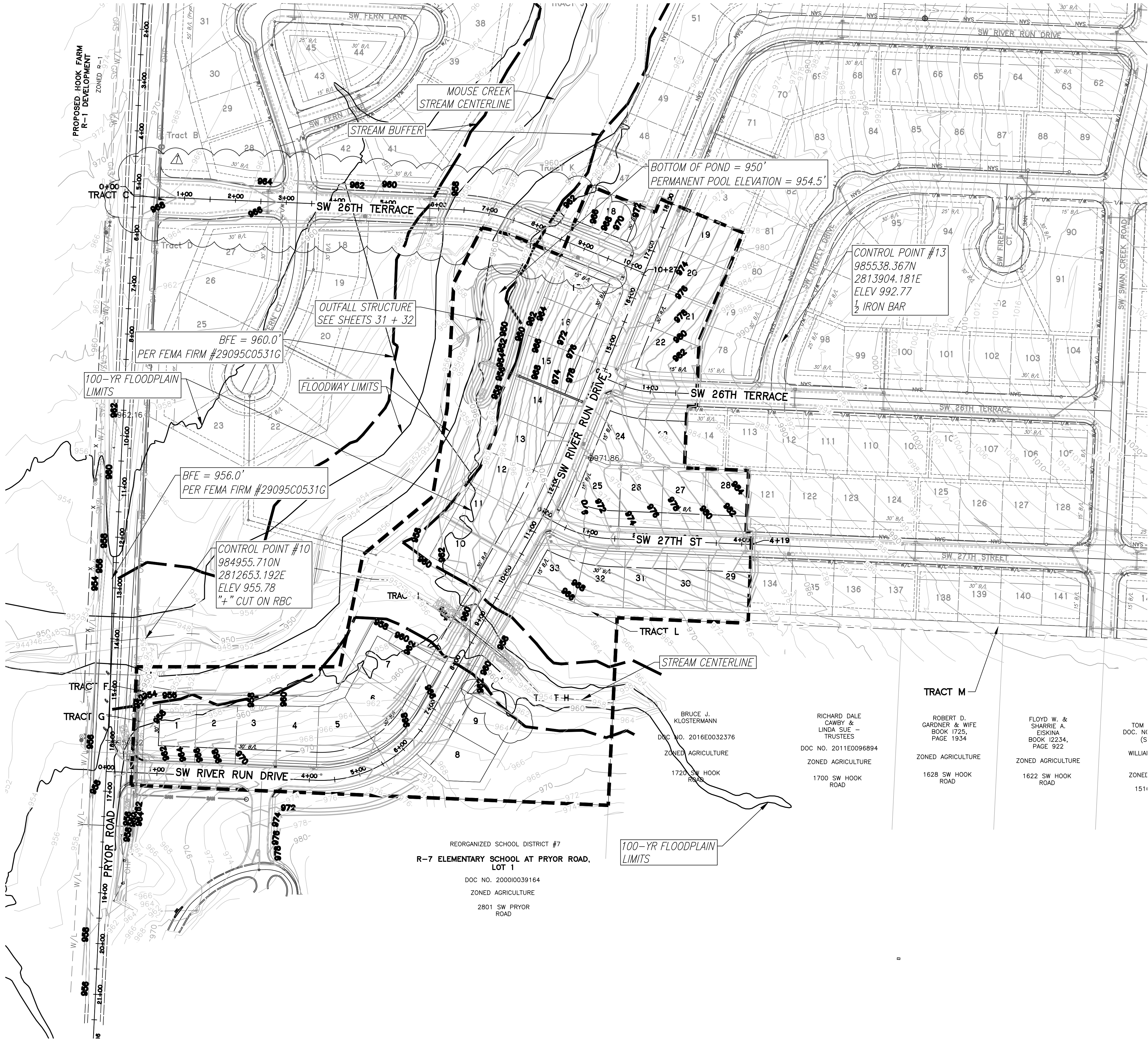
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SCALE
Noted
DATE

09-01-201
JOB NO.
04078
SHEET

4 ^{SHEET} OF 40



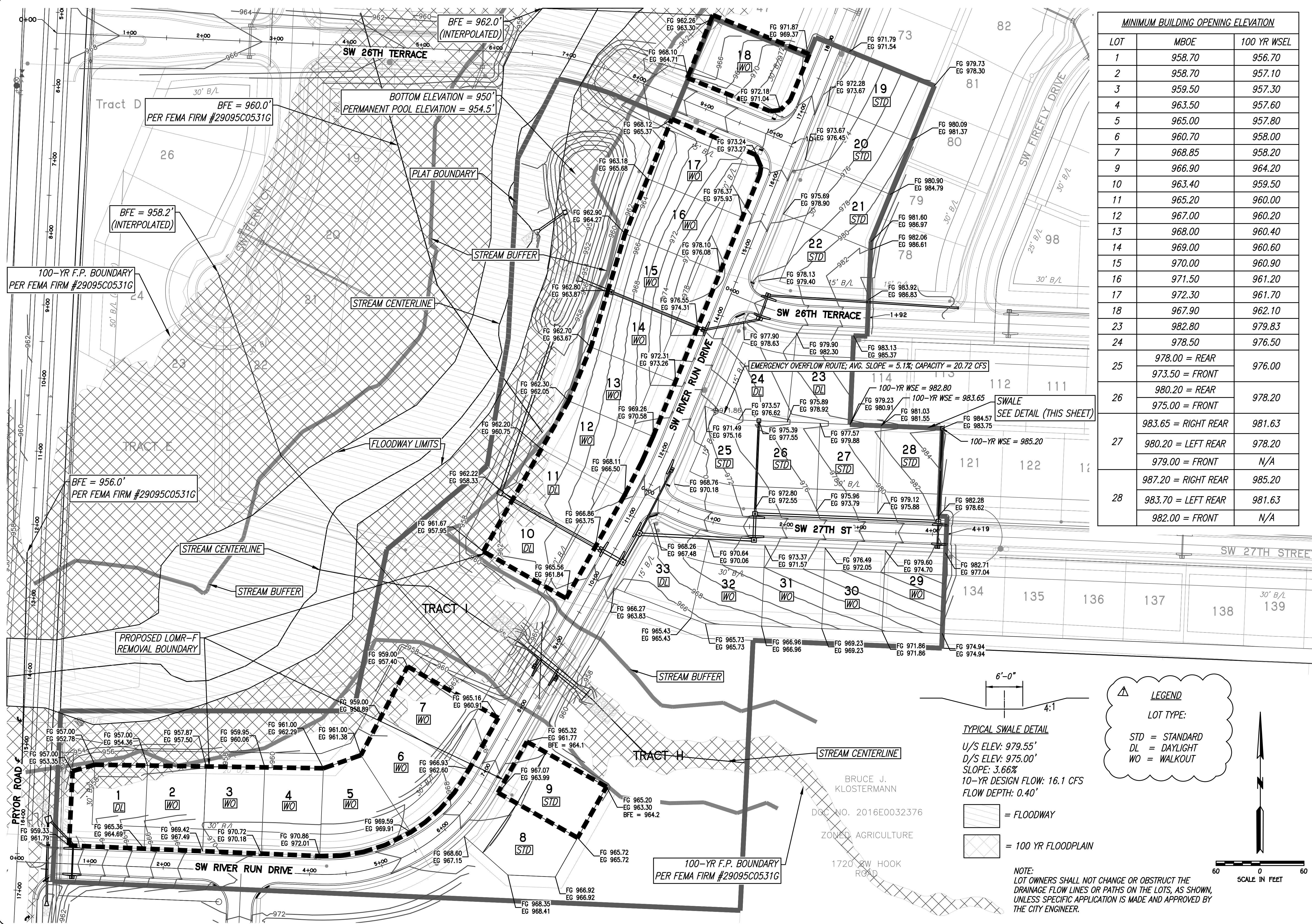
WHISPERING WOODS
LEE'S SUMMIT, JACKSON COUNTY, MO
STREET & STORM SEWER PLANS
GRADING PLAN

DESIGNED	BLG
DRAWN	BLG
SCALE	Noted
DATE	09-01-2017
JOB NO.	04078
SHEET	5 OF 40

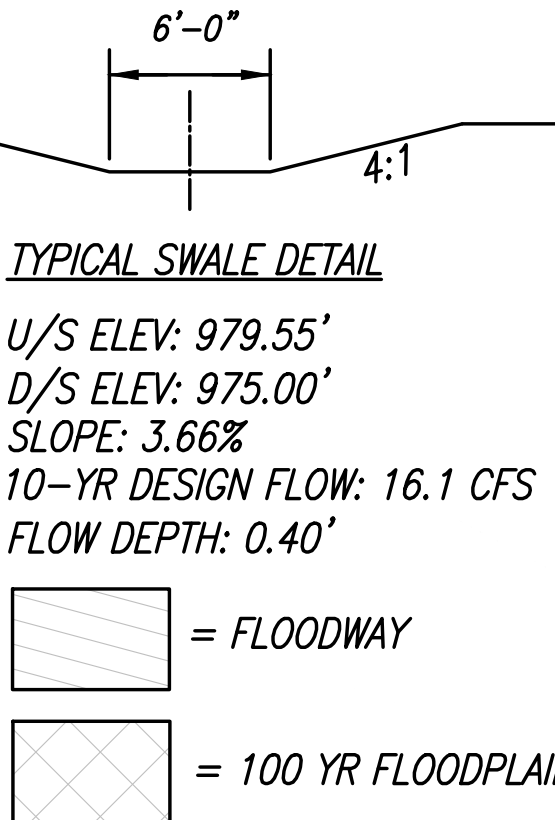
PHOENIX ENGINEERING & SURVEYING, LLC
3833 S. NORTHERN BLVD.
INDIANAPOLIS, IN 46222
(816) 743-9000 FAX: (816) 743-9700
ENGINEERING CERTIFICATE NO. MO E-2000151302-D
SURVEYING CERTIFICATE NO. MO LS-2000151303-D
KS: E-853
KS: LS-138

STATE OF MISSOURI
BRIAN L. GLENN
Professional Engineer
08-10-2018
BRIAN L. GLENN
MO PE 2010011667
AS AGENT OF
PHOENIX ENGINEERING & SURVEYING, LLC

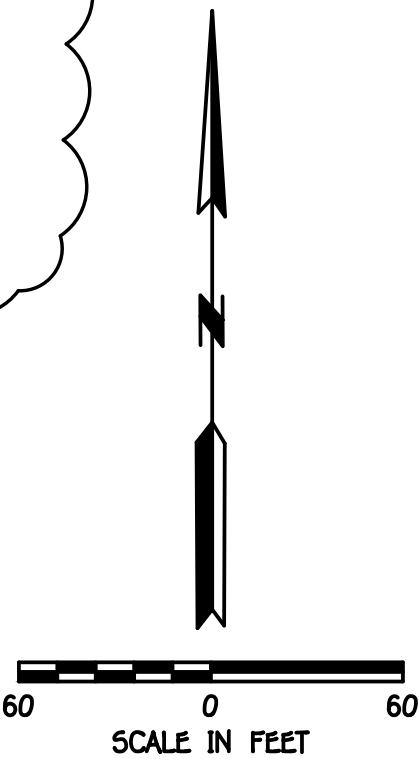
REVISION
△ REVISED ON 4-19-18: ADDED GRADING CONTOUR LINES
△ REVISED ON 06-11-18: GRADE CHANGES NEAR LOT 9



MINIMUM BUILDING OPENING ELEVATION		
LOT	MBOE	100 YR WSEL
1	958.70	956.70
2	958.70	957.10
3	959.50	957.30
4	963.50	957.60
5	965.00	957.80
6	960.70	958.00
7	968.85	958.20
9	966.90	964.20
10	963.40	959.50
11	965.20	960.00
12	967.00	960.20
13	968.00	960.40
14	969.00	960.60
15	970.00	960.90
16	971.50	961.20
17	972.30	961.70
18	967.90	962.10
23	982.80	979.83
24	978.50	976.50
25	978.00 = REAR	976.00
	973.50 = FRONT	
26	980.20 = REAR	978.20
	975.00 = FRONT	
27	983.65 = RIGHT REAR	981.63
	980.20 = LEFT REAR	978.20
	979.00 = FRONT	N/A
28	987.20 = RIGHT REAR	985.20
	983.70 = LEFT REAR	981.63
	982.00 = FRONT	N/A



LEGEND
LOT TYPE:
STD = STANDARD
DL = DAYLIGHT
WO = WALKOUT



REVISION

Δ REVISED ON 06-07-2018: ADDED LEGEND FOR LOT TYPE

PHOENIX ENGINEERING & SURVEYING, LLC

WHISPERING WOODS
LEE'S SUMMIT, JACKSON COUNTY, MO
STREET & STORM SEWER PLANS
MASTER DRAINAGE PLAN

DESIGNED
BLG

DRAWN
BLG

SCALE
Noted

DATE
09-01-2017

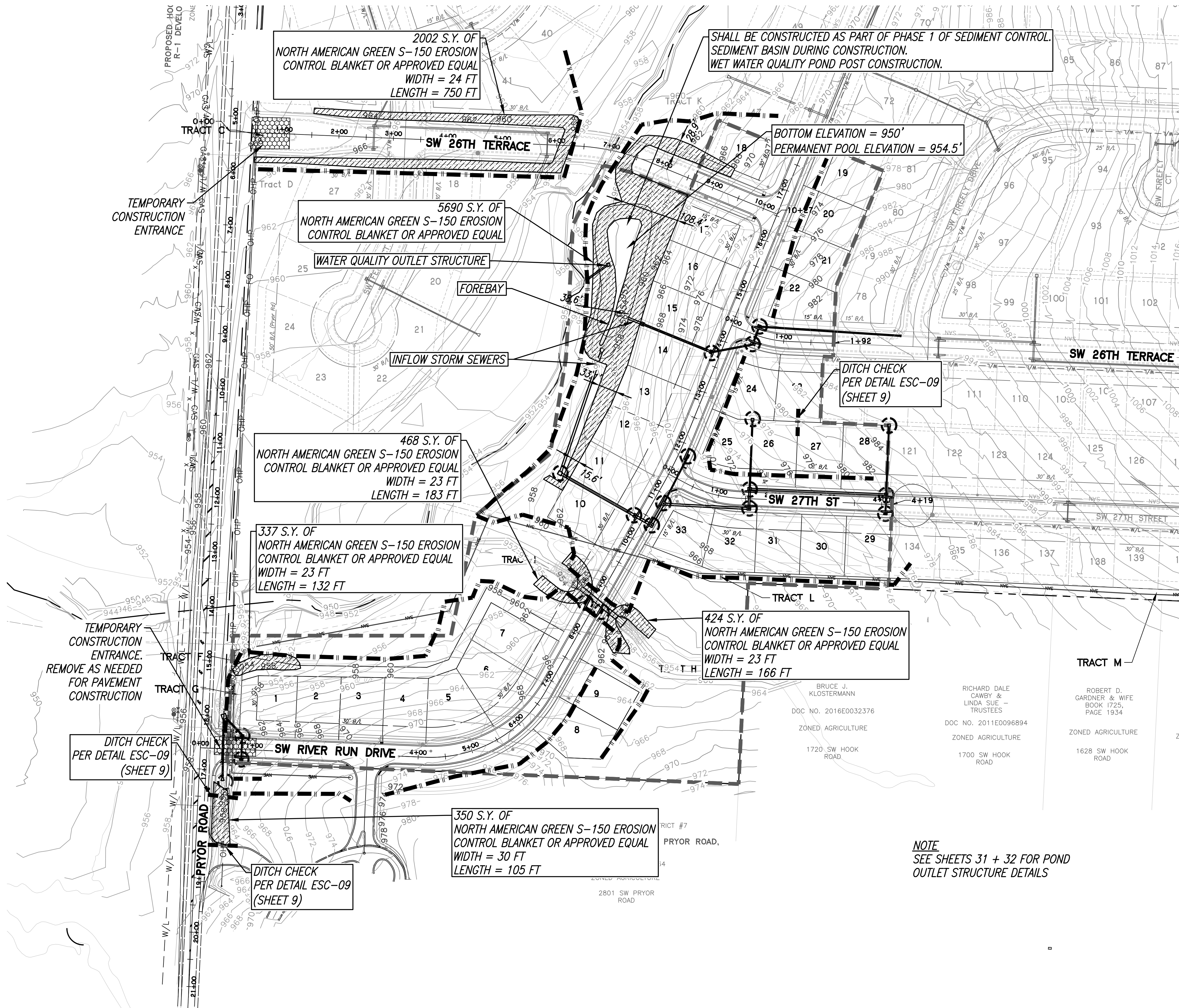
JOB NO.
04078

SHEET
6 OF 40

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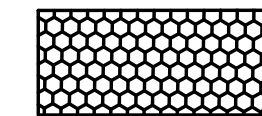
BRIAN L. GLENN
REGISTERED PROFESSIONAL ENGINEER
STATE OF MISSOURI
NO. 2010011687
EXPIRATION DATE 08-10-2018

3833 S. NORTHERN BLVD.
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(816) 743-9000 FAX: (816) 743-9700
ENGINEERING CERTIFICATE NO. MO E-2000151302-D
SURVEYING CERTIFICATE NO. MO LS-2000151303-D KS: LS-138



LEGEND

CONSTRUCTION
ENTRANCE
USE 3"-6" ROCK



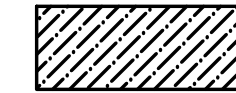
SILT FENCE



INLET PROTECTION



EROSION CONTROL BLANKET
(SEE DETAIL ESC-02)



UPON COMPLETION CONTRACTOR SHALL
SEED AND MULCH DISTURBED AREAS
AND REMOVE ALL TRASH AND DEBRIS.

PHASE 1 WORK SCHEDULE

1. INSTALL PERIMETER SILT FENCE.
2. INSTALL CONSTRUCTION ENTRANCE.
3. INSTALL WATER QUALITY POND AND OUTLET STRUCTURE (SEE SHEET 31 & 32).

PHASE 2 WORK SCHEDULE

1. GRADE ENTIRE SITE AS SHOWN.
2. SEED AND MULCH AREAS THAT ARE COMPLETED WITHIN TWO WEEKS.
3. METHODS AND MATERIALS TO CONTROL SEDIMENTATION AND EROSION ARE TO BE INCORPORATED INTO THE GRADING OPERATIONS AS SHOWN OR AT THE DIRECTION OF THE CITY ENGINEER. UPON COMPLETION OF GRADING OPERATIONS, SUCH FACILITIES TO PROVIDE FOR SAID EROSION AND SEDIMENTATION CONTROL ARE TO REMAIN IN PLACE AND ARE TO BE MAINTAINED BY THE DEVELOPER UNTIL SUCH TIME AS SEEDED AREAS BECOME ESTABLISHED.
4. ALL AREAS TO BE SEEDED SHALL BE SPREAD WITH A MINIMUM 6-INCH DEPTH OF TOP SOIL. ALL SEEDING SHALL BE DONE IN COMPLIANCE WITH THE REQUIREMENTS SET FORTH IN THE CITY OF LEE'S SUMMIT SPECIFICATION AND DESIGN CRITERIA MANUAL.
5. ALL AREAS SEEDED ARE TO BE SPREAD WITH MULCH AT THE RATE OF 1 1/2 TON PER ACRE AND SHALL BE ANCHORED BY DISCING.
6. ALL AREAS DISTURBED BY GRADING OPERATIONS AUTHORIZED BY THIS PERMIT SHALL BE SEEDED WITHIN TWO WEEKS AFTER COMPLETION AND ACCEPTANCE OF SITE GRADING. THE ENTIRE AREA AFFECTED SHALL BE MAINTAINED BY THE DEVELOPER UNTIL SUCH TIME AS SEEDED AREAS HAVE BECOME ESTABLISHED.
7. ANY INCIDENTAL WORK NOT SPECIFICALLY PERMITTED DURING FINAL CLEANUP WILL BE COMPLETED BY THE CONTRACTOR.

PHASE 3 WORK SCHEDULE

1. STABILIZE SITE.
2. REMOVE TEMPORARY CONSTRUCTION ENTRANCES.
3. REMOVE SEDIMENT CONTROL DEVICES, AFTER VEGETATION IS ESTABLISHED.
4. SEDIMENT BASINS WILL REMAIN FOR WATER QUALITY PURPOSES.

NOTE
UPON FINAL STABILIZATION;
SEDIMENT IN WATER QUALITY
BASIN SHALL BE REMOVED AND
SIDE SLOPES/BOTTOM RESTORED
AS NECESSARY

NOTE
INLET PROTECTION AND SILT
FENCE SHALL BE REMOVED BY
CONTRACTOR/OWNER AT SUCH
ALL UPSTREAM DISTURBED AREAS
HAVE BEEN PERMANENTLY
STABILIZED.

NOTE
ALL SLOPES GREATER THAN
4:1 WILL BE EVALUATED FOR
USE OF MATS/BLANKETS

NOTE
EROSION CONTROL FEATURES NED TO BE INSTALLED PRIOR TO LAND
DISTURBANCE AND MAINTAINED THROUGHOUT THE DURATION OF
OPERATIONS. WE NEED TO CONTAIN THE SILT TO THIS SITE AND KEEP THE
ADJACENT STREETS FREE OF MUD AND DEBRIS AT ALL TIMES (WHICH MAY
INCLUDE ADDITIONAL EROSION CONTROL FEATURES NOT INCLUDED IN THIS
PLAN IF IT IS DETERMINED THAT THE CURRENT PLAN IS INADEQUATE.

EROSION & SEDIMENT CONTROL MEASURES IN PLACE SHALL BE CHECKED
& MAINTAINED WEEKLY OR WITHIN 24 HOURS FOLLOWING A RAIN
MEASURING GREATER THAN 0.5 INCHES IN 24 HOURS AS RECORDED AT
KCI AIRPORT.

100 0 100
SCALE IN FEET

REVISION
Δ REVISED ON 06-07-2018: ADDED WORK PHASE SCHEDULE



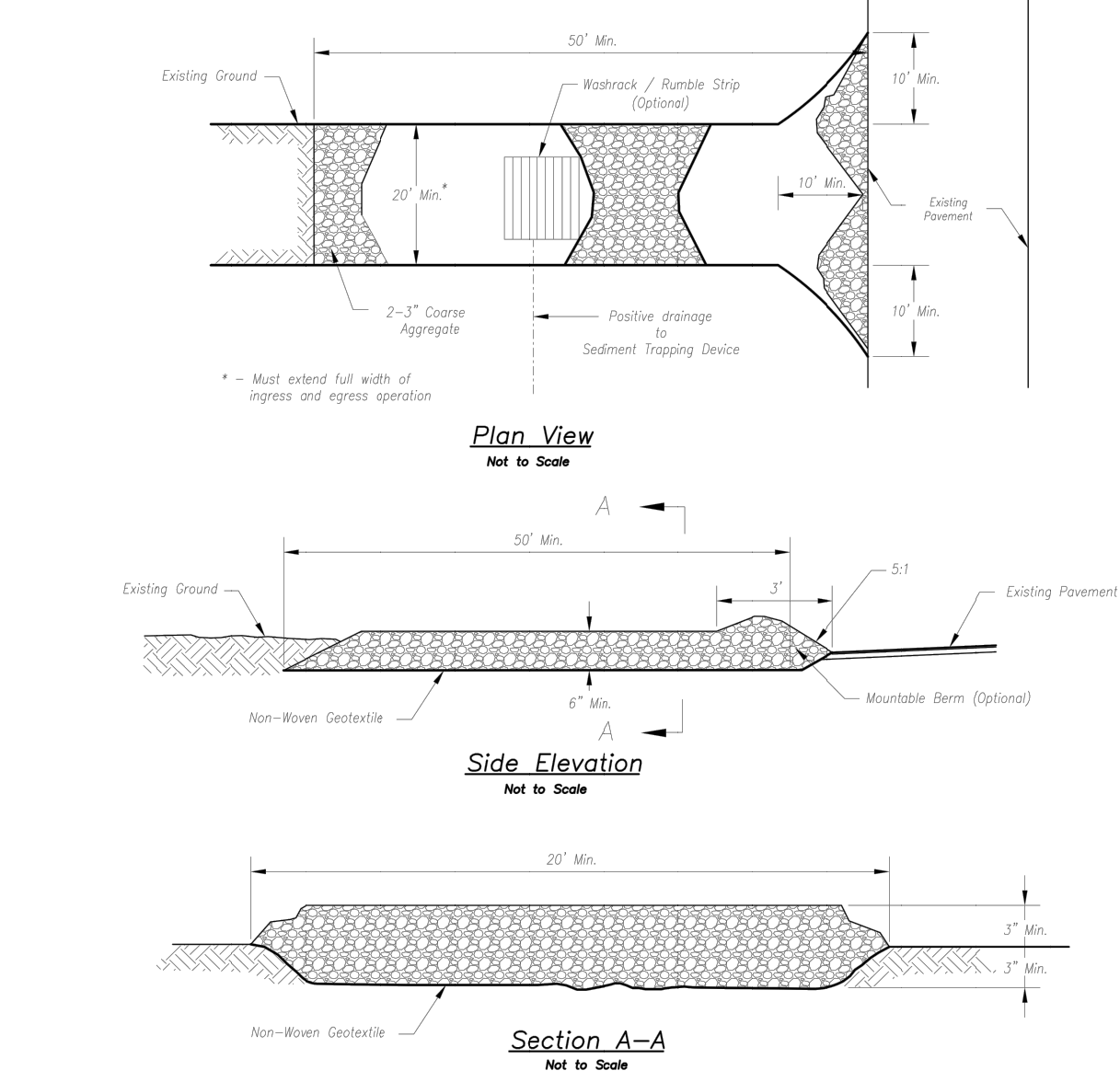
PHOENIX ENGINEERING
& SURVEYING, LLC

3835 S. NORTHERN BLVD.
INDEPENDENCE, MO 64602
(816) 743-9000 FAX: (816) 743-9700
ENGINEERING CERTIFICATE NO.: MO E-2000151302-D
SURVEYING CERTIFICATE NO.: MO LS-2000151303-D
KS: E-853
KS: LS-138

WHISPERING WOODS
LEE'S SUMMIT, JACKSON COUNTY, MO
STREET & STORM SEWER PLANS
ESC - PLAN

DESIGNED
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DATE
09-01-2017
JOB NO.
04078
SHEET

7 OF 40



CONSTRUCTION ENTRANCE

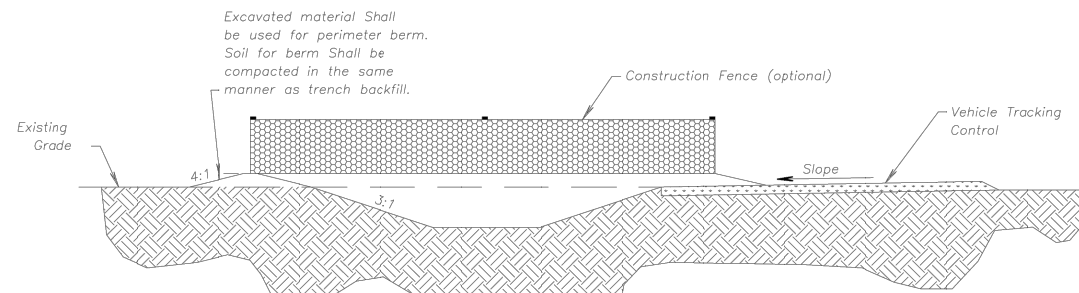
Construction Entrance modified from 2015 Overland Park Standard Details for Erosion and Sediment Control; Concrete Washout modified from 2009 City of Great Bend Standard Drawings.

Notes for Concrete Washout:

- Concrete washout areas shall be installed prior to any concrete placement on site.
- Concrete washout area shall include a flat subsurface pit sized relative to the amount of concrete to be placed on site. The slopes leading out of the subsurface pit shall be 2:1. The vehicle tracking pad shall be sloped towards the concrete washout area.
- Vehicle tracking control is required at the access point to all concrete washout areas.
- Slopes shall be placed of the construction site entrance, washout area and elsewhere as necessary to clearly indicate the location(s) of the concrete washout area(s) to operators of concrete truck and pump rigs.
- A one-piece impervious liner may be required along the bottom and sides of the subsurface pit in sandy or gravelly soils.

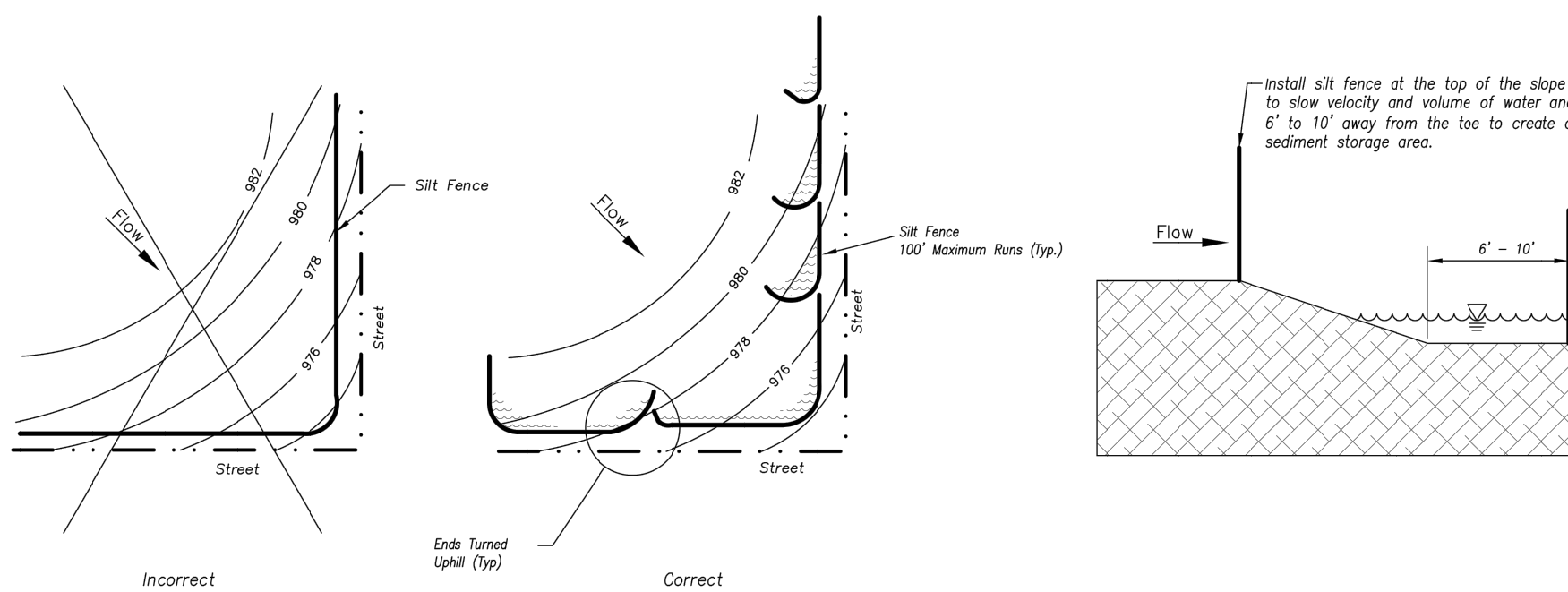
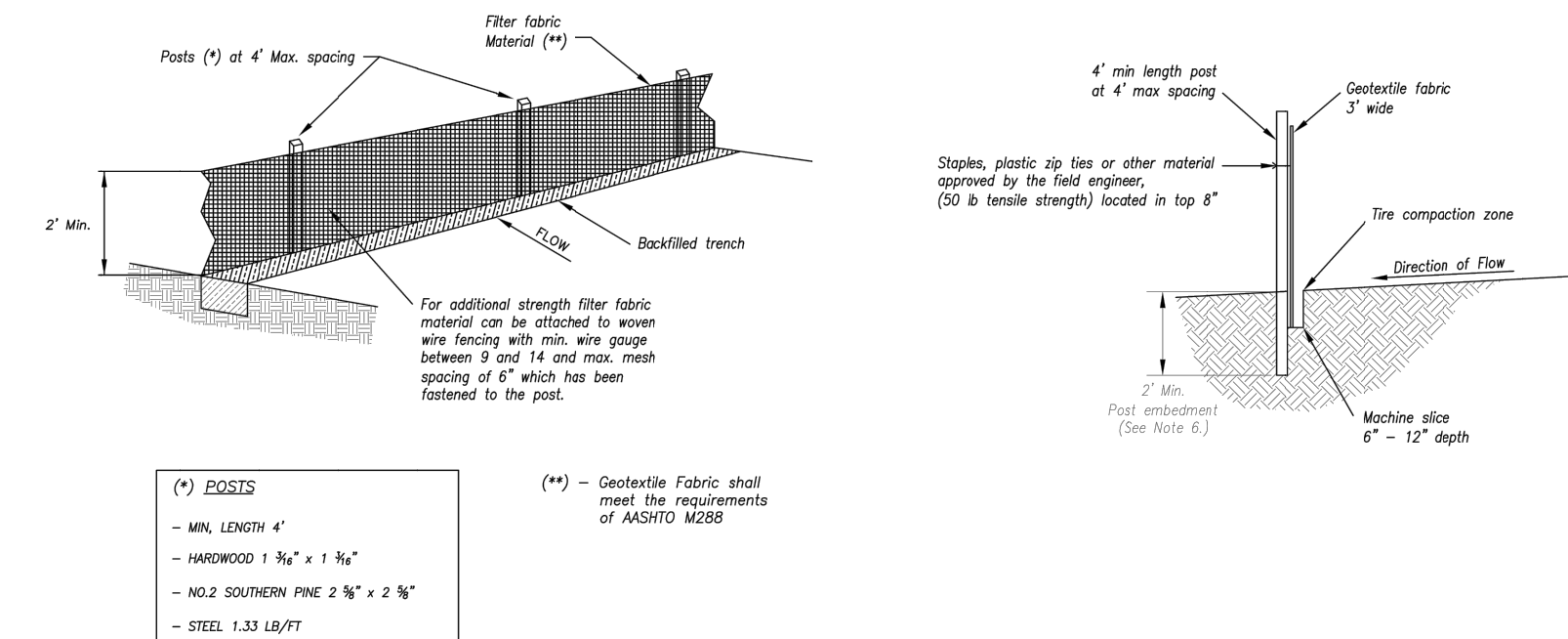
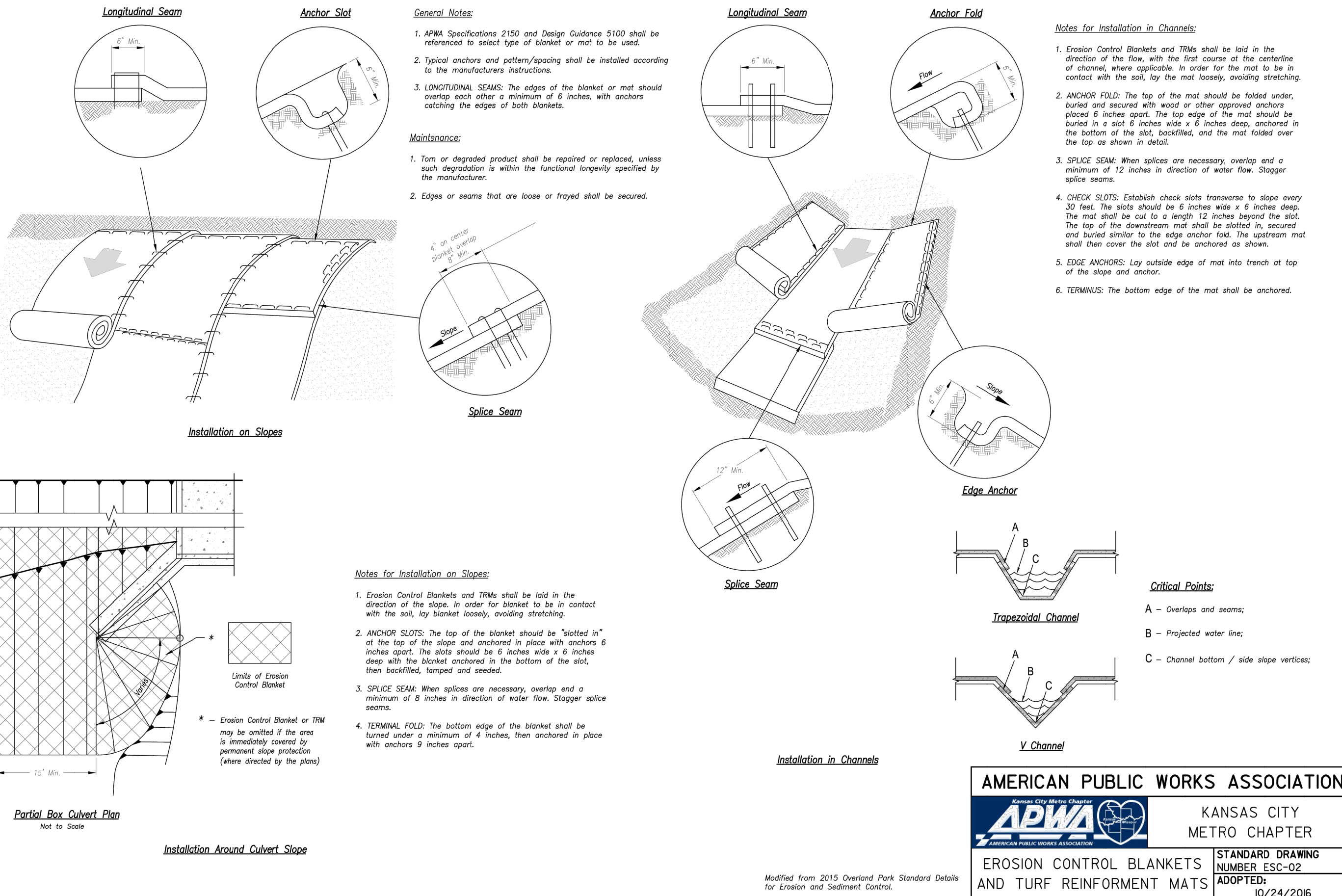
Maintenance for Concrete Washout:

- Concrete washout materials shall be removed once the materials have filled the washout to approximately 75% full.
- Concrete washout areas shall be enlarged as necessary to maintain capacity for washed concrete.
- Concrete washout water, waste pieces of concrete and all other debris in the subsurface pit shall be transported from the job site in a water-tight container and disposed of properly.
- Concrete washout areas shall remain in place until all concrete for the project is placed.
- When concrete washout areas are removed, excavations shall be filled with suitable compacted backfill and topped, any disturbed areas associated with the installation, maintenance, and/or removal of the concrete washout areas shall be stabilized.



CONCRETE WASHOUT

AMERICAN PUBLIC WORKS ASSOCIATION		
	KANSAS CITY METRO CHAPTER	
CONSTRUCTION ENTRANCE AND CONCRETE WASHOUT	STANDARD DRAWING NUMBER ESC-01	ADOPTED: 10/24/2016

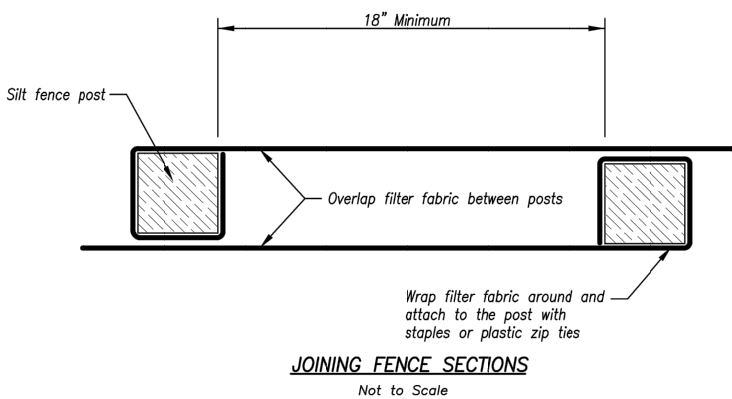


Notes:

- In order to contain water, the ends of the silt fence must be turned uphill (Figure A).
- Long perimeter runs of silt fence must be limited to 100'. Runs should be broken up into several smaller segments to minimize water concentrations (Figure A).
- Long slopes should be broken up with intermediate rows of silt fence to slow runoff velocities.
- Attach fabric to upstream side of post.
- Install posts a minimum of 2' into the ground.
- Trenching will only be allowed for small or difficult installation, where slicing machine cannot be reasonably used.

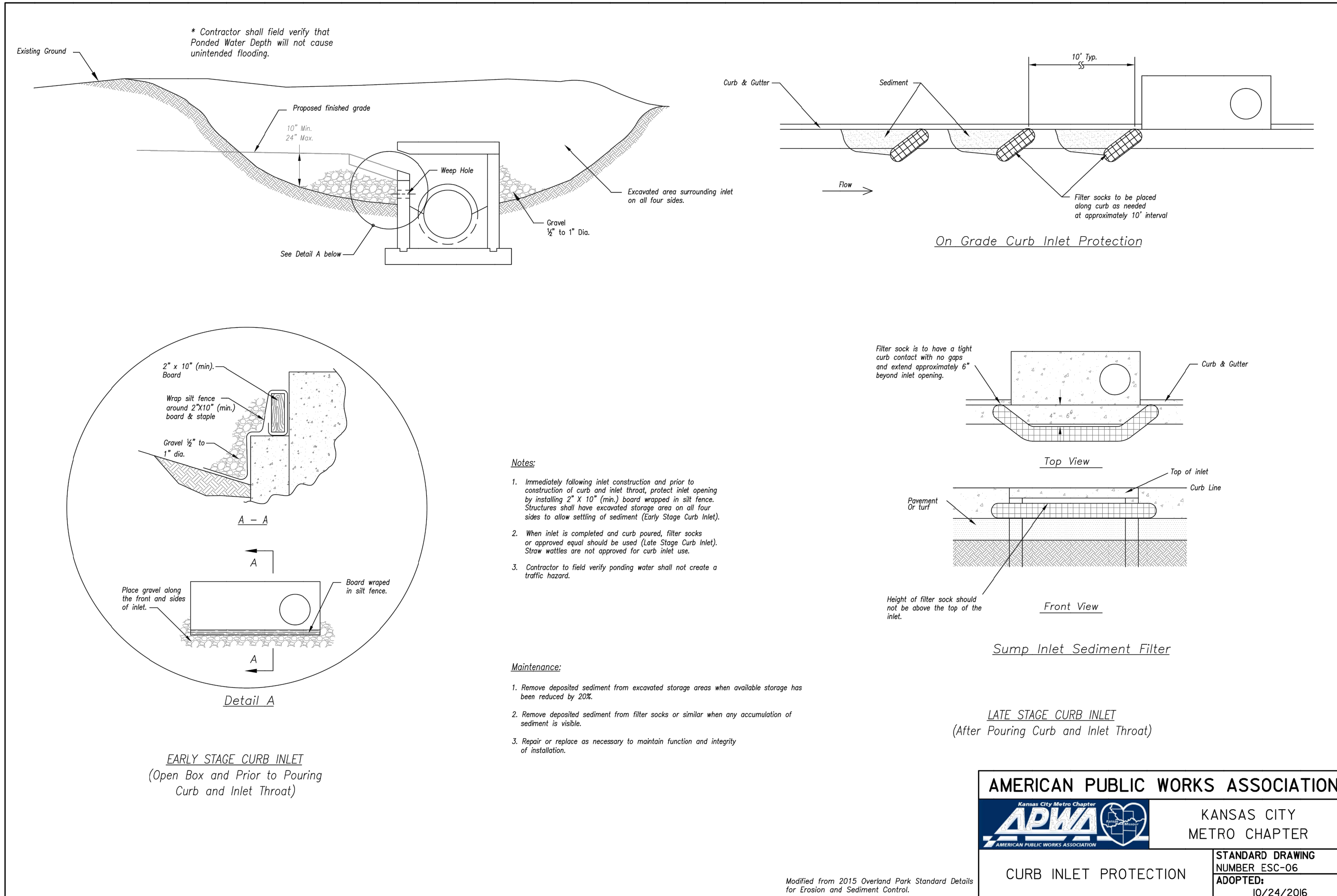
Maintenance:

- Remove and dispose of sediment deposits when the deposit approaches 1/2 the height of silt fence.
- Repair as necessary to maintain function and structure.

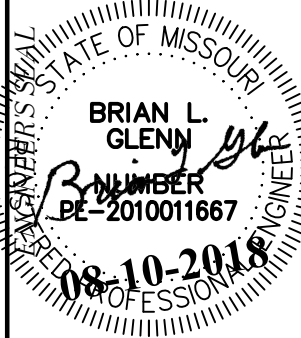


AMERICAN PUBLIC WORKS ASSOCIATION		
	KANSAS CITY METRO CHAPTER	
SILT FENCE	STANDARD DRAWING NUMBER ESC-03	ADOPTED: 10/24/2016

Modified from 2015 Overland Park Standard Details for Erosion and Sediment Control.



REVISION



PHOENIX ENGINEERING & SURVEYING, LLC

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(816) 743-9000 FAX: (816) 743-9700
ENGINEERING CERTIFICATE NO: MO E-2000151302-D KS: E-853
SURVEYING CERTIFICATE NO: MO LS-2000151303-D KS: LS-138

WHISPERING WOODS

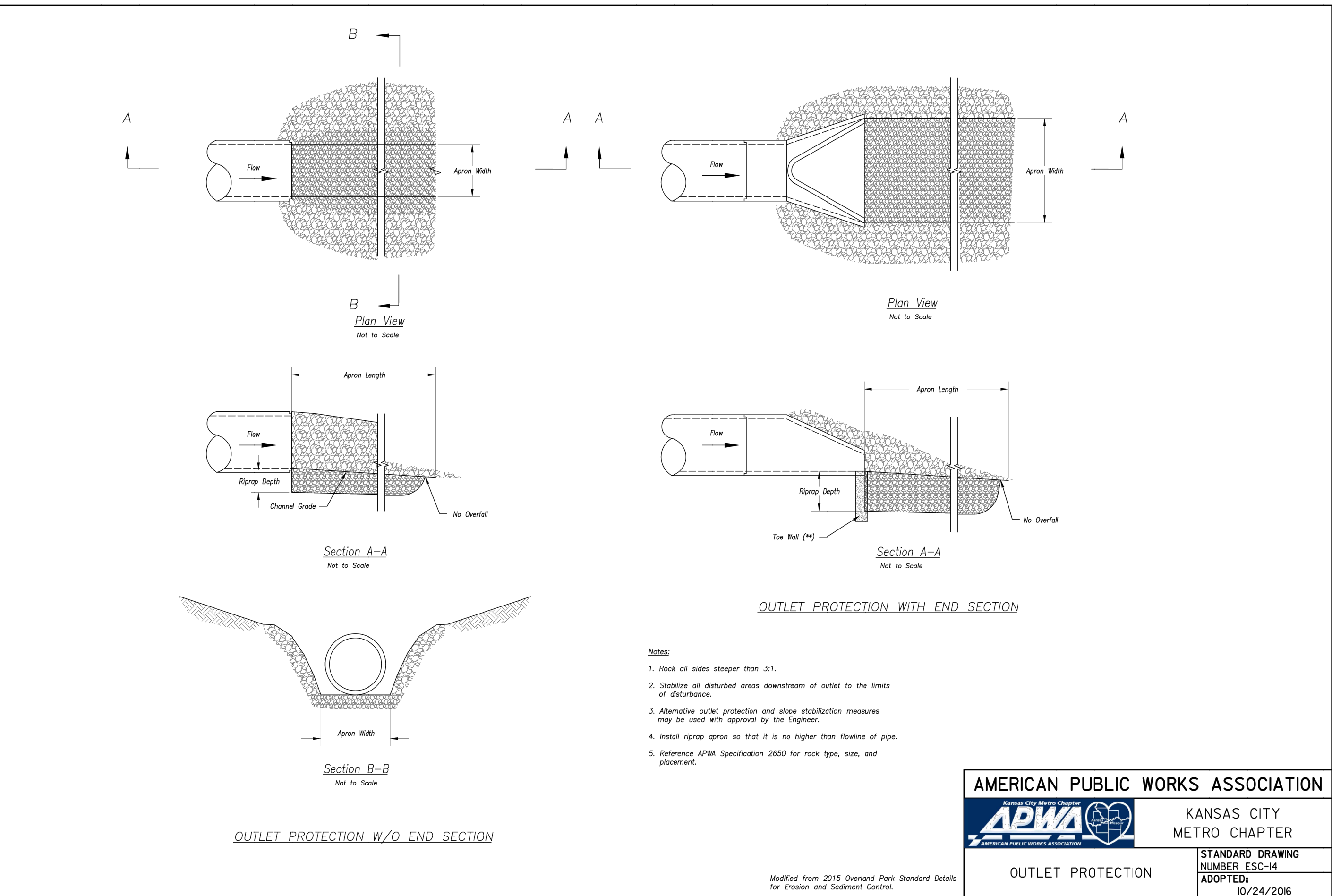
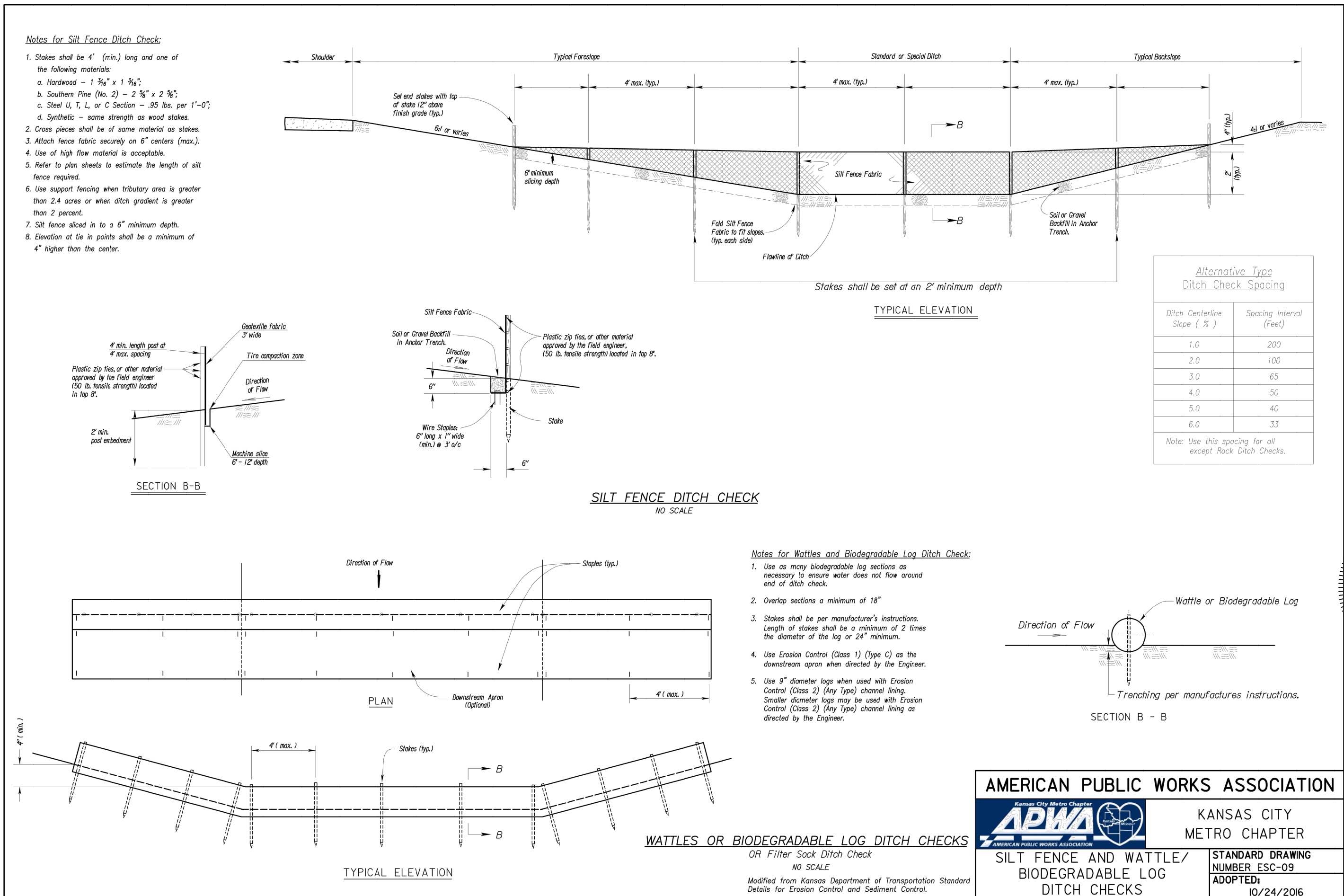
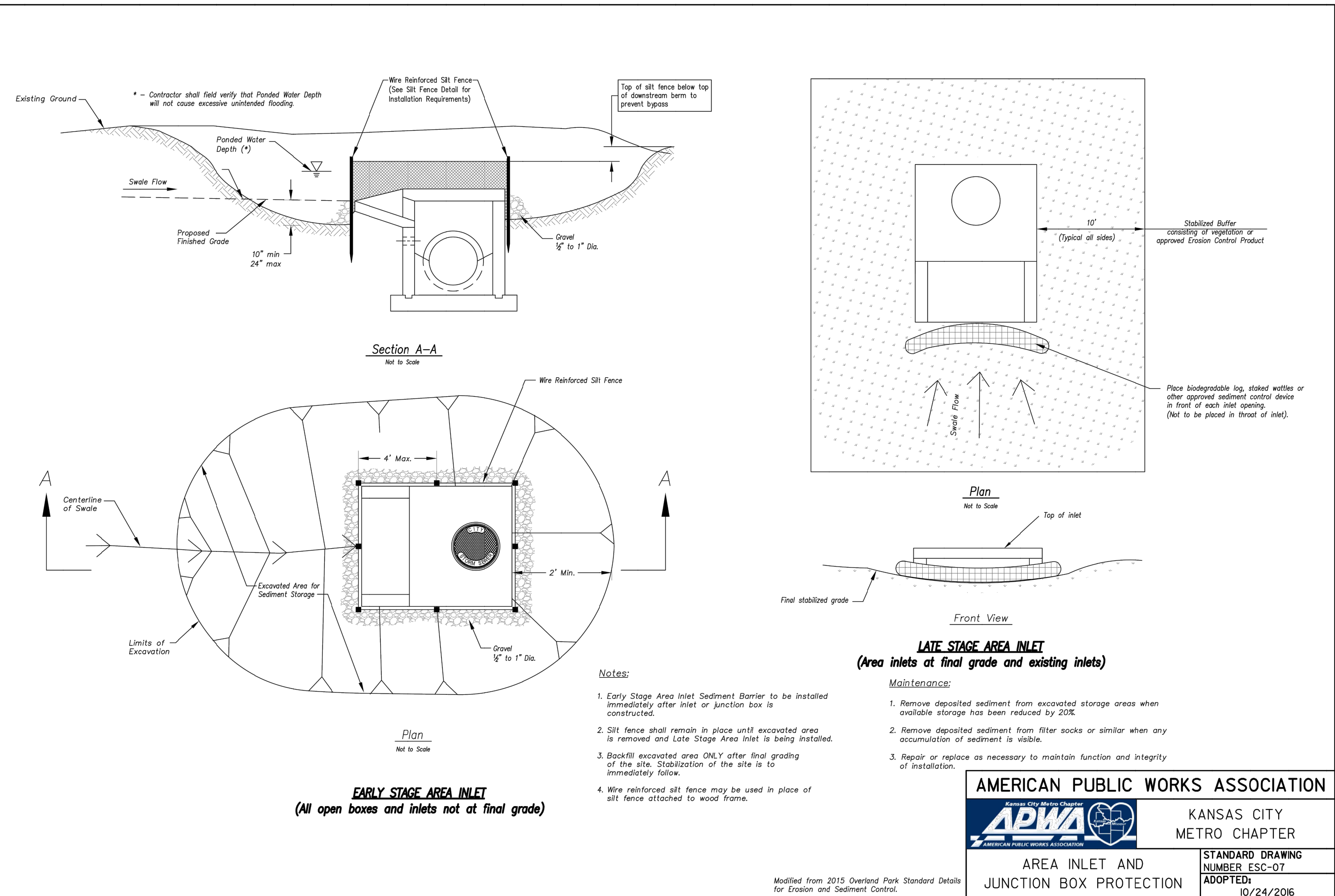
LEE'S SUMMIT, JACKSON COUNTY, MO

STREET & STORM SEWER PLANS

ESC DETAILS

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SCALE
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DATE
09-01-2017
JOB NO.
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8 OF 40

REVISION

THE GREAT SEAL OF THE STATE OF MISSOURI

BRIAN L. GLENN

REGISTERED PROFESSIONAL ENGINEER

PE-2010011667

08-10-2018

MO PE 2010011667

AS AGENT OF

PHOENIX ENGINEERING & SURVEYING, LLC



**PHOENIX ENGINEERING
& SURVEYING, LLC**

3835 S. NORTHERN BLVD.
INDEPENDENCE, MO 64032

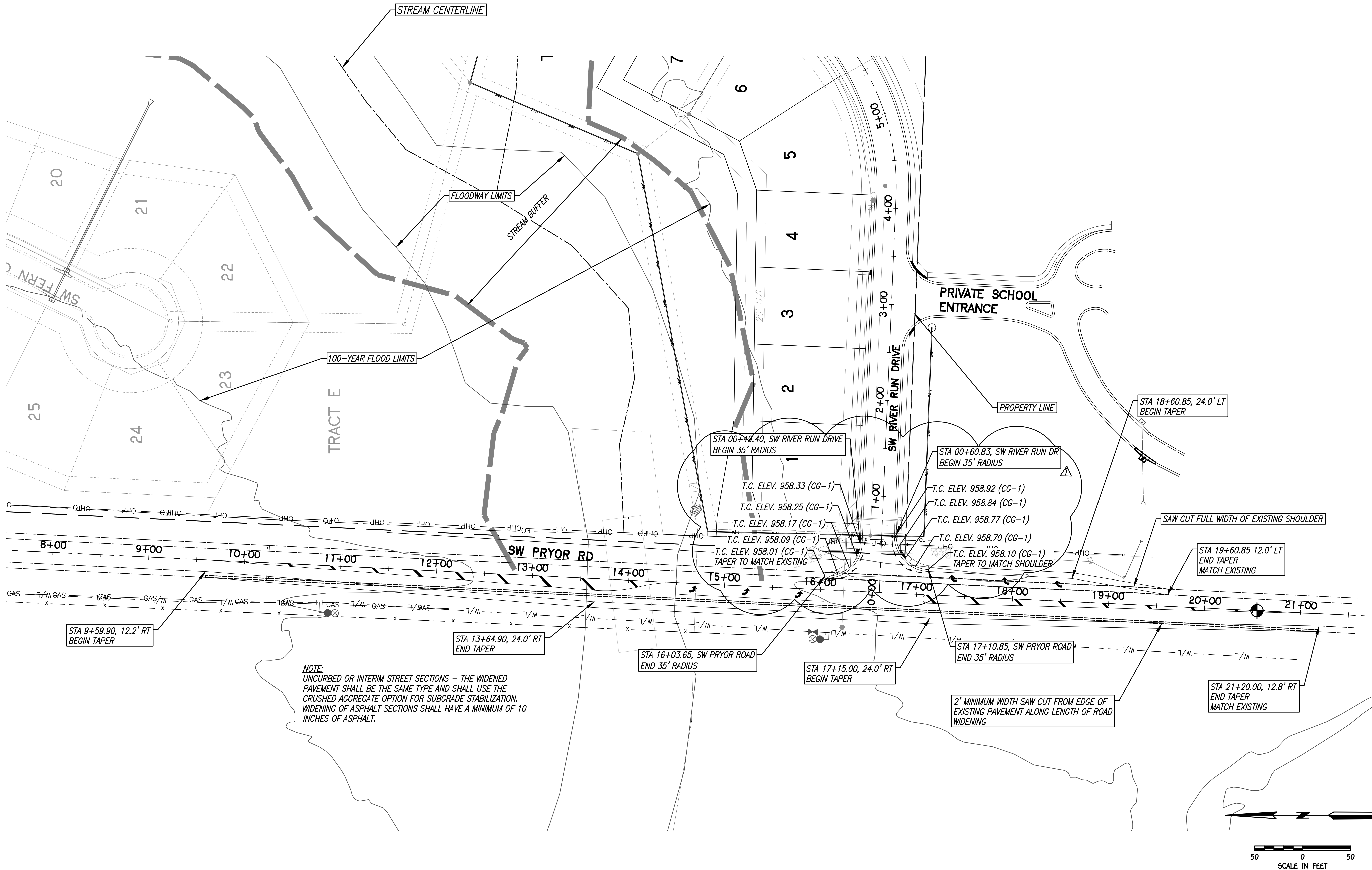
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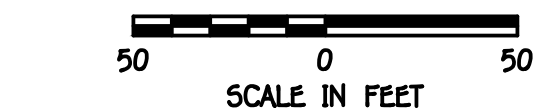
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KS: LS-1383

WHISPERING WOODS
†
LEE'S SUMMIT, JACKSON COUNTY, MO
STREET & STORM SEWER PLANS
ESC DETAILS

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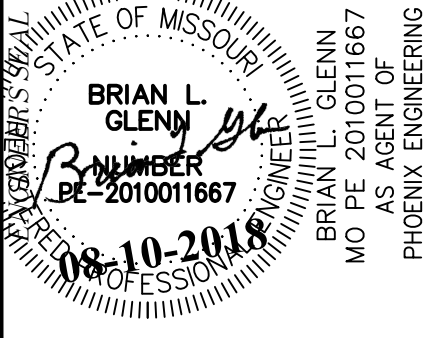
NOTE:
UNCURBED OR INTERIM STREET SECTIONS - THE WIDENED
PAVEMENT SHALL BE THE SAME TYPE AND SHALL USE THE
CRUSHED AGGREGATE OPTION FOR SUBGRADE STABILIZATION.
WIDENING OF ASPHALT SECTIONS SHALL HAVE A MINIMUM OF 10
INCHES OF ASPHALT.



WHISPERING WOODS
LEE'S SUMMIT, JACKSON COUNTY, MO
STREET & STORM SEWER PLANS
PRYOR LAYOUT

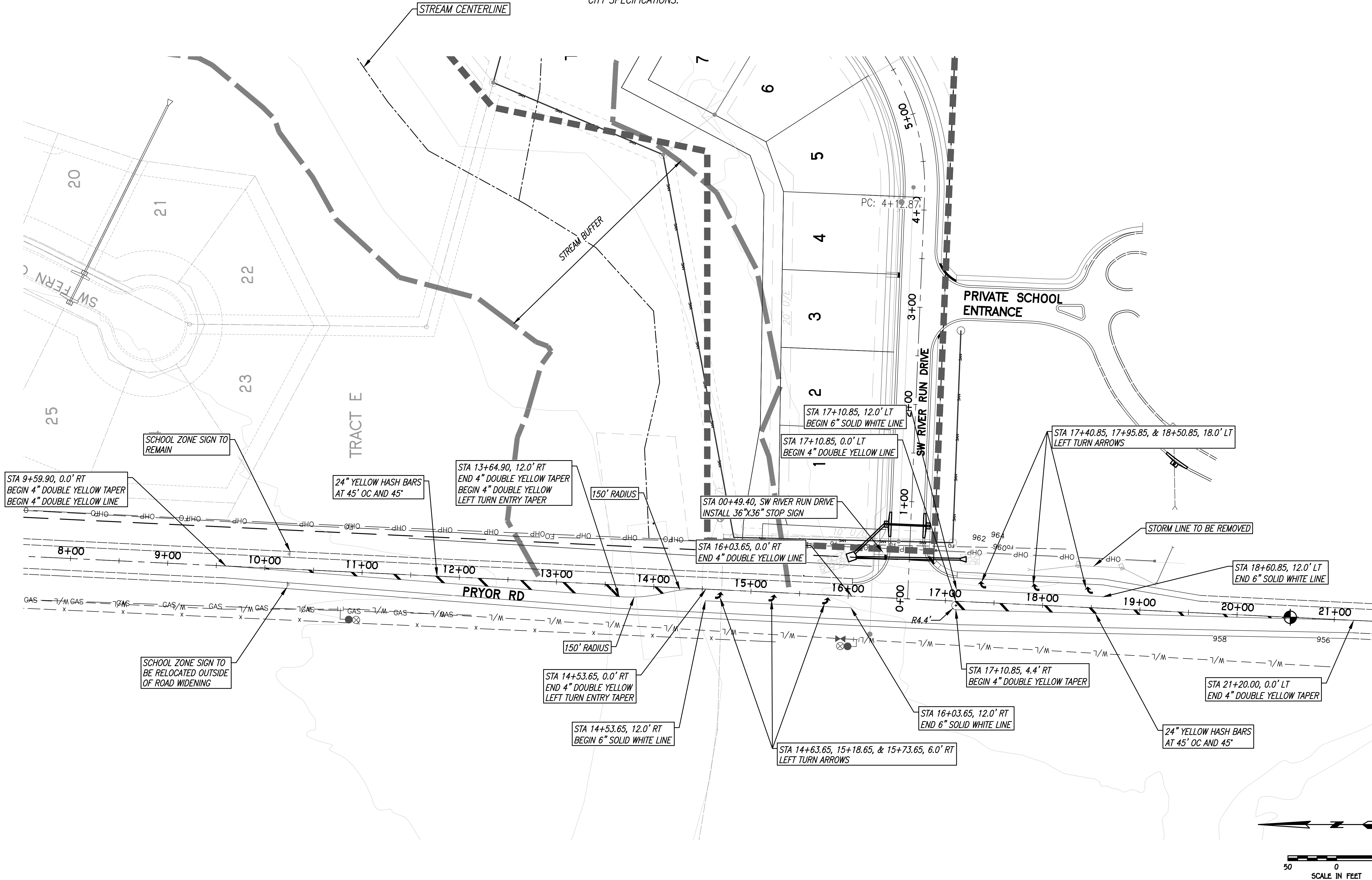
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SCALE	Noted
DATE	09-01-2017
JOB NO.	04078
SHEET	10 OF 40

PHOENIX ENGINEERING
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(816) 743-9000 FAX: (816) 743-9700
ENGINEERING CERTIFICATE NO.: MO E-2000151302-D KS: E-853
SURVEYING CERTIFICATE NO.: MO LS-2000151303-D KS: LS-138



REVISION
△ REVISED ON 06-07-2018: FIXED CURB TYPE LABEL
FROM CG-2 TO CG-1

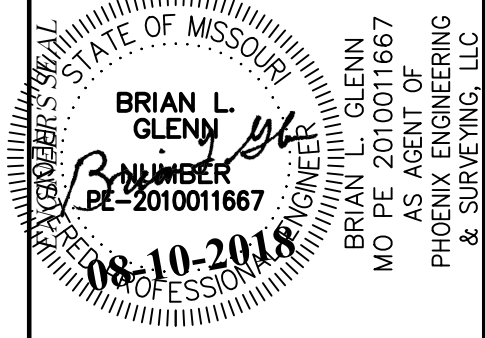
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ESTIMATES, REPORTS, OR OTHER DOCUMENTS OR INSTRUMENTS RELATING TO OR INTENDED TO
BE USED FOR ANY PART OR PARTS OF THE ENGINEERING OR SURVEYING PROJECT.



NOTE:
ALL TURN ARROWS, DIAGONAL LINES, CROSSWALK LINES, AND STOP LINES SHALL
BE PRE-FORMED THERMOPLASTIC IN CONFORMANCE WITH CITY SPECIFICATIONS.

ALL LONGITUDINAL MARKINGS SHALL USE HIGH BUILD PAINT IN CONFORMANCE WITH
CITY SPECIFICATIONS.

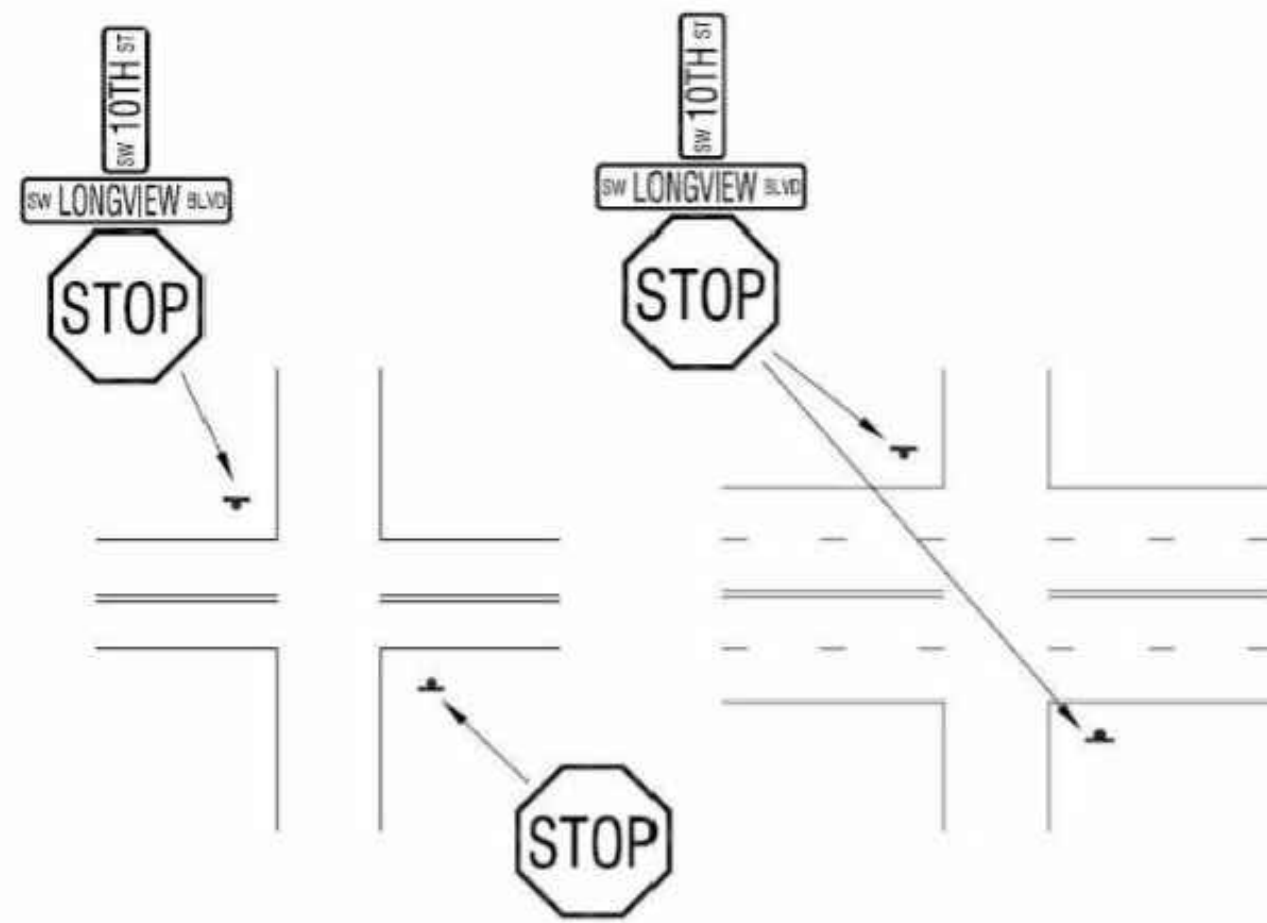
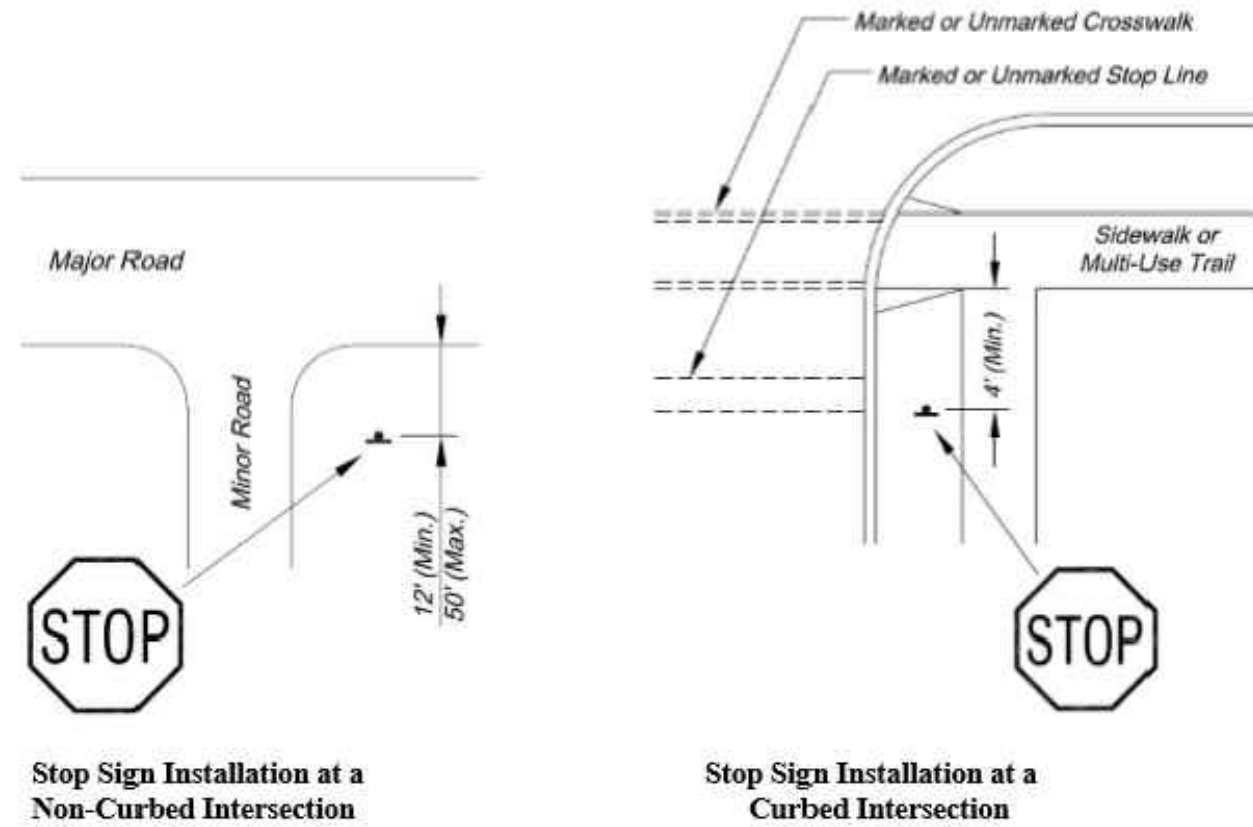
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INDEPENDENCE, MO 64602
(816) 743-9000 FAX: (816) 743-9700
ENGINEERING CERTIFICATE NO.: MO E-2000151302-D KS: E-853
SURVEYING CERTIFICATE NO.: MO LS-2000151303-D KS: LS-138

WHISPERING WOODS
LEE'S SUMMIT, JACKSON COUNTY, MO
STREET & STORM SEWER PLANS
STRIPING PLAN

DESIGNED	BLG
DRAWN	BLG
SCALE	Noted
DATE	09-01-2017
JOB NO.	04078
SHEET	11 OF 40



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BLG
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SCALE
Noted
DATE
09-01-2017
JOB NO.
04078
SHEET

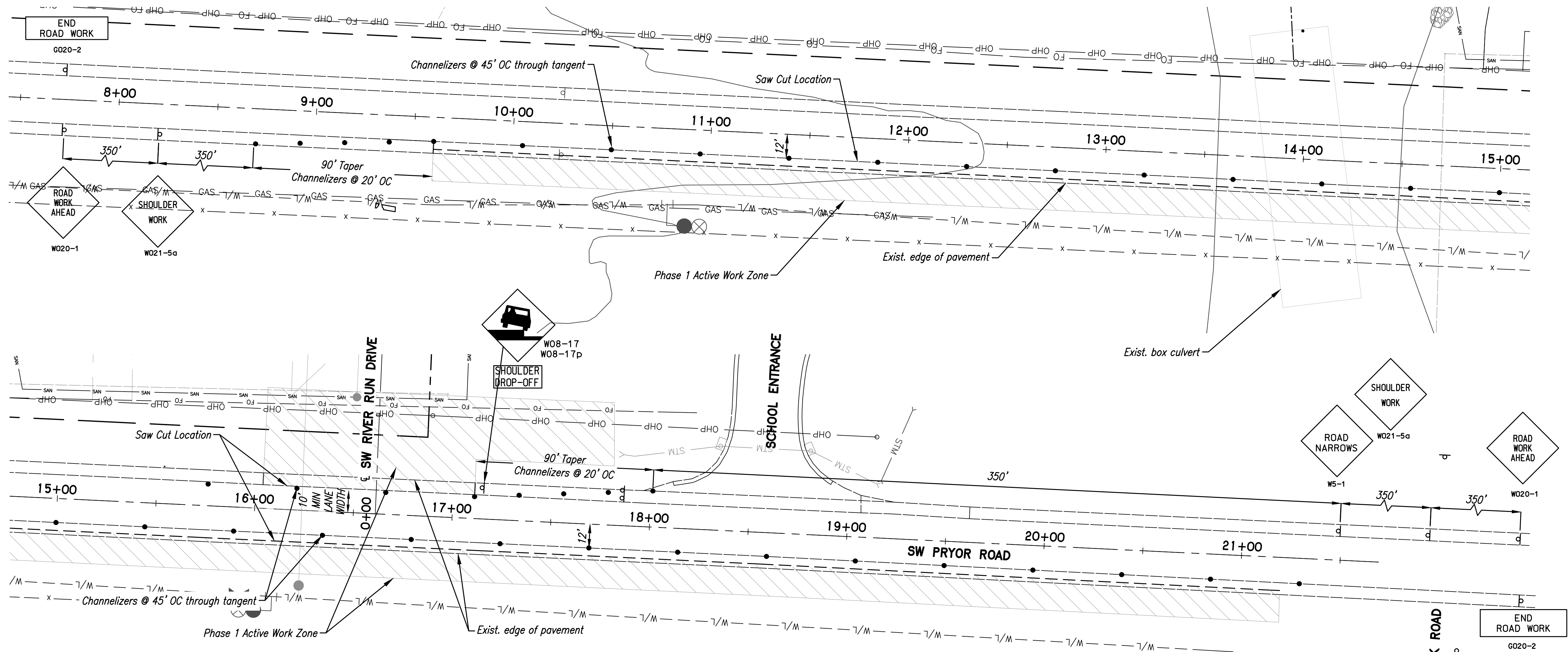
WHISPERING WOODS
†
LEE'S SUMMIT, JACKSON COUNTY, MO
STREET & STORM SEWER PLANS
STRIPING PLAN DETAILS

MISSOURI
 STATE OF MISSOURI
 BRIAN L. GLENN
 ENGINEER
 NUMBER
 BE-2010011667
 08-10-2018
 OF SESSION

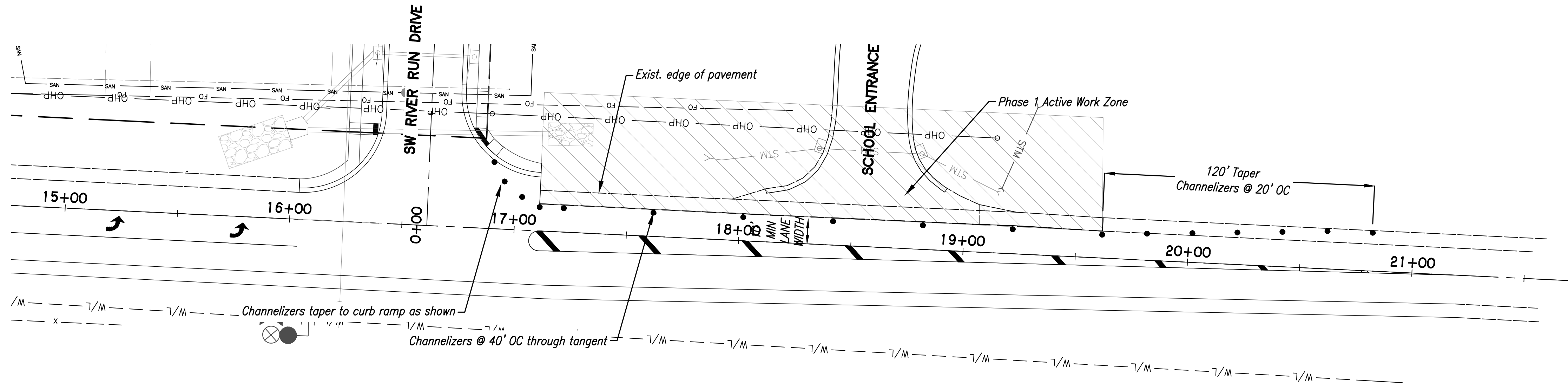
3835 S. NORTHERN BLVD.
INDEPENDENCE, MO 64632
(816) 743-9000 FAX: (816) 743-9700
ENGINEERING CERTIFICATE NO: MO E-2000151302-D
SURVEYING CERTIFICATE NO: MO LS-2000151303-D
BRIAN L. GLENN
MO PE 2001011667
AS AGENT OF
PHOENIX ENGINEERING
& SURVEYING, LLC
KS: E-853
KS: LS-138

REVISION

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PHASE 1 TEMPORARY TRAFFIC CONTROL PLAN



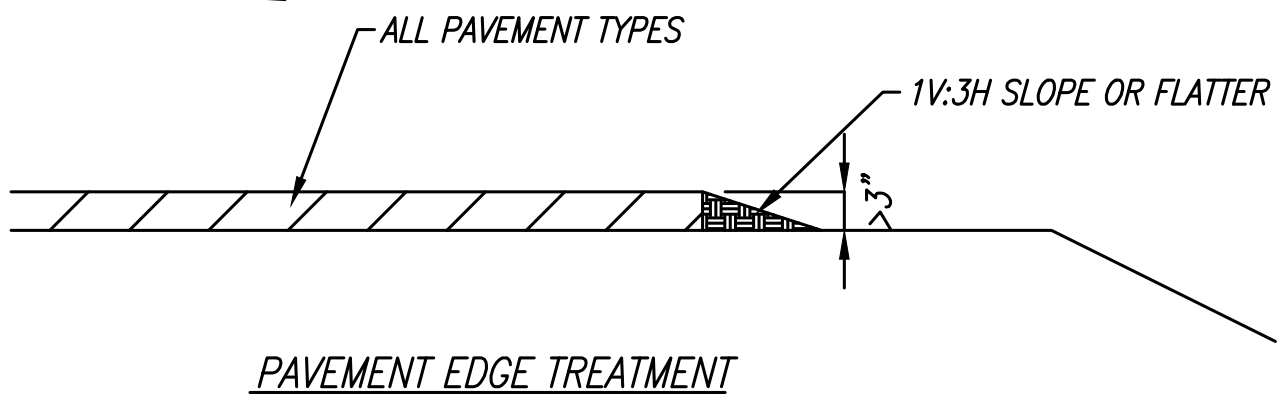
PHASE 2 TEMPORARY TRAFFIC CONTROL PLAN

NOTES:
PHASE 1 OF TEMPORARY TRAFFIC CONTROL SHALL INCLUDE PAVEMENT CONSTRUCTION OF SW RIVER RUN DRIVE ENTRANCE TO THE END OF CURB RETURN AND CONSTRUCTION OF THE ROADSIDE DRAINAGE DITCH TO THE END OF THE EXISTING STORM LINE UNDER THE SCHOOL ENTRANCE.

EXISTING SCHOOL ENTRANCE SHALL REMAIN OPEN AND FREE OF CONSTRUCTION ACTIVITIES, MATERIALS, AND EQUIPMENT DURING PHASE 1 OF SW PRYOR ROAD IMPROVEMENTS.

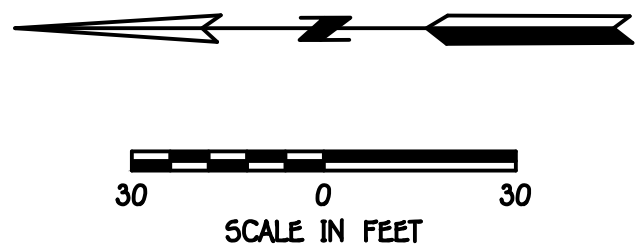
PHASE TWO SHALL COMMENCE ONLY ONCE THE PROPOSED SCHOOL ENTRANCE AND SW RIVER RUN DR ENTRANCE ARE OPERATIONAL AND CONSTRUCTION SCHEDULE APPROVED BY THE SCHOOL.

ALL TEMPORARY TRAFFIC CONTROL DEVICES SHALL COMPLY WITH THE LEE'S SUMMIT DESIGN AND CONSTRUCTION MANUAL AND THE FHWA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.



NOTE:
WEDGE SLOPE TO 1V:3H SLOPE OR FLATTER DURING NON-WORKING HOURS.

DELINEATE DIFFERENTIAL WITH CHANNELIZERS DURING WORKING HOURS.



REVISION

Δ REVISED ON 06-07-2018: FIXED CURB TYPE LABEL FROM CG-2 TO CG-1

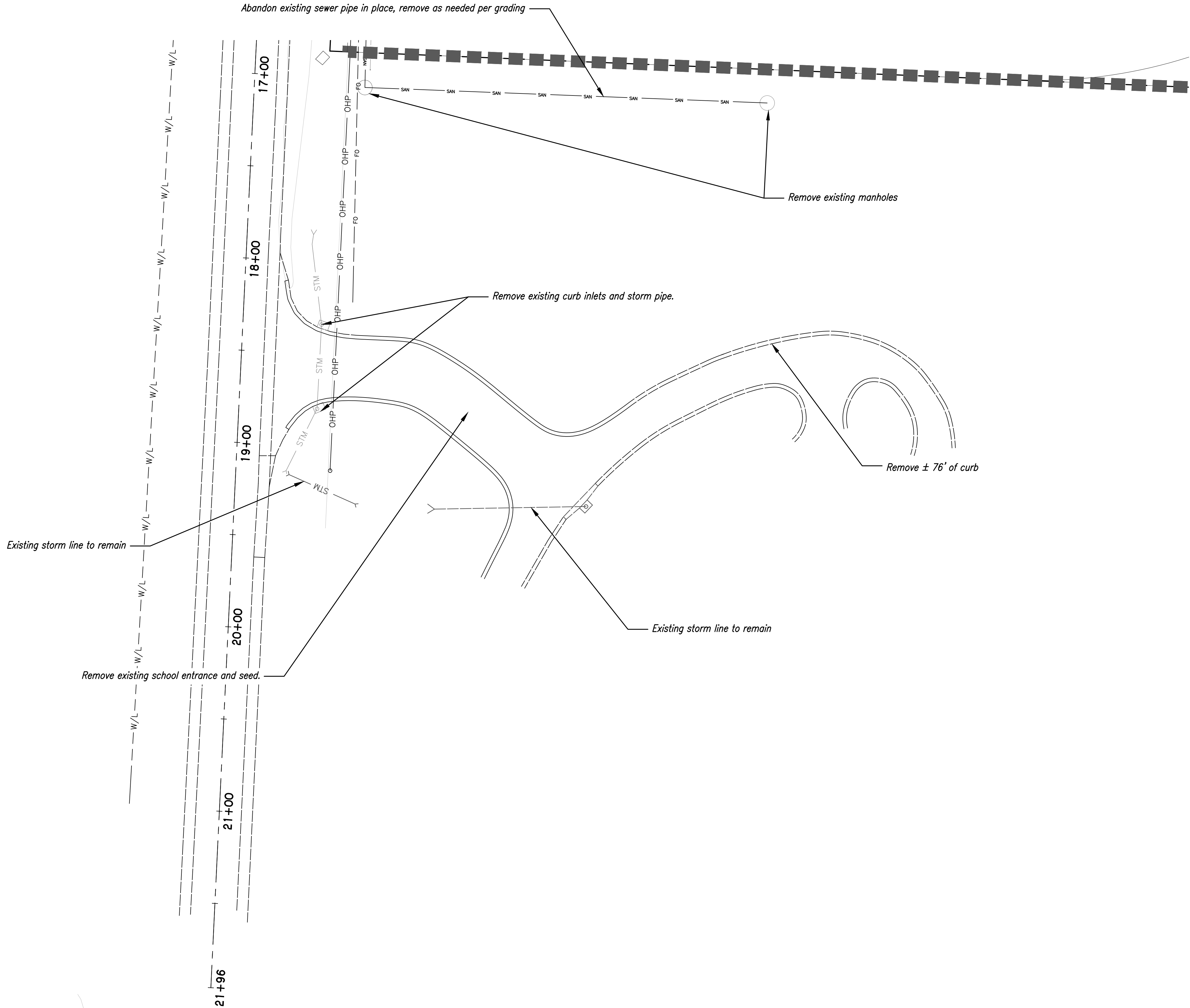
STATE OF MISSOURI
BRIAN L. GLEN
REGISTERED PROFESSIONAL ENGINEER
NO. E-2010011667
EXPIRATION DATE 08-24-2018

PHOENIX ENGINEERING & SURVEYING, LLC
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INDEPENDENCE, MO 64662
(816) 743-9000 FAX: (816) 743-9700
ENGINEERING CERTIFICATE NO. MO E-2000151302-D
SURVEYING CERTIFICATE NO. MO LS-2000151303-D
KS: E-853
KS: LS-138

PHOENIX ENGINEERING & SURVEYING, LLC

WHISPERING WOODS
LEE'S SUMMIT, JACKSON COUNTY, MO
STREET & STORM SEWER PLANS
TEMPORARY TRAFFIC CONTROL PLAN

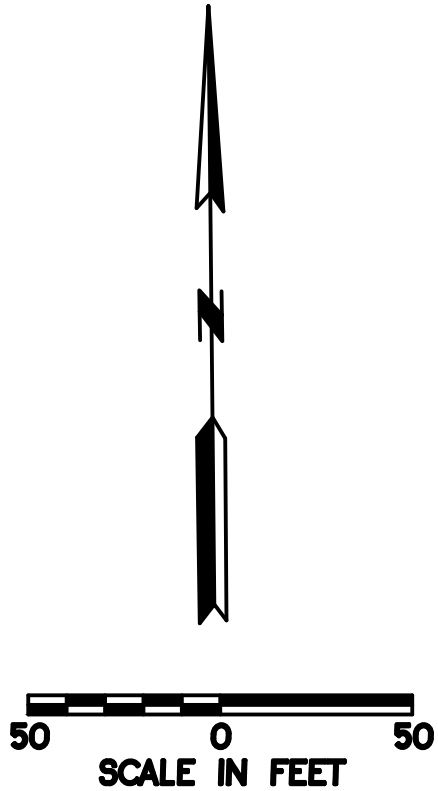
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04078
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13 OF 40



NOTE:

DEMOLITION OF EXISTING SCHOOL ENTRANCE SHALL NOT COMMENCE UNTIL NEW SCHOOL ENTRANCE CONSTRUCTION IS COMPLETED.

NO CONSTRUCTION SHALL TAKE PLACE WHILE SCHOOL IS IN SESSION.

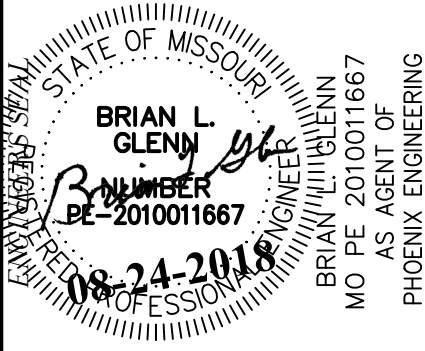


WHISPERING WOODS
+
LEE'S SUMMIT, JACKSON COUNTY, MO
STREET & STORM SEWER PLANS
SCHOOL ENTRANCE DEMO PLAN

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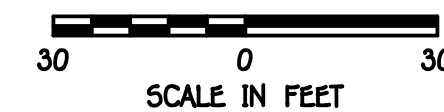
15 OF 40

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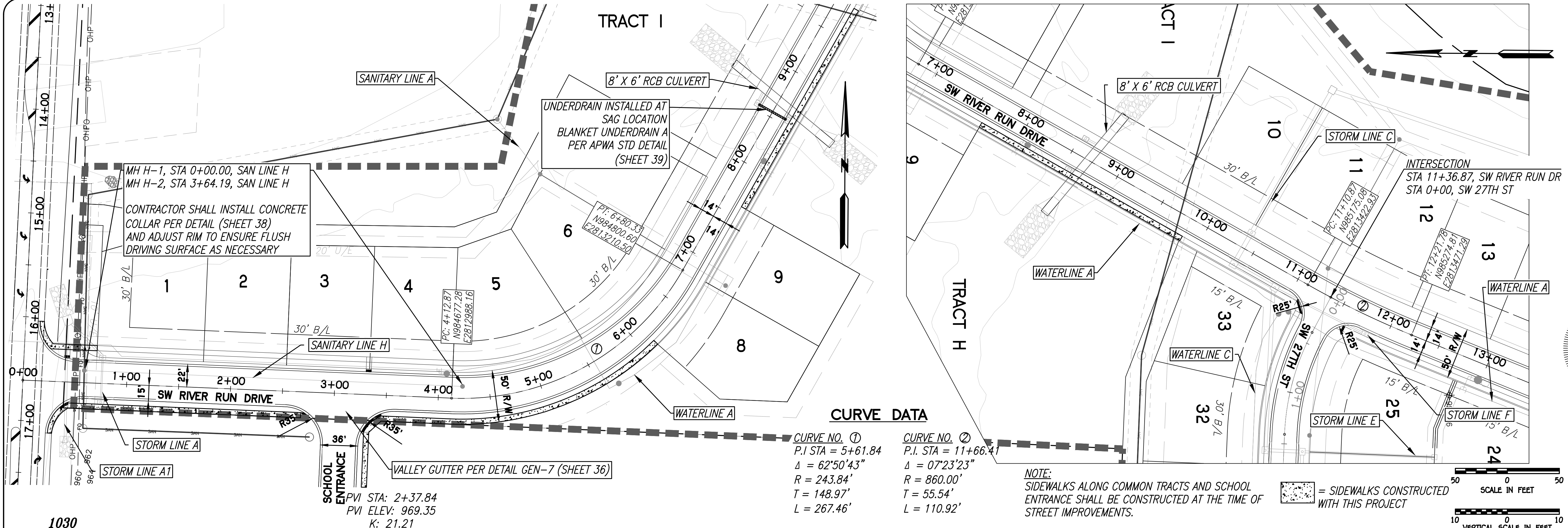
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 = SIDEWALKS

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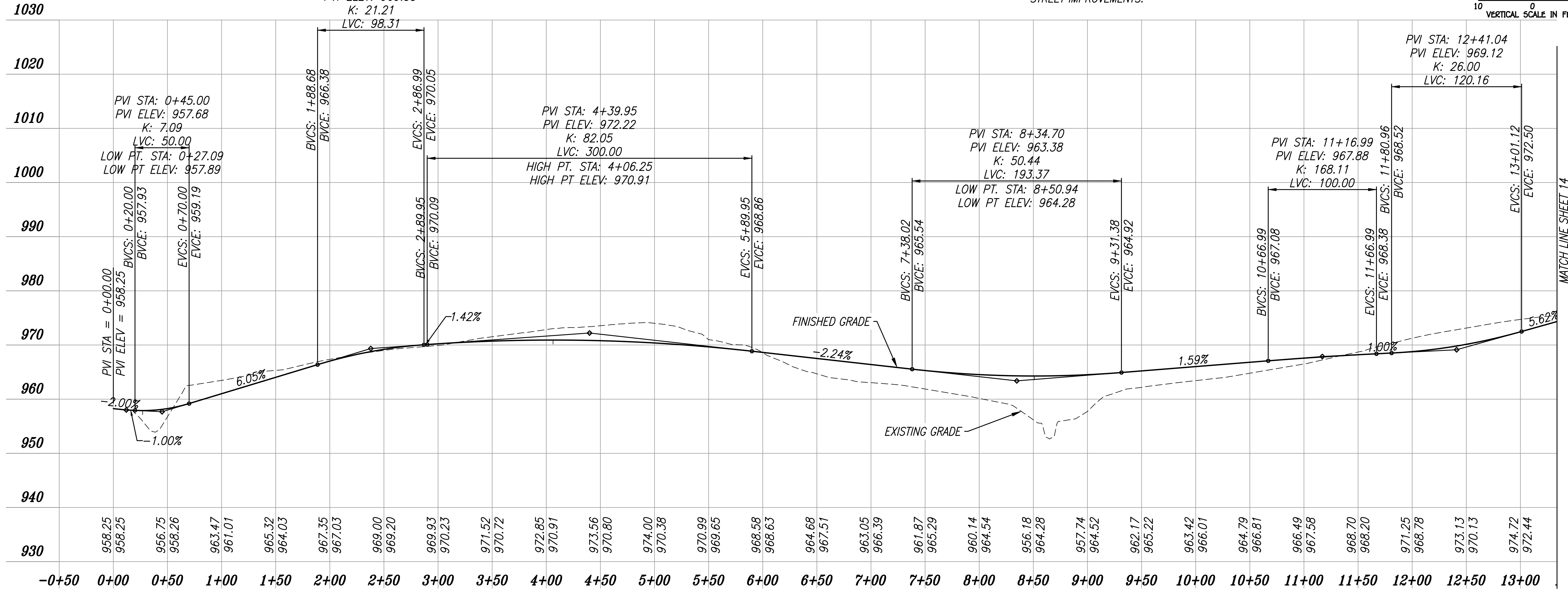
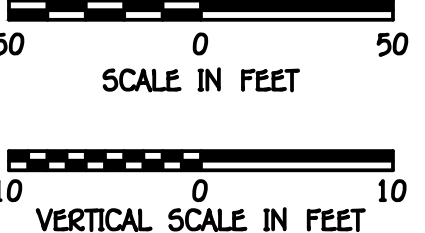


CURVE DATA

CURVE NO. ①	CURVE NO. ②
P.I. STA = 5+61.84	P.I. STA = 11+66.41
$\Delta = 62^{\circ}50'43''$	$\Delta = 07^{\circ}23'23''$
$R = 243.84'$	$R = 860.00'$
$T = 148.97'$	$T = 55.54'$
$L = 267.46'$	$L = 110.92'$

NOTE:
SIDEWALKS ALONG COMMON TRACTS AND SCHOOL
ENTRANCE SHALL BE CONSTRUCTED AT THE TIME OF
STREET IMPROVEMENTS.

☐ = SIDEWALKS CONSTRUCTED
WITH THIS PROJECT



SW RIVER RUN DRIVE PROFILE

REVISION

PHOENIX ENGINEERING & SURVEYING, LLC

DESIGNED
BLG

DRAWN
BLG

SCALE
Noted

DATE
09-01-2017

JOB NO.
04078

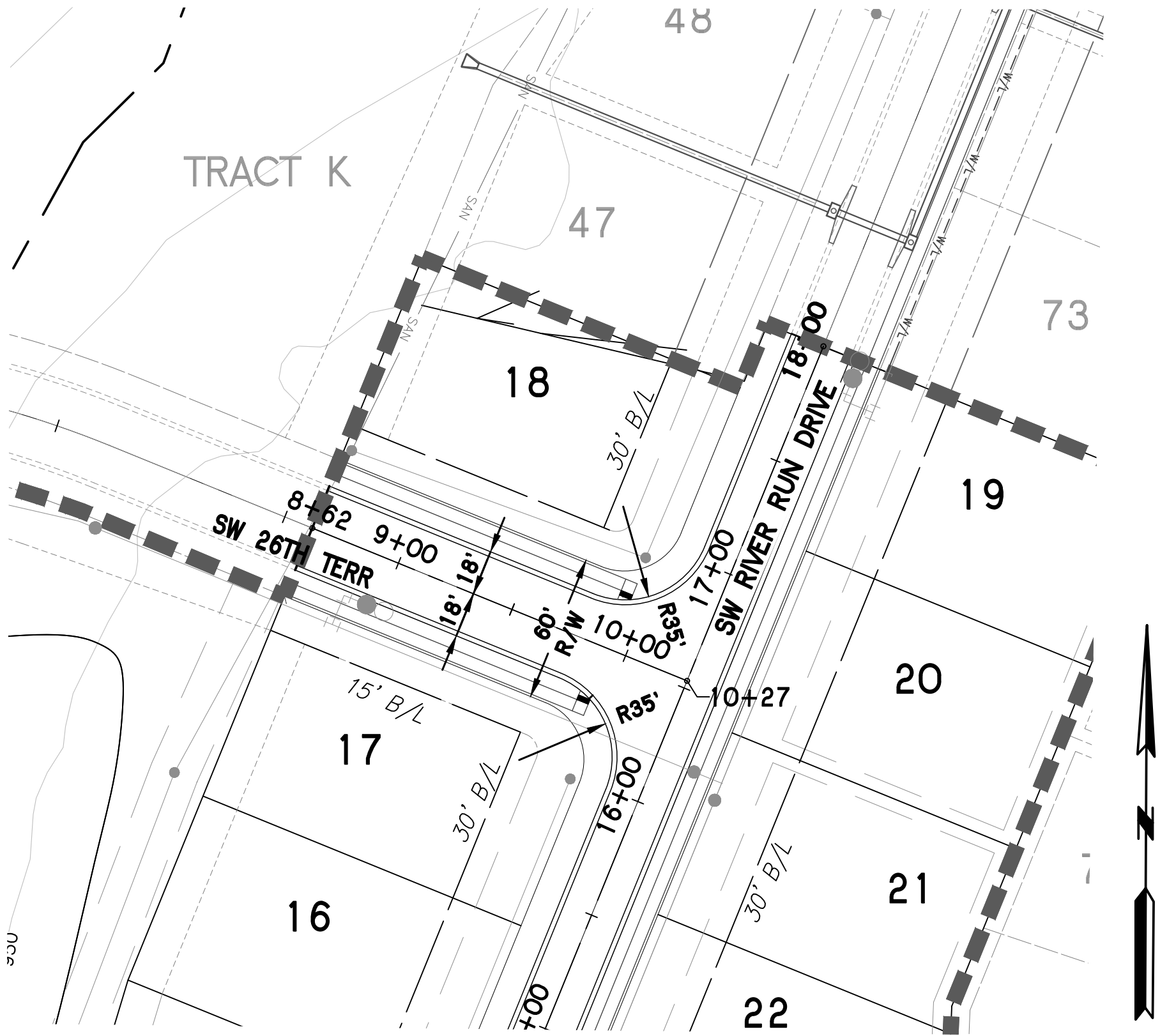
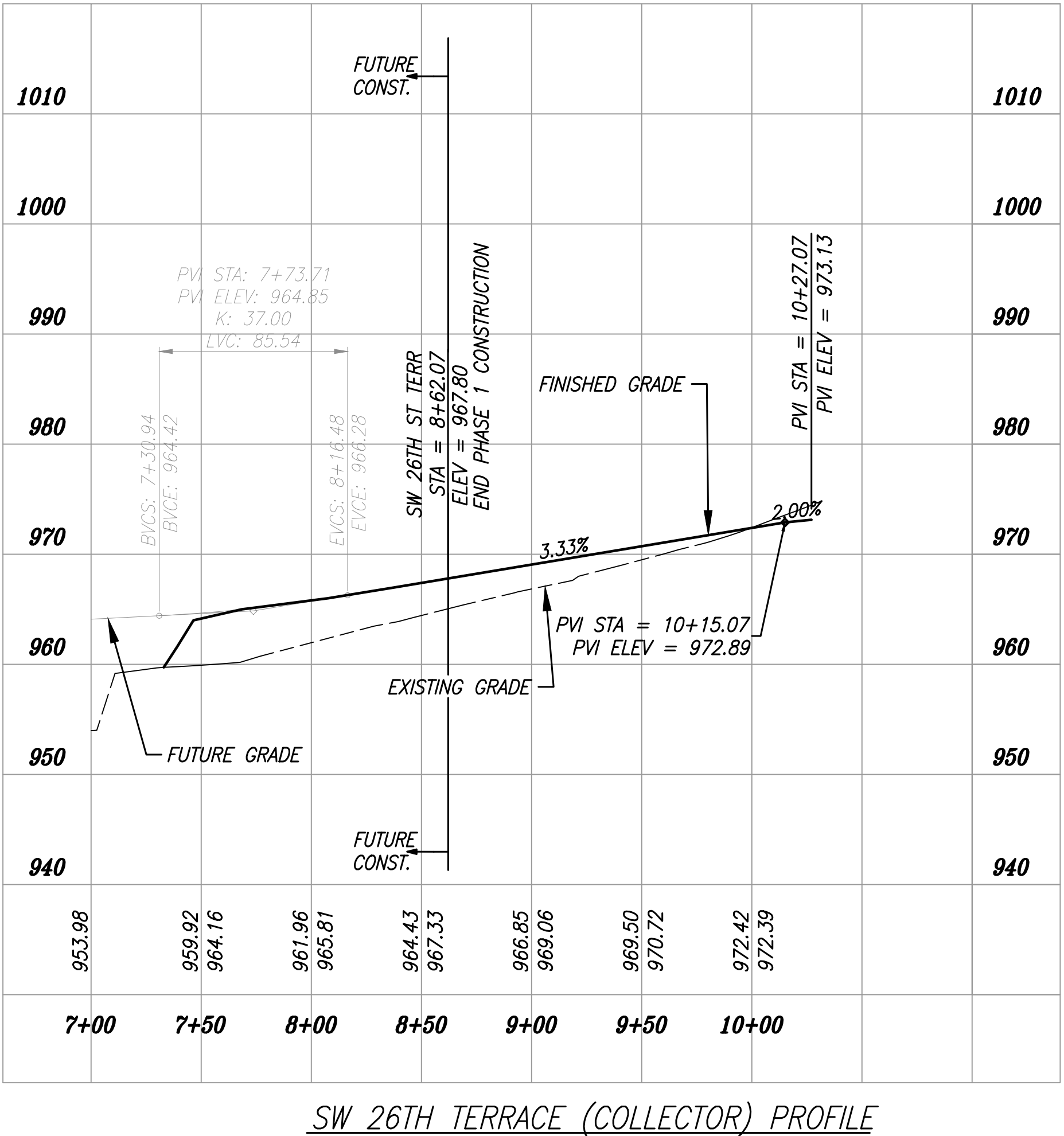
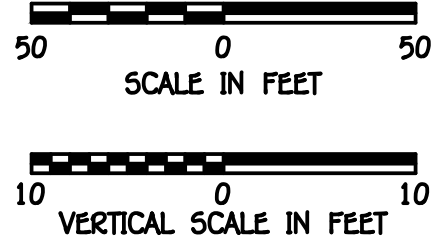
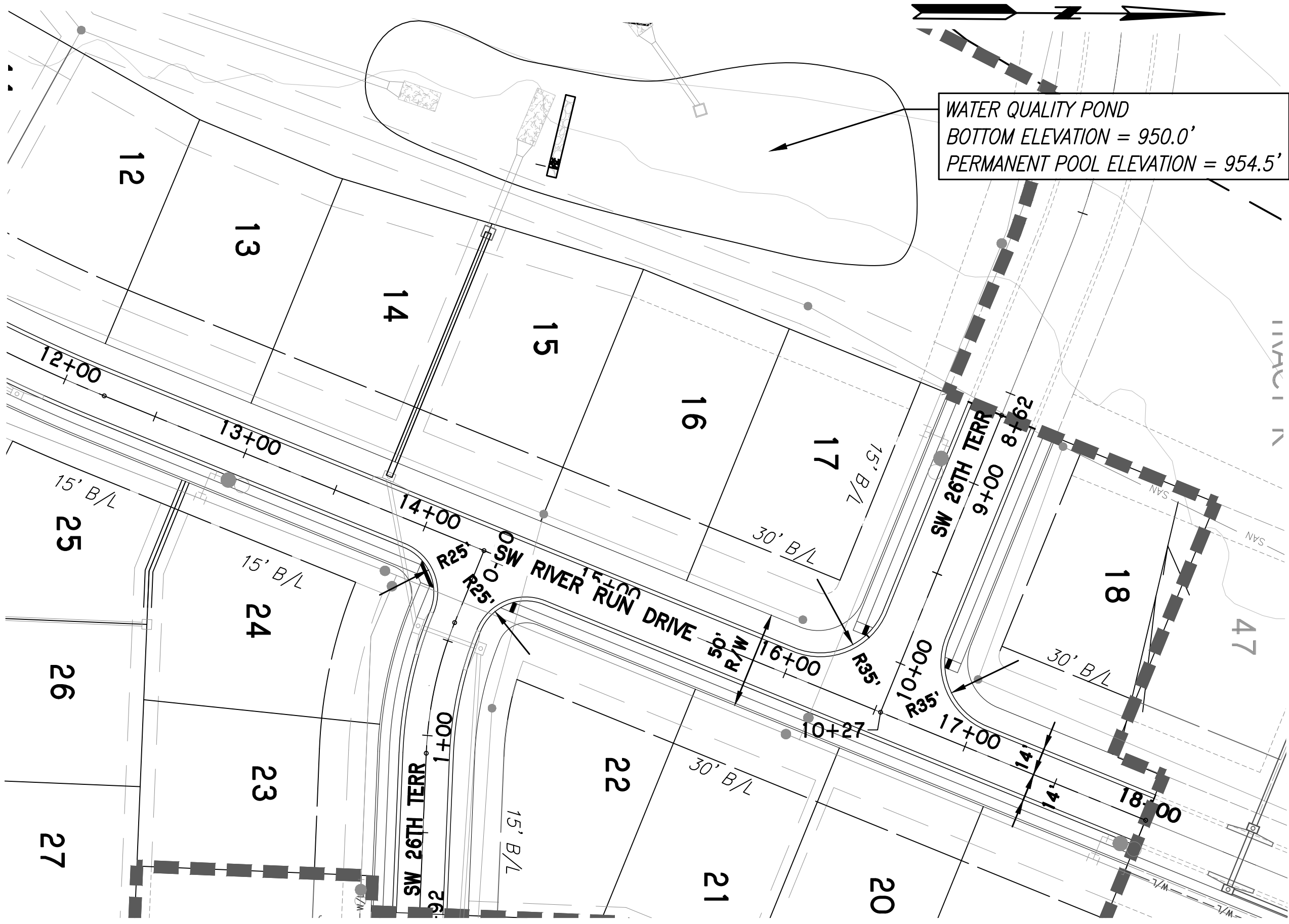
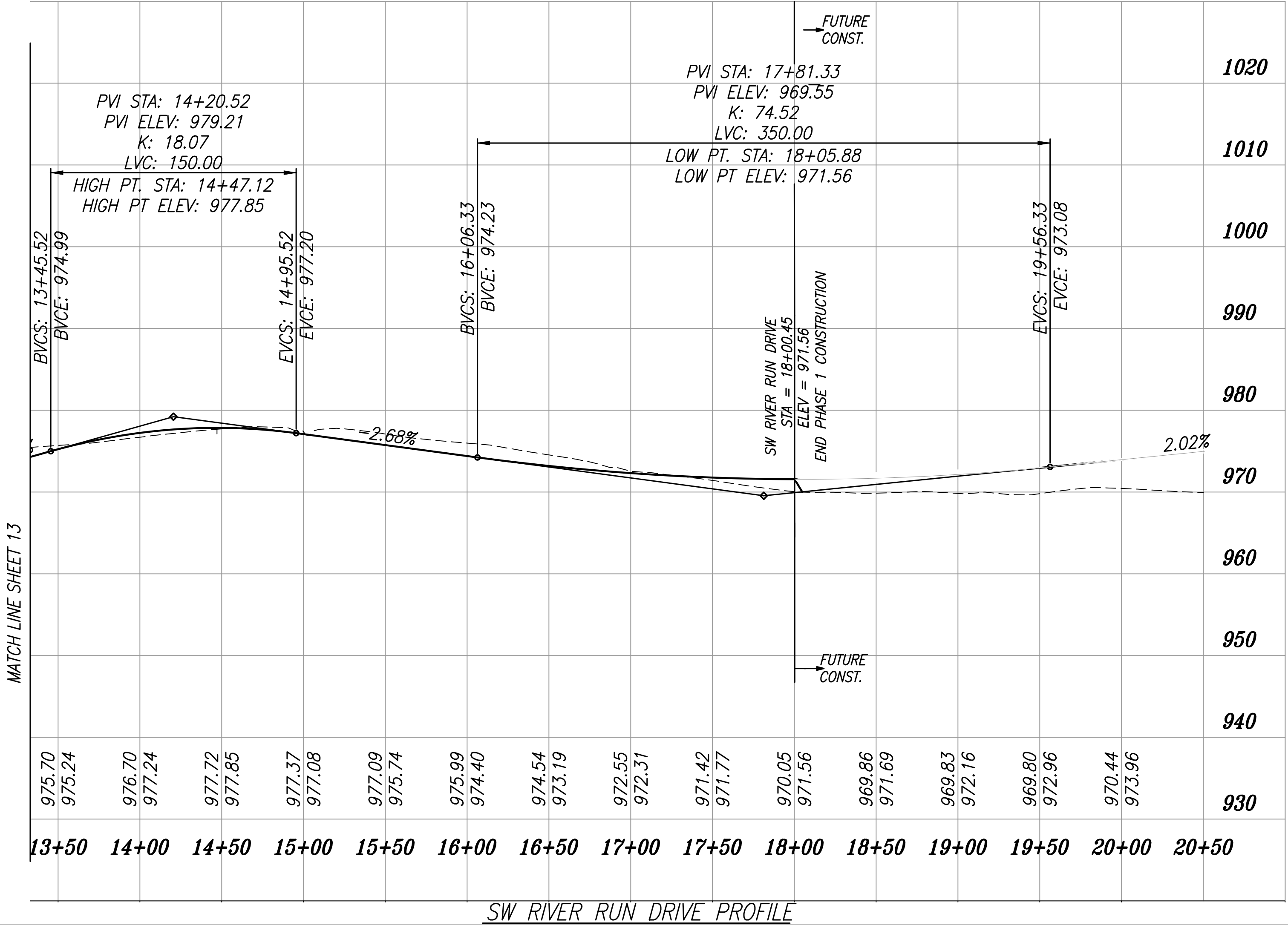
SHEET
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WHISPERING WOODS
LEE'S SUMMIT, JACKSON COUNTY, MO
STREET & STORM SEWER PLANS
STREET PLAN & PROFILE

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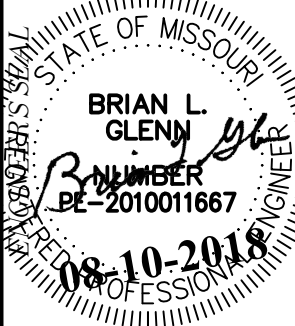
BRIAN L. GLENN
PE 2010011687
K.S. E-863
LS-13-38

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3833 S. NORTHERN BLVD.
INDEPENDENCE, MO 64602
(816) 743-9000 FAX: (816) 743-9700
ENGINEERING CERTIFICATE NO.: MO E-2000151302-D
SURVEYING CERTIFICATE NO.: MO LS-2000151303-D



WHISPERING WOODS
LEE'S SUMMIT, JACKSON COUNTY, MO
STREET & STORM SEWER PLANS
STREET PLAN & PROFILE

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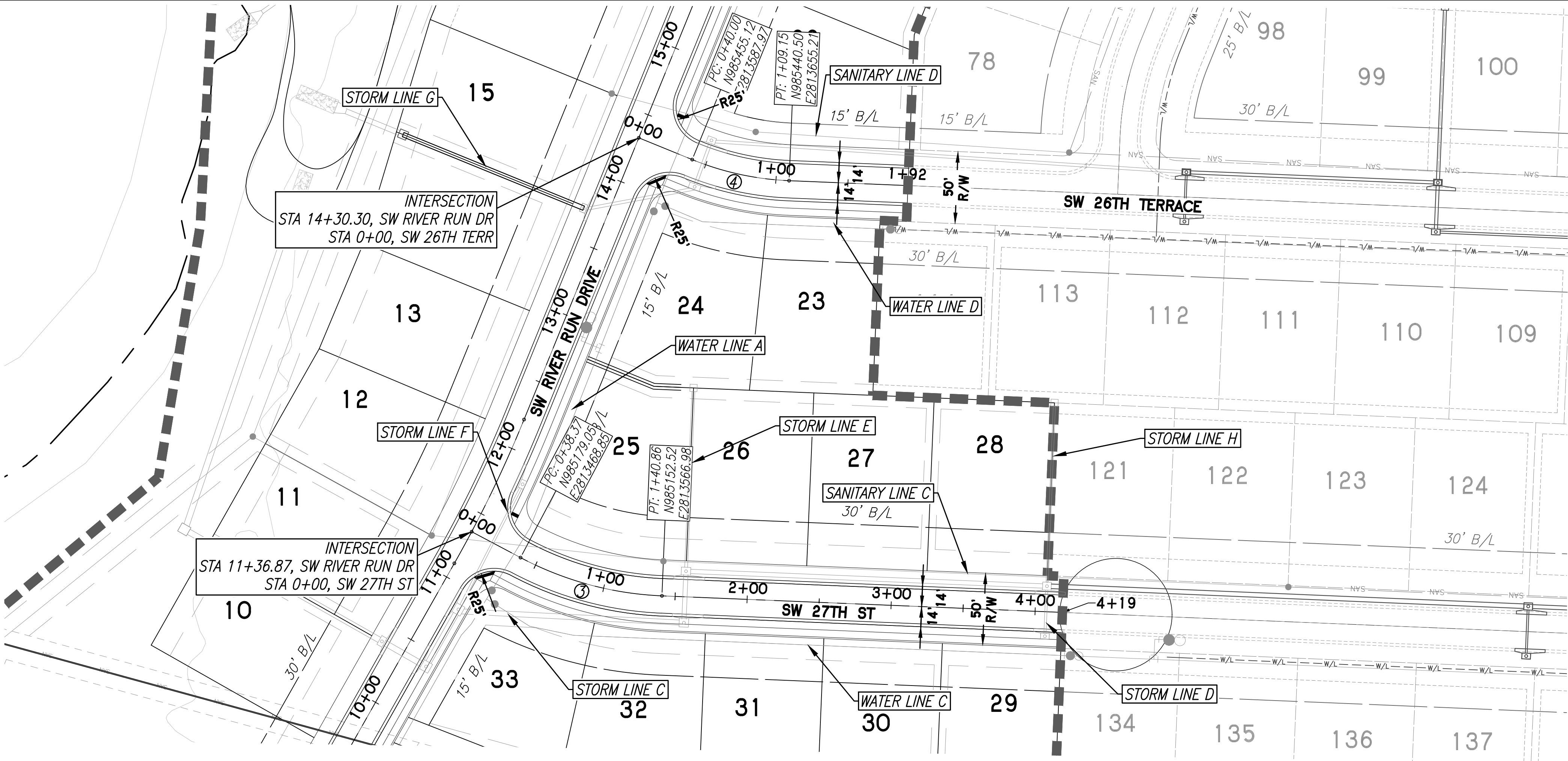


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& SURVEYING, LLC

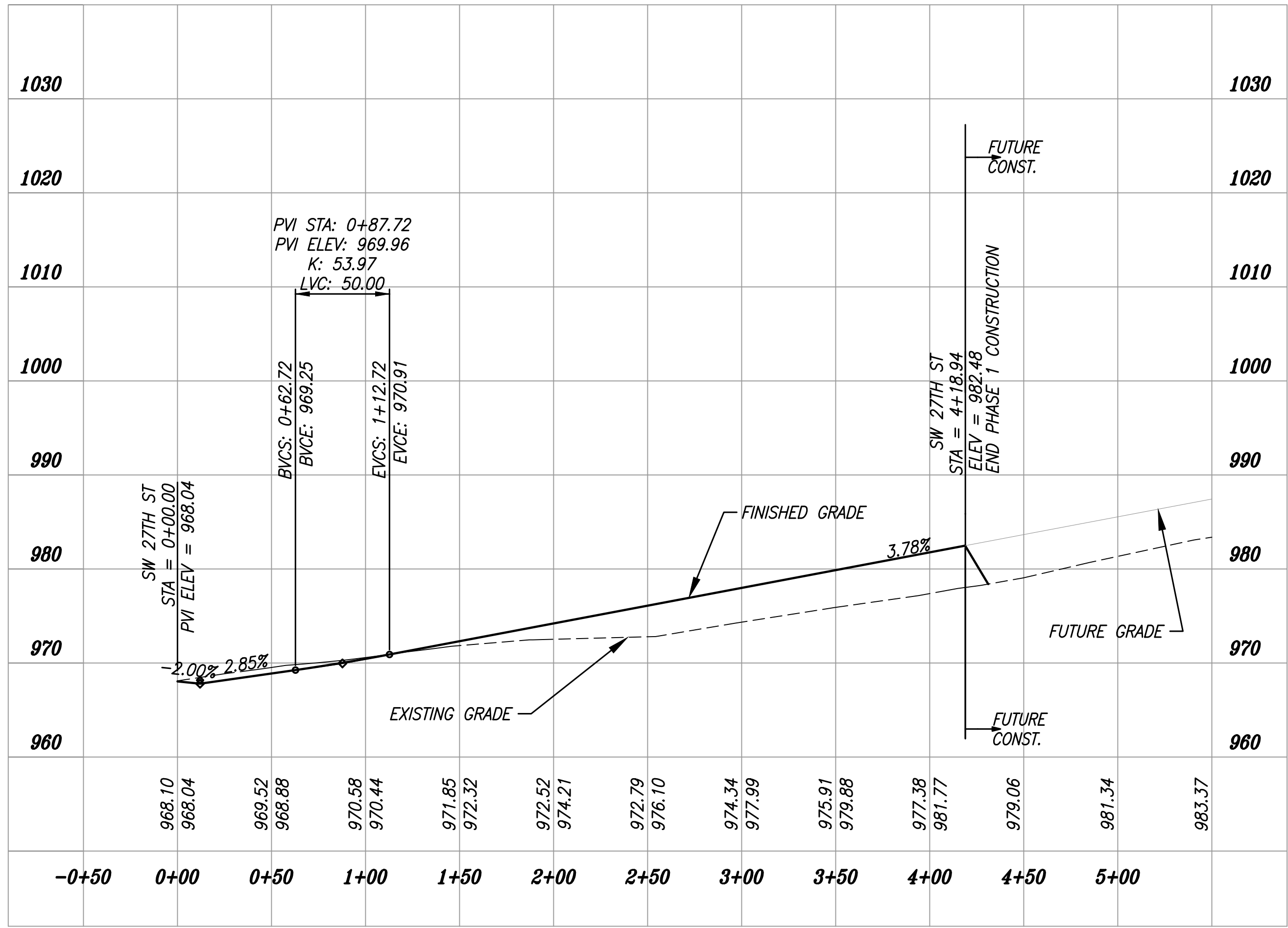
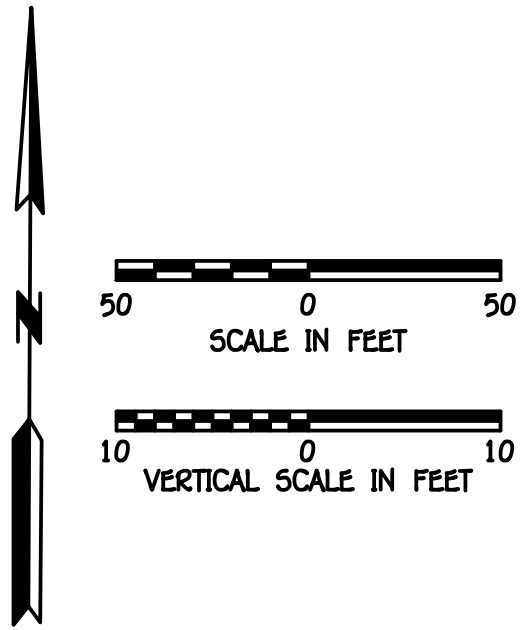
3834 S. NORTHERN BLVD.
INDEPENDENCE, MO 64602
(816) 743-9700 FAX: (816) 743-9700
ENGINEERING CERTIFICATE NO: MO E-2000151302-D
SURVEYING CERTIFICATE NO: MO LS-2000151303-D

BRIAN L. GLENN
MO PE 2010011667
AS AGENT OF
PHOENIX ENGINEERING
& SURVEYING, LLC

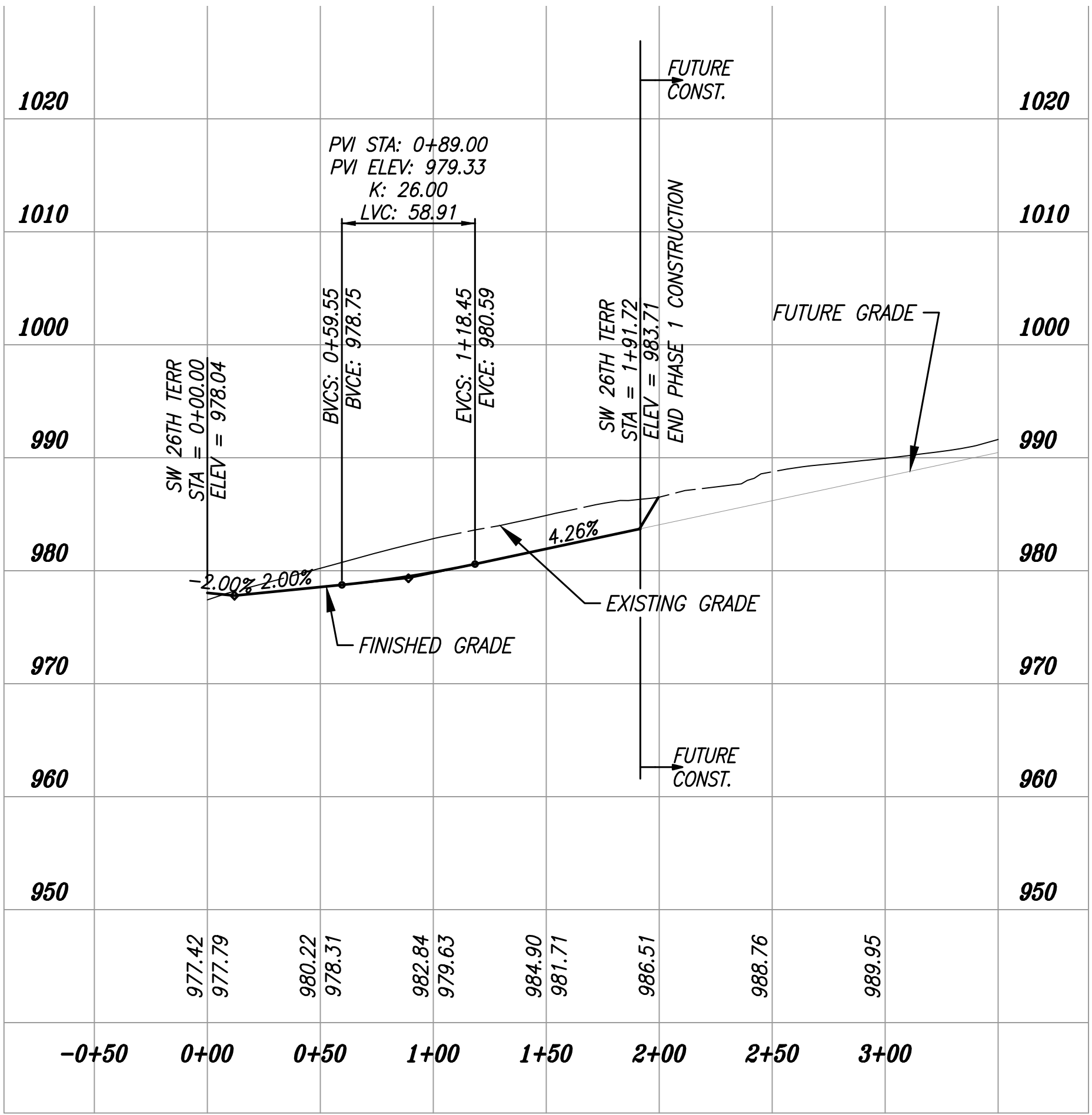
REVISION



CURVE DATA	
CURVE NO. ③	CURVE NO. ④
P.I. STA = 1+92.97	P.I. STA = 1+44.07
$\Delta = 25^{\circ}31'58''$	$\Delta = 19^{\circ}48'33''$
$R = 230.00'$	$R = 200.00'$
$T = 52.11'$	$T = 34.92'$
$L = 102.50'$	$L = 69.15'$



SW 27TH ST PROFILE



SW 26TH TERRACE PROFILE

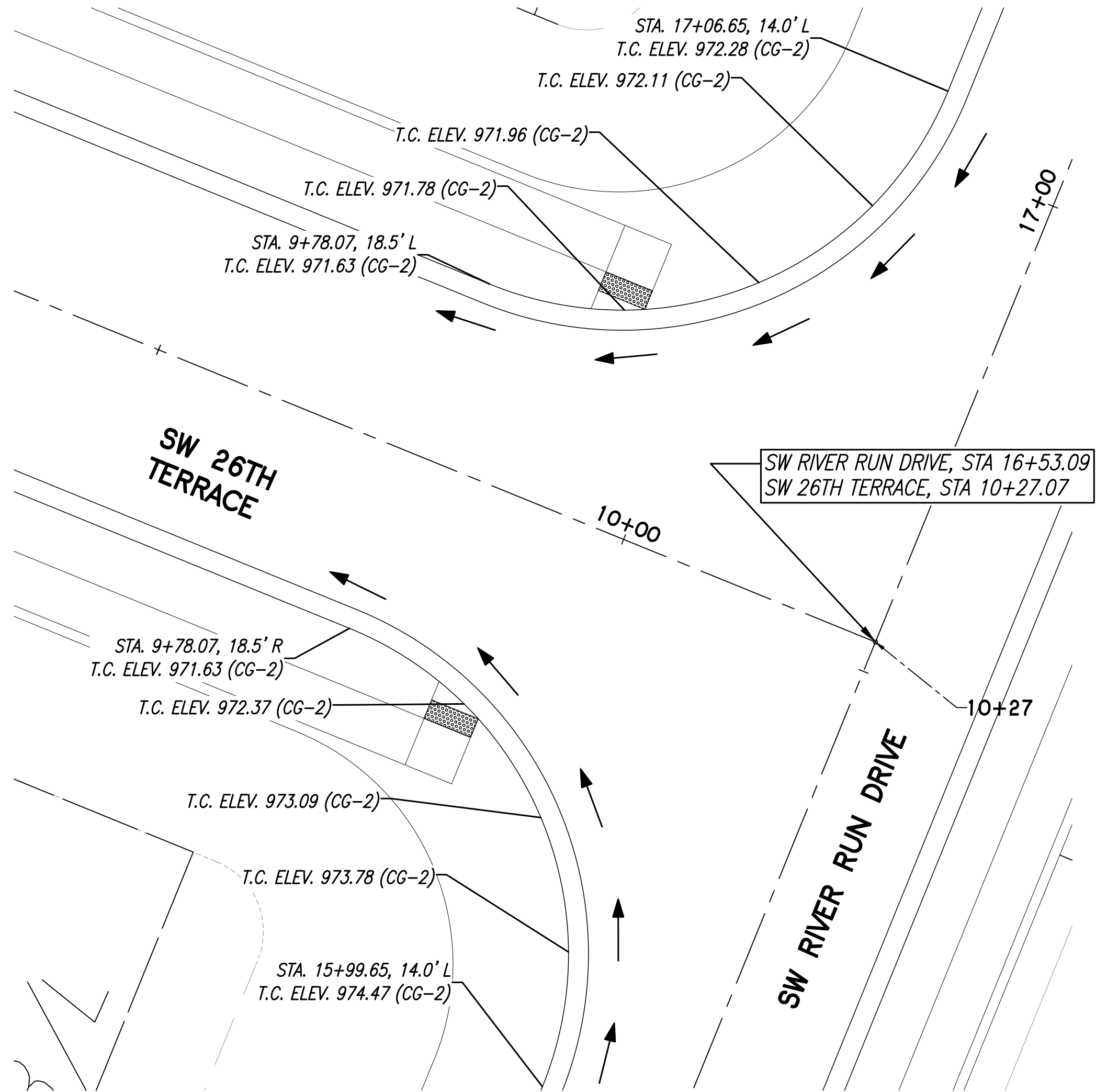
REVISION



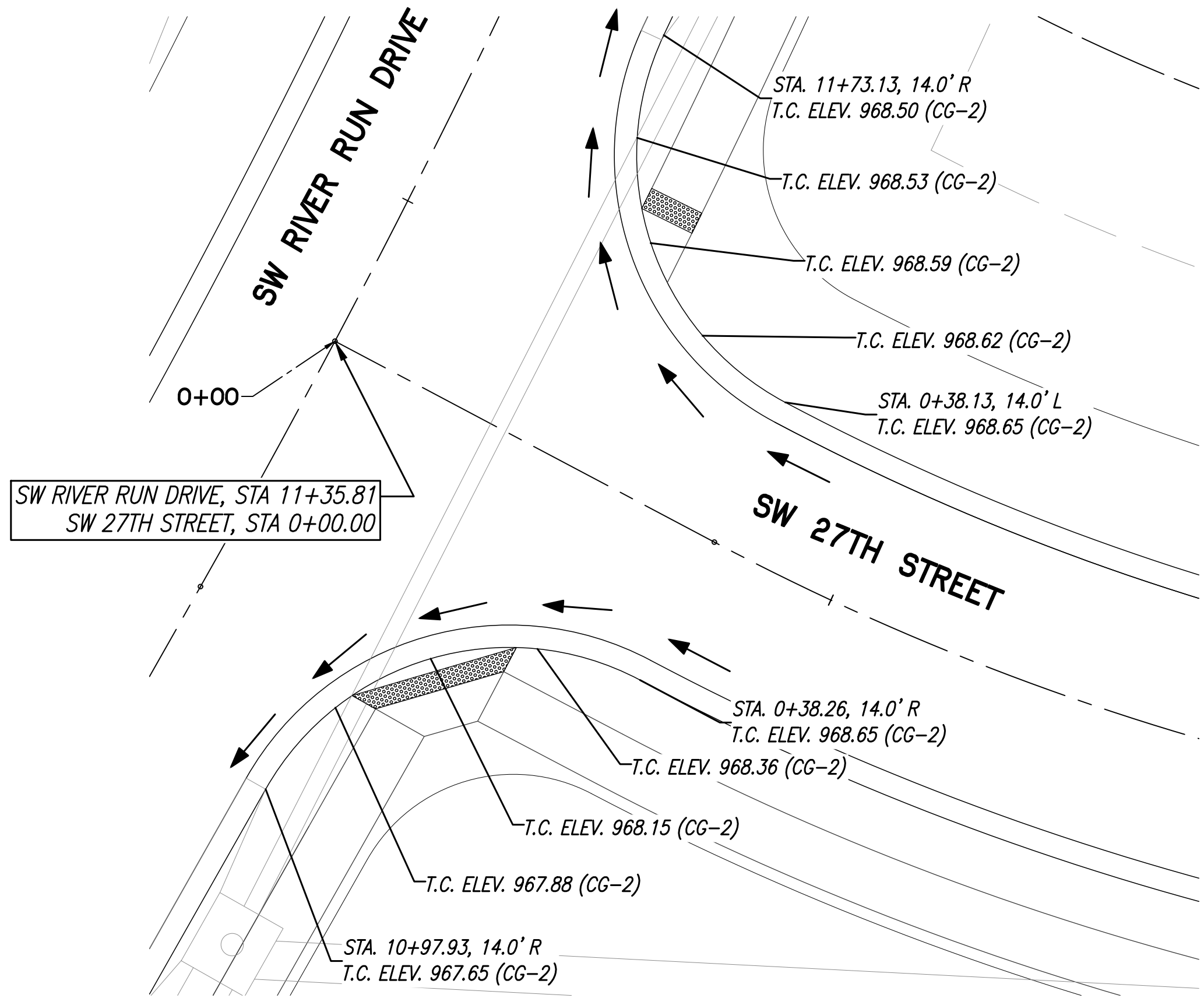
PHOENIX ENGINEERING & SURVEYING, LLC
3833 S. NORTHERN BLVD.
INDEPENDENCE, MO 64602
(816) 743-9000 FAX: (816) 743-9700
ENGINEERING CERTIFICATE NO. MO E-2000151302-D KS: E-853
SURVEYING CERTIFICATE NO. MO LS-2000151303-D KS: LS-138

WHISPERING WOODS
LEE'S SUMMIT, JACKSON COUNTY, MO
STREET & STORM SEWER PLANS
STREET PLAN & PROFILE

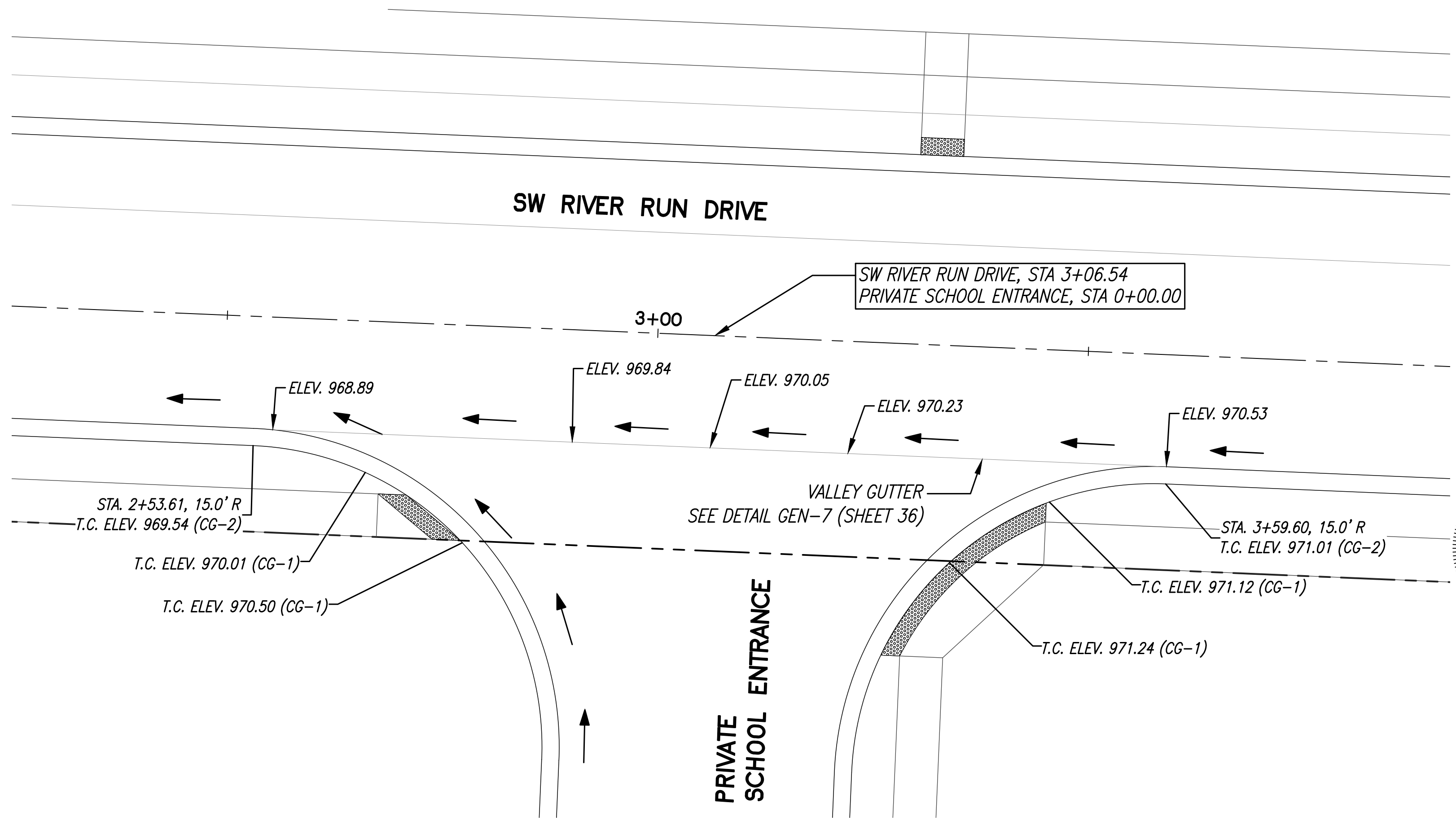
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DRAWN	BLG
SCALE	Noted
DATE	09-01-2017
JOB NO.	04078
SHEET	40



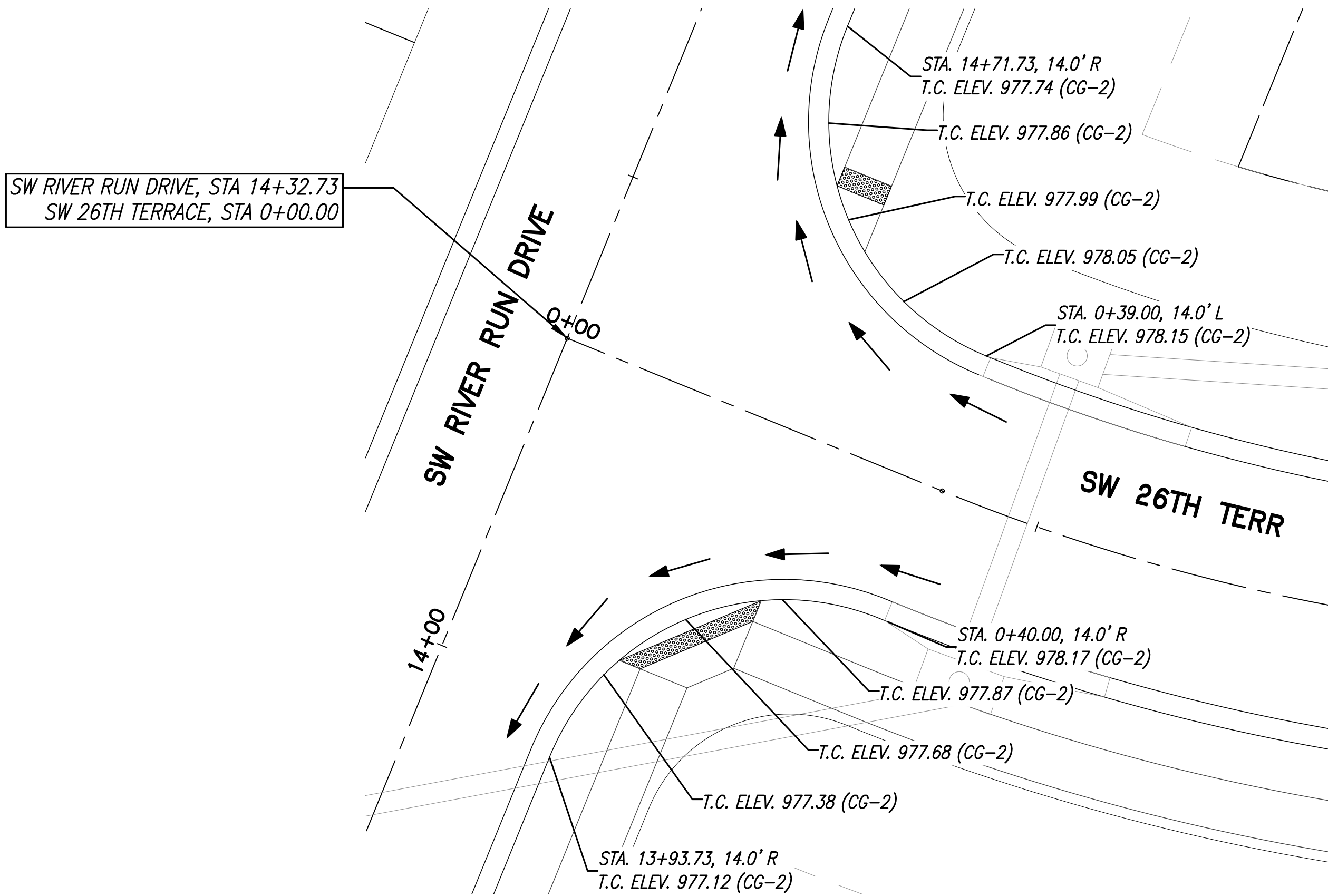
SW RIVER RUN DRIVE & SW 26TH ST DETAILS



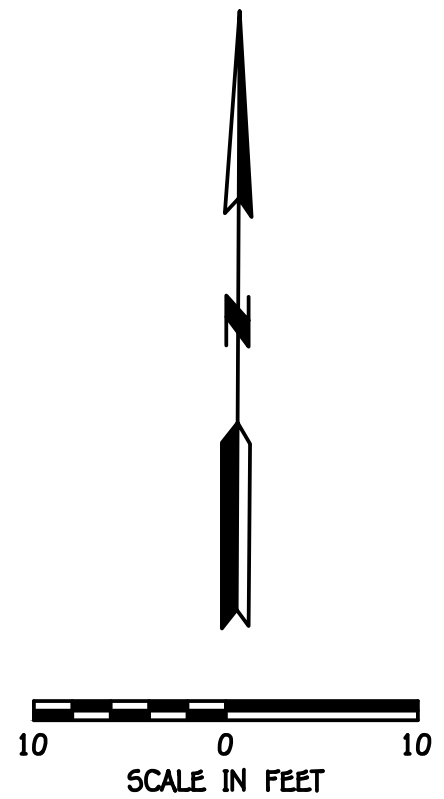
SW RIVER RUN DRIVE & SW 27TH ST DETAILS



SW RIVER RUN DRIVE & SCHOOL ENTRANCE DETAILS



SW RIVER RUN DRIVE & SW 26TH TERR DETAILS



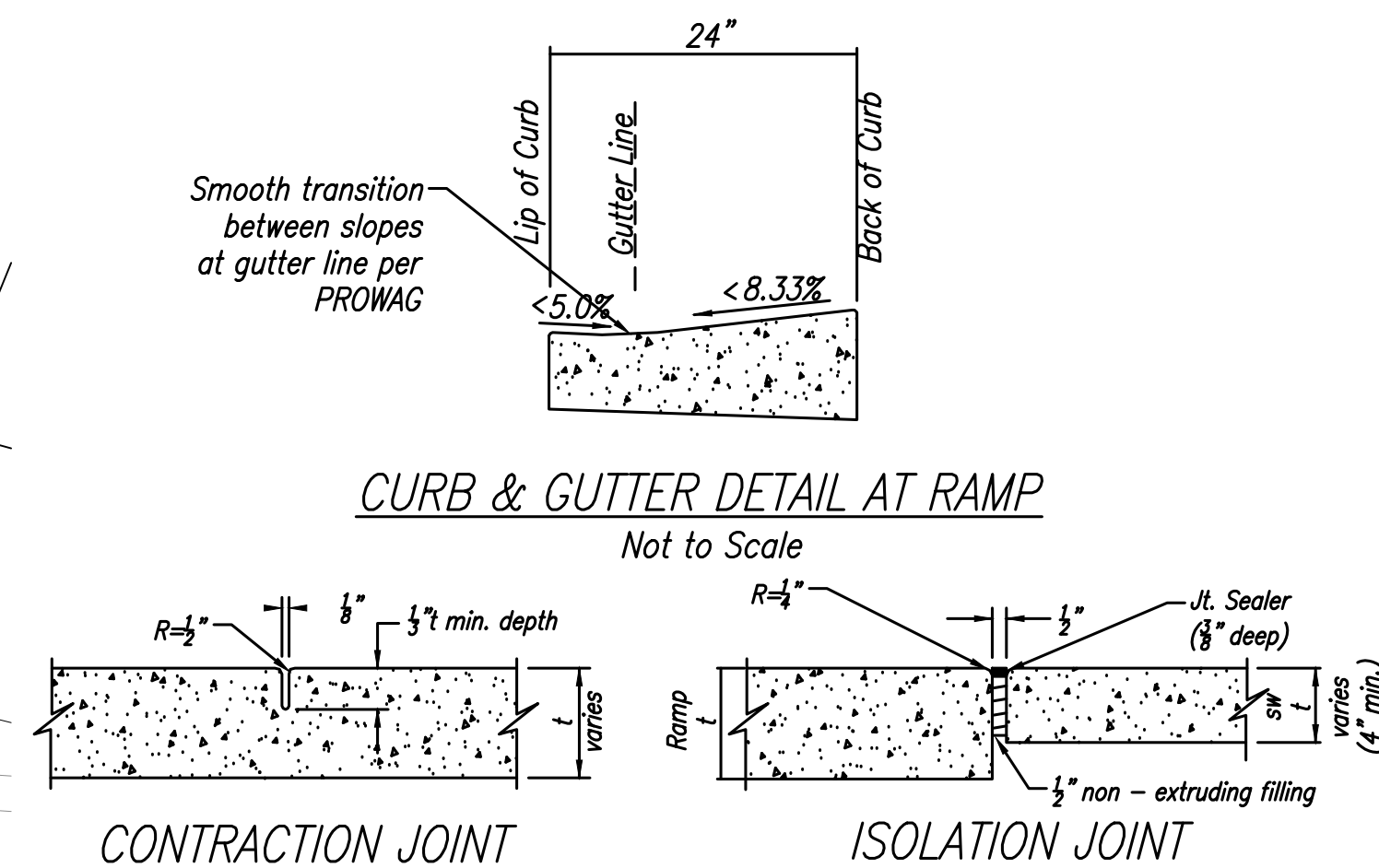
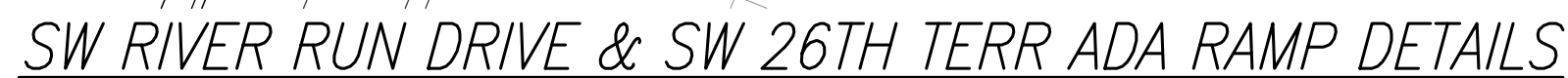
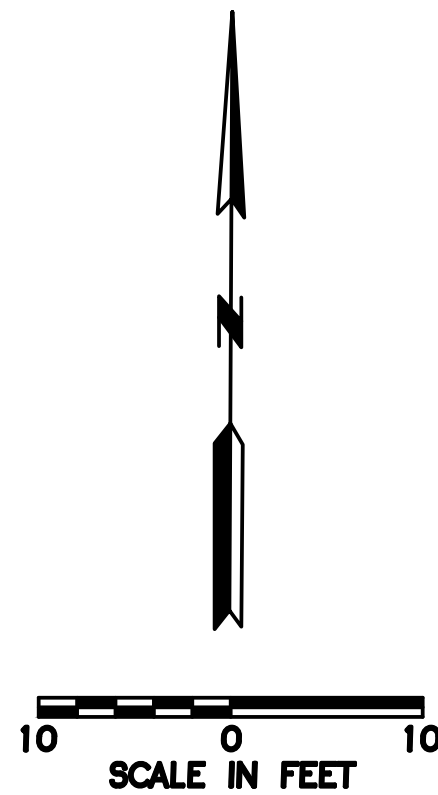
REVISION



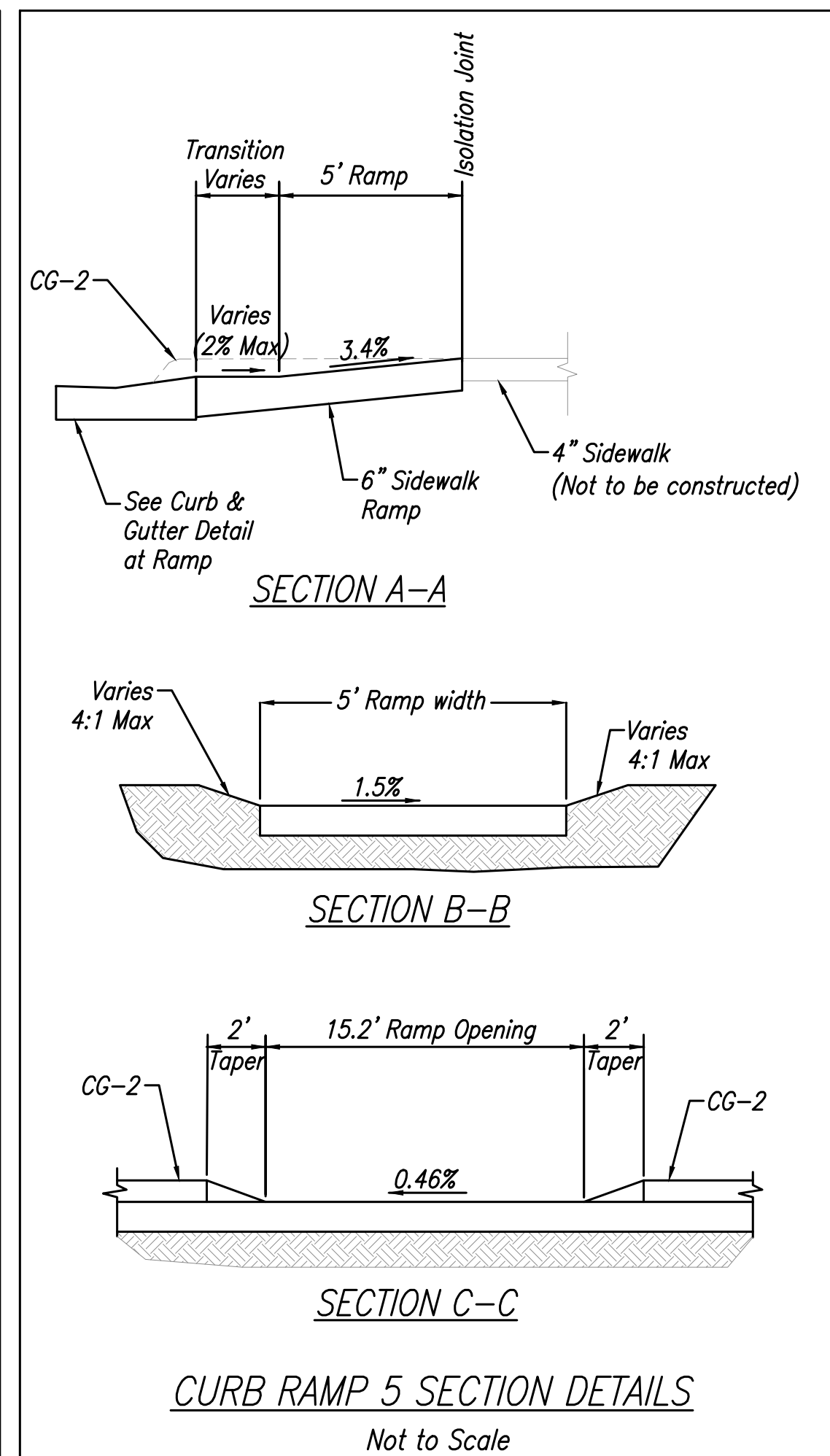
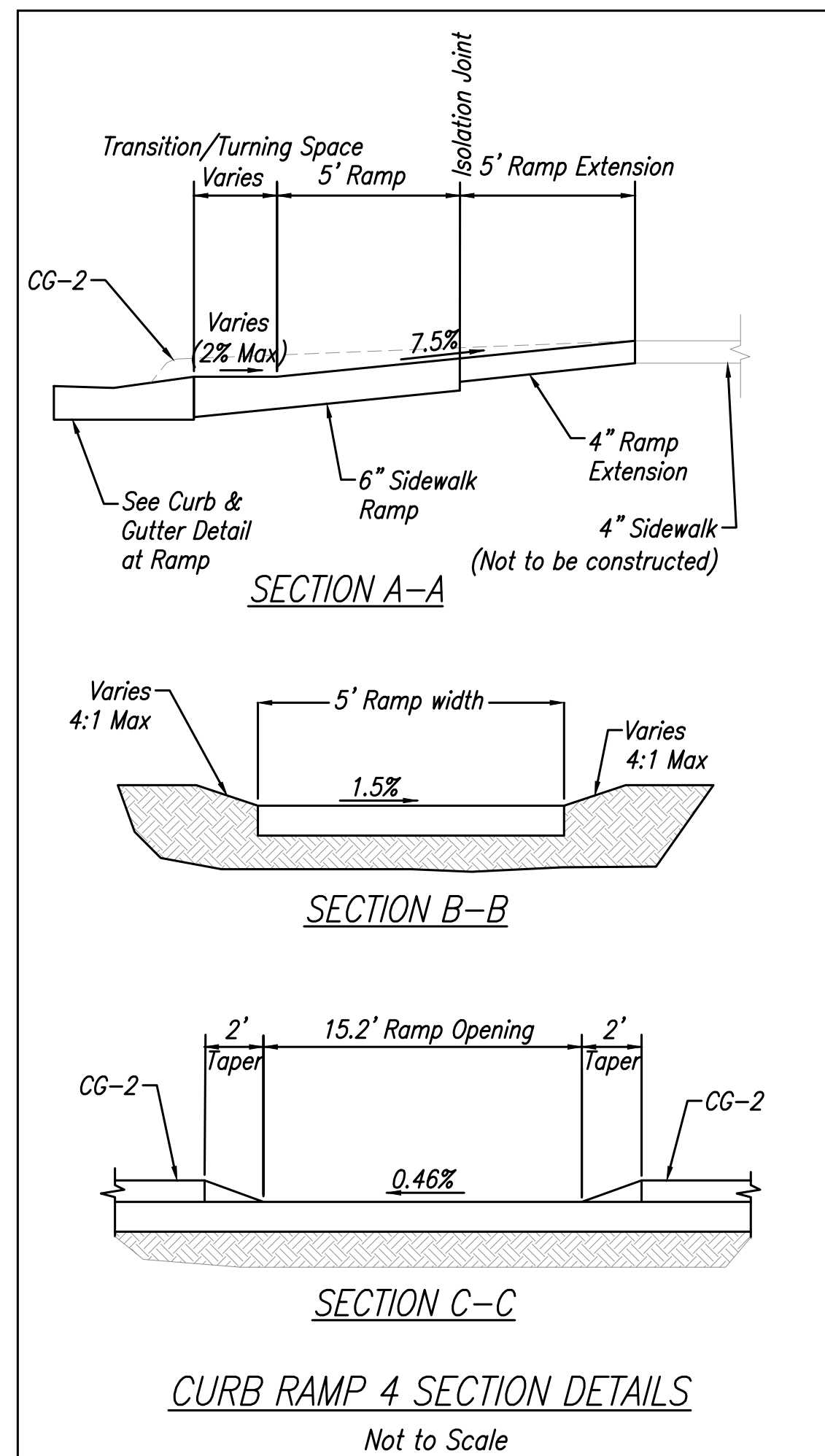
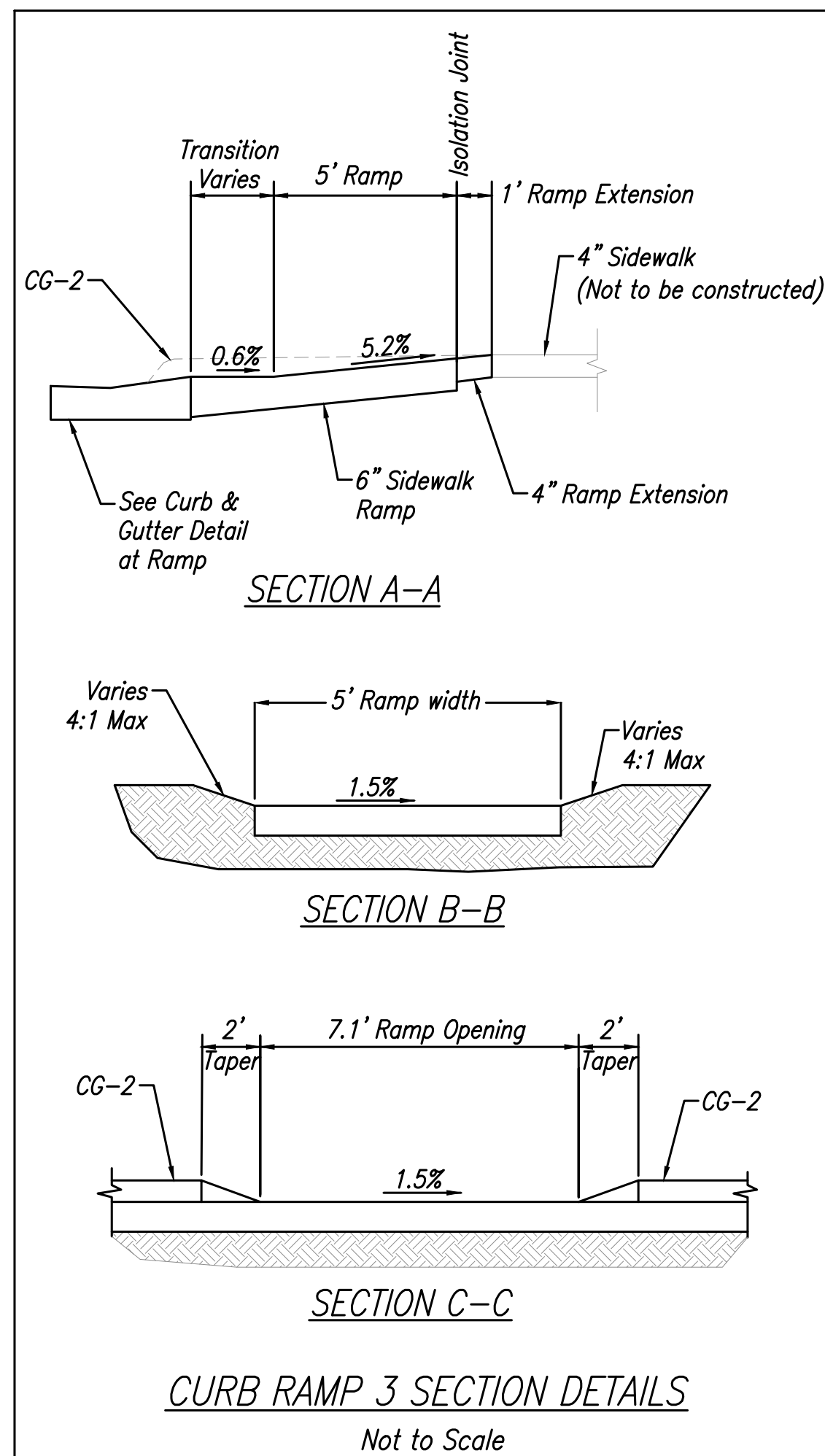
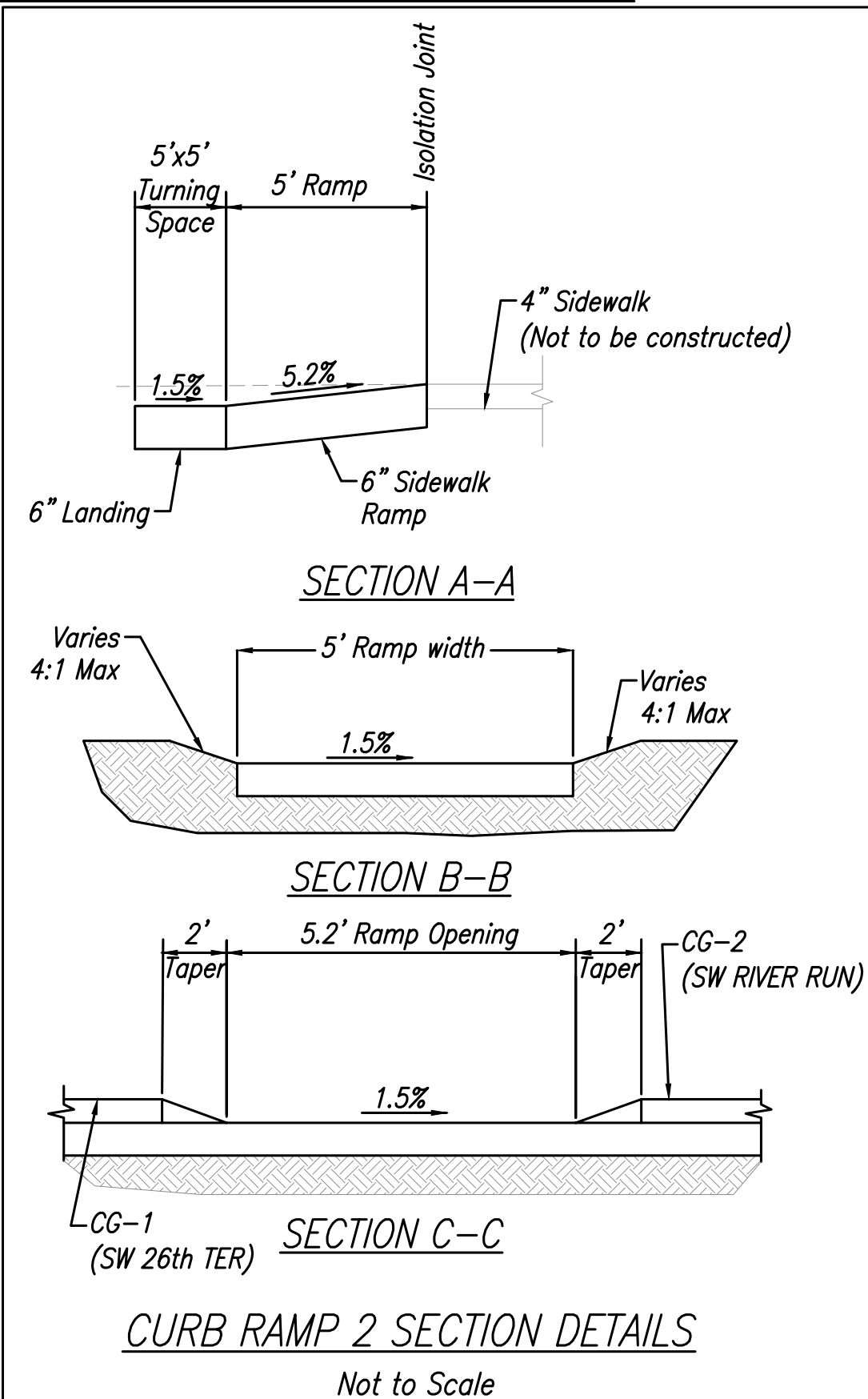
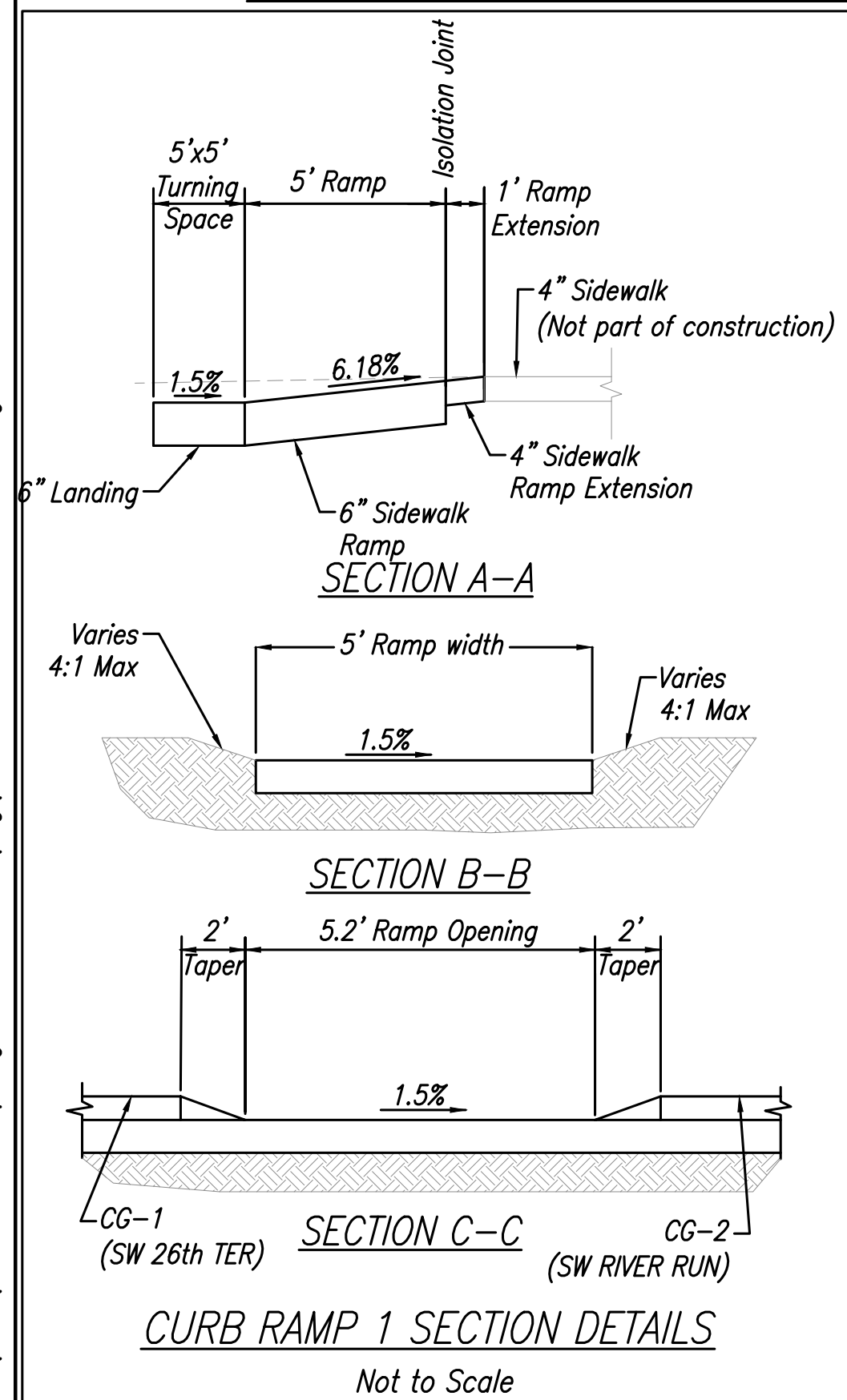
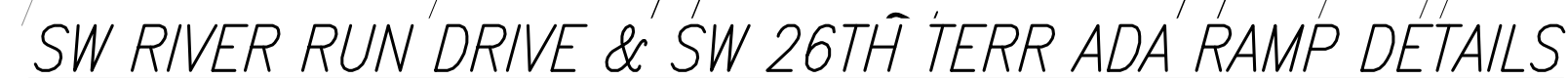
PHOENIX ENGINEERING & SURVEYING, LLC
3833 S. NORTHERN BLVD.
INDEPENDENCE, MO 64602
(816) 743-9000 FAX: (816) 743-9700
ENGINEERING CERTIFICATE NO: MO E-2000151302-D KS: E-853
SURVEYING CERTIFICATE NO: MO LS-2000151303-D KS: LS-138

WHISPERING WOODS
LEE'S SUMMIT, JACKSON COUNTY, MO
STREET & STORM SEWER PLANS
INTERSECTION DETAILS

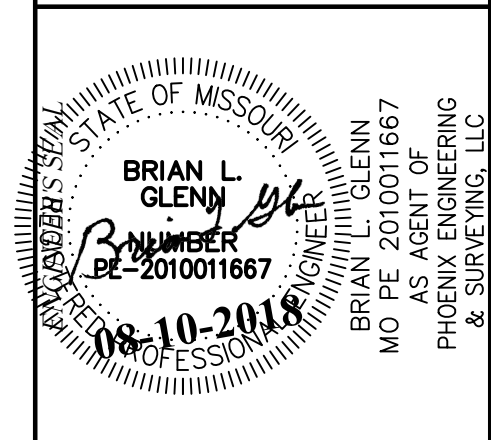
DESIGNED	BLG
DRAWN	BLG
SCALE	Noted
DATE	09-01-2017
JOB NO.	04078
SHEET	40



<i>STREET CROSSING SPOT ELEVATION TABLE</i>		
	<i>CROSSWALK 1</i>	<i>CROSSWALK 2</i>
<i>SPOT</i>	<i>ELEVATION</i>	<i>ELEVATION</i>
<i>A</i>	<i>971.43</i>	<i>977.64</i>
<i>B</i>	<i>971.74</i>	<i>977.65</i>
<i>C</i>	<i>972.04</i>	<i>977.70</i>
<i>D</i>	<i>971.97</i>	<i>977.53</i>
<i>E</i>	<i>971.93</i>	<i>977.34</i>
<i>F</i>	<i>971.51</i>	<i>977.69</i>
<i>G</i>	<i>971.82</i>	<i>977.73</i>
<i>H</i>	<i>972.12</i>	<i>977.78</i>
<i>I</i>	<i>972.48</i>	<i>977.61</i>
<i>J</i>	<i>972.01</i>	<i>977.44</i>



REVISION



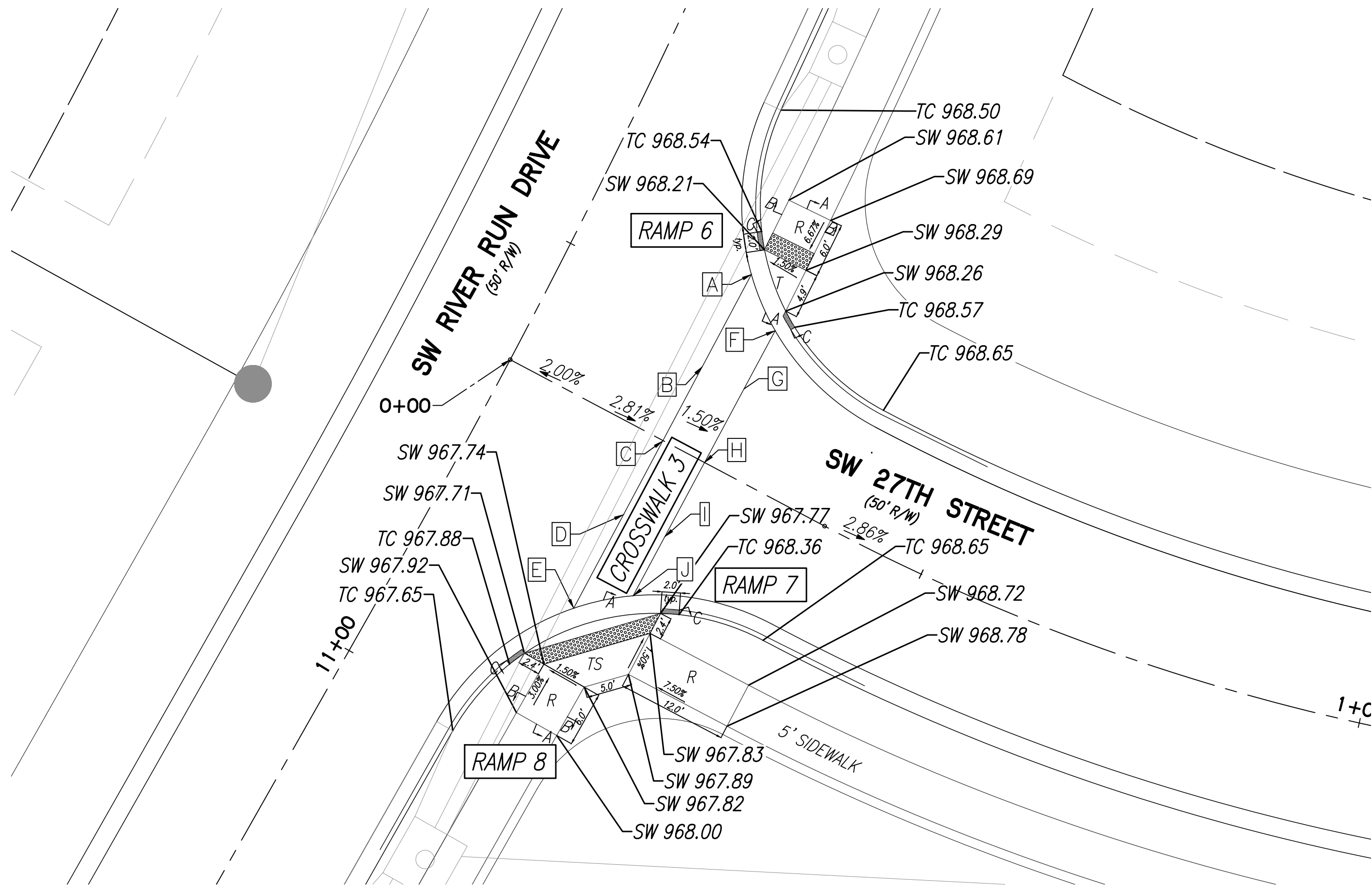
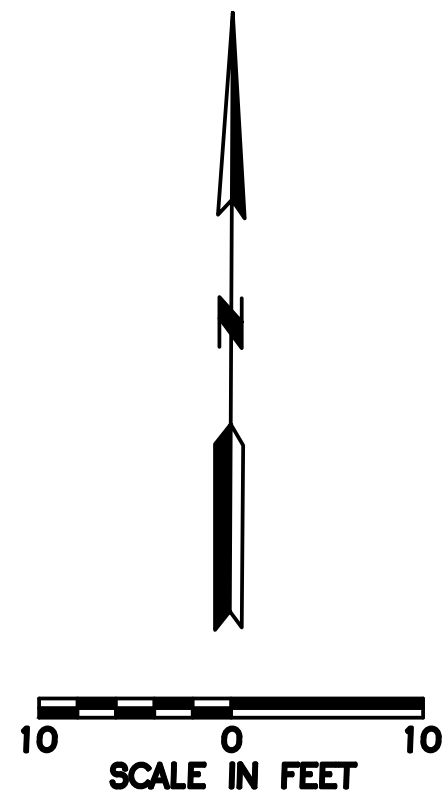
PHOENIX ENGINEERING
& SURVEYING, LLC

3835 S. NORTHERN BLVD.
INDEPENDENCE, MO 64052
(816) 743-9000 FAX: (816) 743-9700
ENGINEERING CERTIFICATE NO: MO E-2000151302-D
SURVEYING CERTIFICATE NO: MO LS-2000151303-D
KS: E-853
KS: LS-138

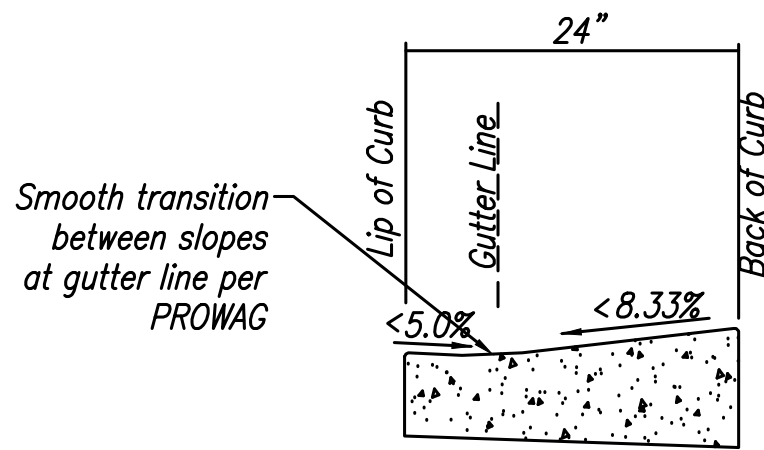
WHISPERING WOODS
LEE'S SUMMIT, JACKSON COUNTY, MO
STREET & STORM SEWER PLANS
ADA RAMP DETAILS

DESIGNED
BLG
DRAWN
BLG
SCALE
Noted
DATE
09-01-2017
JOB NO.
04078
SHEET

NOTE:
CONTRACTOR SHALL
INSTALL ALL ADA RAMPS.

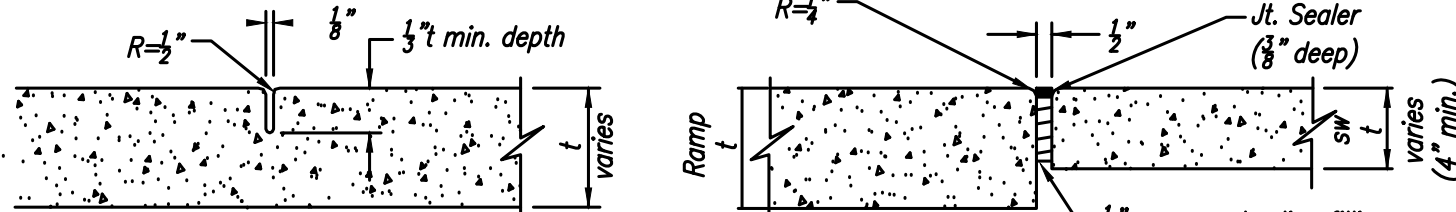


SW RIVER RUN DRIVE & SW 27TH ST ADA RAMP DETAILS



CURB & GUTTER DETAIL AT RAMP

Not to Scale



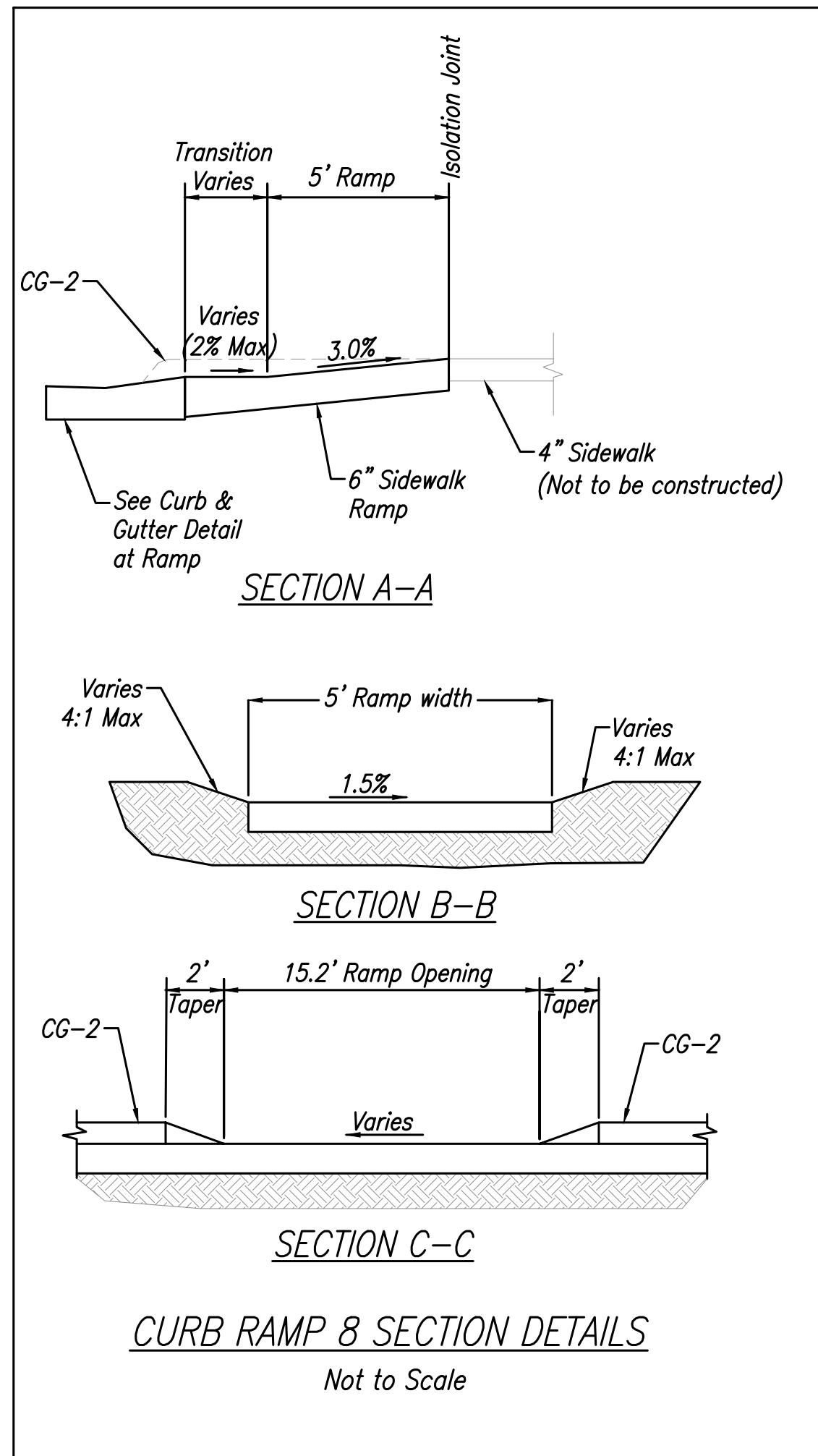
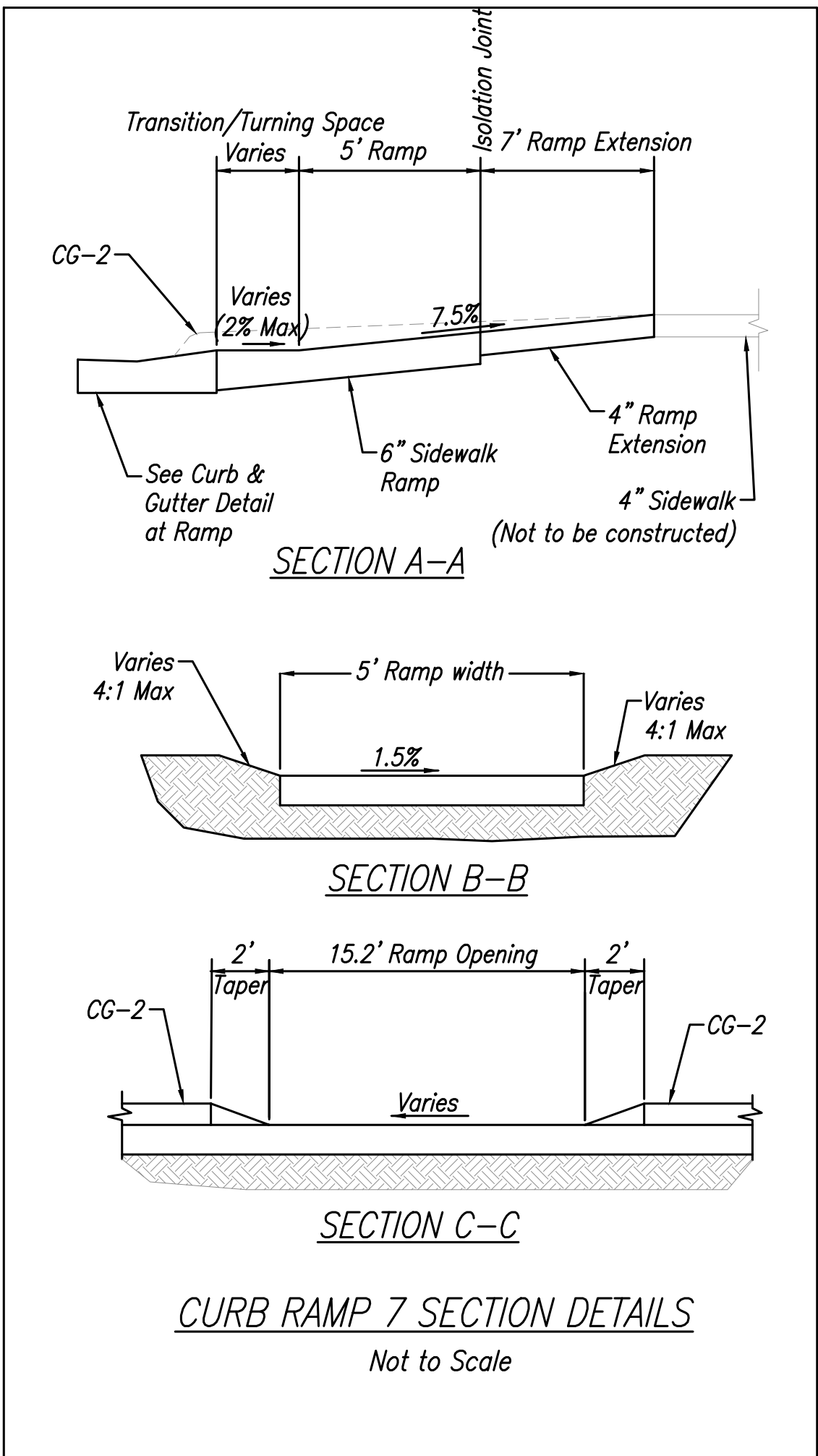
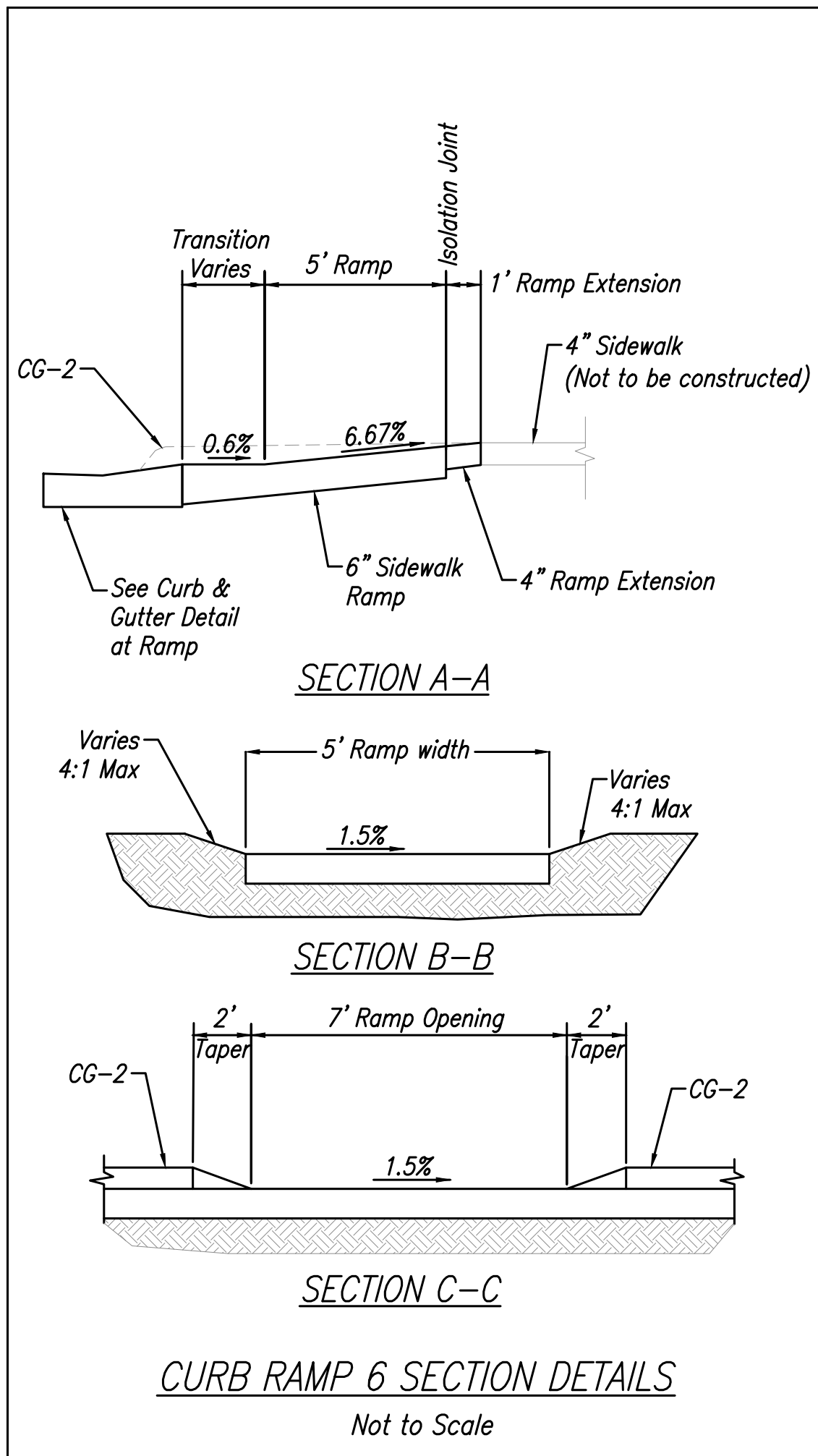
CONTRACTION JOINT

ISOLATION JOINT

JOINT DETAILS

Not to Scale

SPOT ELEVATION TABLE	
SPOT	CROSSWALK 3 ELEVATION
A	968.22
B	968.08
C	968.02
D	967.91
E	967.76
F	968.29
G	968.16
H	968.10
I	967.99
J	967.80



REVISION



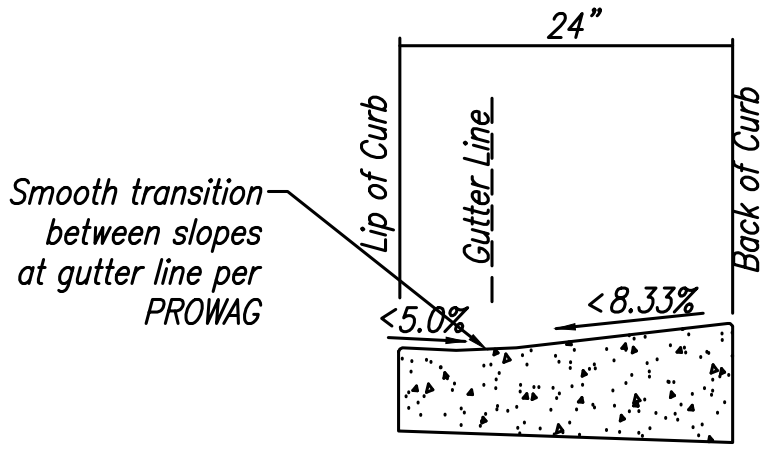
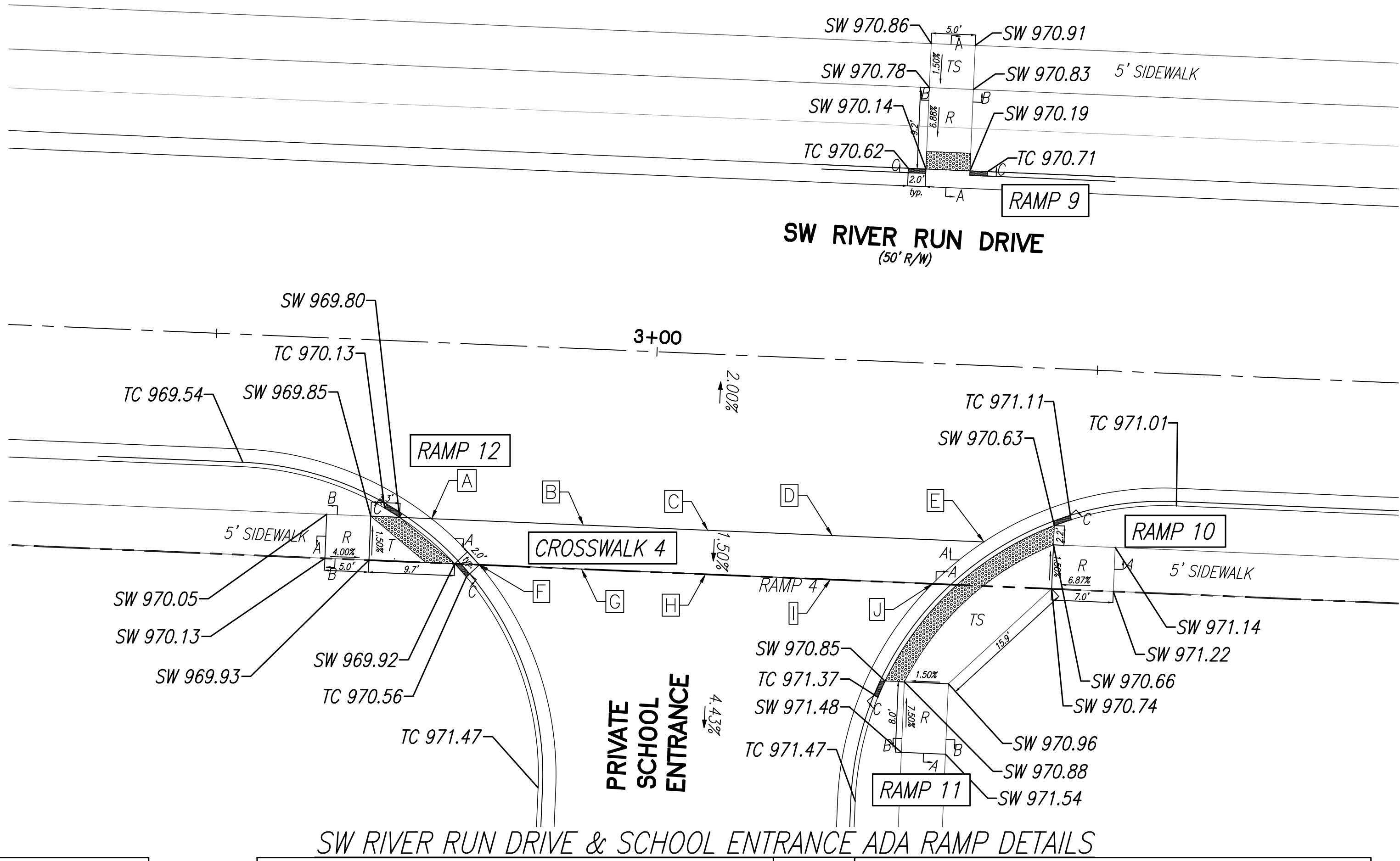
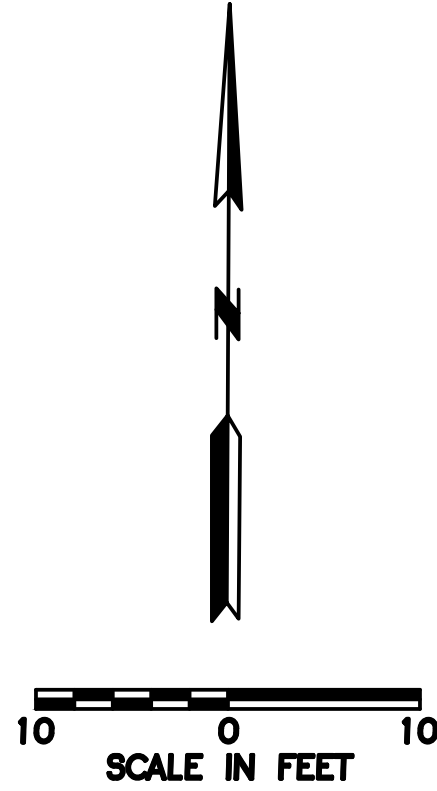
PHOENIX ENGINEERING
& SURVEYING, LLC

3833 S. NORTHERN BLVD.
INDEPENDENCE, MO 64602
(816) 743-9000 FAX: (816) 743-9700
ENGINEERING CERTIFICATE NO: MO E-2000151302-D KS: E-853
SURVEYING CERTIFICATE NO: MO LS-2000151303-D KS: LS-138

WHISPERING WOODS
LEE'S SUMMIT, JACKSON COUNTY, MO
STREET & STORM SEWER PLANS
ADA RAMP DETAILS

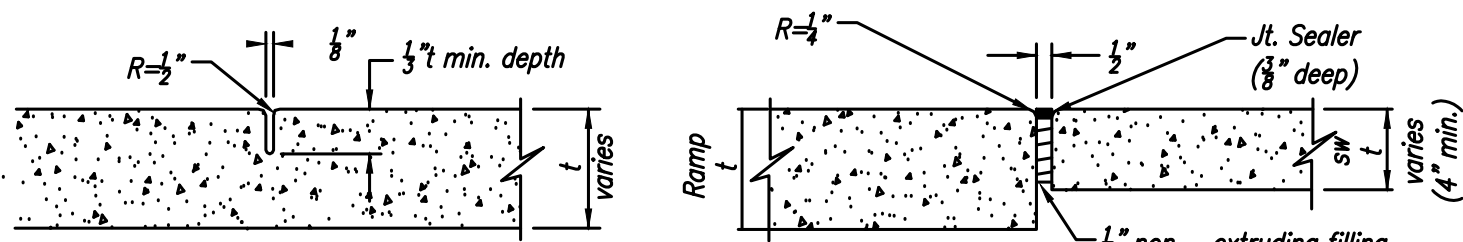
DESIGNED
BLG
DRAWN
JRT
SCALE
Noted
DATE
09-01-2017
JOB NO.
04078
SHEET

NOTE:
CONTRACTOR SHALL
INSTALL ALL ADA RAMP.



CURB & GUTTER DETAIL AT RAMP

Not to Scale



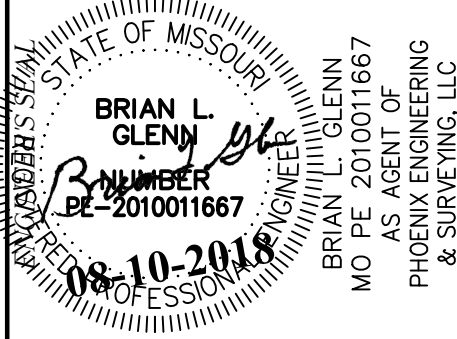
CONTRACTION JOINT

ISOLATION JOINT

JOINT DETAILS

Not to Scale

SPOT ELEVATION TABLE	
CROSSWALK 4	
SPOT	ELEVATION
A	969.80
B	970.10
C	970.21
D	970.43
E	970.70
F	970.90
G	970.18
H	970.29
I	970.51
J	970.75

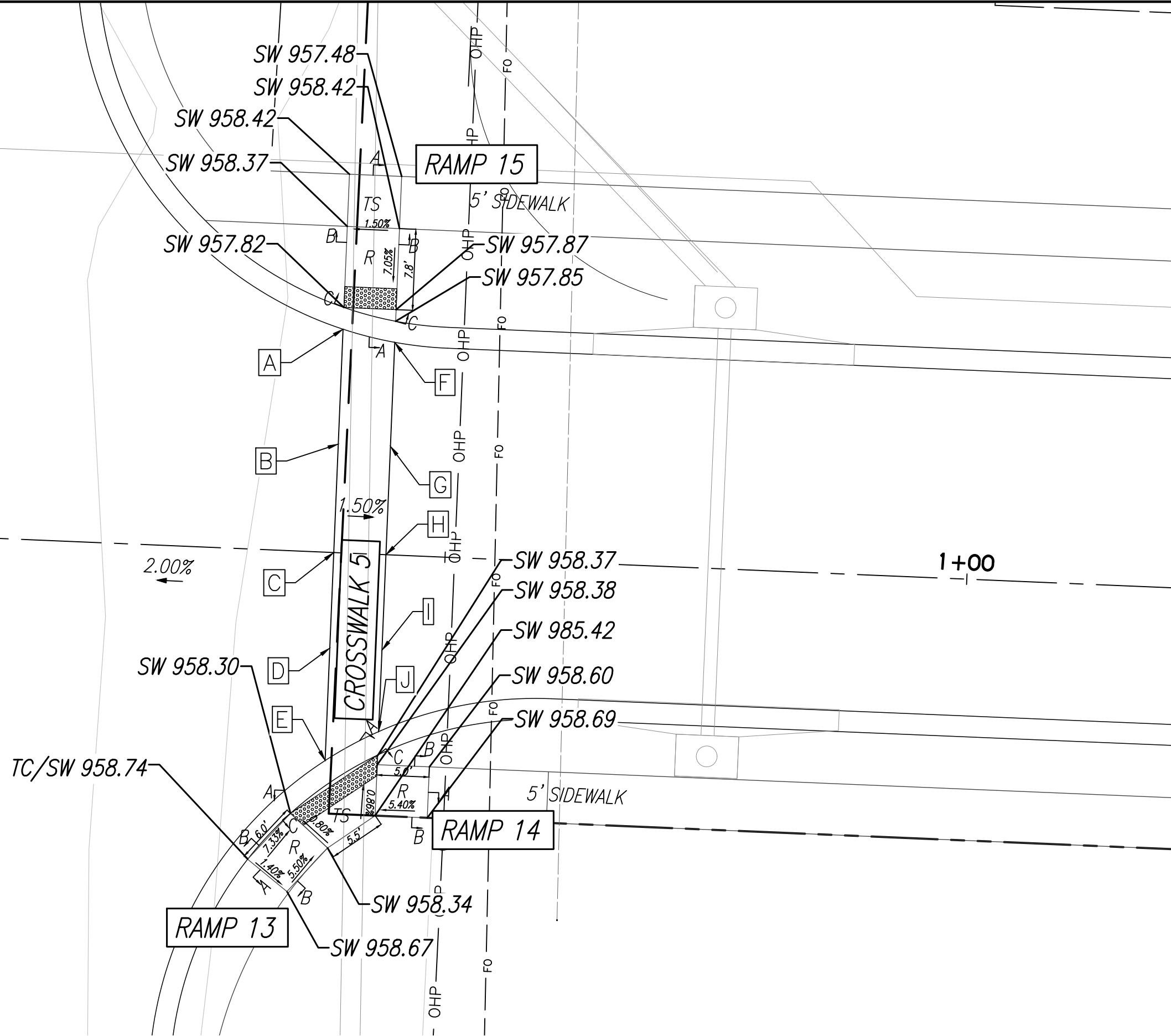
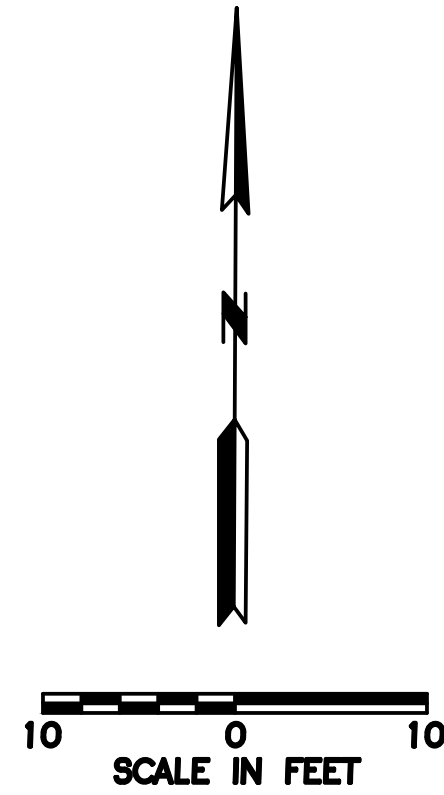


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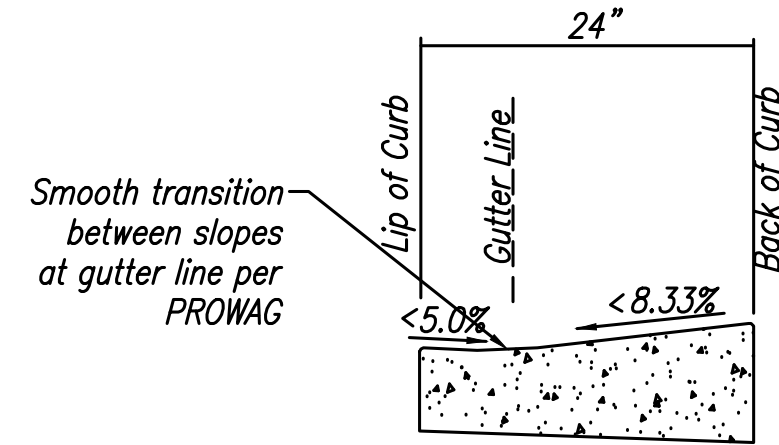
WHISPERING WOODS
LEE'S SUMMIT, JACKSON COUNTY, MO
STREET & STORM SEWER PLANS
ADA RAMP DETAILS

DESIGNED	BLG
DRAWN	JRT
SCALE	Noted
DATE	09-01-2017
JOB NO.	04078
SHEET	

NOTE:
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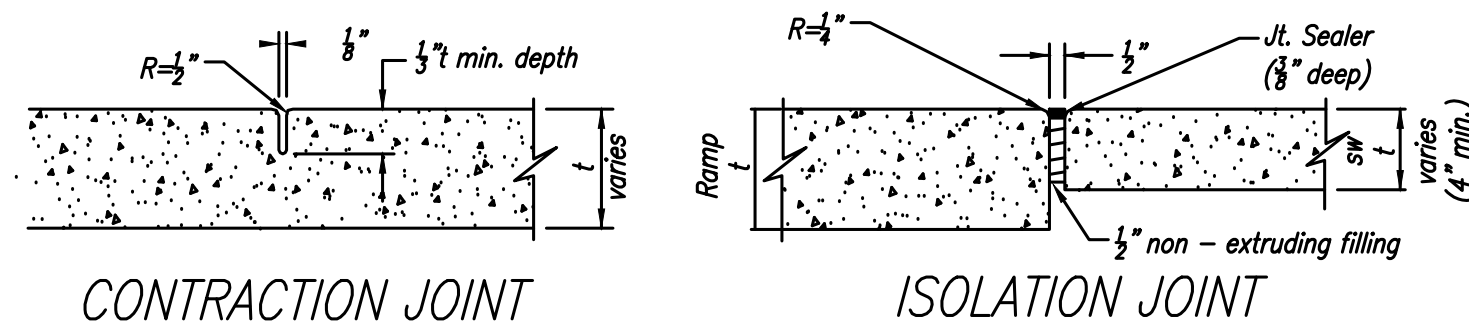


SW RIVER RUN DRIVE & SCHOOL ENTRANCE ADA RAMP DETAILS



CURB & GUTTER DETAIL AT RAMP

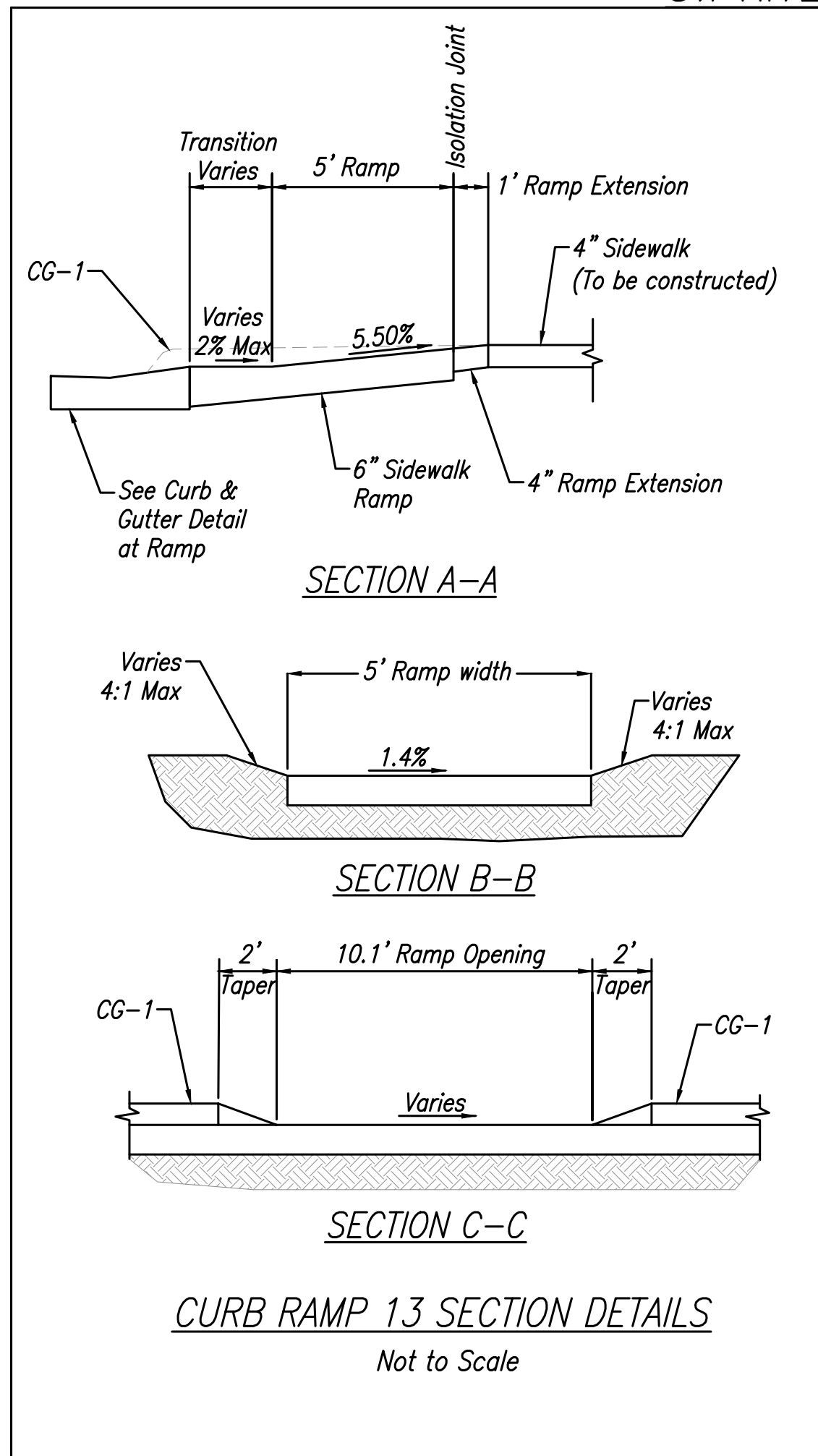
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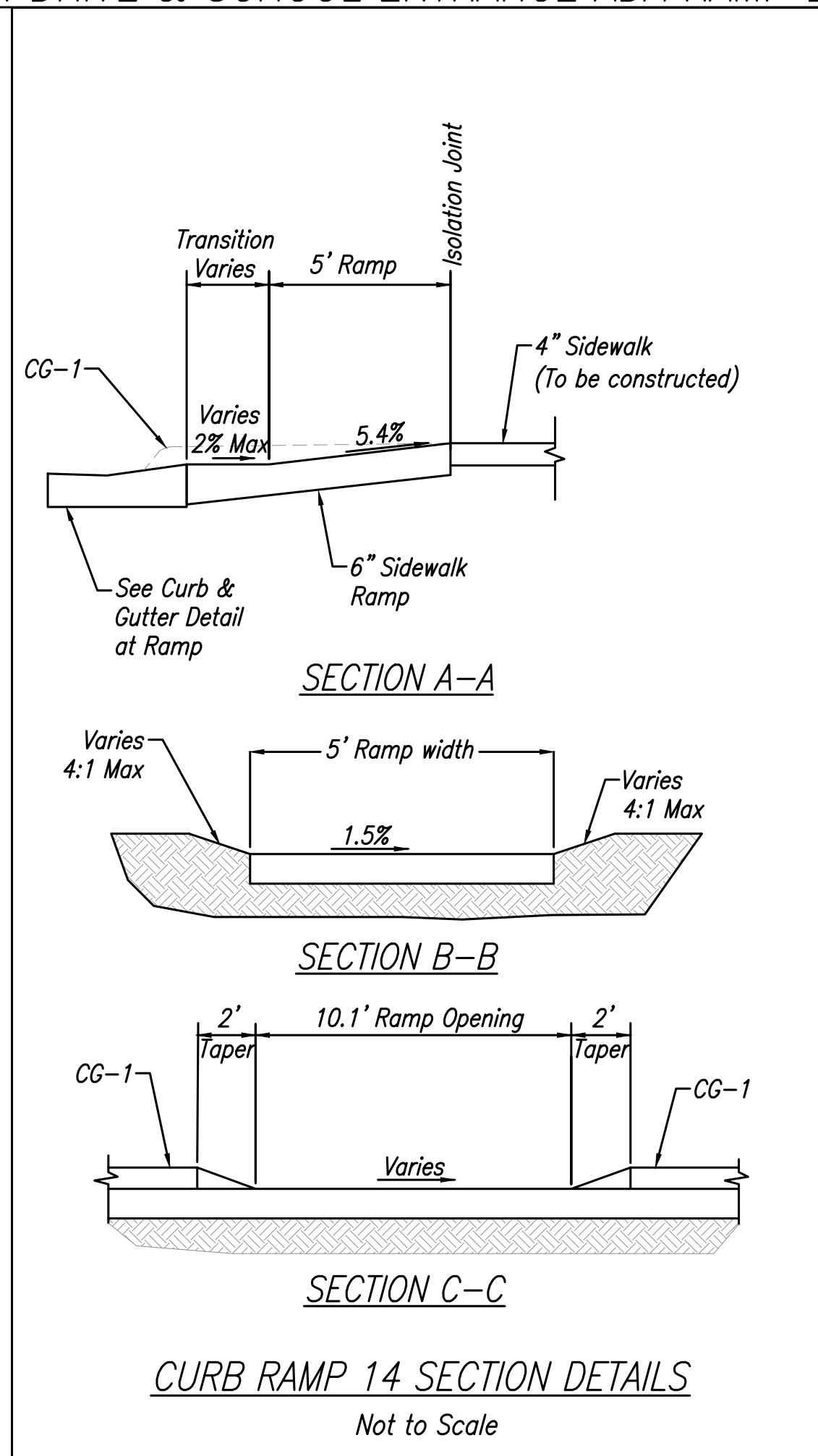
JOINT DETAILS

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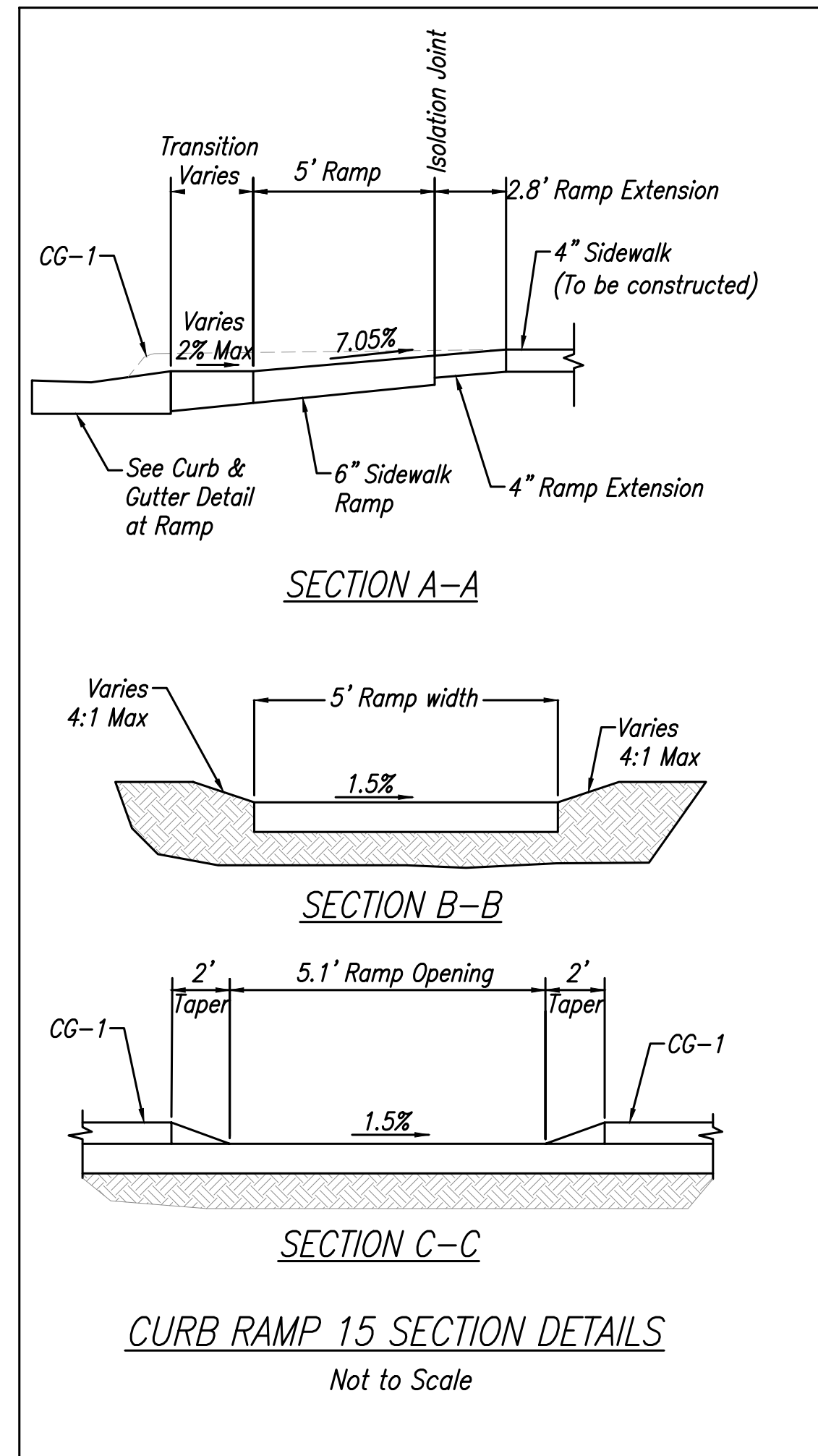
SPOT ELEVATION TABLE	
CROSSWALK 5	
SPOT	ELEVATION
A	957.77
B	957.87
C	958.01
D	958.14
E	958.31
F	957.84
G	957.95
H	958.09
I	958.21
J	958.34



CURB RAMP 13 SECTION DETAILS
Not to Scale



CURB RAMP 14 SECTION DETAILS
Not to Scale



CURB RAMP 15 SECTION DETAILS
Not to Scale

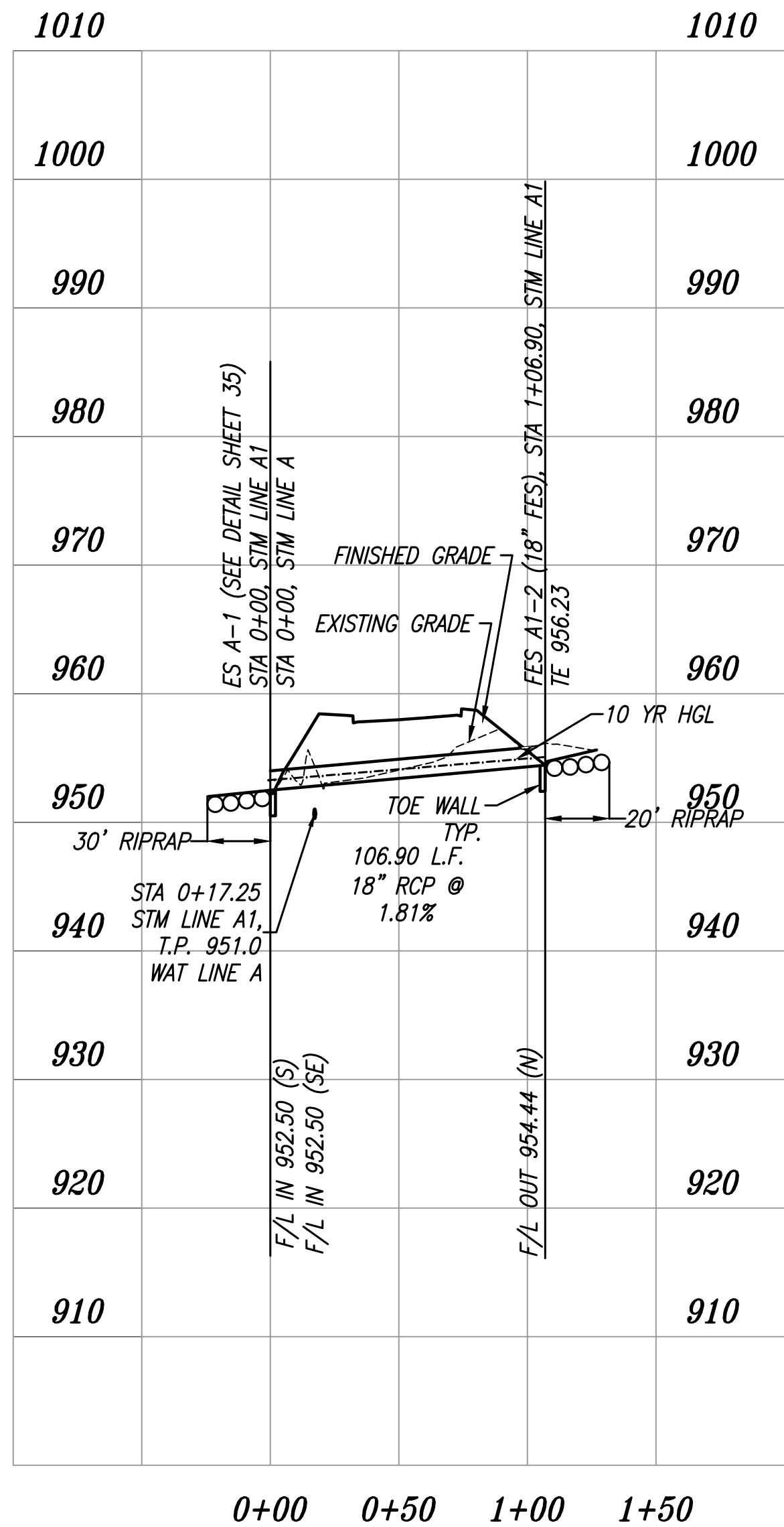
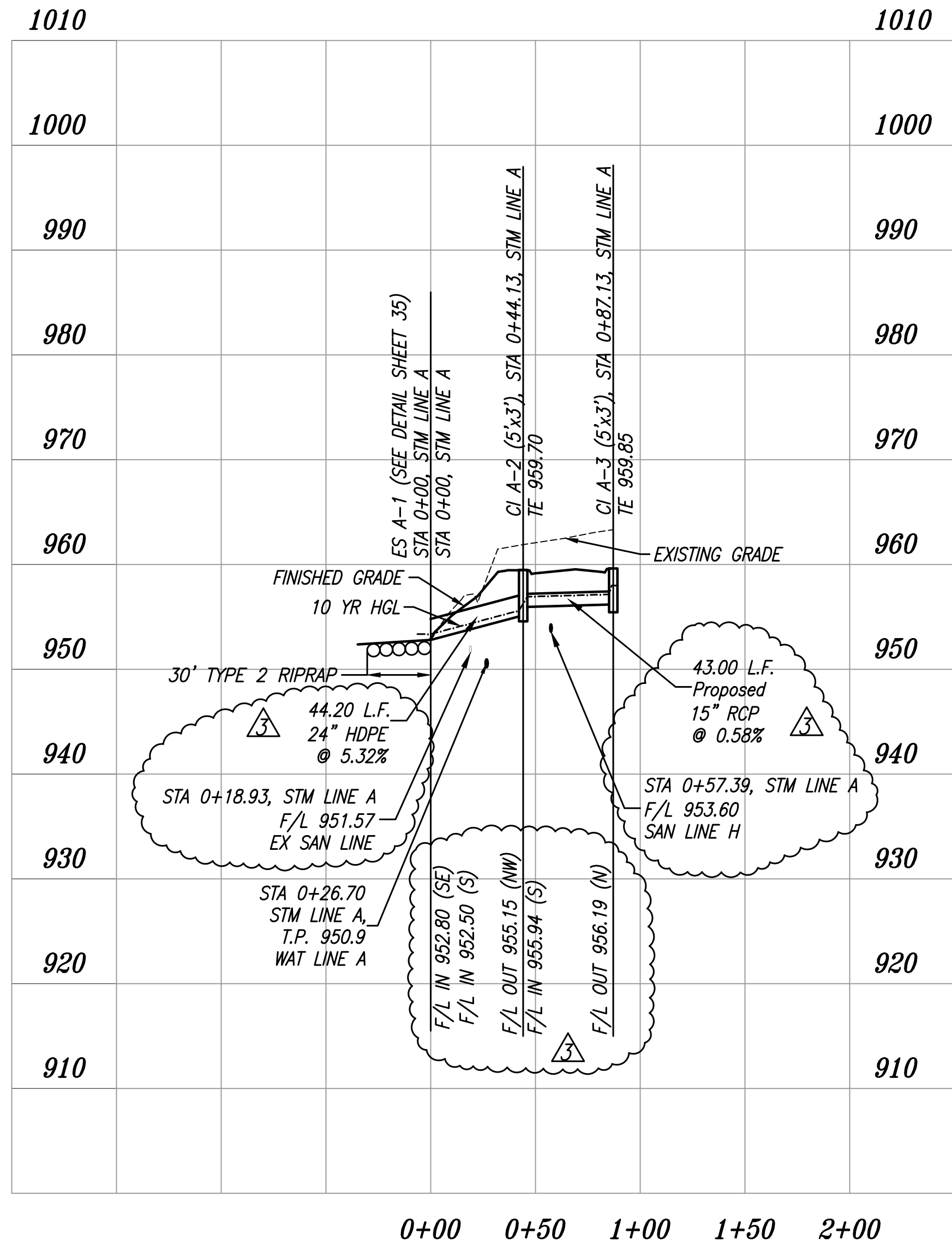
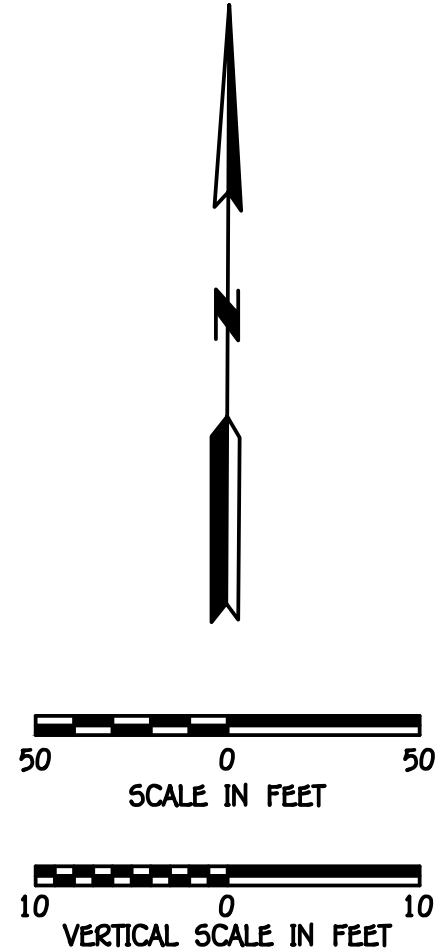
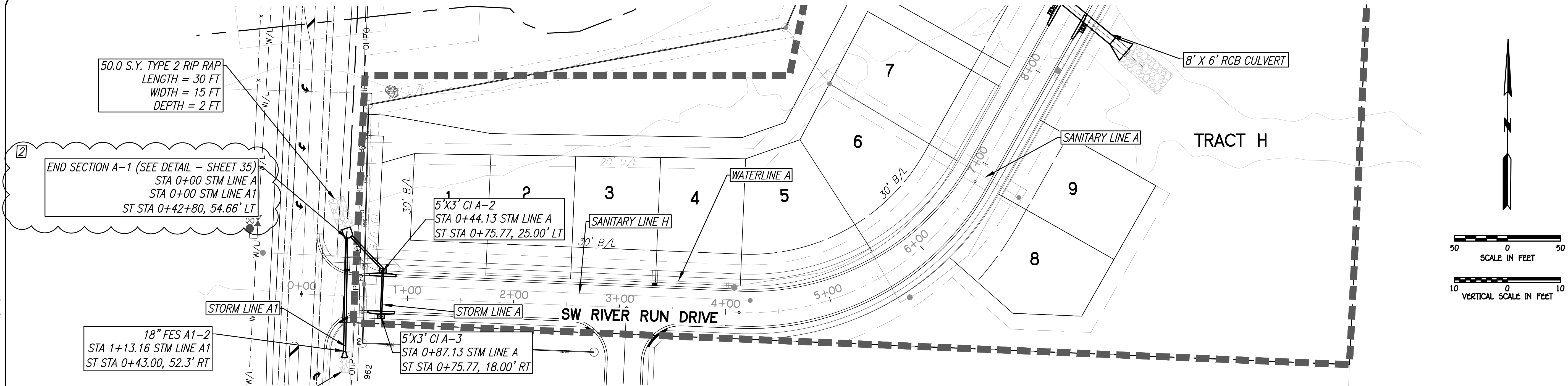
REVISION

STATE OF MISSOURI
BRIAN L. GLEN
Professional Engineer
No. 2010011687
08-10-2018

PHOENIX ENGINEERING & SURVEYING, LLC
3834 S. NORTHERN BLVD.
INDEPENDENCE, MO 64602
(816) 743-9000 FAX: (816) 743-9700
ENGINEERING CERTIFICATE NO. MO E-2000151302-D KS: E-853
SURVEYING CERTIFICATE NO. MO LS-2000151303-D KS: LS-138

WHISPERING WOODS
LEE'S SUMMIT, JACKSON COUNTY, MO
STREET & STORM SEWER PLANS
ADA RAMP DETAILS

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04078
SHEET



WHISPERING WOODS
LEE'S SUMMIT, JACKSON COUNTY, MO
STREET & STORM SEWER PLANS
STORM PLAN & PROFILE

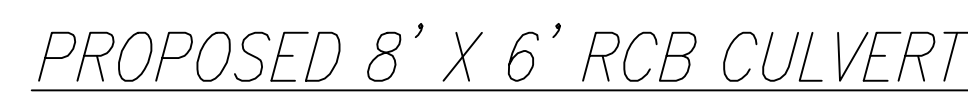
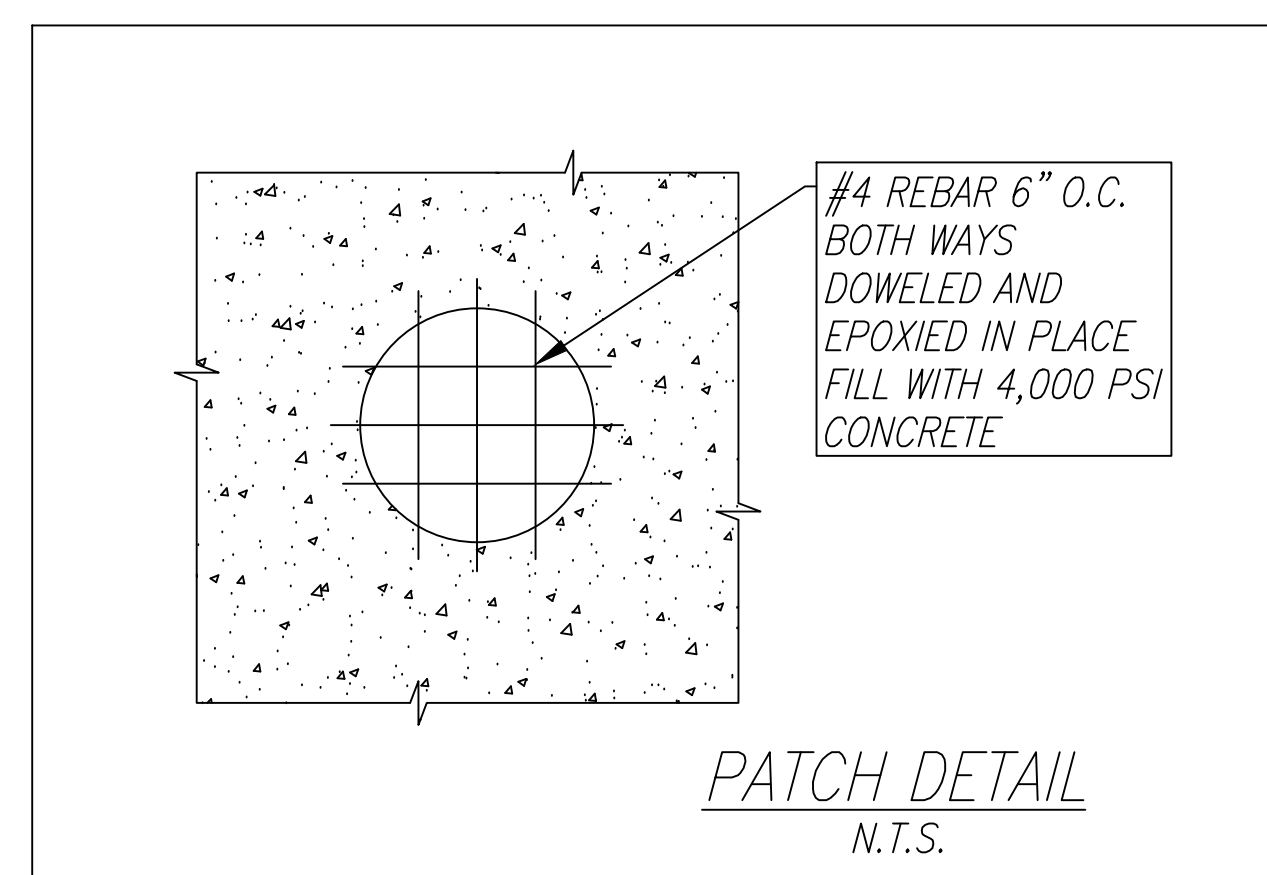
PHOENIX ENGINEERING
& SURVEYING, LLC
3833 S. NORTHERN BLVD.
INDEPENDENCE, MO 64602
(816) 743-9000 FAX: (816) 743-9700
ENGINEERING CERTIFICATE NO. MO E-2000151302-D
SURVEYING CERTIFICATE NO. MO LS-2000151303-D
KS: E-853
KS: LS-138

STATE OF MISSOURI
BRIAN L. GLENN
REGISTERED PROFESSIONAL ENGINEER
NO. 2010011667
EXPIRATION DATE 08-10-2018
PHOENIX ENGINEERING & SURVEYING, LLC
MO PE 2010011667
AS AGENT OF
PHOENIX ENGINEERING & SURVEYING, LLC

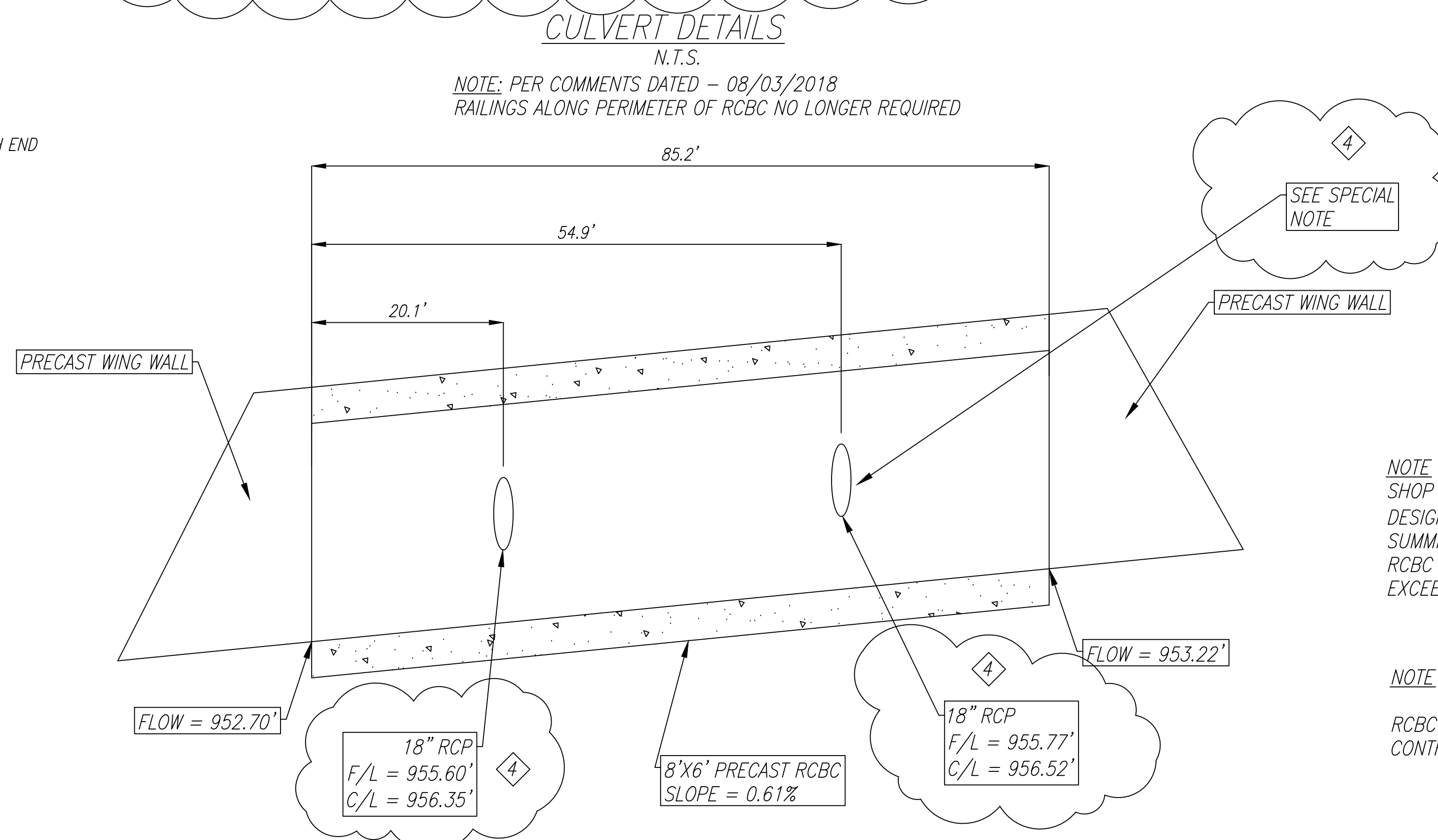
REVISION
2 REVISED ON 06-07-2018: ADDED FES LABEL (LINE A & A1)
3 REVISED ON 08-01-18: CORRECTIONS DUE TO FIELD VERIFIED SEWER ELEVATIONS

THE SEAL(S) AND SIGNATURE(S) APPLY ONLY TO THE DOCUMENT TO WHICH THEY ARE AFFIXED, AND EXPRESSLY DISCLAIM ANY RESPONSIBILITY FOR ALL OTHER PLANS, SPECIFICATIONS, ESTIMATES, REPORTS, OR OTHER DOCUMENTS OR INSTRUMENTS RELATING TO OR INTENDED TO BE USED FOR ANY PART OR PARTS OF THE ENGINEERING OR SURVEYING PROJECT.

DESIGNED
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04078
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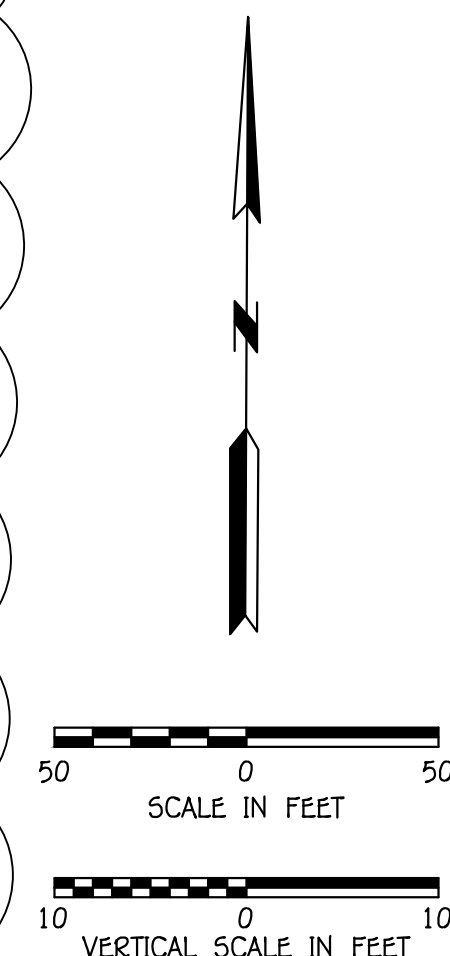
SPECIAL NOTE:
CONTRACTOR SHALL PATCH UNUSED
"KNOCK-OUTS" WITH REINFORCED
CONCRETE. SEE PATHC DETAIL THIS SHEET



NOTE
SHOP DRAWINGS SHALL BE SUBMITTED TO
DESIGN ENGINEER AND CITY OF LEE'S
SUMMIT FOR APPROVAL.
RCBC LOAD DESIGN SHALL MEET OR
EXCEED HL-9.3 STANDARDS.

NOTE

RCBC AND WING WALL SHALL BE PRECAST.
CONTRACTOR TO PROVIDE SHOP DRAWINGS.



3 REVISED 03-25-2019:
RECONFIGURED SHEET TO
ALLOW FOR ADDITION OF
STORM LINE B PROFILE.
PROFILE ADDED DUE TO FIELD
CONDITIONS DEEMING ORIGINAL
CONDUIT ALIGNMENTS
UNOBTAINABLE.

4 REVISED 03-26-2019:
REVISED DETAIL TO CORRECT
ERRORS IN CONNECTION
ELEVATIONS AT SIDE OF
CULVERT. ADDITIONAL
REVISIONS PER EMAIL
COMMENTS DATED 3-26-19
CONNECTION ELEVATION AT
RCBC VERIFIED BY FIELD
SURVEY 3-26-19

WHISPERING WOODS
†
LEE'S SUMMIT, JACKSON COUNTY, MO
STREET & STORM SEWER PLANS
STORM PLAN & PROFILE

DESIGNED
BLG
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WHISPERING WOODS

LEE'S SUMMIT, JACKSON COUNTY, MO
STREET & STORM SEWER PLANS
STORM PLAN & PROFILE

REVISION

REVISED ON 06-07-2018: CULVERT DIMENSIONS EDITED
DUE TO WING WALL ADJUSTMENT; ADDED NOTE STATING
RCBC SHALL BE PRECAST

REVISED ON 08-10-2018: A
ALONG PERIMETER OF RCBC

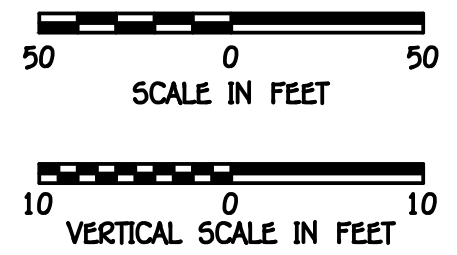
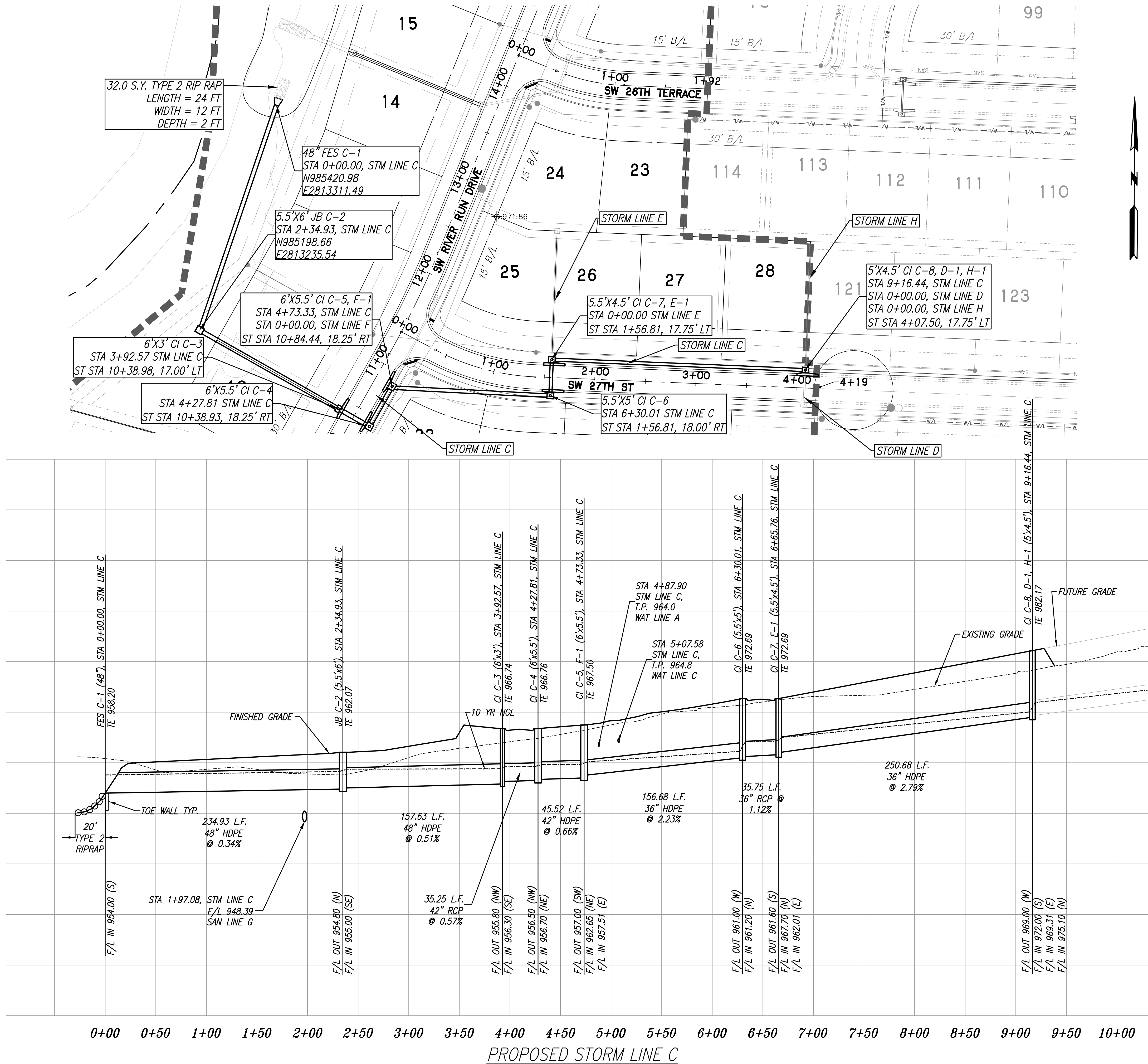
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STATE OF MISSOURI
BRIAN L. GLENN
PE-2010011667
03-27-2019
PROFESSIONAL ENGINEER

PHOENIX ENGINEERING
& SURVEYING, LLC

3355 S. CORTLAND BLVD.
INDEPENDENCE, MO 64852
(816) 743-9000 FAX: (816) 743-9700
ENGINEERING CERTIFICATE NO: MO E-2000151302-D
SURVEYING CERTIFICATE NO: MO LS-2000151303-D

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REVISION

THE SEAL(S) AND SIGNATURE(S) APPLY ONLY TO THE DOCUMENT TO WHICH THEY ARE AFFIXED. ANY OTHER PLANS, SPECIFICATIONS, AND EXPLANATIONS SHALL BE THE RESPONSIBILITY OF THE ENGINEER OR SURVEYOR. ESTIMATES, REPORTS, OR OTHER DOCUMENTS OR INSTRUMENTS RELATING TO OR INTENDED TO BE USED FOR ANY PART OR PARTS OF THE ENGINEERING OR SURVEYING PROJECT.

PHOENIX ENGINEERING & SURVEYING, LLC

BRIAN L. GLENN
REGISTERED PROFESSIONAL ENGINEER
MO PE-2010011667
08-10-2018

PHOENIX ENGINEERING & SURVEYING, LLC
3833 S. NORTHERN BLVD.
INDEPENDENCE, MO 64602
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WHISPERING WOODS
LEE'S SUMMIT, JACKSON COUNTY, MO
STREET & STORM SEWER PLANS
STORM PLAN & PROFILE

DESIGNED
BLG

DRAWN
BLG

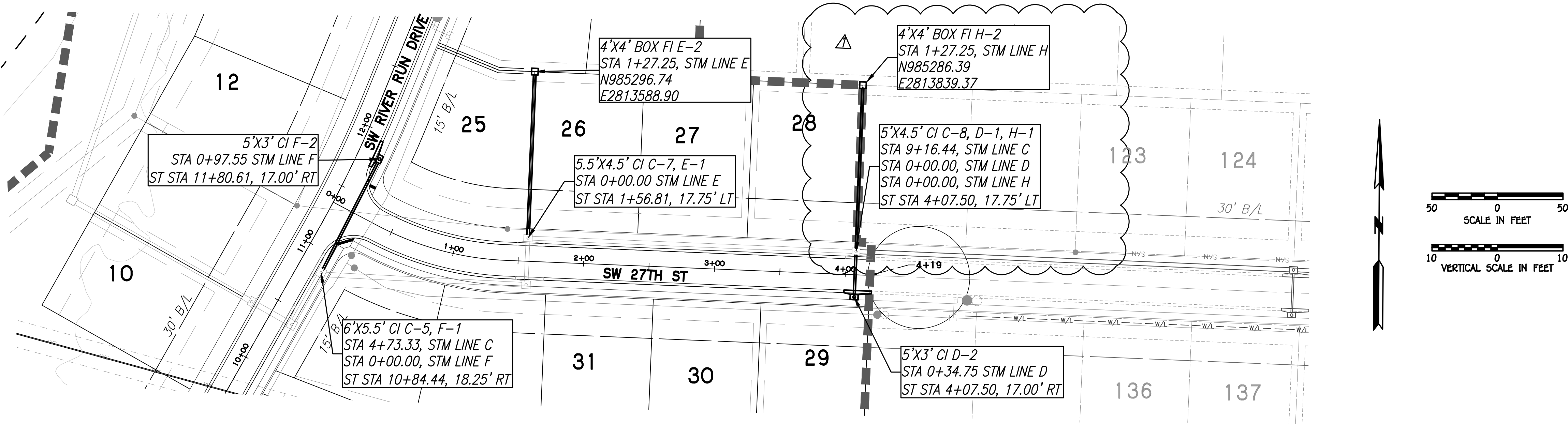
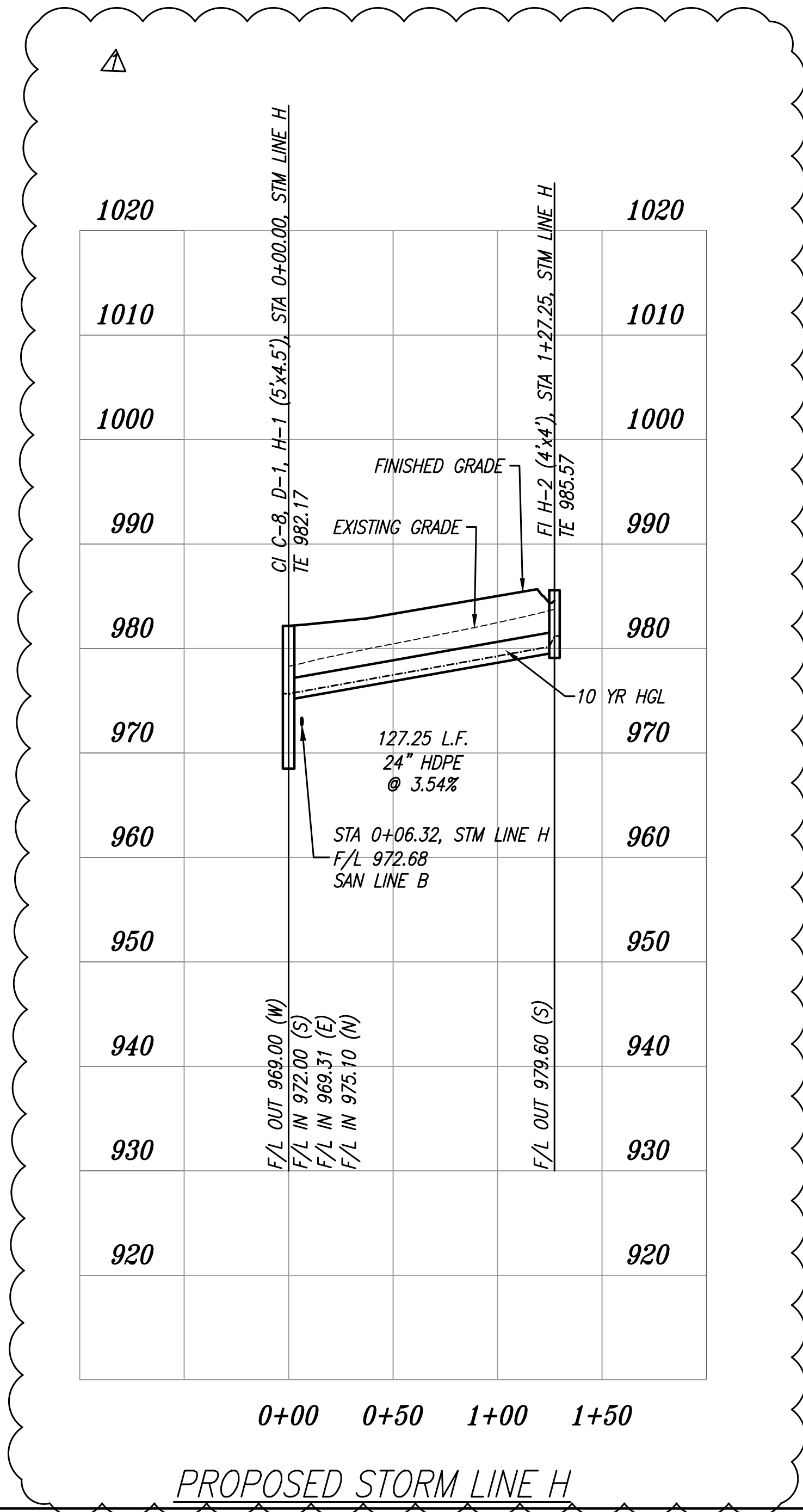
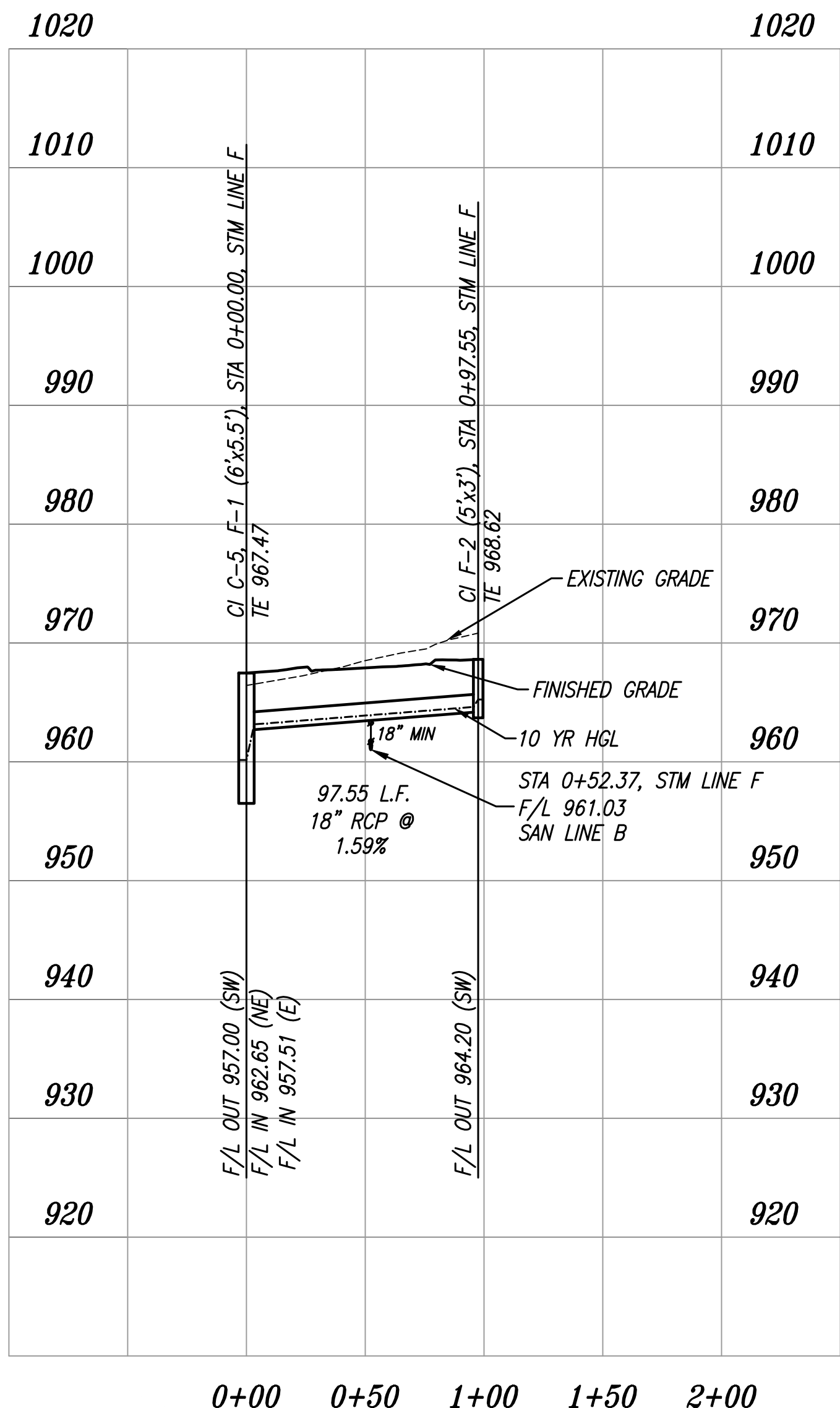
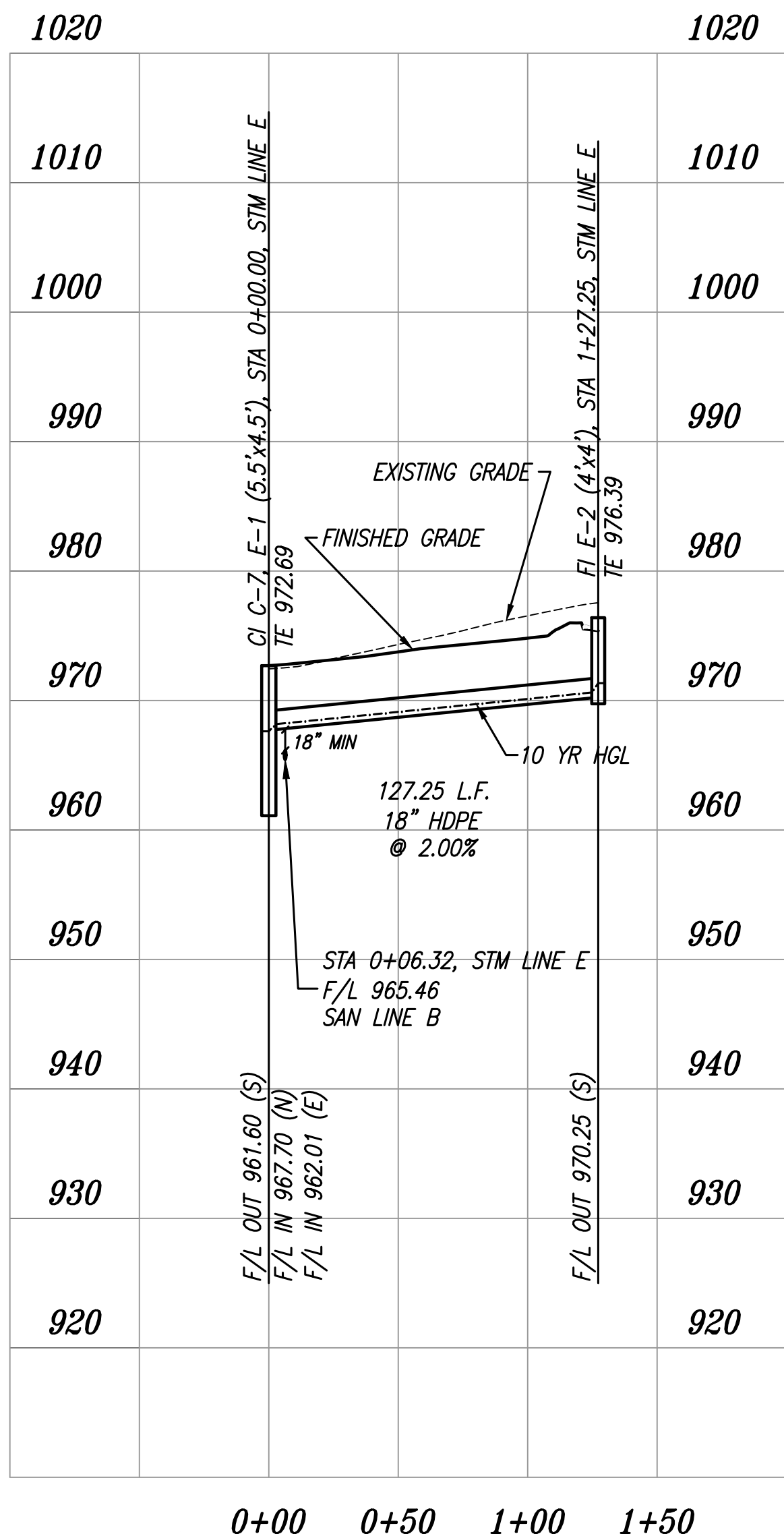
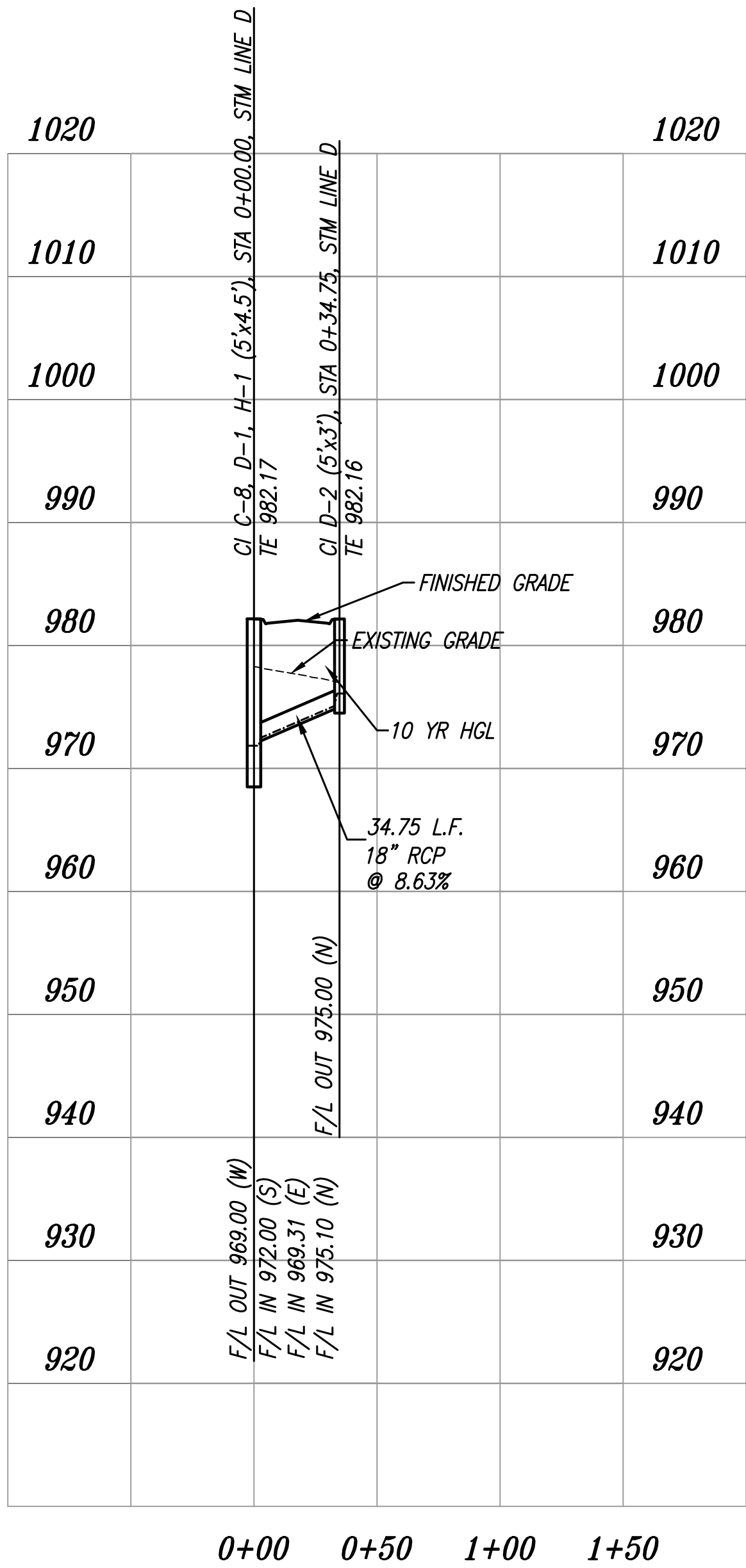
SCALE
Noted

DATE
09-01-2017

JOB NO.
04078

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27 OF 40

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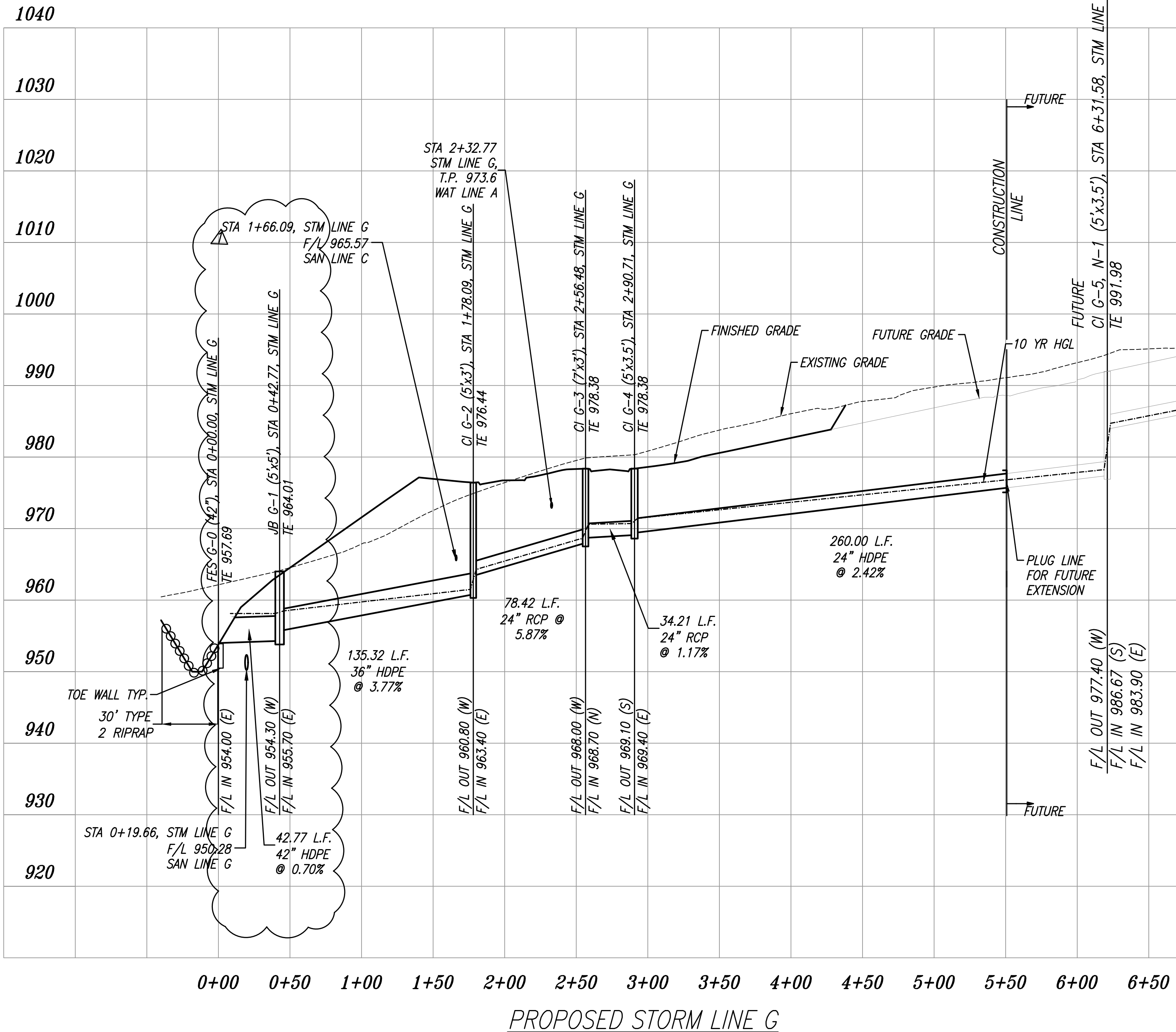
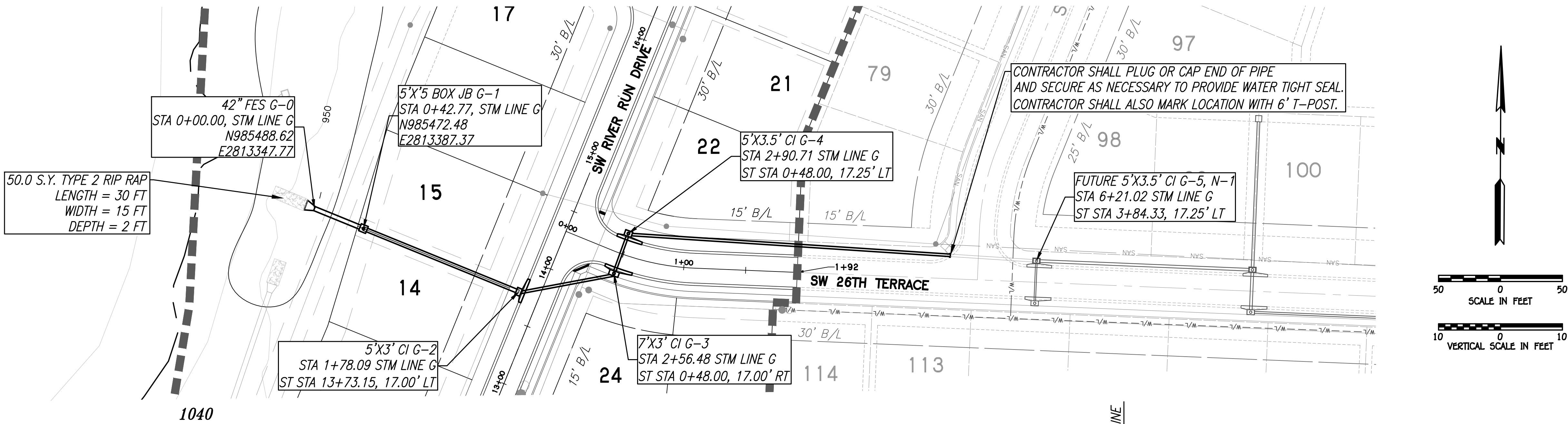
WHISPERING WOODS
LEE'S SUMMIT, JACKSON COUNTY, MO
STREET & STORM SEWER PLANS
STORM PLAN & PROFILE

DESIGNED
BLG
DRAWN
BLG
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Noted
DATE
09-01-2017
JOB NO.
04078
SHEET

PHOENIX ENGINEERING & SURVEYING, LLC
BRIAN L. GLENN
REGISTERED PROFESSIONAL ENGINEER
NO. 2010011667
MO. EX. 2010011667
MO. PE. 2010011667
AS AGENT OF
PHOENIX ENGINEERING & SURVEYING, LLC
KS. E-853
KS. LS-138
SURVEYING CERTIFICATE NO. MO. LS-2000151303-D

REVISION
REVISED ON 06-07-2018: ADDED FIELD INLET/STORM LINE H

THE SEAL(S) AND SIGNATURE(S) APPLY ONLY TO THE DOCUMENT TO WHICH THEY ARE AFFIXED, AND EXPRESSLY DISCLAIM ANY RESPONSIBILITY FOR ALL OTHER PLANS, SPECIFICATIONS, ESTIMATES, REPORTS, OR OTHER DOCUMENTS OR INSTRUMENTS RELATING TO OR INTENDED TO BE USED FOR ANY PART OR PARTS OF THE ENGINEERING OR SURVEYING PROJECT.



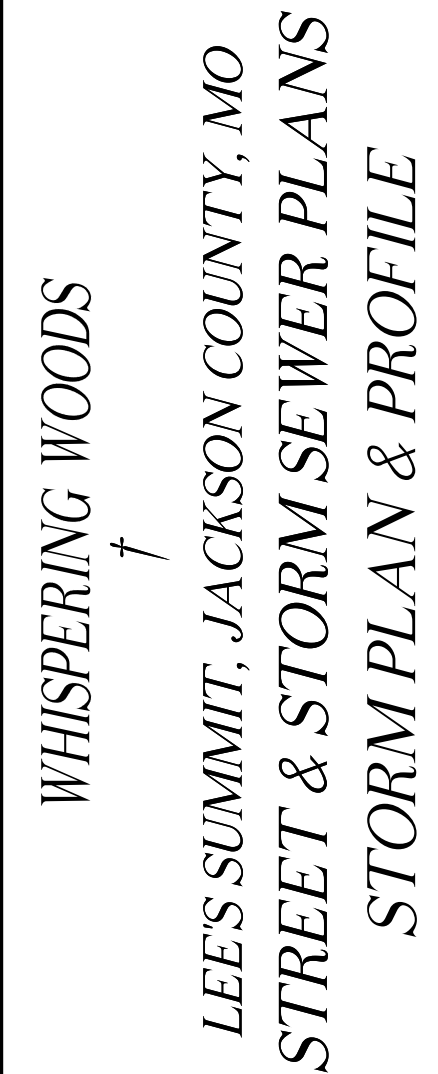
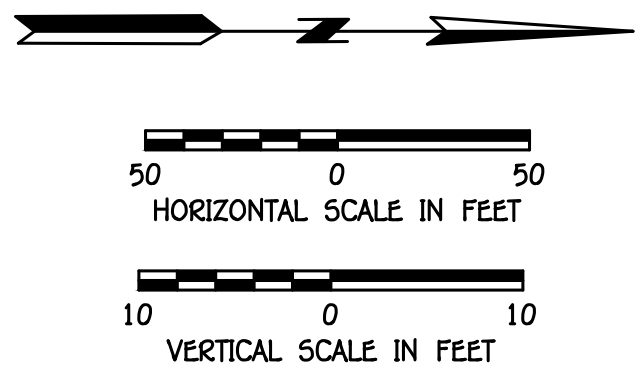
WHISPERING WOODS
LEE'S SUMMIT, JACKSON COUNTY, MO
STREET & STORM SEWER PLANS
STORM PLAN & PROFILE

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SCALE
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DATE
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PHOENIX ENGINEERING
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3834 S. NORTHERN BLVD.
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SURVEYING CERTIFICATE NO: MO LS-2000151303-D KS: LS-138

BRIAN L. GLEN
REGISTERED PROFESSIONAL ENGINEER
STATE OF MISSOURI
LICENSE NO. 2010011687
08-10-2018

REVISION
REVISED ON 06-07-2018: ADDED JUNCTION BOX;
UPSIZED DOWNSTREAM PIPE FROM 24" TO 42" PIPE
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STATE OF MISSOURI
BRIAN L. GLENDY
LICENSE NUMBER
PE-2010011667
COMMISSION EXPIRES
08-10-2018
PROFESSIONAL ENGINEER

PHOENIX ENGINEERING
& SURVEYING, LLC

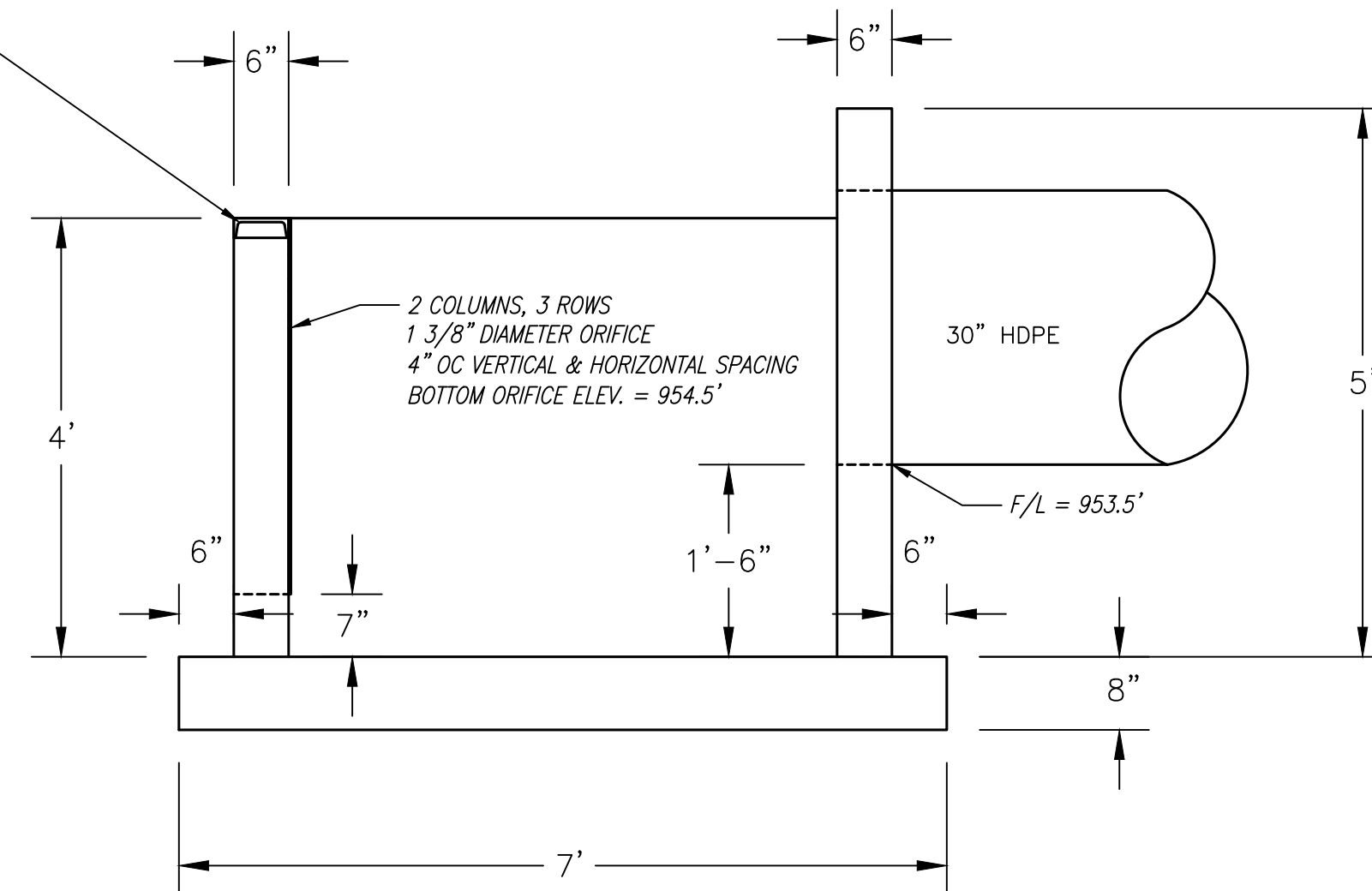
3835 S. NORTHERN BL. VD.
INDEPENDENCE, MO 64052
(816) 743-9000 FAX: (816) 743-9700
ENGINEERING CERTIFICATE NO: MO E-2000151302-D
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KS: E-853
KS: LS-138

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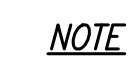
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FRONT VIEW



SIDE VIEW



OUTLET STRUCTURE SHALL BE PRECAST IN NATURE.
CONTRACTOR TO PROVIDE SHOP DRAWINGS FOR
APPROVAL PRIOR TO MANUFACTURING.

WHISPERING WOODS
+
LEE'S SUMMIT, JACKSON COUNTY, MO
STREET & STORM SEWER PLANS
POND OUTLET DETAIL



PHOENIX ENGINEERING
& SURVEYING, LLC

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KS: E-953
KS: LS-138

STATE OF MISSOURI
BRIAN L. GLENN
NUMBER
PE-2010011667
08-10-2018
PROFESSIONAL ENGINEER

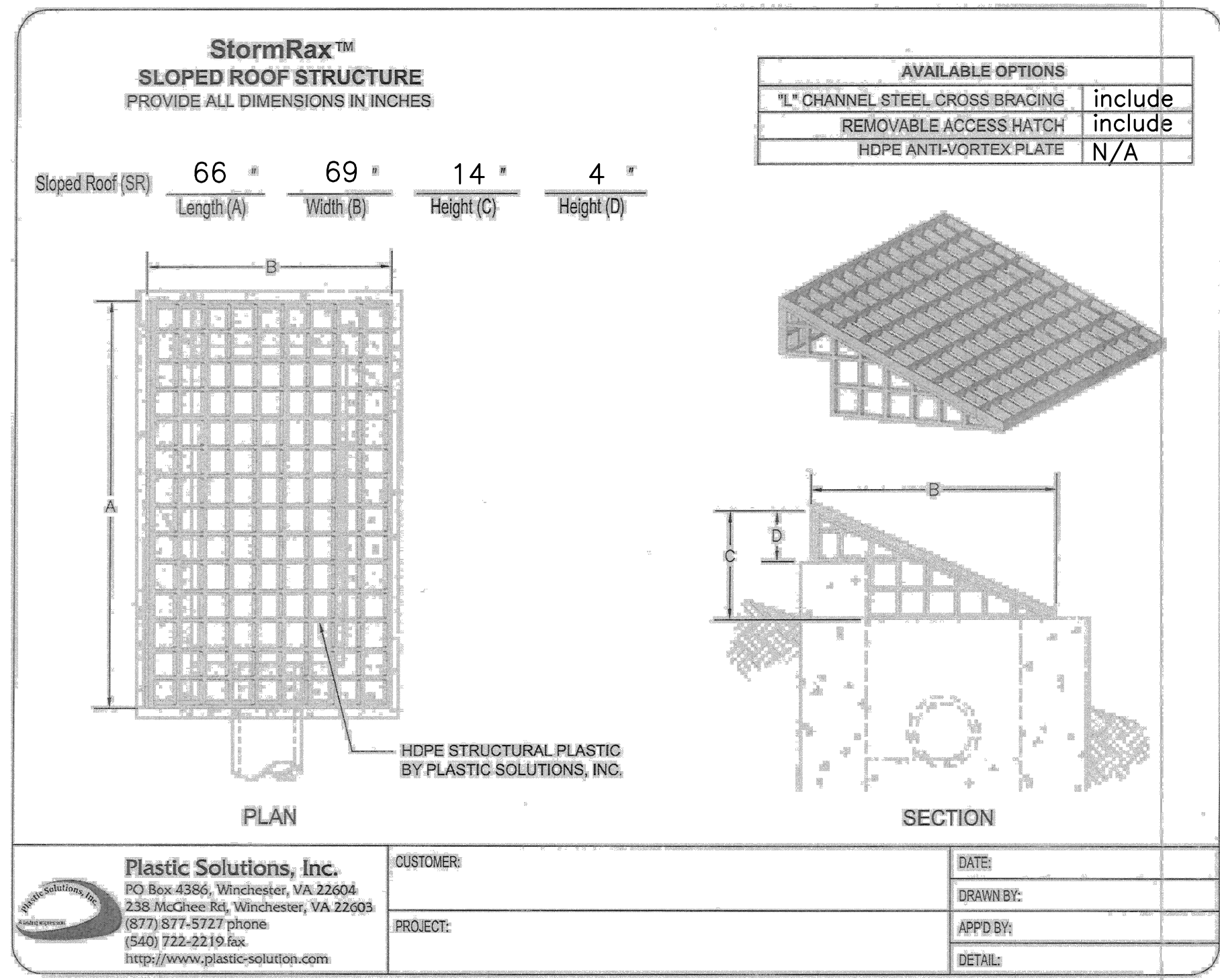
ENGINEER
BRIAN L. GLENN
MO PE 2010011667
AS AGENT OF
PHOENIX ENGINEERING
& SURVEYING, LLC

REVISION

P

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StormRax™ Installation Instructions

All StormRax trash racks are supplied pre-drilled, include concrete anchor bolts and all the necessary mounting hardware.
NOTE: Installer must use the pre-drilled holes. Please call if you have any questions.

Concrete Riser Pipes and Boxes

The following instructions will guide the installer(s) through a quick and successful installation of concrete riser pipes and boxes.

Tools Required:

- Hammer drill
- 3/8" diameter masonry drill bit
- 1/2" wrench or adjustable wrench

STEP 1: Lift trash rack onto concrete structure (typically can be done with 1-2 persons) Note: Top of structure must be sound and flat (within 118") around top of mounting surface. Mounting a trash rack to a structure that is not sound is not recommended.

STEP 2: Position (center) trash rack on structure and mark all mounting hole locations.

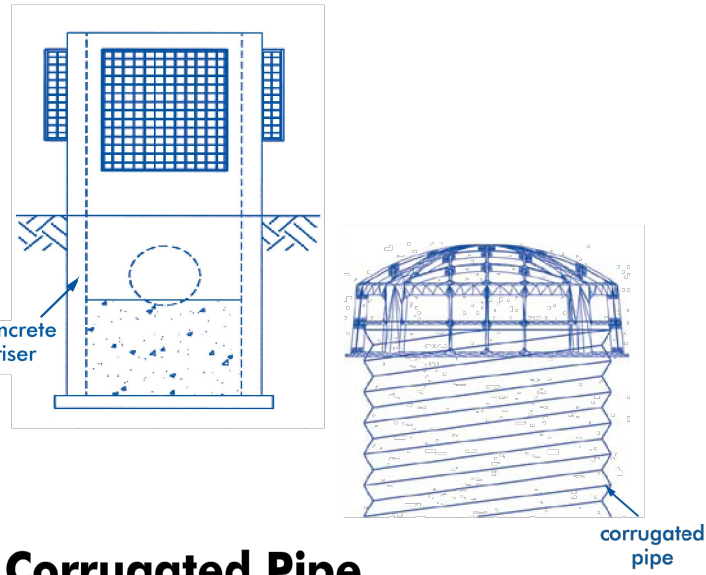
STEP 3: Remove trash rack from concrete structure.

STEP 4: Drill mounting holes using a 3/8" diameter masonry drill bit.

STEP 5: Install 3/8" X 3" anchor bolts (supplied).

STEP 6: Lift trash rack over anchor bolts. Ensure trash rack is completely flush against concrete mounting surface and then secure using flat washers and nuts (supplied).

STEP 7: Ensure all anchor bolt nuts are tight and secure. DO NOT OVERTIGHTEN!



Corrugated Pipe

The following instructions will guide the installer(s) through a quick and successful installation on corrugated pipes.

STEP 1: Locate the 4 mounting brackets on the crossbars and slide to the outside of the rack.

STEP 2: Lift trash rack onto corrugated riser, resting crossbars on top of riser. (Typically can be done with 1 or 2 persons) Top of riser should be sound and flat.

STEP 3: Center rack on top of riser, having equal distance between the outside of the riser and the outside of the trash rack.

STEP 4: Slide all 4 mounting brackets to the outside of the riser. With appropriate screw (for metal or plastic), attach the mounting brackets to the corrugated riser.

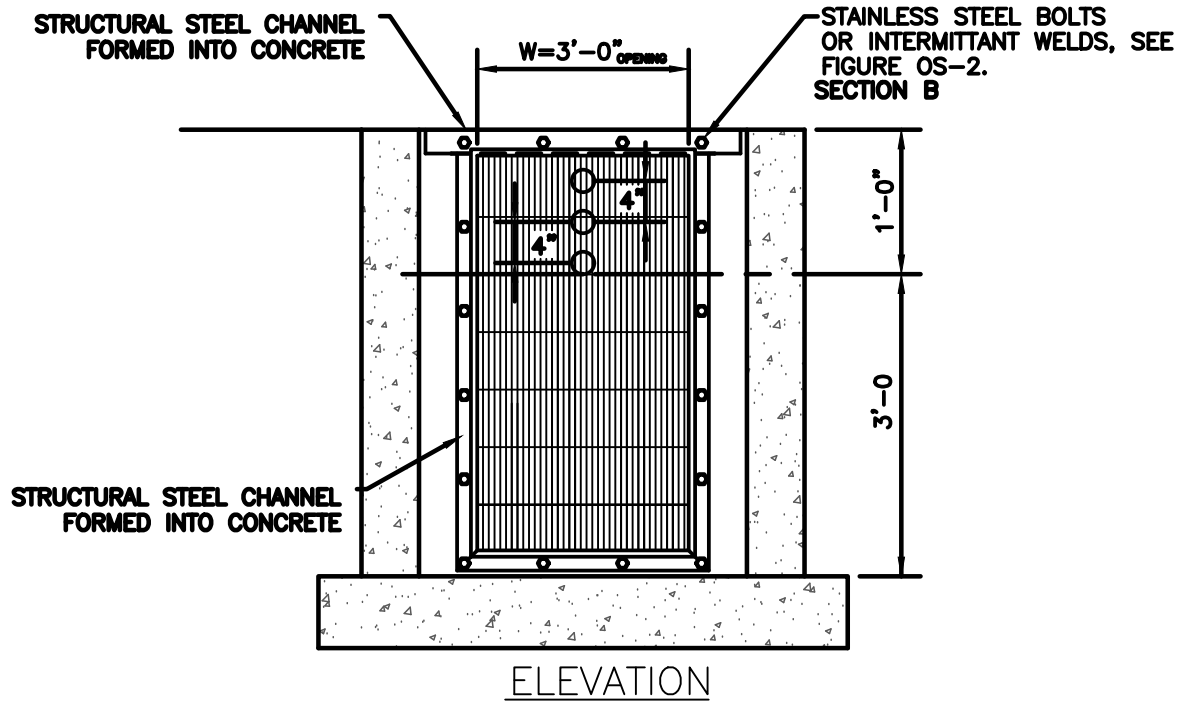
If you have any questions concerning installation, please contact your local sales engineer.

StormRax™
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ORIFICE PLATE NOTES:

1. PROVIDE CONTINUOUS NEOPRENE GASKET MATERIAL BETWEEN THE ORIFICE PLATE AND CONCRETE.
2. BOLT PLATE TO CONCRETE 12" MAX. ON CENTER. SEE TABLE OS-2 FOR PLATE THICKNESS.

EURY AND WQCV TRASH RACKS:

1. WELL-SCREEN TRASH RACKS SHALL BE STAINLESS STEEL AND SHALL BE ATTACHED BY INTERMITTENT WELDS ALONG THE EDGE OF THE MOUNTING FRAME.
2. TRASH RACK OPEN AREAS ARE FOR SPECIFIED TRASH RACK MATERIALS. TOTAL TRASH RACK SIZE MAY NEED TO BE ADJUSTED FOR MATERIALS HAVING DIFFERENT OPEN AREA/GROSS AREA RATIO (R VALUE).
3. STRUCTURAL DESIGN OF TRASH RACKS SHALL BE BASED ON FULL HYDROSTATIC HEAD WITH ZERO HEAD DOWNSTREAM OF THE RACK.

OVERFLOW SAFETY GRATES:

1. OVERFLOW SAFETY GRATE SHALL BE STORMRAX SLOPED ROOF STRUCTURE OR APPROVED EQUAL.
2. INSTALLATION OF OVERFLOW SAFETY GRATE SHALL BE PER MANUFACTURER'S INSTALLATION GUIDE PROVIDED ON THIS SHEET

FIGURE OS-1 ORIFICE PLATE AND TRASH RACK DETAILS AND NOTES
NTS

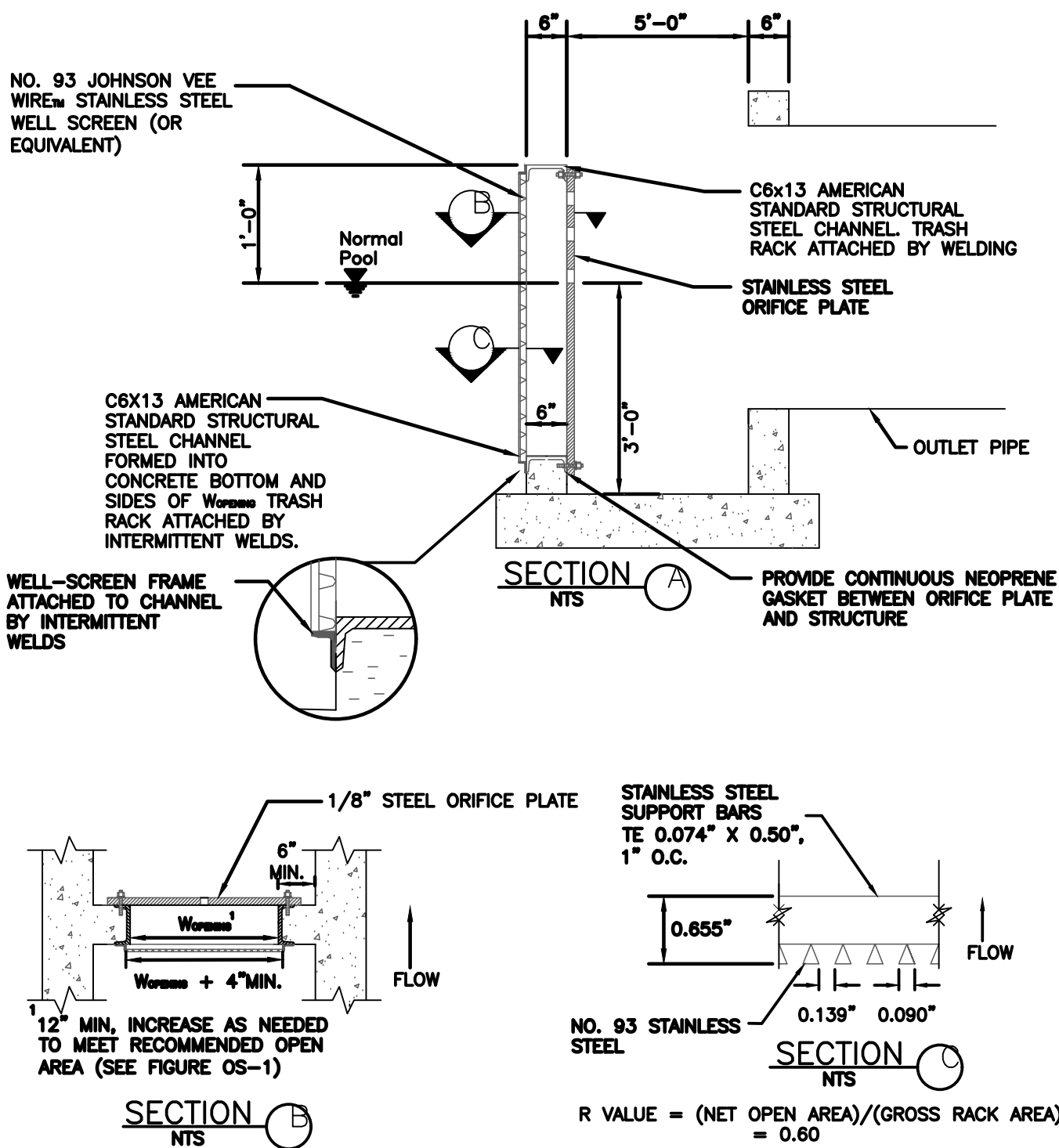
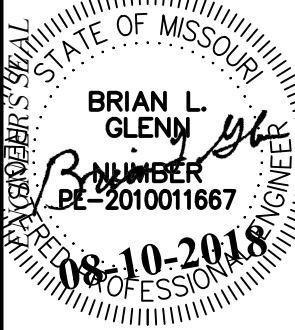


FIGURE OS-2 TYPICAL OUTLET STRUCTURE WITH WELL SCREEN TRASH RACK

REVISION

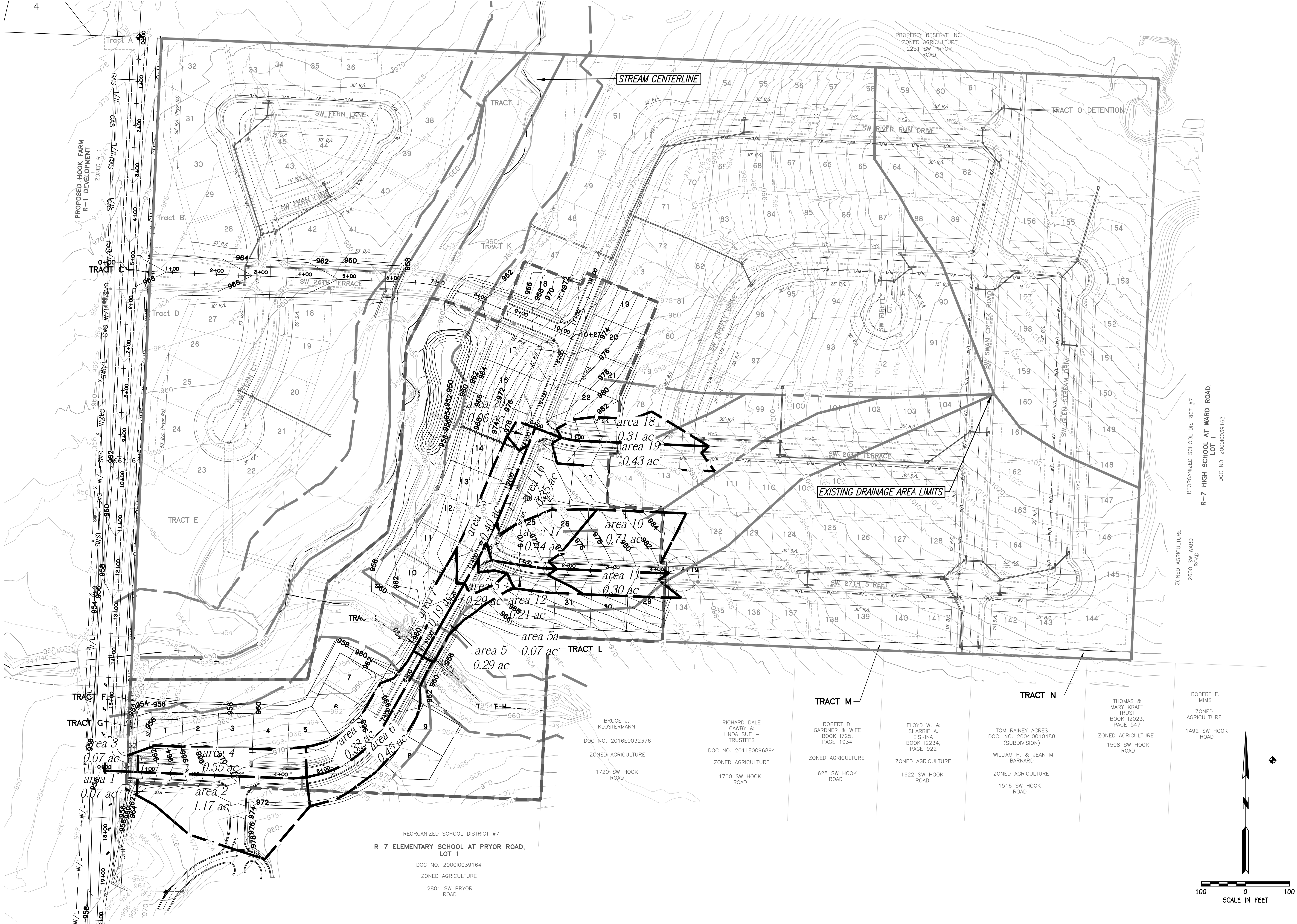


PHOENIX ENGINEERING & SURVEYING, LLC
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SURVEYING CERTIFICATE NO: MO LS-2000151303-D
KS: E-853
KS: LS-138

WHISPERING WOODS
LEE'S SUMMIT, JACKSON COUNTY, MO
STREET & STORM SEWER PLANS
POND OUTLET DETAIL

DESIGNED: BLG
DRAWN: JRT
SCALE: Noted
DATE: 09-01-2017
JOB NO: 04078
SHEET

32 OF 40



REVISION

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PHOENIX ENGINEERING & SURVEYING, LLC

BRIAN L. GLENN
REGISTERED PROFESSIONAL ENGINEER
STATE OF MISSOURI
No. 2010011667
Exp. 08-10-2018

BRIAN L. GLENN
REGISTERED PROFESSIONAL ENGINEER
STATE OF MISSOURI
No. 2010011667
Exp. 08-10-2018

DESIGNED
BLG

DRAWN
BLG

SCALE
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DATE
09-01-2017

JOB NO.
04078

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33 OF 40

WHISPERING WOODS
LEE'S SUMMIT, JACKSON COUNTY, MO
STREET & STORM SEWER PLANS
DRAINAGE AREAS

PHOENIX ENGINEERING & SURVEYING, LLC
3833 S. NORTHERN BLVD.
INDEPENDENCE, MO 64602
(816) 749-9000 FAX: (816) 743-9700
ENGINEERING CERTIFICATE NO.: MO E-2000151302-D
SURVEYING CERTIFICATE NO.: MO LS-2000151303-D
KS: E-853
KS: LS-138

	Conduit Height ft	100-yr Flow cfs	Tailwater Depth ft	100-yr Velocity fps	Min D50 ft	Min D50 inch	Min Apron Length ft	Actual Apron Length ft
SW River Run RCBC	6	595.61	5.97	12.41	1.52	18.26	42	48
Storm Line C	4	62.3	0	8.43	0.48	5.76	16	24
Storm Line G	3.5	25.36	0	7.66	0.20	2.37	14	30
Storm Line A	2	12.6	0	6.15	0.29	3.45	8	30*
Storm Line A1	1.5	3.14	0	6.92	0.09	1.06	6	20**

* 30 ft apron length at combined ES A-1

** 20 ft apron length at FES A1-2

Rip Rap Sizing (Chapter 10 & Appendix D, HEC 14; Fletcher and Grace (1972))

$$D_{50} = 0.020D \left(\frac{Q}{\sqrt{g} \times D^{2.5}} \right)^{\frac{2}{3}} \left(\frac{D}{TW} \right)$$

D₅₀ = Median Rock Size, ft

Q = Flowrate, cfs

D = Culvert Rise, ft

*TW = Tailwater Depth, ft

1.0D.

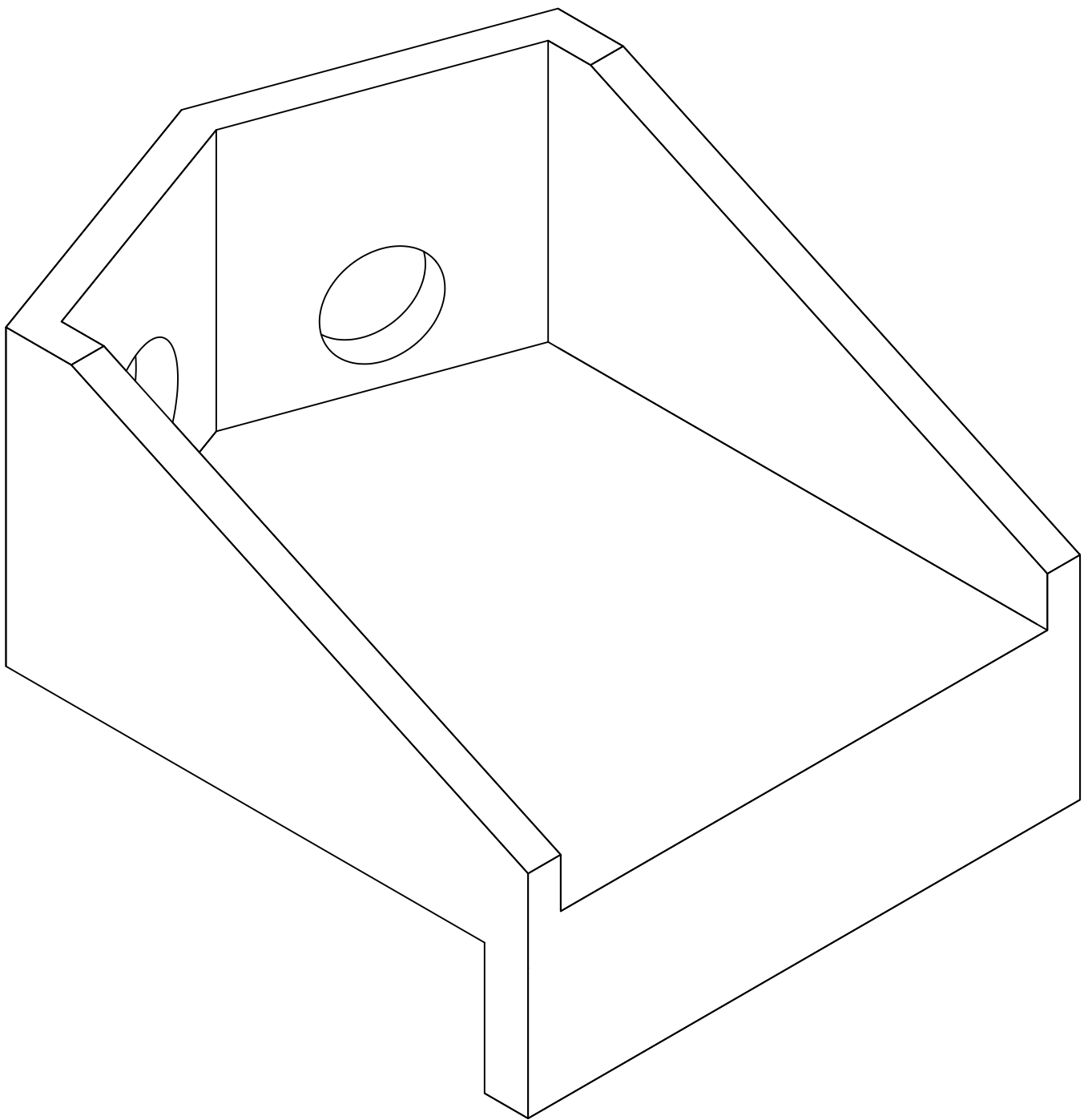
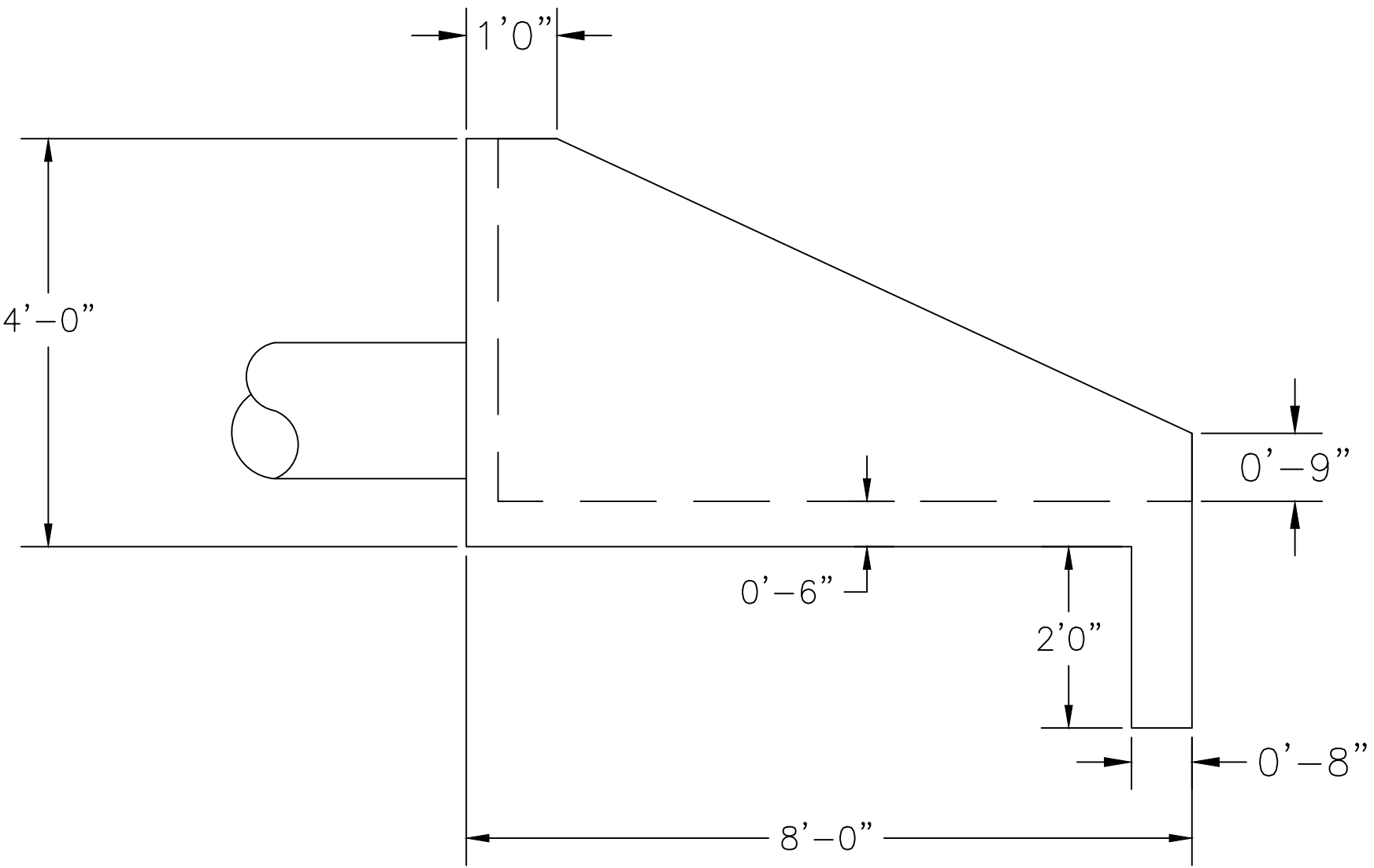
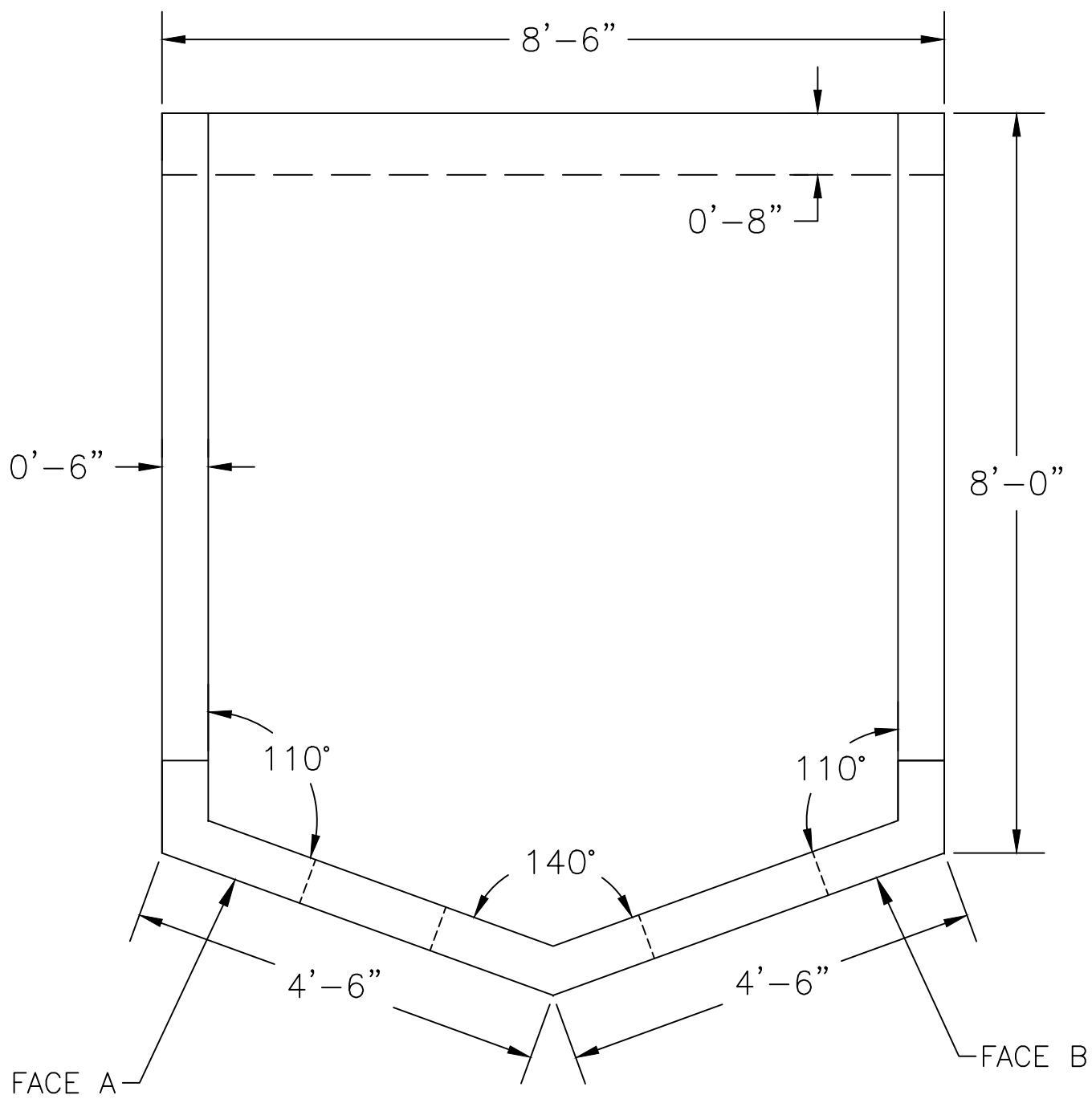
If tailwater is unknown, use 0.4D

Slope #	Inlet	Area Number	Area (Acres)	Street Slope (ft/ft)	Max Gutter Flow	Gutter Flow, cfs (+bypass)		Cross Slope (%)	Gutter Spread (ft)		Inlet Length (ft)	Curb Type (A or B)	Inlet Intercept		Inlet Bypass	
						Q-10 yr	Q- 100 yr		10 yr	100 yr			10-Year	100-Year	10-Year	100-Year
1	A-3 (W)	1	0.07	2.18	5.84	0.34	0.60	2	3.97	4.90	5	A	0.33	0.56	0.01	0.03
2	A-3 (E)	2	1.17	6.16	9.81	5.68	9.96	2	9.40	11.60	5	A	1.96	2.08	3.71	7.88
-	A-3 (low pt)	21	1.24	0	-	6.02	10.56	2	-	-	5	A	6.02	10.56	0.00	0.00
1	A-2 (W)	3	0.07	2.18	5.84	0.34	0.60	2	3.97	4.90	5	A	0.33	0.56	0.01	0.03
2	A-2 (E)	4	0.55	6.16	9.81	2.67	4.68	2	7.08	8.74	5	A	1.52	1.88	1.15	2.80
-	A-2 (low pt)	22	0.62	0	-	3.01	5.28	2	-	-	5	A	3.01	5.28	0.00	0.00
4	B-2 (N)	5	0.29	1.84	5.36	1.67	4.26	2	7.44	10.58	5	A	1.43	2.87	0.24	1.39
3	B-2 (S)	6	0.45	3.64	7.54	2.18	3.83	2	7.25	8.95	5	A	1.57	2.19	0.61	1.64
-	B-2 (low pt)	23	0.74	0	-	3.85	8.09	2	-	-	5	A	3.85	8.09	0.00	0.00
4	B-1 (N)	7	0.19	1.84	5.36	2.29	6.13	2	8.38	12.13	5	A	1.85	3.52	0.44	2.61
3	B-1 (S)	8	0.38	3.64	7.54	1.84	3.24	2	6.80	8.40	5	A	1.40	2.01	0.45	1.23
-	B-1 (low pt)	24	0.57	0	-	4.13	9.36	2	-	-	5	A	4.13	9.36	0.00	0.00
8	C-7, D-1	9	1.12	3.78	7.68	6.94	13.43	2	11.10	14.22	5	A	2.68	2.93	4.25	10.50
8	C-6, E-1	10	0.71	3.78	7.68	7.70	16.55	2	11.54	15.38	5	A	2.75	2.95	4.95	13.60
8	C-5	11	0.30	3.78	7.68	3.05	6.79	2	8.16	11.01	5	A	1.92	2.67	1.13	4.12
5	C-4, F-1	12	0.21	1	3.95	2.15	5.91	2	9.18	13.42	5	A	1.89	4.13	0.26	1.79
4	C-3	13	0.40	1.84	5.36	4.21	8.57	2	10.54	13.75	5	A	2.85	4.06	1.36	4.51
8	D-2	14	0.71	3.78	7.68	3.73	6.92	2	8.79	11.09	5	A	2.13	2.68	1.60	4.24
6	F-2 (N)	16	0.46	5.62	9.37	2.23	3.92	2	6.74	8.32	5	A	1.42	1.86	0.81	2.06
5	F-2 (S)	17	0.44	1	3.95	2.14	3.75	2	9.16	11.31	5	A	1.88	2.98	0.26	0.77
-	F-2 (low pt)	25	0.90	0	-	4.37	7.66	2	-	-	5	A	4.37	7.66	0.00	0.00
15	G-4	18	0.31	2	5.59	1.95	3.86	2	7.78	10.04	5	A	1.61	2.64	0.34	1.22
15	G-3	19	0.43	2	5.59	2.21	4.03	2	8.14	10.21	5	A	1.77	2.71	0.44	1.32
6	G-2	20	0.86	5.62	9.37	4.17	7.32	2	8.52	10.52	5	A	1.90	2.16	2.27	5.17

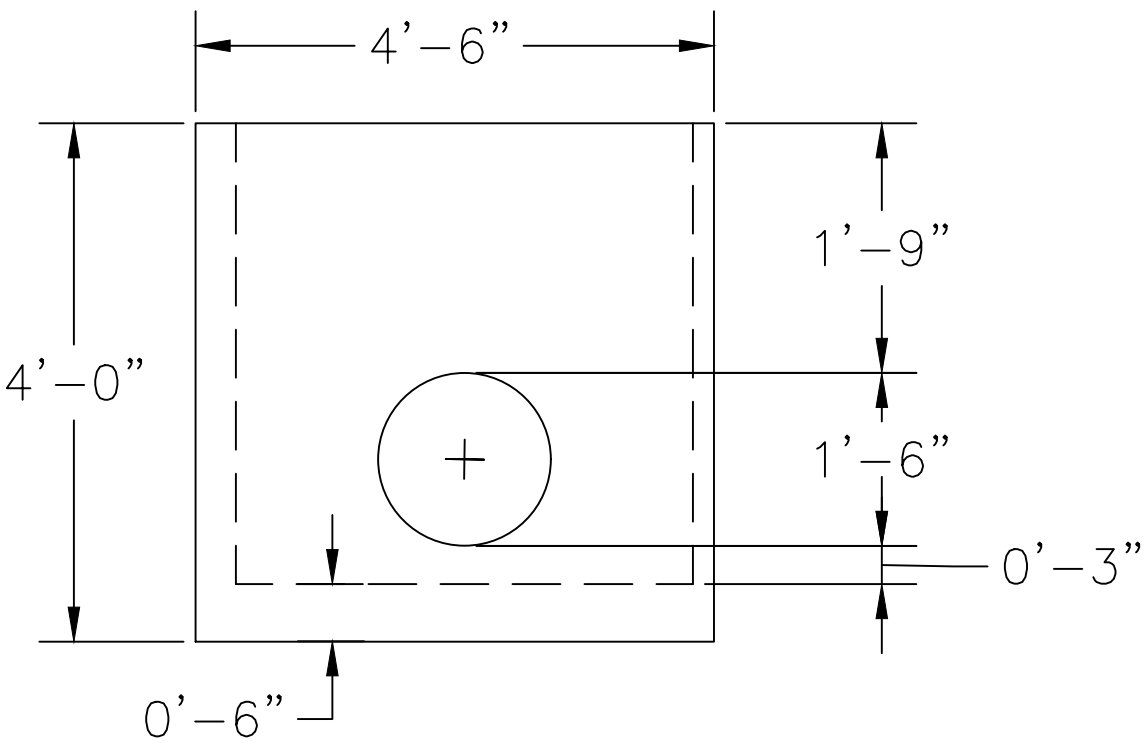
DATE: 08/01/2018		STORM SEWER PIPE AND STRUCTURE TABLE																															
TITLE: WHISPERING WOODS, LEE'S SUMMIT, MO																																	
JOB #: 04078																																	
DESIGN CONDITIONS: PUBLIC - 10 YEAR STORM EVENT																																	
STRUCTURES		RUNOFF CALCULATIONS													PIPE DESIGN																		
FROM	TO	DIRECT AREA (ACRES)	TOTAL AREA (ACRES)	C	KC (K=1.0)	Tc (MIN)	FLOW TIME (MIN)	INTENSITY (IN/HR)	DESIGN Q (CFS)	DESCRIPTION	PIPE LENGTH (L.F.)	PIPE SLOPE (%)	PIPE DIA (IN)	Q FULL (CFS)	PIPE AREA (SQ.FT.)	V FULL (F/S)	DESIGN V (F/S)	HwD	MH TOP ELEVATION	UPSTREAM FLOWLINE	DOWNSTREAM FLOWLINE	DOWNSTREAM WATER ELEVATION	FRICTION HEAD (h f)	ENTRY LOSS COEFFICIENT (K)	ACTUAL ENTRY LOSS (K)	ENTRY LOSS (h m)	h f + h m (FT)	HGL Pipe U/S	HW, INLET CONTROL	HW, OUTLET CONTROL	HYDRAULIC GRADE ELEV.	HYDRAULIC GRADE (MAX)	
H-2		1.53		0.66	0.66	5.00		7.35	7.43	Field Inlet									985.57														
D-2	C-8, D-1, H-1	0.42	1.53	0.66	0.66	5.00	0.21	7.35	7.43	24" HDPE	127.25	3.54	24	55.45	3.14	17.65	10.18	0.80	982.16	979.60	975.10	975.67	0.08	0.40	1.00	1.61	1.69	980.17	981.19	979.60	981.19	984.07	
E-2	C-8, D-1, H-1	0.53	0.42	0.66	0.66	5.00	0.06	7.35	2.04	Curb Inlet	34.75	8.63	18	40.23	1.77	22.77	9.90	0.72	976.39	975.00	972.00	972.26	0.01	0.40	1.00	1.52	1.53	975.26	976.09	975.00	976.09	980.66	
F-2	C-7, E-1	0.35	0.53	0.66	0.66	5.00	0.34	7.35	2.57	Curb Inlet	127.25	2.00	18	19.39	1.77	10.97	6.32	0.73	976.39	970.25	967.70	968.12	0.05	0.40	1.00	0.62	0.67	970.67	971.34	970.25	971.34	974.89	
	C-5, F-1	1.12	0.35	0.66	0.66	5.00	0.43	7.35	1.70	Curb Inlet	97.55	1.59	18	17.27	1.77	9.77	3.80	0.69	968.62	964.20	962.65	963.10	0.02	0.40	1.00	0.22	0.24	964.85	965.24	964.20	965.24	967.12	
C-8, D-1, H-1	C-7, E-1	0.71	7.21	0.66	0.66	5.00	0.31	6.82	32.43	Curb Inlet									982.17														
C-7, E-1	C-6	0.71	8.45	0.66	0.66	5.00	0.06	6.74	37.57	Curb Inlet									972.69	961.60	961.20	964.21	0.07	0.40	0.40	0.64	0.71	964.28	964.74	964.92	964.92	971.19	
C-6	C-5, F-1	0.30	8.75	0.66	0.66	5.00	0.06	7.35	1.46	Curb Inlet	35.75	1.12	36	92.01	7.07	20.54	13.87	0.95	972.69	961.60	961.20	964.21	0.07	0.40	0.40	0.64	0.71	964.28	964.74	964.92	964.92	971.19	
C-5, F-1	C-4	0.21	9.31	0.66	0.66	5.00	0.09	6.73	1.02	Curb Inlet									967.50	957.00	956.70	959.65	0.04	0.40	0.40	0.45	0.49	959.69	960.07	960.14	960.14	966.00	
C-4	C-3	0.40	9.71	0.66	0.66	5.00	0.07	6.67	1.94	Curb Inlet	45.52	0.66	42	106.54	9.62	11.07	8.50	0.88	967.50	957.00	956.70	959.65	0.04	0.40	0.40	0.45	0.49	959.69	960.07	960.14	960.14	966.00	
C-3	C-2	0.40	10.11	0.66	0.66	5.00	0.33	6.65	44.36	Curb Inlet									966.76	956.50	956.30	959.20	0.04	0.40	0.40	0.41	0.45	959.24	959.63	959.65	959.65	965.26	
C-2	C-1	0.00	10.11	0.66	0.66	5.00	0.63	6.57	0.90	Curb Inlet									962.06	955.80	955.00	958.73	0.09	0.40	0.40	0.38	0.47	958.81	958.98	959.20	958.73	960.56	
				0.66	0.66	7.86	0.63	6.57	44.36	Curb Inlet	284.05	0.46	48	126.87	12.57	10.10	7.57	0.79	962.06	954.80	953.50	958.12	0.16	0.50	0.50	0.44	0.61	958.28	957.38	958.73	958.73	960.56	
G-5, N-1	G-4	0.36	3.14	0.66	0.66	5.00	0.52	6.91	1.75	Curb Inlet									991.98														
				0.66	0.66	6.52	0.52	6.91	14.32	Curb Inlet									978.38	977.40	969.40	971.40	0.79	0.40	0.40	0.70	1.49	978.29	979.57	977.40	979.57	990.48	
G-4	G-3	0.31	3.45	0.66	0.66	7.04	0.07	6.77	1.50	Curb Inlet									978.38	969.10	968.70	970.61	0.09	0.40	0.40	0.42	0.52	970.71	971.40	971.13	971.40	976.88	
G-3	G-2	0.53	3.98	0.66	0.66	5.00	0.08	6.75	2.57	Curb Inlet									978.38	968.00	963.40	964.18	0.29	0.40	0.40	0.40	0.41	968.78	970.61	968.00	970.61	976.88	
				0.66	0.66	7.11	0.08	6.75	17.74	Curb Inlet	78.42	5.87	24	71.44	3.14	22.74	15.58	1.31	976.44	968.00	963.40	964.18	0.29	0.40	0.40	0.40	0.41	968.78	970.61	968.00	970.61	976.88	
G-2	G-1	0.06	4.04	0.66	0.66	5.00	0.29	7.35	0.29	Curb Inlet									976.44	960.80	955.70	958.43	0.06	0.40	0.40	1.03	1.09	961.55	963.07	960.80	963.07	974.84	
				0.66	0.66	7.19	0.18	6.73	17.95	Curb Inlet	133.32	3.37	36	168.81	7.07	23.88	12.88	0.76	964.01	954.20	953.90	958.12	0.01	0.40	0.40	0.30	0.31	958.13	956.68	958.43	958.43	962.51	
G-1	G-0	0.00	4.04	0.66	0.66	5.00	0.10	6.69	0.01	Junction Box									959.85	956.19	955.94	956.93	0.22	0.40	1.00	0.37	0.60	957.16	957.99	957.79	957.99	958.35	
				0.66	0.66	7.37	0.10	6.69	18.01	Curb Inlet	42.50	0.70	42	109.84	9.62	11.42	6.97	0.71	959.85	954.20	953.90	958.12	0.01	0.40	0.40	0.30	0.31	958.13	956.68	958.43	958.43	962.51	
A-3	A-2	1.24	1.86	0.66	0.66	5.00	0.15	7.35	6.02	Curb Inlet									959.85	956.19	955.94	956.93	0.22	0.40	1.00	0.37	0.60	957.16	957.99	957.79	957.99	958.35	
				0.66	0.66	5.00	0.15	7.35	3.01	Curb Inlet									959.70	955.15	952.80	953.36	0.04	0.40	0.40	0.96	1.00	955.71	956.81	955.15	956.81	958.20	
A-2	A-1	0.62	1.86	0.66	0.66	5.00	0.06	7.31	8.97	Curb Inlet	44.20	5.32	24	68.02	3.14	21.65	12.43	0.83	956.23	955.15	952.80	953.36	0.04	0.40	0.40	0.96	1.00	955.71	956.81	955.15	956.81	958.20	
				0.66	0.66	5.00	0.06	7.35	2.43	24" HDPE									956.23	954.44	952.50	953.38	0.03	0.40	1.00	0.56	0.59	954.86	955.52	954.44	955.52	954.73	
A1 - 2	A1 - 1	0.50	0.50	0.66	0.66	5.00	0.30	7.35	2.43	18" RCP	106.90	1.81	18	18.44	1.77	10.44	5.99	0.72	956.23	954.44	952.50	953.38	0.03	0.40	1.00	0.56	0.59	954.86	955.52	954.44	955.52	954.73	

DATE: 08/01/2018		STORM SEWER PIPE AND STRUCTURE TABLE																														
TITLE: WHISPERING WOODS, LEE'S SUMMIT, MO																																
JOB #: 04078																																
DESIGN CONDITIONS: PUBLIC - 100 YEAR STORM EVENT																																
STRUCTURES				RUNOFF CALCULATIONS																												
PIPE DESIGN																																
FROM	TO	DIRECT AREA (ACRES)	TOTAL AREA (ACRES)	C	KC (K=1.25)	Tc (MIN)	FLOW TIME (MIN)	INTENSITY (IN/HR)	DESIGN Q (CFS)	DESCRIPTION	PIPE LENGTH (L.F.)	PIPE SLOPE (%)	PIPE DIA (IN)	Q FULL (CFS)	PIPE AREA (SQ.FT.)	V FULL (F/S)	DESIGN V (F/S)	Hw/D	MH TOP ELEVATION	UPSTREAM FLOWLINE	DOWNSTREAM FLOWLINE	DOWNSTREAM WATER ELEVATION	FRICTION HEAD (h f)	ENTRY LOSS COEFFICIENT (k)	ACTUAL ENTRY LOSS (k)	ENTRY LOSS (h m)	h f + h m (FT)	HGL Pipe U/S	HW INLET CONTROL	HW OUTLET CONTROL	HYDRAULIC GRADE ELEV.	HYDRAULIC GRADE (MAX)
H-2		1.53	0.66	0.83	5.00	10.32	13.03	13.03	13.03	Field Inlet									985.57											981.63	985.57	
	C-8, D-1, H-1	0.42	1.53	0.66	0.83	5.00	0.18	10.32	13.03	24" HDPE	127.25	3.54	24	55.45	3.14	17.65	11.91	1.02		979.80	975.10	975.86	0.25	0.40	1.00	2.20	2.45	980.36	981.63	979.60	976.19	982.16
D-2		0.42	0.66	0.83	5.00	10.32	3.58	18" RCP	34.75	8.63	18	40.23	1.77	22.77	11.66	0.79			982.16	975.00	972.00	973.61	0.02	0.40	1.00	2.11	2.14	975.34	976.19	975.75	976.19	982.16
E-2		0.53	0.66	0.83	5.00	10.32	4.51	18" RCP	127.25	2.00	18	19.39	1.77	10.97	7.39	0.84			975.39	970.25	967.70	968.26	0.14	0.40	1.00	0.85	0.99	970.82	971.51	970.25	971.51	976.39
F-2		0.35	0.66	0.83	5.00	10.32	2.88	18" RCP	97.55	1.59	18	17.27	1.77	9.77	4.43	0.75			968.62	964.20	962.65	963.26	0.05	0.40	1.00	0.31	0.35	964.81	965.32	964.20	965.32	968.62
C-8, D-1, H-1		1.12	0.66	0.83	5.00	10.32	9.54	36" RCP	250.68	2.19	36	145.22	7.07	20.54	15.86	1.54			962.17	968.00	962.01	967.74	1.09	0.40	0.40	1.56	2.66	970.52	973.61	970.40	973.61	982.17
C-7, E-1		0.71	7.21	0.66	0.83	5.00	10.32	6.05	36" RCP	156.68	2.23	36	129.83	7.07	18.37	15.18	1.91		972.69	961.60	961.20	966.73	0.21	0.40	0.40	0.80	1.01	966.94	967.10	967.74	967.74	972.69
C-6		0.30	0.66	0.83	5.00	10.32	2.55	36" RCP	156.68	2.23	36	129.83	7.07	18.37	15.18	1.91			972.69	961.00	957.51	962.00	0.98	0.40	0.40	1.43	2.41	962.98	966.73	964.41	966.73	972.69
C-5, F-1		0.21	0.66	0.83	5.00	10.32	1.79	42" RCP	45.52	0.66	42	106.54	9.62	11.07	9.59	1.31			967.50	957.00	956.70	961.29	0.14	0.40	0.40	0.57	0.71	961.42	961.59	962.00	962.00	967.50
C-4		0.40	0.66	0.83	5.00	10.32	3.41	42" RCP	157.63	0.51	48	133.72	12.57	10.64	8.99	1.06			966.76	955.80	955.00	959.40	0.28	0.40	0.40	0.50	0.78	959.67	960.02	960.17	960.17	966.74
C-3		0.40	0.66	0.83	5.00	10.32	3.41	42" RCP	157.63	0.51	48	133.72	12.57	10.64	8.99	1.06			966.74	955.80	955.00	959.40	0.28	0.40	0.40	0.50	0.78	959.67	960.02	960.17	960.17	966.74
C-2		0.00	10.11	0.66	0.83	5.00	10.32	0.00	48" RCP	284.05	0.46	48	126.87	12.57	10.10	8.61	1.06		962.06	954.80	953.50	958.32	0.50	0.50	0.50	0.58	1.08	958.82	959.02	959.40	959.40	962.06
G-5, N-1		0.36	0.66	0.83	5.00	10.32	3.07	48" RCP	330.30	2.42	24	45.89	3.14	14.61	12.18	1.95			991.98	977.40	969.40	974.04	2.45	0.40	0.40	0.92	3.37	978.65	981.30	977.41	981.30	991.98
G-4		0.31	0.66	0.83	5.00	10.32	2.64	48" RCP	34.21	1.17	24	31.90	3.14	10.15	8.64	2.16			978.38	969.10	968.70	973.28	0.29	0.40	0.40	0.46	0.76	973.57	973.42	974.04	974.04	978.38
G-3		0.53	0.66	0.83	5.00	10.32	4.51	48" RCP	78.42	5.87	24	71.44	3.14	22.74	18.02	2.64			978.38	968.00	965.40	964.48	0.89	0.40	0.40	2.02	2.91	969.08	973.28	968.00	973.28	978.38
G-2		0.06	0.66	0.83	5.00	10.32	0.51	36" RCP	135.32	3.77	36	168.81	7.07	23.88	15.13	0.94			976.44	960.80	955.70	958.76	0.18	0.40	0.40	1.42	1.60	961.81	963.61	960.80	963.61	976.44
G-1		0.00	0.66	0.83	5.00	10.32	0.00	Junction Box	42.50	0.70	42	109.84	9.62	11.42	8.13	0.79			964.01	954.20	953.90	958.32	0.02	0.40	0.40	0.41	0.44	958.34	956.98	958.76	958.76	964.01
A-3		1.24	0.66	0.83	5.00	10.32	10.56	15" RCP	43.00	0.58	15	6.41	1.23	5.23	8.61	3.03			959.70	956.19	955.94	957.49	0.69	0.40	1.00	1.15	1.84	958.18	959.98	959.33	959.98	959.70
A-2		0.62	1.86	0.66	0.83	5.15	10.26	15.75	24" HDPE	44.20	5.32	24	68.02	3.14	21.65	14.54	1.17		955.23	955.15	955.80	955.74	0.13	0.40	0.40	1.31	1.44	955.90	957.49	957.18	957.49	959.70
A1 - 2		0.50	0.50	0.66	0.83	5.00	0.25	10.32	4.26	18" RCP	106.90	1.81	18	18.44	1.77	10.44	7.01	0.82		954.44	952.50	953.20	0.11	0.40	1.00	0.76	0.87	955.00	955.68	954.44	955.68	956.23

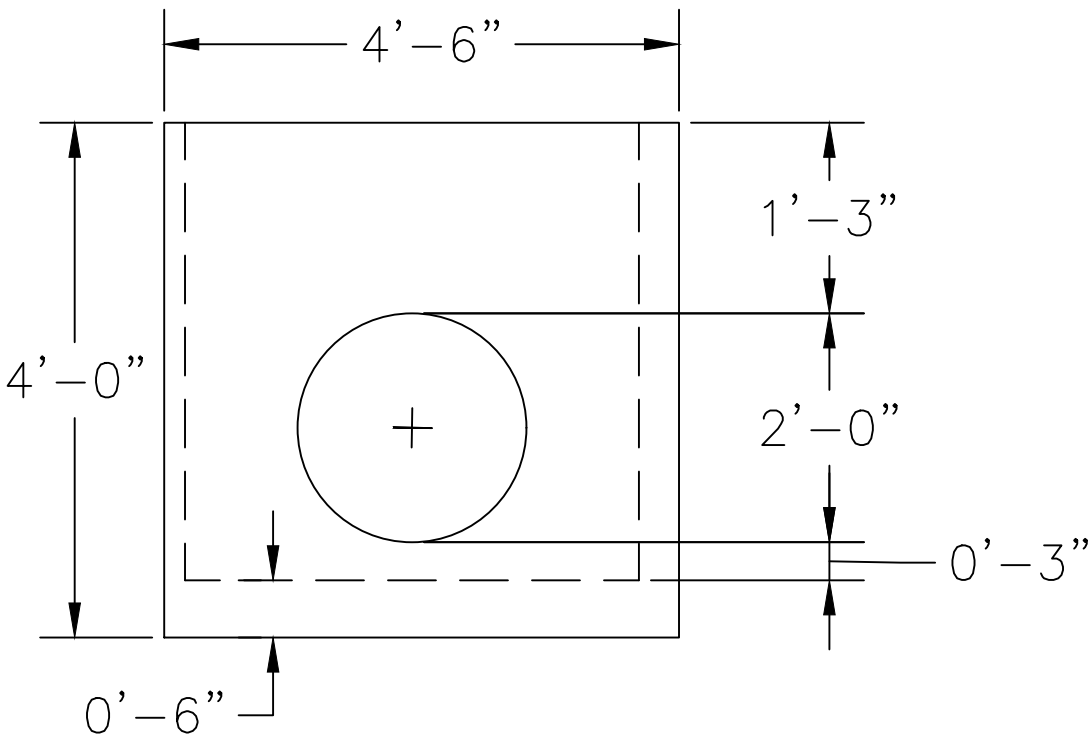
PRE-CAST END SECTION DETAILS – STORM LINE A & STORM LINE A1



FACE A – 18" RCP (STM LINE A1)



FACE B – 24" HDPE (STM LINE A)



NOTE
SHOP DRAWINGS SHALL BE
SUBMITTED TO DESIGN ENGINEER
FOR APPROVAL.

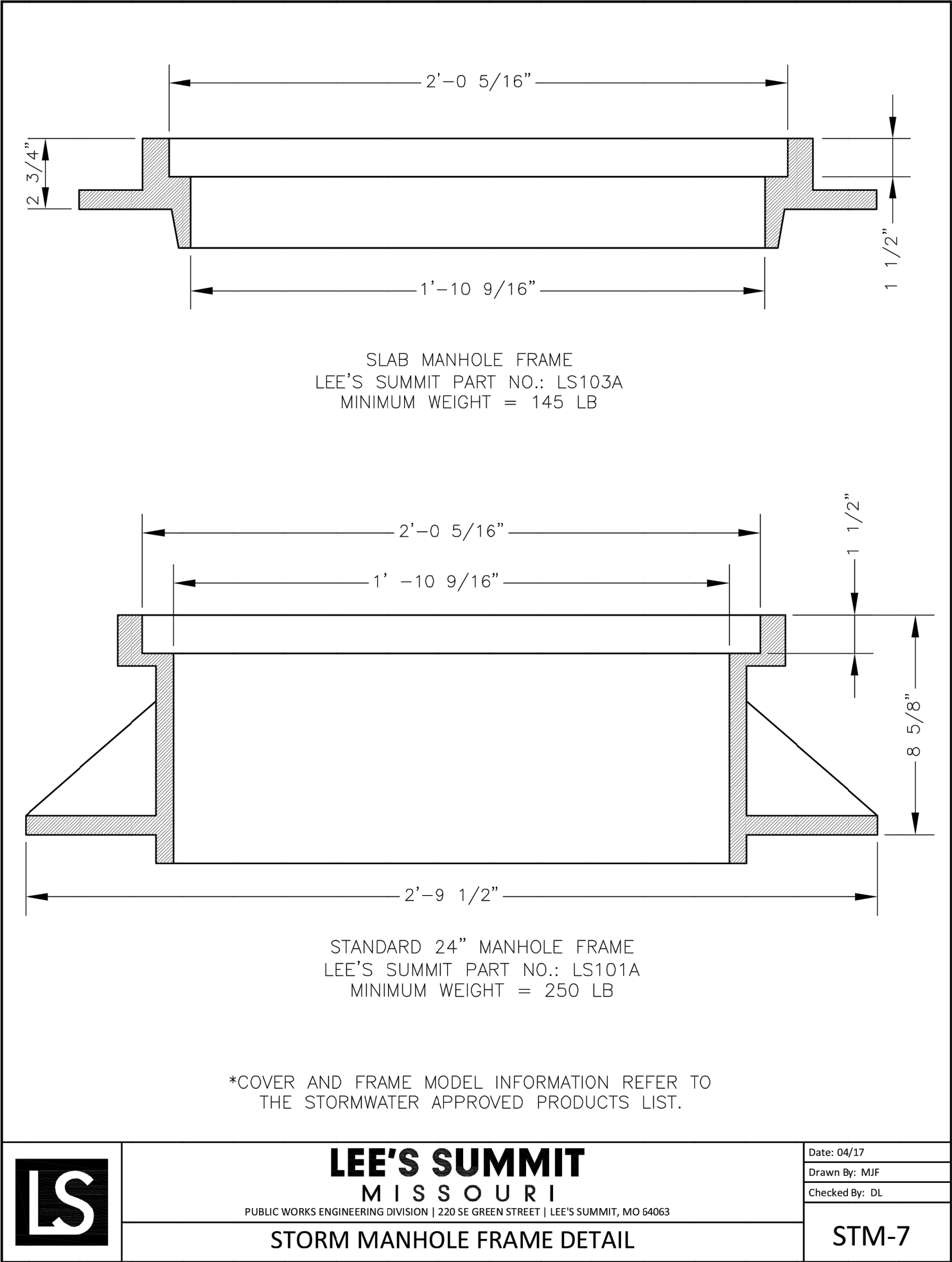
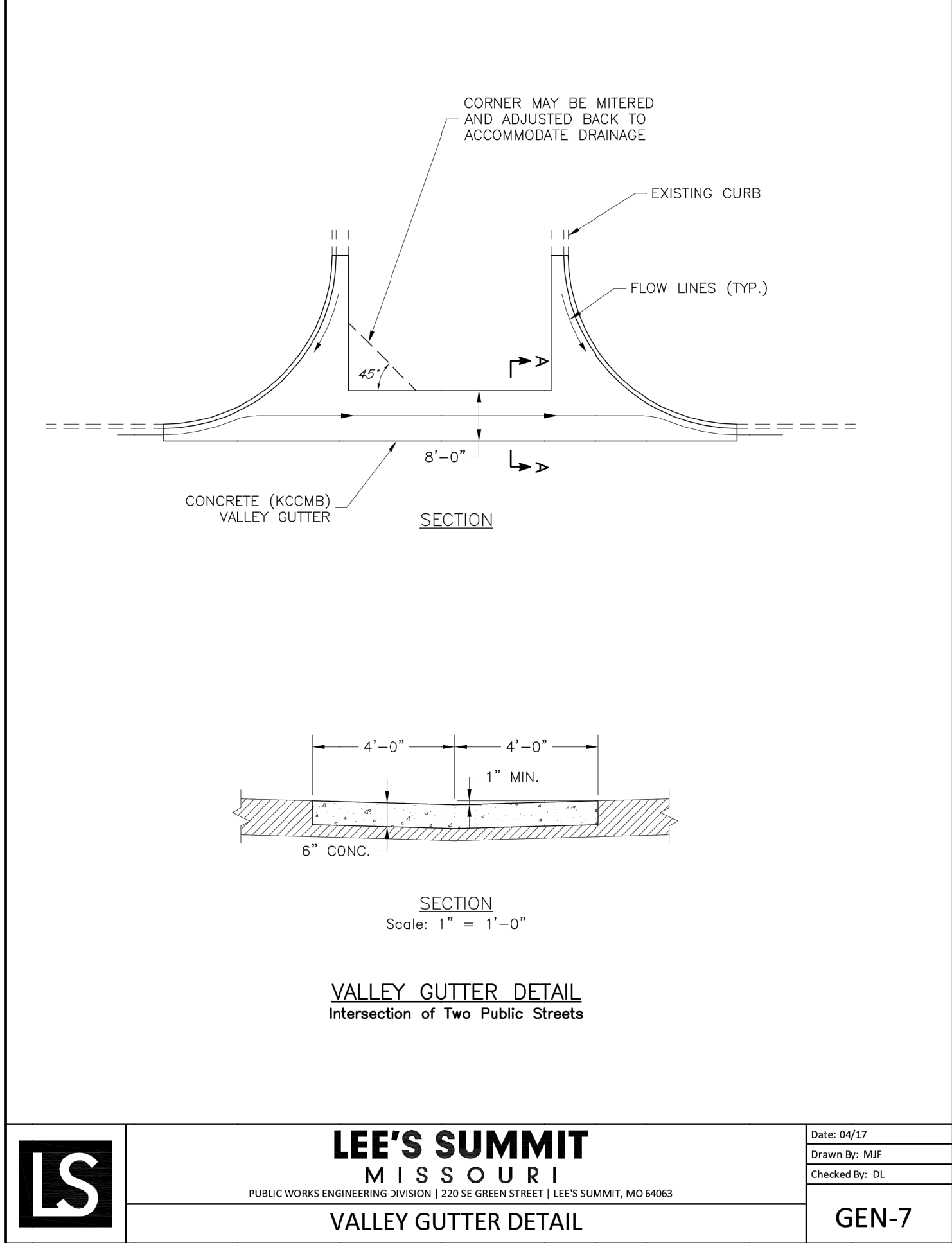
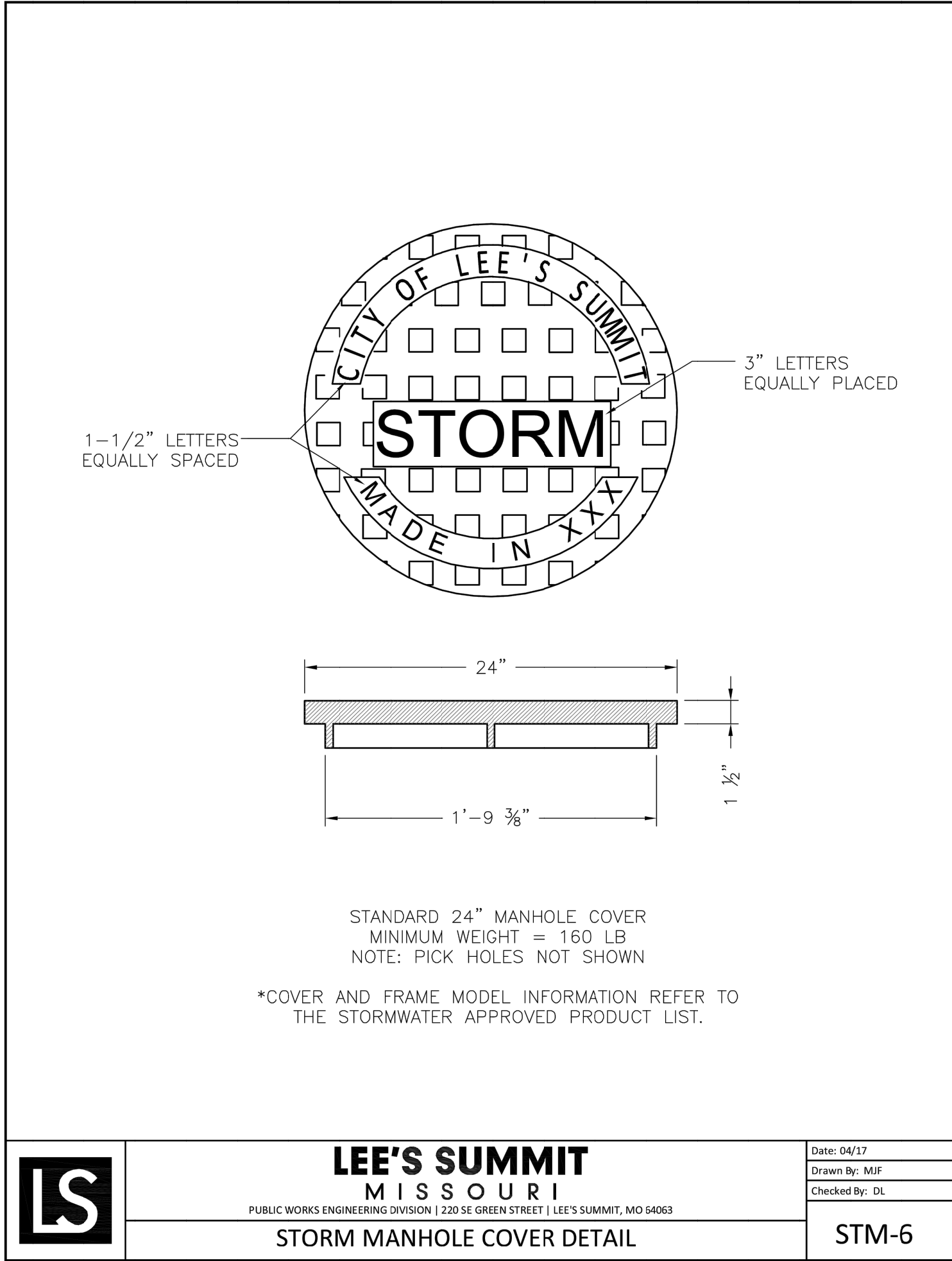
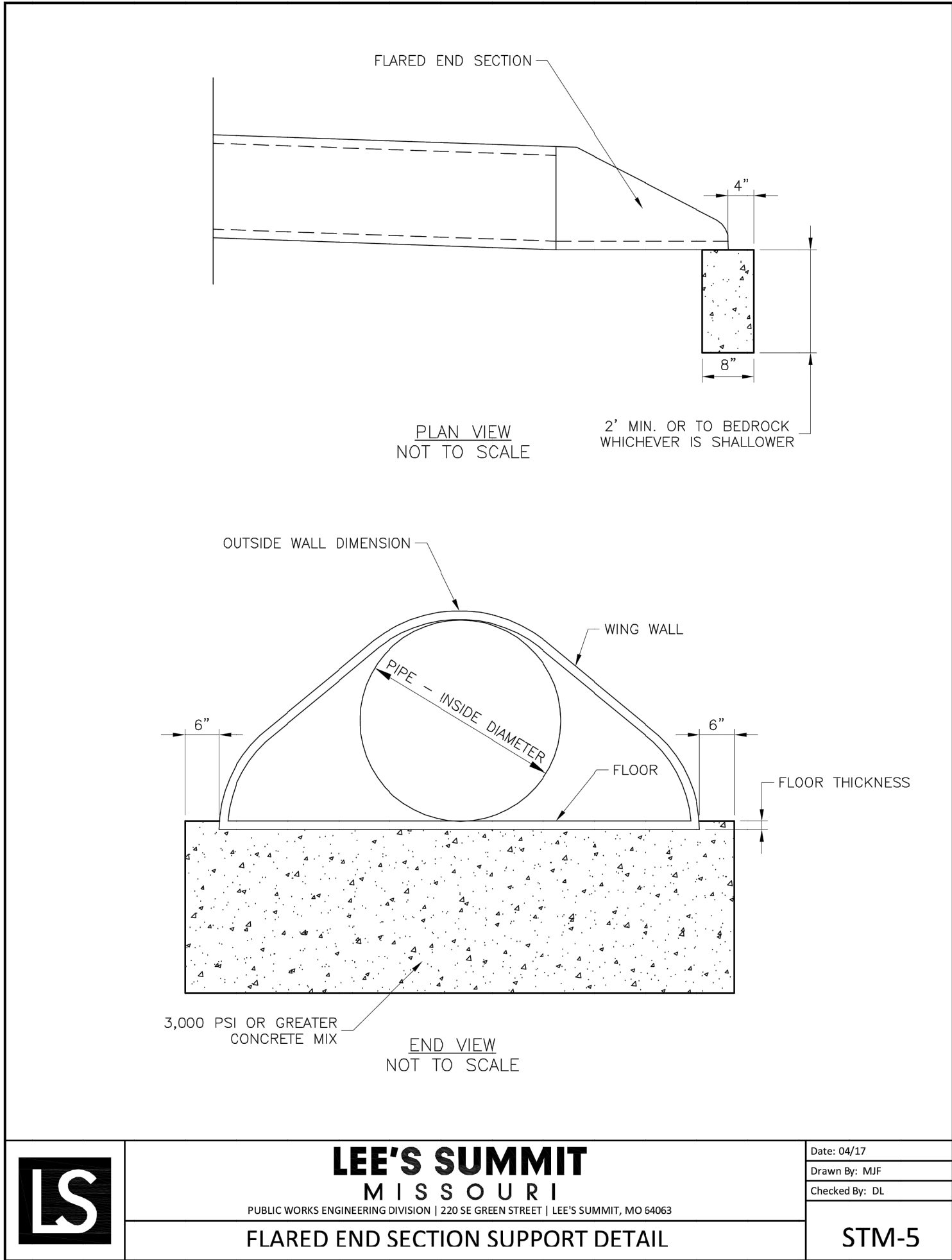
REVISION



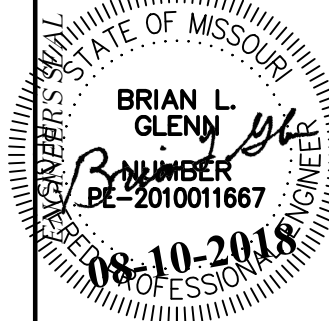
**PHOENIX ENGINEERING
& SURVEYING, LLC**
3833 S. NORTHERN BLVD.
INDEPENDENCE, MO 64602
(816) 743-9000 FAX: (816) 743-9700
ENGINEERING CERTIFICATE NO: MO E-2000151302-D
SURVEYING CERTIFICATE NO: MO LS-2000151303-D
KS: E-853
KS: LS-138

WHISPERING WOODS
LEE'S SUMMIT, JACKSON COUNTY, MO
STREET & STORM SEWER PLANS
STRUCTURE A-1 DETAILS

DESIGNED
BLG
DRAWN
BLG
SCALE
Noted
DATE
09-01-2017
JOB NO.
04078
SHEET



REVISION

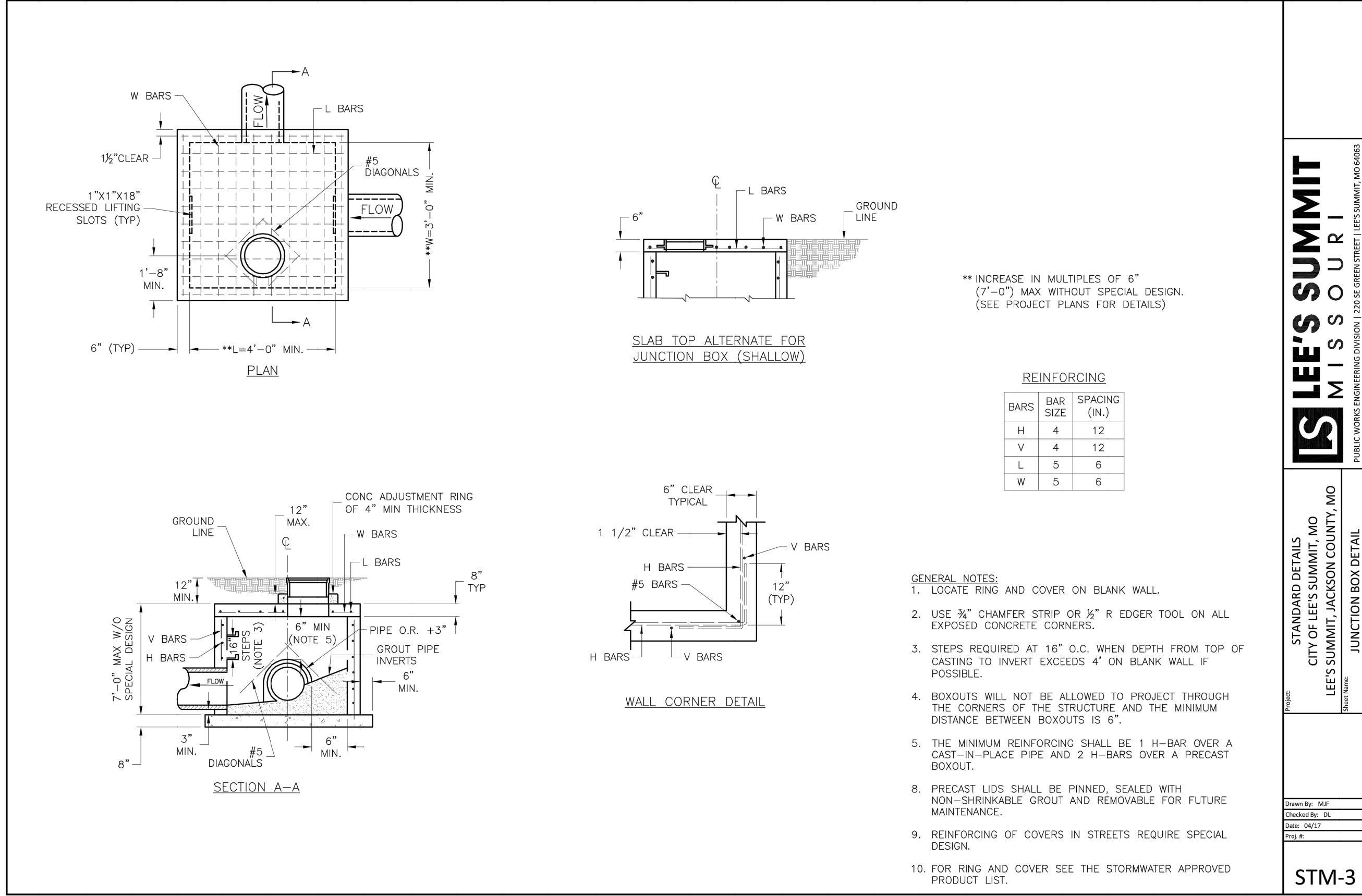
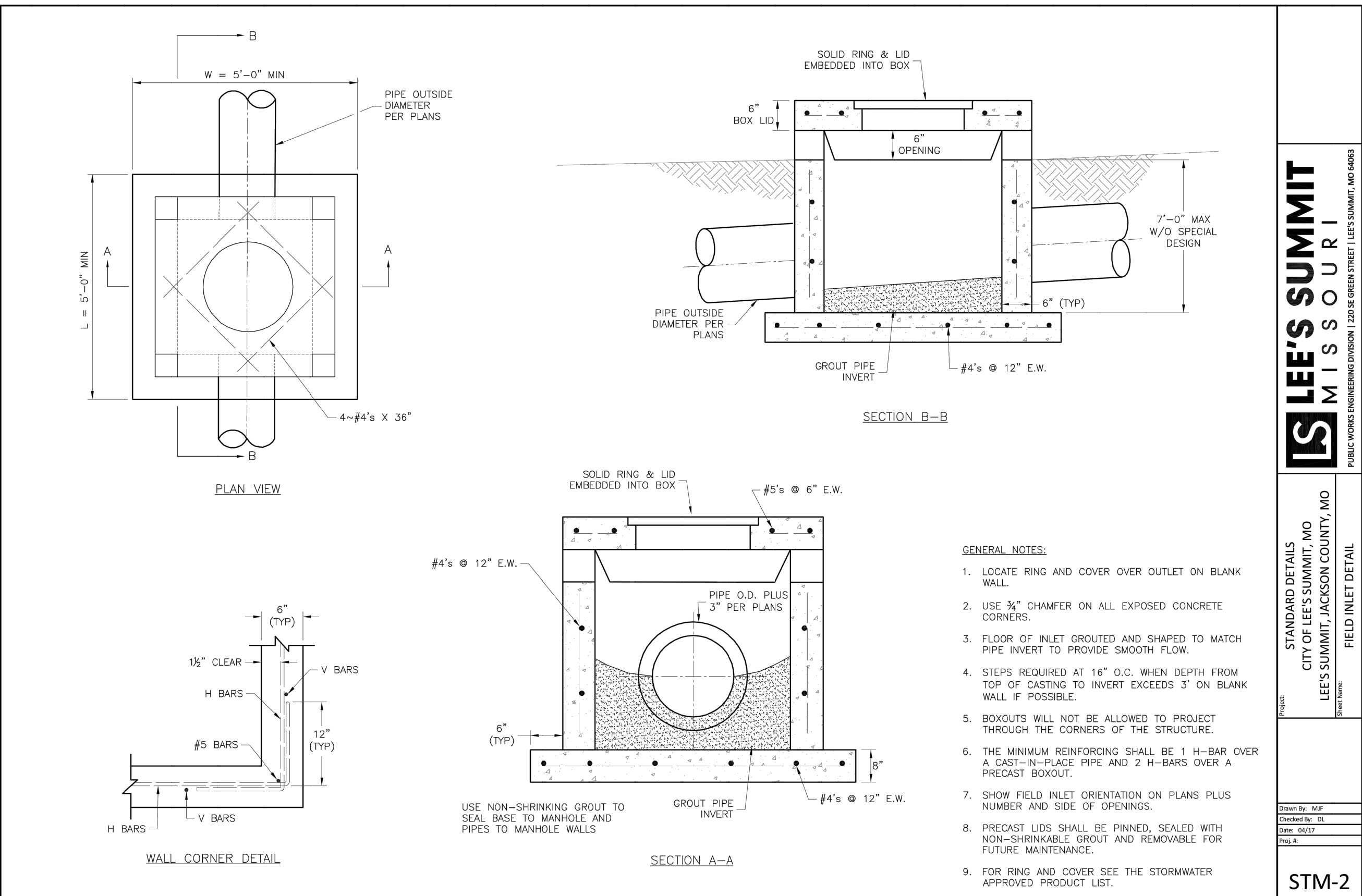
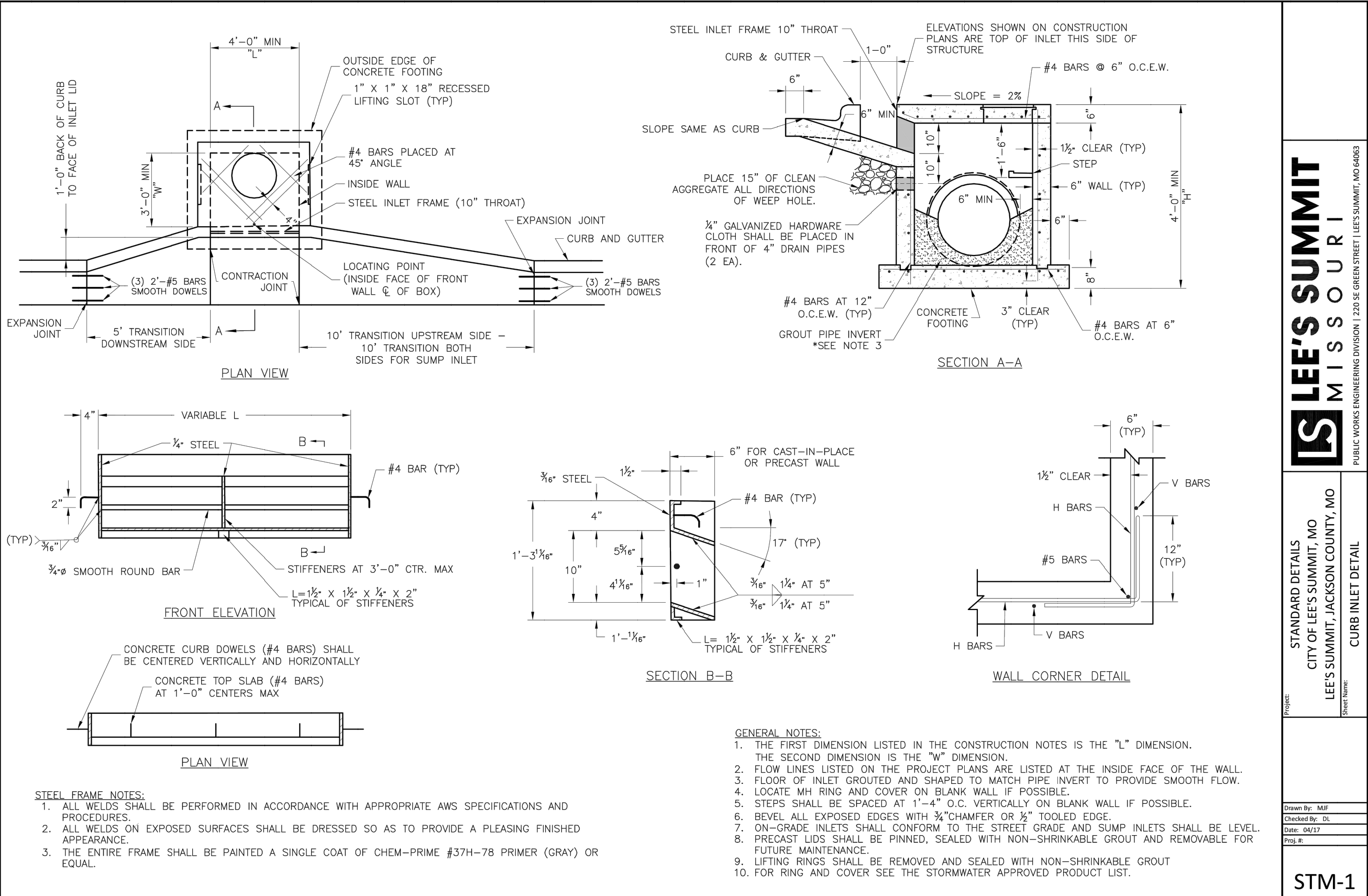
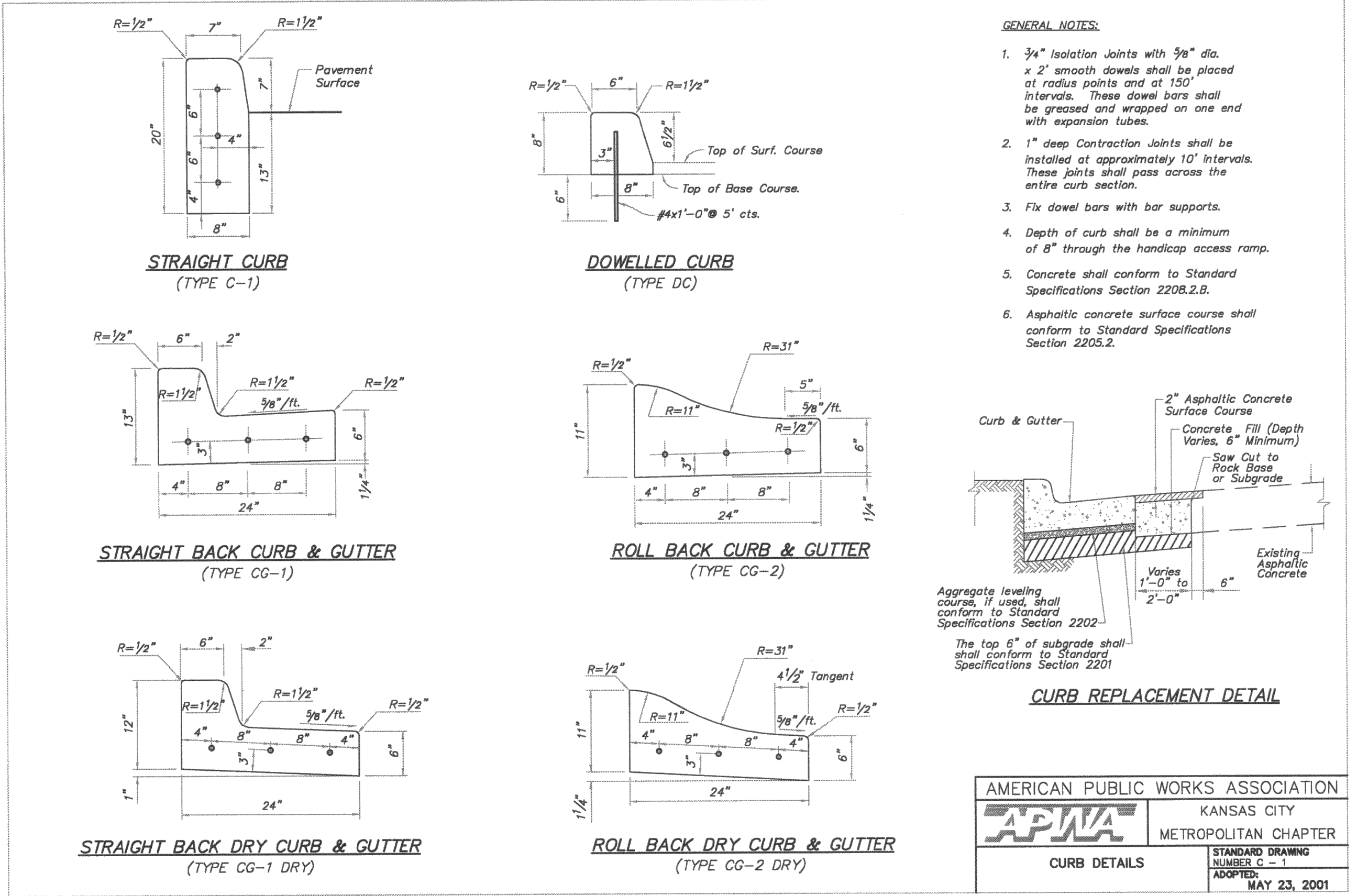


**PHOENIX ENGINEERING
& SURVEYING, LLC**

3834 S. NORTHERN BLVD.
INDEPENDENCE, MO 64062
(816) 743-9000 FAX: (816) 743-9700
ENGINEERING CERTIFICATE NO: MO E-2000151302-D
SURVEYING CERTIFICATE NO: MO LS-2000151303-D
KS: E-853
KS: LS-138

WHISPERING WOODS
+
LEE'S SUMMIT, JACKSON COUNTY, MO
STREET & STORM SEWER PLANS
STREET & STORM DETAILS

DESIGNED
BLG
DRAWN
BLG
SCALE
Noted
DATE
09-01-2017
JOB NO.
04078
SHEET



LEE'S SUMMIT MISSOURI

STANDARD DETAILS CITY OF LEE'S SUMMIT, MO LEE'S SUMMIT, JACKSON COUNTY, MO CURB INLET DETAIL

STM-1

PHOENIX ENGINEERING & SURVEYING, LLC

WHISPERING WOODS + LEE'S SUMMIT, JACKSON COUNTY, MO STREET & STORM SEWER PLANS STREET & STORM DETAILS

DESIGNED BLG DRAWN BLG SCALE Noted DATE 09-01-2017 JOB NO. 04078 SHEET 37 OF 40

REVISION

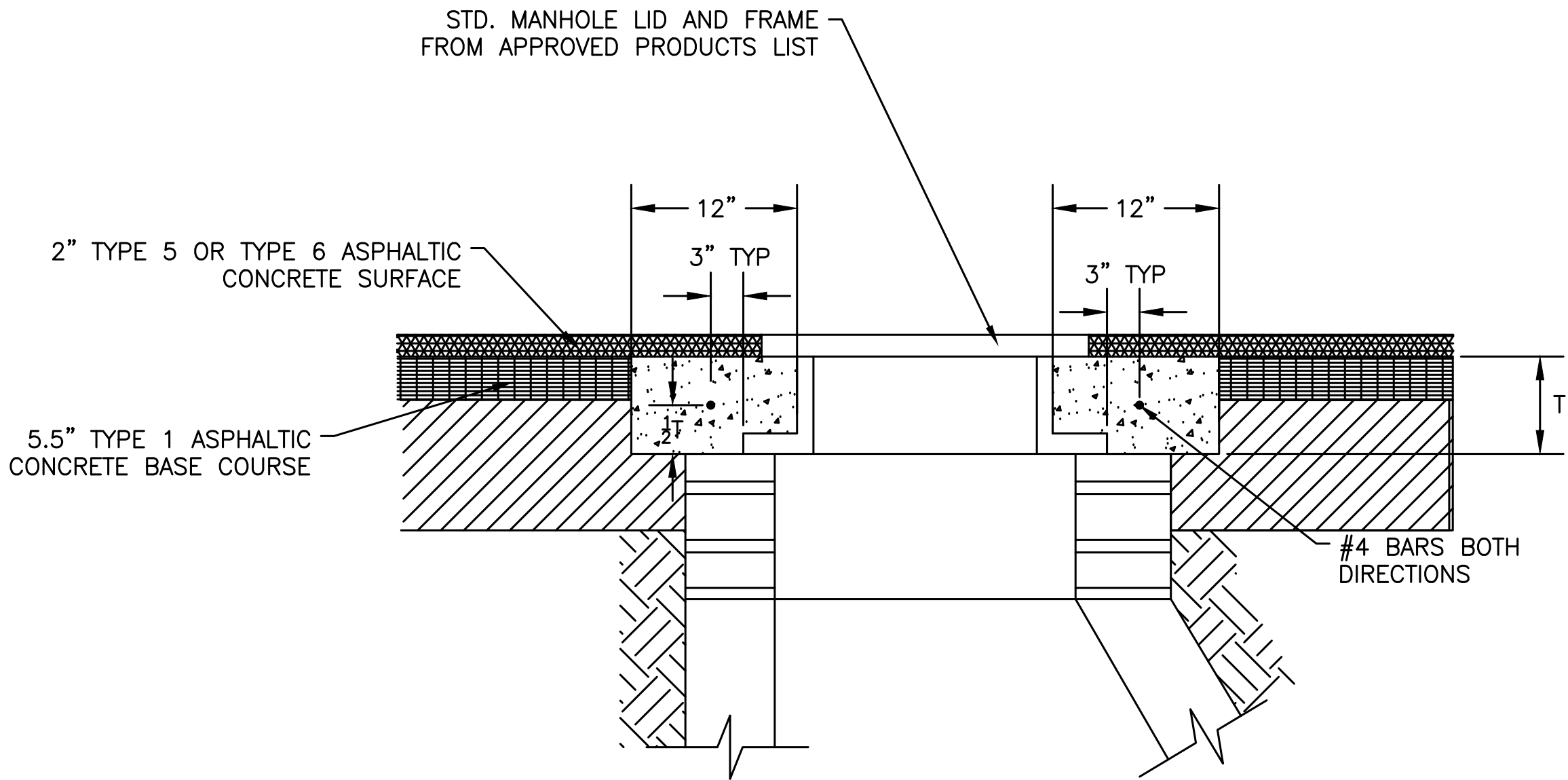
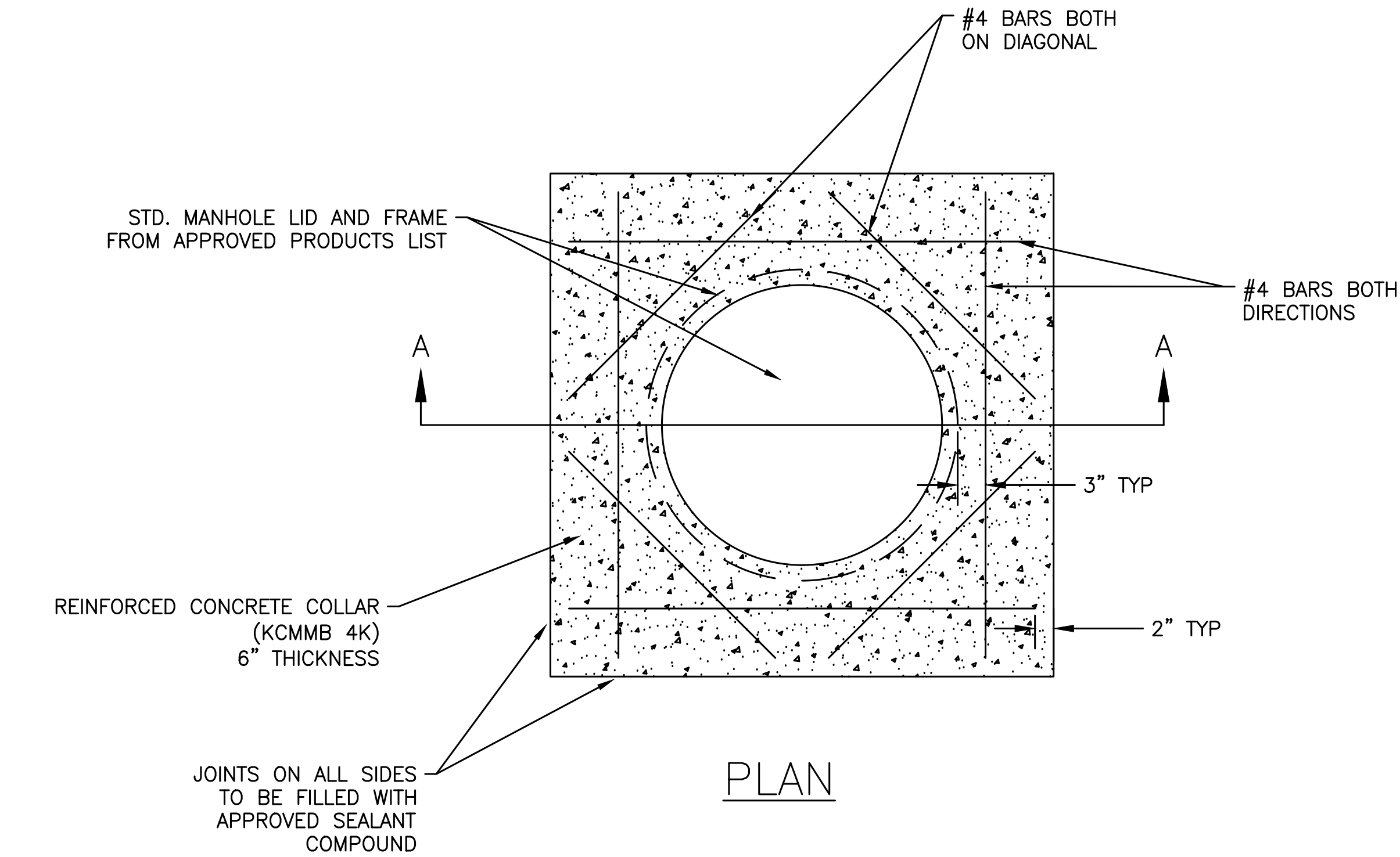
BRIAN L. GLENN, PE 2010011667

PHOENIX ENGINEERING & SURVEYING, LLC

KS: E-853 KS: LS-138

3833 S. NORTHERN BLVD. INDEPENDENCE, MO 64602 (816) 743-9700 FAX: (816) 743-9700

ENGINEERING CERTIFICATE NO. MO E-2000151302-D SURVEYING CERTIFICATE NO. MO LS-2000151302-D



CONCRETE MANHOLE COLLAR
FOR USE WITH MANHOLES WITHIN PAVEMENT

- GENERAL NOTES
1. ADJUST MANHOLE FRAME AND COVER TO FINISH GRADE AND SLOPE WITH CONNCRETE ADJUSTMENT RINGS AND LEVELING MORTAR AS NECESSARY
 2. THE ORIENTATION OF THE REINFORCED CONCRETE COLLAR SHALL BE DETERMINED BY THE ENGINEER OR INSPECTOR IN THE FIELD.

WHISPERING WOODS
+
LEE'S SUMMIT, JACKSON COUNTY, MO
STREET & STORM SEWER PLANS
IN PAVEMENT MANHOLE DETAIL

DESIGNED
BLG
DRAWN
BLG
SCALE
Noted
DATE
09-01-2017
JOB NO.
04078
SHEET

38 OF 40

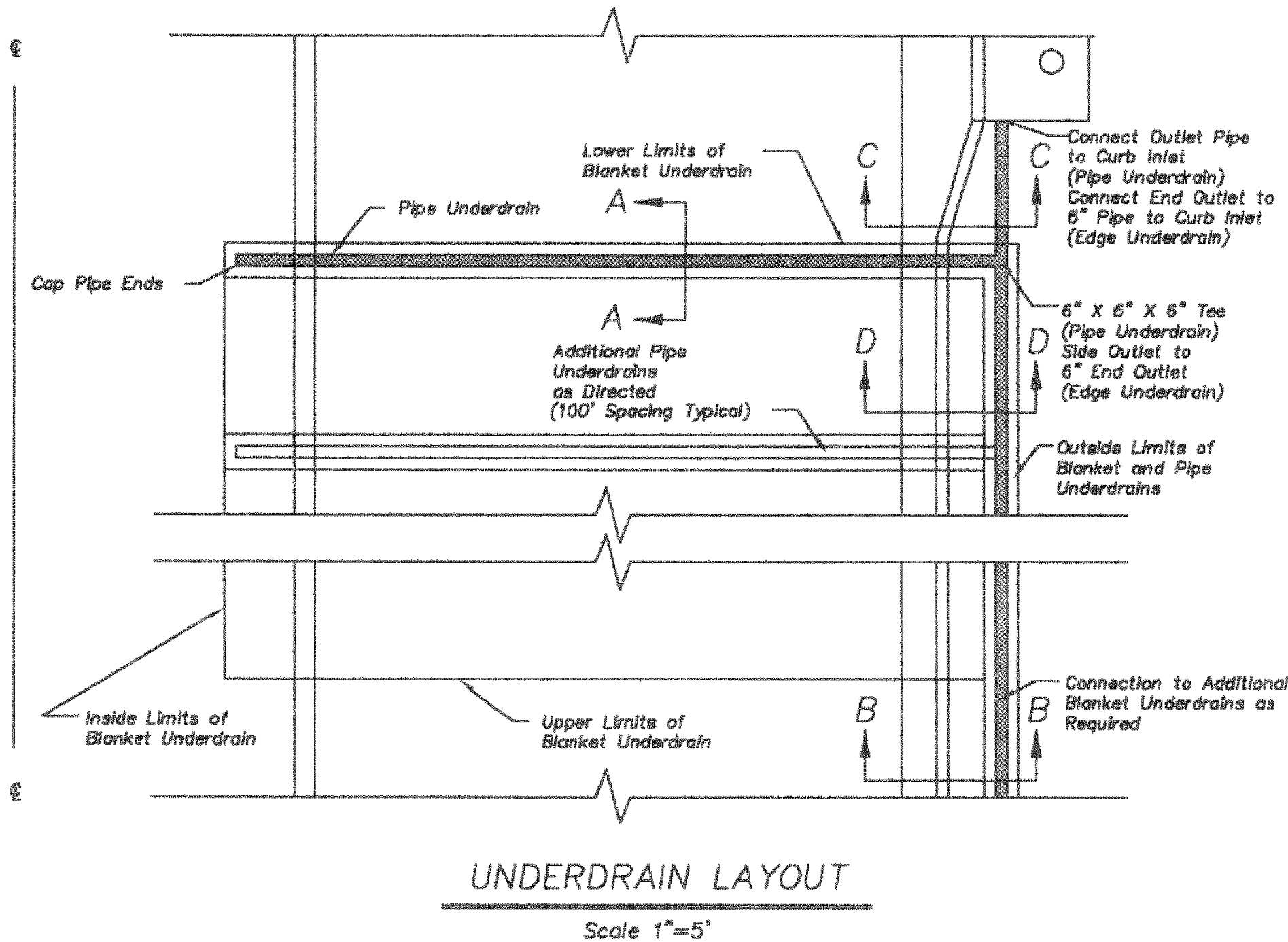
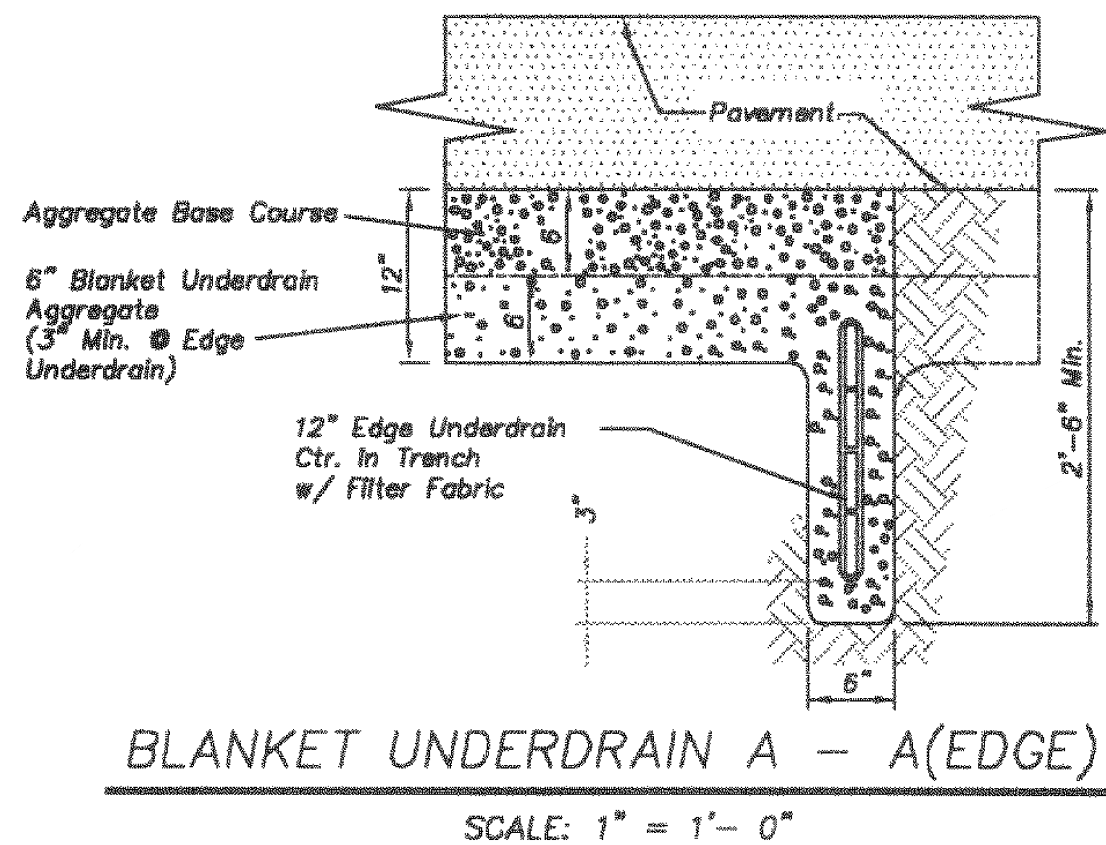
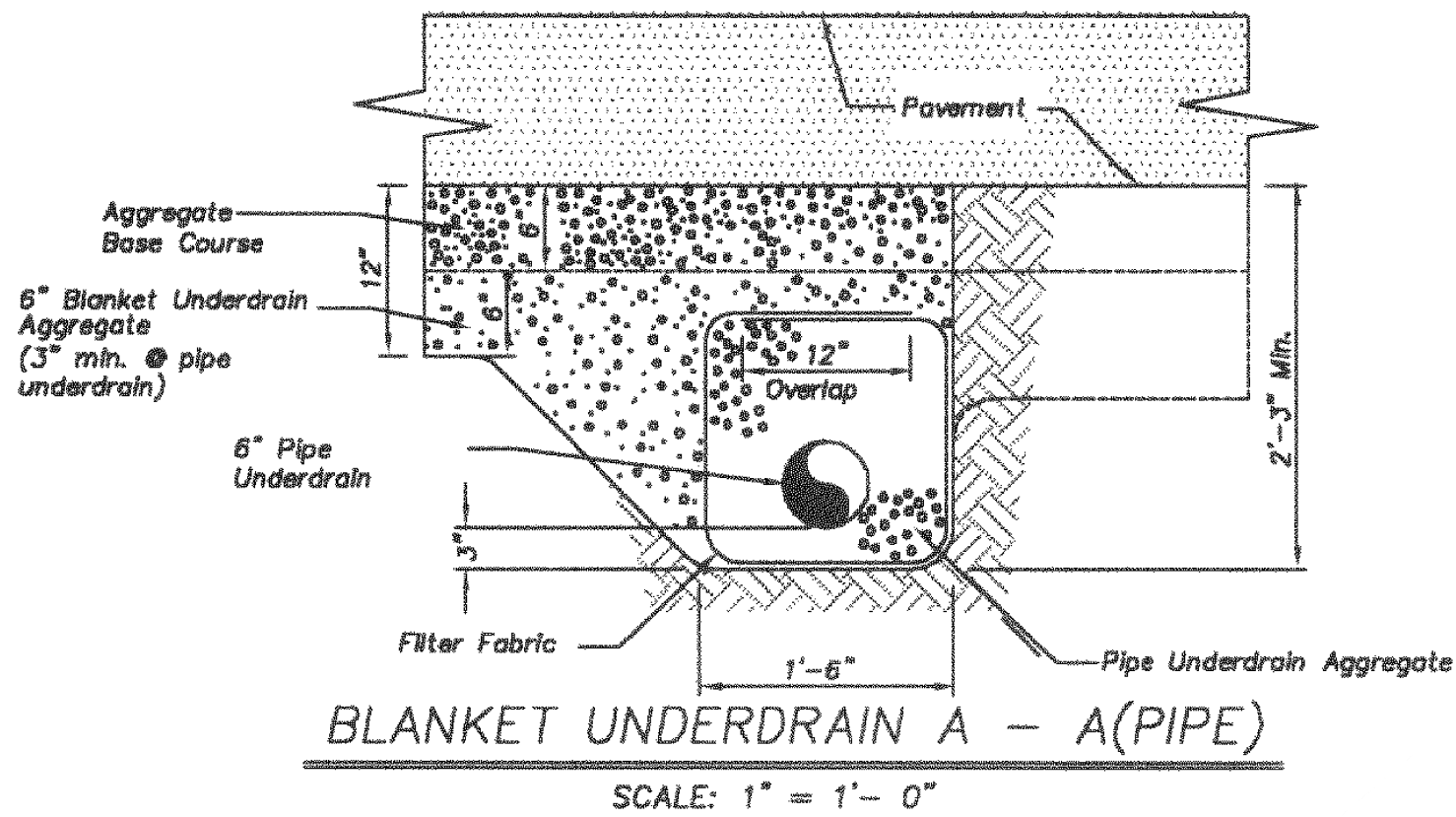


PHOENIX ENGINEERING
& SURVEYING, LLC

3833 S. NORTHERN BLVD.
INDEPENDENCE, MO 64602
(816) 743-9000 FAX: (816) 743-9700
ENGINEERING CERTIFICATE NO: MO E-2000151302-D KS: E-853
SURVEYING CERTIFICATE NO: MO LS-2000151303-D KS: LS-138

REVISION

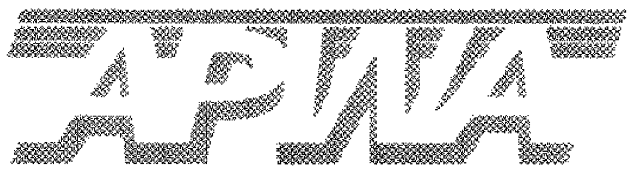
THE SEAL(S) AND SIGNATURE(S) APPLY ONLY TO THE DOCUMENT TO WHICH THEY ARE AFFIXED, AND EXPRESSLY DISCLAIM ANY RESPONSIBILITY FOR ALL OTHER PLANS, SPECIFICATIONS, ESTIMATES, REPORTS, OR OTHER DOCUMENTS OR INSTRUMENTS RELATING TO OR INTENDED TO BE USED FOR ANY PART OR PARTS OF THE ENGINEERING OR SURVEYING PROJECT.



Underdrain Notes:

1. All roadway excavation in rock will be undercut no less than 15" for the full width of the roadway as shown.
2. In areas where underdrains are not required, undercut and overbreakage in limestone and shale shall be brought to within 6" of the subgrade line with properly compacted crushed stone, shot rock, and/or rock rubble. The remaining 6" shall conform to Standard Specifications Section 2202.
3. Layers of earth or shale shall not be permitted for backfill up to the bottom of the crushed stone.
4. A minimum of 12" of select soil (topsoil) shall be placed on exposed rock cut or fill slopes outside the limits of the roadway. All rock and shale slopes shall be benched @ maximum 2' vertical intervals prior to placement of select soil.
5. Proposed underdrain pipe layout, flowline elevations, inlet connection points, and details shall be approved prior to construction by the City Engineer.
6. Where pipe underdrains are used, all underdrain outlet pipes shall be solid wall with watertight joints. All outlet pipes shall be tied into the nearest storm sewer inlet as approved. Where edge underdrains are used, all underdrain outlet pipes shall be solid wall with manufacturer joints approved by the City Engineer. All connections between pipes and edge connectors or curb inlets shall be made with 2' minimum length of pipe.
7. All underdrain pipes shall be installed at a minimum slope of 1%. Underdrain pipe shall be installed with the perforations placed down.
8. Blanket underdrains shall be placed on bedrock unless otherwise directed by the City Engineer. Undercut and overbreakage in limestone and shale shall be brought to within 12" of the subgrade line with properly compacted crushed stone, shot rock and/or rock rubble.
9. All filter fabric used for pipe underdrain construction shall conform to Standard Specifications Section 2203.6.
10. The Contractor may, at his option, use either pipe underdrain or edge underdrain, but shall not mix underdrain types within any underdrain system.
11. All edge underdrain shall be held in the center of the trench by mechanical methods while placing granular backfill. See detail this sheet. Alternate methods may be used with prior approval by the City Engineer.
12. Blanket underdrain aggregate, pipe underdrain aggregate, pipe underdrain, edge underdrain and outlet pipe shall conform to Standard Specifications Section 2203.6.

AMERICAN PUBLIC WORKS ASSOCIATION



KANSAS CITY
METROPOLITAN CHAPTER

UNDERDRAIN DETAILS

STANDARD DRAWING
UD-1

ADOPTED:
MAY 23, 2001

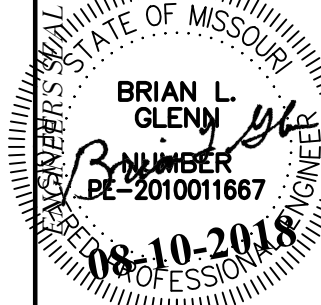
WHISPERING WOODS

LEE'S SUMMIT, JACKSON COUNTY, MO
STREET & STORM SEWER PLANS
UNDERDRAIN DETAILS

DESIGNED
BLG
DRAWN
BLG
SCALE
Noted
DATE
09-01-2017
JOB NO.
04078
SHEET

39 OF 40

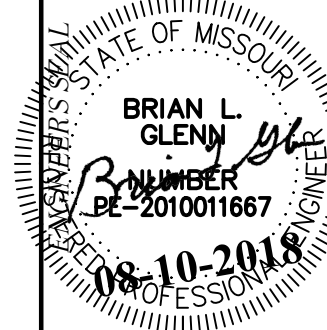
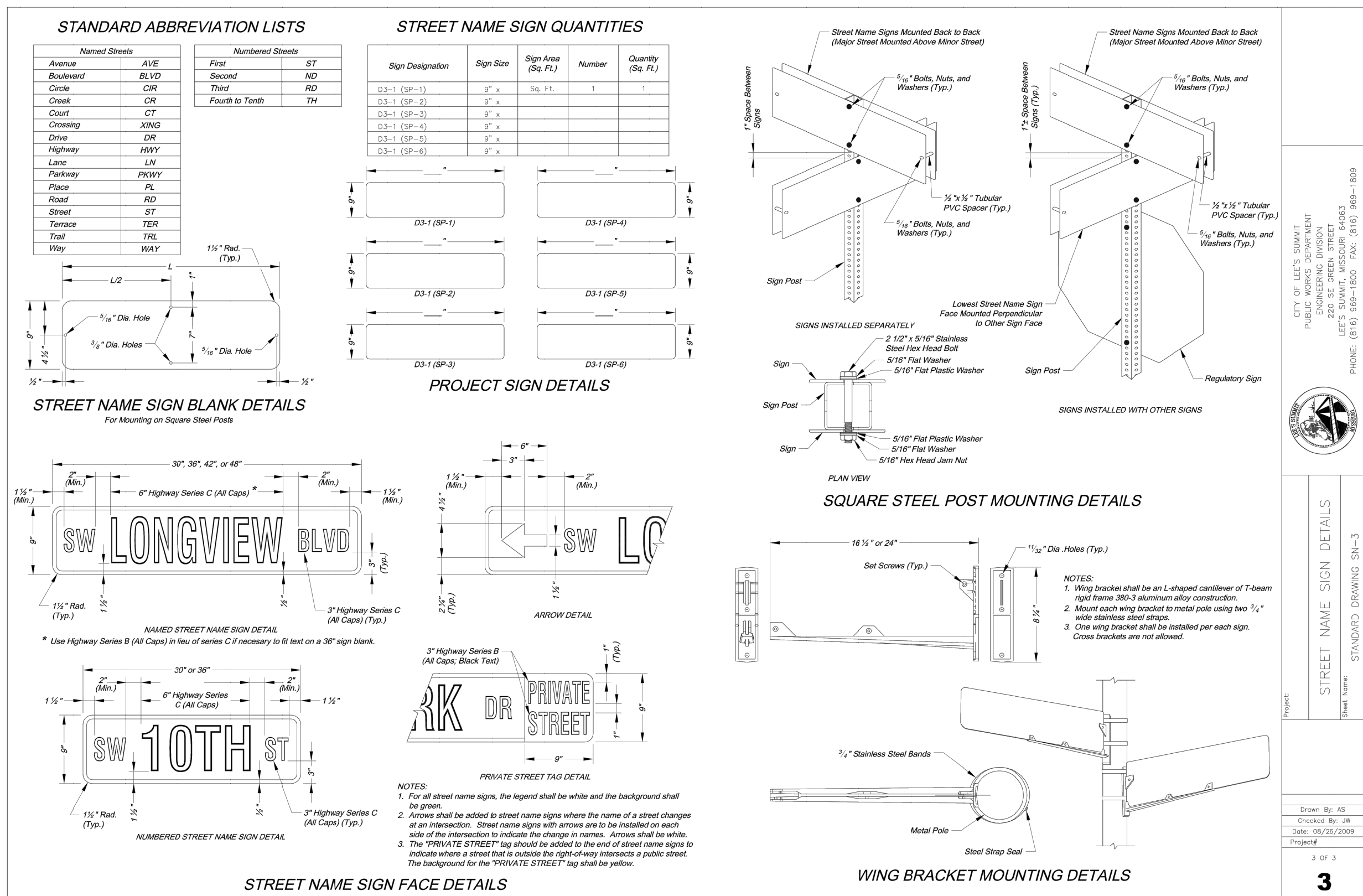
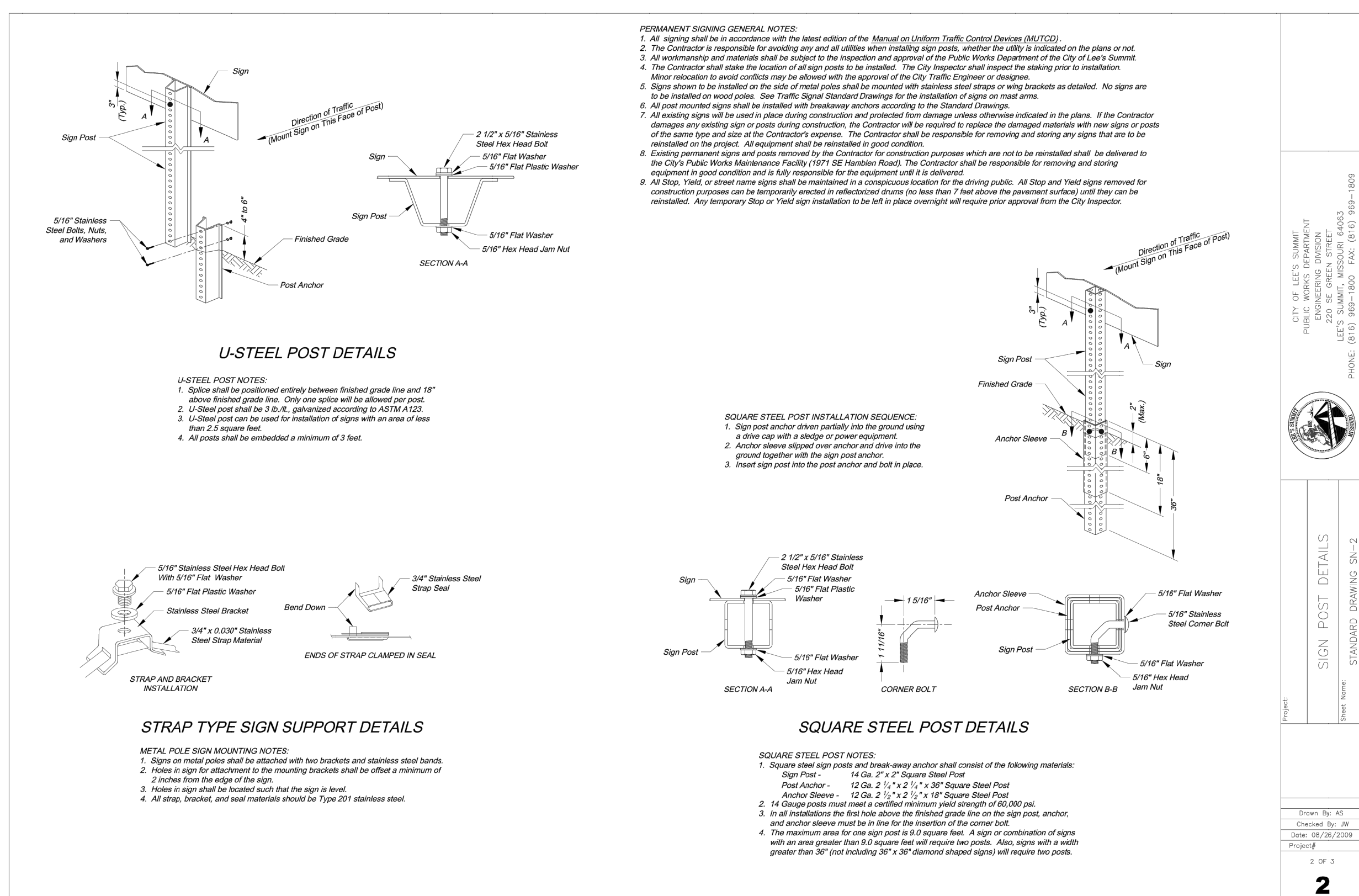
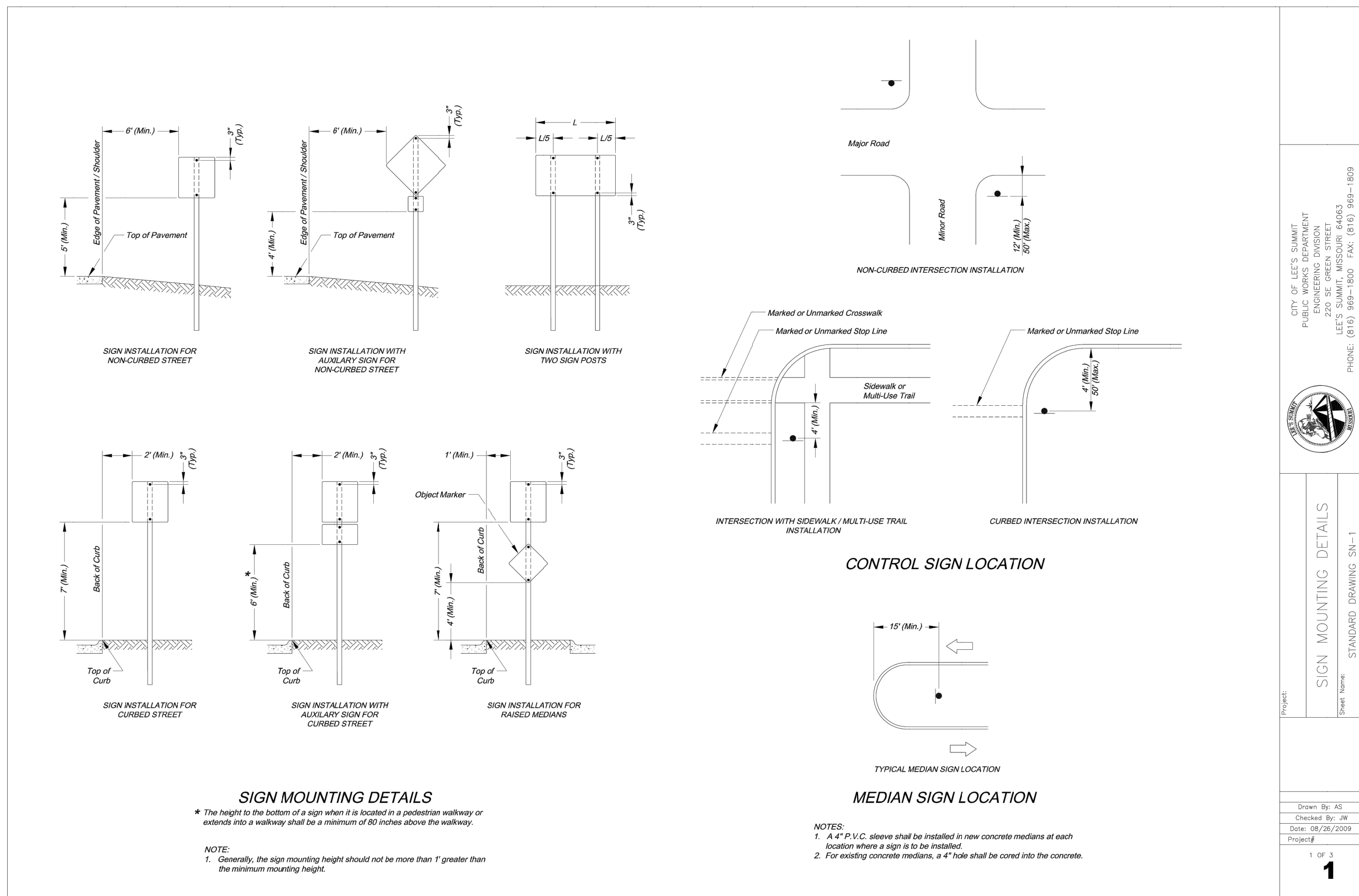
REVISION



PHOENIX ENGINEERING
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WHISPERING WOODS
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