

WOODLAND OAKS

Lots 1 thru 42

STREET AND STORM SEWER CONSTRUCTION PLANS

Section 27, Township 48 North, Range 31 West LEE'S SUMMIT, JACKSON COUNTY, MISSOURI

OIL - GAS WELLS
ACCORDING TO EDWARD ALTON MAY JR'S ENVIRONMENTAL IMPACT STUDY OF ABANDONED OIL AND GAS WELLS IN LEE'S SUMMIT, MISSOURI IN 1995, THERE ARE NOT OIL AND GAS WELLS WITHIN 185 FEET OF THE PROPERTY AS SURVEYED HEREON.

FLOOD INFORMATION:
THE SUBJECT PROPERTY SURVEYED LIES WITHIN A FLOOD ZONE DESIGNATED ZONE (X), AREAS LOCATED OUTSIDE THE 100 YEAR FLOOD PLAIN, PER F.E.M.A. MAP, COMMUNITY PANEL NO. 29095C0416G EFFECTIVE DATE: JANUARY 20, 2017.

CONSTRUCTION AND DESIGN NOTES:

STREET & STORM SEWERS:

1 - STORM PAVEMENT SHALL CONSIST OF TYPE CG-2 CURBS WITH PAVEMENT PER TABLE LS-2 OF THE LEE'S SUMMIT DESIGN AND CONSTRUCTION MANUAL

RESIDENTIAL LOCAL STREET SEE BELOW FOR TYPICAL SECTION.

- OPTION 1) 4" TYPE 5 ASPHALT BASE AND 2" TYPE 5 OR 6 ASPHALT SURFACE OVER A 6" MoDOT TYPE 5 BASE AND A SUBGRADE MIXTURE OF 6" FLY ASH STABILIZED SUBGRADE IN ACCORDANCE WITH THE CITY OF LEE'S SUMMIT DESIGN AND CONSTRUCTION MANUAL.
- OPTION 2) 4" TYPE 5 ASPHALT BASE AND 2" TYPE 5 OR 6 ASPHALT SURFACE OVER 10" MoDOT TYPE 5 BASE OVERTOP A BIAXIAL GEOGRID PER THE CITY'S APPROVED PRODUCT LIST.

2 - STORM SEWER PIPE SHALL BE HIGH DENSITY POLYETHYLENE (HDPE) AS APPROVED BY CITY OF LEE'S SUMMIT DESIGN AND CONSTRUCTION MANUAL.

3 - JUNCTION BOXES SHALL BE PER CITY OF LEE'S SUMMIT STANDARD DRAWING NO. STM-3. FIELD INLETS SHALL BE PER CITY OF LEE'S SUMMIT STANDARD DRAWING STM-2. TOEWALLS SHALL BE PER CITY OF LEE'S SUMMIT DRAWING NO. STM-5. JUNCTION BOXES SHALL BE PER CITY OF LEE'S SUMMIT STM-3. ROCK LINING AND RIP RAP SHALL BE PER CITY OF LEE'S SUMMIT.

GENERAL NOTES:

- 1 - ALL CONSTRUCTION SHALL CONFORM TO THE CITY OF LEE'S SUMMIT DESIGN AND CONSTRUCTION MANUAL AS ADOPTED BY ORDINANCE 5813.
- 2 - ALL REQUIRED EASEMENTS WITHIN THE BOUNDARY OF THIS PROJECT SHALL BE PROVIDED FOR ON THE FINAL PLAT.
- 3 - ANY REQUIRED EASEMENT LOCATED OUTSIDE OF THE BOUNDARY OF THIS PROJECT SHALL BE PROVIDED FOR BY SEPARATE INSTRUMENT PRIOR TO ISSUANCE OF CONSTRUCTION PERMITS.
- 4 - THE CONTRACTOR SHALL CONTACT THE CITY'S DEVELOPMENT SERVICES ENGINEERING INSPECTION TO SCHEDULE A PRE-CONSTRUCTION MEETING WITH A FIELD ENGINEERING INSPECTOR PRIOR TO ANY LAND DISTURBANCE WORK AT (816) 969-1200.
- 5 - THE CONTRACTOR SHALL NOTIFY ENGINEERING SOLUTIONS AT 816.623.9888 OF ANY CONFLICT WITH THE IMPROVEMENTS PROPOSED BY THESE PLANS AND SITE CONDITIONS.
- 6 - THE CONTRACTOR SHALL NOTIFY THE CITY ENGINEER AND OBTAIN THE APPROPRIATE BLASTING PERMITS FOR A REQUIRED BLASTING. IF BLASTING IS ALLOWED, ALL BLASTING SHALL CONFORM TO STATE REGULATIONS AND LOCAL ORDINANCES.

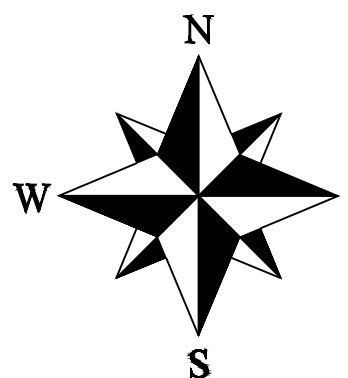
UTILITY COMPANIES:

THE FOLLOWING LIST OF UTILITY COMPANIES IS PROVIDED FOR INFORMATION ONLY. WE DO NOT OFFER ANY GUARANTEE OR WARRANTY THAT THIS LIST IS COMPLETE OR ACCURATE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING ALL UTILITY COMPANIES THAT MAY BE AFFECTED BY THE PROPOSED CONSTRUCTION AND VERIFYING THE ACTUAL LOCATION OF EACH UTILITY LINE. THE CONTRACTOR SHALL NOTIFY ENGINEERING SOLUTIONS AT 816.623.9888 OF ANY CONFLICT WITH PROPOSED IMPROVEMENTS.

- EVERGY - 298-1196
- MISSOURI GAS ENERGY - 756-5261
- SOUTHWESTERN BELL TELEPHONE - 761-5011
- COMCAST CABLE - 795-1100
- WILLIAMS PIPELINE - 422-6300
- CITY OF LEE'S SUMMIT PUBLIC WORKS - 969-1800
- CITY OF LEE'S SUMMIT PUBLIC WORKS INSPECTIONS - 969-1800
- CITY OF LEE'S SUMMIT WATER UTILITIES - 969-1900
- MISSOURI ONE CALL (DIG RITE) - 1-800-344-7483



SITE LOCATION MAP

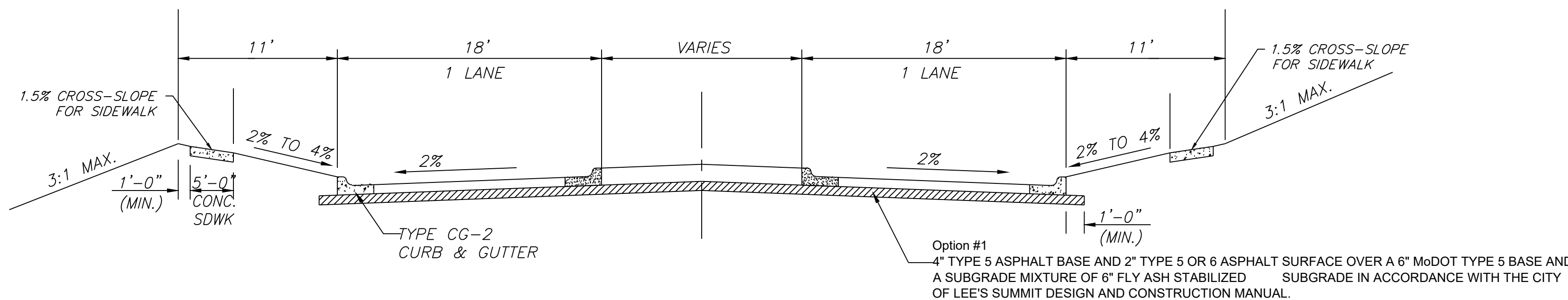


- LEGEND:**
- B/L - BUILDING SET-BACK
 - C/A - COMMON AREA
 - D/E - DRAINAGE EASEMENT
 - FND. - FOUND
 - L/E - LANDSCAPE EASEMENT
 - L.N.A. - LIMITS OF NO ACCESS
 - R/W - RIGHT OF WAY
 - SAN - SANITARY SEWER LINE
 - S/W - SIDEWALK
 - U/E - UTILITY EASEMENT
 - W - WATER LINE
 - ST - STORM SEWER LINE

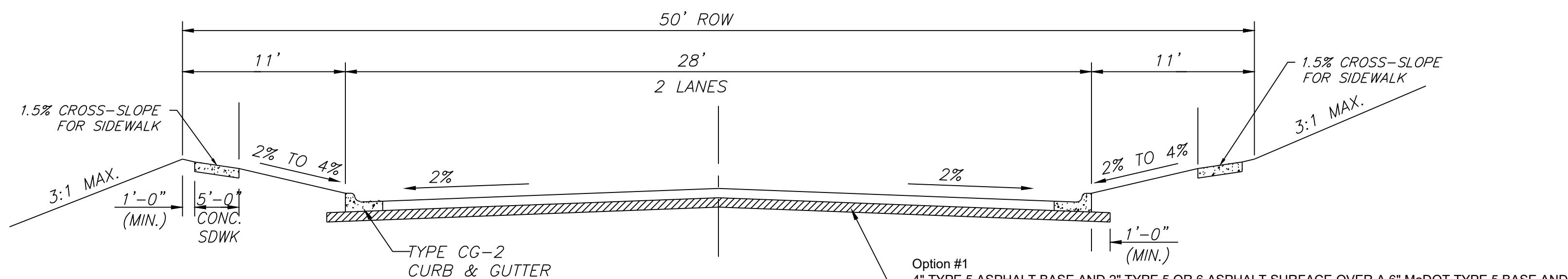
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- CITY OF LEE'S SUMMIT PUBLIC WORKS - 969-1800
- CITY OF LEE'S SUMMIT DEVELOPMENT ENGINEERING INSPECTION AT 816.969.1200
- CITY OF LEE'S SUMMIT WATER UTILITIES - 969-1900
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**TYPICAL SECTION BLADKWELL RD/WOODLAND OAK DR
(RESIDENTIAL STREET)**



**TYPICAL SECTION
(RESIDENTIAL STREET)**

Summary of Quantities:

ITEM AND DESCRIPTION	UNIT	ESTIMATED QUANTITY
ASPHALT PAVING	S.Y.	7,187.12
CURBING	FT	4643.65
MoDOT Type 5 Base	S.Y.	7,689.66
GEOGRID	S.Y.	7,689.66
CLEARING, GRADING & GRUBBING	LS	1.00
SILT FENCE	FT	12,550.00
INLET PROTECTION	UNIT	81.00
SEEDING / MULCHING/ FERTILIZING	AC	19.51
CONST. ENTRANCE	UNIT	1.00
RIP RAP W/ FABRIC	S.Y.	142.05
SEDIMENT TRAP ROCK	C.Y.	19.00
FAIRCLOTH SKIMMER ASSEMBLY	UNIT	1.00
5' SIDEWALK	S.F.	9,524
STREET SIGNAGE	UNIT	4
ADA SIDEWALK RAMP	UNIT	11
STORM		
15" HDPE	FT	1598.78
18" HDPE	FT	829.84
24" HDPE	FT	307.87
30" HDPE	FT	51.00
15" HDPE END SECTION / TOE WALL	LS	3.00
18" HDPE END SECTION / TOE WALL	LS	1.00
24" HDPE END SECTION / TOE WALL	LS	4.00
30" HDPE END SECTION / TOE WALL	LS	1.00
4' x 4' STORM FIELD INLET	EA	10.00
5' x 5' JUNCTION BOX	EA	2.00
5' x 4' STORM CURB INLET	EA	14.00
5' x 5' CONTROL STRUCTURE	EA	1.00
5' x 4' CONTROL STRUCTURE	EA	1.00

ENGINEER'S CERTIFICATION:

I HEREBY CERTIFY THAT THIS PROJECT HAS BEEN DESIGNED AND THESE PLANS PREPARED IN ACCORDANCE WITH THE CURRENT DESIGN CRITERIA OF THE CITY OF LEE'S SUMMIT, MISSOURI AND THE STATE OF MISSOURI. I FURTHER CERTIFY THAT THESE PLANS WERE DESIGNED IN ACCORDANCE TO AASHTO STANDARDS.

Street, Stormwater, Master Drainage Plan, and Erosion and Sediment Control

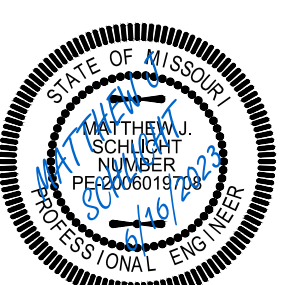


Professional Registration
Missouri
Engineering 2005002186-D
Surveying 2005008319-D
Kansas
Engineering E-1685
Surveying LS-218
Oklahoma
Engineering 6254
Nebraska
Engineering CA2821

Part of the Southeast
Section 27, Township 48 North, Range 31 West
Lee's Summit, Jackson County, Missouri

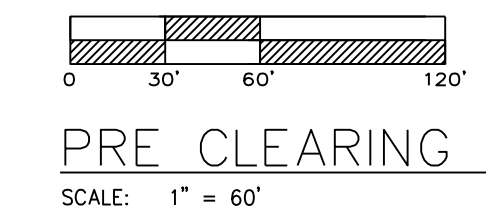
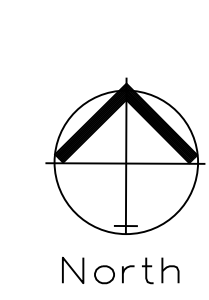
Project:
WOODLAND OAKS
LSMO
Issue Date:
February 25, 2021

Street & Storm Cover Sheet
Construction Plans for:
WOODLAND OAKS
Lots 1 thru 42
Lee's Summit, Jackson County, Missouri



Matthew J. Schlicht
MO PE 2006019708
KS PE 19071
OK PE 25226
NE PE E-143325

REVISIONS
REV. 5/5/2021
REV. 5/26/2021
REV. 6/22/2021
REV. 6/29/2021
Updated 6/16/2023



PRE CLEARING PLAN
SCALE: 1" = 60'

NOTES: The Land Disturbance Plans indicates the Final placement of erosion control devices. The contractor(s) may proceed with construction prior to the final placement of these devices by providing additional devices to control erosion on their items of work. These devices shall be maintained until the final devices are in place.

SILT FENCE PROTECTION TO BE MAINTAINED BY CONTRACTOR

LEGEND

PHASE 1 SILT FENCE	SF-1	SF-1
PHASE 2 SILT FENCE	SF-2	SF-2
INLET PROTECTION		

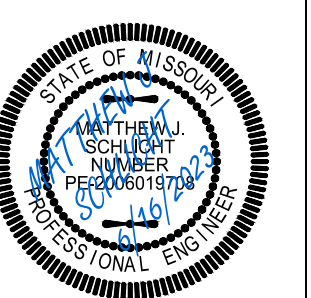
DURING ALL PHASES OF CONSTRUCTION, INACTIVE AREA STABILIZATION METHODS AS DESCRIBED IN APWA SECTION 5111.3 SHALL BE USED TO CONTROL EROSION AND SILTATION.

Perimeter Silt Fence Must Be Installed Prior to Any Land Disturbance Activities Per APWA Detail ESC-11. (Typ.)

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Temporary Construction Entrance Must Be Installed Prior to Any Land Disturbance Activities Per APWA Detail ESC-01.

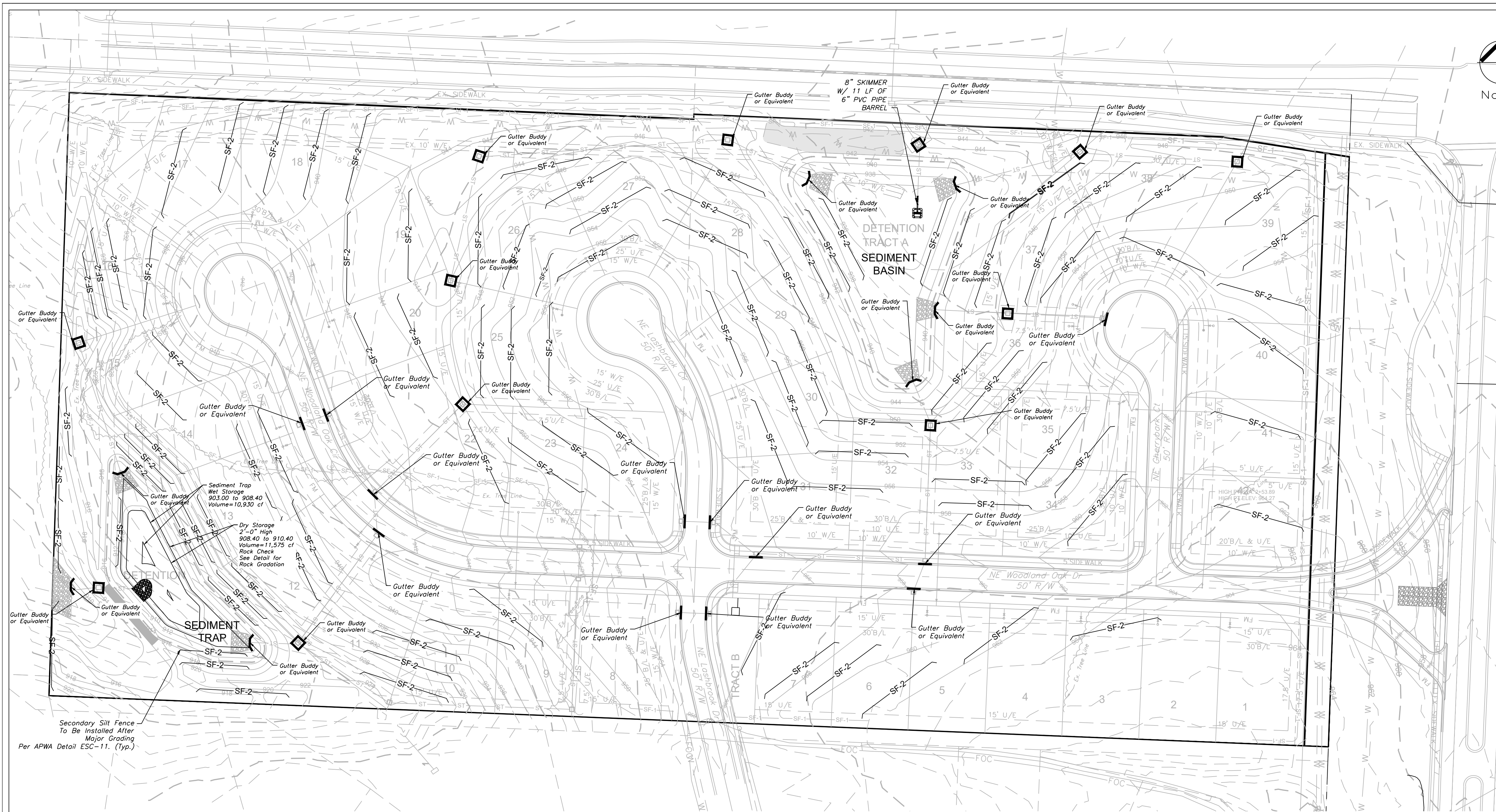


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REVISIONS

REV. 5/5/2021	
REV. 5/26/2021	
REV. 6/22/2021	
REV. 6/29/2021	

Updated 6/16/2023



INACTIVE AREA STABILIZATION PLAN
 SCALE: 1" = 60'

NOTES: The Land Disturbance Plans indicates the Final placement of erosion control devices. The contractor(s) may proceed with construction prior to the final placement of these devices by providing additional devices to control erosion on their items of work. These devices shall be maintained until the final devices are in place.

SILT FENCE PROTECTION TO BE MAINTAINED BY CONTRACTOR

LEGEND

PHASE 1 SILT FENCE — SF-1 — SF-1

PHASE 2 SILT FENCE — SF-2 — SF-2

INLET PROTECTION GUTTER BUDDY OR EQUIVALENT

NOTES: The Land Disturbance Plans indicates the Final placement of erosion control devices. The contractor(s) may proceed with construction prior to the final placement of these devices by providing additional devices to control erosion on their items of work. These devices shall be maintained until the final devices are in place.

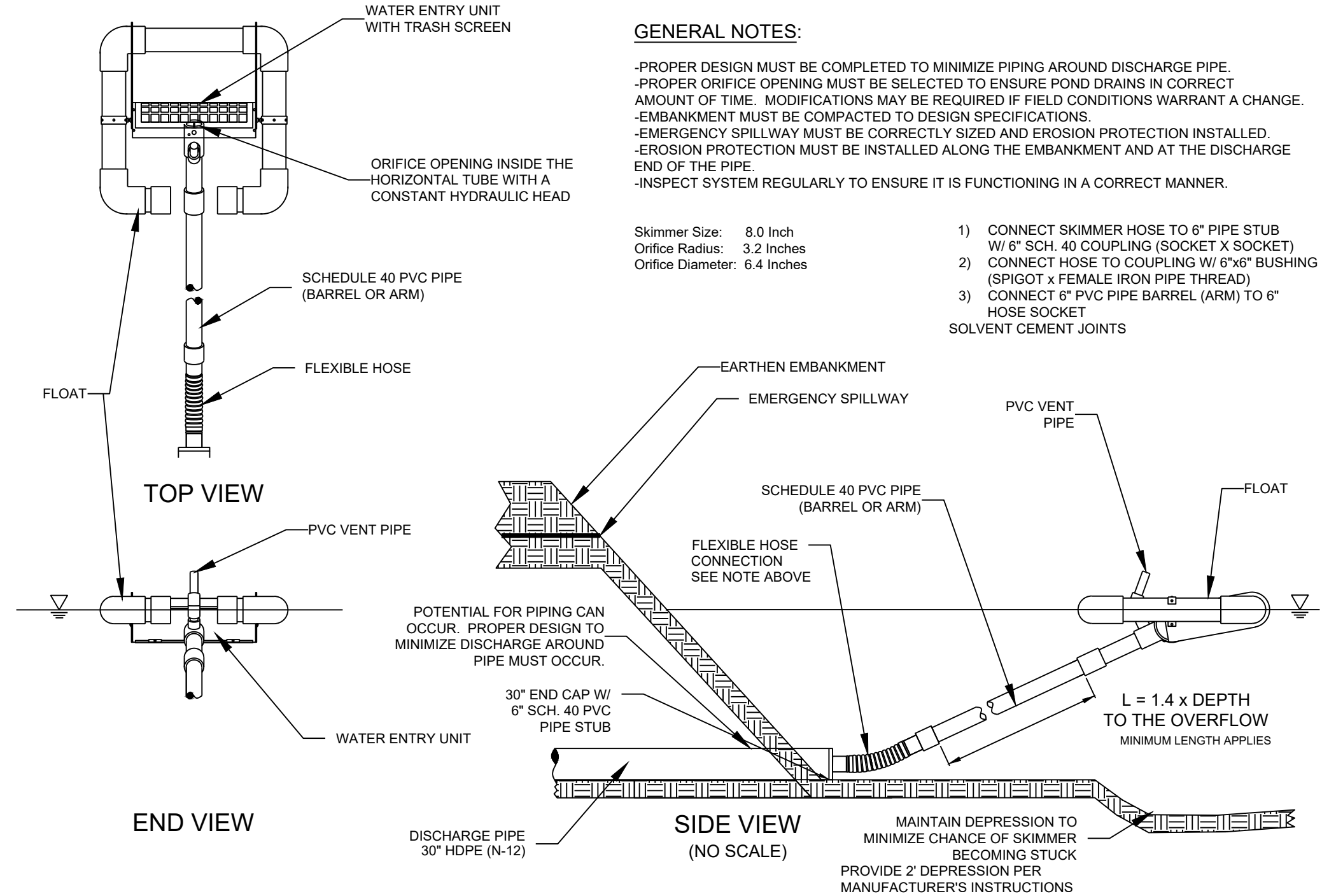
DURING ALL PHASES OF CONSTRUCTION, INACTIVE AREA STABILIZATION METHODS AS DESCRIBED IN APWA SECTION 511.3 SHALL BE USED TO CONTROL EROSION AND SILTATION.

TEMPORARY SEDIMENT BASIN CALCULATIONS:

- TOTAL AREA DRAINING TO BASIN = 11.0 ac**
- REQUIRED VOLUME OF TRAP = 3,600cft PER acre = 11.0 X 3,600 = 39,600 cft**
- VOLUME OF PROPOSED TRAP = 129,219 cft**

GENERAL NOTES:

- PROPER DESIGN MUST BE COMPLETED TO MINIMIZE PIPING AROUND DISCHARGE PIPE.
- PROPER ORIFICE OPENING MUST BE SELECTED TO ENSURE POND DRAINS IN CORRECT AMOUNT OF TIME. MODIFICATIONS MAY BE REQUIRED IF FIELD CONDITIONS WARRANT A CHANGE.
- EMBANKMENT MUST BE COMPACTED TO DESIGN SPECIFICATIONS.
- EMERGENCY SPILLWAY MUST BE CORRECTLY SIZED AND EROSION PROTECTION INSTALLED.
- EROSION PROTECTION MUST BE INSTALLED ALONG THE EMBANKMENT AND AT THE DISCHARGE END OF THE PIPE.
- INSPECT SYSTEM REGULARLY TO ENSURE IT IS FUNCTIONING IN A CORRECT MANNER.



MAINTENANCE:
 TO MAINTAIN THE EROSION AND SEDIMENT CONTROLS, THE FOLLOWING PROCEDURES WILL BE PERFORMED:
SEDIMENT CAPTURE DEVICES: SEDIMENT WILL BE REMOVED FROM THE UPSTREAM OR UPSLOPE SIDE OF THE FILTER FABRIC FENCES, WHEN THE DEPTH OF ACCUMULATED SEDIMENT REACHES ABOUT ONE-THIRD THE HEIGHT OF THE STRUCTURE.
STORM SEWER INLETS: ANY SEDIMENT IN THE STORM SEWER INLETS WILL BE REMOVED AND DISPOSED OF PROPERLY.
TEMPORARY CONTROLS: ALL TEMPORARY CONTROLS WILL BE REMOVED AFTER THE DISTURBED AREAS HAVE BEEN STABILIZED.

INSPECTION PROCEDURES:
 INSPECTIONS WILL BE DONE BY THE RESPONSIBLE PERSON(S) AT LEAST ONCE EVERY WEEK AND WITHIN 24 HOURS EACH STORM EVENT PRODUCING ANY AMOUNT OF RAINFALL. AREAS THAT HAVE BEEN RESEEDED WILL BE INSPECTED REGULARLY AFTER SEED GERMINATION TO ENSURE COMPLETE COVERAGE OF EXPOSED AREAS. DISTURBED AREAS THAT HAVE NOT BEEN FINALLY STABILIZED SHALL HAVE ALL POLLUTION CONTROL MEASURES INSPECTED FOR PROPER INSTALLATION, OPERATION AND MAINTENANCE. LOCATIONS WHERE STORM WATER LEAVES THE SITE SHALL BE INSPECTED FOR EVIDENCE OF EROSION OR SEDIMENT DEPOSITION. ANY DEFICIENCIES SHALL BE NOTED IN A REPORT OF THE INSPECTION AND CORRECTED WITHIN SEVEN CALENDAR DAYS OF THE INSPECTION. THE PERMITTEE SHALL PROMPTLY NOTIFY THE SITE CONTRACTORS RESPONSIBLE FOR OPERATION AND MAINTENANCE OF POLLUTION CONTROL DEVICES OF DEFICIENCIES.

IF THE EXISTING GROUND COVER IS NATURAL GRASS, DISTURBED AREAS SHALL BE TEMPORARILY SEEDDED WITH WHEATGRASS AT A RATE OF 1.5 POUNDS PER 1000 SQUARE FEET. PERMANENT SEEDING SHALL CONSIST OF 90% IN THREE EQUAL PARTS OF THIN BLADE, TURF-TYPE, TALL FESCUE AND 10% BLUEGRASS SEED AT A RATE OF 10 POUNDS PER 1000 SQUARE FEET. BOTH TEMPORARY AND PERMANENT SEEDS SHALL BE MULCHED AND WATERED TO MAINTAIN THE PROPER MOISTURE LEVEL OF THE SOIL TO ESTABLISH GRASS. NEW GRASS SHALL BE WATERED AND MAINTAINED UNTIL IT REACHES A HEIGHT OF 3 INCHES. ANY BARE AREAS SHALL BE RESEEDED.

ALL EROSION CONTROL DEVICES SHALL BE REMOVED BY GENERAL CONTRACTOR AFTER SITE STABILIZATION IS COMPLETE AND APPROVED BY ENGINEER.

THE DEVELOPER WILL DESIGNATE A QUALIFIED PERSON OR PERSONS TO PERFORM THE FOLLOWING INSPECTIONS:
STABILIZATION MEASURES: DISTURBED AREAS AND AREAS USED FOR STORAGE OF MATERIALS THAT ARE EXPOSED TO PRECIPITATION WILL BE INSPECTED FOR EVIDENCE OF, OR THE POTENTIAL FOR, POLLUTANTS ENTERING THE DRAINAGE SYSTEM. AFTER A PORTION OF THE SITE IS FINALLY STABILIZED, INSPECTIONS WILL BE CONDUCTED AT LEAST ONCE EVERY MONTH THROUGHOUT THE LIFE OF THE PROJECT. CONTRACTOR CAN CONTACT ENGINEERING SOLUTIONS FOR COPIES OF THE INSPECTION FORM TO BE USED FOR STABILIZATION MEASURES.
STRUCTURAL CONTROLS: FILTER FABRIC FENCES AND ALL OTHER EROSION AND SEDIMENT CONTROL MEASURES IDENTIFIED IN THE PLAN WILL BE INSPECTED REGULARLY FOR PROPER POSITIONING, ANCHORING, AND EFFECTIVENESS IN TRAPPING SEDIMENTS. SEDIMENT WILL BE REMOVED FROM THE UPSTREAM OR UPSLOPE SIDE OF THE FILTER FABRIC. CONTRACTOR CAN CONTACT ENGINEERING SOLUTIONS FOR COPIES OF THE INSPECTION FORM TO BE USED FOR STABILIZATION MEASURES.
DISCHARGE POINTS: DISCHARGE POINTS OR LOCATIONS WILL BE INSPECTED TO DETERMINE WHETHER EROSION CONTROL MEASURES ARE EFFECTIVE IN PREVENTING SIGNIFICANT AMOUNTS OF POLLUTANTS FROM ENTERING RECEIVING WATERS.
CONSTRUCTION ENTRANCE: LOCATIONS WHERE VEHICLES ENTER OR EXIT THE SITE WILL BE INSPECTED FOR EVIDENCE OF OFF-SITE SEDIMENT TRACKING.

A LOG OF EACH INSPECTION SHALL BE KEPT. THE INSPECTION REPORT IS TO INCLUDE THE FOLLOWING MINIMUM INFORMATION: INSPECTOR'S NAME, DATE OF INSPECTION, OBSERVATIONS RELATIVE TO THE EFFECTIVENESS OF THE POLLUTION CONTROL DEVICES, ACTIONS TAKEN OR NECESSARY TO CORRECT DEFICIENCIES, AND LISTING OF AREAS WHERE LAND DISTURBANCE OPERATIONS HAVE PERMANENTLY OR TEMPORARILY STOPPED. THE INSPECTION REPORT SHALL BE SIGNED BY THE PERMITTEE OR BY THE PERSON PERFORMING THE INSPECTION IF DULY AUTHORIZED TO DO SO.

EROSION CONTROL DESCRIPTION:

- SILT FENCE SHALL BE PLACED AT THE PERIMETER OF THE GRADING AND AT INTERMEDIATE AREAS THROUGHOUT THE SITE AS SHOWN ON THE PLAN.
- INLET SEDIMENT TRAPS SHALL BE PLACED SURROUNDING ALL STORM INLETS.
- INSTALL TEMPORARY CONSTRUCTION ENTRANCE AS SHOWN ON PLAN.
- INSTALL SEDIMENT BASINS AND/OR TRAPS AS EARLY AS POSSIBLE DURING PHASE 2 INITIAL AREA STABILIZATION MASS GRADING AS SHOWN ON PLAN. SEDIMENT TRAPS TO BE INCORPORATED INTO PERMANENT DETENTION BASIN.

EROSION CONTROL PROCEDURE:

- SILT FENCE AND TEMPORARY CONSTRUCTION ENTRANCE SHALL BE INSTALLED AT THE PERIMETER OF THE GRADED AREAS PRIOR TO BEGINNING OF CLEARING OR DEMOLITION OPERATIONS. THE CONTRACTOR SHALL INSTALL SILT FENCE AS SHOWN ON PLANS AS GRADING PROGRESSES. SEDIMENT BASINS AND/OR TRAPS SHALL BE CLEANED OUT WHEN THE SEDIMENT CAPACITY HAS BEEN REDUCED BY 20% OF ITS ORIGINAL DESIGN VOLUME. REMOVE SEDIMENT BASINS AND/OR TRAPS DURING PHASE 3 INACTIVE AREA STABILIZATION AS THE FINAL STEP IN MASS GRADING ACTIVITIES. IF A SEDIMENTATION BASIN IS EMPLOYED THE SKIMMER SHALL REMAIN IN SERVICE UNTIL ALL AREAS CONTRIBUTING RUNOFF HAVE BEEN STABILIZED WITH THE ESTABLISHMENT OF VEGETATION 90% MINIMUM.
- TROUBLESHOOTING

TEMPORARY CONSTRUCTION ENTRANCE NOTES:

A) INSTALLATION

- AVOID LOCATING ON STEEP SLOPES OR AT CURVES ON PUBLIC STREETS. IF POSSIBLE, LOCATE WHERE PERMANENT ROADS WILL EVENTUALLY BE CONSTRUCTED.
- REMOVE ALL VEGETATION AND OTHER UNSUITABLE MATERIAL FROM THE FOUNDATION AREA, GRADE AND CROWN FOR POSITIVE DRAINAGE.
- IF SLOPE TOWARDS THE PUBLIC ROAD EXCEEDS 2%, CONSTRUCT A 6 TO 8 INCH HIGH RIDGE WITH 3H:1V SIDE SLOPES ACROSS THE FOUNDATION APPROXIMATELY 15 FEET FROM THE EDGE OF THE PUBLIC ROAD TO DIVERT RUNOFF AWAY FROM IT.
- INSTALL PIPE UNDER THE ENTRANCE IF NEEDED TO MAINTAIN DRAINAGE DITCHES ALONG PUBLIC ROADS.
- PLACE STONE TO DIMENSIONS AND GRADAS AS SHOWN ON PLANS. LEAVE SURFACE SMOOTH AND SLOPED FOR DRAINAGE.
- DIVERT ALL SURFACE RUNOFF AND DRAINAGE FROM THE ENTRANCE TO A SEDIMENT CONTROL DEVICE.
- IF WET CONDITIONS ARE ANTICIPATED PLACE GEOTEXTILE FABRIC ON THE GRADED FOUNDATION TO IMPROVE STABILITY.

TEMPORARY CONSTRUCTION ENTRANCE NOTES (CONT'D):

B) TROUBLESHOOTING

- CONSULT WITH A QUALIFIED DESIGN PROFESSIONAL IF ANY OF THE FOLLOWING OCCUR:
 -INADEQUATE RUNOFF CONTROLS TO THE EXTENT THAT SEDIMENT WASHES ONTO PUBLIC ROADS
 -INSTALL DIVERSIONS OR OTHER RUNOFF CONTROL MEASURES
 -SMALL STONE, THIN PAD, OR ABSENCE OF GEOTEXTILE FABRIC RESULTS IN RUTS AND MUDDY CONDITIONS AS STONE IS PRESSED INTO SOIL - INCREASE STONE SIZE OR PAD THICKNESS OR ADD GEOTEXTILE FABRIC.
 -PAD TOO SHORT FOR HEAVY CONSTRUCTION TRAFFIC - EXTEND PAD BEYOND THE MINIMUM 50 FOOT LENGTH AS NECESSARY

C) INSPECTION AND MAINTENANCE

- INSPECT STONE PAD AND SEDIMENT DISPOSAL AREA WEEKLY AND AFTER ANY RAIN EVENT
- REPAIR PAD AS NEEDED FOR PROPER RUNOFF CONTROL
- TOP DRESS WITH CLEAN 2 AND 3 INCH STONE AS NEEDED
- IMMEDIATELY REMOVE MUD OR SEDIMENT TRACKED OR WASHED ONTO PUBLIC ROADWAY. REPAIR ANY BROKEN ROAD PAVEMENT IMMEDIATELY
- REMOVE ALL TEMPORARY ROAD MATERIALS FROM AREAS WHERE PERMANENT VEGETATION WILL BE ESTABLISHED

TEMPORARY SEDIMENT TRAP CALCULATIONS:
(AREA D1)

- TRIBUTARY AREA = 6.00 ac**
- REQUIRED WET VOLUME OF TRAP = 67 cy/ac = 6.00 X 67 = 402 cy = 10,854 cf**
- REQUIRED DRY VOLUME OF TRAP = 67 cy/ac = 6.00 X 67 = 402 cy = 10,854 cf**
- WET VOLUME OF PROPOSED TRAP = 10,930 cf**
- DRY VOLUME OF PROPOSED TRAP = 11,585 cf**

ENGINEERING SOLUTIONS
 ENGINEERING & SURVEYING
 50 SE 30TH STREET
 LEE'S SUMMIT, MO 64082
 P: (816) 623-9888 F: (816) 623-9849

Professional Registration
 Missouri
 Engineering 2005002186-D
 Surveying 2005008319-D
 Kansas
 Engineering E-1695
 Surveying LS-218
 Oklahoma
 Engineering 6254
 Nebraska
 Engineering CA2821

Part of the Southeast 1
 Section 27, Township 48 North, Range 31 West
 Lee's Summit, Jackson County, Missouri

Project: WOODLAND OAKS
 LSHMO
 Issue Date: February 25, 2021

ESC PHASE 2 - Inactive Area Stabilization Plan
 Construction Plans for:
 WOODLAND OAKS
 Lots 1 thru 42
 Lee's Summit, Jackson County, Missouri



Matthew J. Schlicht
 MO PE 000019708
 KS PE 19071
 OK PE 25226
 NE PE E-14335

REVISIONS

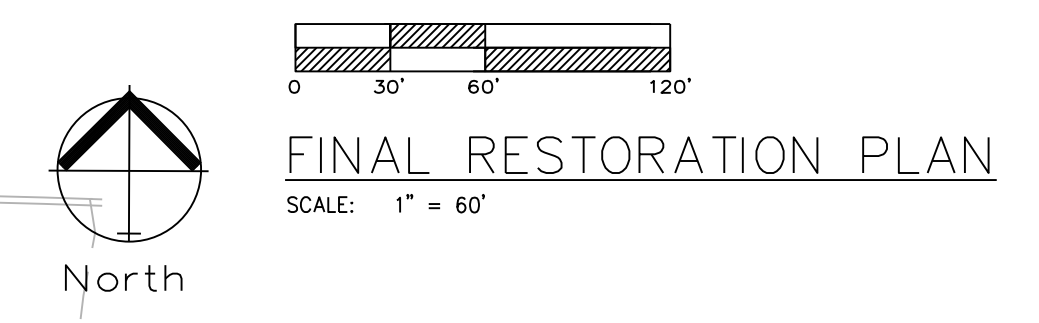
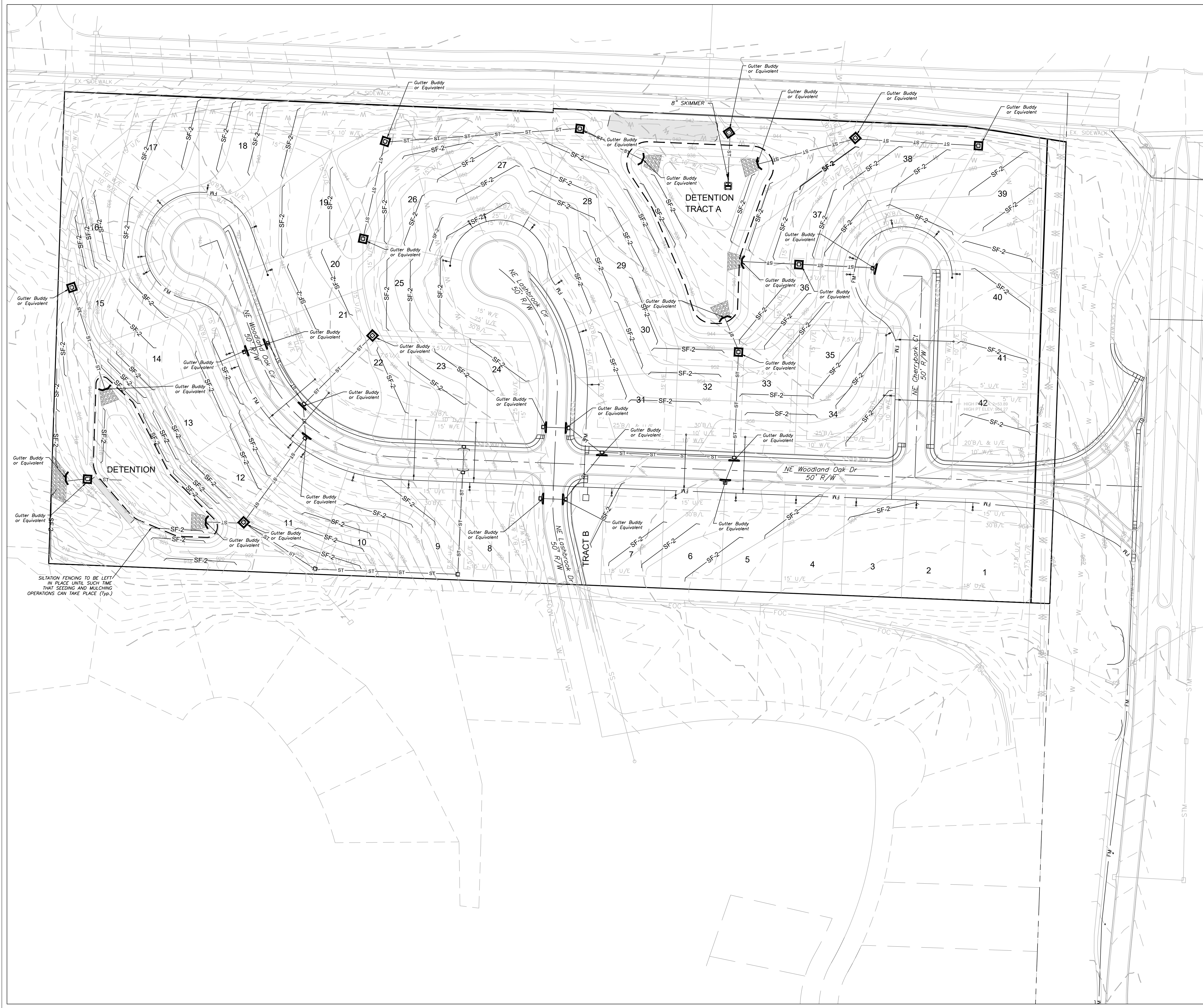
REV. 5/5/2021

REV. 5/26/2021

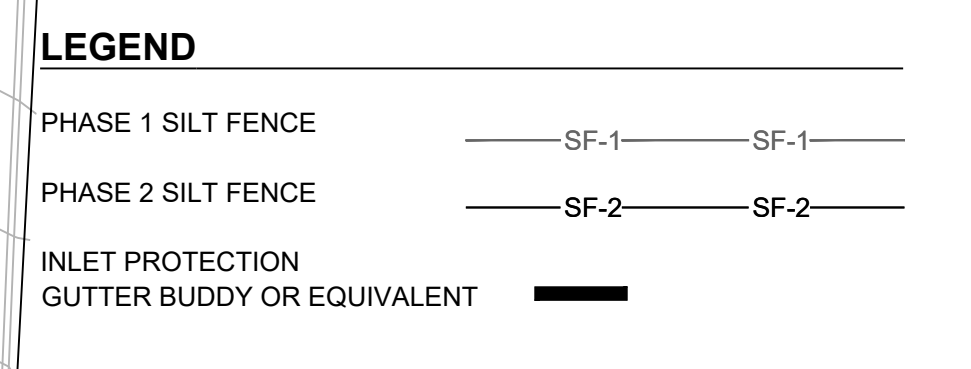
REV. 6/22/2021

REV. 6/29/2021

Updated 6/16/2023



SILT FENCE PROTECTION TO BE MAINTAINED BY CONTRACTOR



DURING ALL PHASES OF CONSTRUCTION, INACTIVE AREA STABILIZATION METHODS AS DESCRIBED IN APWA SECTION 5111.3 SHALL BE USED TO CONTROL EROSION AND SILTATION.

NOTES: The Land Disturbance Plans indicates the Final placement of erosion control devices. The contractor(s) may proceed with construction prior to the final placement of these devices by providing additional devices to control erosion on their items of work. These devices shall be maintained until the final devices are in place.

SEED AND MULCH NOTES:

All areas disturbed by construction activities shall be seeded and mulched. Seeding shall be done before the proposed seedbed becomes eroded, crusted over, or dried out and shall not be done when the ground is frozen, or covered with snow. The seed shall comply with the requirements of the Missouri Seed Law and the Federal Seed Act. Also, it shall contain no seed of any plant on the Federal Noxious Weed List. Other weed seeds shall not exceed one percent by weight of mix.

Seed and Fertilizer Rate:

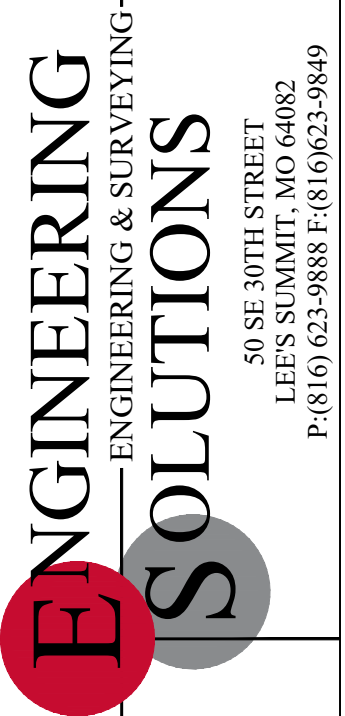
Mix I - Rye Grass / Blue Grass ——— 100 lbs. per Acre
 Mix II - Tall Fescue / Blue Grass ——— 195 lbs. per Acre
 Lime ——— 2000 lbs per Acre (50 lbs. per 1000 sq. ft.)
 Fertilizer ——— 800 to 1200 lbs per Acre (25 lbs per 1000 sq. ft.)

During the dates December 15th through May 31 ALL lime fertilizer, seed and mulch shall be applied to finished slopes of disturbed areas. During the months of June, July, October and November 1st through December 15th, lime fertilizer, seed and mulch shall be applied at the following rates:

Lime - 100% of specified quantity
 Fertilizer - 75% of the specified quantity
 Seed - 50% of the specified quantity
 Mulch - 100% of the specified quantity

Mulch shall be Vegetative type, cereal straw from stalks of oats, rye, or barley, or approved equal. The straw shall be free of prohibited weed seed and relatively free of all other noxious and undesirable seed. Mulch shall be applied at the rate of 2 tons per acre, (70 to 90 lbs per 1000 sq. ft.). Mulch shall be embedded by a mulch anchoring tool or disk type roller having flat serrated disks spaced not more than 10 inches apart and cleaning scrapers shall be provided

ONCE SITE IS 90% VEGETATED ALL ESC DEVICES SHALL BE REMOVED AND ANY DISTURBED AREAS SHALL BE RESTORED



Professional Registration
 Missouri
 Engineering 2005002186-D
 Surveying 2005008319-D
 Kansas
 Engineering E-1685
 Surveying LS-218
 Oklahoma
 Engineering 5254
 Nebraska
 Engineering CA2821

Part of the Southeast 1
 Section 27, Township 48 North, Range 31 West
 Lee's Summit, Jackson County, Missouri

Project:
 WOODLAND OAKS
 LSHO
 Issue Date:
 February 25, 2021

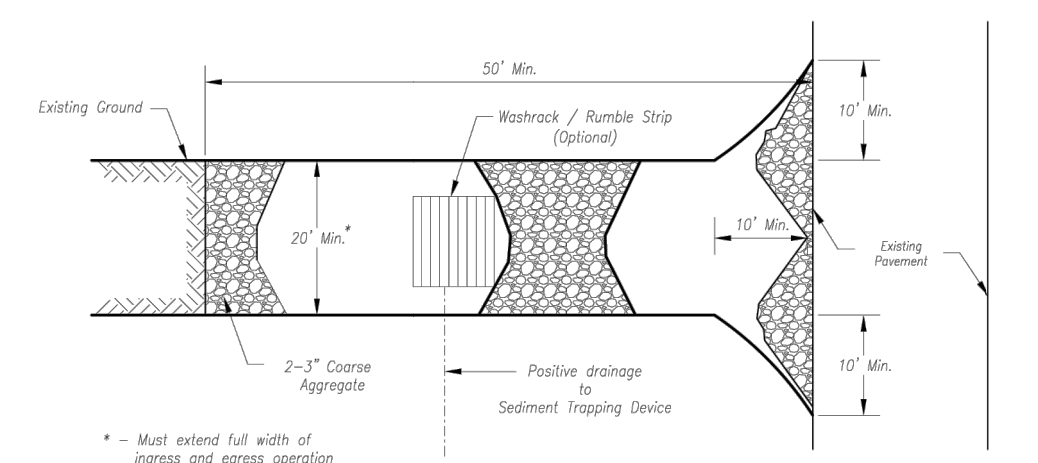
ESC PHASE 3 - Final Restoration Plan
 Construction Plans for:
 WOODLAND OAKS
 Lots 1 thru 42
 Lee's Summit, Jackson County, Missouri



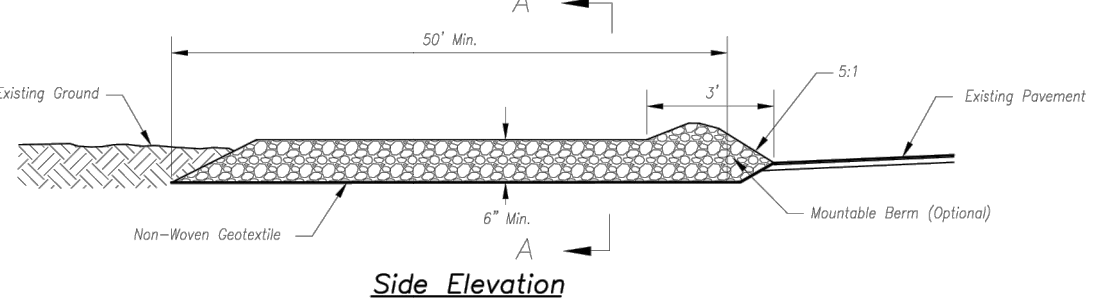
Matthew J. Schlicht
 MO PE 2006019708
 KS PE 19071
 OK PE 25226
 NE PE E-14335

REVISIONS

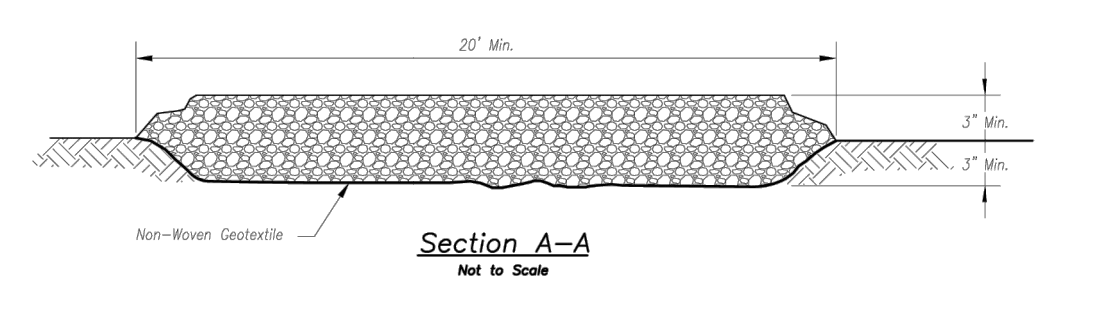
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 REV. 5/26/2021
 REV. 6/22/2021
 REV. 6/29/2021
 Updated 6/16/2023



Plan View
Not to Scale



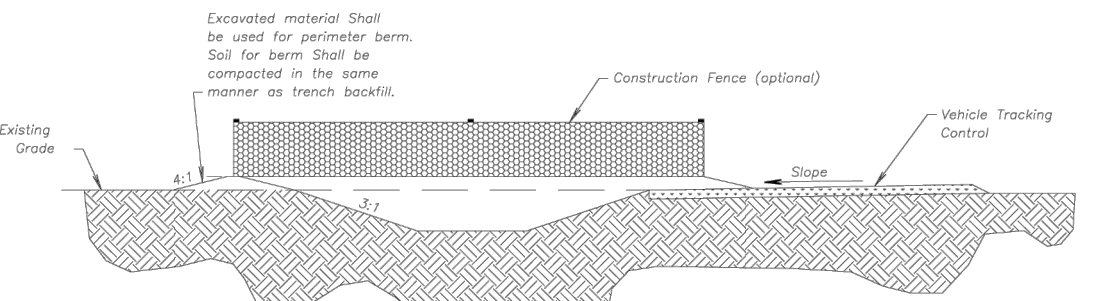
Side Elevation
Not to Scale



Section A-A
Not to Scale

- Notes for Concrete Washout:**
- Concrete washout area shall be installed prior to any concrete placement on site.
 - Concrete washout area shall include a filter substrate all extent relative to the amount of concrete to be placed on site. The slope leading out of the substrate pit shall be 2:1. The vehicle tracking post shall be sloped towards the concrete washout area.
 - Vehicle tracking control is required at the access point to all concrete washout areas.
 - Signs shall be placed at 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-plane impedance liner may be required along the bottom and sides of the substrate 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, wasted pieces of concrete and all other debris in the substrate 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 with a finished surface associated with the installation, maintenance, and/or removal of the concrete washout areas shall be established.



CONCRETE WASHOUT

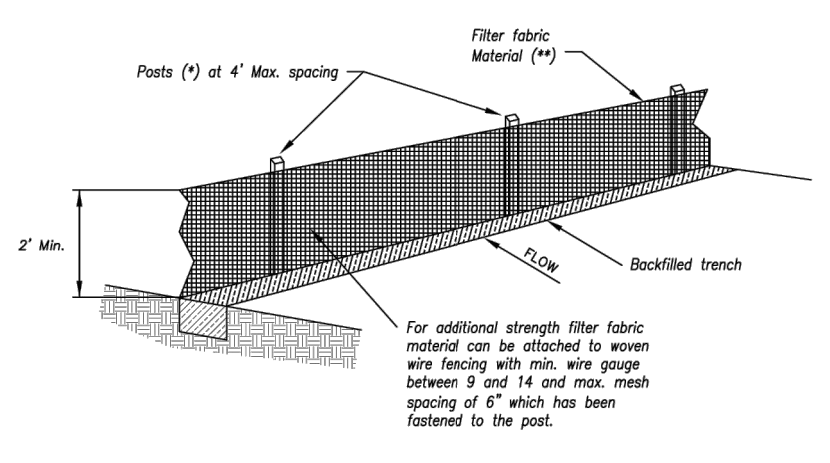
AMERICAN PUBLIC WORKS ASSOCIATION
 KANSAS CITY METRO CHAPTER
 CONSTRUCTION ENTRANCE AND CONCRETE WASHOUT
 STANDARD DRAWING NUMBER ESC-01
 ADOPTED 10/24/2016

- Notes for Construction Entrance:**
- Avoid locating on steep slopes, at curves on public roads, or adjacent to obstructed areas.
 - Remove all vegetation and other unsuitable material from the foundation area, grade, and crown for positive drainage.
 - If slope towards the public road exceeds 2%, construct a 6" to 8" high ridge with 30:1V side slopes across the foundation approximately 15 feet from the edge of the public road to divert runoff from it.
 - Install pipe under the entrance if needed to maintain drainage ditches along public roads.
 - Place stone to dimensions and grade as shown on plans. Leave surface sloped for drainage.
 - Divert all surface runoff and drainage from the entrance to a sediment control device.
 - If conditions warrant, place geotextile fabric on the graded foundation to improve stability.

- Maintenance for Construction Entrance:**
- Reshape entrance as needed to maintain function and integrity of installation. Top dress with clean aggregate as needed.

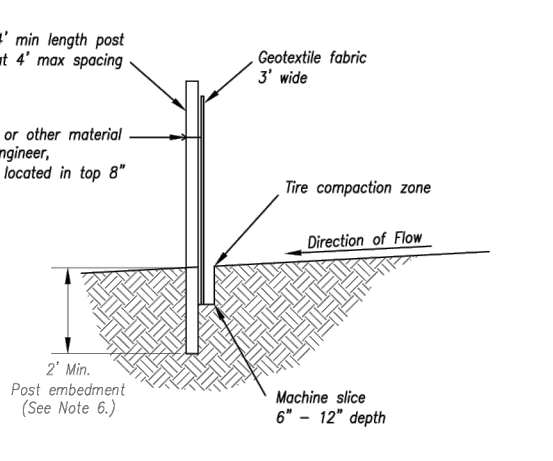
CONSTRUCTION ENTRANCE

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.

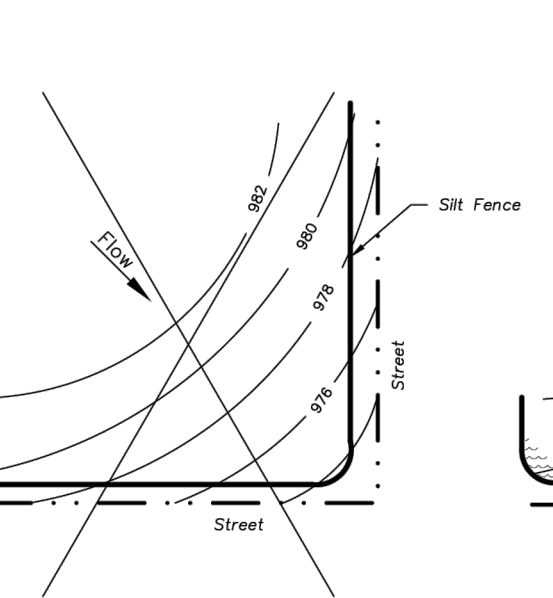


- (*) POSTS**
- MIN LENGTH 4'
 - HARDWOOD 1 1/2" x 1 1/2"
 - NO.2 SOUTHERN PINE 2 1/2" x 2 1/2"
 - STEEL 1.33 LB/FT

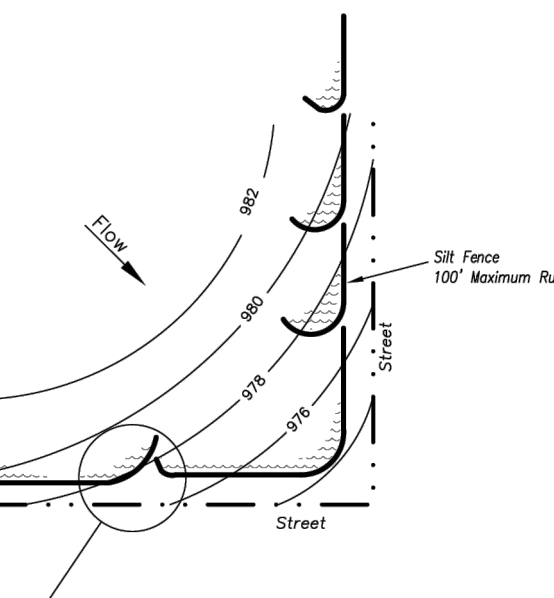
(**) - Geotextile Fabric shall meet the requirements of AASHTO M288



SILT FENCE DETAILS

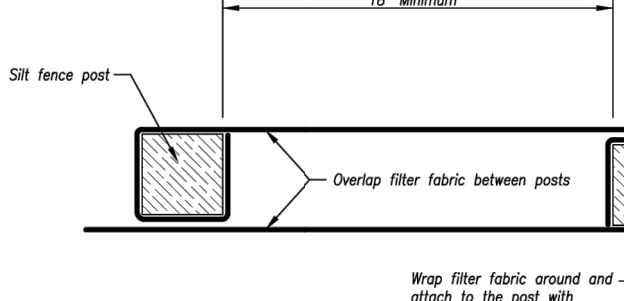
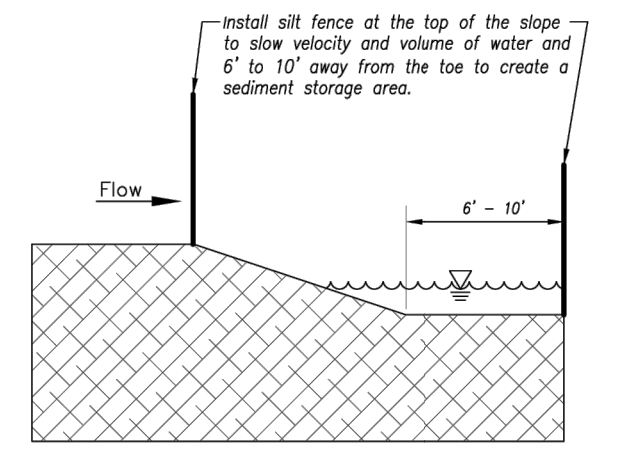


Incorrect



Correct

SILT FENCE LAYOUT



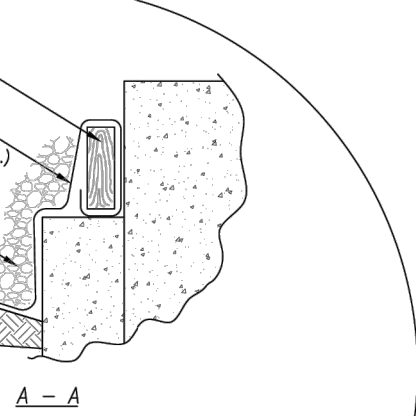
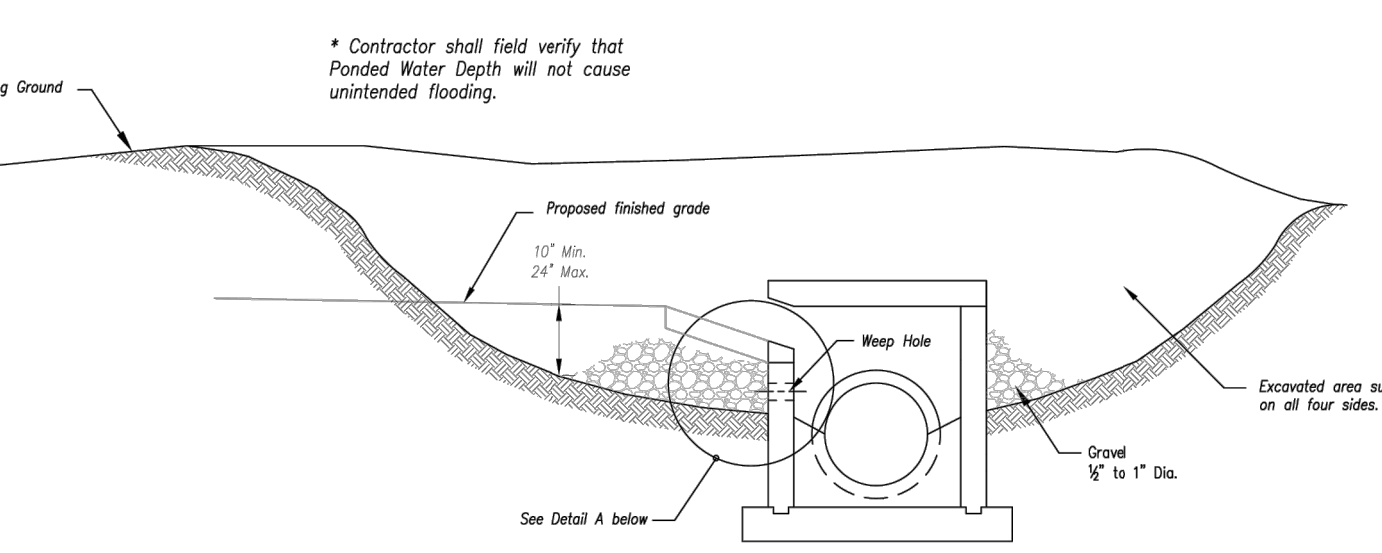
JOINING FENCE SECTIONS
Not to Scale

- 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.

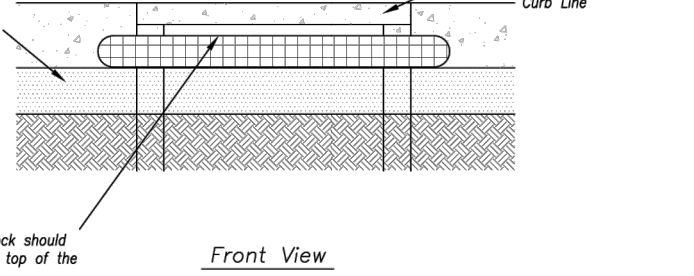
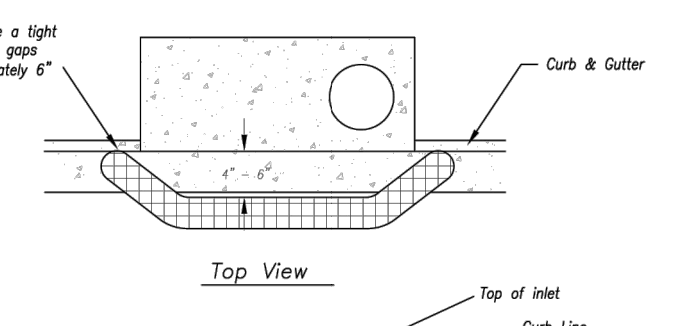
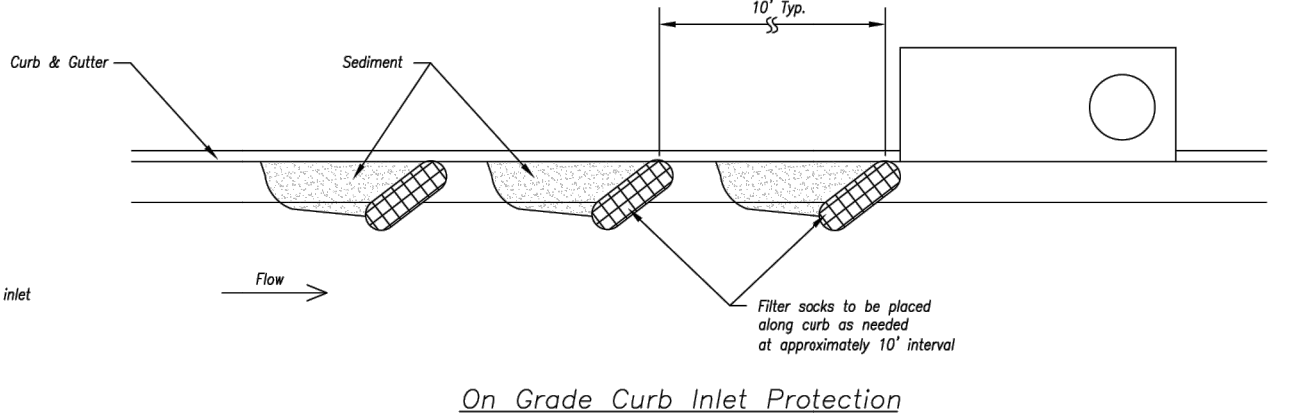
- Maintenance:**
- Remove and dispose of sediment deposits when the deposit approaches 1/2 the height of silt fence.
 - Repair as necessary to maintain function and structure.

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.



EARLY STAGE CURB INLET
(Open Box and Prior to Pouring Curb and Inlet Throat)



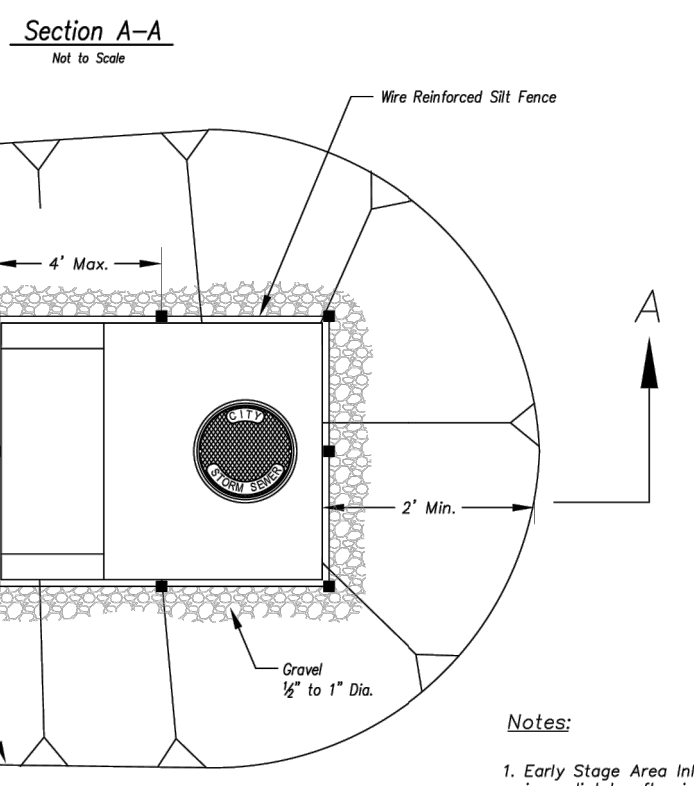
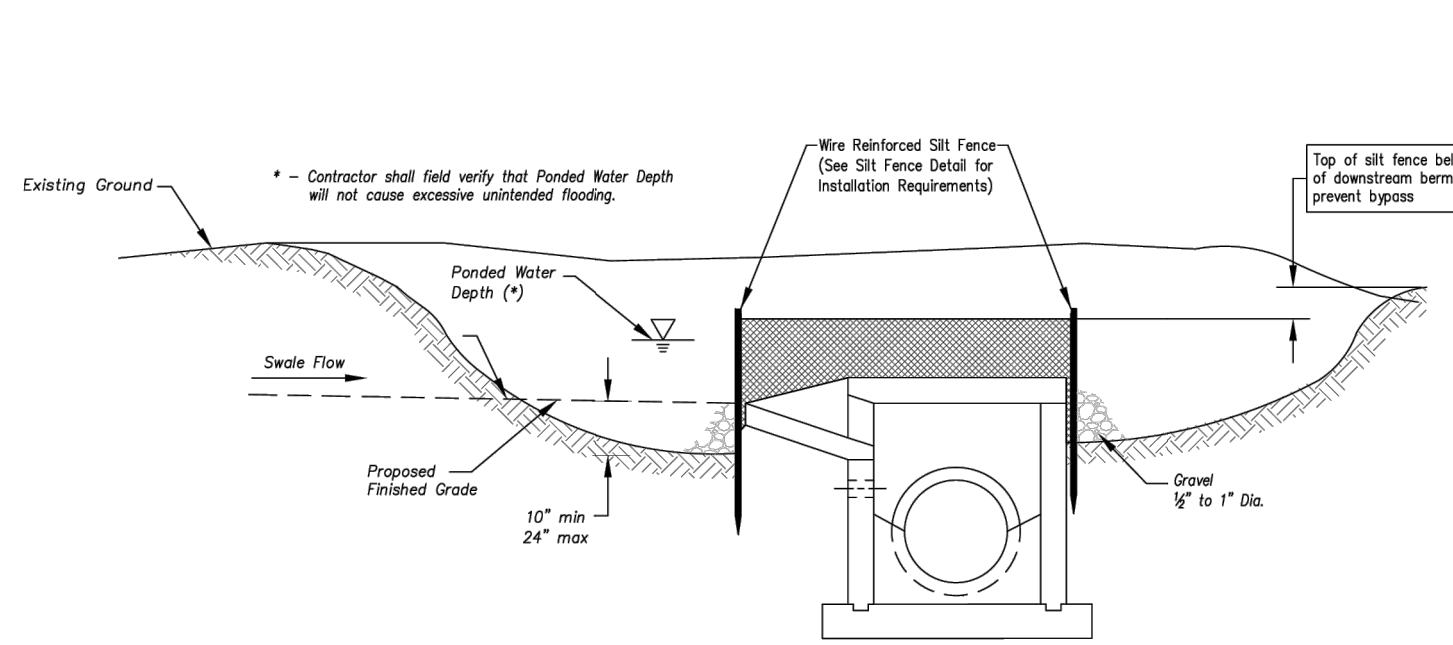
Sump Inlet Sediment Filter

LATE STAGE CURB INLET
(After Pouring Curb and Inlet Throat)

- Notes:**
- Immediately following inlet construction and prior to construction of curb and inlet throat, protect inlet opening by installing 2' x 10' (min.) board wrapped in silt fence. Structures shall have excavated storage area on all four sides to allow settling of sediment (Early Stage Curb Inlet).
 - When inlet is completed and curb poured, filter socks or approved equal should be used (Late Stage Curb Inlet). Stone within are not approved for curb inlet use.
 - Contractor to field verify pouring water shall not create a traffic hazard.
- Maintenance:**
- Remove deposited sediment from excavated storage areas when available storage has been reduced by 20%.
 - Remove deposited sediment from filter socks or similar when any accumulation of sediment is visible.
 - Repair or replace as necessary to maintain function and integrity of installation.

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

AMERICAN PUBLIC WORKS ASSOCIATION
 KANSAS CITY METRO CHAPTER
 CURB INLET PROTECTION
 STANDARD DRAWING NUMBER ESC-06
 ADOPTED 10/24/2016



EARLY STAGE AREA INLET
(All open boxes and inlets not at final grade)

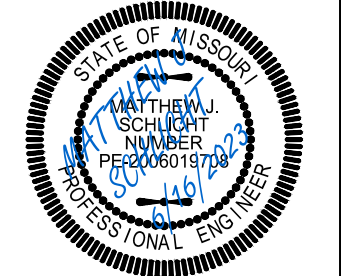
- Notes:**
- Early Stage Area Inlet Sediment Barrier to be installed immediately after inlet or junction box is constructed.
 - Silt fence shall remain in place until excavated area is removed and Late Stage Area Inlet is being installed.
 - Backfill excavated area ONLY after final grading of the site. Stabilization of the site is to immediately follow.
 - Wire reinforced silt fence may be used in place of all fence attached to wood frame.

LATE STAGE AREA INLET
(Area inlets at final grade and existing inlets)

- Maintenance:**
- Remove deposited sediment from excavated storage areas when available storage has been reduced by 20%.
 - Remove deposited sediment from filter socks or similar when any accumulation of sediment is visible.
 - Repair or replace as necessary to maintain function and integrity of installation.

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

AMERICAN PUBLIC WORKS ASSOCIATION
 KANSAS CITY METRO CHAPTER
 AREA INLET AND JUNCTION BOX PROTECTION
 STANDARD DRAWING NUMBER ESC-07
 ADOPTED 10/24/2016



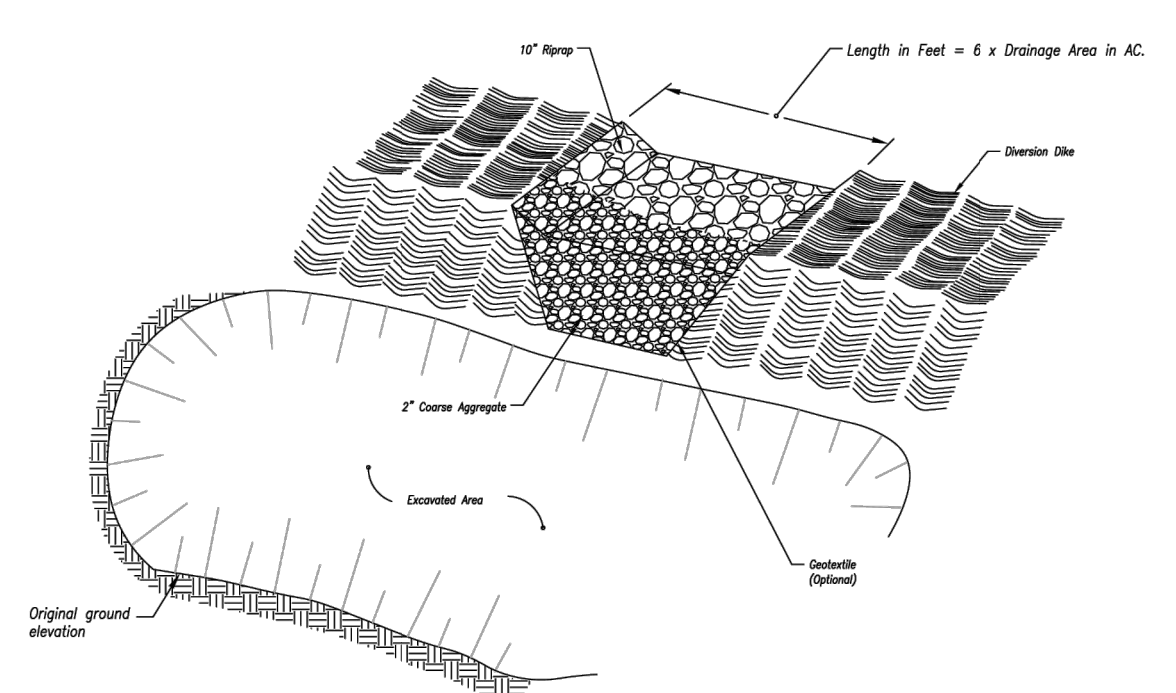
Matthew J. Schlicht
 MO PE 2006019708
 KS PE 19071
 NE PE E-143325

REVISIONS

REV. 5/5/2021	
REV. 5/26/2021	
REV. 6/22/2021	
REV. 6/29/2021	

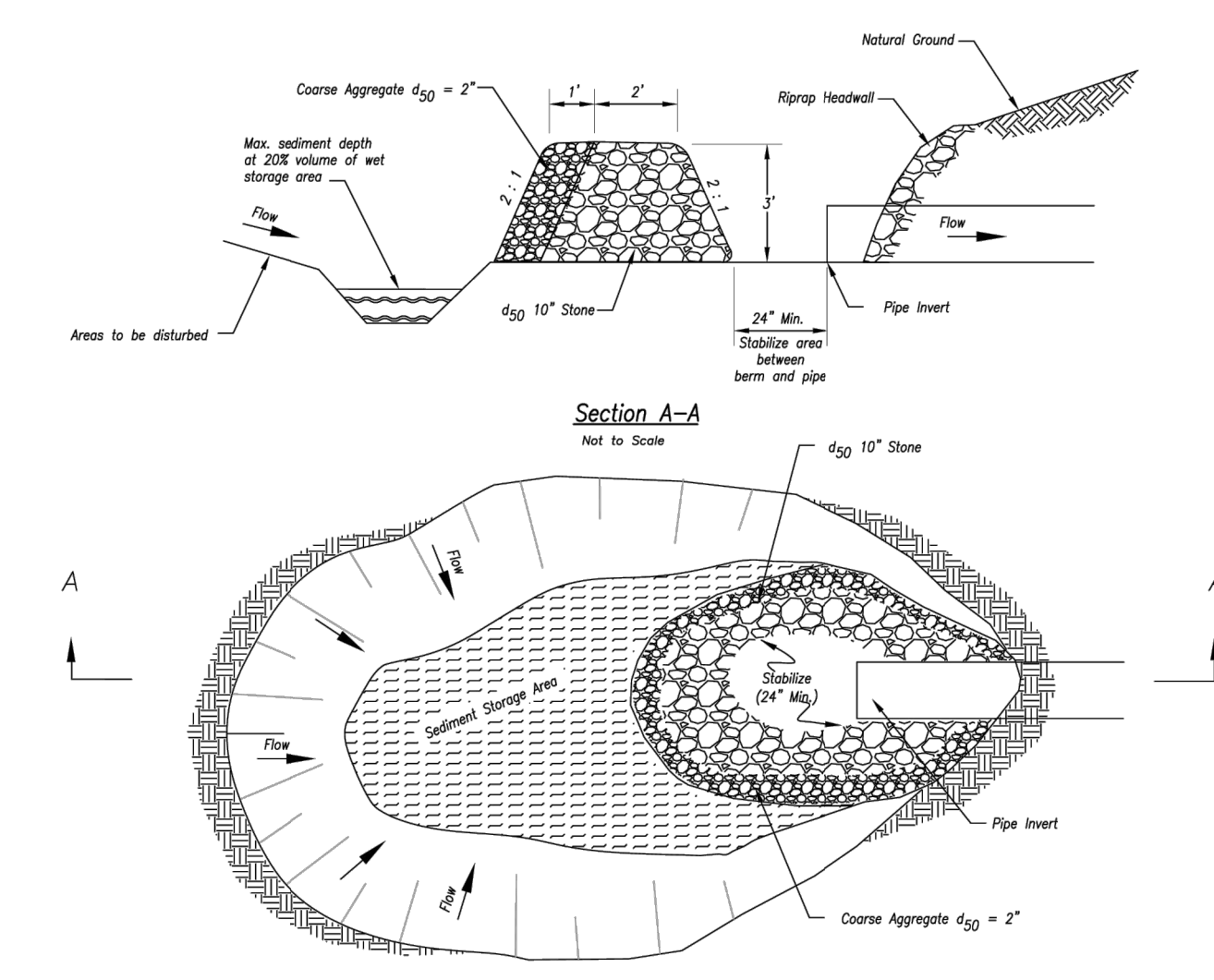
Updated 6/16/2023

H	H ₂	W
1.5	0.5	2.0
2.0	1.0	2.0
2.5	1.5	2.5
3.0	2.0	2.5
3.5	2.5	3.0
4.0	3.0	3.0
4.5	3.5	4.0
5.0	4.0	4.5



- Notes for Sediment Trap:**
1. The area under the embankment shall be cleared, grubbed, and stripped of any vegetation and root mat.
 2. Fill material for the embankment shall be free of rocks or other epoxy, vegetation, organic material, large stones, and other objectionable material. The embankment should be compacted in 6-inch layers by tamping with construction equipment.
 3. The earthen embankment shall be stabilized immediately after installation.
 4. Construction operations shall be carried out to minimize erosion and water pollution.
 5. The structure shall be removed and the area stabilized when the uplake drainage area has been stabilized.
 6. All cut and fill slopes shall be 2H : 1V or flatter, except for excavated, wet storage areas which may be at a maximum 1H : 1V grade.

- Maintenance for Sediment Trap:**
1. Check sediment traps after periods of significant runoff.
 2. Remove sediment and restore the trap to its original dimensions when sediment accumulates to 25% of the storage capacity.
 3. Immediately repair any erosion damage to the embankment and outlet.
 4. Keep outlet and pool area free of all trash and other debris.



- Notes for Sediment Trap at Culvert Opening:**
1. The inlet protection device shall be constructed in a manner that will facilitate clean-out and disposal of trapped sediment and minimize interference with construction activities.
 2. The inlet protection device shall be constructed in such manner that any residual paving stone/mat will not cause excessive inconvenience or damage to adjacent areas or structures.
 3. Geometry of the design will be a horseshoe shape around the culvert inlet.
 4. The toe of the riprap shall be no closer than 24" from the culvert opening to provide an acceptable emergency outlet for flows from larger storm events.
 5. Storage requirements equivalent to that of temporary sediment trap.
 6. 67 C.Y./acre wet storage below base of stone.
 7. 67 C.Y./acre dry storage from base of slope to top of stone berm.

- Maintenance for Sediment Trap at Culvert Opening:**
1. Check sediment traps after periods of significant runoff.
 2. Remove sediment and restore the trap to its original dimensions when sediment accumulates to 25% of the storage capacity.
 3. Immediately repair any erosion damage to the embankment and outlet.
 4. Keep outlet and pool area free of all trash and other debris.

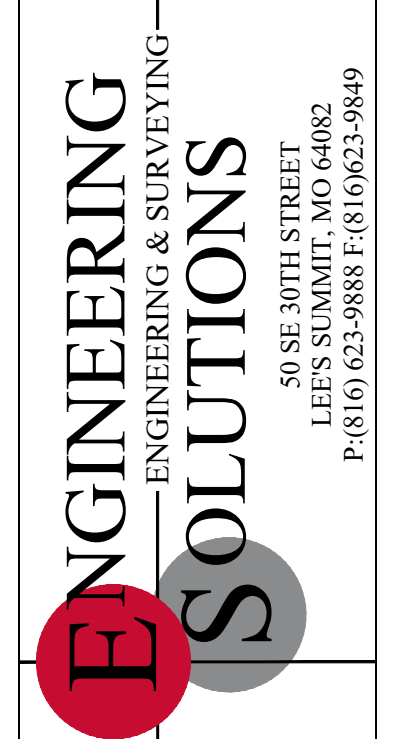
AMERICAN PUBLIC WORKS ASSOCIATION

APWA KANSAS CITY METRO CHAPTER

STANDARD DRAWING NUMBER ESC-08 ADOPTED: 10/24/2016

SEDIMENT TRAP AT CULVERT OPENING

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

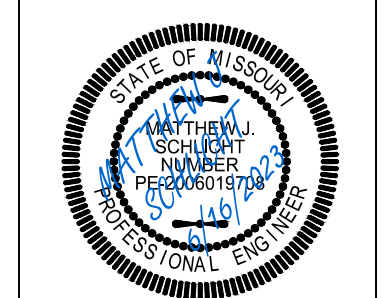


Professional Registration
Missouri
Engineering 2005002186-D
Surveying 2005008319-D
Kansas
Engineering E-1685
Surveying LS-218
Oklahoma
Engineering S254
Nebraska
Engineering CA2821

Part of the Southeast 4
Section 27, Township 48 North, Range 31 West
Lee's Summit, Jackson County, Missouri

Project: WOODLAND OAKS
LSMO
Issue Date: February 25, 2021

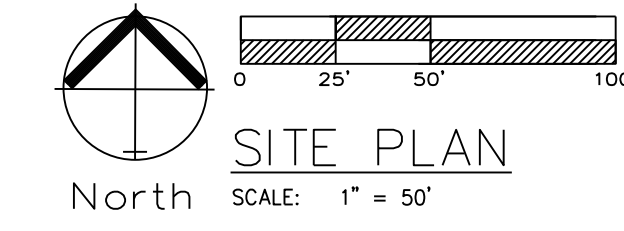
ESC - Standard Details
Construction Plans for:
WOODLAND OAKS
Lots 1 thru 42
Lee's Summit, Jackson County, Missouri



Matthew J. Schlicht
MO PE 2006019708
KS PE 19071
OK PE 25226
NE PE E-14335

- REVISIONS
- REV. 5/5/2021
 - REV. 5/26/2021
 - REV. 6/22/2021
 - REV. 6/29/2021

Updated 6/16/2023

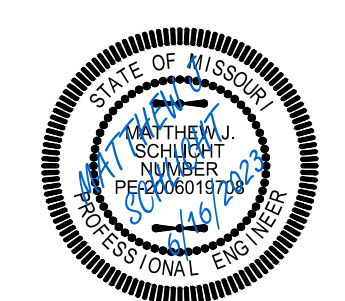


Professional Registration
 Missouri
 Engineering 2005002186-D
 Surveying 2005008319-D
 Kansas
 Engineering E-1695
 Surveying LS-218
 Oklahoma
 Engineering 6254
 Nebraska
 Engineering CA2821

Part of the Southeast 1
 Section 27, Township 48 North, Range 31 West
 Lee's Summit, Jackson County, Missouri

Project: WOODLAND OAKS
 LSNO
 Issue Date: February 25, 2021

Site Plan
 Construction Plans for:
 WOODLAND OAKS
 Lots 1 thru 42
 Lee's Summit, Jackson County, Missouri

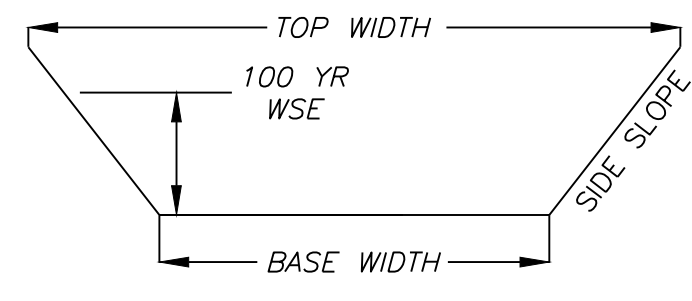


Matthew J. Schlicht
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REVISIONS

REV. 5/5/2021
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Updated 6/16/2023

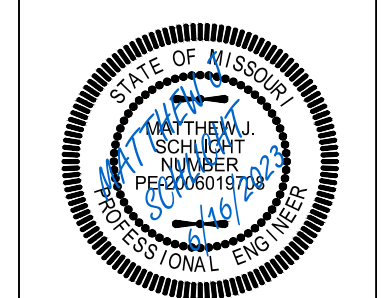
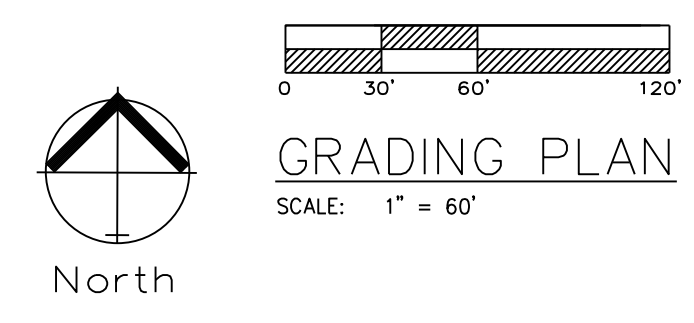


TYPICAL CHANNEL SECTION
SWALE DETAIL
Not To Scale

100 YEAR OVERFLOW SWALE SECTIONS										
Section	100 Yr. Runoff (c.f.s.)	Bed Slope (%)	Base Width (ft)	Side Slope (1:V)	100 Yr WSE (ft)	Sectional Area	Velocity 100Yr. (f.p.s.)	Hydraulic Radius (ft)	Shear Stress (p.s.f.)	
1-1	1.42	2.32	5	6	0.14	0.82	1.73	0.12	0.18	
2-2	1.42	2.19	5	6	0.14	0.82	1.73	0.12	0.17	
3-3	0.96	2.00	5	6	0.12	0.69	1.39	0.11	0.13	
4-4	2.87	2.00	5	6	0.22	1.39	2.06	0.18	0.23	
5-5	1.25	2.00	5	6	0.14	0.82	1.52	0.12	0.15	

NOTE: Swale sections extend the entire length between upstream and downstream structures with the exception of a transition at each structure.

NOTE: Swale should be lined with "Straw with Net" turf reinforcement (Curlex Blanket or Eqv.). Per Table 5607-1 in APWA Manual

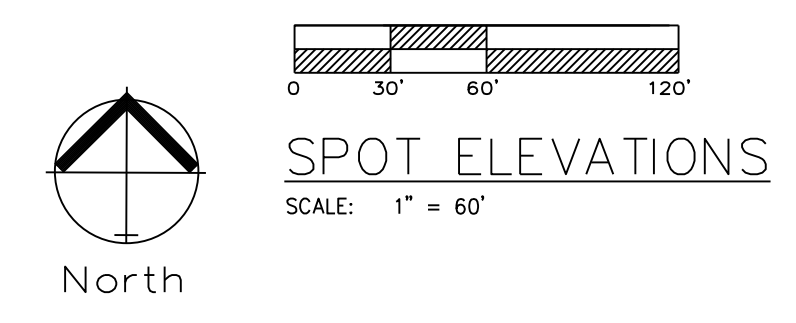
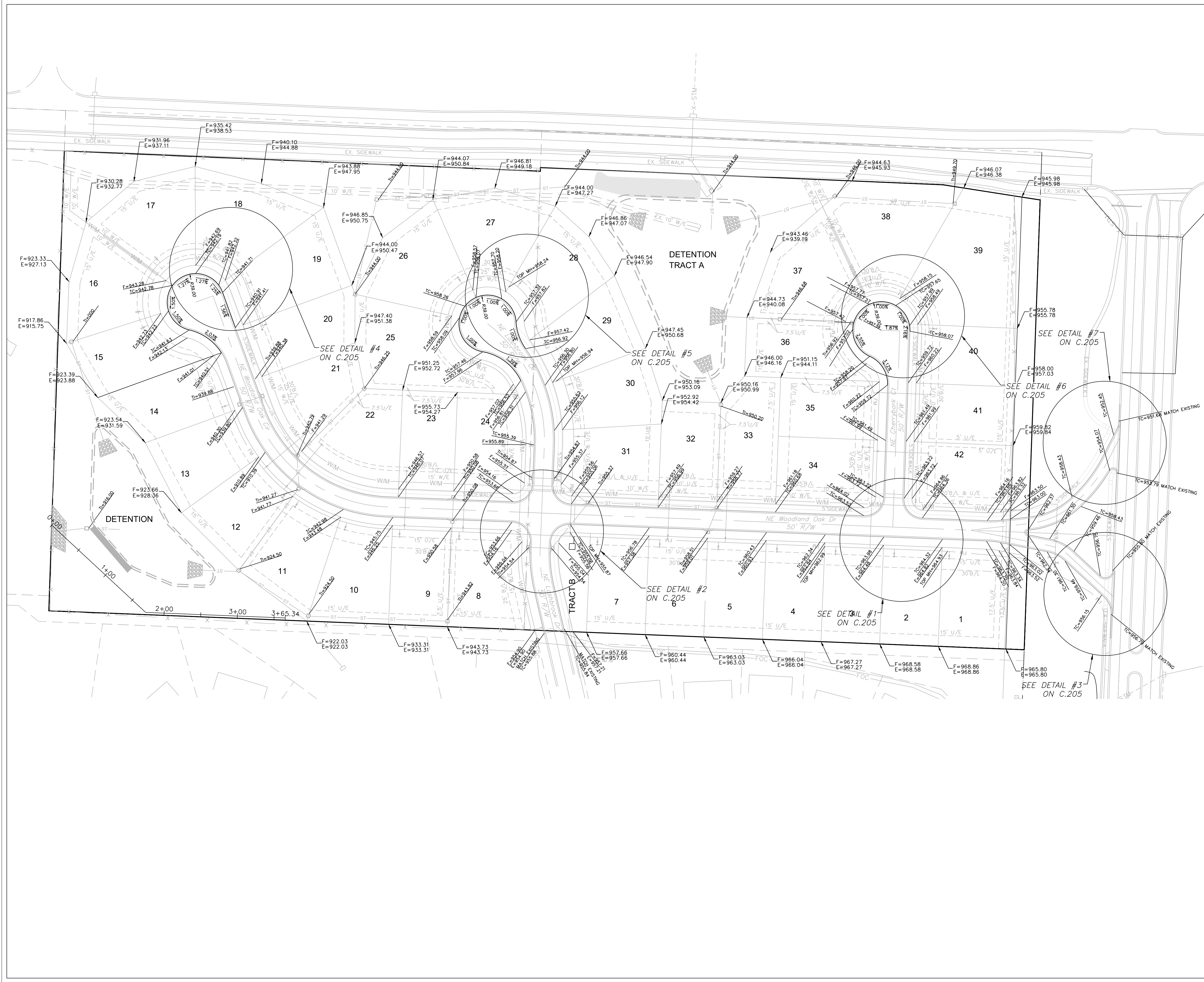


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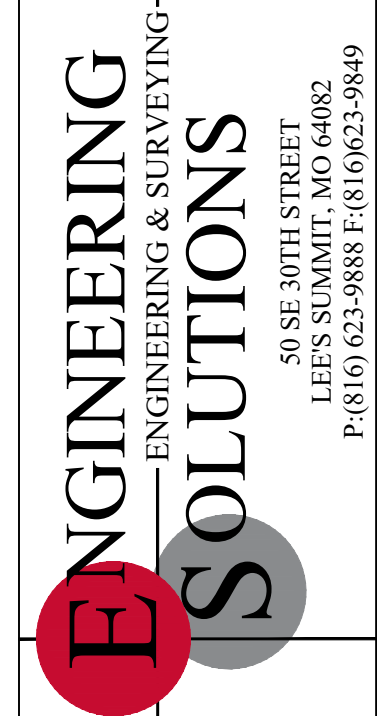
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REV. 5/5/2021
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REV. 6/29/2021

Updated 6/16/2023



Lot Number	Basement Type	MBOE
1	Standard	
2	Standard	
3	Standard	
4	Standard	
5	Standard	
6	Standard	
7	Standard	
8	Walkout	945.58
9	Walkout	945.58
10	Walkout	925.86
11	Walkout	925.65
12	Walkout	925.65
13	Walkout	917.4
14	Walkout	917.4
15	Walkout	919.77
16	Daylight	919.77
17	Standard	
18	Standard	
19	Standard	945.15
20	Standard	945.14
21	Standard	947.42
22	Standard	947.42
23	Standard	
24	Standard	
25	Walkout	945.14
26	Walkout	945.15
27	Walkout	945.12
28	Walkout	943.49
29	Walkout	943.49
30	Daylight	943.49
31	Standard	
32	Walkout	943.49
33	Walkout	943.49
34	Daylight	947.17
35	Daylight	943.49
36	Walkout	943.49
37	Walkout	943.49
38	Daylight	947.17
39	Daylight	950.93
40	Daylight	
41	Daylight	
42	Standard	

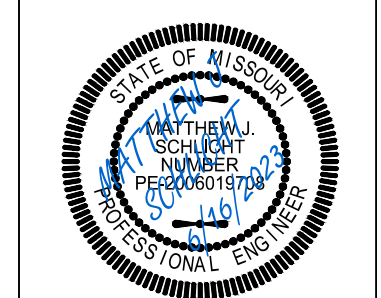


Professional Registration
 Missouri
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Part of the Southeast 1
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 Lee's Summit, Jackson County, Missouri

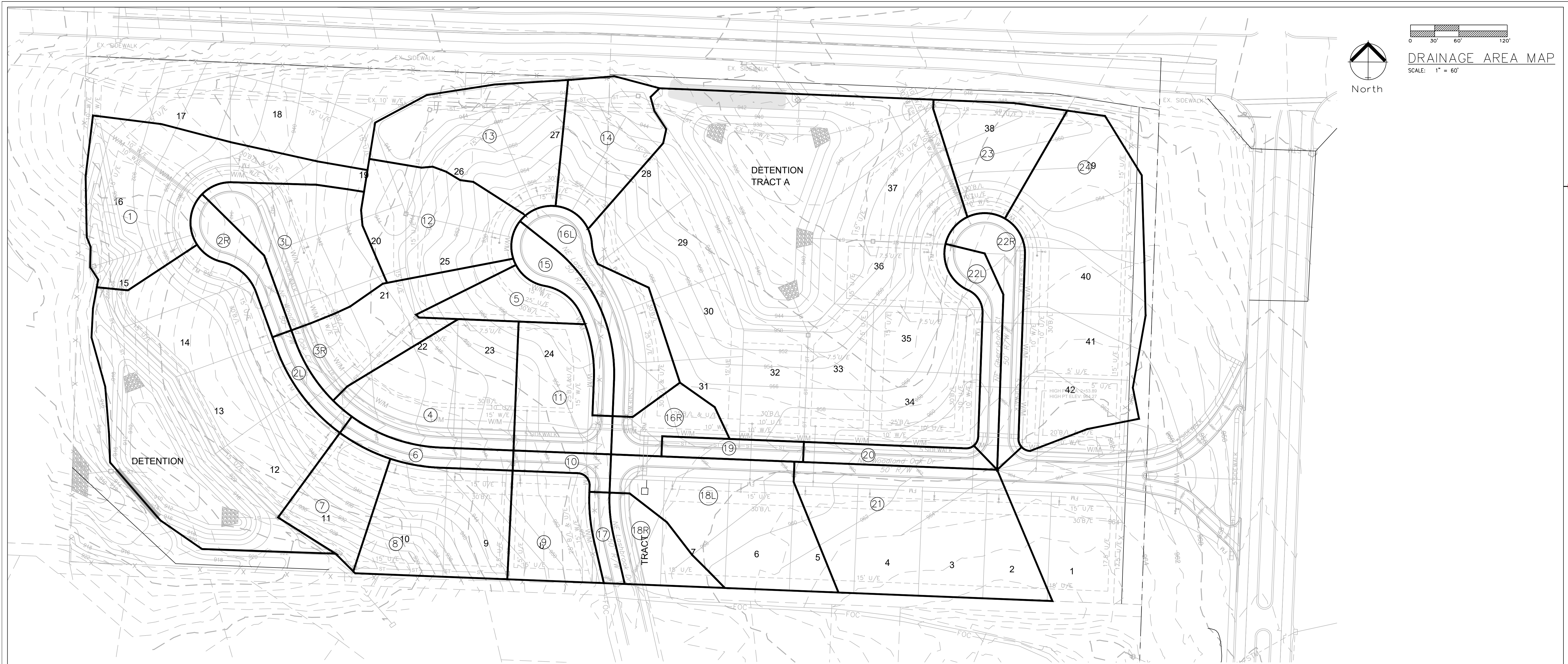
Project:
 WOODLAND OAKS
 LSHO
 Issue Date:
 February 25, 2021

MASTER DRAINAGE PLAN SHEET 2 OF 3
 SPOT ELEVATIONS
 Construction Plans for:
 WOODLAND OAKS
 Lots 1 thru 42
 Lee's Summit, Jackson County, Missouri

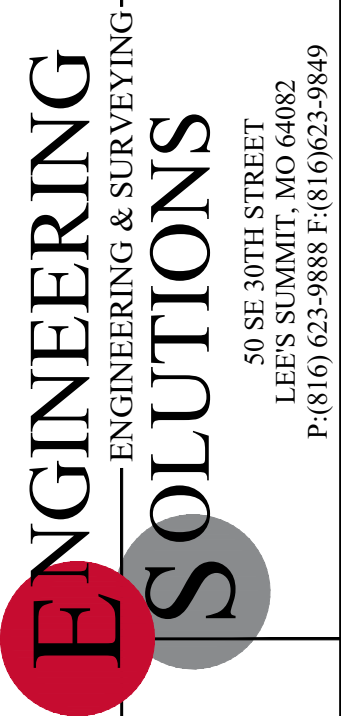


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 OK PE 25226
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REVISIONS
 REV. 5/5/2021
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DRAINAGE AREA MAP
SCALE: 1" = 60'



Professional Registration
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Section 27, Township 48 North, Range 31 West
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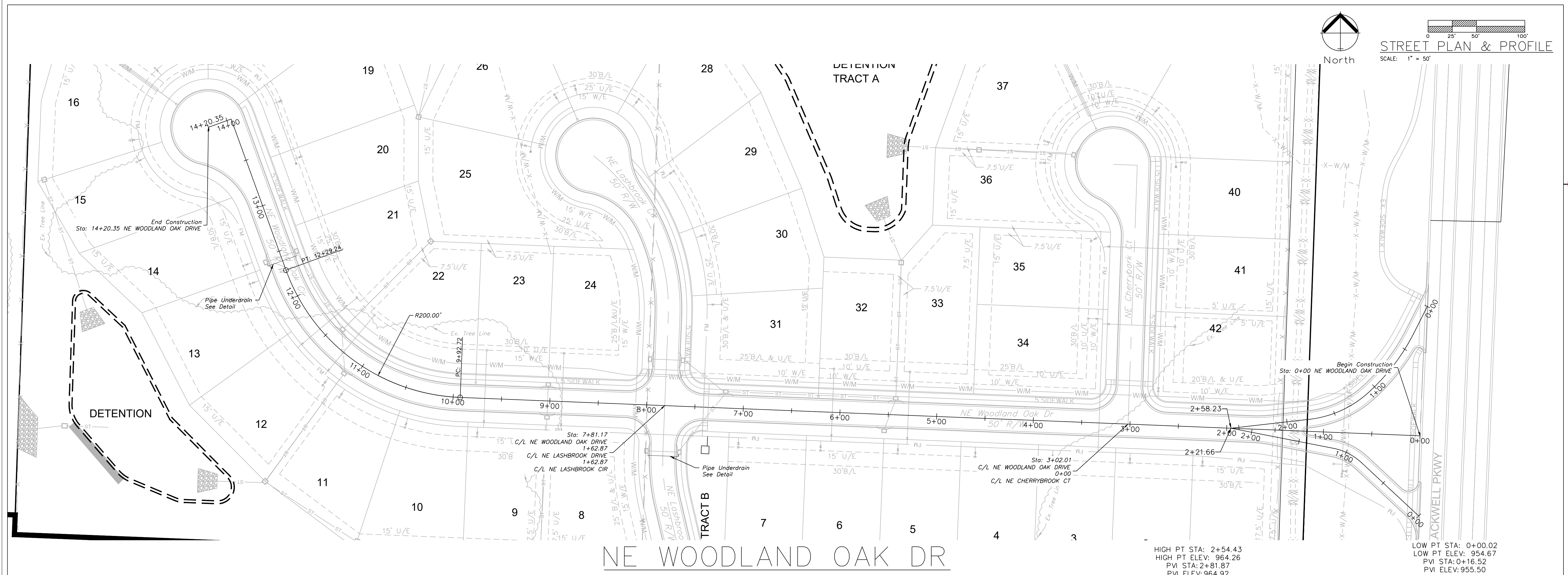
MASTER DRAINAGE PLAN SHEET 3 OF 3
DRAINAGE AREA MAP
Construction Plans for:
WOODLAND OAKS
Lots 1 thru 42
Lee's Summit, Jackson County, Missouri



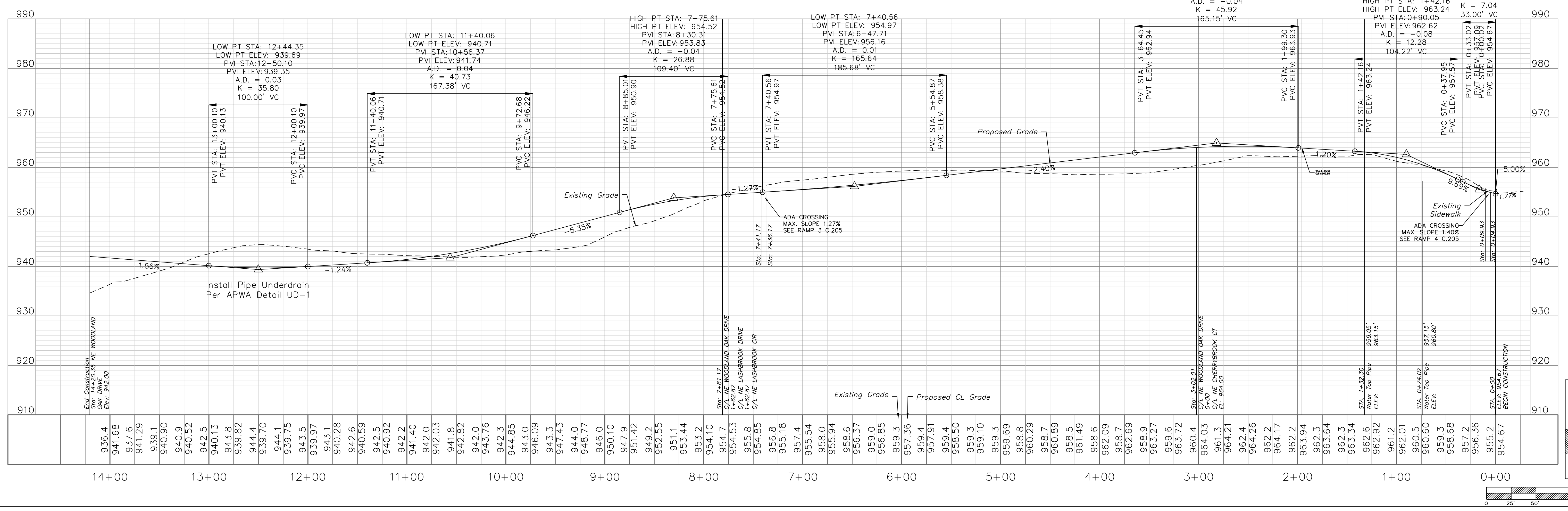
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APWA STORM DRAINAGE "TC" COMPUTATIONS FOR : WOODLAND OAKS (COLBERN & BLACKWELL)

AREA ID	TOTAL ACRES	WTRSHD LENGTH	UP ELEV	DN ELEV	SURFACE CODE	SURFACE TYPES				SLOPE %	SURFACE CODE	TC COMPUTATION				AREA ID										
						A	B	D	G			L	M	S	U		Z	Cal Overland	Used Min 5	Cal Channel One	Cal Channel Two	Total				
1	0.77	495.00	944.00	918.00	S	0.51	100.0	944.0	940.60	3.4	U	395.0	940.6	918.0	5.72	3.9	7.1	7.1	1.7	0.0	8.8	6.3	9.0	2.49	4.40	1
2L	0.09	175.50	942.00	939.80	S	0.51	11.5	942.0	941.75	2.2	P	164.0	941.8	939.8	1.19	2.2	2.8	5.0	1.2	0.0	6.2	7.0	9.8	0.34	0.60	2L
2R	0.14	196.00	941.90	939.80	S	0.51	11.5	941.9	941.65	2.2	P	184.5	941.7	939.8	1.00	2.0	2.8	5.0	1.5	0.0	6.5	6.9	9.7	0.50	0.87	2R
3L	0.48	250.00	945.00	939.80	S	0.51	100.0	945.0	941.00	4.0	P	150.0	941.0	939.8	0.80	1.8	6.7	6.7	1.4	0.0	8.1	6.5	9.2	1.58	2.79	3L
3R	0.51	279.00	951.00	939.80	S	0.51	100.0	951.0	943.00	8.0	P	179.0	943.0	939.8	1.79	2.7	5.3	5.3	1.1	0.0	6.4	6.9	9.8	1.82	3.20	3R
4	0.60	274.00	956.00	941.48	S	0.51	100.0	956.0	947.70	8.3	U	174.0	947.7	941.5	3.57	3.1	5.2	5.2	1.0	0.0	6.2	7.0	9.8	2.16	3.79	4
5	0.19	206.00	955.80	946.00	S	0.51	100.0	955.8	953.80	2.0	U	106.0	953.8	946.0	7.36	4.4	8.4	8.4	0.4	0.0	8.8	6.3	8.9	0.60	1.05	5
6	0.12	226.50	950.00	942.00	S	0.51	11.5	950.0	949.75	2.2	P	215.0	949.8	942.0	3.60	3.9	2.8	5.0	0.9	0.0	5.9	7.1	10.0	0.45	0.79	6
7	0.28	190.00	943.00	924.00	S	0.51	100.0	943.0	931.00	12.0	U	90.0	931.0	924.0	7.78	4.5	4.6	5.0	0.3	0.0	5.3	7.3	10.2	1.03	1.81	7
8	0.54	285.00	950.00	924.00	S	0.51	100.0	950.0	945.00	5.0	U	185.0	945.0	924.0	11.35	5.4	6.2	6.2	0.6	0.0	6.8	6.8	9.6	1.89	3.32	8
9	0.32	165.00	954.00	944.00	S	0.51	100.0	954.0	951.00	3.0	U	65.0	951.0	944.0	10.77	5.3	7.4	7.4	0.2	0.0	7.6	6.6	9.4	1.09	1.91	9
10	0.08	140.50	955.00	950.00	S	0.51	11.5	955.0	954.75	2.2	P	129.0	954.8	950.0	3.68	3.9	2.8	5.0	0.6	0.0	5.6	7.2	10.1	0.31	0.54	10
11	0.37	187.00	955.80	950.00	S	0.51	100.0	955.8	951.30	4.5	P	87.0	951.3	950.0	1.49	2.5	6.4	6.4	0.6	0.0	7.0	6.8	9.5	1.29	2.27	11
12	0.45	214.00	957.00	943.00	S	0.51	100.0	957.0	951.00	6.0	U	114.0	951.0	943.0	7.02	4.3	5.8	5.8	0.4	0.0	6.3	7.0	9.8	1.61	2.84	12
13	0.61	223.00	957.00	943.00	S	0.51	100.0	957.0	951.00	6.0	U	123.0	951.0	943.0	6.50	4.1	5.8	5.8	0.5	0.0	6.3	7.0	9.8	2.18	3.83	13
14	0.40	170.00	957.00	943.00	S	0.51	100.0	957.0	951.00	6.0	U	70.0	951.0	943.0	11.43	5.5	5.8	5.8	0.2	0.0	6.1	7.0	9.9	1.42	2.50	14
15	0.19	292.50	957.00	954.00	S	0.51	11.5	957.0	956.77	2.0	P	281.0	956.8	954.0	0.99	2.0	2.9	5.0	2.3	0.0	7.3	6.7	9.4	0.66	1.16	15
16L	0.37	292.50	957.00	954.00	S	0.51	11.5	957.0	956.77	2.0	P	281.0	956.8	954.0	0.99	2.0	2.9	5.0	2.3	0.0	7.3	6.7	9.4	1.27	2.24	16L
16R	0.17	140.00	957.00	954.00	S	0.51	100.0	957.0	954.60	2.4	P	40.0	954.6	954.0	1.50	2.5	7.9	7.9	0.3	0.0	8.2	6.5	9.1	0.56	0.99	16R
17	0.07	121.50	954.50	953.00	S	0.51	11.5	954.5	954.25	2.2	P	110.0	954.8	953.0	1.14	2.2	2.8	5.0	0.8	0.0	5.8	7.1	10.0	0.24	0.42	17
18L	0.21	172.00	960.40	953.00	S	0.51	100.0	960.4	956.40	4.0	U	72.0	956.4	953.0	4.72	3.5	6.7	6.7	0.3	0.0	7.0	6.8	9.5	1.27	1.27	18L
18R	0.70	383.00	965.25	953.00	S	0.51	100.0	965.3	960.00	5.3	P	283.0	965.3	953.0	2.47	3.2	6.1	6.1	1.5	0.0	7.6	6.6	9.3	2.36	4.16	18R
19	0.10	185.50	958.25	954.80	S	0.51	11.5	958.3	958.00	2.2	P	174.0	958.0	954.8	1.84	2.8	2.8	5.0	1.1	0.0	6.1	7.0	9.9	0.36	0.64	19
20	0.13	229.50	962.00	958.40	S	0.51	11.5	962.0	961.75	2.2	P	218.0	961.8	958.4	1.54	2.5	2.8	5.0	1.4	0.0	6.4	6.9	9.8	0.46	0.82	20
21	0.97	414.00	968.65	958.10	S	0.51	100.0	968.7	965.00	3.6	P	314.0	965.0	958.1	2.20	3.0	6.9	6.9	1.7	0.0	8.6	6.4	9.0	3.15	5.55	21
22L	0.19	286.50	962.00	956.90	S	0.51	11.5	962.0	961.75	2.2	P	275.0	961.8	956.9	1.76	2.7	2.8	5.0	1.7	0.0	6.7	6.9	9.7	0.65	1.15	22L
22R	0.25	371.50	962.00	956.90	S	0.51	11.5	962.0	961.75	2.2	P	360.0	961.8	956.9	1.35	2.4	2.8	5.0	2.5	0.0	7.5	6.6	9.4	0.83	1.47	22R
23	0.35	242.00	957.00	945.00	S	0.51	100.0	957.0	950.00	7.0	U	142.0	950.0	945.0	3.52	3.0	5.6	5.6	0.8	0.0	6.3	7.0	9.8	1.25	2.21	23
24	1.26	396.00	961.25	949.50	S	0.51	100.0	961.3	958.90	2.4	U	296.0	958.9	949.5	3.18	2.9	8.0	8.0	1.7	0.0	9.7	6.1	8.7	3.96	7.00	24



NE WOODLAND OAK DR



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Kansas
Engineering E-1685
Surveying LS-218
Oklahoma
Engineering S254
Nebraska
Engineering CA2821

Project: WOODLAND OAKS
LSMO
Issue Date: February 25, 2021

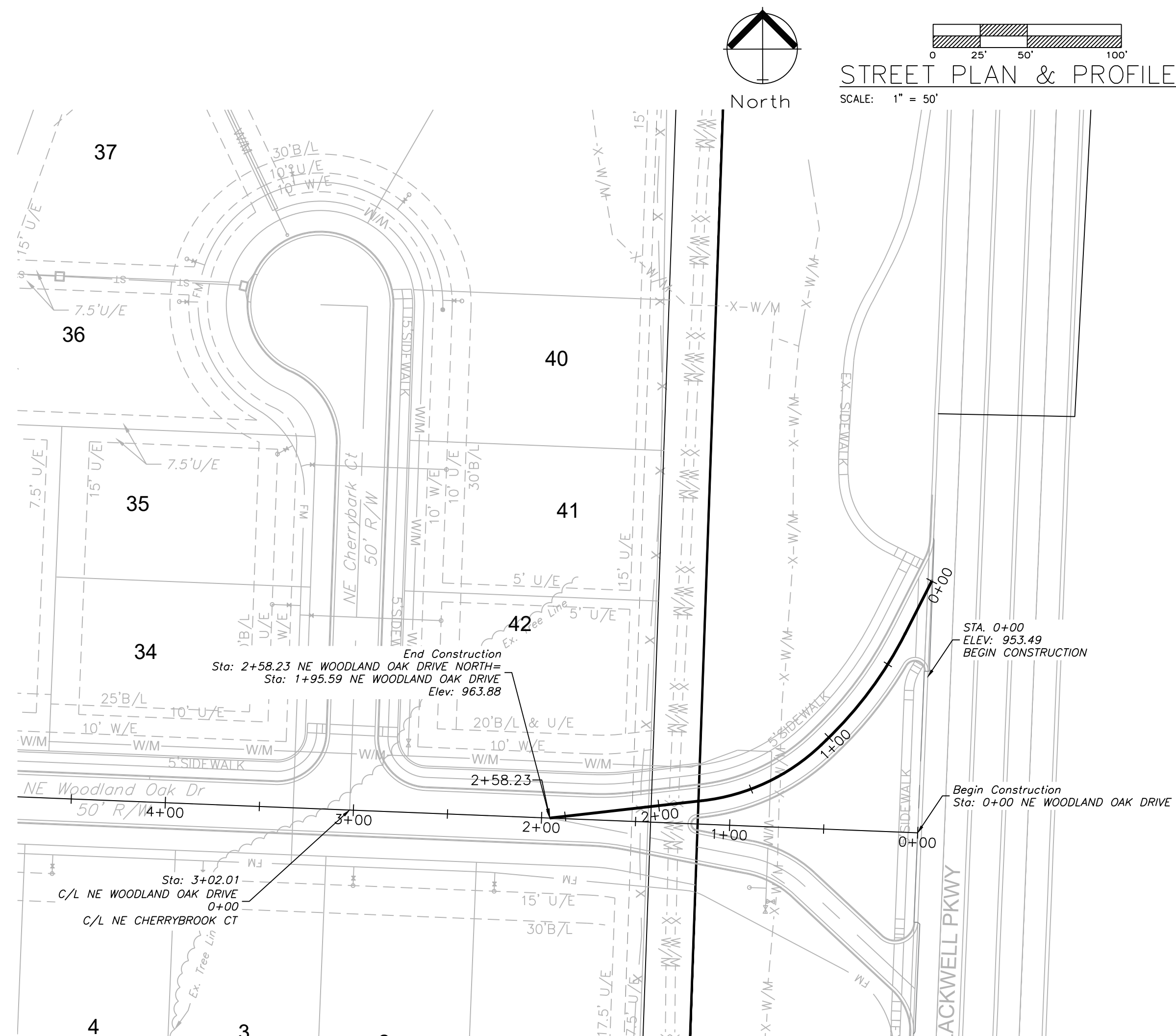
Part of the Southeast 1
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Lee's Summit, Jackson County, Missouri

Street Plan and Profile
Construction Plans for:
WOODLAND OAKS
Lots 1 thru 42
Lee's Summit, Jackson County, Missouri

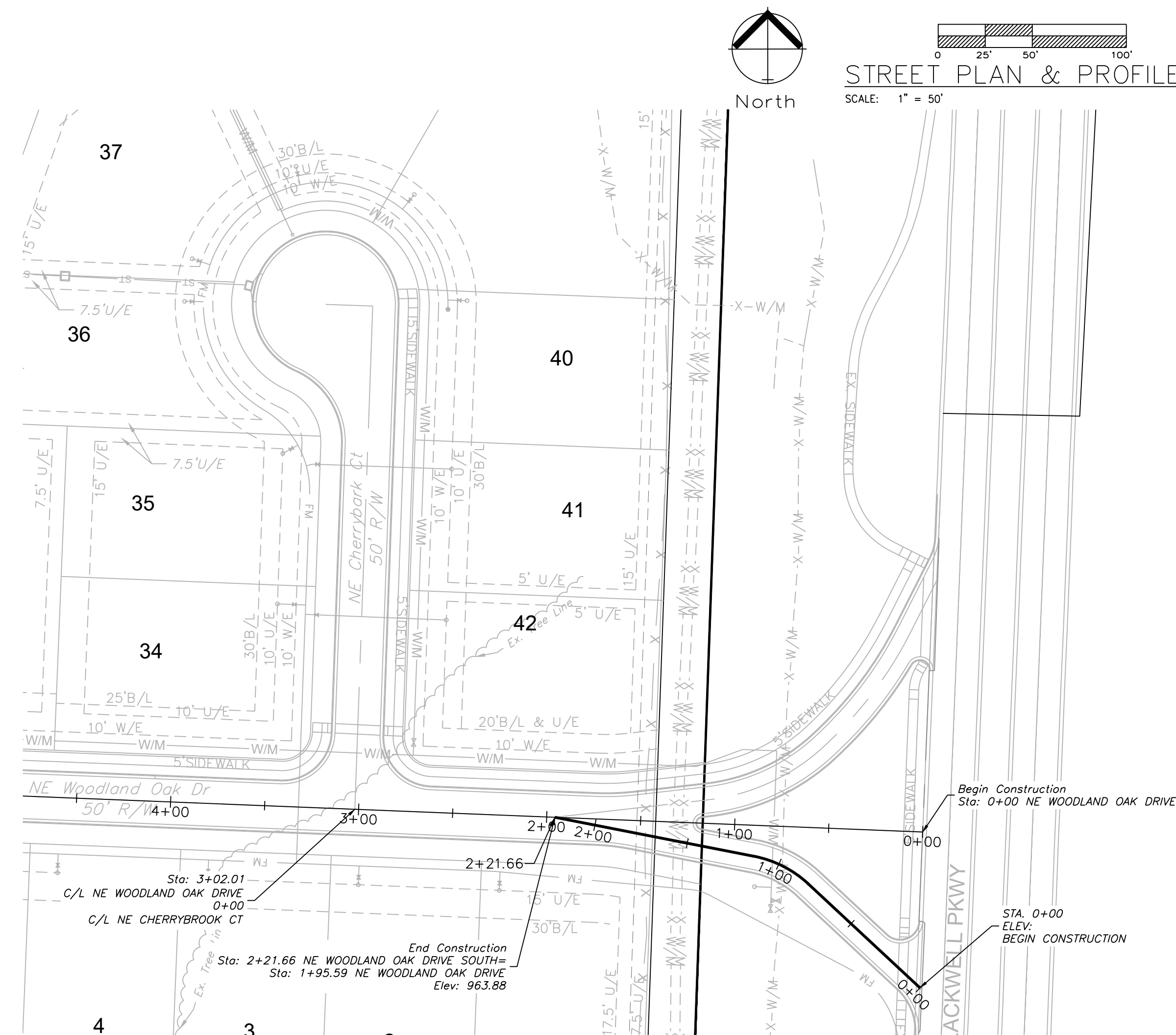
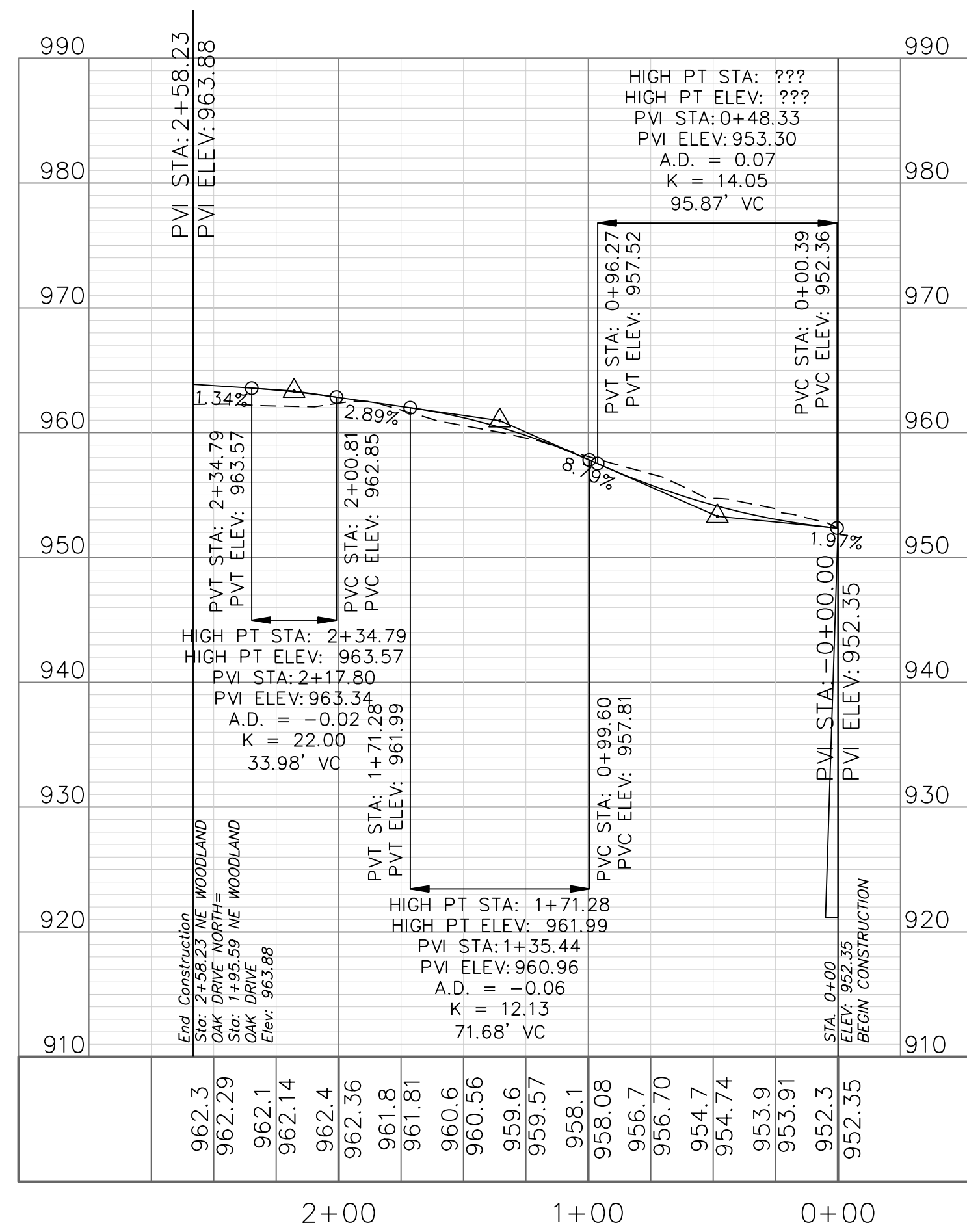
REVISIONS
REV. 5/5/2021
REV. 5/26/2021
REV. 6/22/2021
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KS PE 19071
NE PE 25226
NE PE E-14335
PROFESSIONAL ENGINEER

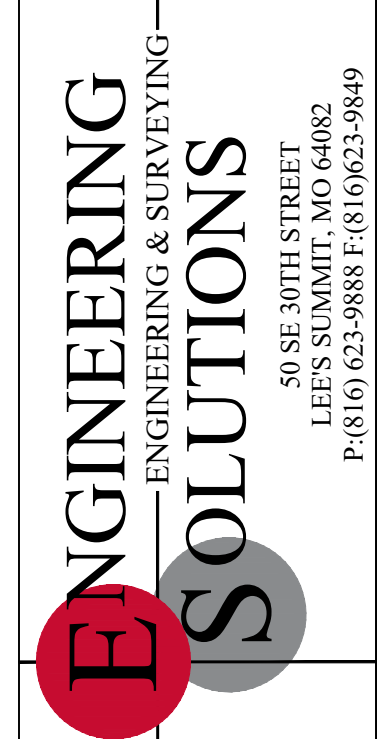
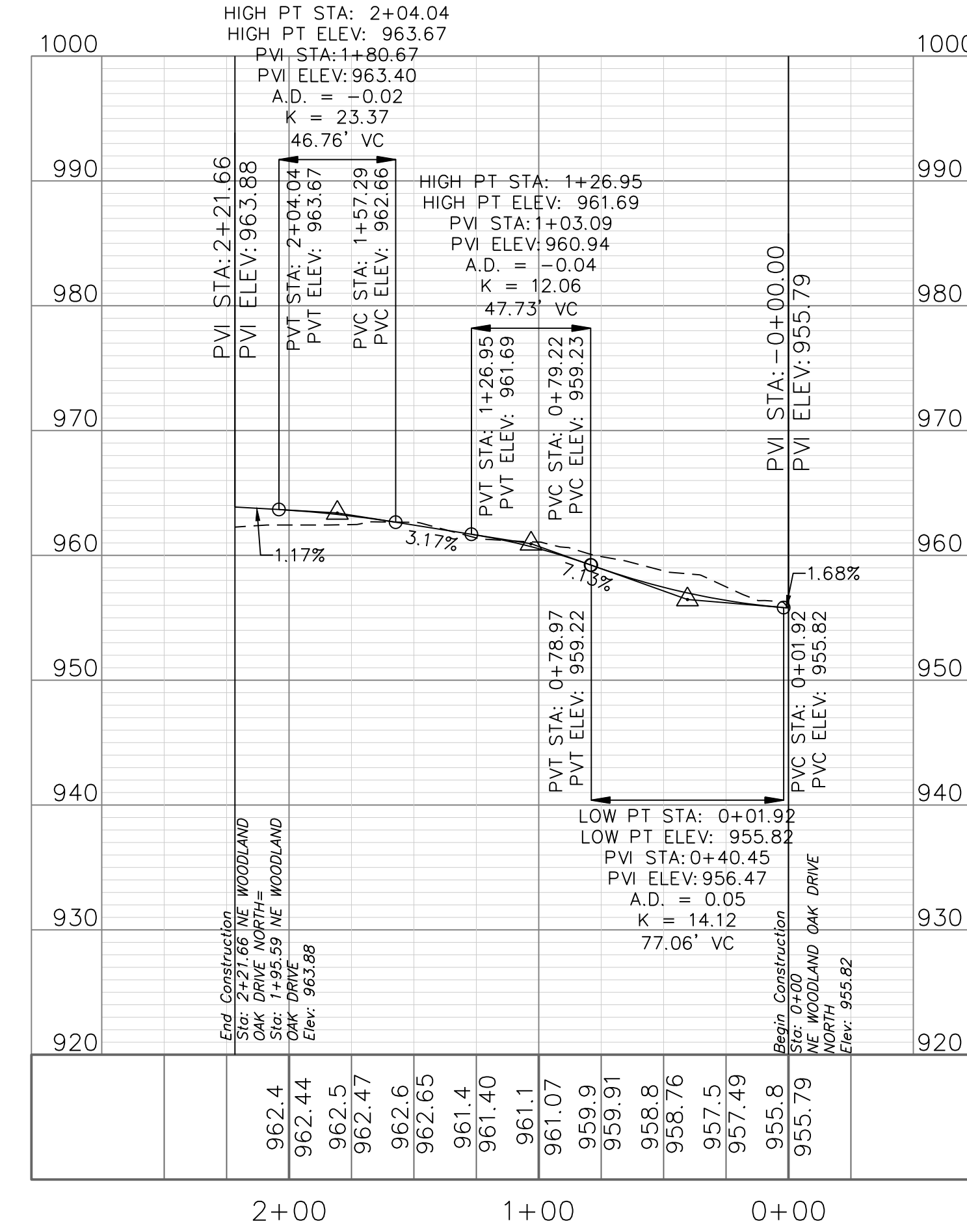
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NE WOODLAND OAK DR NORTH



NE WOODLAND OAK DR SOUTH

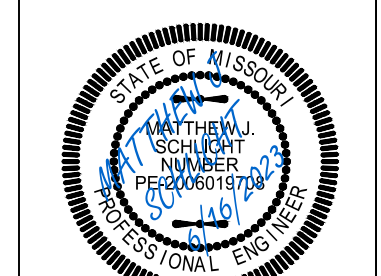


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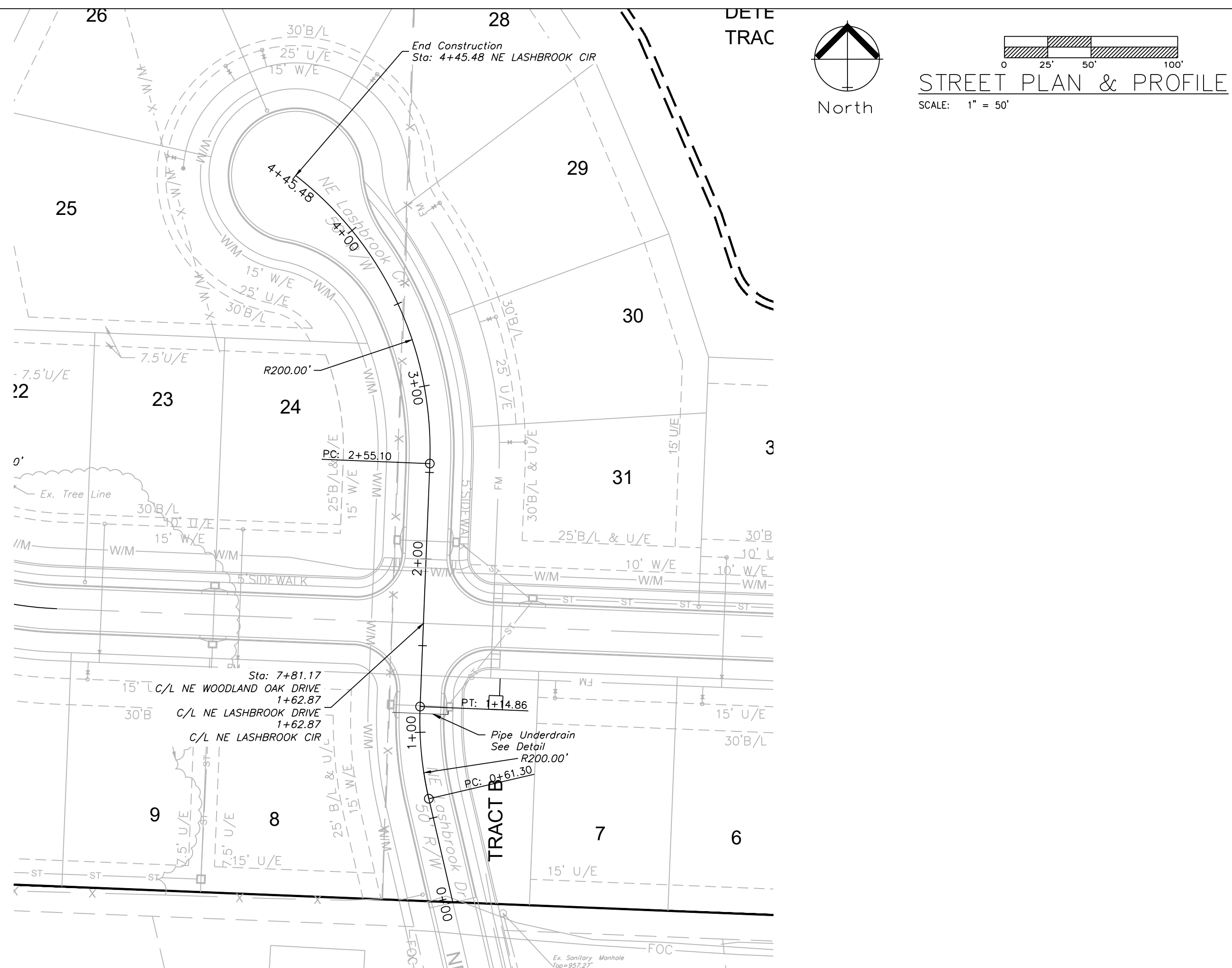
Project:
WOODLAND OAKS
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February 25, 2021

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Construction Plans for:
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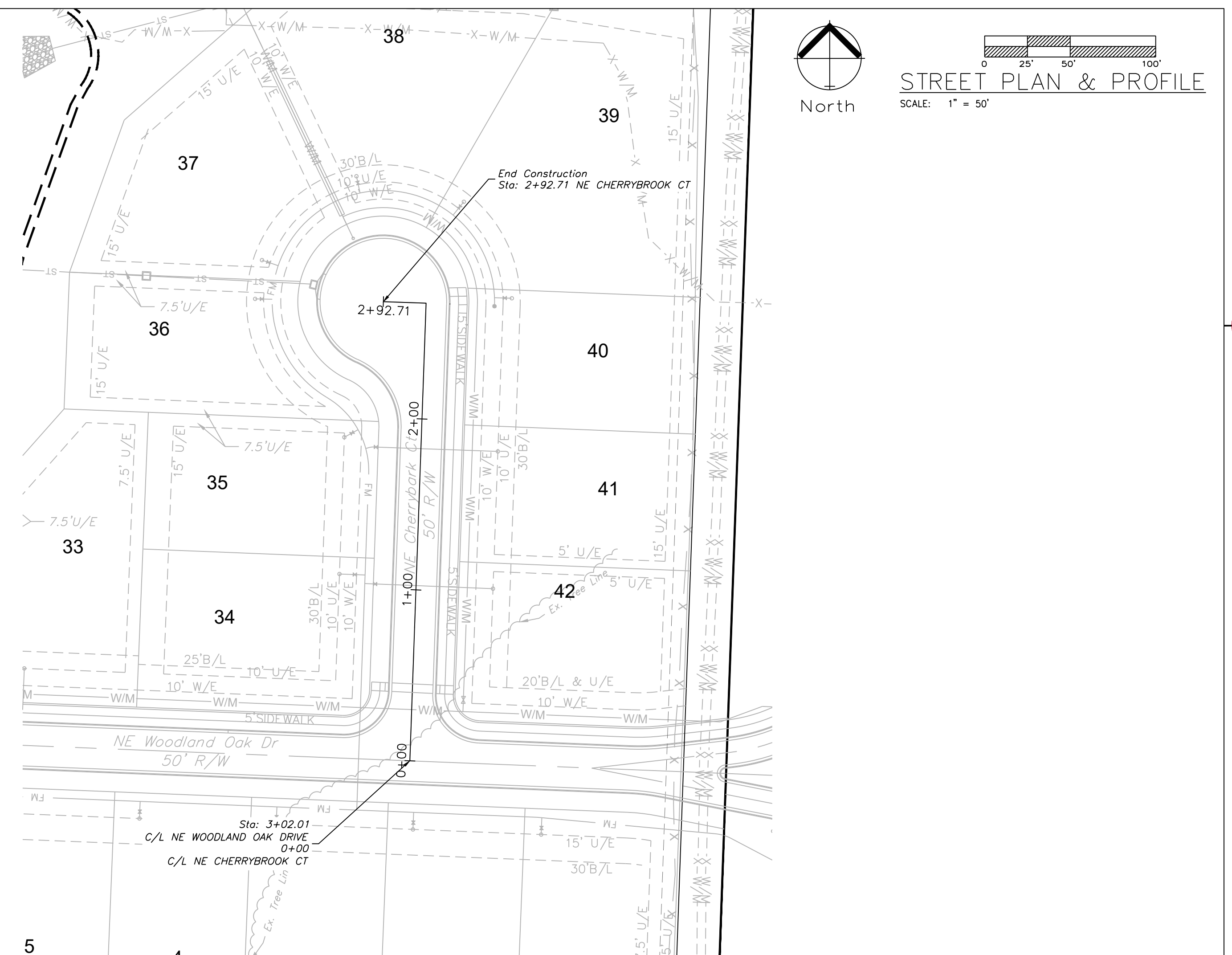
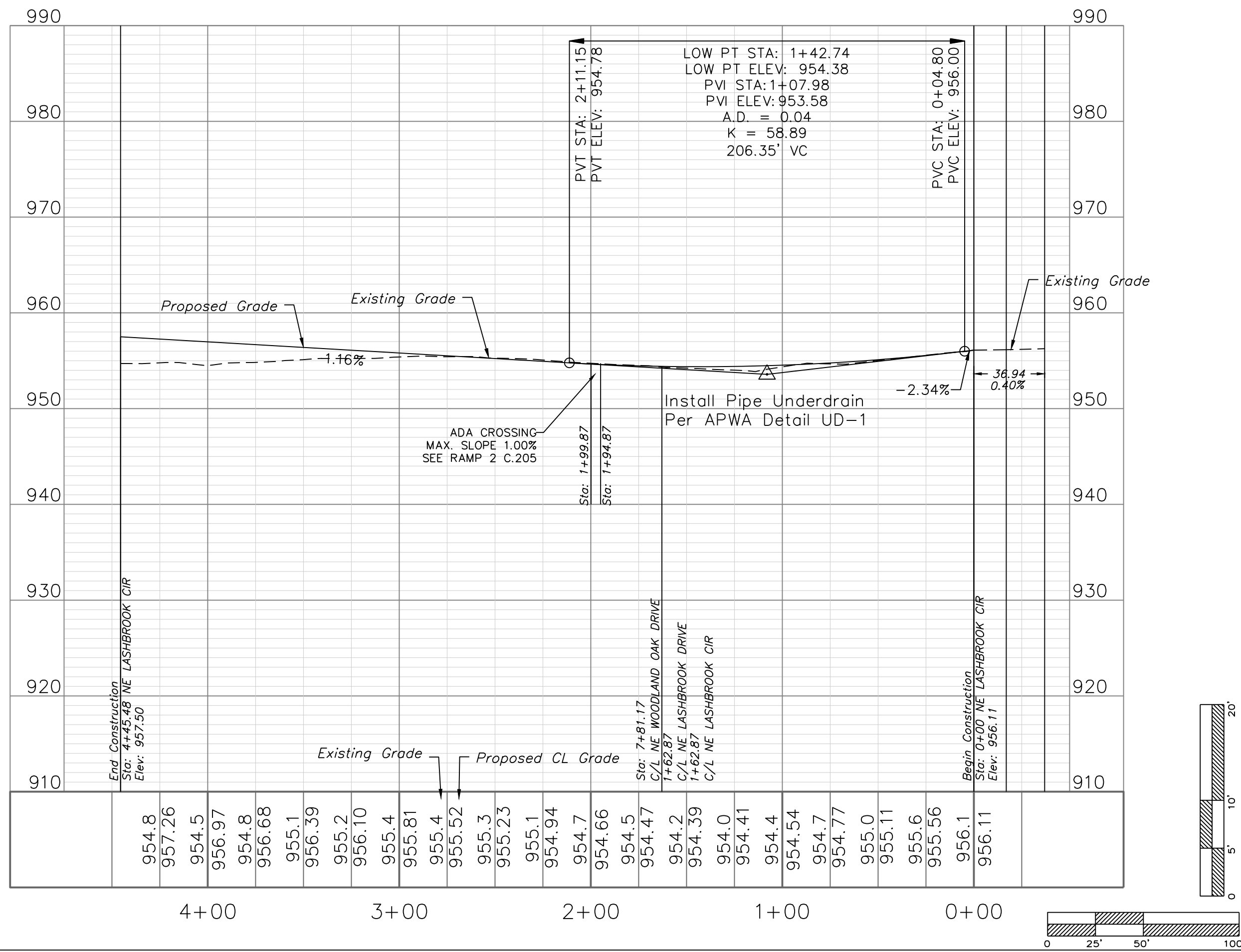


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NE PE E-14335

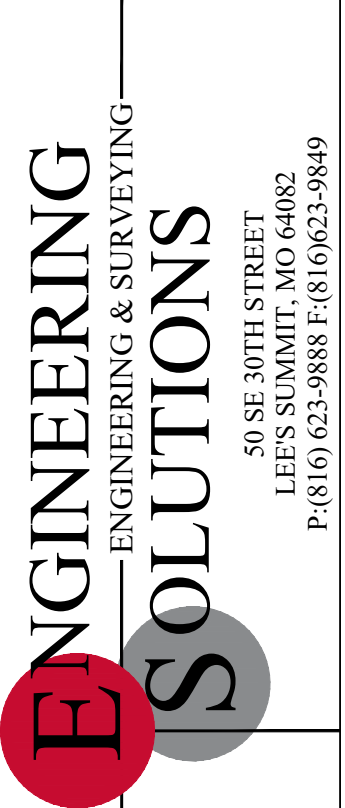
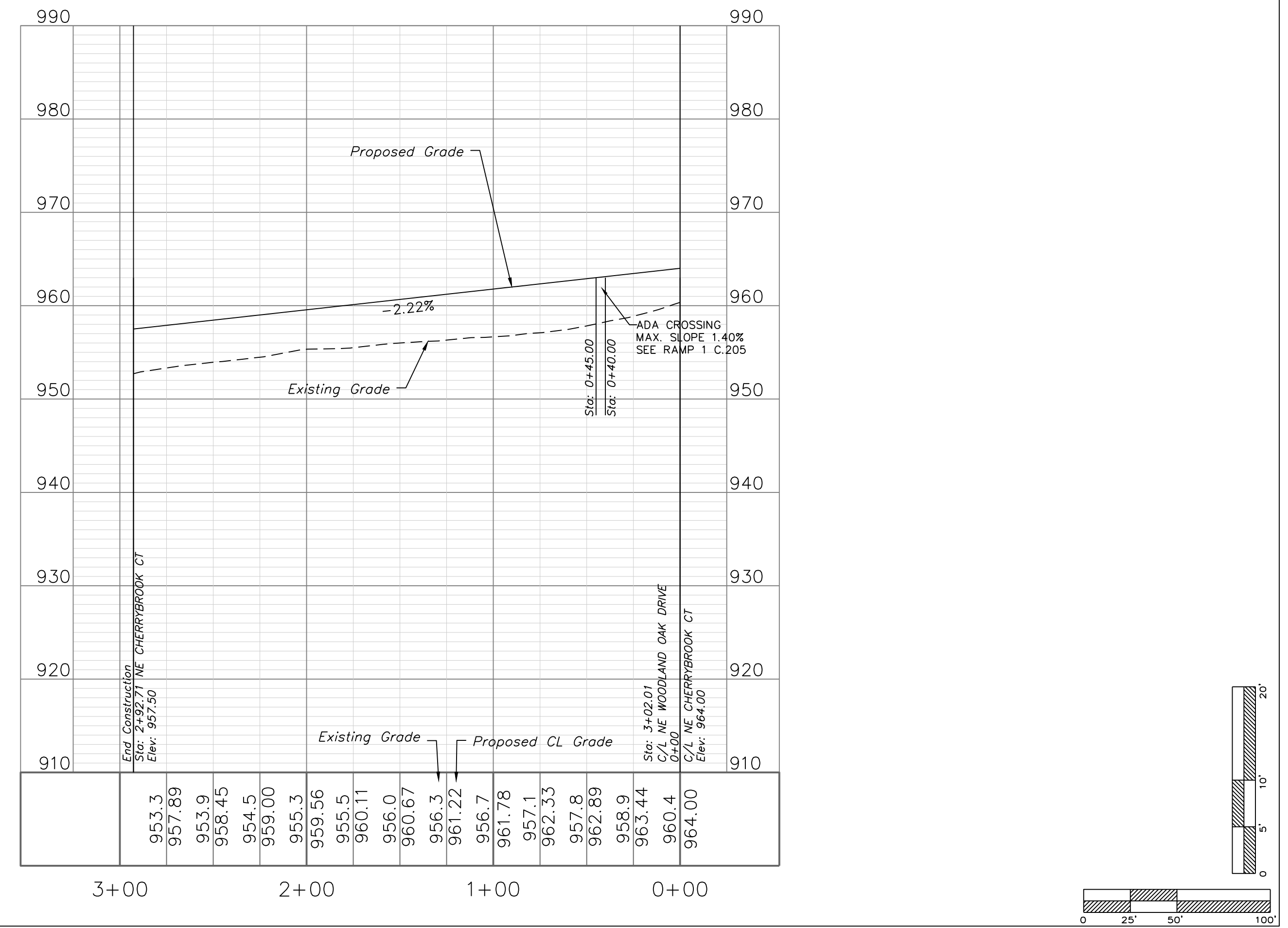
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NE CHERRYBARK CT



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 Oklahoma
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 Nebraska
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 Section 27, Township 48 North, Range 31 West
 Lee's Summit, Jackson County, Missouri

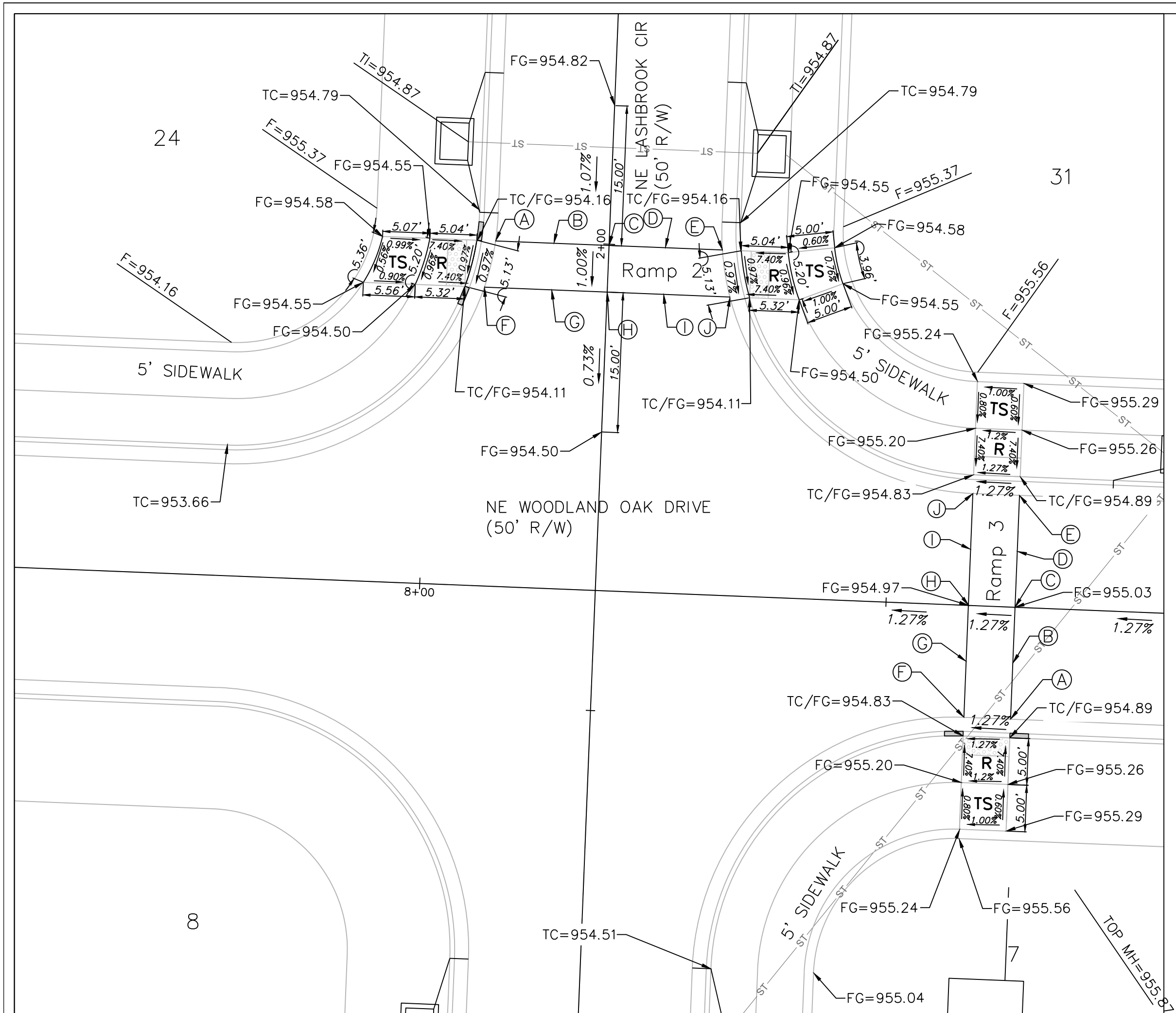
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 WOODLAND OAKS
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 Issue Date:
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Street Plan and Profile
 Construction Plans for:
 WOODLAND OAKS
 Lots 1 thru 42
 Lee's Summit, Jackson County, Missouri

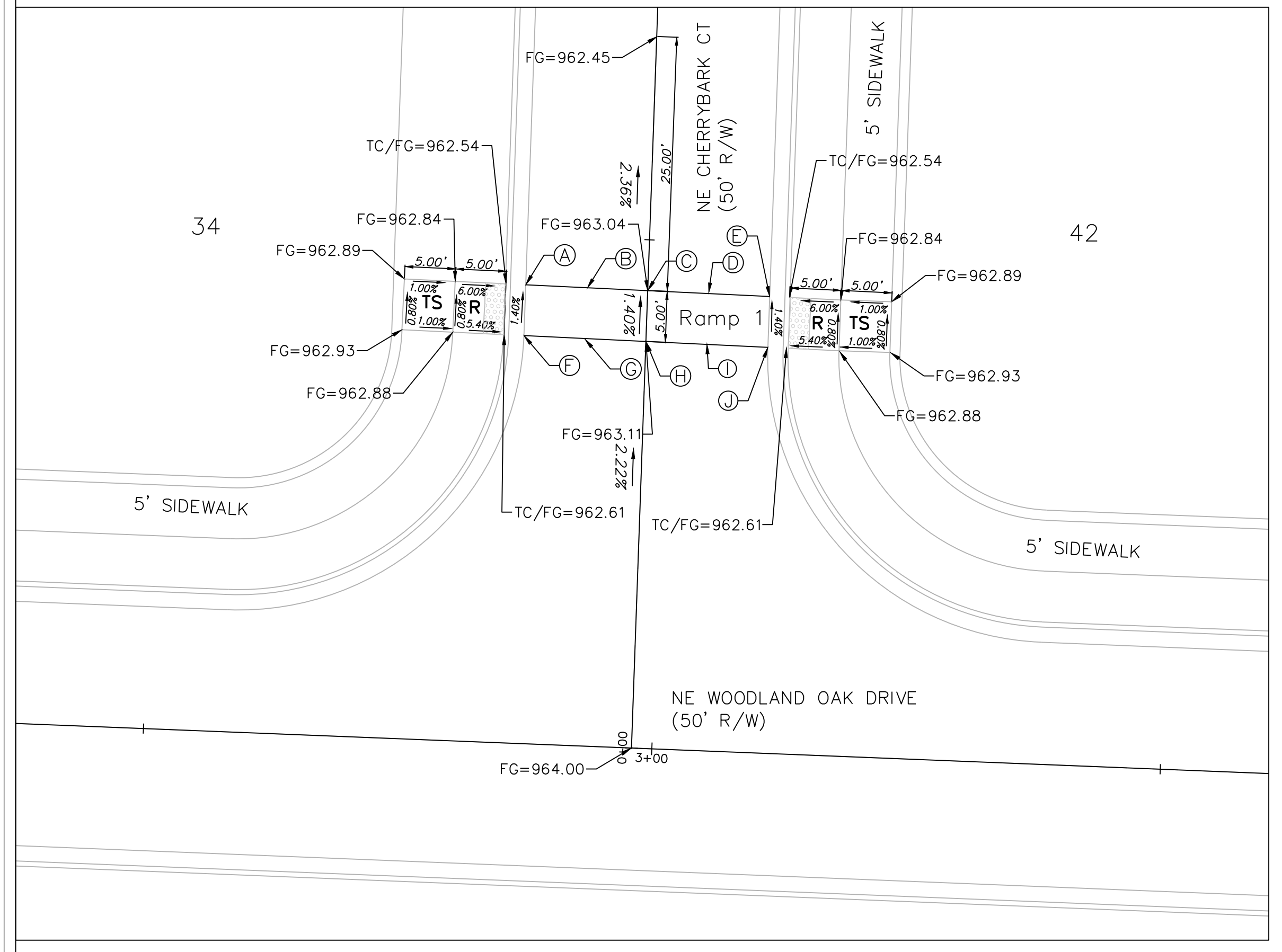


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 NE PE E-14335

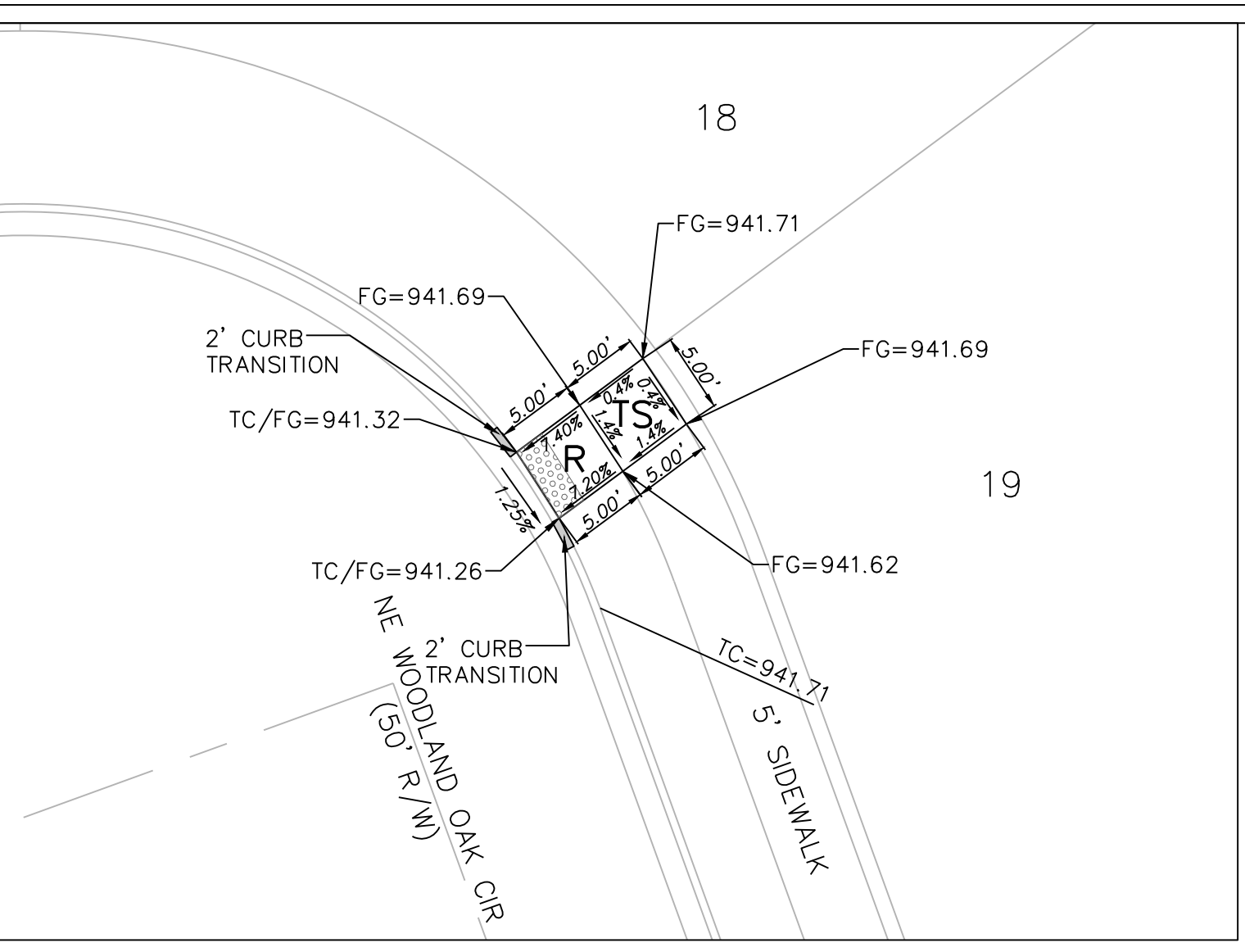
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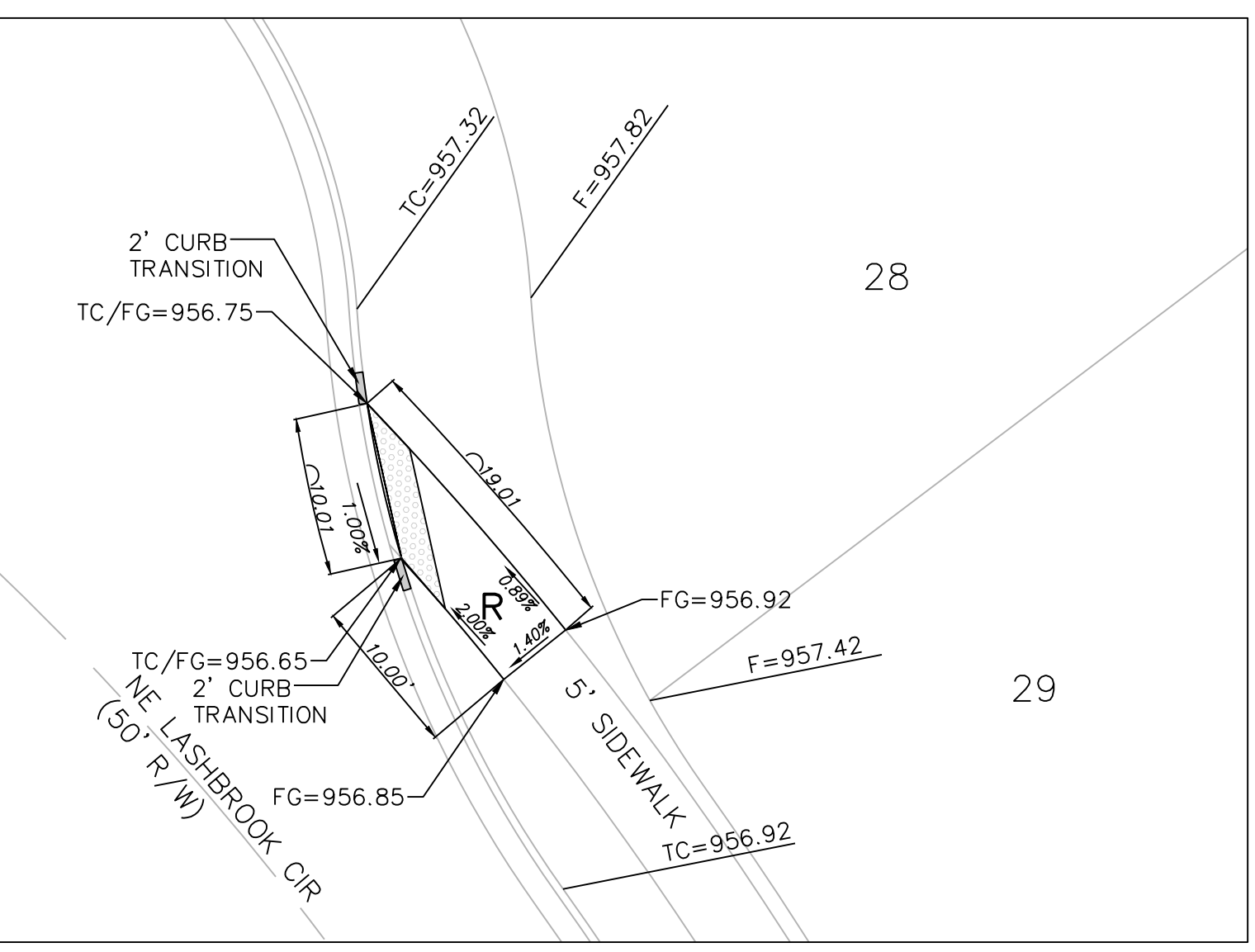
DETAIL 2



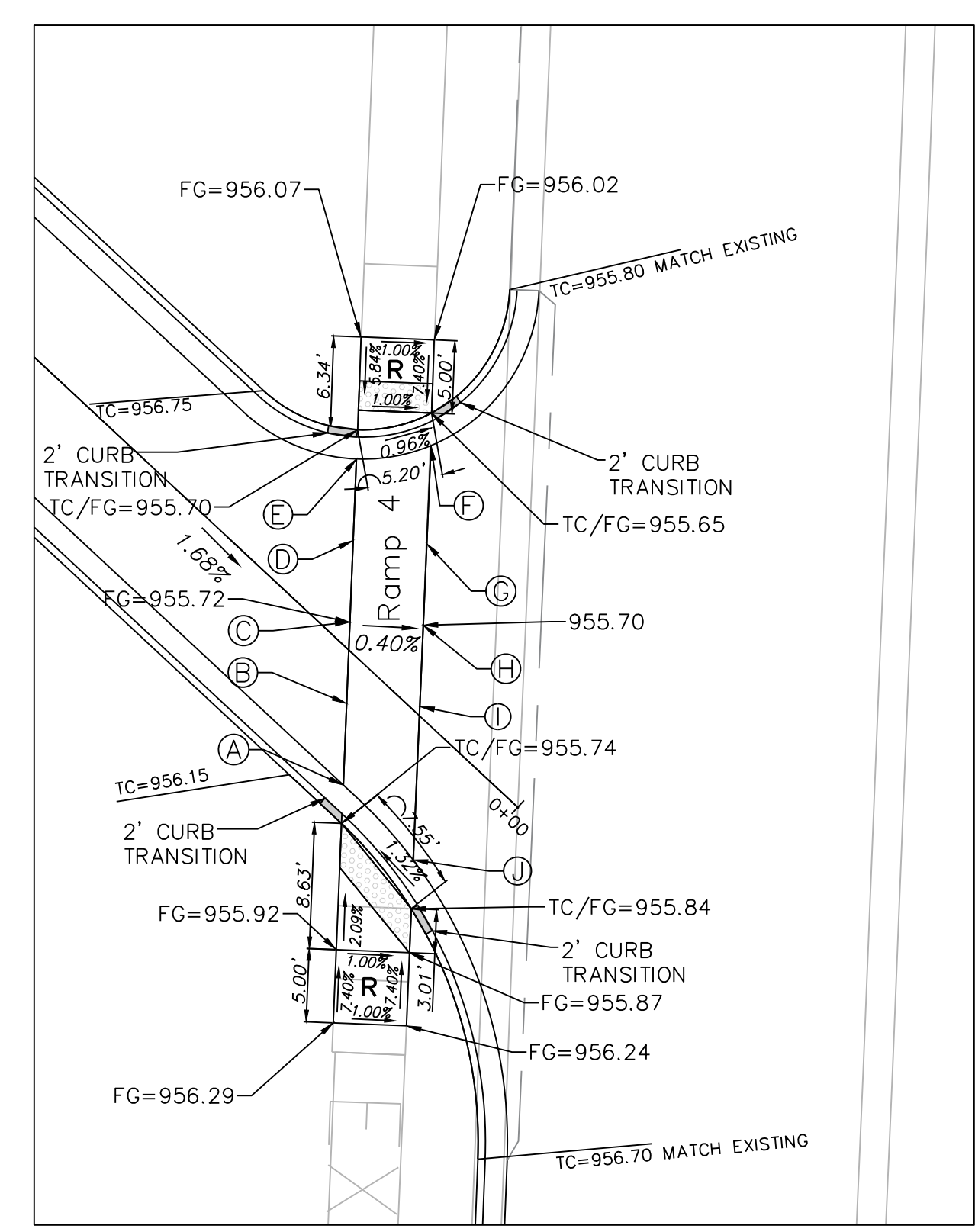
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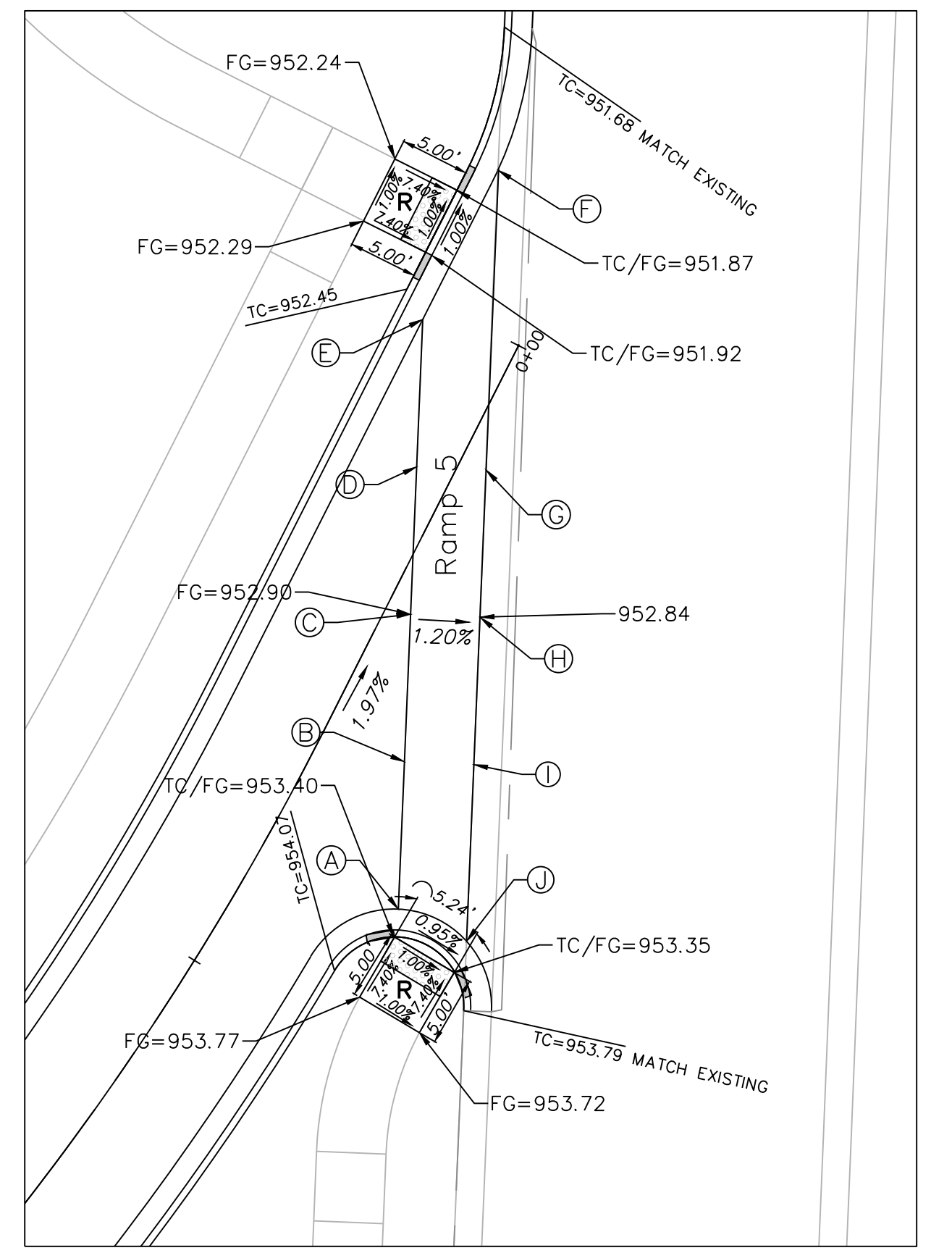
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DETAIL 5

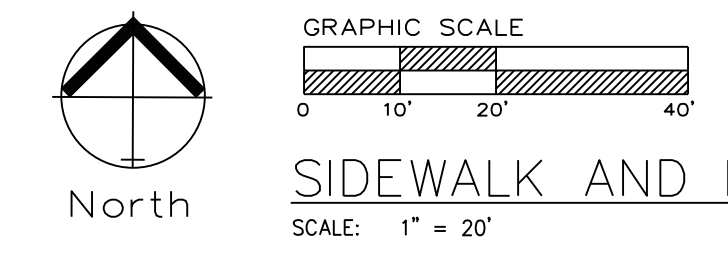


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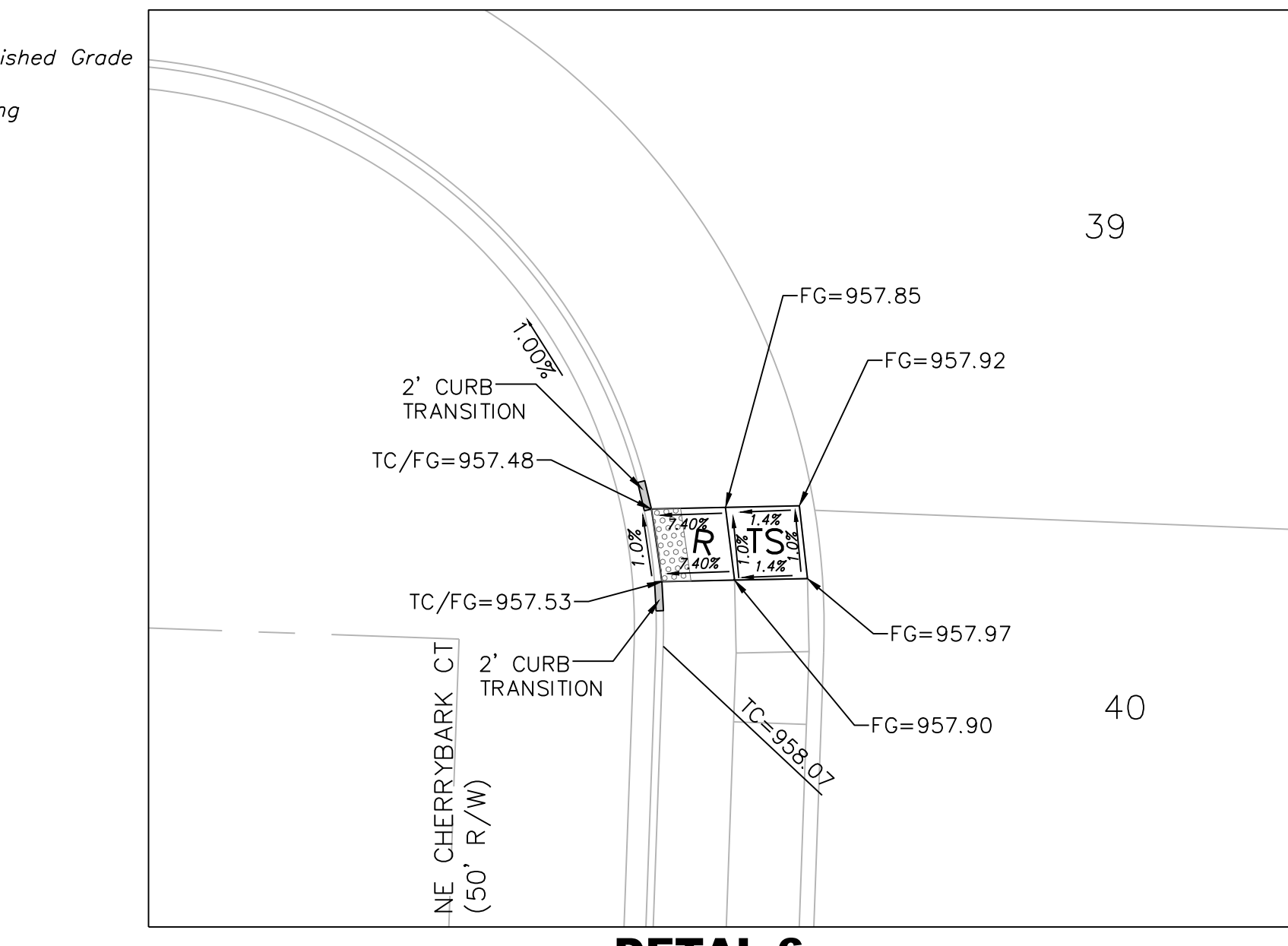


DETAIL 7

- Legend:**
- EX TC = Existing Top of Curb
 - EX FG = Existing Finished Grade
 - FG = Finished Grade
 - TC = Top of Curb
 - TC/FG = Top of Curb/Finished Grade
 - Detectable Warning



SIDEWALK AND INTERSECTION PLAN



SPOT ELEVATION TABLE

Spot	Ramp 1 Elevation	Ramp 2 Elevation	Ramp 3 Elevation	Ramp 4 Elevation	Ramp 5 Elevation
A	962.54	954.16	954.89	955.74	953.40
B	962.92	954.54	954.91	955.73	953.27
C	963.04	954.66	955.03	955.72	952.91
D	962.92	954.54	954.91	955.71	952.61
E	962.54	954.16	954.89	955.70	951.92
F	962.61	954.11	954.83	955.65	951.87
G	962.99	954.49	954.85	955.68	952.55
H	963.11	954.61	954.97	955.70	952.84
I	962.99	954.49	954.85	955.75	953.21
J	962.61	954.11	954.83	955.84	953.35



Professional Registration
 Missouri
 Engineering 2005002186-D
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Part of the Southeast
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 Lee's Summit, Jackson County, Missouri

Sidewalk and
 Intersection Plan
 Construction Plans for:
 WOODLAND OAKS
 Lots 1 thru 42
 Lee's Summit, Jackson County, Missouri

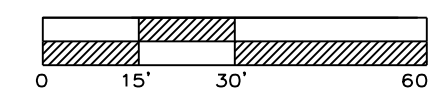
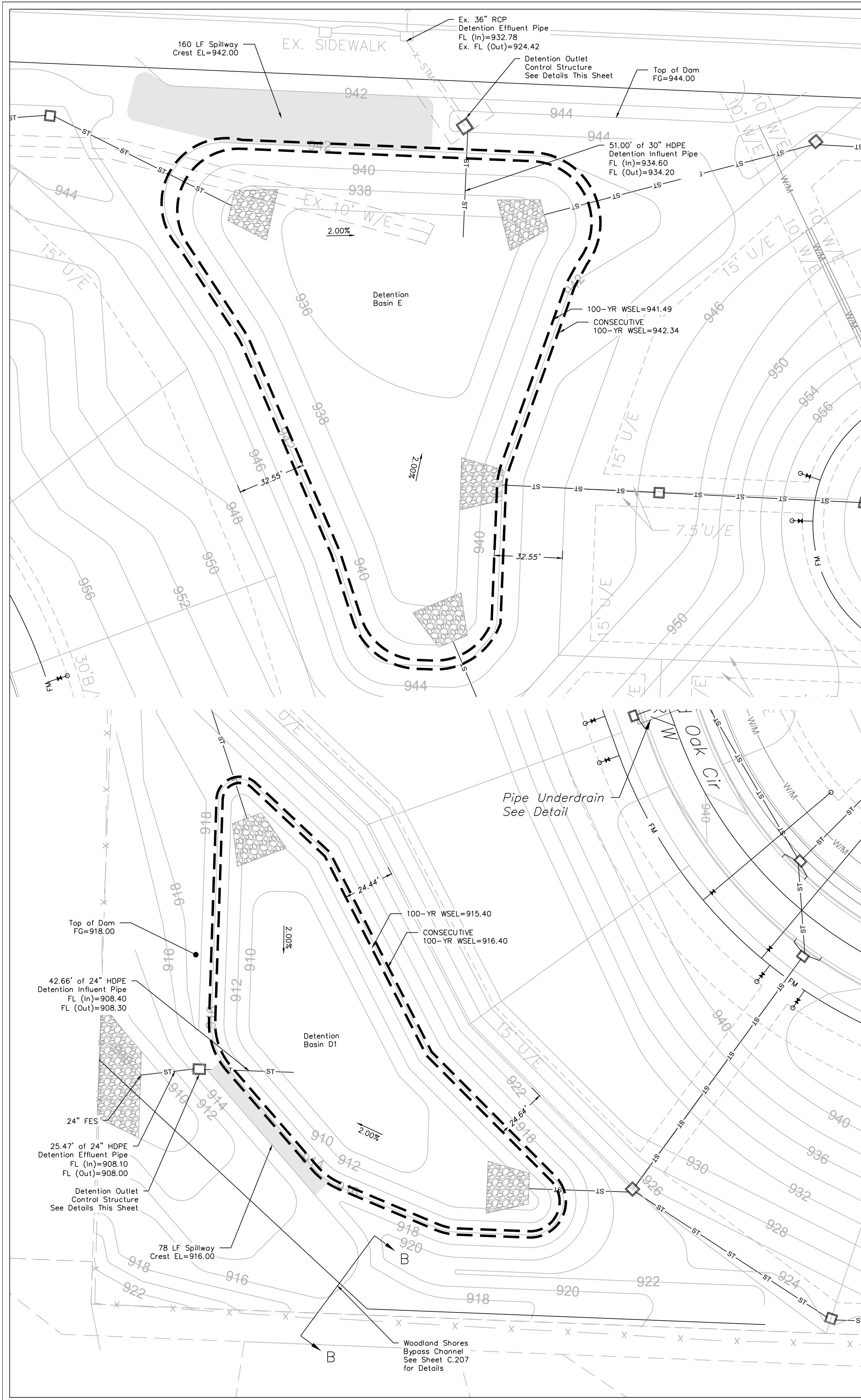


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- REV. 6/29/2021

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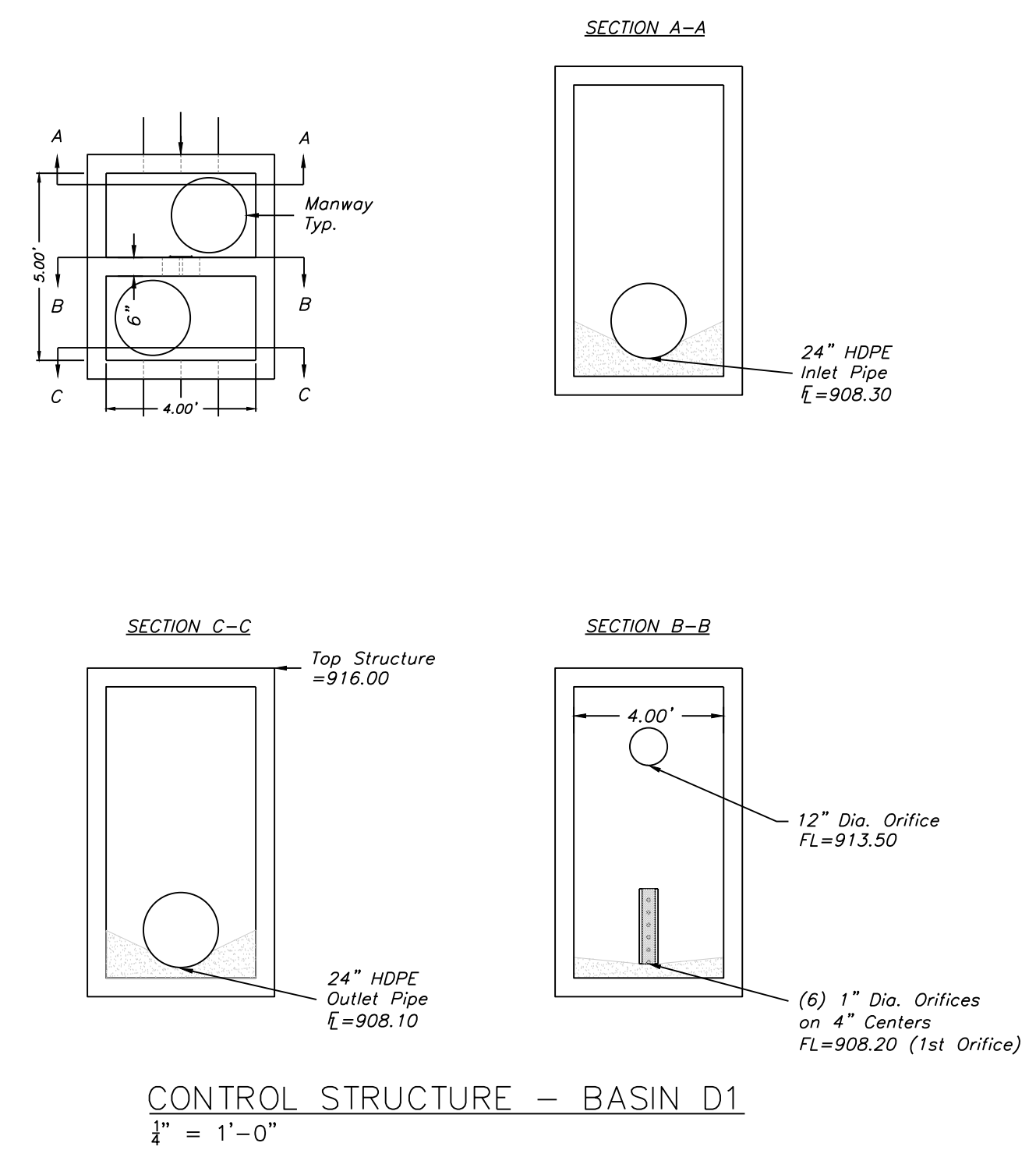
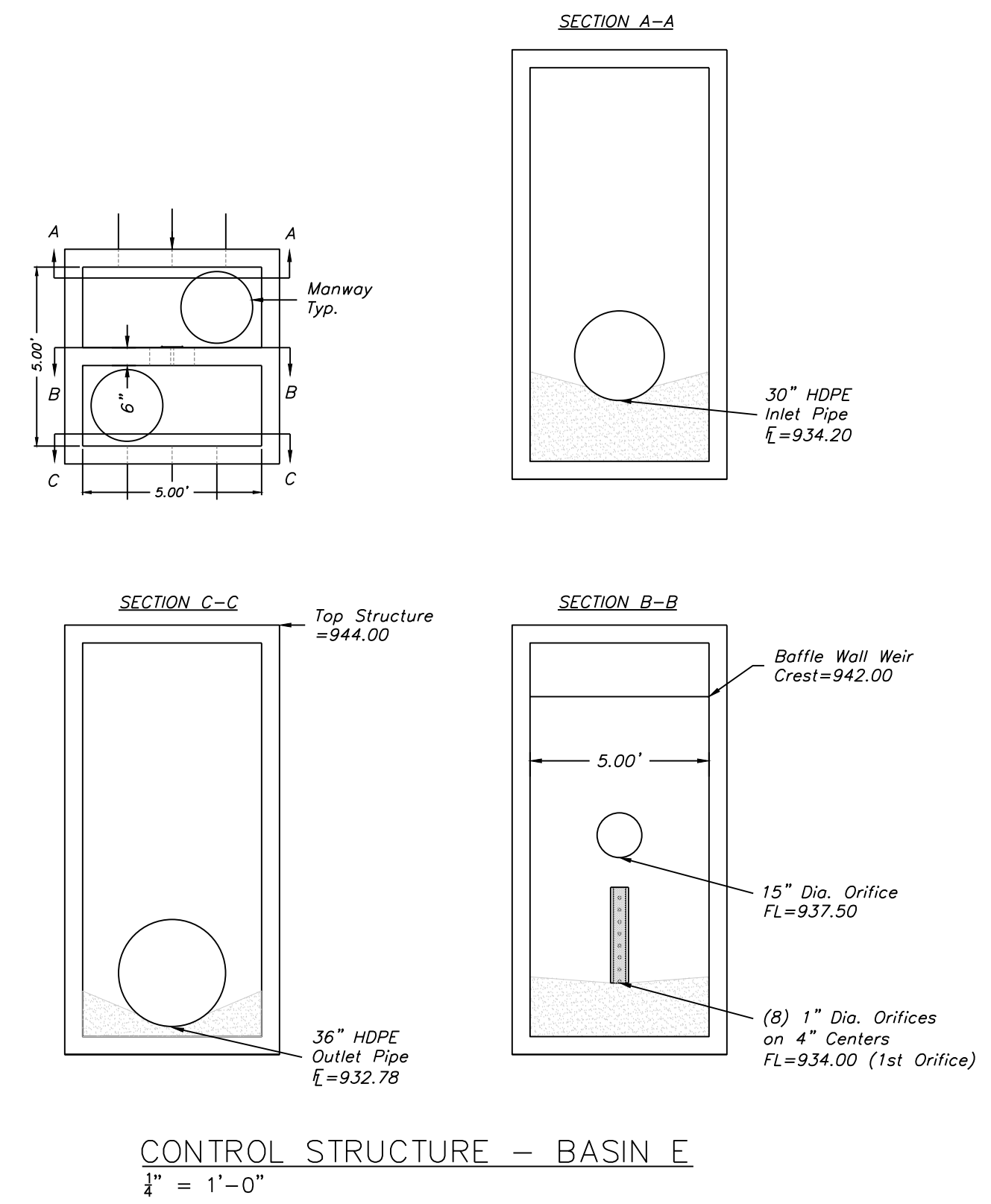
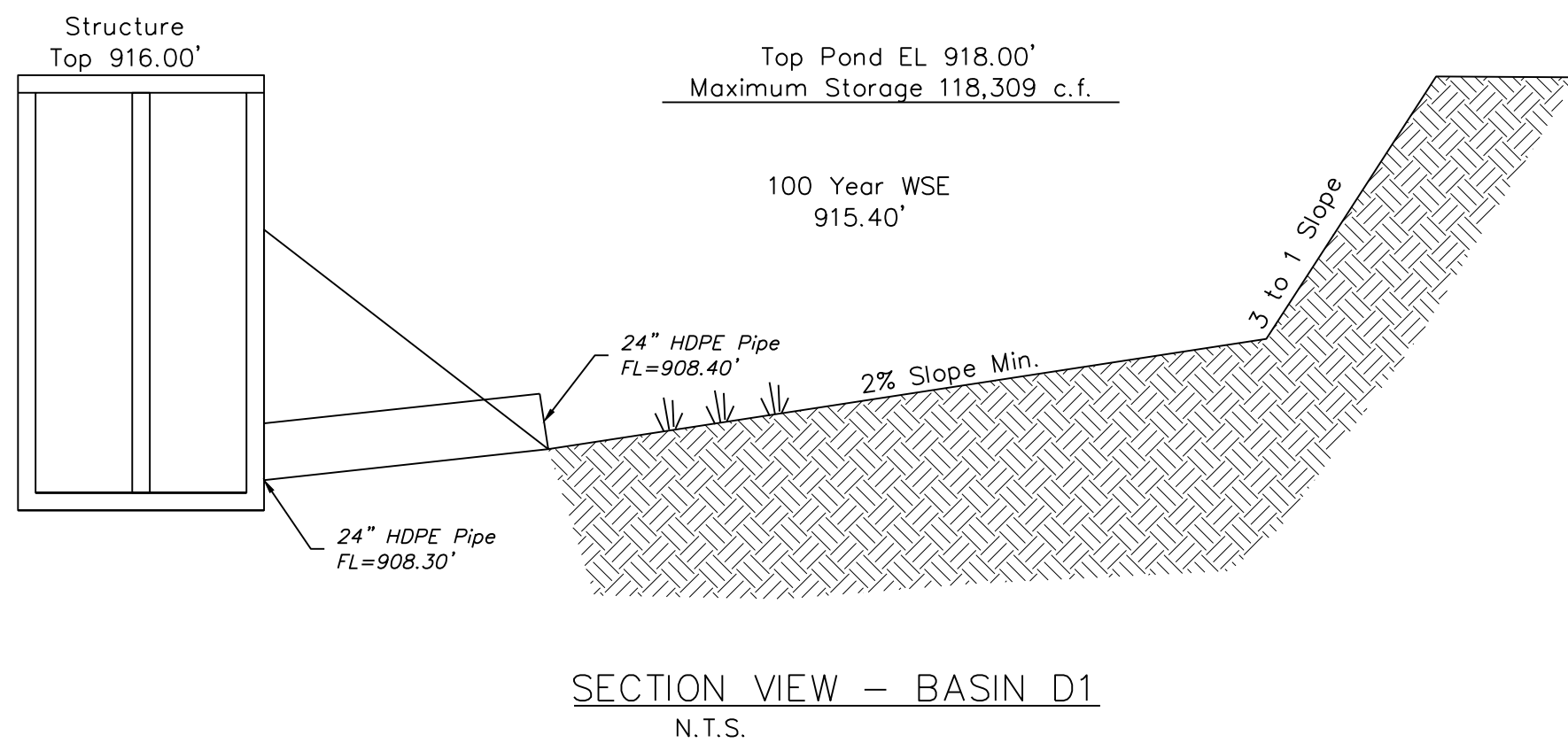
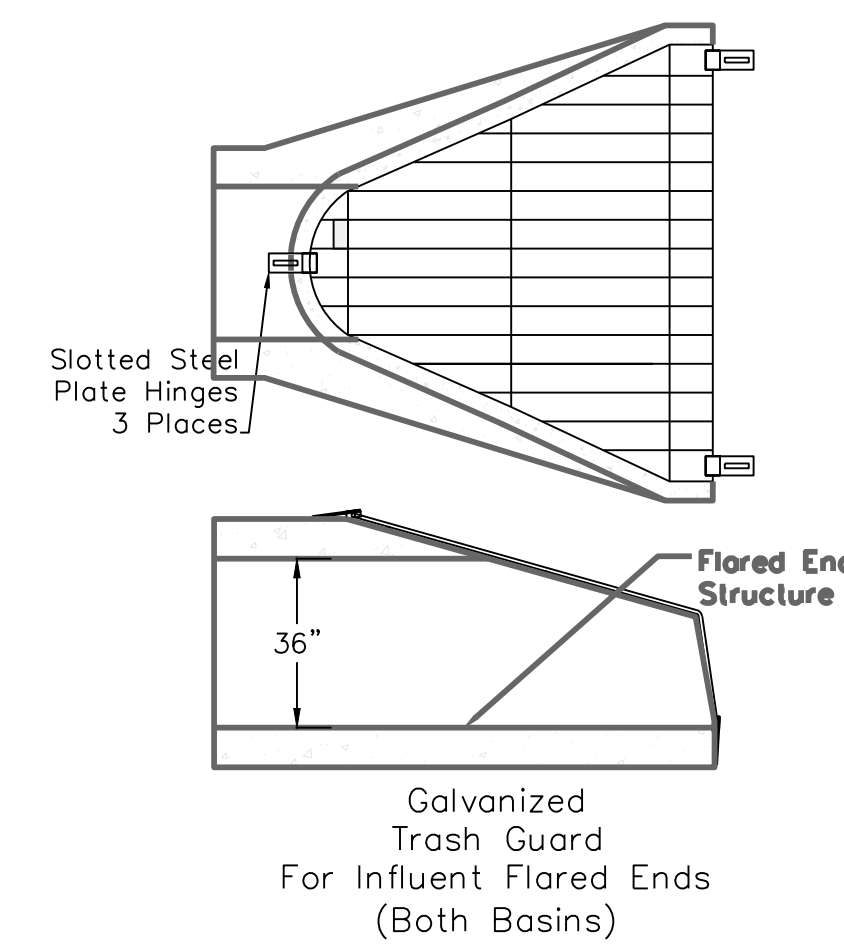
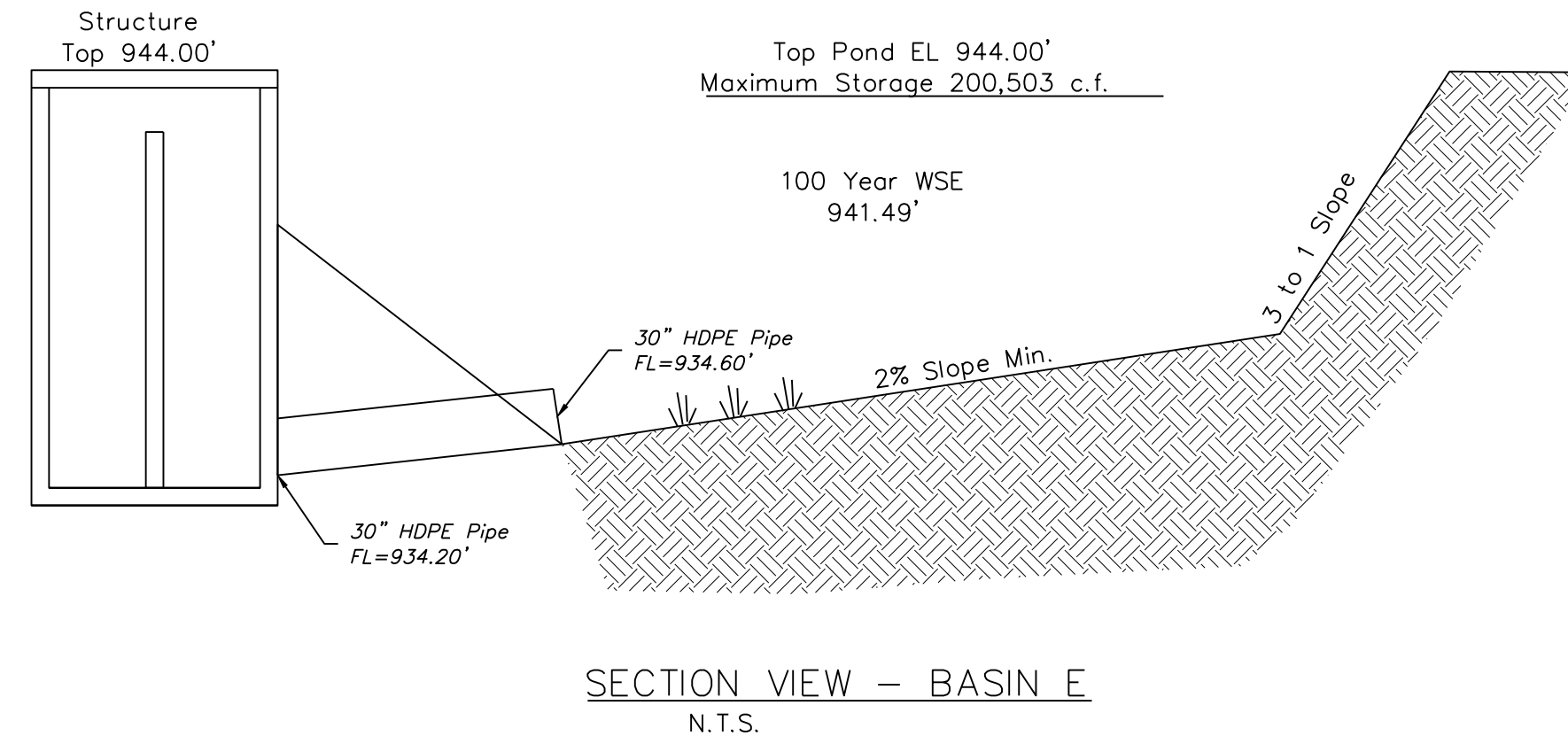


DETENTION BASIN PLAN

SCALE: 1" = 30'

NOTES:

- BOTH BASINS SHALL BE CONSTRUCTED WITH THE EROSION AND SEDIMENT CONTROL MEASURES.
- AN AS-BUILT DETENTION BASIN PLAN SHALL BE SUBMITTED AND ACCEPTED PRIOR TO ISSUANCE OF A CERTIFICATE OF SUBSTANTIAL COMPLETION, WITH AS-BUILT VERSUS PROPOSED STORAGE.

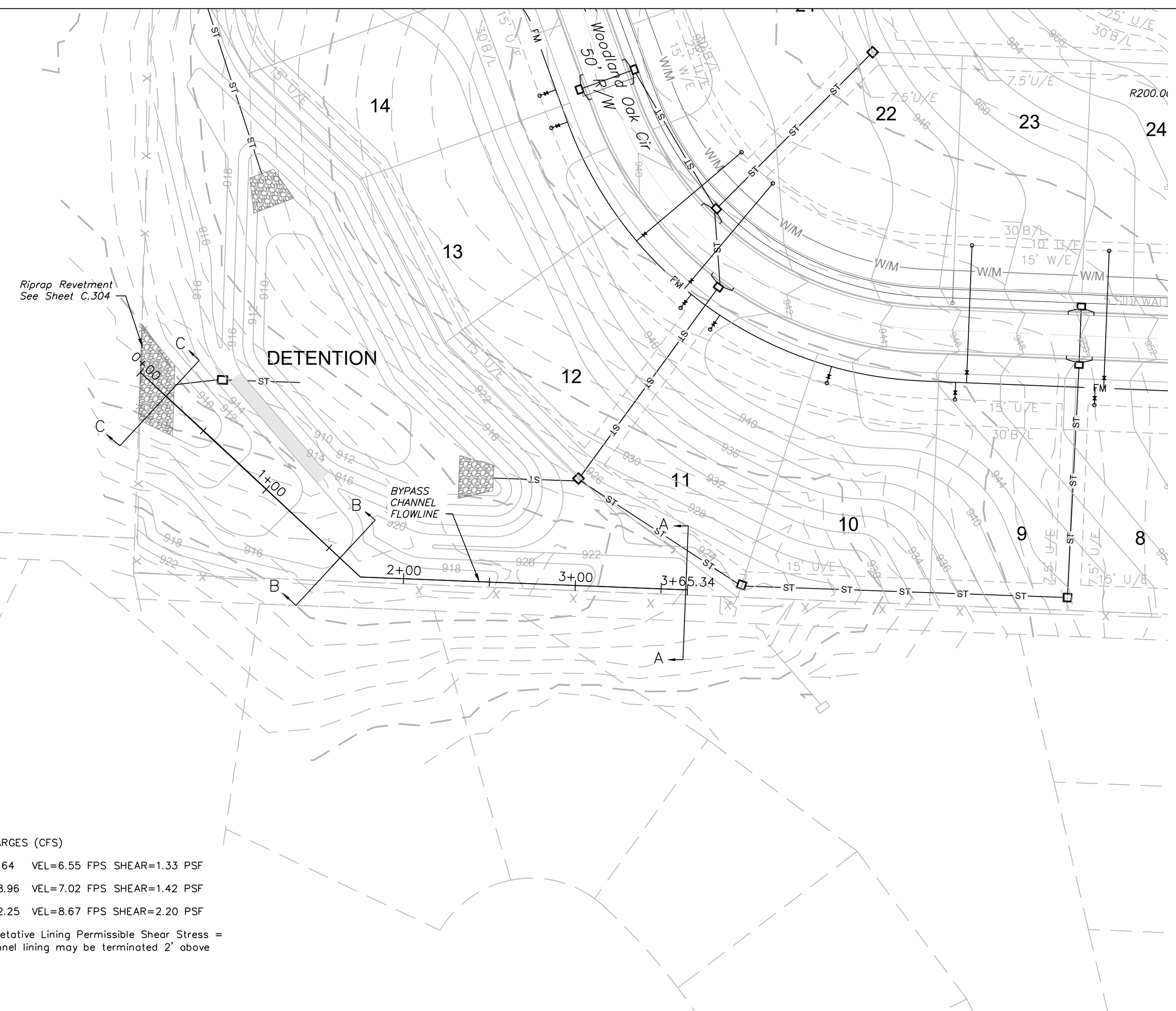


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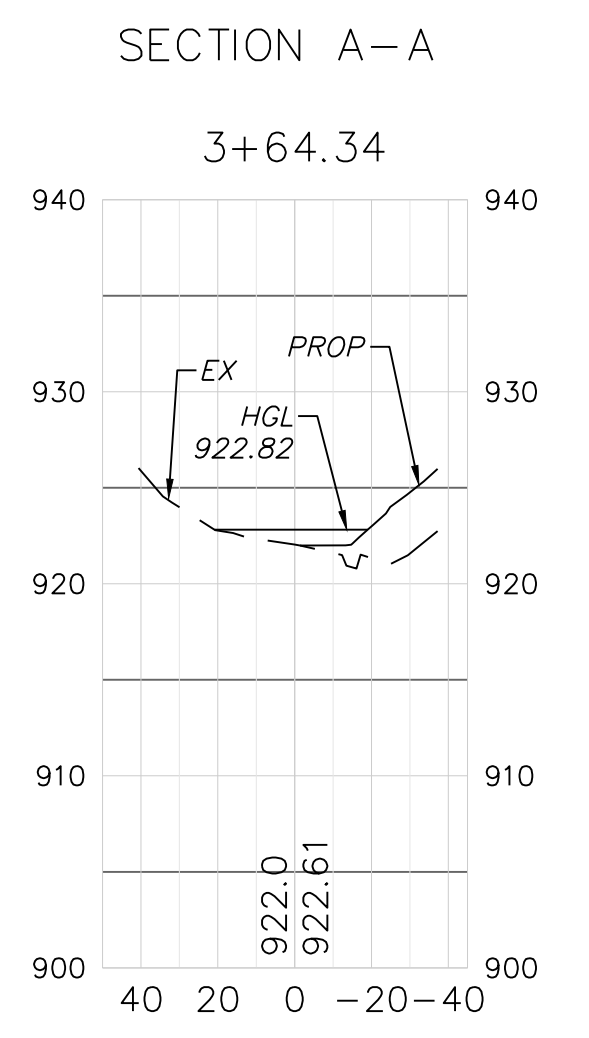
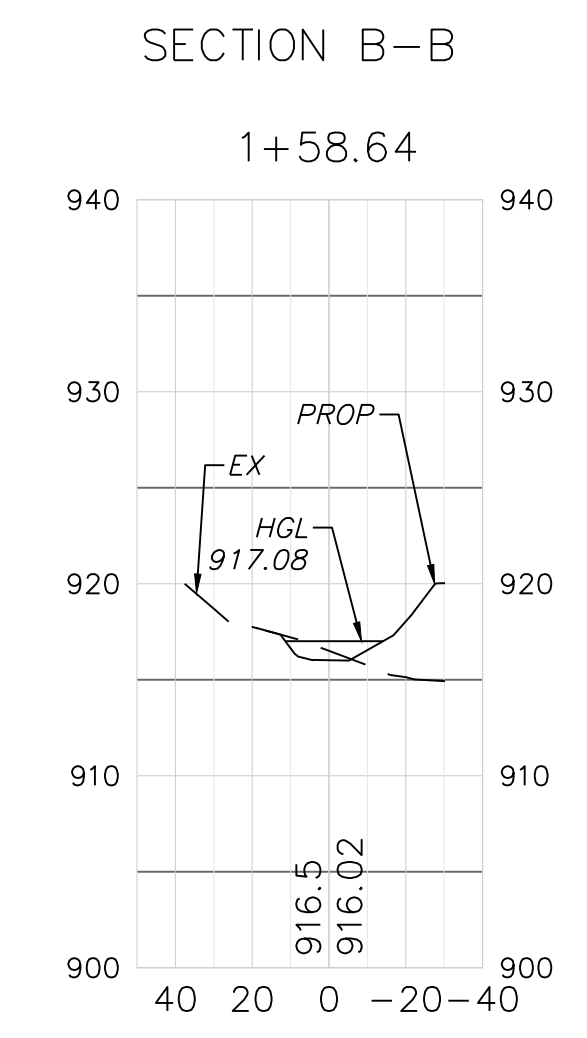
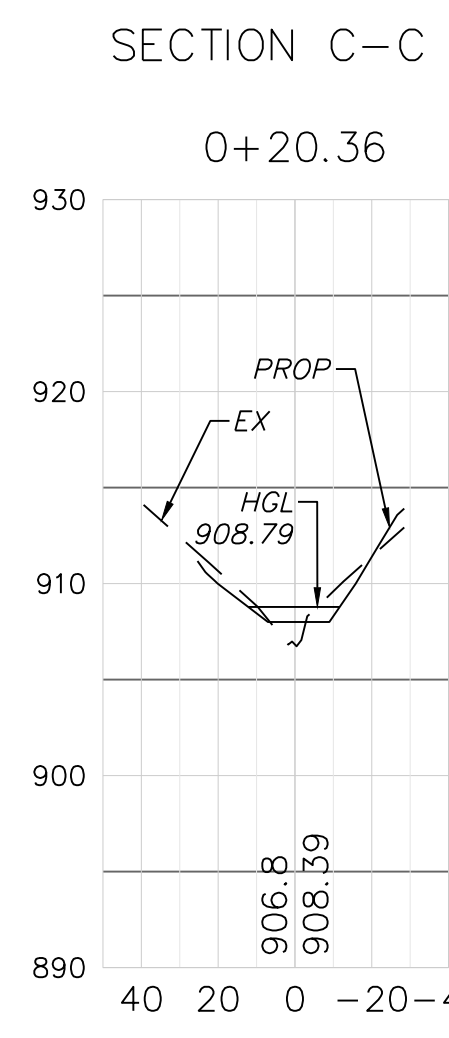
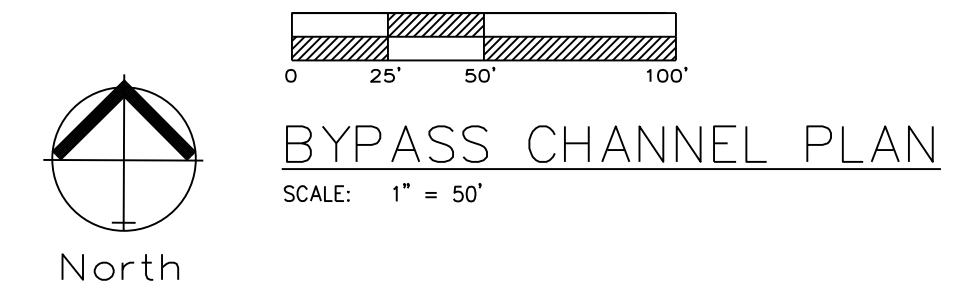
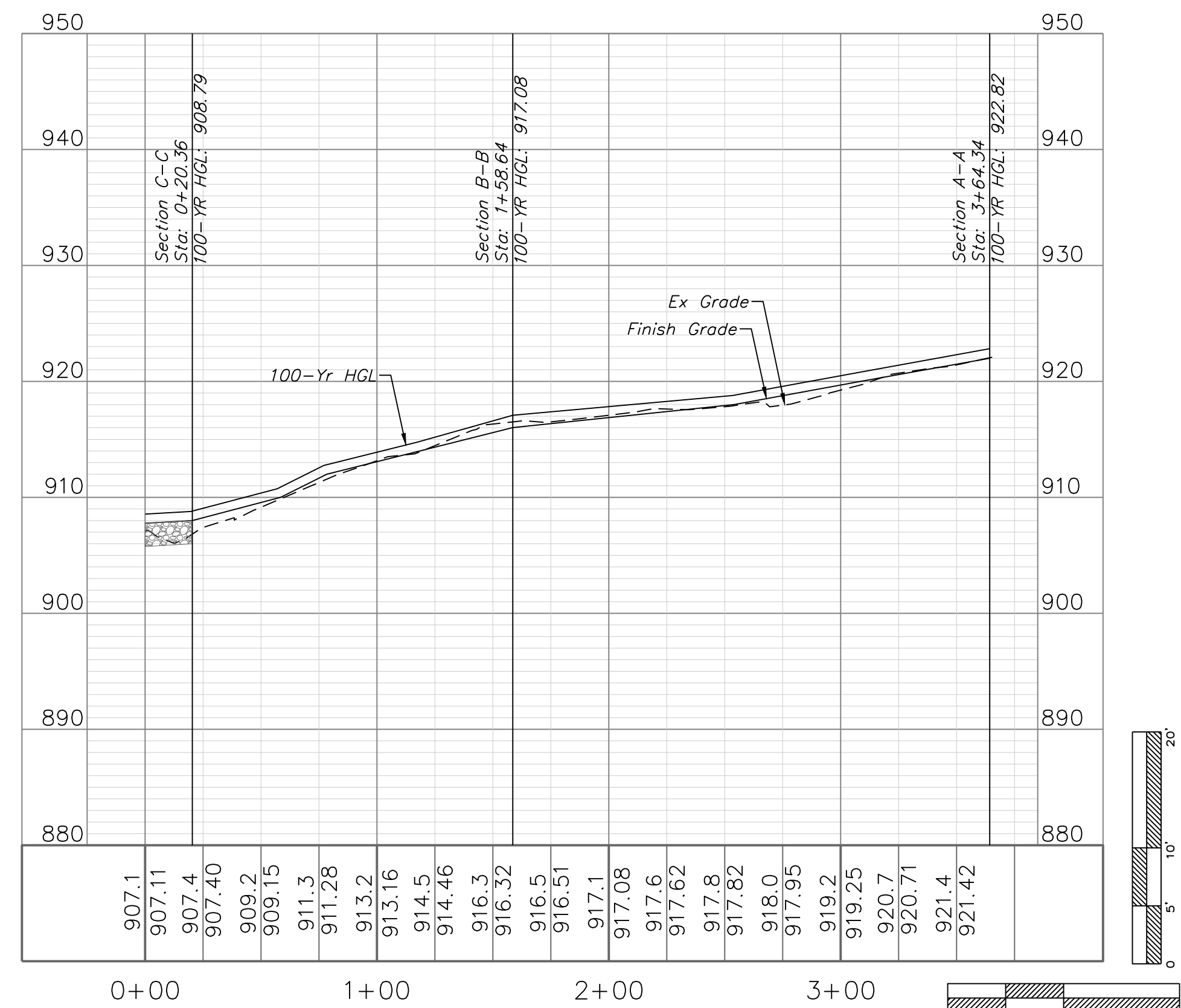


BYPASS CHANNEL 100-YR PEAK DISCHARGES (CFS)

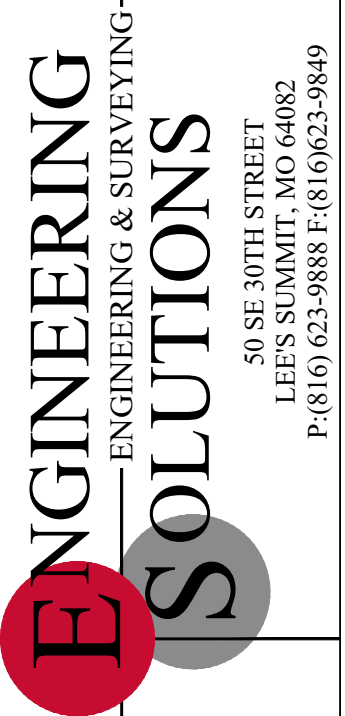
SEC. A-A	EX=121.04	PROP=99.64	VEL=6.55 FPS	SHEAR=1.33 PSF
SEC. B-B	EX=159.00	PROP=128.96	VEL=7.02 FPS	SHEAR=1.42 PSF
SEC. C-C	EX=165.35	PROP=132.25	VEL=8.67 FPS	SHEAR=2.20 PSF

Channel shall be lined with Class A Vegetative Lining Permissible Shear Stress = 3.70 psf per APWA Table 5607-2. Channel lining may be terminated 2' above channel flowline.

BYPASS CHANNEL FLOWLINE



HGL = 100 YEAR
SEE MACRO DRAINAGE STUDY FOR COMPLETE
HYDRAULIC DATA FOR EACH CROSS SECTION.



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Bypass Channel Plan
Construction Plans for:
WOODLAND OAKS
Lots 1 thru 42
Lee's Summit, Jackson County, Missouri



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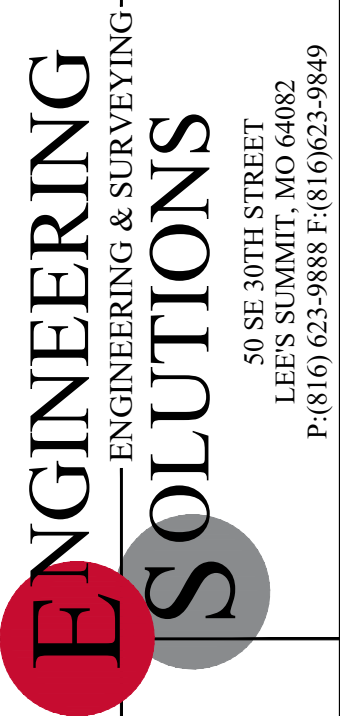
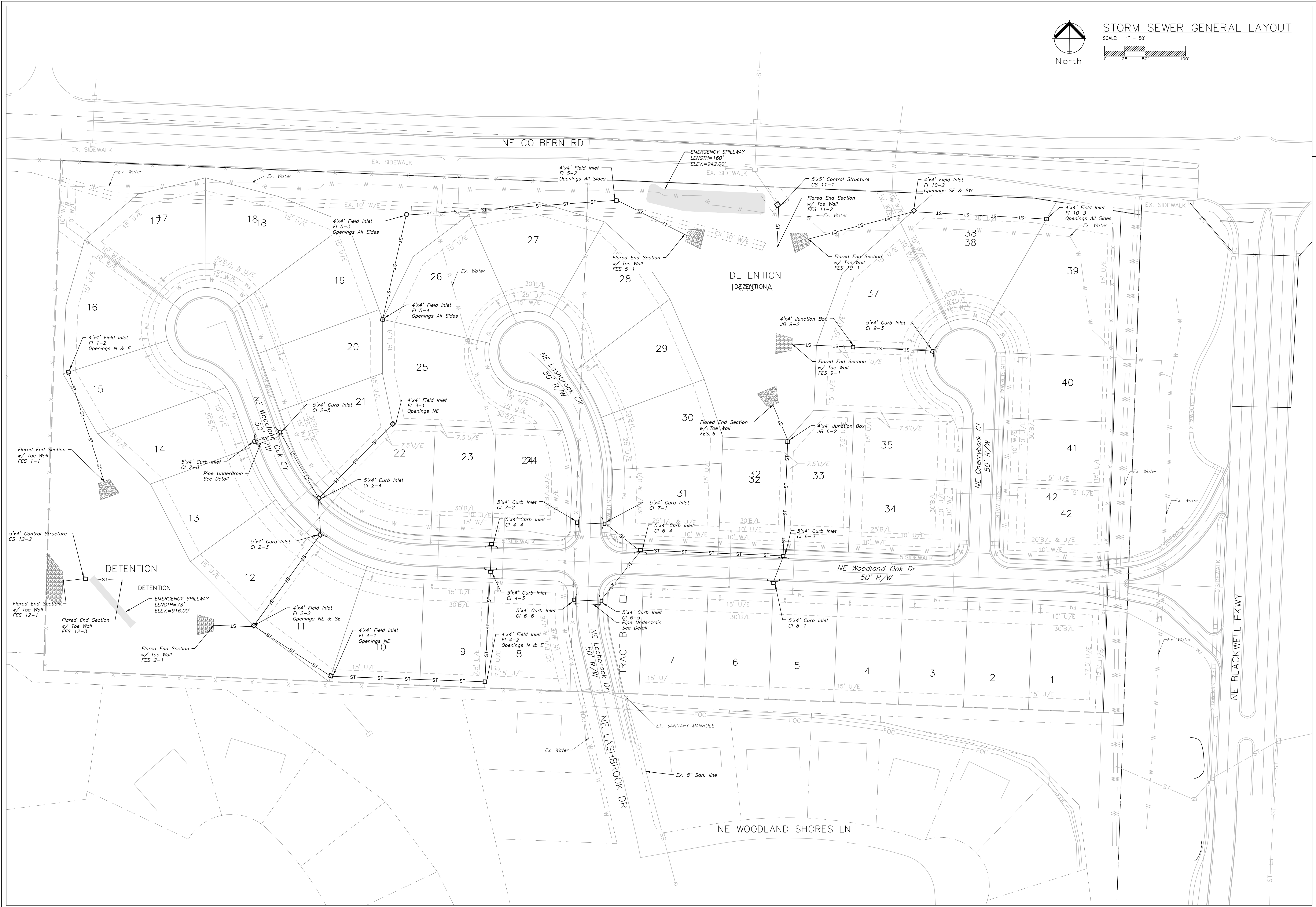
- REV. 5/5/2021
- REV. 5/26/2021
- REV. 6/22/2021
- REV. 6/29/2021

Updated 6/16/2023



STORM SEWER GENERAL LAYOUT

SCALE: 1" = 50'
0 25' 50' 100'



Professional Registration
Missouri
Engineering 2005002186-D
Surveying 2005008319-D
Kansas
Engineering E-1685
Surveying LS-218
Oklahoma
Engineering S254
Nebraska
Engineering CA2821

Project: WOODLAND OAKS
LSMO
Issue Date: February 25, 2021

Part of the Southeast 1
Section 27, Township 48 North, Range 31 West
Lee's Summit, Jackson County, Missouri

Storm Sewer General Layout
Construction Plans for:
WOODLAND OAKS
Lots 1 thru 42
Lee's Summit, Jackson County, Missouri

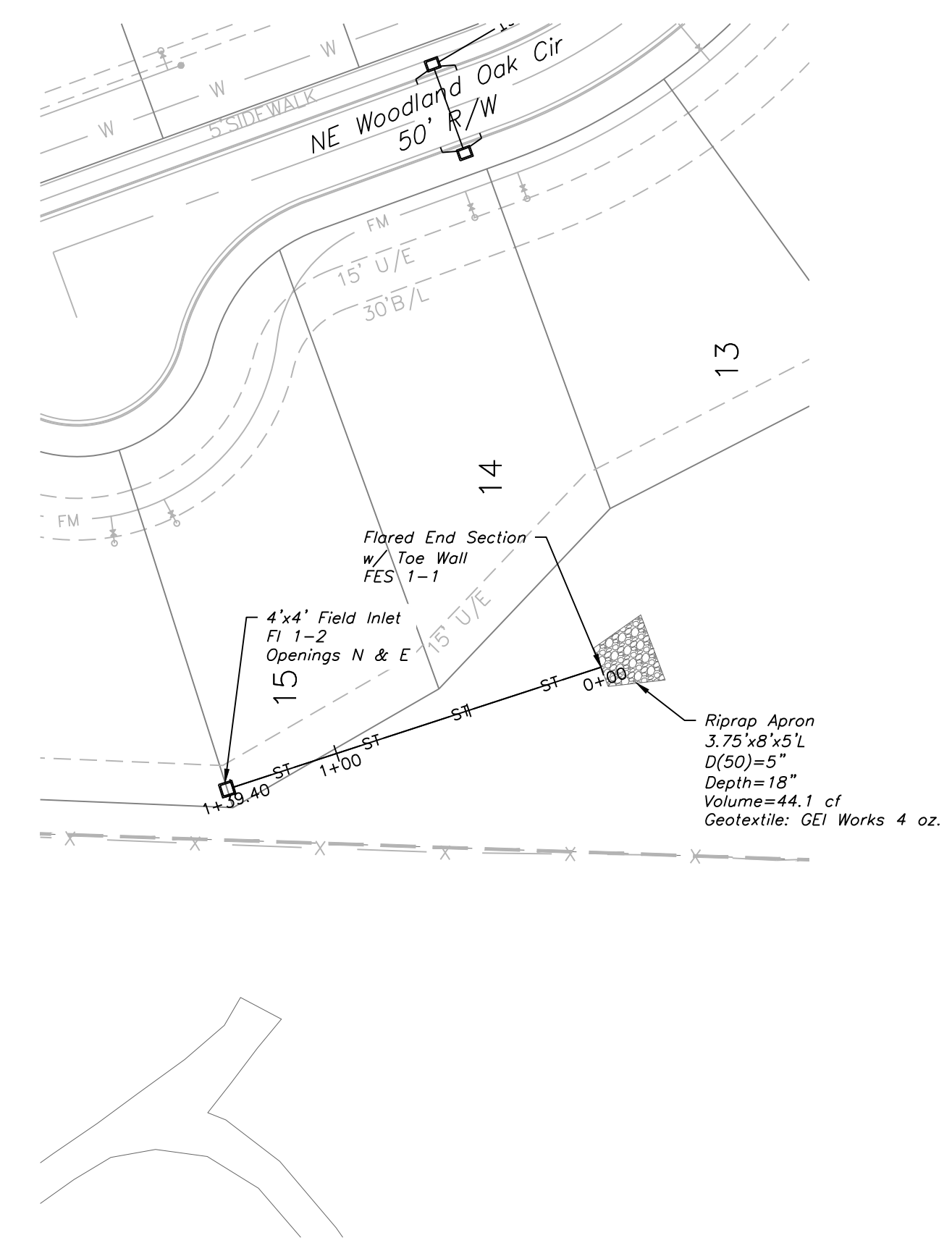
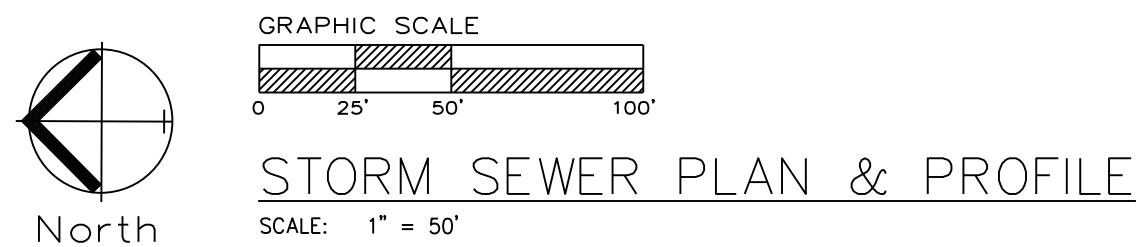


Matthew J. Schlicht
MO PE 2006019708
KS PE 19071
OK PE 25226
NE PE E-14335

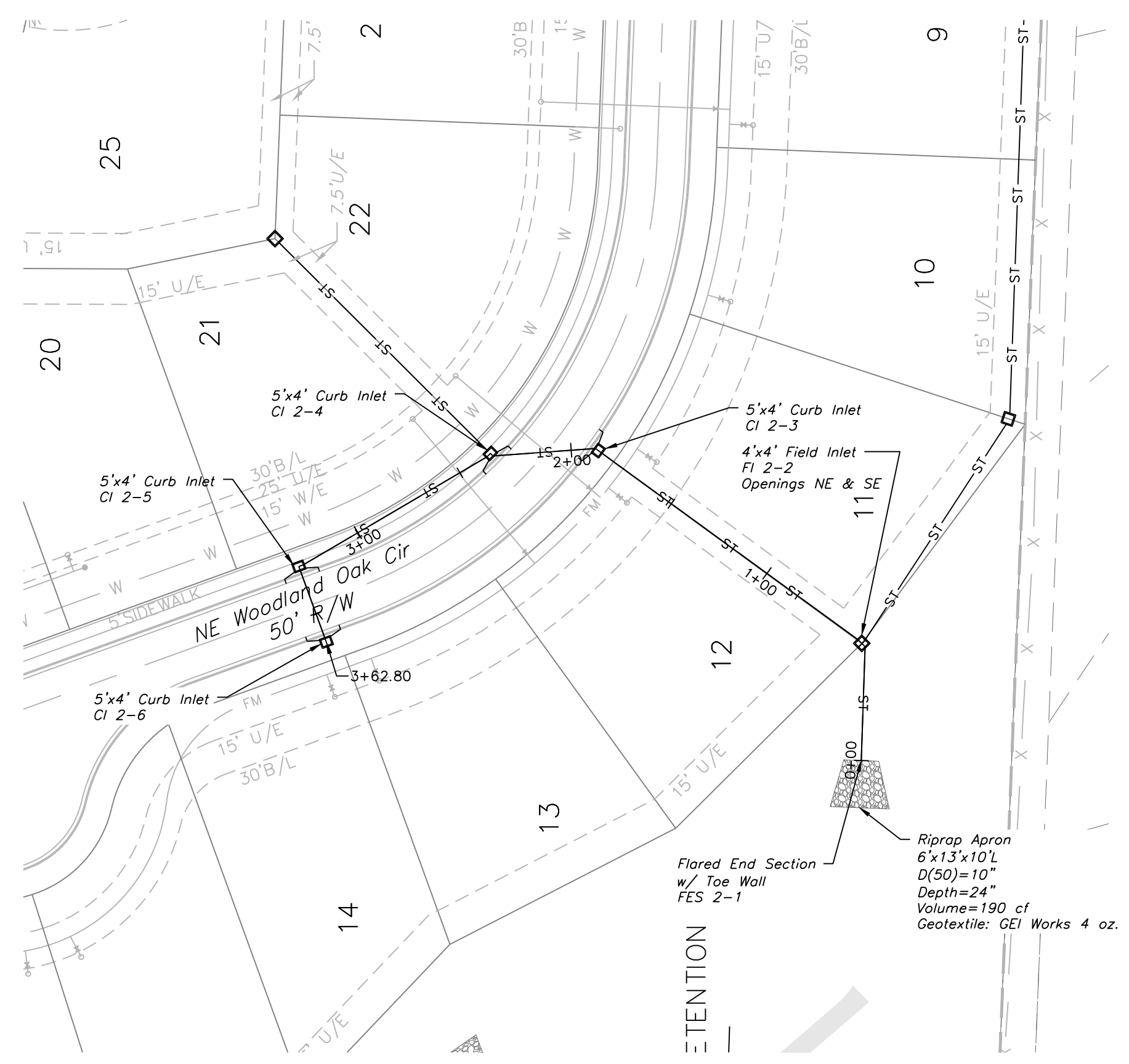
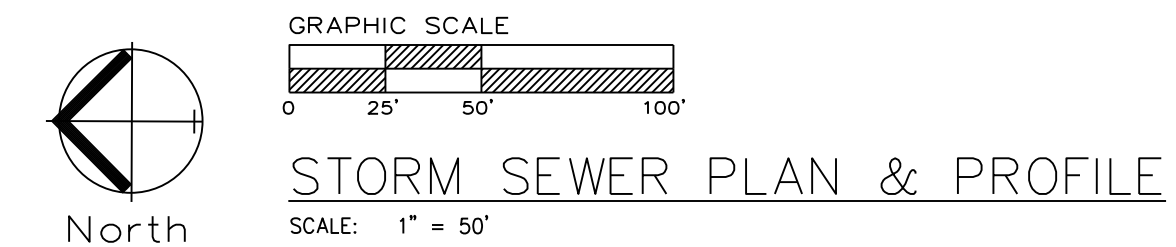
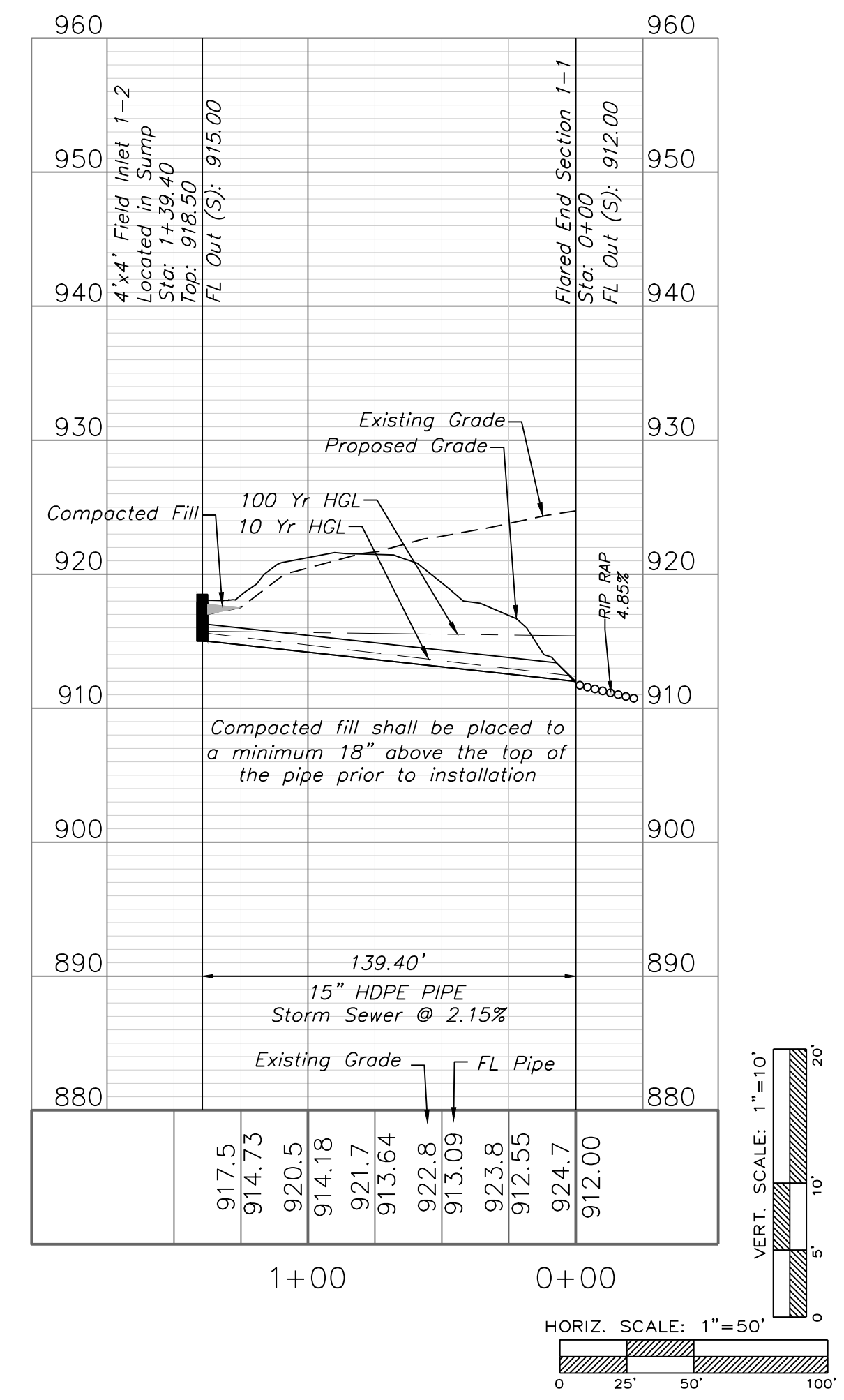
REVISIONS

REV. 5/5/2021
REV. 5/26/2021
REV. 6/22/2021
REV. 6/29/2021

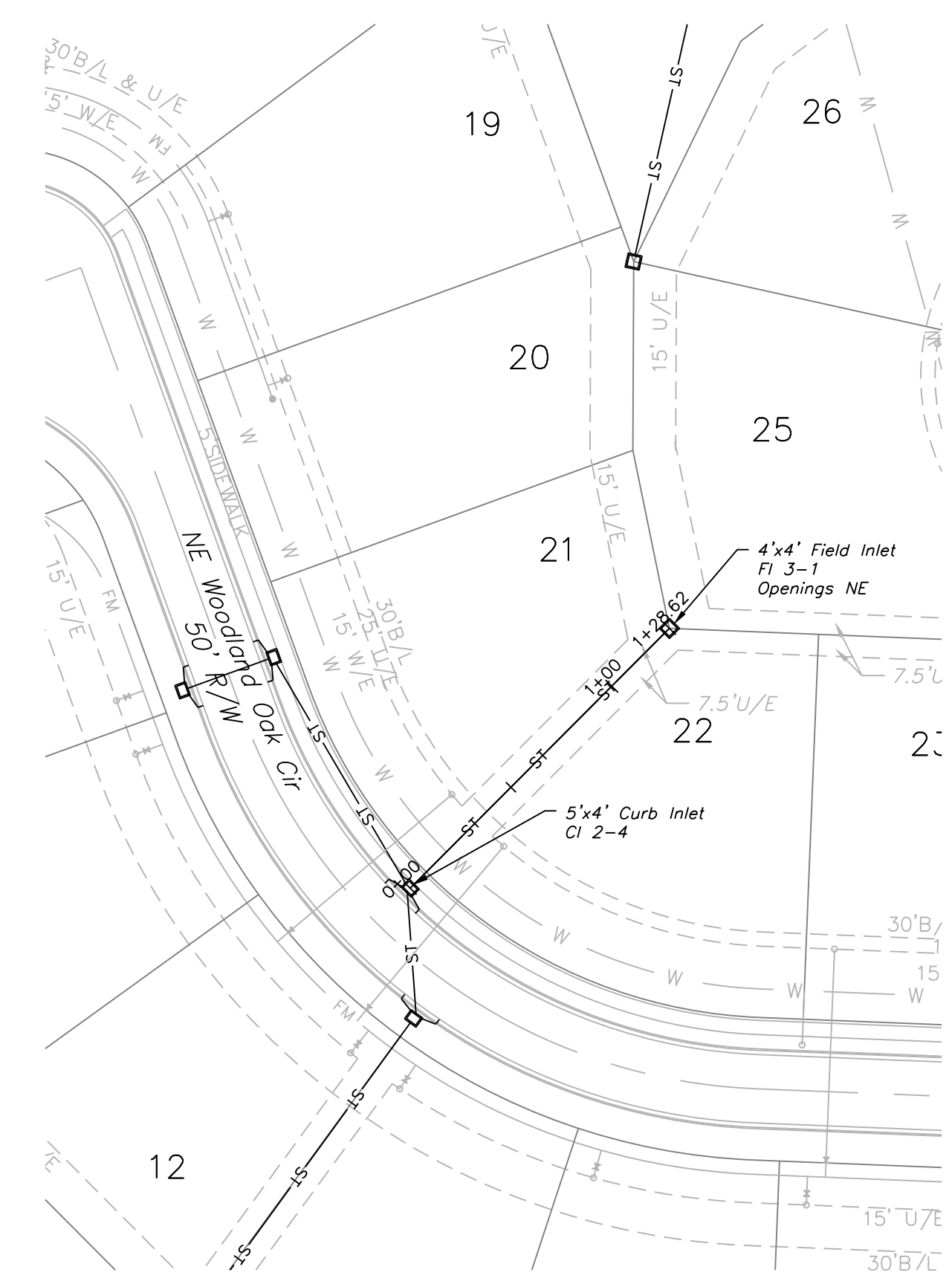
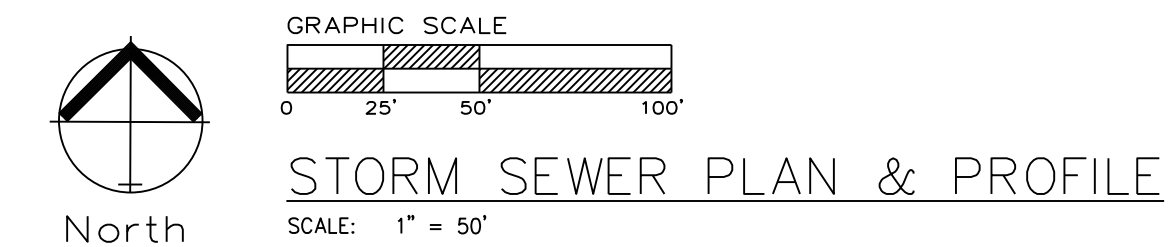
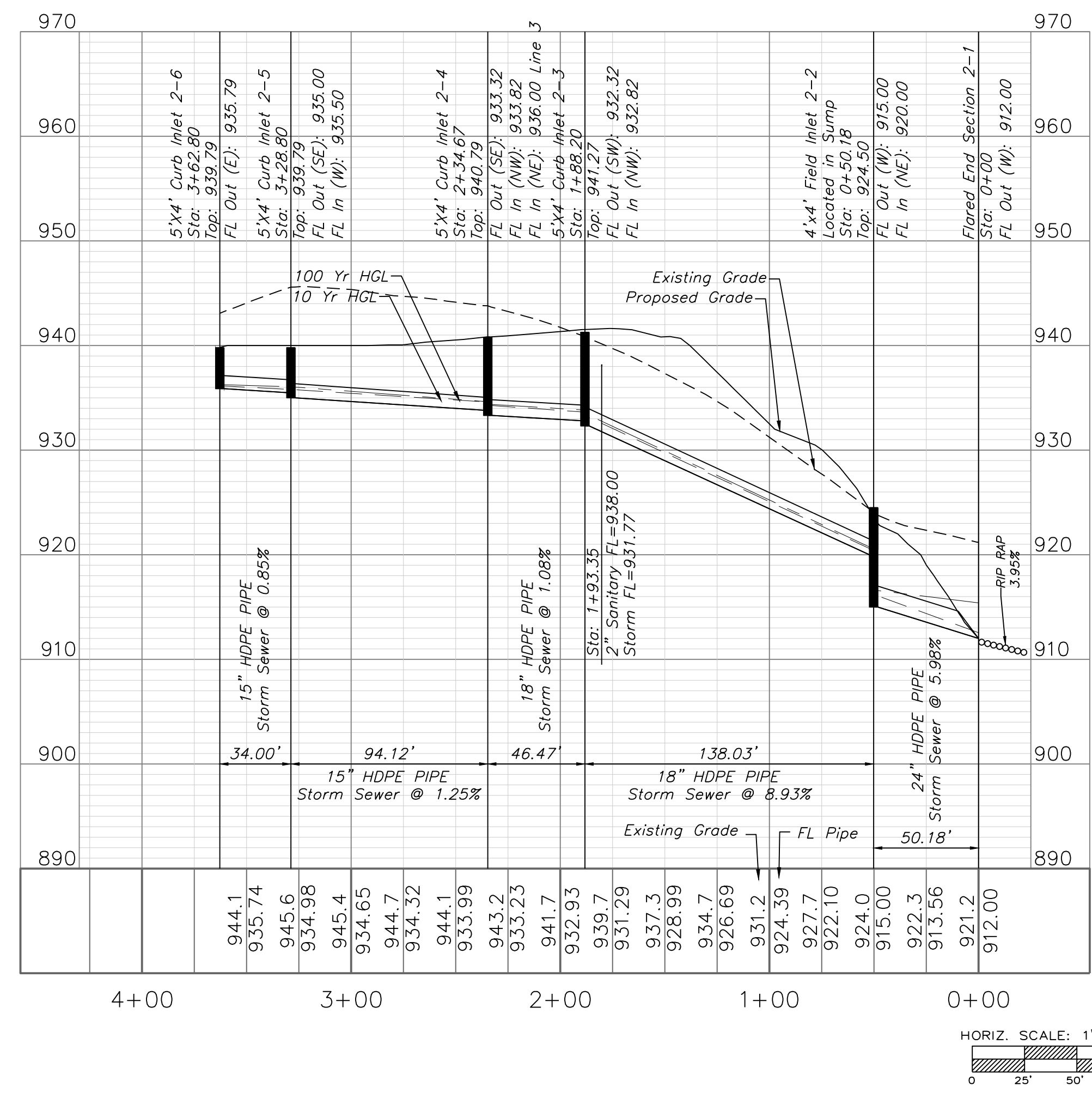
Updated 6/16/2023



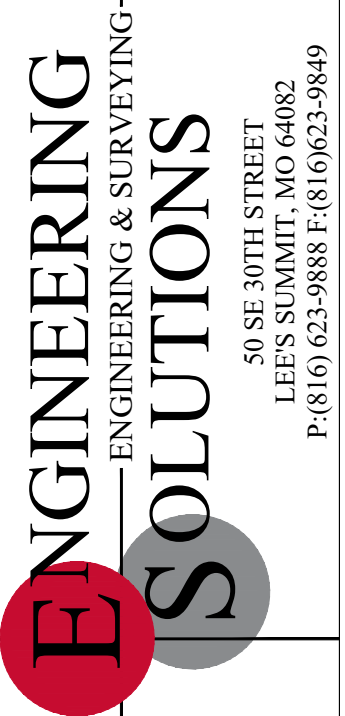
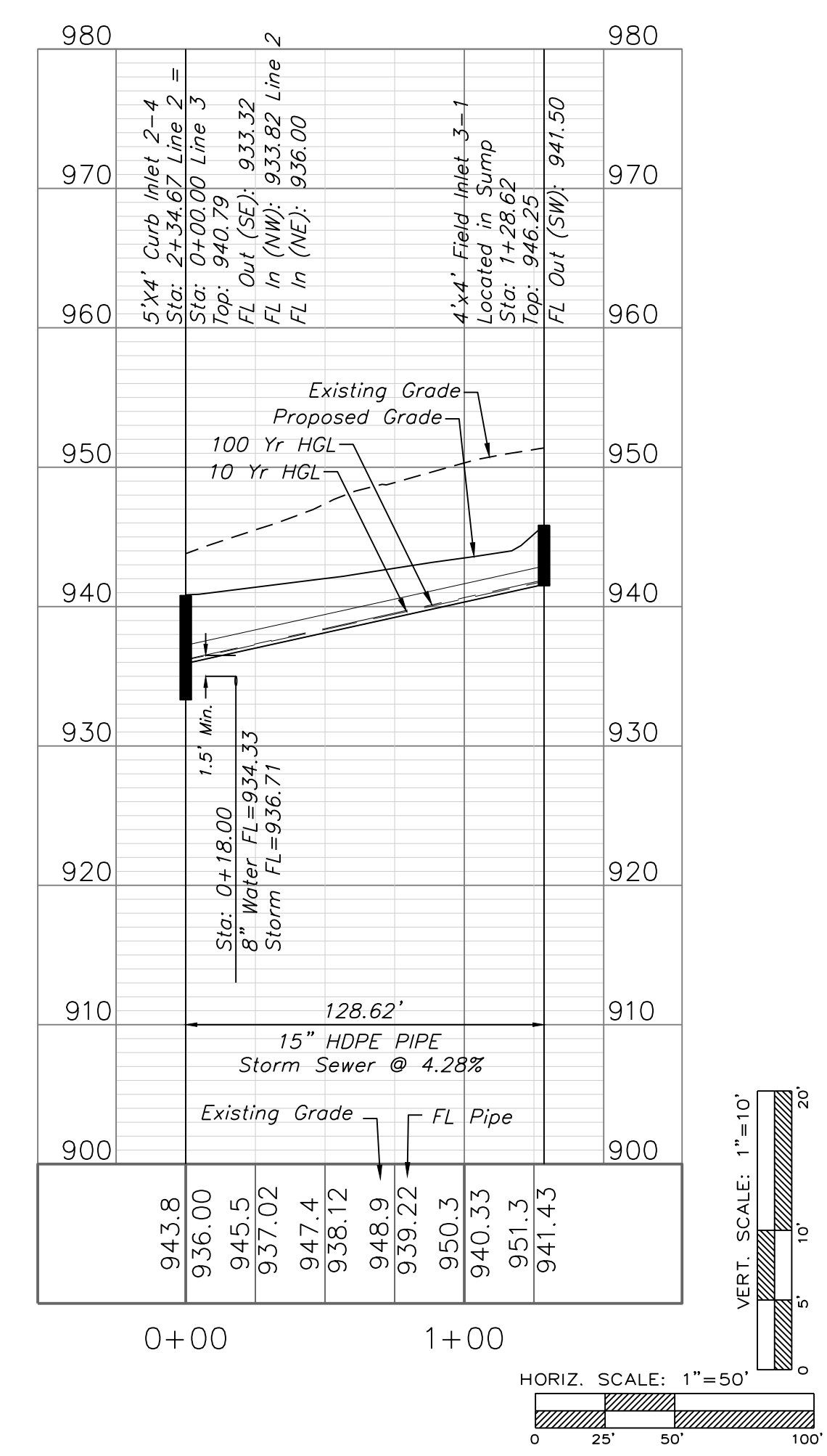
STORM LINE 1



STORM LINE 2



STORM LINE 3



Professional Registration
Missouri
Engineering 2005002186-D
Surveying 200500319-D
Kansas
Engineering E-1685
Surveying LS-218
Oklahoma
Engineering 6254
Nebraska
Engineering CA2821

Project:
WOODLAND OAKS
LSMO
Issue Date:
February 25, 2021

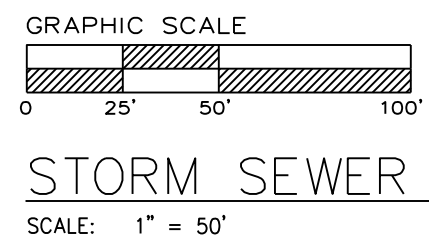
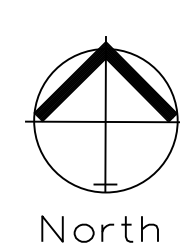
Part of the Southeast 1
Section 27, Township 48 North, Range 31 West
Lee's Summit, Jackson County, Missouri

Storm Sewer Plan & Profile
Construction Plans for:
WOODLAND OAKS
Lots 1 thru 42
Lee's Summit, Jackson County, Missouri



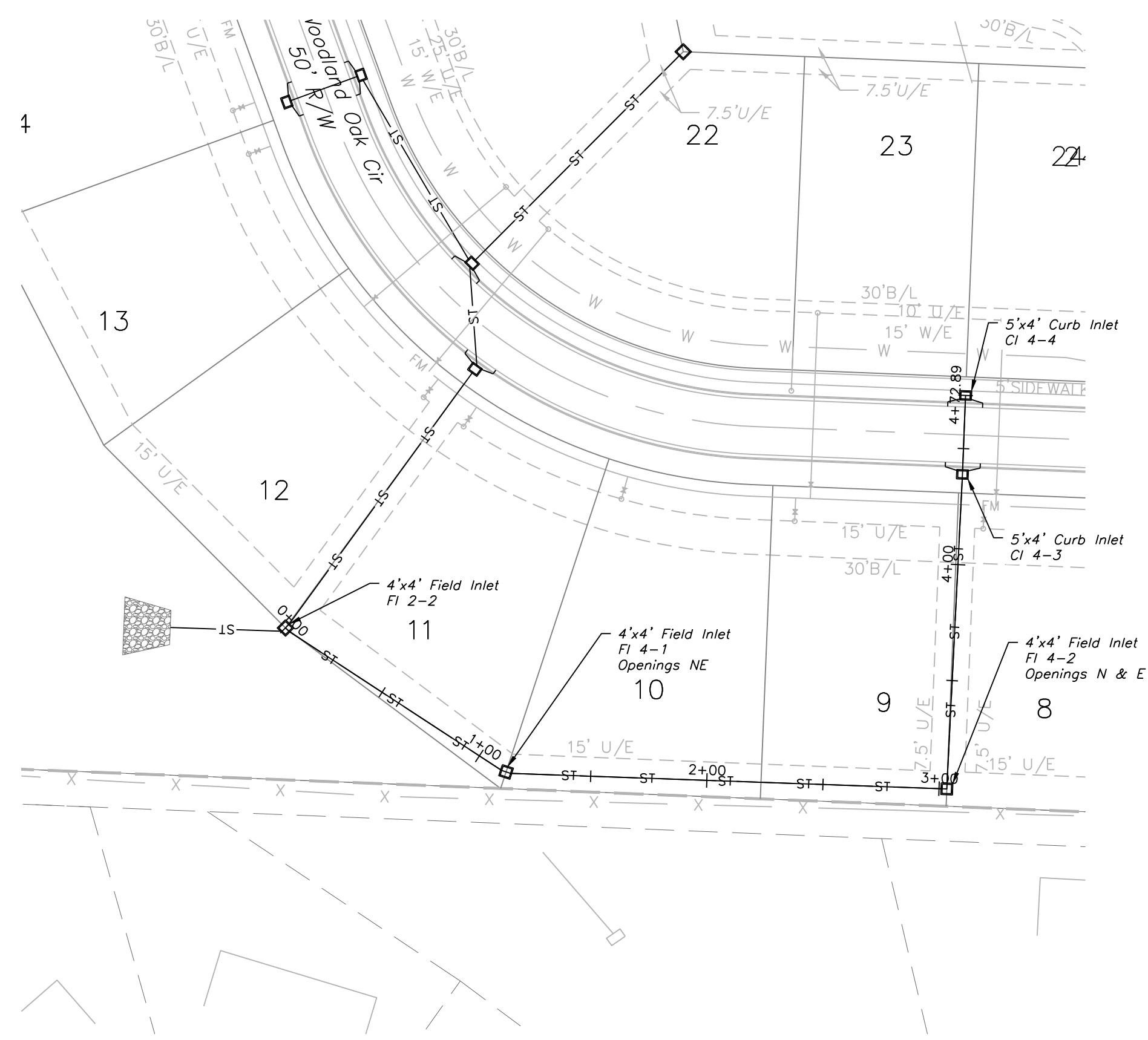
Matthew J. Schlicht
MO PE 2006019708
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OK PE 25226
NE PE E-14335

REVISIONS
REV. 5/5/2021
REV. 5/26/2021
REV. 6/22/2021
REV. 6/29/2021
Updated 6/16/2023

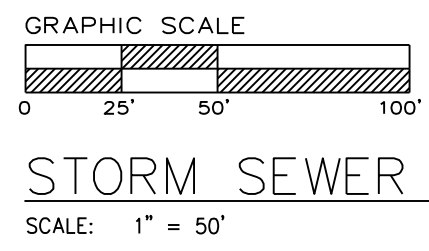
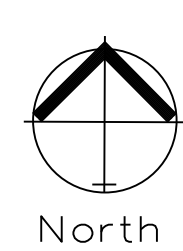


STORM SEWER PLAN & PROFILE

SCALE: 1" = 50'

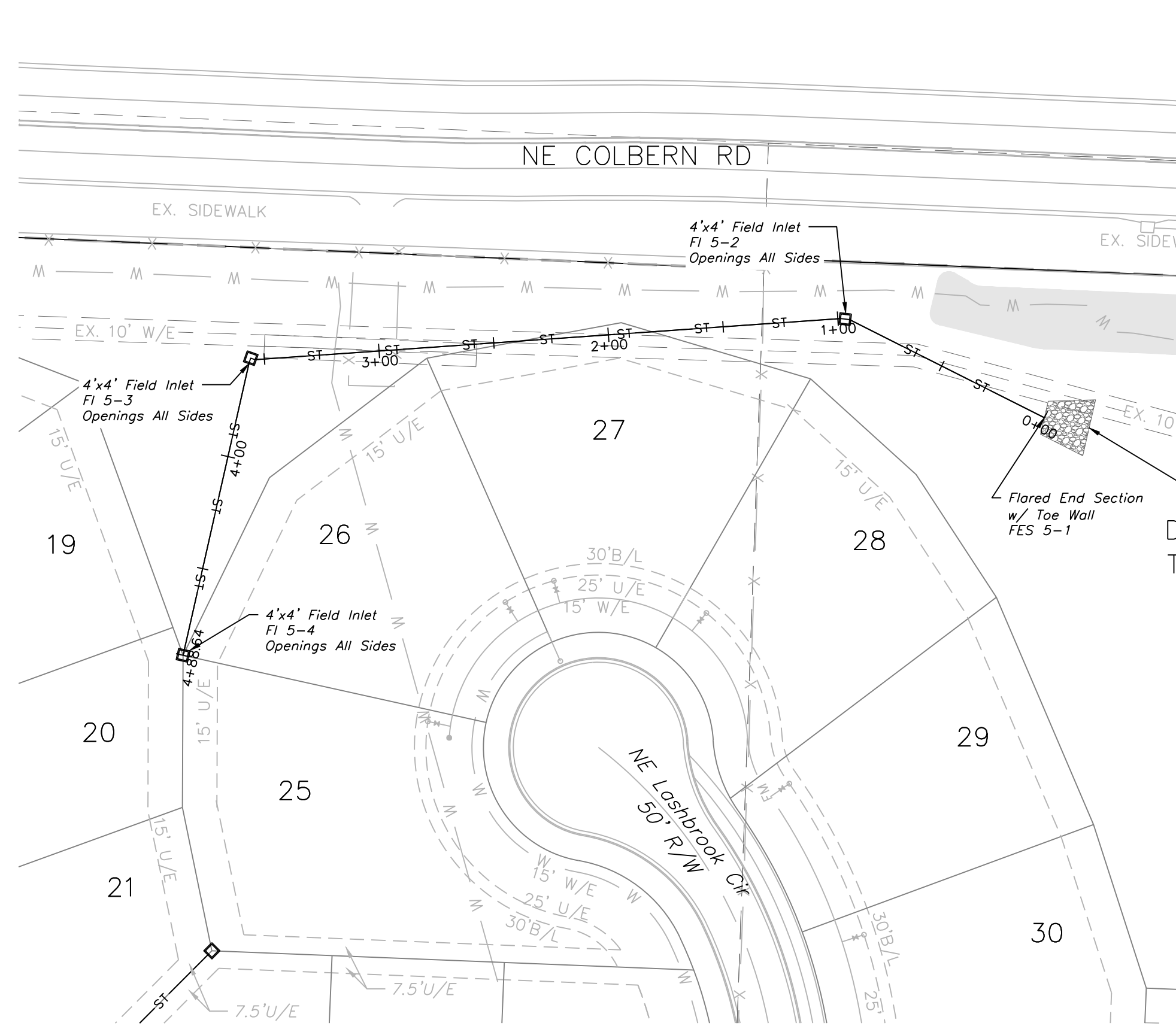


STORM LINE 4

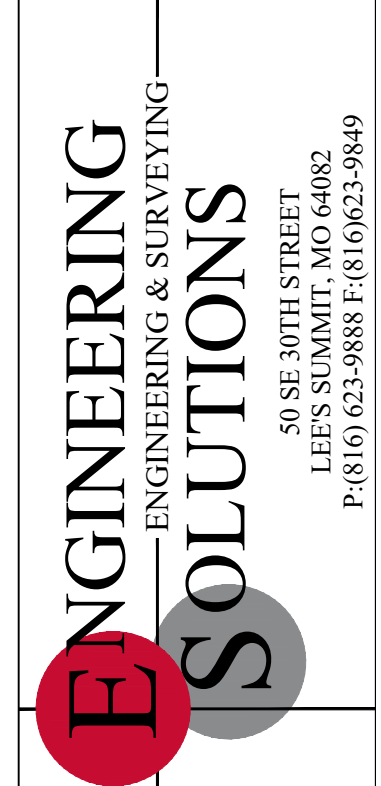
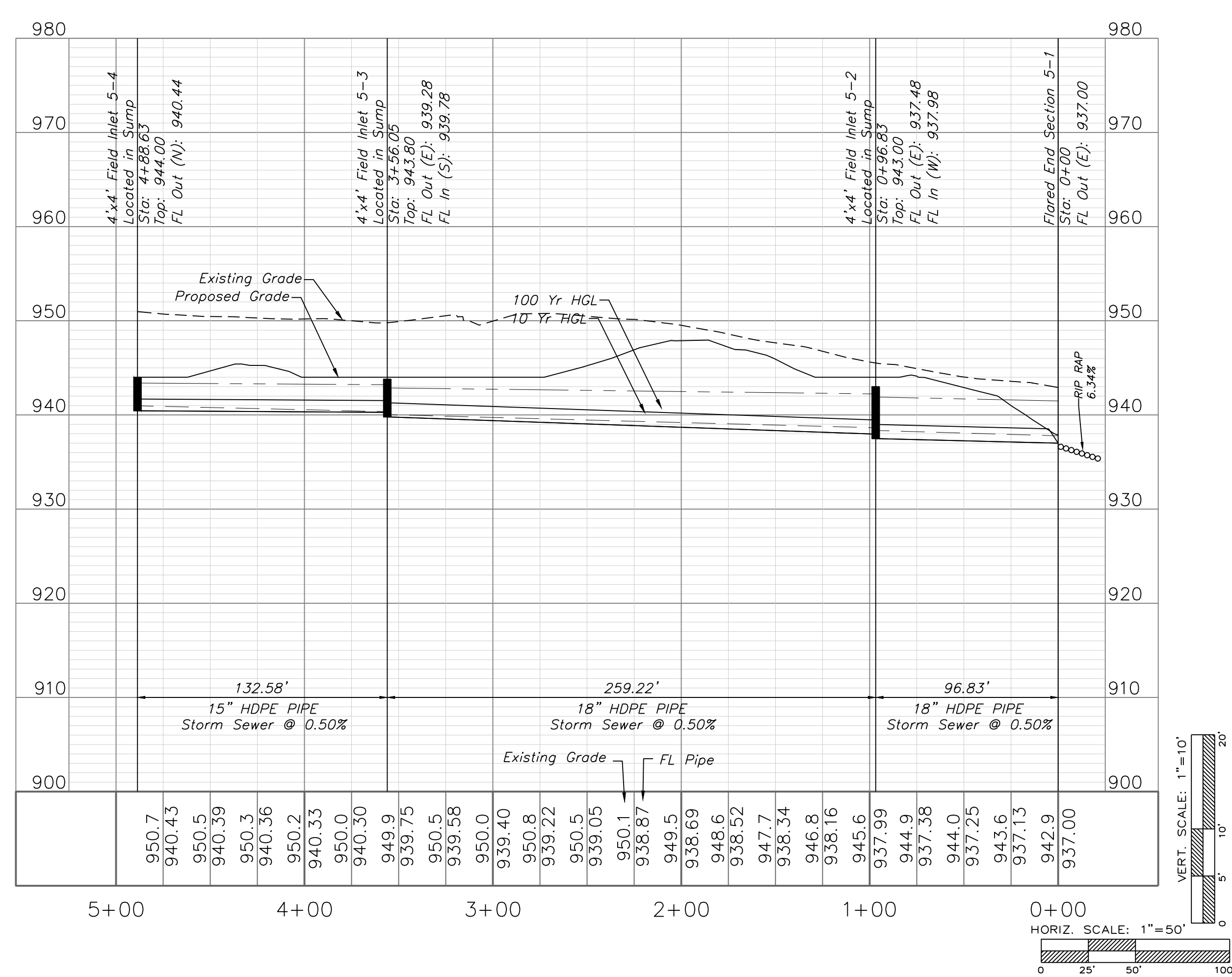
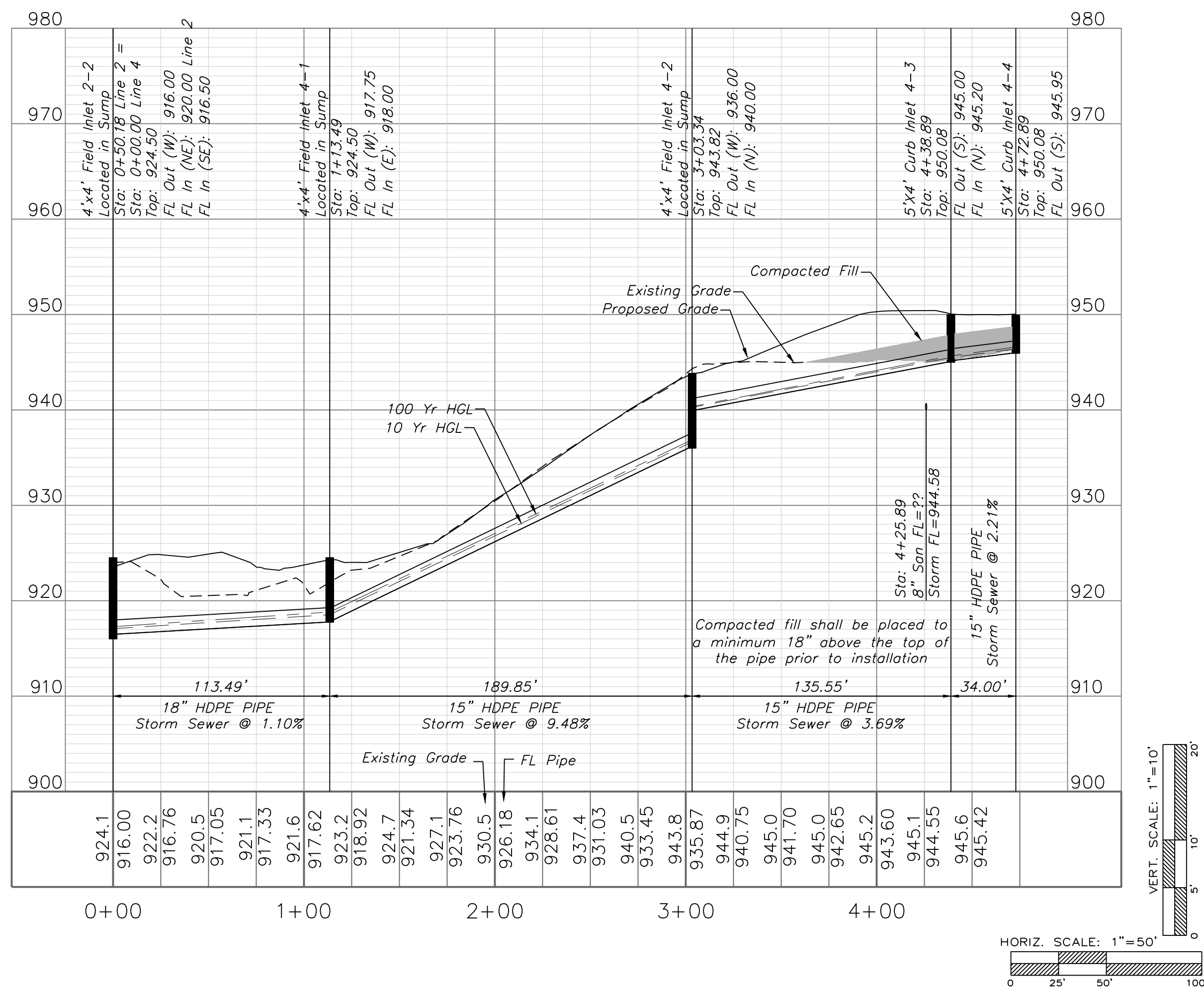


STORM SEWER PLAN & PROFILE

SCALE: 1" = 50'



STORM LINE 5

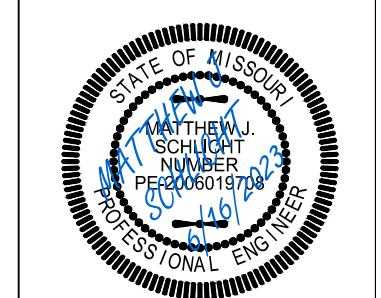


Professional Registration
 Missouri
 Engineering 2005002186-D
 Surveying 2005008319-D
 Kansas
 Engineering E-1685
 Surveying LS-218
 Oklahoma
 Engineering 6254
 Nebraska
 Engineering CA2821

Project:
 WOODLAND OAKS
 LSHMO
 Issue Date:
 February 25, 2021

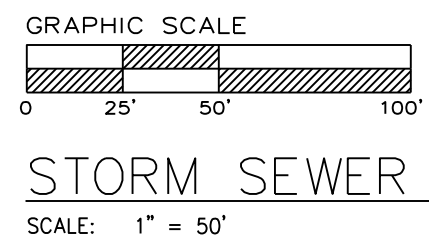
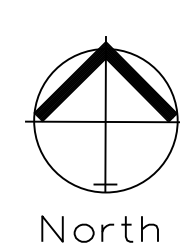
Storm Sewer Plan & Profile
 Construction Plans for:
 WOODLAND OAKS
 Lots 1 thru 42
 Lee's Summit, Jackson County, Missouri

Part of the Southeast 1
 Section 27, Township 48 North, Range 31 West
 Lee's Summit, Jackson County, Missouri



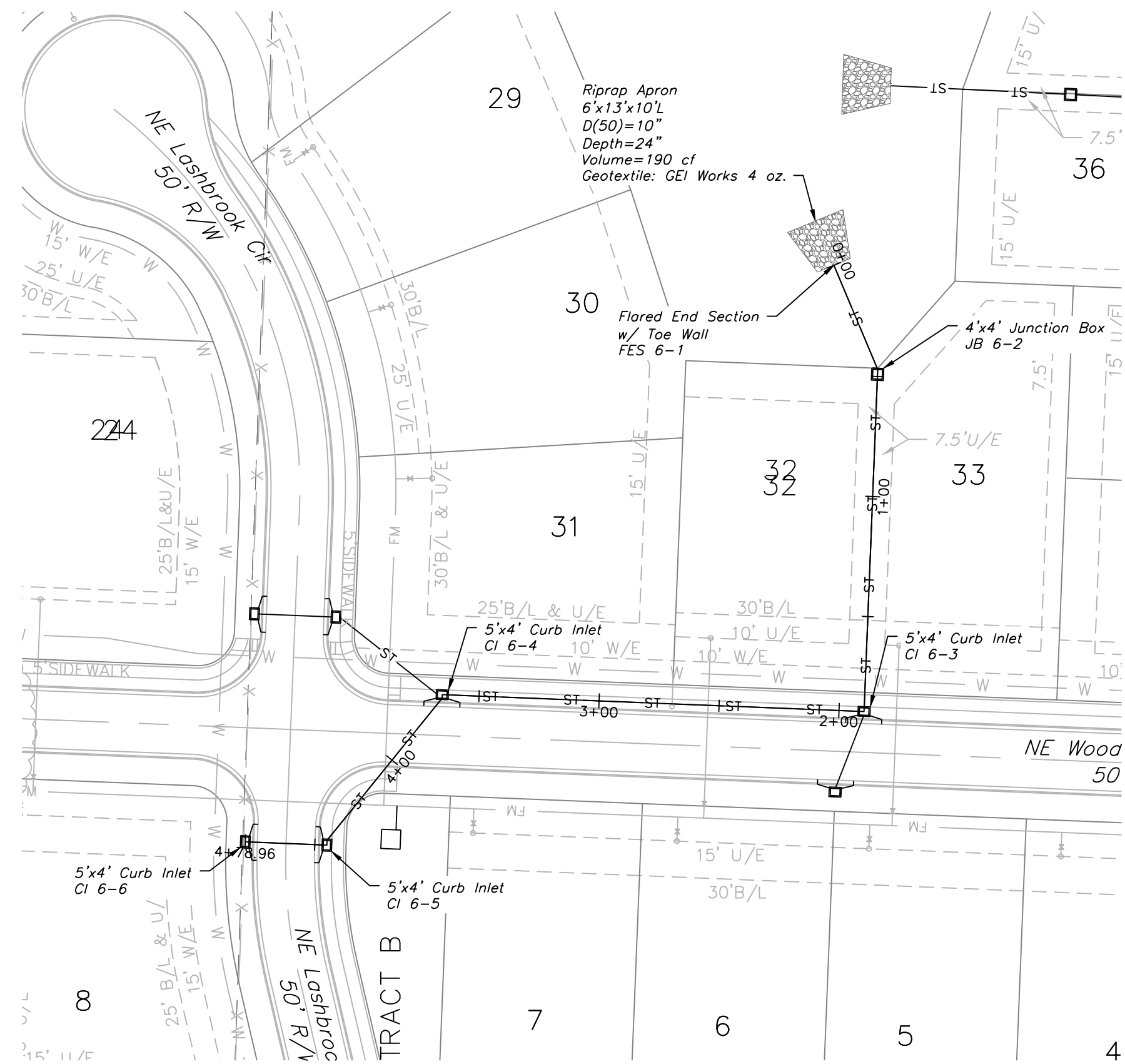
Matthew J. Schlicht
 MO PE 2006019708
 KS PE 19071
 OK PE 25226
 NE PE E-14335

REVISIONS
 REV. 5/5/2021
 REV. 5/26/2021
 REV. 6/22/2021
 REV. 6/29/2021
 Updated 6/16/2023

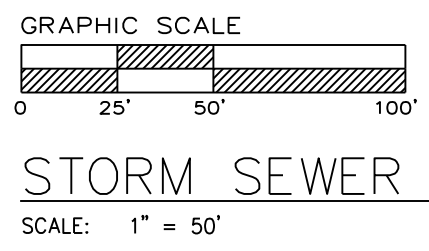
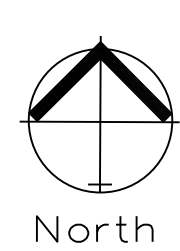
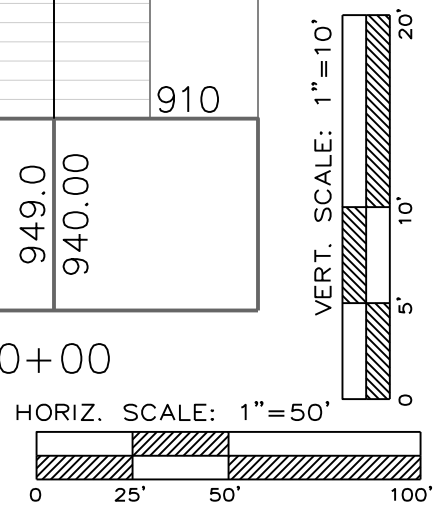
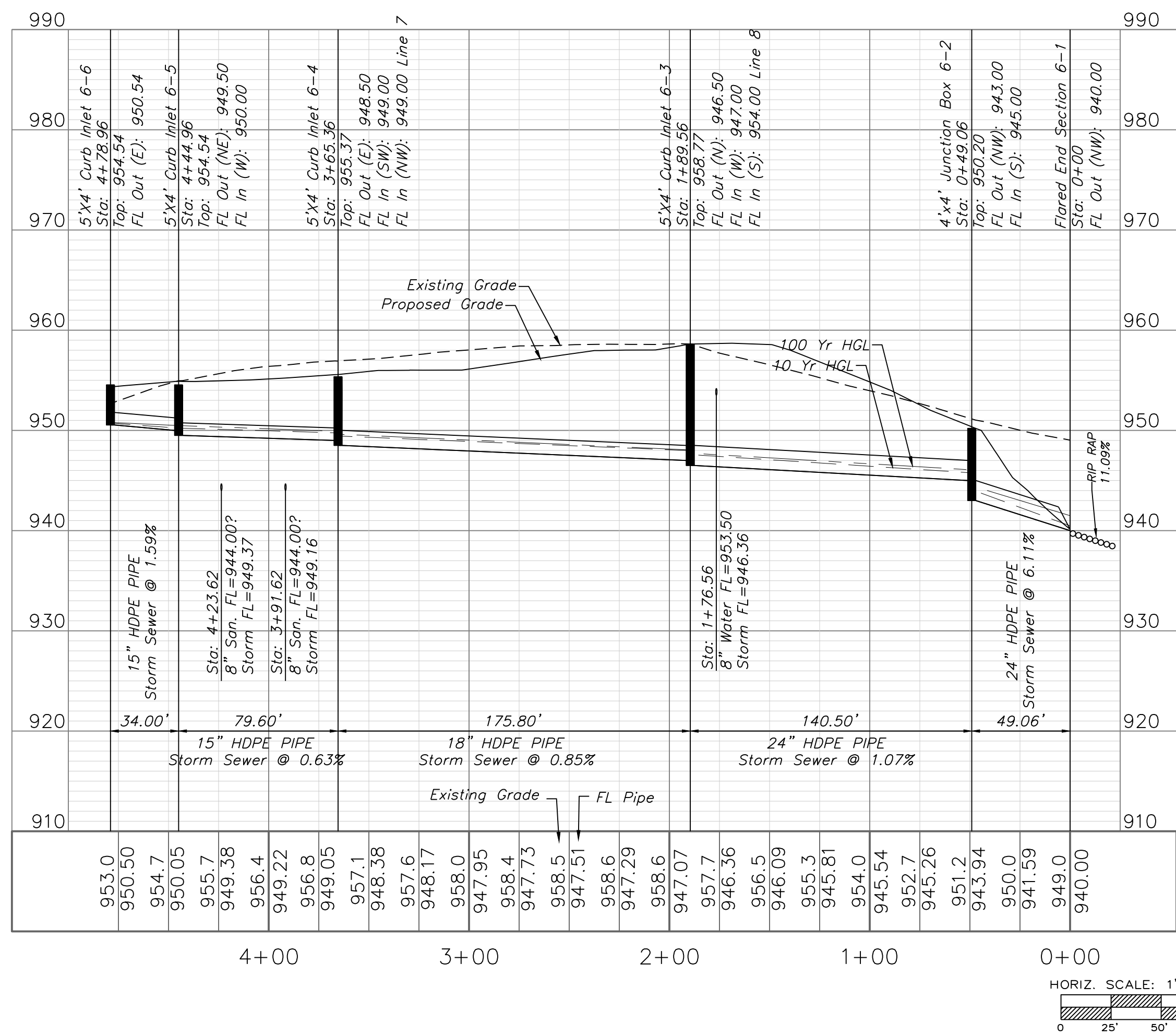


STORM SEWER PLAN & PROFILE

SCALE: 1" = 50'

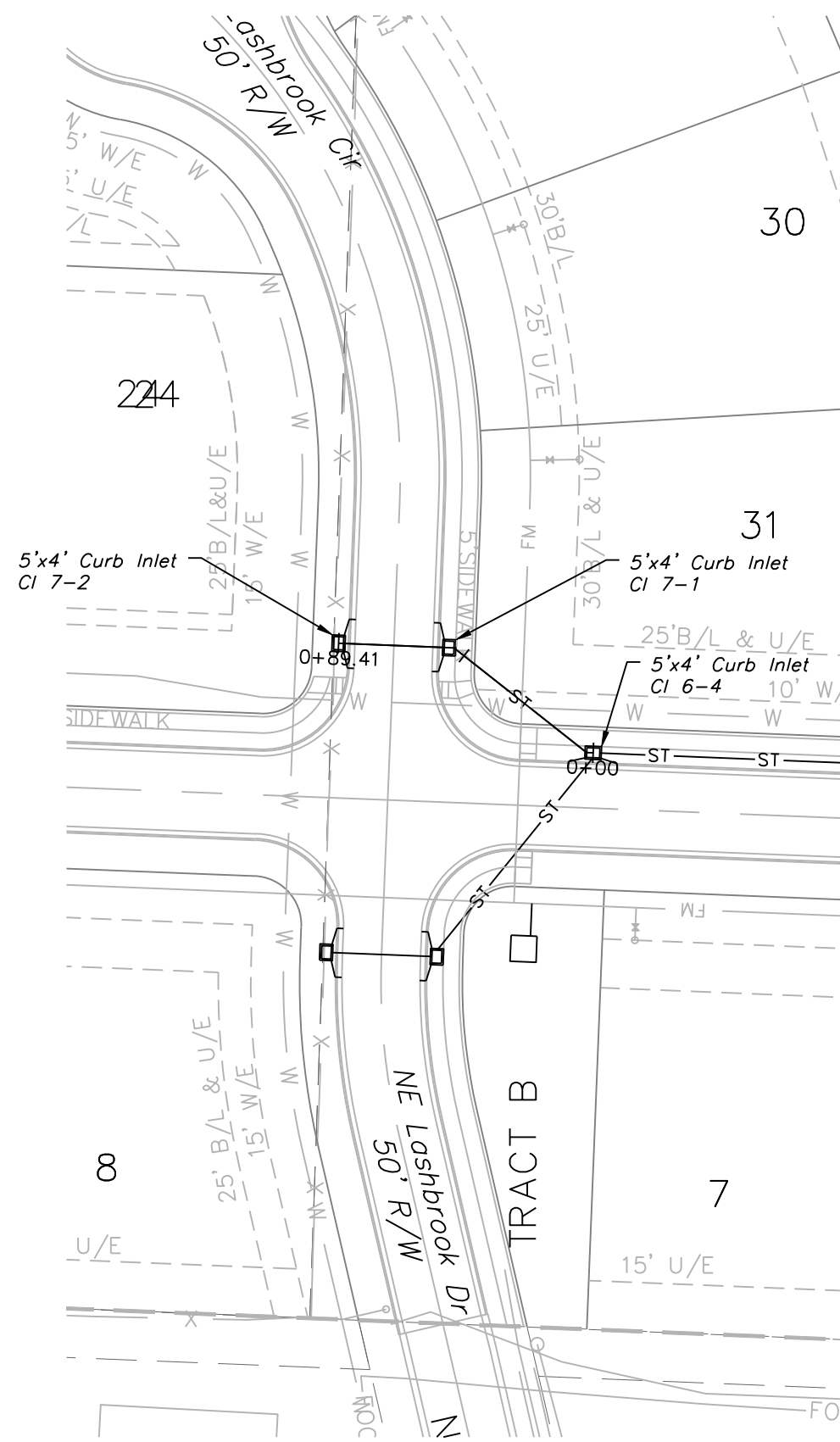


STORM LINE 6

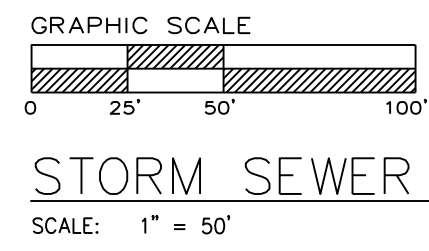
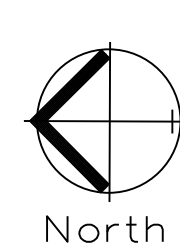
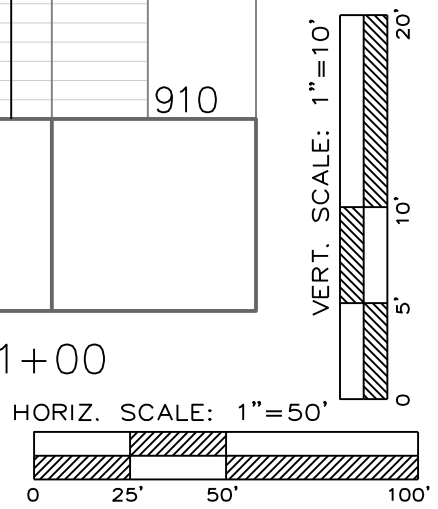
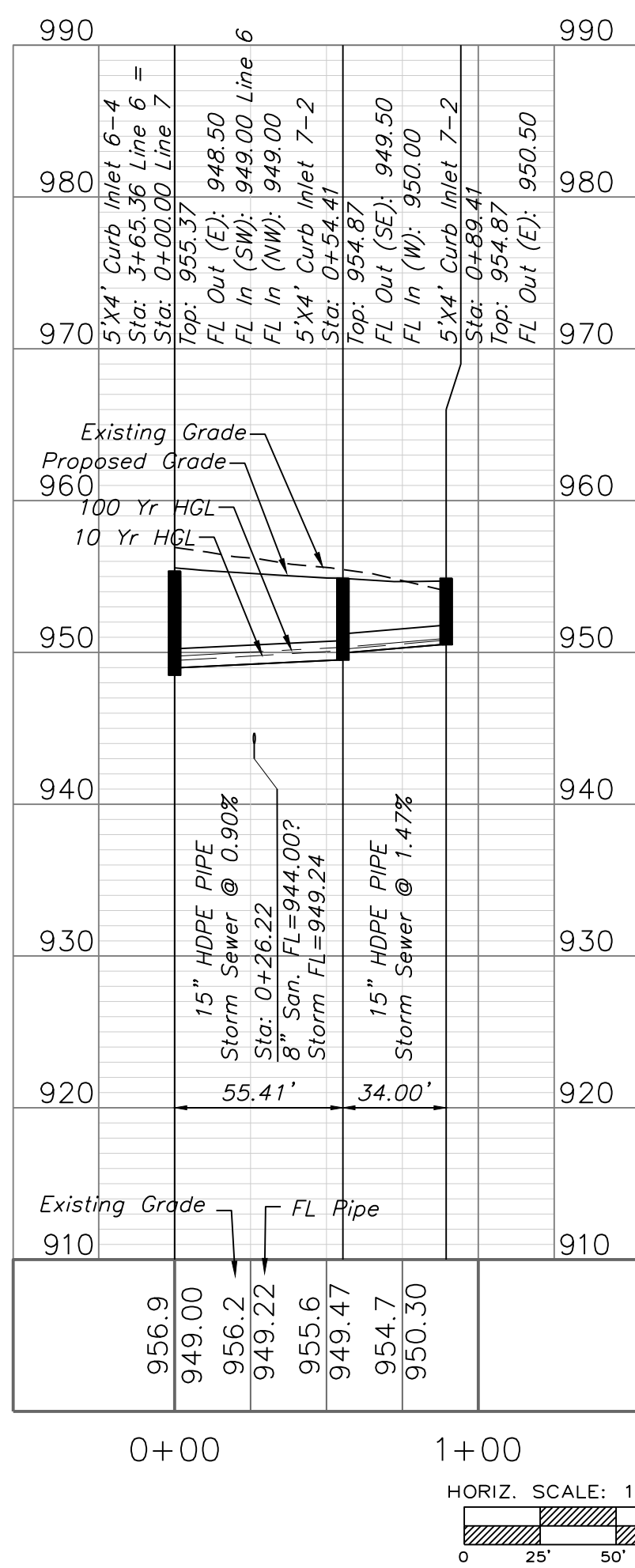


STORM SEWER PLAN & PROFILE

SCALE: 1" = 50'

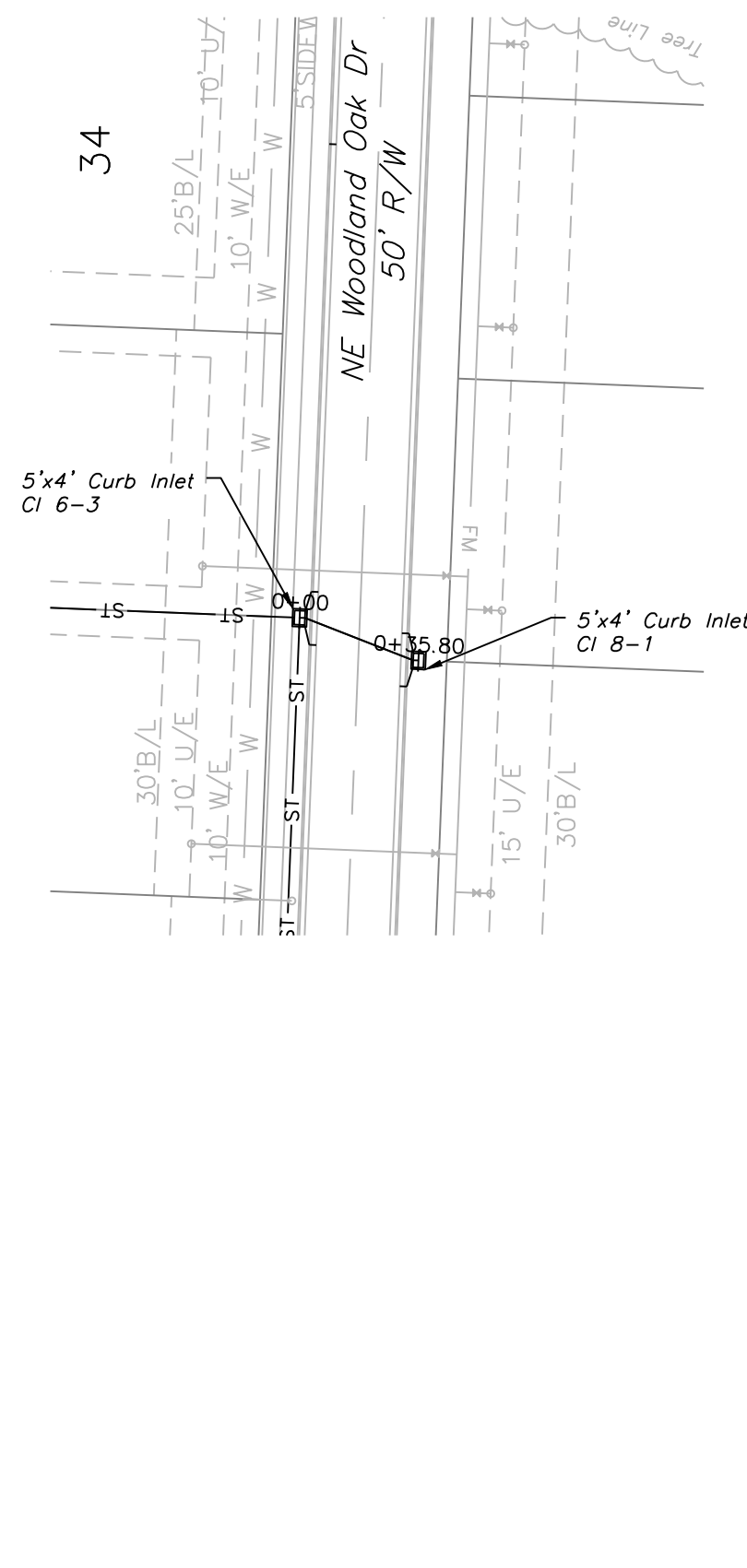


STORM LINE 7

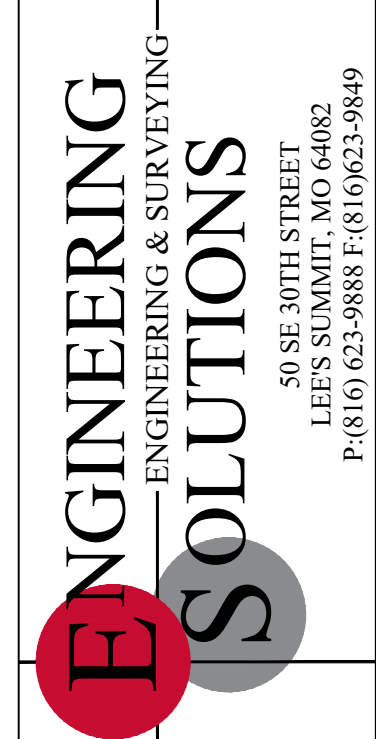
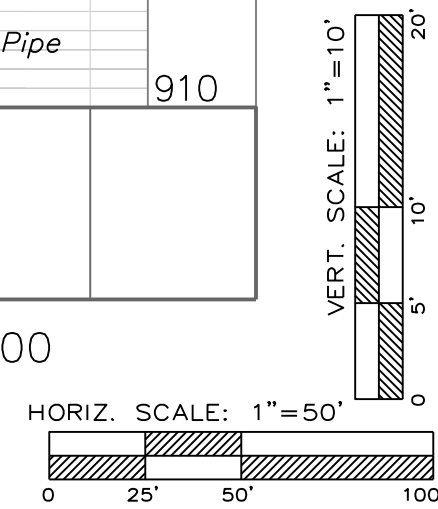
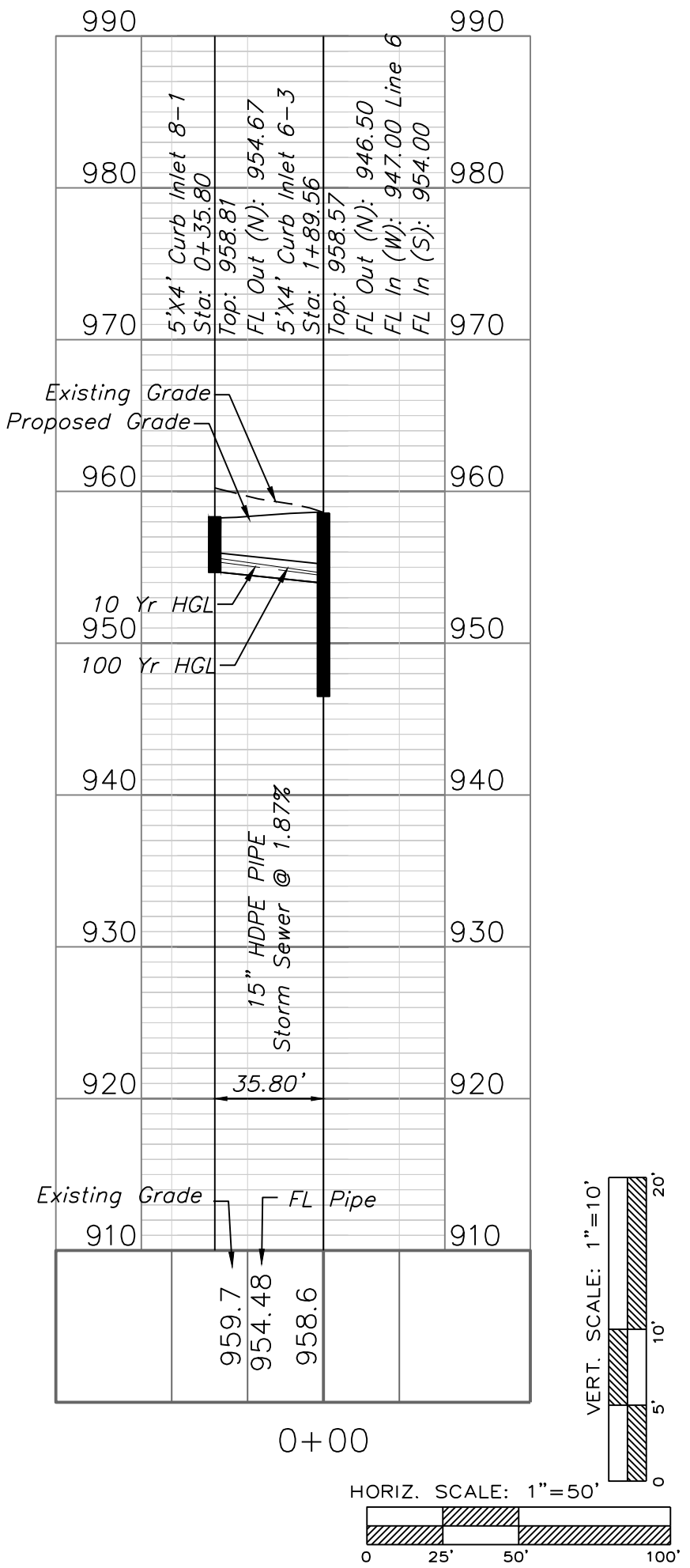


STORM SEWER PLAN & PROFILE

SCALE: 1" = 50'



STORM LINE 8

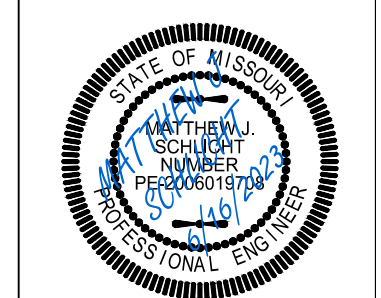


Professional Registration Missouri, Kansas, Oklahoma, Nebraska, California.

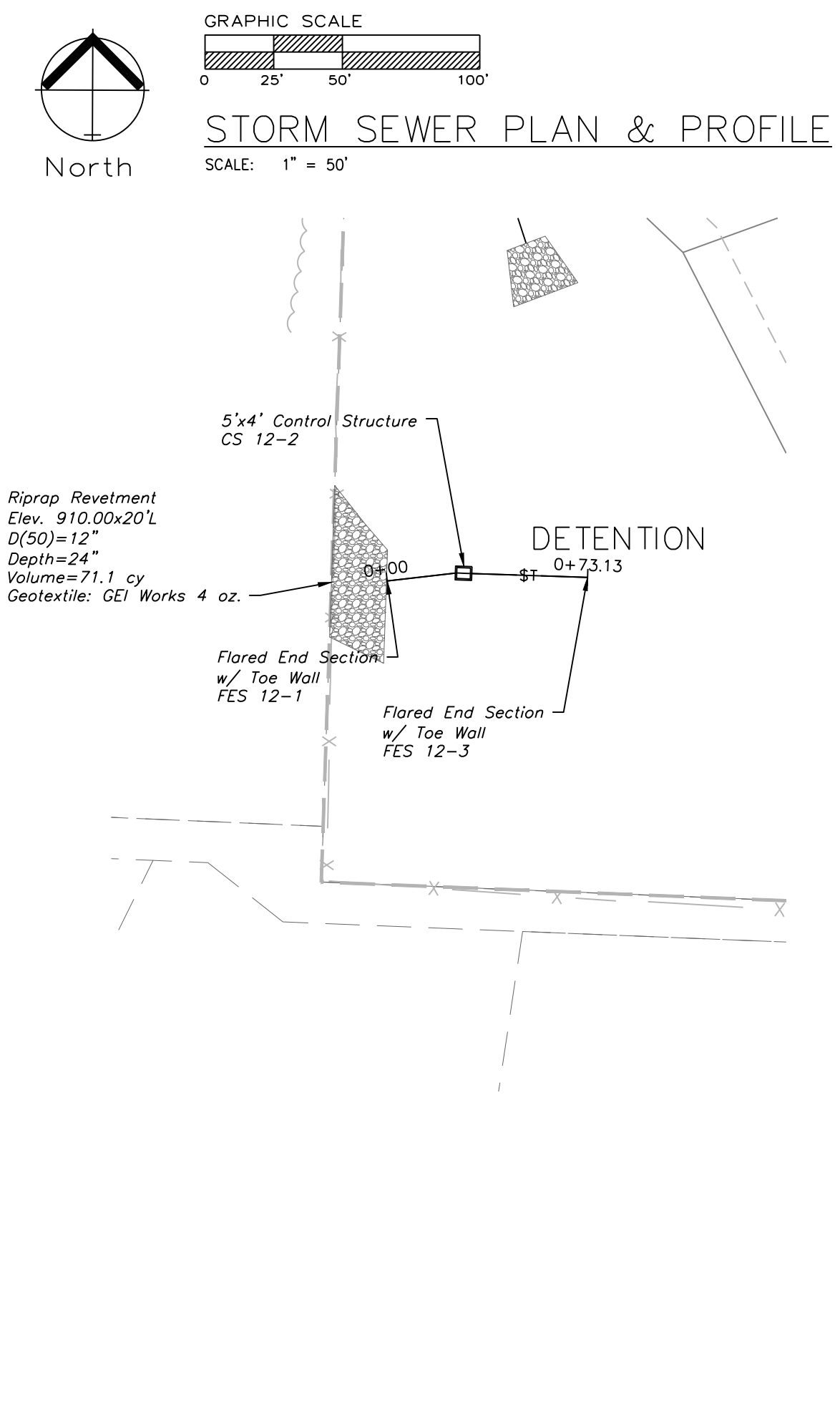
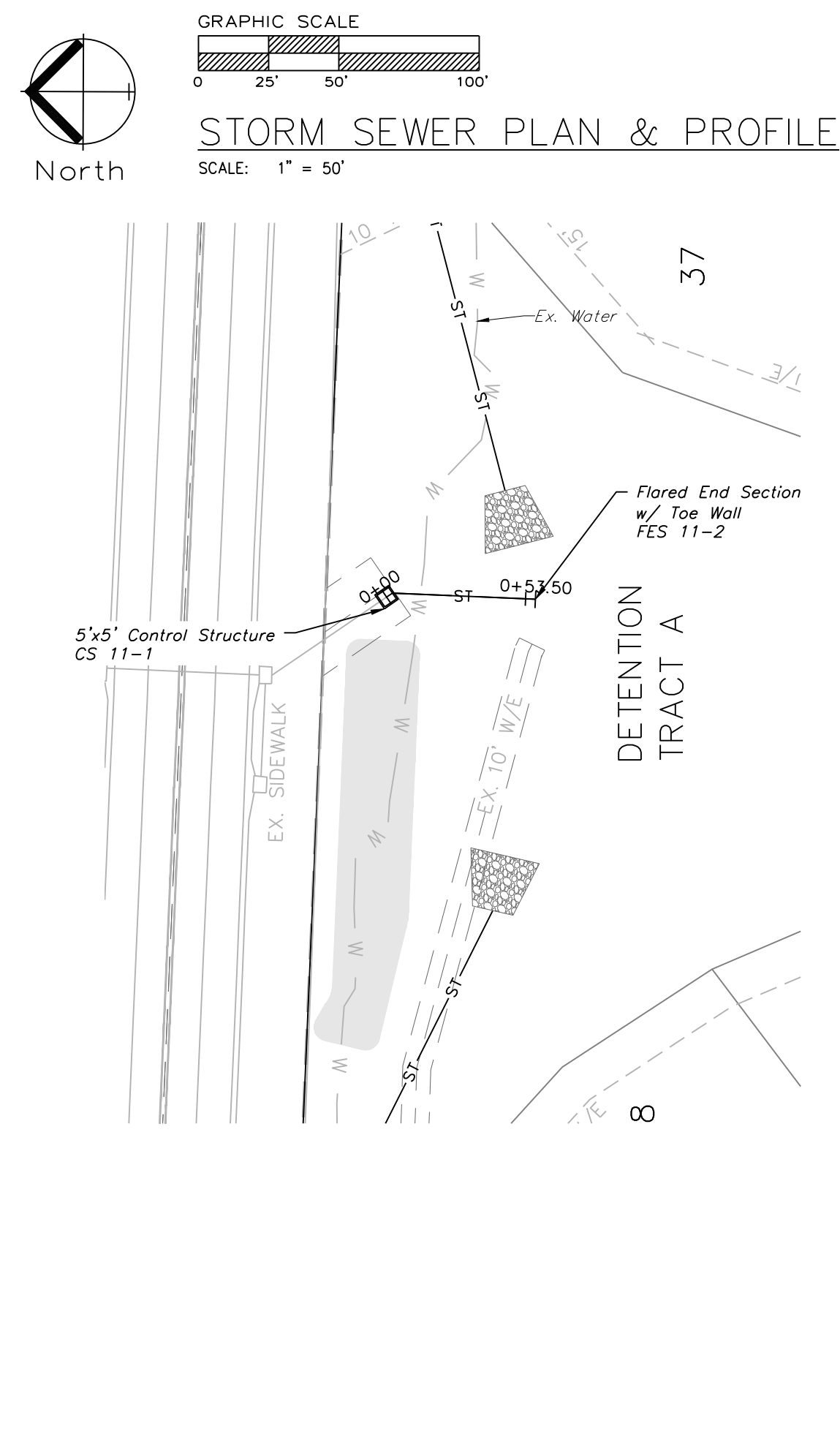
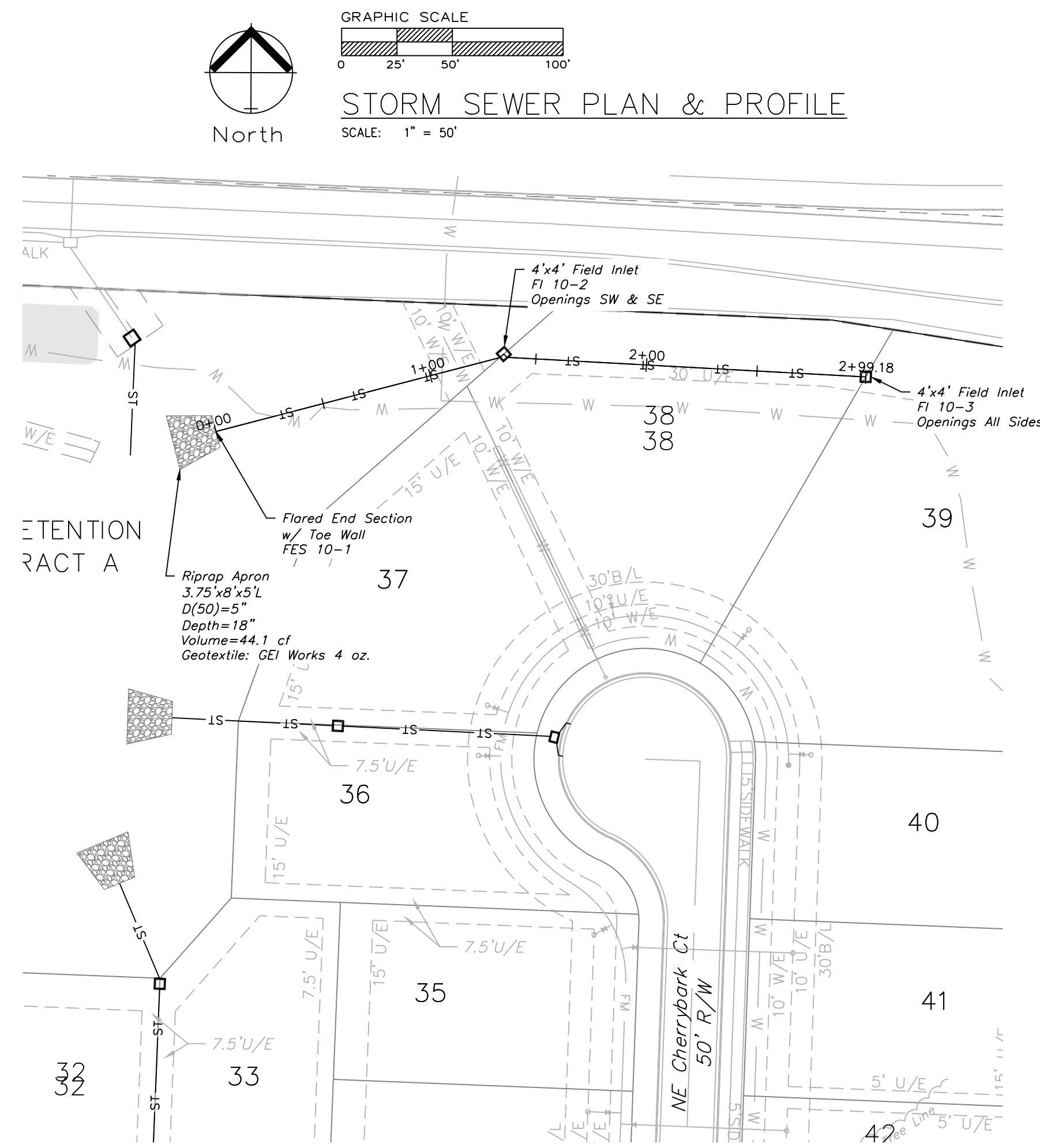
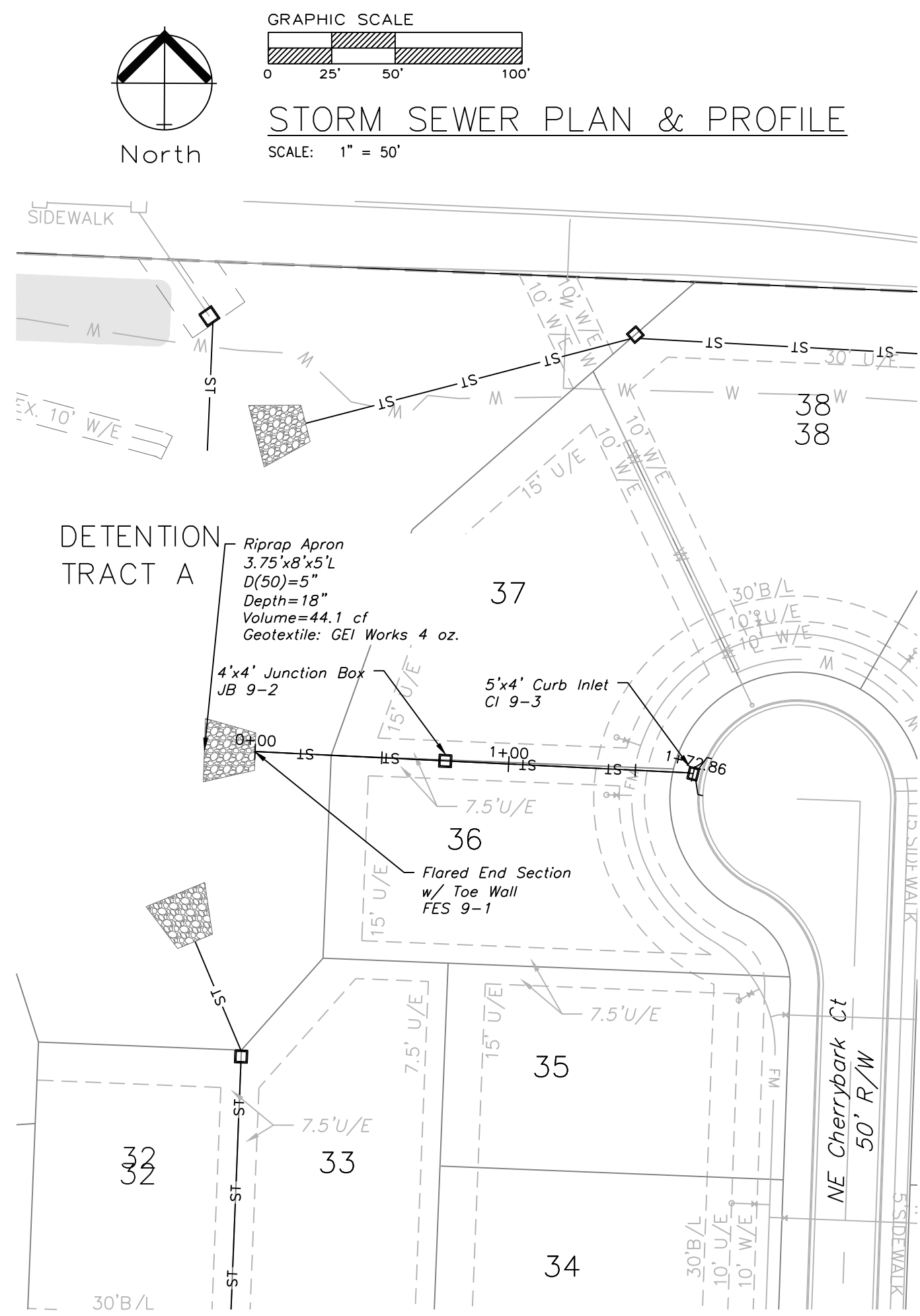
Project: WOODLAND OAKS, LSHMO, Issue Date: February 25, 2021. Part of the Southeast 1 Section 27, Township 48 North, Range 31 West Lee's Summit, Jackson County, Missouri

Storm Sewer Plan & Profile Construction Plans for: WOODLAND OAKS, Lots 1 thru 42, Lee's Summit, Jackson County, Missouri

Matthew J. Schlicht, MO PE 2006019708, KS PE 19071, NE PE E-14335



REVISIONS: REV. 5/5/2021, REV. 5/26/2021, REV. 6/22/2021, REV. 6/29/2021, Updated 6/16/2023

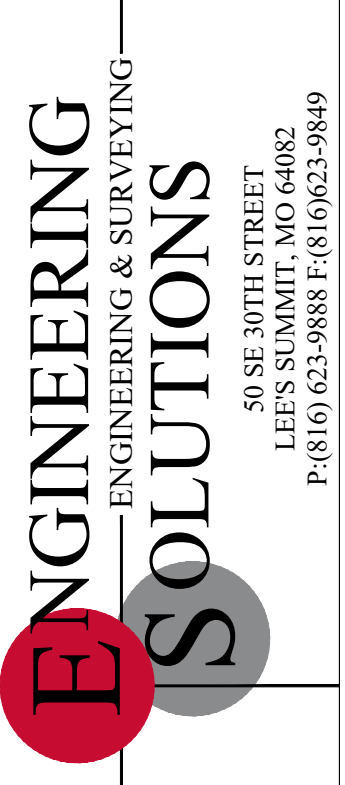
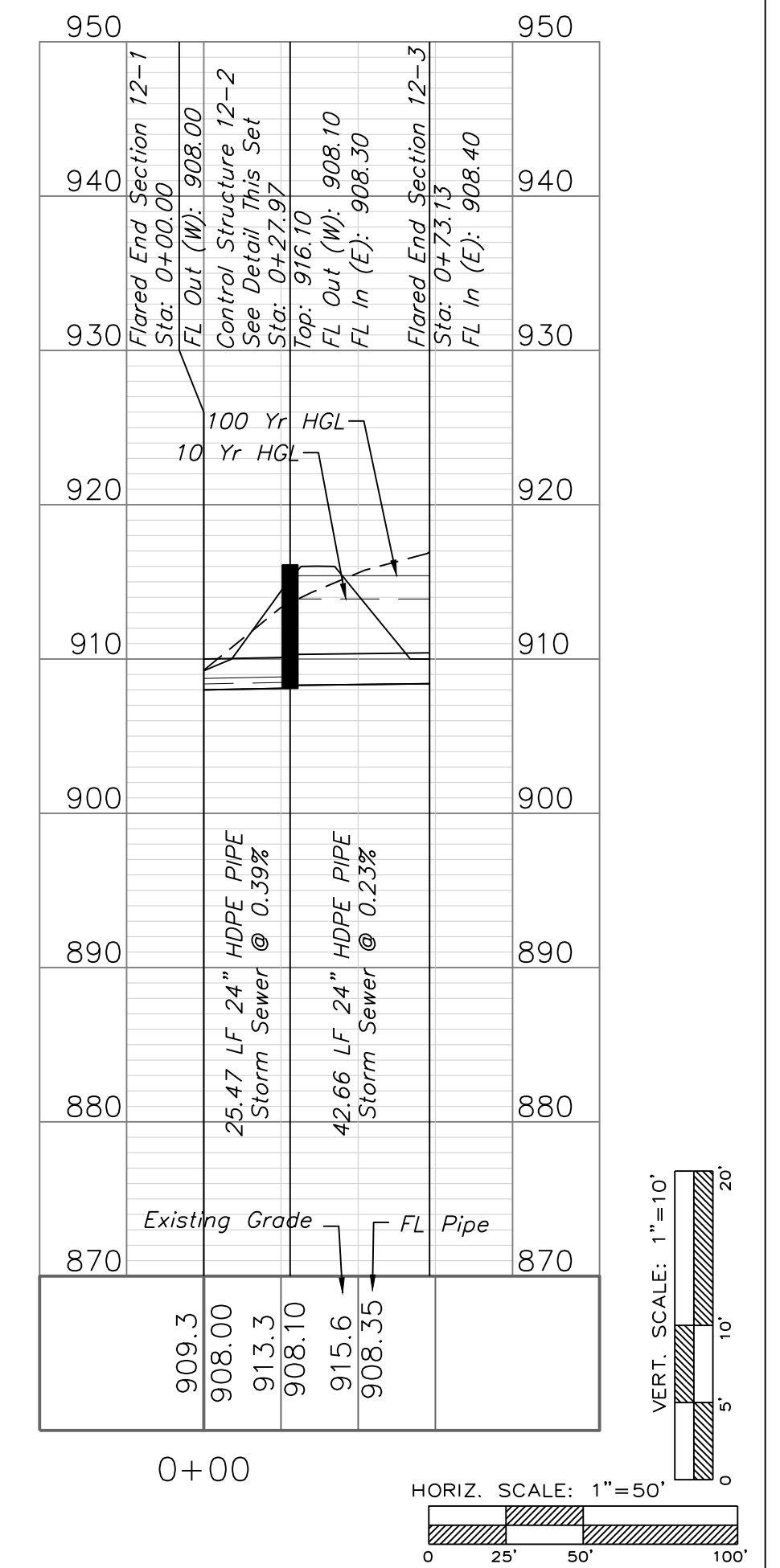
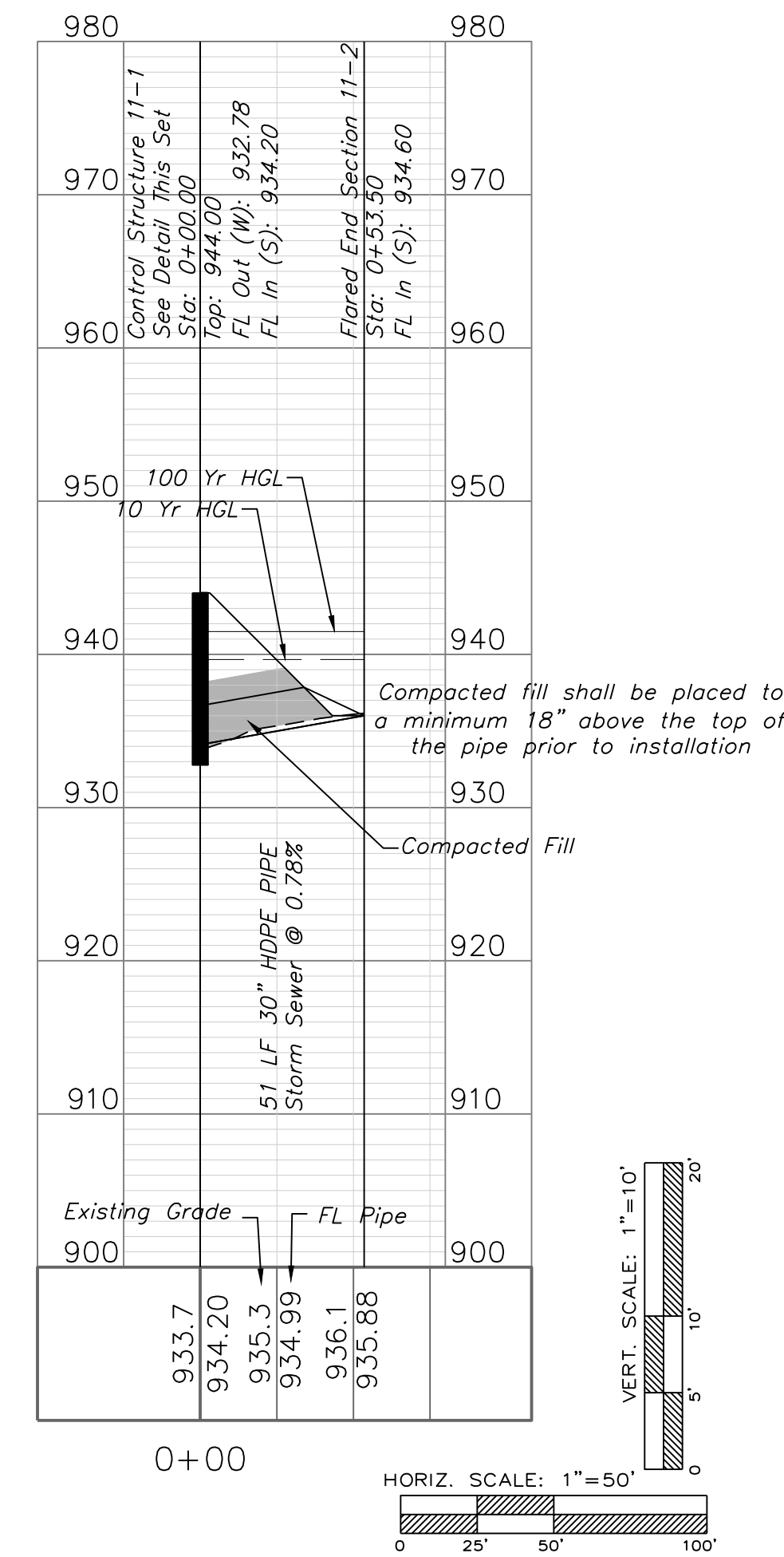
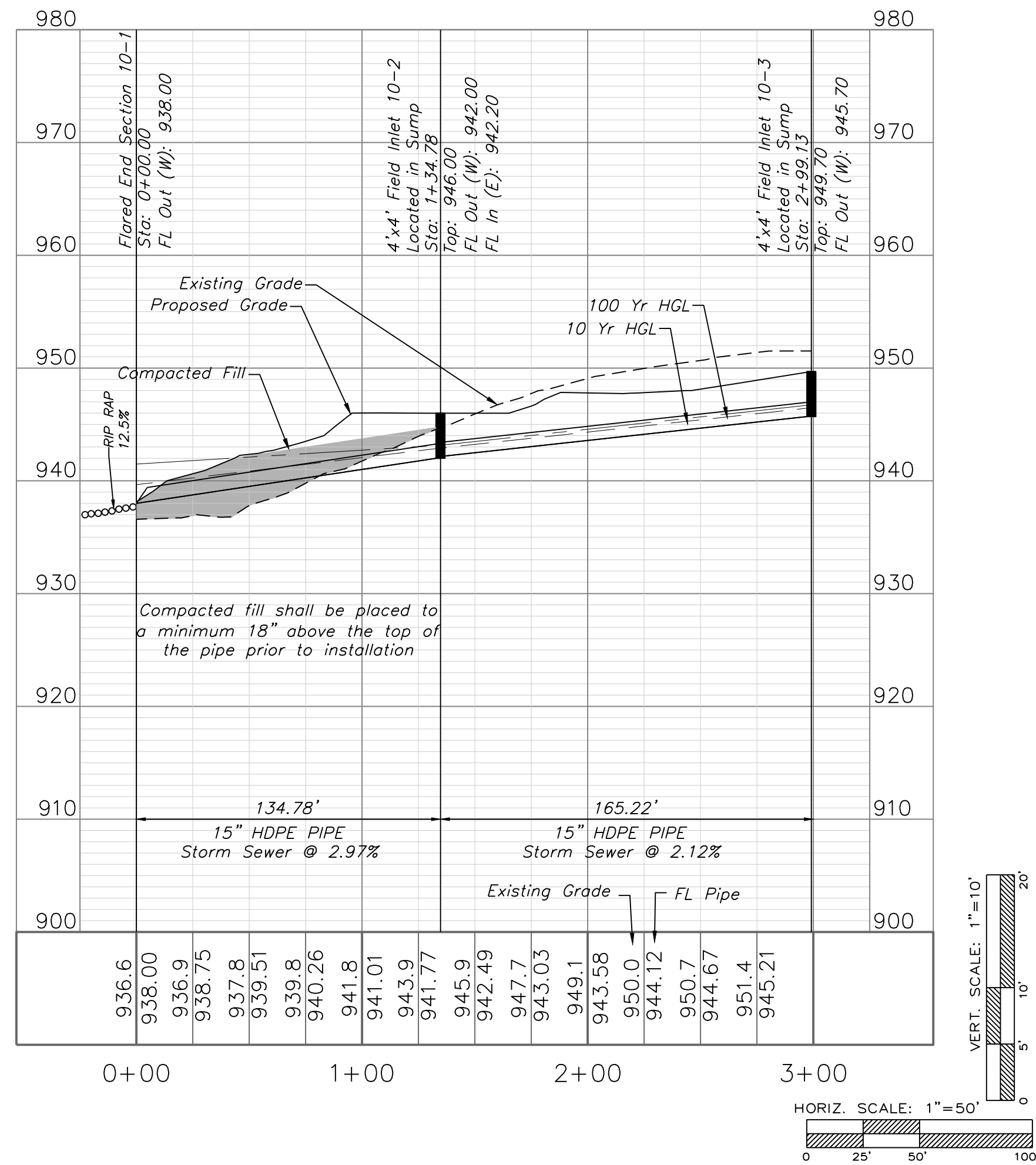
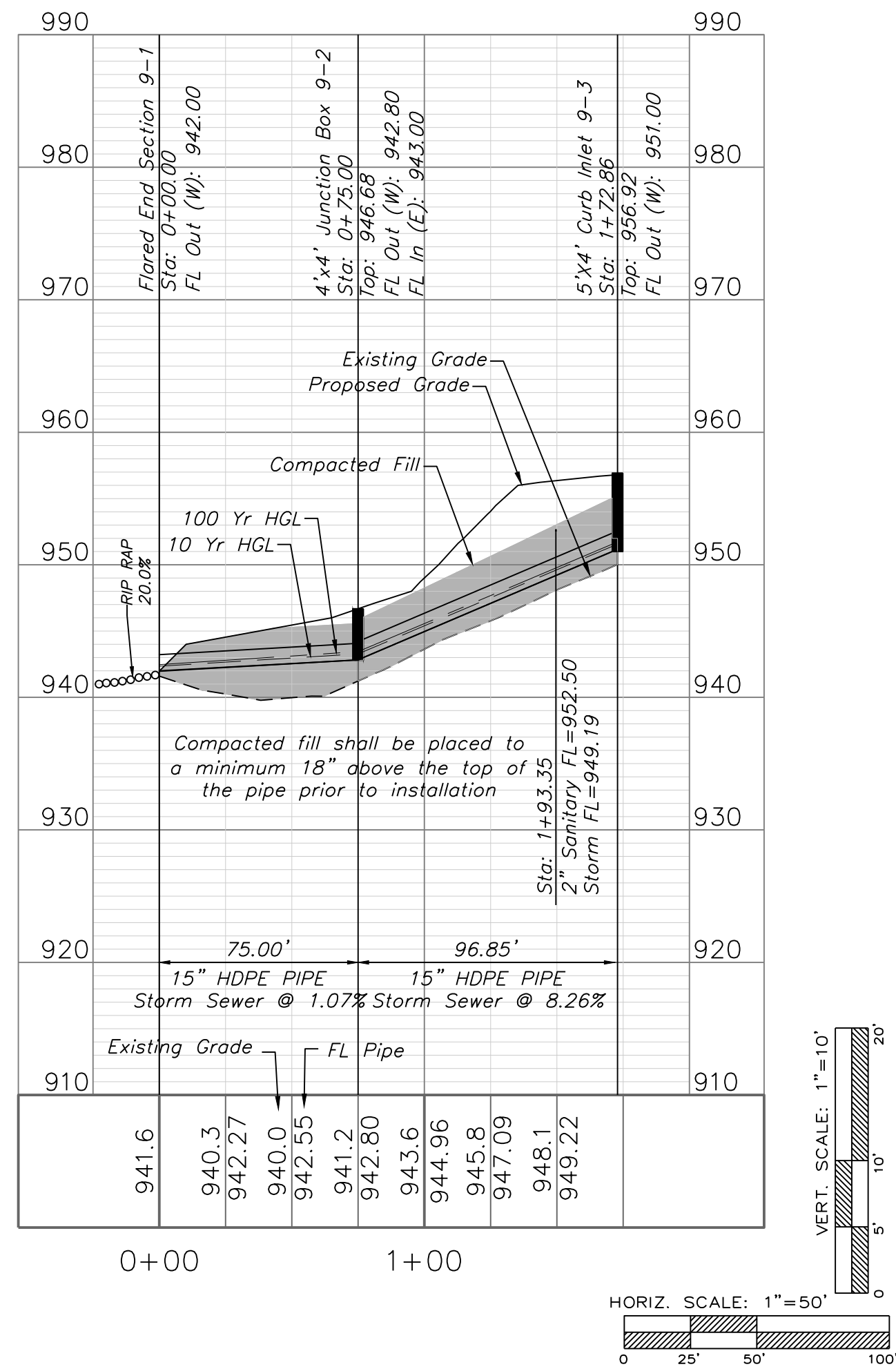


STORM LINE 9

STORM LINE 10

STORM LINE 11

STORM LINE 12

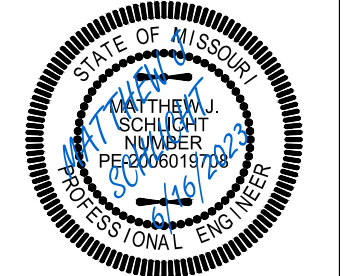


ENGINEERING SOLUTIONS
 ENGINEERING & SURVEYING
 50 SE 30TH STREET
 LEE'S SUMMIT, MO 64082
 P: (816) 623-9888 F: (816) 623-9849

Professional Registration
 Missouri
 Engineering 2005002186-D
 Surveying 2005008319-D
 Kansas
 Engineering E-1685
 Surveying LS-218
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 Engineering 6254
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Project:
 WOODLAND OAKS
 LSHMO
 Issue Date:
 February 25, 2021

Storm Sewer Plan & Profile
 Construction Plans for:
 WOODLAND OAKS
 Lots 1 thru 42
 Lee's Summit, Jackson County, Missouri



Matthew J. Schlicht
 MO PE 2006019708
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REVISIONS
 REV. 5/5/2021
 REV. 5/26/2021
 REV. 6/22/2021
 REV. 6/28/2021
 Updated 6/16/2023

10-YEAR INLET																						
D.S. Str.	Str. No.	Area (ac)	InletTime (min)	Int. (in/hr)	RunoffCoeff. (C)	Q=cIA (cfs)	Q Carry-over (cfs)	QCaptured (cfs)	QBypassed (cfs)	JunctType	CurbHeight (in)	CurbLength (ft)	GutterSlope (ft/ft)	GutterWidth (ft)	CrossSlope, Sw (ft/ft)	CrossSlope, Sx (ft/ft)	InletDepth (ft)	BypassDepth (ft)	BypassSpread (ft)	GutterDepth (ft)	GutterSpread (ft)	Bypass Str.
1-1	1-2	0.77	8.8	6.37	0.51	2.5	0	2.5	0	Dp-Curb	6	8	Sag	.....	0.02	0.02	0.22	n/a	n/a	0.22	11.06	Sag
2-1	2-2	0.28	5.3	7.26	0.51	1.04	0	1.04	0	Dp-Curb	6	8	Sag	.....	0.02	0.02	0.12	n/a	n/a	0.12	6.15	Sag
2-2	2-3	0.12	5.9	7.08	0.51	0.43	0.12	0.3	0.26	Curb	10	5	0.038	2	0.05	0.02	0.12	0.09	1.77	0.12	2.87	2-6
2-3	2-4	0.6	6.2	7	0.51	2.14	1.91	0.89	3.16	Curb	10	5	0.038	2	0.05	0.02	0.22	0.21	7.35	0.22	8.19	2-5
2-4	2-5R	0.4	6.4	6.95	0.51	1.42	3.16	4.58	0	Curb	10	5	Sag	2	0.05	0.02	0.44	n/a	n/a	0.44	18.84	Sag
2-4	2-5L	0.55	8.1	6.53	0.51	1.83	0	1.83	0	Curb	10	5	Sag	2	0.05	0.02	0.26	n/a	n/a	0.26	10.22	Sag
2-5	2-6R	0.16	6.5	6.92	0.51	0.56	0.26	0.82	0	Curb	10	5	Sag	2	0.05	0.02	0.18	n/a	n/a	0.18	6.01	Sag
2-5	2-6L	0.08	6.2	7	0.51	0.29	0	0.29	0	Curb	10	5	Sag	2	0.05	0.02	0.12	n/a	n/a	0.12	2.96	Sag
2-4	3-1	0.19	8.8	6.37	0.51	0.62	0	0.62	0	Dp-Curb	6	4	Sag	.....	0.02	0.02	0.14	n/a	n/a	0.14	6.91	Sag
2-2	4-1	0.54	6.8	6.84	0.51	1.88	0	1.88	0	Dp-Curb	6	4	Sag	.....	0.02	0.02	0.29	n/a	n/a	0.29	14.55	Sag
4-1	4-2	0.32	7.6	6.65	0.51	1.08	0	1.08	0	Dp-Curb	6	4	Sag	.....	0.02	0.02	0.2	n/a	n/a	0.2	10.06	Sag
4-2	4-3	0.08	5.6	7.17	0.51	0.29	0.03	0.19	0.12	Curb	10	5	0.05	2	0.05	0.02	0.09	0.06	1.27	0.09	1.81	2-3
4-3	4-4	0.37	7	6.79	0.51	1.28	1.28	0.66	1.91	Curb	10	5	0.05	2	0.05	0.02	0.19	0.17	5.45	0.19	6.28	2-4
5-1	5-2	0.4	6.1	7.03	0.51	1.43	0	1.43	0	Dp-Curb	6	16	Sag	.....	0.02	0.02	0.1	n/a	n/a	0.1	4.81	Sag
5-2	5-3	0.61	6.3	6.98	0.51	2.17	0	2.17	0	Dp-Curb	6	16	Sag	.....	0.02	0.02	0.13	n/a	n/a	0.13	6.34	Sag
5-3	5-4	0.5	6.3	6.98	0.51	1.78	0	1.78	0	Dp-Curb	6	16	Sag	.....	0.02	0.02	0.11	n/a	n/a	0.11	5.55	Sag
6-1	6-2	0	0	0	0.51	0	.....	.....	.....	MH	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Sag
6-2	6-3	0.13	6.4	6.95	0.51	0.46	0	0.3	0.16	Curb	10	5	0.02	2	0.05	0.02	0.12	0.08	1.65	0.12	3.14	6-4
6-3	6-4	0.1	6.1	7.03	0.51	0.36	0.16	0.33	0.19	Curb	10	5	0.02	2	0.05	0.02	0.13	0.09	1.76	0.13	3.38	4-4
6-4	6-5R	0.7	7.6	6.65	0.51	2.37	2.26	4.63	0	Curb	10	5	Sag	2	0.05	0.02	0.44	n/a	n/a	0.44	18.99	Sag
6-4	6-5L	0.21	7	6.79	0.51	0.73	0	0.73	0	Curb	10	5	Sag	2	0.05	0.02	0.17	n/a	n/a	0.17	5.52	Sag
6-5	6-6	0.07	5.8	7.11	0.51	0.25	0	0.23	0.03	Curb	10	5	0.01	2	0.05	0.02	0.11	0.05	0.95	0.11	2.62	4-3
6-4	7-1R	0.17	8.2	6.5	0.51	0.56	0	0.37	0.19	Curb	10	5	0.014	2	0.05	0.02	0.14	0.09	1.9	0.14	3.99	4-4
6-4	7-1L	0.37	7.3	6.72	0.51	1.27	0	0.6	0.66	Curb	10	5	0.014	2	0.05	0.02	0.18	0.15	4.38	0.18	6.08	4-4
7-1	7-2	0.19	7.3	6.72	0.51	0.65	0	0.41	0.24	Curb	10	5	0.014	2	0.05	0.02	0.15	0.1	2.19	0.15	4.33	4-4
6-3	8-1	0.97	8.6	6.41	0.51	3.17	0	0.91	2.26	Curb	10	5	0.02	2	0.05	0.02	0.23	0.21	7.3	0.23	8.46	6-5
9-1	9-2	0	0	0	0.51	0	.....	.....	.....	MH	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Sag
9-2	9-3R	0.25	7.5	6.67	0.51	0.85	0	0.85	0	Curb	10	5	Sag	2	0.05	0.02	0.18	n/a	n/a	0.18	6.13	Sag
9-2	9-3L	0.19	6.7	6.87	0.51	0.67	0	0.67	0	Curb	10	5	Sag	2	0.05	0.02	0.16	n/a	n/a	0.16	5.21	Sag
10-1	10-2	0.35	6.3	6.98	0.51	1.25	0	1.25	0	Dp-Curb	6	8	Sag	.....	0.02	0.02	0.14	n/a	n/a	0.14	6.95	Sag
10-2	10-3	1.26	9.7	6.18	0.51	3.97	0	3.97	0	Dp-Curb	6	16	Sag	.....	0.02	0.02	0.19	n/a	n/a	0.19	9.48	Sag

EX. RIPRAP APRON CALCULATIONS

Field End Section # 1-1

Q = 3.4 cfs
D = 1.25 ft
Tw = 0.5 ft
g = 32.2 ft/s^2

D₅₀ = 1.80 inches

S = 0.0231 ft/ft
n = 0.01
Qcap = 12.71 ft^3/s
Q/Qcap = 0.27
d/D = 0.35
Vcap = 10.36 ft^2/s
V/Vcap = 0.8430
V = 8.73 ft/s
Fr = 2.33
Flow = Supercritical

D' = 0.84 ft
yn = 0.44 ft
D₅₀ = 3.04 inches
Classify = 3.04 inches

D₅₀ = riprap size, m(ft)
Q = design discharge, m^3/s (ft^3/s)
D = culvert diameter (circular), m(ft)
Tw = tailwater depth, m(ft), if unknown use 0.4*D
g = acceleration due to gravity, 9.81 m/s^2 (32.2 ft/s^2)
Subcritical Flow

S = pipe slope, m/m(ft/ft)
n = manning's roughness coefficient, unitless
Qcap = full pipe capacity, m^3/s(ft^3/s)
Q/Qcap = design discharge/full pipe capacity, unitless
d/D = water depth/pipe diameter, unitless
Vcap = velocity full m^2/s(ft^2/s)
V/Vcap = design velocity/full pipe velocity, unitless
V = velocity of flow segment, m^2/s(ft^2/s)
Fr > 1 Supercritical, Fr < 1 Subcritical
If flow is Supercritical adjust culvert diameter

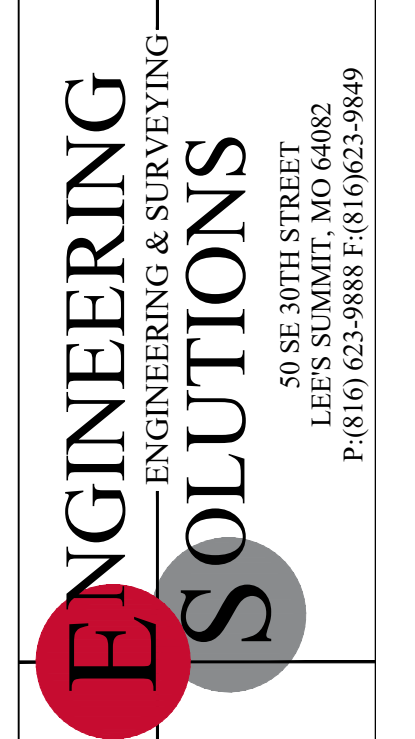
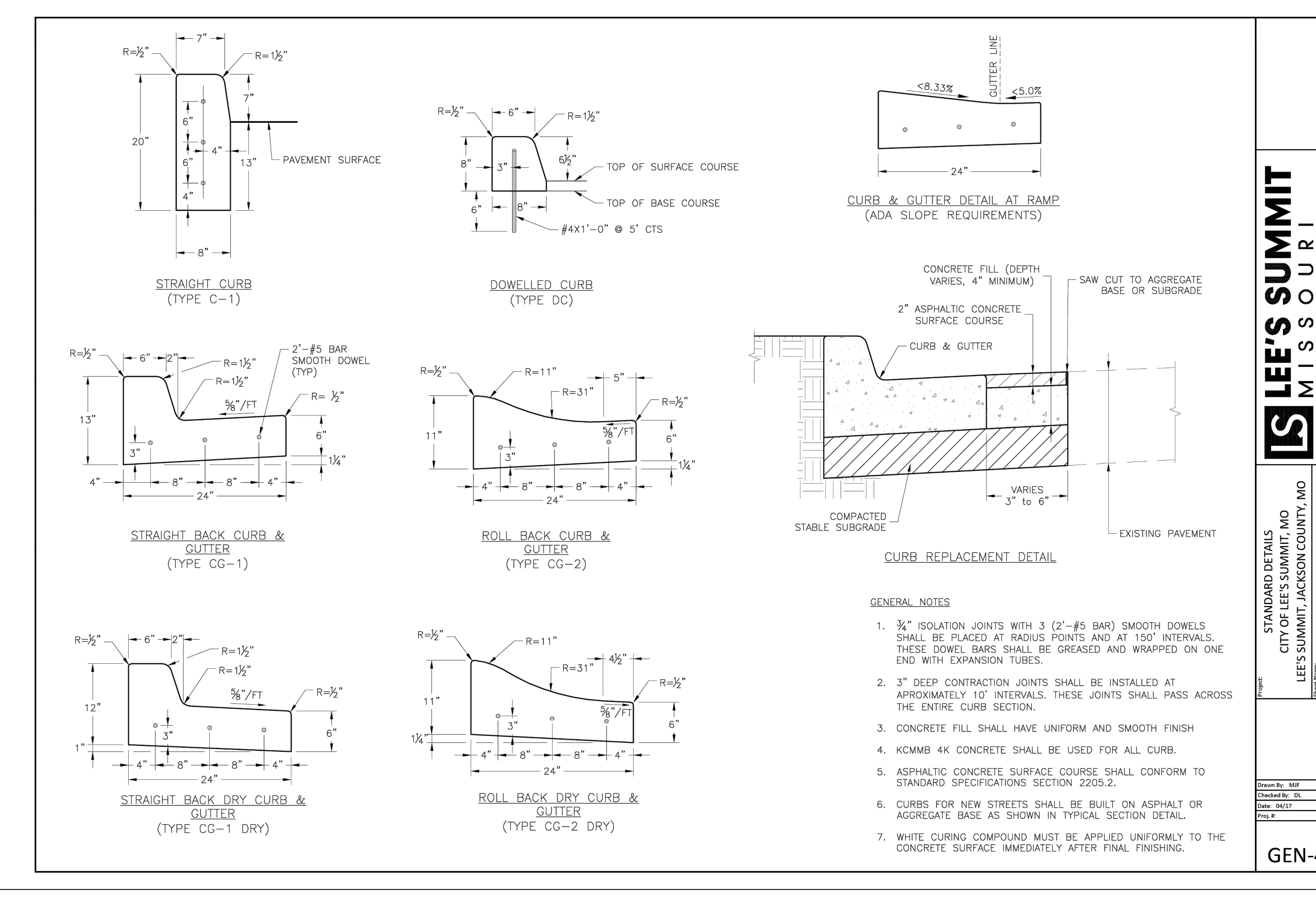
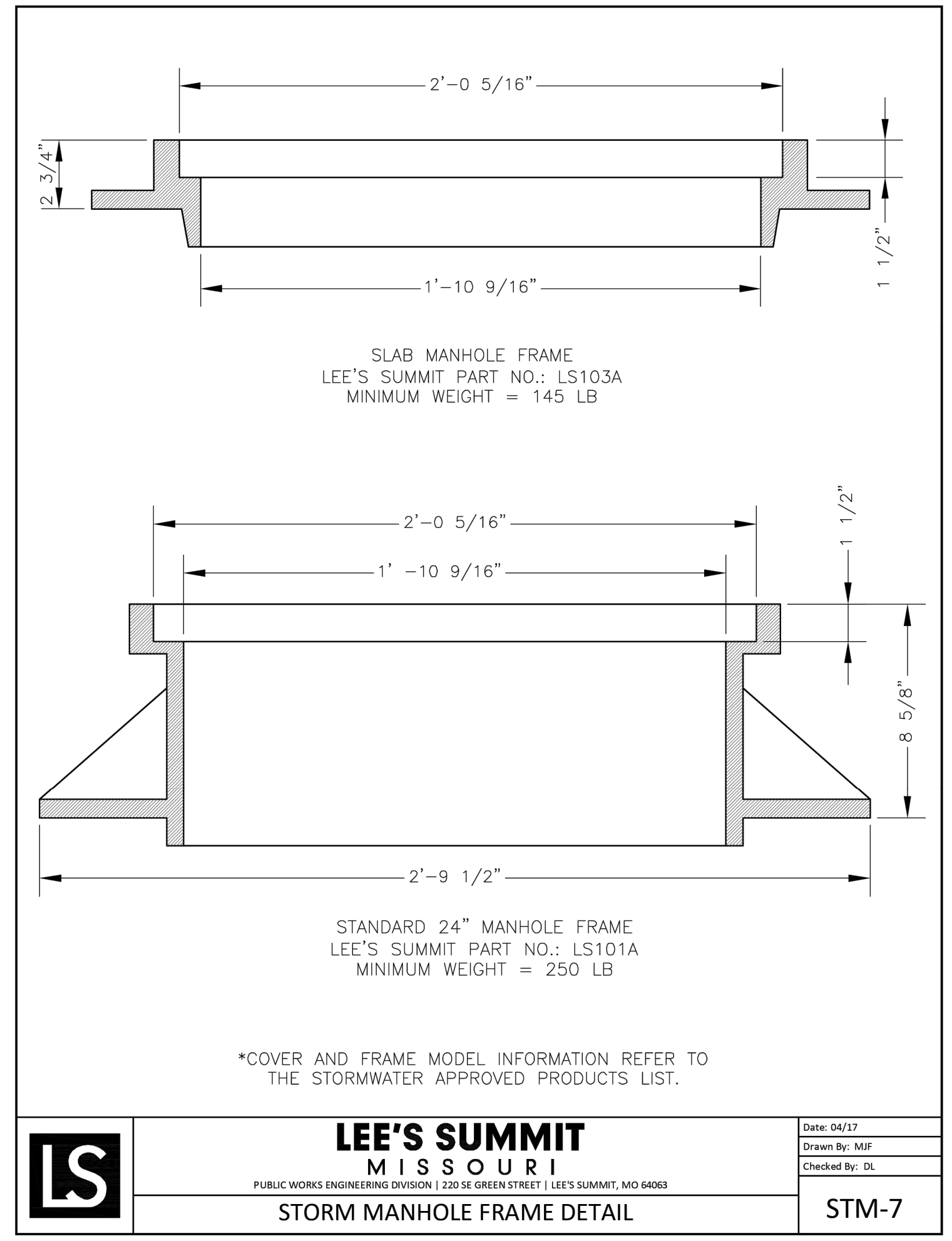
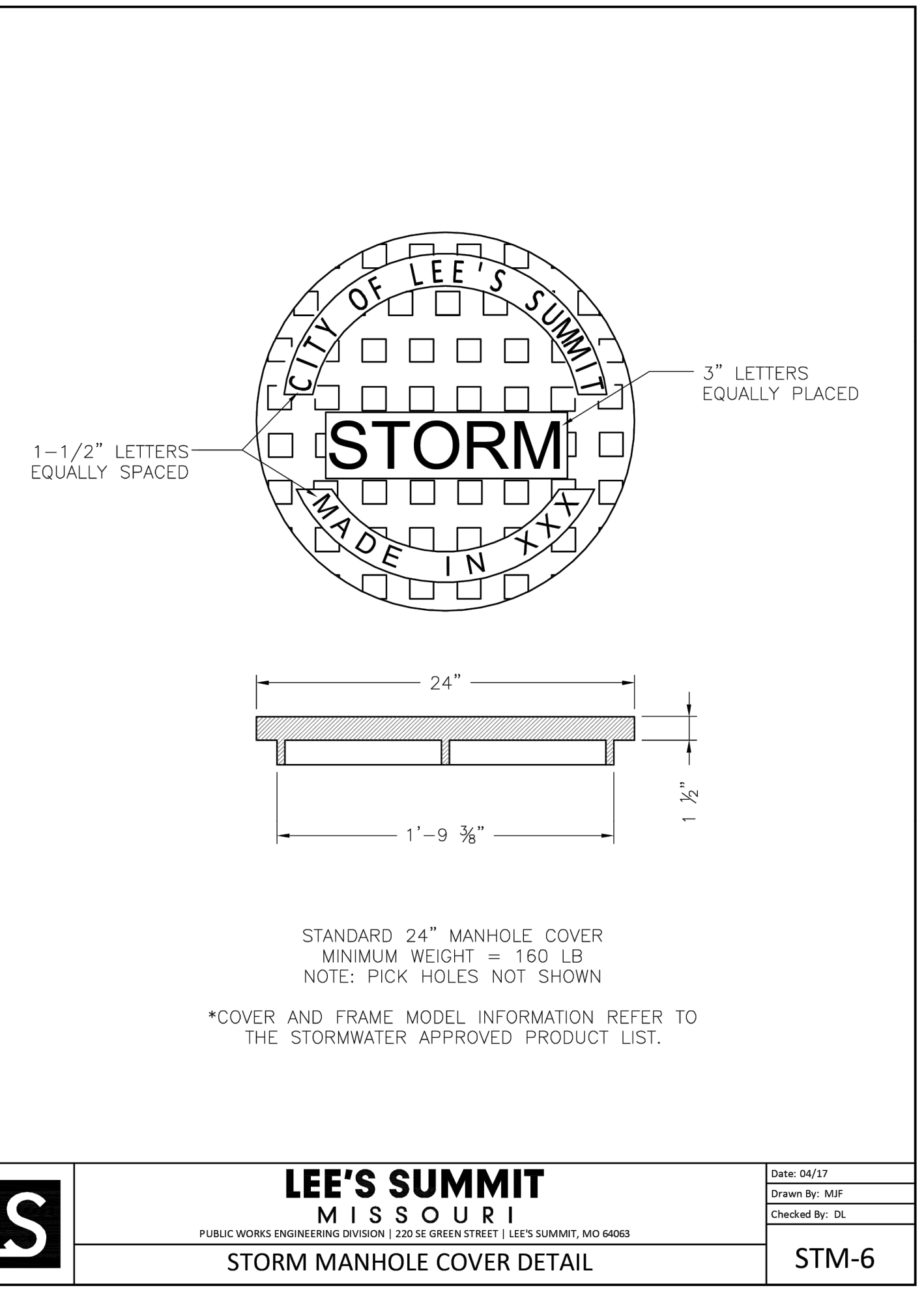
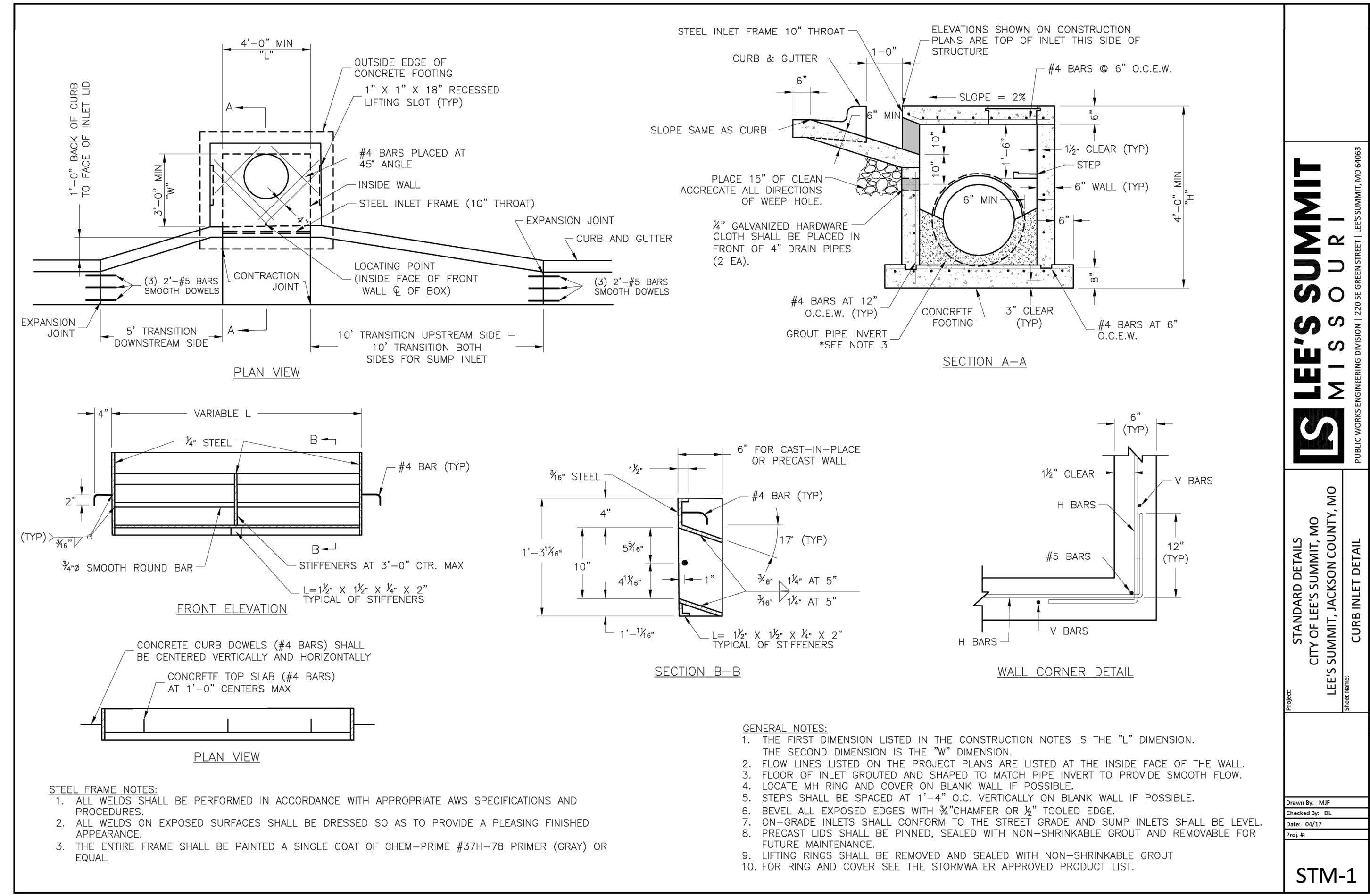
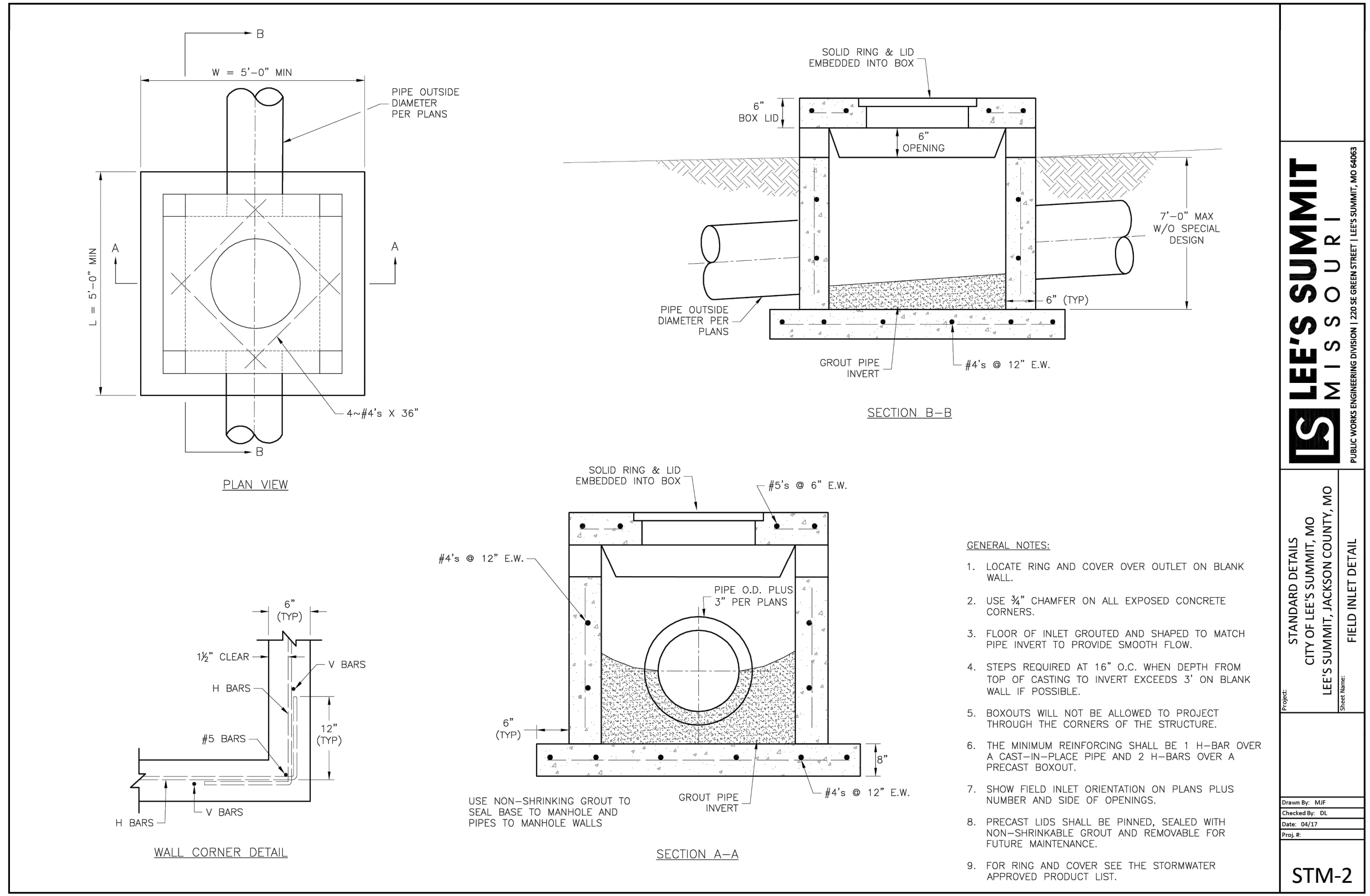
D' = culvert diameter adjustment, m(ft)
yn = normal (supercritical) depth in culvert, m(ft)

Class 1 Use D₅₀ = 5
Apron Length = 4 * D 5.00 ft Use 5.00 ft
Apron Depth = 3.5 * D₅₀ 17.50 inches Use 18.00 inches
Apron Width = 3*D+(2/3)L 7.08 ft Use 8.00 ft

10-YEAR PIPE																						
D.S. Str.	U.S. Str.	LineLength (ft)	Incr.Area (ac)	TotalArea (ac)	RunoffCoeff. (C)	IncrCx A	TotalCx A	InletTime (min)	TimeConc (min)	RfnlInlt (in/hr)	TotalRunoff (cfs)	TotalFlow (cfs)	CapacFull (cfs)	Veloc (ft/s)	PipeSize (in)	PipeSlope (%)	Inv ElevDn (ft)	Inv ElevUp (ft)	HGLDn (ft)	HGLUp (ft)	Grnd/RimDn (ft)	Grnd/RimUp (ft)
1-1	1-2	139.4	0.77	0.77	0.51	0.39	0.39	8.8	8.8	6.4	2.5	2.5	12.32	5.94	15	2.15	912	915	912.38	915.63	0	918.5
2-1	2-2	50.18	0.28	3.69	0.51	0.14	1.88	5.3	9.6	6.2	11.67	11.67	71.89	11.31	24	5.98	912	915	912.55	916.23	0	924.5
2-2	2-3	138.03	0.12	2.1	0.51	0.06	1.07	5.9	9.4	6.2	6.69	6.69	40.78	11.18	18	8.93	920	932.32	920.41	933.32	924.5	941.27
2-3	2-4	46.47	0.6	1.98	0.51	0.31	1.01	6.2	9.3	6.3	6.33	6.33	14.16	6.51	18	1.08	932.82	933.32	933.52	934.29	941.27	940.79
2-4	2-5R	94.12	0.4	1.19	0.51	0.2	0.61	6.4	8.1	6.5	3.96	3.96	9.4	6.04	15	1.25	933.82	935	934.39	935.8	940.79	939.79
2-4	2-5L	1	0.55	0.55	0.51	0.28	0.28	8.1	8.1	6.5	1.83	1.83	26.54	2.91	15	10	935	935.1	935.8	935.64	939.79	939.79
2-5	2-6R	34	0.16	0.24	0.51	0.08	0.12	6.5	6.5	6.9	0.85	0.85	7.75	3.28	15	0.85	935.5	935.79	935.8	936.15	939.79	939.79
2-5	2-6L	1	0.08	0.08	0.51	0.04	0.04	6.2	6.2	7	0.29	0.29	26.55	1.56	15	10	935.79	935.89	936.15	936.1	939.79	939.79
2-4	3-1	128.62	0.19	0.19	0.51	0.1	0.1	8.8	8.8	6.4	0.62	0.62	17.36	4.65	15	4.28	936	941.5	936.16	941.81	940.79	946.25
2-2	4-1	113.49	0.54	1.31	0.51	0.28	0.67	6.8	8.3	6.5	4.33	4.33	14.33	5.82	18	1.1	916.5	917.75	917.07	918.55	924.5	924.5
4-1	4-2	189.85	0.32	0.77	0.51	0.16	0.39	7.6	7.6	6.6	2.61	2.61	25.85	4.56	15	9.48	918	936	918.55	936.65	924.5	944.33
4-2	4-3	135.55	0.08	0.45	0.51	0.04	0.23	5.6	7.1	6.8	1.55	1.55	16.12	5.87	15	3.69	940	945	940.26	945.49	944.33	950.08
4-3	4-4	34	0.37	0.37	0.51	0.19	0.19	7	7	6.8	1.28	1.28	12.47	4.55	15	2.21	945.2	945.95	945.49	946.4	950.08	950.08
5-1	5-2	96.83	0.4	1.51	0.51	0.2	0.77	6.1	7.8	6.6	5.09	5.09	9.61	5.16	18	0.5	937	937.48	937.78	938.35	0	944
5-2	5-3	259.22	0.61	1.11	0.51	0.31	0.57	6.3	6.9	6.8	3.87	3.87	9.67	4.76	18	0.5	937.98	939.28	938.64	940.03	944	944
5-3	5-4	132.58	0.5	0.5	0.51	0.26	0.26	6.3	6.3	7	1.78	1.78	5.92	3.91	15	0.5	939.78	940.44	940.25	940.97	944	944
6-1	6-2	49.06	0	2.91	0.51	0	1.48	0	9.2	6.3	9.33	9.33	72.71	10.62	24	6.11	940	943	940.48	944.09	0	950.2
6-2	6-3	140.5	0.13	2.91	0.51	0.07	1.48	6.4	8.9	6.4	9.44	9.44	30.38	6.94	24	1.07	945	946.5	945.77	947.6	950.2	958.57
6-3	6-4	175.8	0.1	1.81	0.51	0.05	0.92	6.1	8.4	6.5	5.97	5.97	12.61	6.07	18	0.85	947	948.5	947.73	949.44	958.57	955.36
6-4	6-5R	79.6	0.7	0.98	0.51	0.36	0.5	7.6	7.6	6.6	3.32	3.32	6.65	4.93	15	0.63	949	949.5	949.62	950.23	955.36	954.54
6-4	6-5L	1	0.21	0.21	0.51	0.11	0.11	7	7	6.8	0.73	0.73	26.54	1.87	15	10	949.5	949.6	950.23	949.93	954.54	954.54
6-5	6-6	34	0.07	0.07	0.51	0.04	0.04	5.8	5.8	7.1	0.25	0.25	10.58	1.84	15	1.59	950	950.54	950.23	950.73	954.54	954.54
6-4	7-1R	50	0.17	0.73	0.51	0.09	0.37	8.2	8.2	6.5	2.42	2.42	8.39	4.94	15	1	949	949.5	949.46	950.12	955.36	954.87
6-4	7-1L	1	0.37	0.56	0.51	0.19	0.29	7.3	7.5	6.7	1.91	1.91	26.54	3.4	15	10	949.5	949.6	950.12	950.15	954.87	954.87
7-1	7-2	34	0.19	0.19	0.51	0.1	0.1	7.3	7.3	6.7	0.65	0.65	10.18	3.67	15	1.47	950	950.5	950.21	950.81		

100-YEAR INLET																						
D.S. Str.	Str. No.	Area (ac)	InletTime (min)	Int. (in/hr)	RunoffCoeff. (C)	Q=CIA (cfs)	Q Carry-over (cfs)	Q Captured (cfs)	Q Bypassed (cfs)	JunctType	CurbHeight (in)	CurbLength (ft)	GutterSlope (ft/ft)	GutterWidth (ft)	CrossSlope, Sw (ft/ft)	CrossSlope, Sx (ft/ft)	InletDepth (ft)	BypassDepth (ft)	BypassSpread (ft)	GutterDepth (ft)	GutterSpread (ft)	Bypass Str.
1-1	1-2	0.77	8.8	11.31	0.51	4.44	0	4.44	0	Dp-Curb	6	8	Sag	.....	0.02	0.02	0.32	n/a	n/a	0.32	16.22	Sag
2-1	2-2	0.28	5.3	12.75	0.51	1.82	0	1.82	0	Dp-Curb	6	8	Sag	.....	0.02	0.02	0.18	n/a	n/a	0.18	8.95	Sag
2-2	2-3	0.12	5.9	12.48	0.51	0.76	0.32	0.44	0.64	Curb	10	5	0.038	2	0.05	0.02	0.15	0.12	3.17	0.15	4.36	7
2-3	2-4	0.6	6.2	12.34	0.51	3.78	4.31	1.27	6.82	Curb	10	5	0.038	2	0.05	0.02	0.28	0.26	10.19	0.28	10.92	5
2-4	2-5R	0.4	6.4	12.26	0.51	2.5	6.82	9.32	0	Curb	10	5	Sag	2	0.05	0.02	0.67	n/a	n/a	0.67	30.26	Sag
2-4	2-5L	0.55	8.1	11.57	0.51	3.24	0	3.24	0	Curb	10	5	Sag	2	0.05	0.02	0.36	n/a	n/a	0.36	14.97	Sag
2-5	2-6R	0.16	6.5	12.21	0.51	1	0.64	1.64	0	Curb	10	5	Sag	2	0.05	0.02	0.25	n/a	n/a	0.25	9.5	Sag
2-5	2-6L	0.08	6.2	12.34	0.51	0.5	0	0.5	0	Curb	10	5	Sag	2	0.05	0.02	0.15	n/a	n/a	0.15	4.32	Sag
2-4	3-1	0.19	8.8	11.31	0.51	1.1	0	1.1	0	Dp-Curb	6	4	Sag	.....	0.02	0.02	0.2	n/a	n/a	0.2	10.13	Sag
2-2	4-1	0.54	6.8	12.08	0.51	3.33	0	3.33	0	Dp-Curb	6	4	Sag	.....	0.02	0.02	0.43	n/a	n/a	0.43	21.26	Sag
4-1	4-2	0.32	7.6	11.76	0.51	1.92	0	1.92	0	Dp-Curb	6	4	Sag	.....	0.02	0.02	0.29	n/a	n/a	0.29	14.72	Sag
4-2	4-3	0.08	5.6	12.61	0.51	0.51	0.1	0.3	0.32	Curb	10	5	0.05	2	0.05	0.02	0.12	0.09	1.82	0.12	2.8	3
4-3	4-4	0.37	7	12	0.51	2.26	2.99	0.95	4.31	Curb	10	5	0.05	2	0.05	0.02	0.23	0.22	7.92	0.23	8.63	4
5-1	5-2	0.4	6.1	12.39	0.51	2.53	0	2.53	0	Dp-Curb	6	16	Sag	.....	0.02	0.02	0.14	n/a	n/a	0.14	7.02	Sag
5-2	5-3	0.61	6.3	12.3	0.51	3.83	0	3.83	0	Dp-Curb	6	16	Sag	.....	0.02	0.02	0.19	n/a	n/a	0.19	9.25	Sag
5-3	5-4	0.5	6.3	12.3	0.51	3.14	0	3.14	0	Dp-Curb	6	16	Sag	.....	0.02	0.02	0.16	n/a	n/a	0.16	8.1	Sag
6-1	6-2	0	0	0	0.51	0	.....	.....	.....	MH	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
6-2	6-3	0.13	6.4	12.26	0.51	0.81	0	0.43	0.38	Curb	10	5	0.02	2	0.05	0.02	0.15	0.11	2.74	0.15	4.44	19
6-3	6-4	0.1	6.1	12.39	0.51	0.63	0.38	0.49	0.52	Curb	10	5	0.02	2	0.05	0.02	0.16	0.13	3.41	0.16	4.98	13
6-4	6-5R	0.7	7.6	11.76	0.51	4.2	4.4	8.6	0	Curb	10	5	Sag	2	0.05	0.02	0.63	n/a	n/a	0.63	28.69	Sag
6-4	6-5L	0.21	7	12	0.51	1.29	0	1.29	0	Curb	10	5	Sag	2	0.05	0.02	0.22	n/a	n/a	0.22	8.07	Sag
6-5	6-6	0.07	5.8	12.52	0.51	0.45	0	0.34	0.1	Curb	10	5	0.01	2	0.05	0.02	0.14	0.08	1.61	0.14	3.84	12
6-4	7-1R	0.17	8.2	11.53	0.51	1	0	0.53	0.47	Curb	10	5	0.014	2	0.05	0.02	0.17	0.13	3.59	0.17	5.42	13
6-4	7-1L	0.37	7.3	11.88	0.51	2.24	0	0.82	1.42	Curb	10	5	0.014	2	0.05	0.02	0.22	0.19	6.41	0.22	7.87	13
7-1	7-2	0.19	7.3	11.88	0.51	1.15	0	0.57	0.58	Curb	10	5	0.014	2	0.05	0.02	0.18	0.14	4.06	0.18	5.81	13
6-3	8-1	0.97	8.6	11.38	0.51	5.63	0	1.23	4.4	Curb	10	5	0.02	2	0.05	0.02	0.27	0.25	9.71	0.27	10.74	20
9-1	9-2	0	0	0	0.51	0	.....	.....	.....	MH	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
9-2	9-3R	0.25	7.5	11.8	0.51	1.5	0	1.5	0	Curb	10	5	Sag	2	0.05	0.02	0.24	n/a	n/a	0.24	8.97	Sag
9-2	9-3L	0.19	6.7	12.13	0.51	1.18	0	1.18	0	Curb	10	5	Sag	2	0.05	0.02	0.21	n/a	n/a	0.21	7.61	Sag
10-1	10-2	0.35	6.3	12.3	0.51	2.2	0	2.2	0	Dp-Curb	6	8	Sag	.....	0.02	0.02	0.2	n/a	n/a	0.2	10.14	Sag
10-2	10-3	1.26	9.7	10.99	0.51	7.06	0	7.06	0	Dp-Curb	6	16	Sag	.....	0.02	0.02	0.28	n/a	n/a	0.28	13.93	Sag

100-YEAR PIPE																						
D.S. Str.	U.S. Str.	LineLength (ft)	Incr Area (ac)	TotalArea (ac)	RunoffCoeff. (C)	Incr C x A	Total C x A	InletTime (min)	TimeConc (min)	Rnfallnt (in/hr)	TotalRunoff (cfs)	TotalFlow (cfs)	CapacFull (cfs)	Veloc (ft/s)	PipeSize (in)	PipeSlope (%)	Inv ElevDn (ft)	Inv ElevUp (ft)	HGLDn (ft)	HGLUp (ft)	Grnd/RimDn (ft)	Grnd/RimUp (ft)
1-1	1-2	139.4	0.77	0.77	0.51	0.39	0.39	8.8	8.8	11.3	4.44	4.44	12.32	4.3	15	2.15	912	915	915.4	915.85	0	918.5
2-1	2-2	50.18	0.28	3.69	0.51	0.14	1.88	5.3	9.5	11.1	20.84	20.84	71.89	7.11	24	5.98	912	915	915.4	916.63	0	924.5
2-2	2-3	138.03	0.12	2.1	0.51	0.06	1.07	5.9	9.3	11.1	11.92	11.92	40.78	13.65	18	8.93	920	932.32	920.56	933.63	924.5	941.27
2-3	2-4	46.47	0.6	1.98	0.51	0.31	1.01	6.2	9.2	11.2	11.28	11.28	14.16	7.95	18	1.08	932.82	933.32	933.83	934.6	941.27	940.79
2-4	2-5R	94.12	0.4	1.19	0.51	0.2	0.61	6.4	8.1	11.6	7.02	7.02	9.4	7.36	15	1.25	933.82	935	934.63	936.06	940.79	939.79
2-4	2-5L	1	0.55	0.55	0.51	0.28	0.28	8.1	8.1	11.6	3.24	3.24	26.54	3.66	15	10	935	935.1	936.06	935.83	939.79	939.79
2-5	2-6R	34	0.16	0.24	0.51	0.08	0.12	6.5	6.5	12.2	1.49	1.49	7.75	3.11	15	0.85	935.5	935.79	936.06	936.27	939.79	939.79
2-5	2-6L	1	0.08	0.08	0.51	0.04	0.04	6.2	6.2	12.3	0.5	0.5	26.55	1.83	15	10	935.79	935.89	936.27	936.17	939.79	939.79
2-4	3-1	128.62	0.19	0.19	0.51	0.1	0.1	8.8	8.8	11.3	1.1	1.1	17.36	5.5	15	4.28	936	941.5	936.21	941.91	940.79	946.25
2-2	4-1	113.49	0.54	1.31	0.51	0.28	0.67	6.8	8.2	11.5	7.7	7.7	14.33	6.97	18	1.1	916.5	917.75	917.28	918.82	924.5	924.5
4-1	4-2	189.85	0.32	0.77	0.51	0.16	0.39	7.6	7.6	11.8	4.62	4.62	25.85	5.22	15	9.48	918	936	918.82	936.87	924.5	944.33
4-2	4-3	135.55	0.08	0.45	0.51	0.04	0.23	5.6	7.1	12	2.74	2.74	16.12	6.96	15	3.69	940	945	940.35	945.66	944.33	950.08
4-3	4-4	34	0.37	0.37	0.51	0.19	0.19	7	7	12	2.26	2.26	12.47	4.67	15	2.21	945.2	945.95	945.66	946.55	950.08	950.08
5-1	5-2	96.83	0.4	1.51	0.51	0.2	0.77	6.1	8.3	11.5	8.85	8.85	9.61	5.01	18	0.5	937	937.48	941.49	941.9	0	944
5-2	5-3	259.22	0.61	1.11	0.51	0.31	0.57	6.3	7.2	11.9	6.76	6.76	9.67	3.82	18	0.5	937.98	939.28	942.23	942.87	944	944
5-3	5-4	132.58	0.5	0.5	0.51	0.26	0.26	6.3	6.3	12.3	3.14	3.14	5.92	2.56	15	0.5	939.78	940.44	943.21	943.39	944	944
6-1	6-2	49.06	0	2.91	0.51	0	1.48	0	9	11.2	16.65	16.65	72.71	6.68	24	6.11	940	943	941.49	944.47	0	950.2
6-2	6-3	140.5	0.13	2.91	0.51	0.07	1.48	6.4	8.8	11.3	16.8	16.8	30.38	8.34	24	1.07	945	946.5	946.06	947.98	950.2	958.57
6-3	6-4	175.8	0.1	1.81	0.51	0.05	0.92	6.1	8.4	11.5	10.59	10.59	12.61	7.36	18	0.85	947	948.5	948.05	949.75	958.57	955.36
6-4	6-5R	79.6	0.7	0.98	0.51	0.36	0.5	7.6	7.6	11.8	5.88	5.88	6.65	5.91	15	0.63	949	949.5	949.91	950.48	955.36	954.54
6-4	6-5L	1	0.21	0.21	0.51	0.11	0.11	7	7	12	1.29	1.29	26.54	2.25	15	10	949.5	949.6	950.48	950.05	954.54	954.54
6-5	6-6	34	0.07	0.07	0.51	0.04	0.04	5.8	5.8	12.5	0.45	0.45	10.58	1.73	15	1.59	950	950.54	950.48	950.8	954.54	954.54
6-4	7-1R	50	0.17	0.73	0.51	0.09	0.37	8.2	8.2	11.5	4.29	4.29	8.39	5.25	15	1	949	949.5	949.75	950.34	955.36	954.87
6-4	7-1L	1	0.37	0.56	0.51	0.19	0.29	7.3	7.5	11.8	3.38	3.38	26.54	4.16	15	10	949.5	949.6	950.34	950.34	954.87	954.87
7-1	7-2	34	0.19	0.19	0.51	0.1	0.1	7.3	7.3	11.9	1.15	1.15	10.18	3.71	15	1.47	950	950.5	950.34	950.92	954.87	954.87
6-3	8-1	35.8	0.97	0.97	0.51	0.49	0.49	8.6	8.6	11.4	5.63	5.63	11.48	7.44	15	1.87	954	954.67	954.62	955.63	958.57	958.33
9-1	9-2	75	0	0.44	0.51	0	0.22	0	7.8	11.7	2.62	2.62	8.67	5.13	15	1.07	942	942.8	942.47	943.45	0	950.86
9-2	9-3R	96.85	0.25	0.44	0.51	0.13	0.22	7.5	7.5	11.8	2.65	2.65	24.13	5.39	15	8.26	943	951	943.45	951.65	950.86	956.92
9-2	9-																					

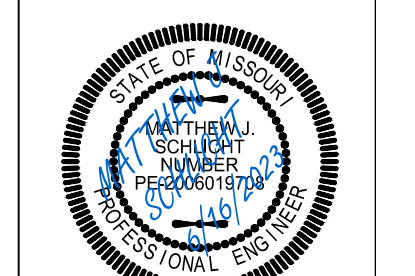


Professional Registration
Missouri
Engineering 2005002186-D
Surveying 2005008319-D
Kansas
Engineering E-1685
Surveying LS-218
Oklahoma
Engineering S254
Nebraska
Engineering CA2821

Part of the Southeast 1
Section 27, Township 48 North, Range 31 West
Lee's Summit, Jackson County, Missouri

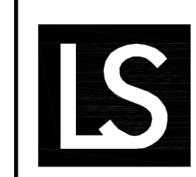
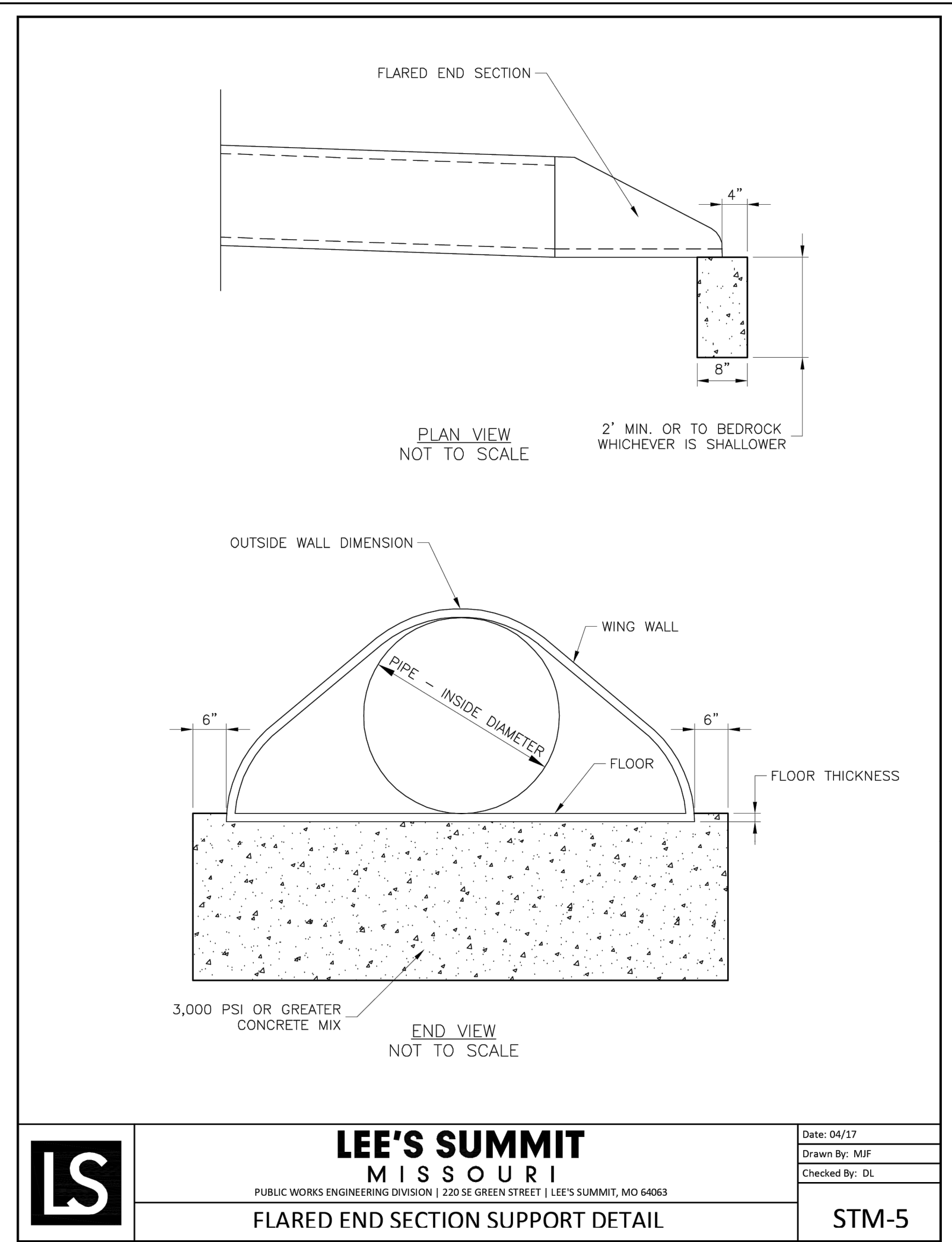
Project:
WOODLAND OAKS
LSMO
Issue Date:
February 25, 2021

Construction Details
Construction Plans for:
WOODLAND OAKS
Lots 1 thru 42
Lee's Summit, Jackson County, Missouri



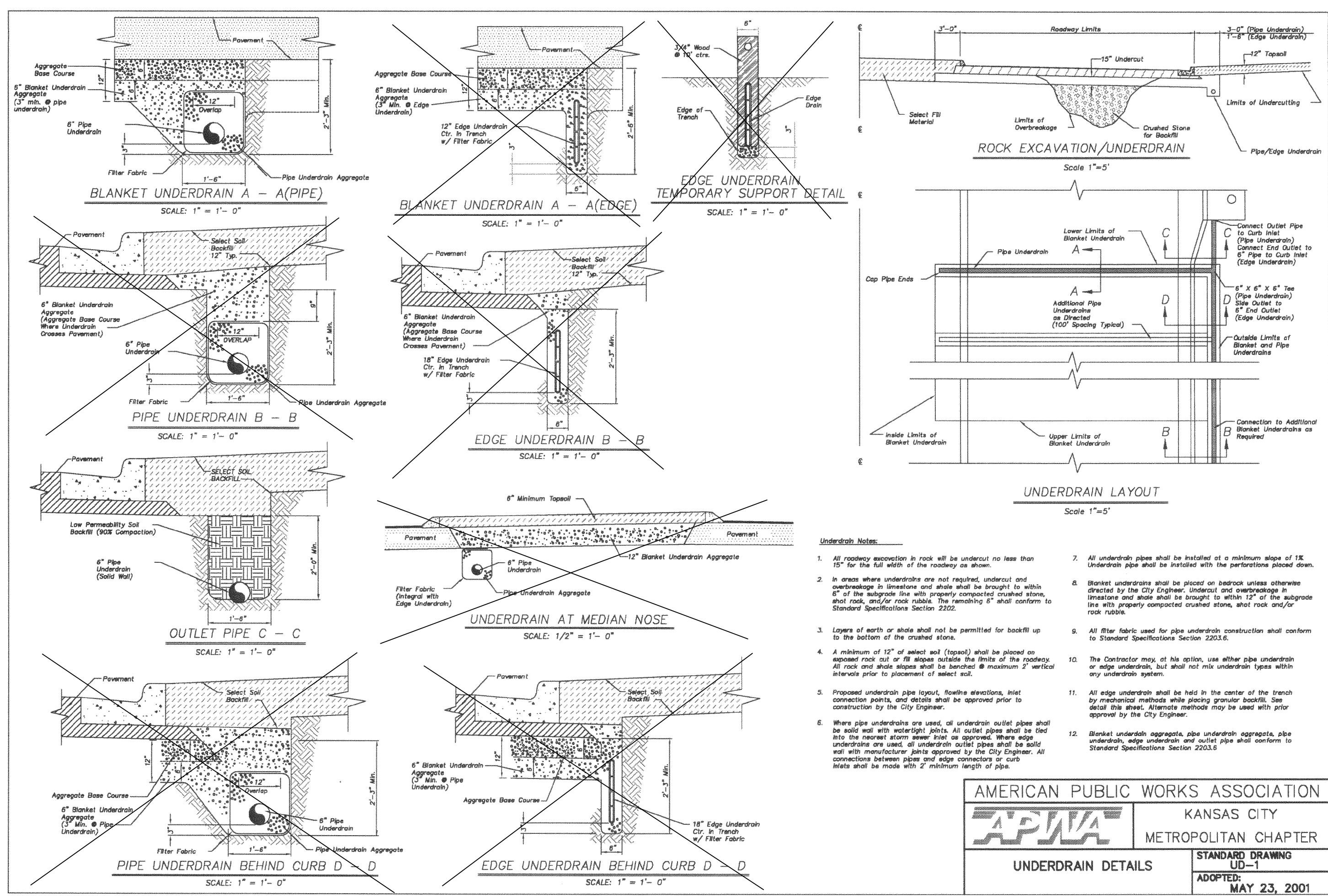
Matthew J. Schlicht
MO PE 2006019708
KS PE 19071
OK PE 25226
NE PE E-14335

REVISIONS
REV. 5/5/2021
REV. 5/26/2021
REV. 6/22/2021
REV. 6/29/2021
Updated 6/16/2023



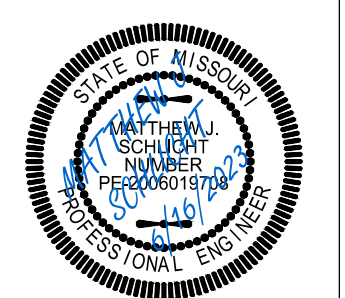
LEE'S SUMMIT
MISSOURI
PUBLIC WORKS ENGINEERING DIVISION | 230 SE GREEN STREET | LEE'S SUMMIT, MO 64663

Date: 04/17
Drawn By: MIF
Checked By: DL
STM-5



- Underdrain Notes:**
- All roadway excavation in rock will be underdrain no less than 12" for the full width of the roadway on which.
 - In areas where underdrains are not required, underdrain and overdrainage in limestone and shale shall be brought to within 6" of the highway line with properly compacted crushed stone, and rock and/or rock rubble. The remaining 6" shall conform to Standard Specifications Section 2202.
 - Layers of earth or shale shall not be permitted for backfill up to the bottom of the crushed stone.
 - A minimum of 12" of select soil (topsoil) shall be placed on exposed rock and/or its slopes outside the limits of the roadway. All rock and shale slopes shall be banked @ maximum 2' vertical intervals prior to placement of select soil.
 - Proposed underdrain pipe layout, location, elevation, joint connection points, and details shall be approved prior to construction by the City Engineer.
 - Where pipe underdrains are used, all underdrain outlet pipes shall be tied into the main waterline. All outlet pipes shall be tied into the main waterline. Where pipe is approved, shall be tied into the main waterline. Where pipe is approved, shall be tied into the main waterline. Where pipe is approved, shall be tied into the main waterline.
 - All underdrain pipes shall be installed at a minimum slope of 1% Underdrain pipe shall be installed with the partitions placed down.
 - Blanket underdrains shall be placed on bottom unless otherwise directed by the City Engineer. Underdrain and overdrainage in limestone and shale shall be brought to within 12" of the highway line with properly compacted crushed stone, and rock and/or rock rubble.
 - All pipe fabric used for pipe underdrain construction shall conform to Standard Specifications Section 2203.6.
 - The Contractor may, at his option, use either pipe underdrain or edge underdrain, but shall not mix underdrain types within any underdrain system.
 - All edge underdrains shall be tied in the center of the trench by mechanical methods with piping granular backfill. See detail for detail. Alternate methods may be used with prior approval by the City Engineer.
 - Where pipe underdrains are used, all underdrain outlet pipes shall be tied into the main waterline. All outlet pipes shall be tied into the main waterline. Where pipe is approved, shall be tied into the main waterline. Where pipe is approved, shall be tied into the main waterline.
 - 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
APWA KANSAS CITY METROPOLITAN CHAPTER
STANDARD DRAWING UD-1
ADOPTED: MAY 23, 2001



Matthew J. Schlicht
MO PE 2006019708
KS PE 19071
OK PE 25226
NE PE E-143325

- REVISIONS
- REV. 5/5/2021
 - REV. 5/26/2021
 - REV. 6/22/2021
 - REV. 6/29/2021

Updated 6/16/2023