

STREET & STORM SEWER PLANS
FOR
ORCHARD WOODS
IN THE CITY OF LEE'S SUMMIT, JACKSON COUNTY, MISSOURI

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UTILITY COMPANIES:

MISSOURI GAS ENERGY (816) 969-2218
LUCAS WALLS (LUCAS.WALLS@SUG.COM)
3025 SOUTHEAST CLOVER DRIVE
LEE'S SUMMIT, MO 64082

EVERGY (816) 347-4339
PHILLIP INGRAM (PHILLIP.INGRAM@KCPL.COM)
RON DEJARNETTE (RON.DEJARNETTE@KCPL.COM) (816) 347-4316
1300 HAMBLEM ROAD
LEE'S SUMMIT, MO 64081

STORM SEWER (PUBLIC WORKS DEPARTMENT) (816) 969-1800
220 SE GREEN STREET
LEE'S SUMMIT, MO 64063

SANITARY SEWER & WATER (WATER UTILITIES DEPT.) (816)-969-1900
1200 SE HAMBLEM ROAD,
LEE'S SUMMIT, MO 64081

AT&T (913) 383-4929
MR. CLAYTON ANSPAUGH (CA4089@ATT.COM) (913) 383-4849-FAX
9444 NALL AVENUE
OVERLAND PARK, KANSAS 66207

OIL-GAS WELLS:

Missouri Department of Natural Resources, Missouri Geological Survey, GeoSTRAT website indicates there are two wells drilled on this property. 10 #095-00155 is shown as a dry hole, dated 10/27/1938. 10 # 0005120 is shown as an exploratory hole, dated 10/28/1938. Phelps Engineering has made a field investigation and found no visible evidence of these wells on the property, as of this date.

PRE-CONSTRUCTION MEETING NOTE:

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.

BENCHMARK:

"+" CUT S.W. CORNER CURB INLET EAST SIDE OF INTERSECTION OF NE SUWANNEE DRIVE & NE PIEDMONT DRIVE
ELEV.=965.22

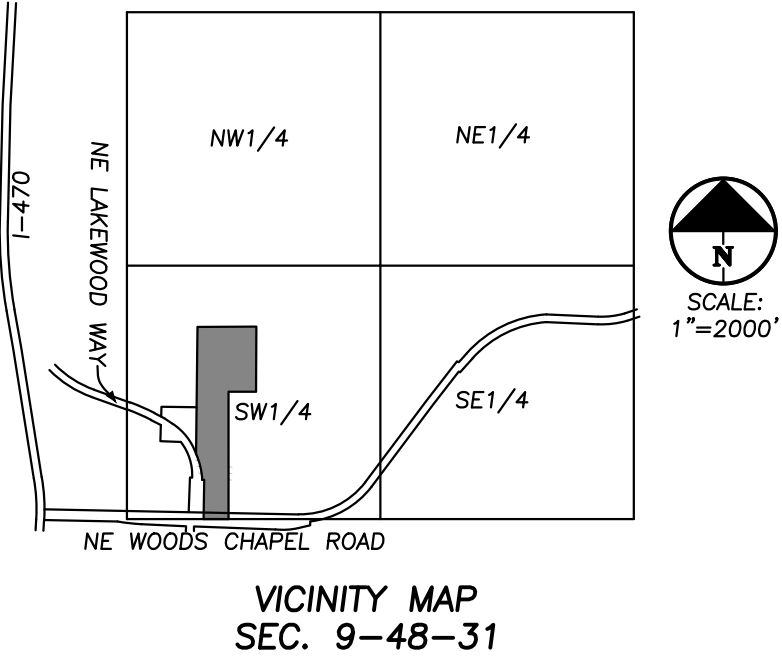


PREPARED & SUBMITTED BY:

PHELPS ENGINEERING, INC.
1270 N. WINCHESTER
OLATHE, KS 66061
913-393-1155 OFFICE
913-393-1166 FAX
CONTACT: JUDD CLAUSSEN, P.E.

OWNER:

ENTRES DEVELOPMENT, LLC
ATTN: DANIEL VILLANUEVA
424 NE BROCKTON DR
LEE'S SUMMIT MO, 64064
(310) 760-6205



LEGEND

PROPERTY LINE



UTILITY NOTES:
VISUAL INDICATIONS OF UTILITIES ARE AS SHOWN.
UNDERGROUND LOCATIONS SHOWN, AS FURNISHED BY THEIR LESSORS, ARE APPROXIMATE AND SHOULD BE VERIFIED IN THE FIELD AT THE TIME OF CONSTRUCTION. FOR ACTUAL FIELD LOCATIONS OF UNDERGROUND UTILITIES CALL 811.

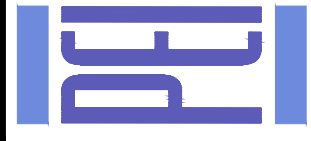
FLOOD NOTE:

THIS PROPERTY LIES WITHIN ZONE X, DEFINED AS AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN, AS SHOWN ON THE FLOOD INSURANCE RATE MAP PREPARED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY FOR THE CITY OF LEE'S SUMMIT, COMMUNITY NO. 290174, JACKSON COUNTY, MISSOURI, PANEL NO. 29095C0430G, AND DATED JANUARY 20, 2017.



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PLANNING
ENGINEERING
IMPLEMENTATION



COVER SHEET
ORCHARD WOODS
LEE'S SUMMIT, JACKSON COUNTY, MISSOURI

PROJECT NO.	211142	No.	Date	By	App.
DATE	10-21-2022	1.	2-27-23	JMO	DEU
CHECKED	DEU	2.	4-24-23	JMO	DEU
CORPORATE	DATE OF AUTHORIZATION	3.	6-15-23	BJG	DEU
LAND SURVEYING	- LS-82				
ENGINEERING	- E-361				
CERTIFICATE OF AUTHORIZATION					
LAND SURVEYING	- 200701028				
ENGINEERING	- 200700208				

SHEET
1

GENERAL NOTES:

1. ALL CONSTRUCTION TO FOLLOW THE CITY OF LEE'S SUMMIT DESIGN AND CONSTRUCTION MANUAL AS ADOPTED BY ORDINANCE 5813.
2. ALL WORKMANSHIP AND MATERIALS SHALL BE SUBJECT TO THE INSPECTION AND APPROVAL OF THE ENGINEERING DEPARTMENT OF THE CITY OF LEE'S SUMMIT, MISSOURI.
3. LINEAL FOOT MEASUREMENTS SHOWN ON THE PLANS ARE HORIZONTAL MEASUREMENTS, NOT SLOPE MEASUREMENTS. ALL PAYMENTS SHALL BE MADE ON HORIZONTAL MEASUREMENTS.
4. NO GEOLOGICAL INVESTIGATION HAS BEEN PERFORMED ON THE SITE.
5. THE UTILITY LOCATIONS SHOWN ON THESE PLANS ARE TAKEN FROM UTILITY COMPANY RECORDS AND APPARENT FIELD LOCATIONS. THE CONTRACTOR SHALL VERIFY THE LOCATION AND DEPTH OF ALL UTILITIES PRIOR TO CONSTRUCTION.
6. THE CONTRACTOR SHALL ADHERE TO THE PROVISIONS OF THE SENATE BILL NUMBER 583, 78TH GENERAL ASSEMBLY OF THE STATE OF MISSOURI. THE BILL REQUIRES THAT ANY PERSON OR FIRM DOING EXCAVATION ON PUBLIC RIGHT OF WAY DO SO ONLY AFTER GIVING NOTICE TO, AND OBTAINING INFORMATION FROM, UTILITY COMPANIES. STATE LAW REQUIRES 48 HOURS ADVANCE NOTICE. THE CONTRACTOR MAY ALSO UTILIZE THE FOLLOWING TOLL FREE PHONE NUMBER PROVIDED BY "MISSOURI ONE CALL SYSTEM, INC.": 1-800-DIG-RITE. THIS PHONE NUMBER IS APPLICABLE ANYWHERE WITHIN THE STATE OF MISSOURI. PRIOR TO COMMENCEMENT OF WORK, THE CONTRACTOR SHALL NOTIFY ALL THOSE COMPANIES WHICH HAVE FACILITIES IN THE NEAR VICINITY OF THE CONSTRUCTION TO BE PERFORMED.
7. PRIOR TO ORDERING PRECAST STRUCTURES, SHOP DRAWING SHALL BE SUBMITTED TO THE DESIGN ENGINEER FOR APPROVAL. AFTER APPROVAL OF THE SHOP DRAWINGS, A COPY OF THE APPROVED AND SIGNED SHOP DRAWINGS SHALL BE PROVIDED TO THE FIELD INSPECTOR.
8. THE CONTRACTOR SHALL PROTECT ALL MAJOR TREES FROM DAMAGE. NO TREE SHALL BE REMOVED WITHOUT PERMISSION OF THE OWNER, UNLESS SHOWN OTHERWISE.
9. CLEARING AND GRUBBING OPERATIONS AND DISPOSAL OF ALL DEBRIS THEREFROM SHALL BE PERFORMED BY THE CONTRACTOR IN STRICT ACCORDANCE WITH ALL LOCAL CODES AND ORDINANCES.
10. ALL WASTE MATERIAL RESULTING FROM THE PROJECT SHALL BE DISPOSED OF OFF-SITE BY THE CONTRACTOR, OR AS DIRECTED BY THE OWNER.
11. ALL EXCAVATIONS SHALL BE UNCLASSIFIED. NO SEPARATE PAYMENT WILL BE MADE FOR ROCK EXCAVATION.
12. THE CONTRACTOR SHALL CONTROL THE EROSION AND SILTATION DURING ALL PHASED OF CONSTRUCTION, AND SHALL KEEP THE STREETS CLEAN OF MUD AND DEBRIS.
13. ALL MANHOLES, CATCH BASINS, UTILITY VALVES AND METER PITS TO BE ADJUSTED OR REBUILT TO GRADE AS REQUIRED.
14. 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
15. THE CONTRACTOR SHALL CONTACT THE RIGHT OF WAY INSPECTOR AT 816-969-1800 PRIOR TO ANY LAND DISTURBANCE ACTIVITIES WITHIN THE RIGHT OF WAY. THESE ACTIVITIES MAY REQUIRE A PERMIT.
16. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN ALL TRAFFIC HANDLING MEASURES NECESSARY TO ENSURE THAT THE GENERAL PUBLIC IS PROTECTED AT ALL TIMES. TRAFFIC CONTROL SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD-LATEST EDITION).

EARTHWORK:

1. It is recommended that a Geotechnical Engineer observe and document all earthwork activities.
2. Contours have been shown at 1-foot or 2-foot intervals, as indicated. Grading shall consist of completing the earthwork required to bring the physical ground elevations of the existing site to the finished grade (or sub-grade) elevations provided on the plans as spot grades, contours or others means as indicated on the plans.
3. The existing site topography depicted on the plans by contouring has been established by aerial photography and field verified by g.p.s. observation near 2-20-19.The contour elevations provided may not be exact ground elevations, but rather interpretations of such. Accuracy shall be considered to be such that not more than 10 percent of spot elevation checks shall be in error by more than one-half the contour interval provided, as defined by the National Map Accuracy Standards. Any quantities provided for earthwork volumes are established using this topography contour accuracy, and therefore the inherent accuracy of any earthwork quantity is assumed from the topography accuracy.
4. Proposed contours are to approximate finished grade.
5. Unless otherwise noted, payment for earthwork shall include backfilling of the curb and gutter, sidewalk and further manipulation of utility trench spoils. The site shall be left in a mowable condition and positive drainage maintained throughout.
6. Unless otherwise noted, all earthwork is considered Unclassified. No additional compensation will be provided for rock or shale excavation, unless specifically stated otherwise.
7. Prior to earthwork activities, pre-disturbance erosion and sediment control devices shall be in place per the Storm Water Pollution Prevention plan and/or the Erosion and Sediment Control Plan prepared for this site.
8. All topsoil shall be stripped from all areas to be graded and stockpiled adjacent to the site at an area specified by the project owner or his appointed representative. Vegetation, trash, trees, brush, tree roots and limbs, rock fragments greater than 6-inches and other deleterious materials shall be removed and properly disposed of offsite or as directed by the owner or his appointed representative.
9. Unless otherwise specified in the Geotechnical Report, all fills shall be placed in maximum 6-inch lifts and compacted to 95-percent of maximum density as defined using a standard proctor test (AASHTO T99/ASTM 698).
10. Fill materials shall be per Geotechnical Report and shall not include organic matter, debris or topsoil. All fills placed on slopes greater than 6:1 shall be benched.
11. The Contractor shall be responsible for redistributing the topsoil over proposed turf and landscaped areas to a minimum depth of 6-inches below final grade.
12. All areas shall be graded for positive drainage. Unless noted otherwise the following grades shall apply:
a. Turf Areas -2.5% Minimum, 4H:1V Maximum
b. Paved Areas -1.2% Minimum, 5% Maximum
13. All disturbed areas shall be fertilized, seeded and mulched immediately after earthwork activities have ceased. Seeding shall be per the Erosion and Sediment Control Plan and/or Landscape Plan. If not specified seeding shall be per APWA Section 2400, latest edition. Unless otherwise noted, seeding shall be subsidiary to the contract price for earthwork and grading activities.
14. All disturbed areas in the right-of-way shall be sodded.
15. Underdrains are recommended for all paved areas adjacent to irrigated turf and landscaped beds.
16. Contractor shall adhere to the reporting requirements outlined in the Storm Water Pollution Prevention Plan (SWPPP) prepared for this project. Erosion and Sediment control devices shall be properly maintained and kept clean of silt and debris and in good working order. Additional erosion and sediment control measures shall be installed as required.

STREET NOTES:

1. ALL STREET CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE CITY OF LEE'S SUMMIT DESIGN AND CONSTRUCTION MANUAL. ALL APPLICABLE AASHTO STANDARDS HAVE BEEN MET.
2. ALL INSPECTION OF STREET CONSTRUCTION TO BE PERFORMED BY THE CITY OF LEE'S SUMMIT DEVELOPMENT ENGINEERING.
3. CURB RETURN RADII SHALL BE 25' AT BACK OF CURB UNLESS OTHERWISE NOTED.
4. SUBGRADE TO BE COMPACTED TO 95% STANDARD PROCTOR DENSITY.
5. ASSUMED DESIGN SPEED = 25 MPH (RESIDENTIAL).
6. MINIMUM STOPPING SIGHT DISTANCE = 155 FEET.
7. MINIMUM K, SAG CURVE = 26 (14 WITH LIGHTING), CREST CURVE = 12.
8. GRADE INTERSECTIONS TO DRAIN AS SHOWN.
9. SSD = STOPPING SIGHT DISTANCE.
10. ALL ADA SIDEWALK RAMPS SHALL BE CONSTRUCTED BY THE DEVELOPER WITH THE PUBLIC INFRASTRUCTURE.

UTILITIES:

1. Existing utilities have been shown to the greatest extent possible based upon information provided to the Engineer. The contractor is responsible for contacting the respective utility companies and field locating utilities prior to construction and identifying any potential conflicts. All conflicts shall immediately be brought to the attention of the Engineer.
2. The contractor shall be responsible for coordinating any required utility relocations. Utilities damaged through the negligence of the contractor shall be repaired at the contractor's expense.
3. Contractor shall verify flow-lines and structure tops prior to construction, and shall notify Engineer of any discrepancies. Provide shop drawings for all precast and manufactured utility structures for review by the Engineer prior to construction of the structures.
4. Utility Separation: Waterlines shall have a minimum of 10 feet horizontal and 2 feet vertical separation from all sanitary sewer lines, manholes, and sanitary sewer service laterals, as measured from edge to edge. If minimum separations can not be obtained, concrete encasement of the sanitary line shall be required 10 feet in each direction of the conflict.
5. Payment for trenching, backfilling, pipe embedment, flowable fill, backfill materials, clean up, seeding, sodding and any other items necessary for the construction of the utility line shall be included in the contract price for the utility installation.
6. The Contractor shall be responsible for contacting respective utility companies 48-hours in advance for the inspection of any proposed utility main extension or service line or service connection to any existing main.
7. Trench spoils shall be neatly placed onsite adjacent to the trench, and compacted to prevent saturation and excess sediment runoff. Unsuitable materials, excess rock and shale, asphalt, concrete, trees, brush etc. shall be properly disposed of offsite. Materials may be wasted onsite at the direction of the Owner or his appointed representative.
8. All excavation is considered unclassified, unless noted otherwise. Unclassified excavation for utility trenching is subsidiary to the unit price provided for the pipe. Any quantity provided for rock excavation is estimated based on the best information provided to the Project Engineer. The Engineer has the authority to identify and define the physical characteristics to determine the classification. Unit price quantities for rock excavation will be paid at a trench width of the nominal pipe diameter of the installed main plus 18 inches. Contractor is required to dispose of excess rock from their trenches by disposing it in areas as specified by the Project Engineer.

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GENERAL NOTES
ORCHARD WOODS
LEE'S SUMMIT, JACKSON COUNTY, MISSOURI

PROJECT NO.	211142	No.	Date	Revisions:	By	App.
DATE:10-21-2022 CHECKED: DEU CORRODATE OF AUTHORIZATION LAND SURVEYING - LS-82 ENGINEERING - E-381	1.	1.	2-27-23	REVISED PER CITY COMMENTS	JMO	DEU
		2.	4-24-23	REVISED PER CITY COMMENTS	JMO	DEU
		3.	6-15-23	REVISED PER CITY COMMENTS	BJG	DEU
CORRODATE OF AUTHORIZATION LAND SURVEYING-2007010728 ENGINEERING-200705029						

SHEET

2

SUMMARY OF QUANTITIES			
PREPARED BY: MRH/KAD 6-15-2023			
STREET & GRADING			
ITEM		QUANTITY	
1	FINE GRADING - STEET R/W	2244	L.F.
2	CONCRETE CURB & GUTTER	4443	L.F.
3	2" ASPHALTIC CONCRETE INTERMEDIATE COURSE (SURFACE)	7114	S.Y
4	4" ASPHALTIC CONCRETE INTERMEDIATE COURSE (RES. BASE)	5646	S.Y
5	7.5" ASPHALTIC CONCRETE INTERMEDIATE COURSE (COLL. BASE)	1468	S.Y
6	FLY ASH SUBGRADE STABILIZATION (6" SUBGRADE STABILIZATION)	6852	S.Y
7	FLY ASH SUBGRADE STABILIZATION (9" SUBGRADE STABILIZATION)	1743	S.Y
8	5' CONCRETE SIDEWALK	435	L.F.
9	TYPE "A" SIDEWALK RAMP	8	EA.
10	TYPE "B" SIDEWALK RAMP	3	EA.
11	END OF ROAD OBJECT MARKERS	7	EA.
12	AREA GRADING - R/W	1	L.S.
13	STREET SIGN	3	EA.
14	CONCRETE ENTRANCE - CONCRETE	24	S.Y
15	DRIVE ENTRANCE - 8" ASPHALT	31	S.Y
16	DRIVE ENTRANCE 6" AGGREGATE BASE	42	S.Y
17	RETAINING WALL	700	F.F.
ANY DEMOLITION OR REMOVAL OF ANY STRUCTURES AND DEBRIS SHALL BE CONSIDERED SUBSIDIARY TO THE WORK PERFORMED BY THE GRADING CONTRACTOR			
STORM SEWER			
ITEM		QUANTITY	
1	15" HDPE**	457	L.F.
2	36" HDPE**	767	L.F.
3	42" HDPE**	97	L.F.
4	48" HDPE**	55	L.F.
5	15" RCP**	57	L.F.
6	42" RCP**	36	L.F.
7	4'x4' AREA INLET	3	EA.
8	5'x4' AREA INLET	1	EA.
9	6'x5' AREA INLET	1	EA.
10	6'x5' JUNCTION BOX	1	EA.
11	6'x6' JUNCTION BOX	1	EA.
12	6'x4' CURB INLET	3	EA.
13	6'x5' CURB INLET	1	EA.
14	6'x6' CURB INLET	3	EA.
15	7'x4' CURB INLET	1	EA.
16	8'x6' SPECIAL OUTLET STRUCTURE	1	EA.
17	42" RCP END SECTION W/ TOEWALL	1	EA.
18	36" RCP END SECTION W/TOEWALL	1	EA.
19	15" RCP END SECTION W/TOEWALL	1	EA.
20	150# MIN. STONE RIP-RAP	51	S.Y.
21	REMOVE EXISTING END SECTION	1	EA.
22	CONNECT TO EXISTING STRUCTURE	1	EA.
** UNCLASSIFIED TRENCH & TAMPED BACKFILL			



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QUANTITIES
ORCHARD WOODS
LEE'S SUMMIT, JACKSON COUNTY, MISSOURI

PROJECT NO.	211142	No.	Date	Revisions:		By	App.
				REVISED PER CITY COMMENTS	DATE		
DATE: 10-21-2022 DRAWN: BAG	1.	2.	2-27-23	REVISED PER CITY COMMENTS	4-24-23	JMO	DEU
				REVISED PER CITY COMMENTS	6-15-23	BAG	DEU
CHECKED: DEU APPROVED: DEU	2.	3.		REVISED PER CITY COMMENTS			
COORDINATE OF AUTHORIZATION							
LAND SURVEYING - LS-82							
ENGINEERING - E-301							
COORDINATE OF AUTHORIZATION							
LAND SURVEYING - 2007001028							
ENGINEERING - 2007001028							

SHEET

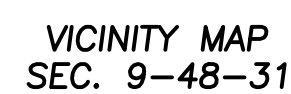
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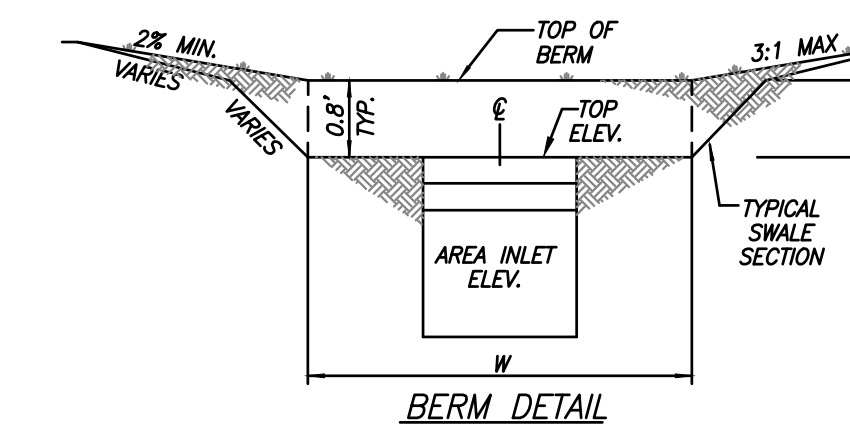
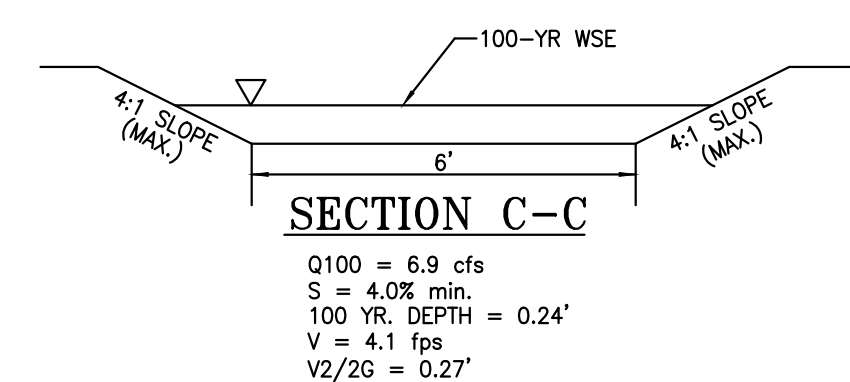
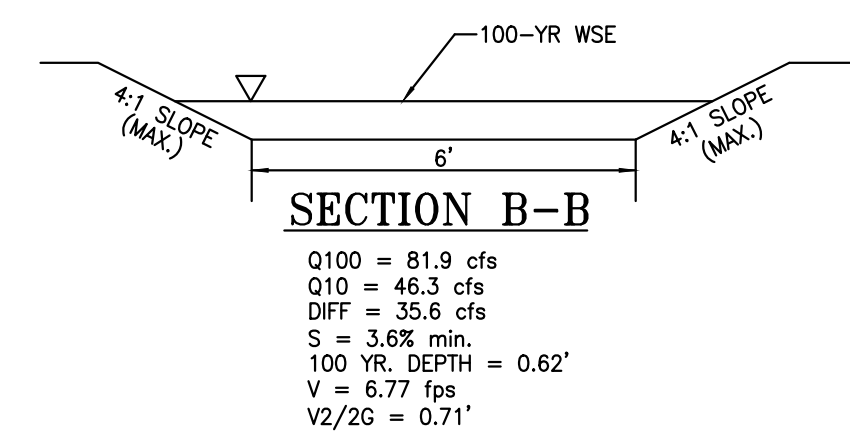
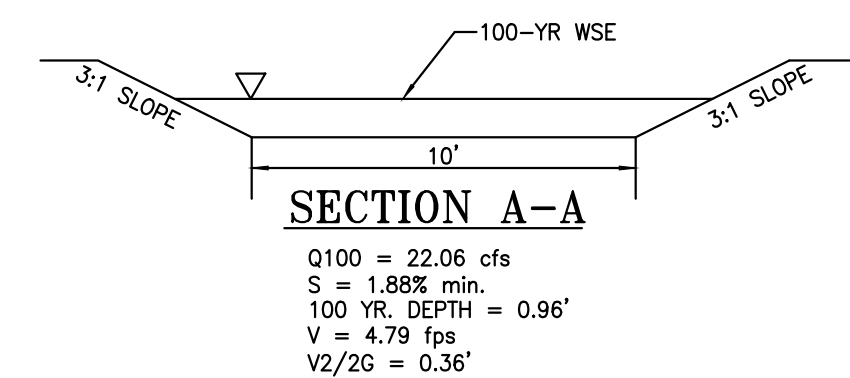
MISSOURI DEPARTMENT OF NATURAL RESOURCES, MISSOURI GEOLOGICAL SURVEY, GEOSTRAT WEBSITE INDICATES THERE ARE TWO WELLS DRILLED ON THIS PROPERTY. ID #095-00155 IS SHOWN AS A DRY HOLE, DATED 10/27/1938. ID# 0005120 IS SHOWN AS AN EXPLORATORY HOLE, DATED 10/28/1938. PHELPS ENGINEERING HAS MADE A FIELD INVESTIGATION AND FOUND NO VISIBLE EVIDENCE OF THESE WELLS ON THE PROPERTY, AS OF THIS DATE.

FLOOD NOTE:
THIS PROPERTY LIES WITHIN ZONE X, DEFINED AS AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN, AS SHOWN ON THE FLOOD INSURANCE RATE MAP PREPARED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY FOR THE CITY OF LEE'S SUMMIT, COMMUNITY NO. 290174, JACKSON COUNTY, MISSOURI, PANEL NO. 2909SC0430G, AND DATED JANUARY 20, 2017.

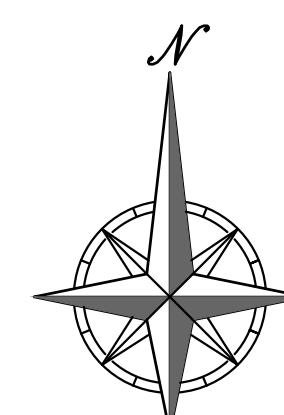
Raw Excavation	26,166 Cu. Yds.	
In Place Compaction (+15%)	-24,524 Cu. Yds.	
<u>Pavement Adjustment</u>	<u>1,776 Cu. Yds.</u>	(assume 9" of additional excavation)
On Site Net	3,418 Cu. Yds.	



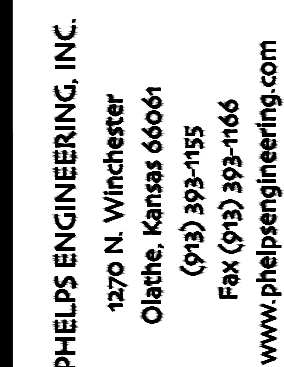
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 ADA ROUTE
 LIMITS OF DISTURBANCE



SCALE: 1"=60'

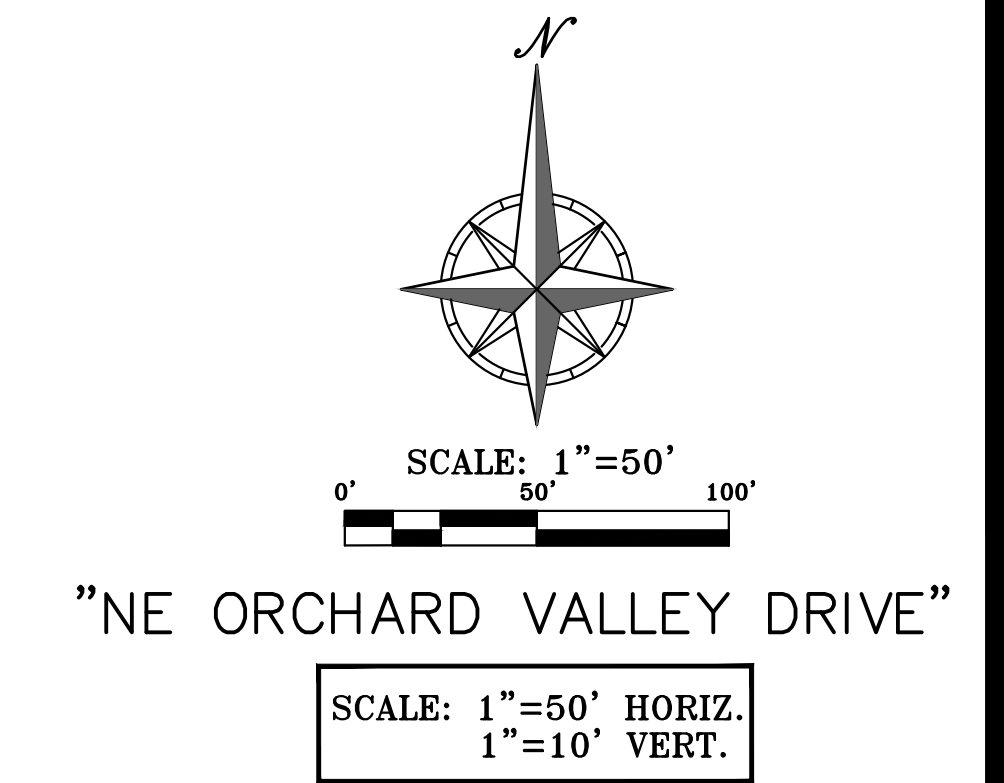


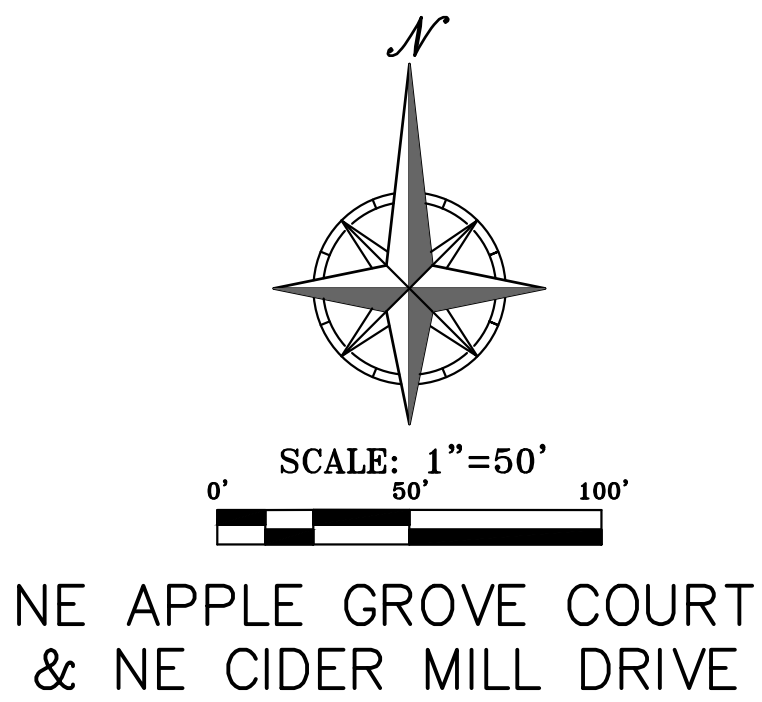
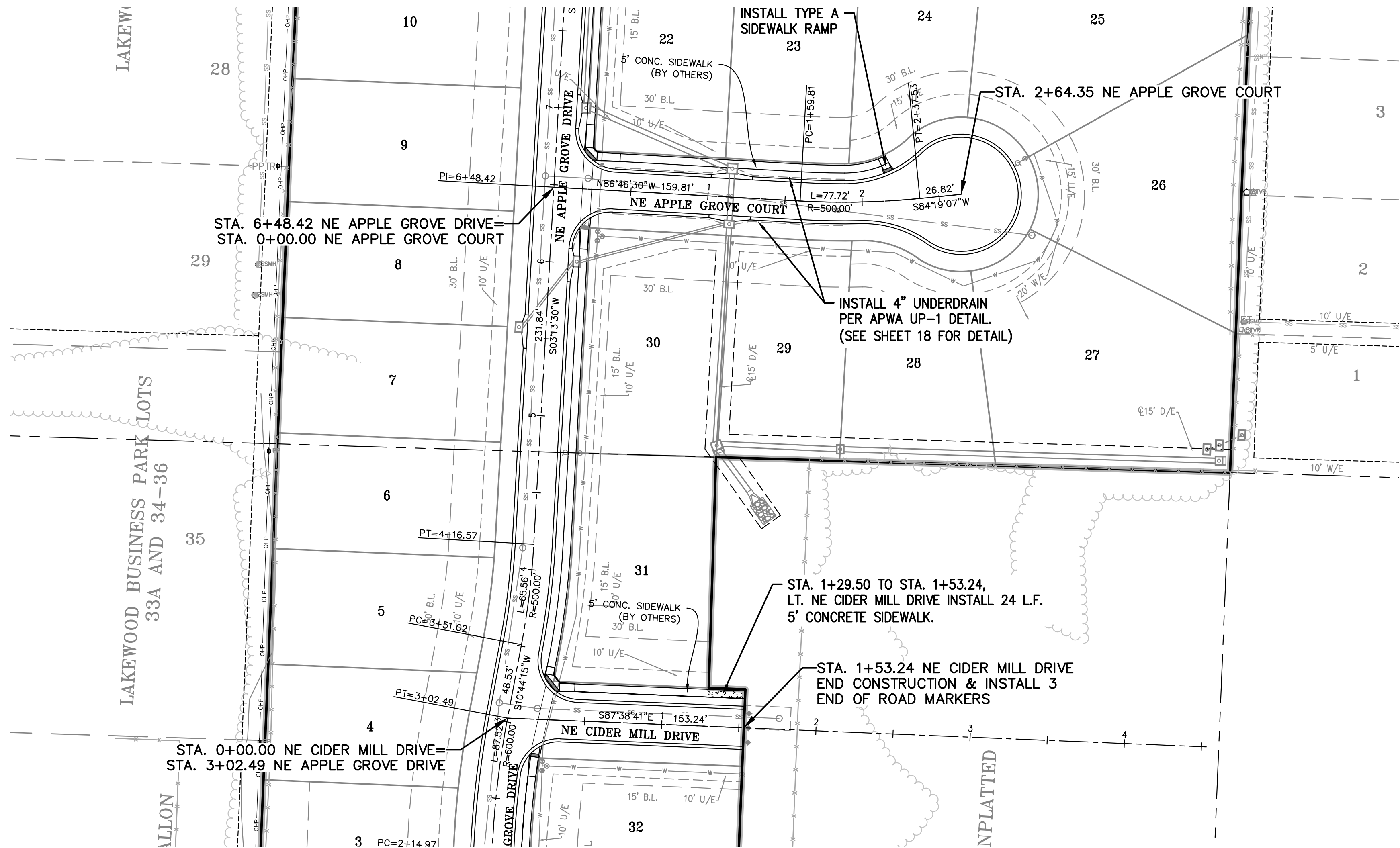
GRADING PLAN
ORCHARD WOODS
LEE'S SUMMIT, JACKSON COUNTY, MISSOURI

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SHEET

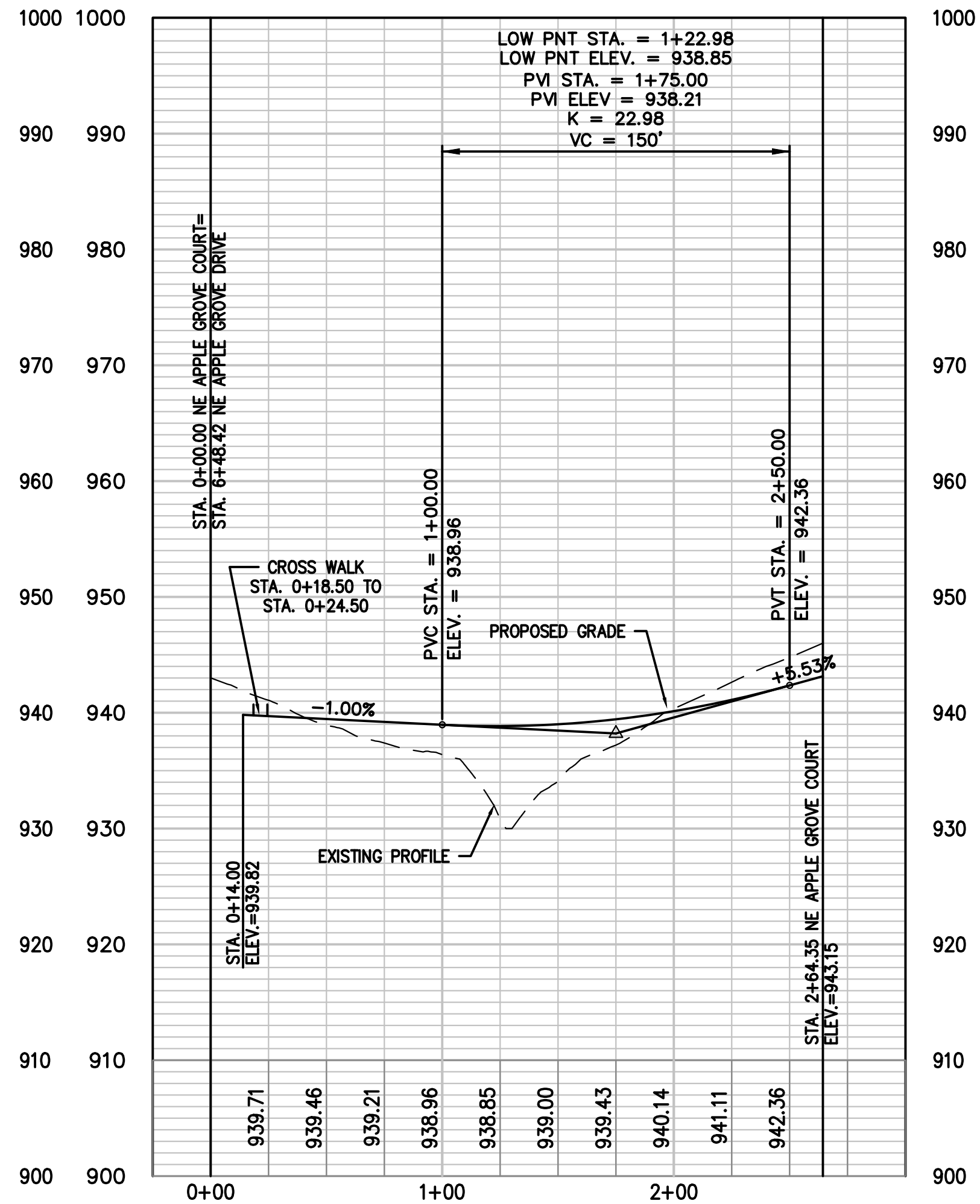
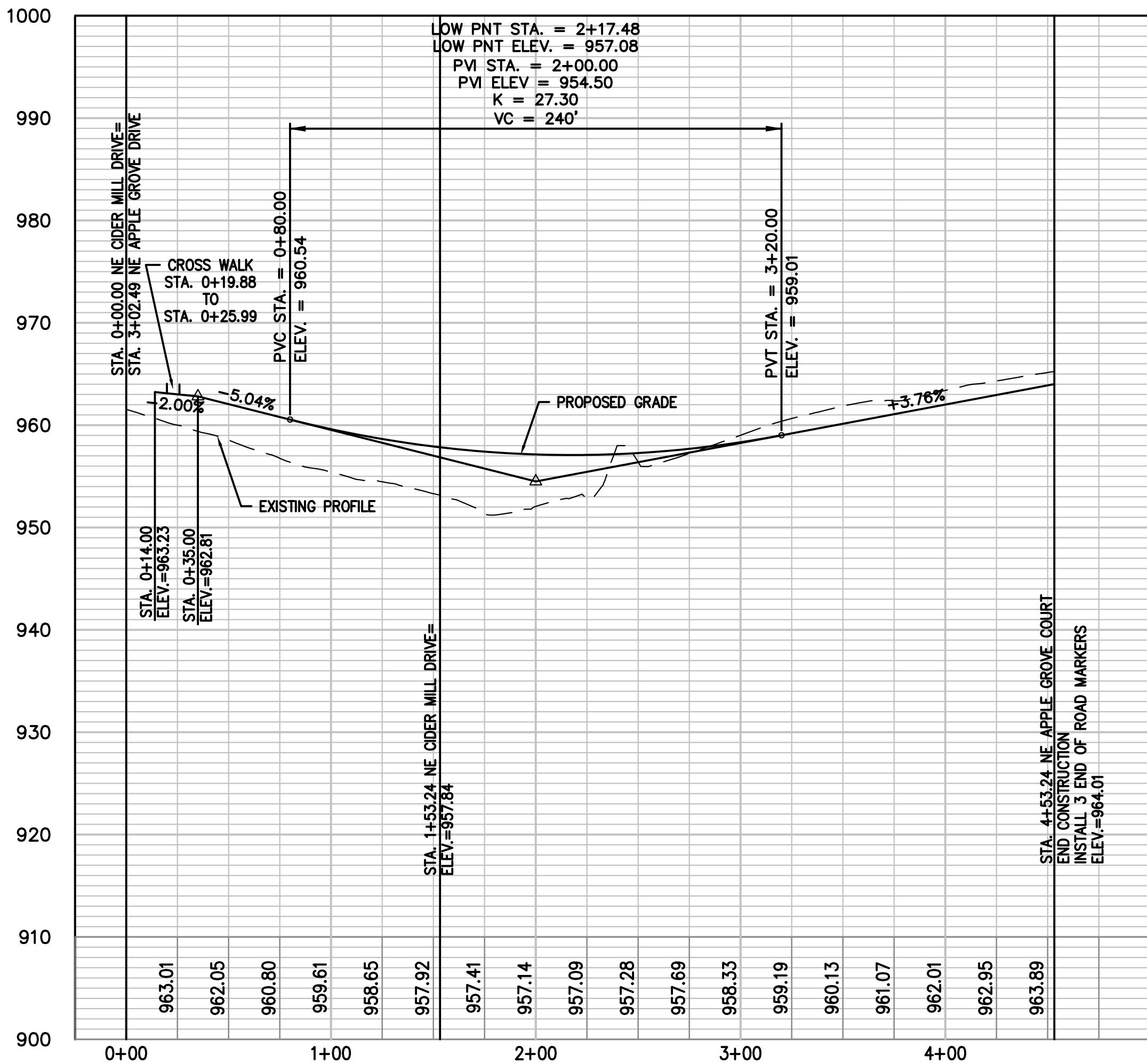
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NE CIDER MILL DRIVE (RESIDENTIAL LOCAL)

NE APPLE GROVE COURT (RESIDENTIAL LOCAL)

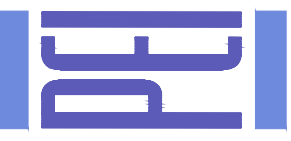


NOTE:
UNDERDRAINS ARE REQUIRED AT ALL LOW POINTS.
INSALL UNDERDRAIN AS PER APWA DETIAL UD-1.



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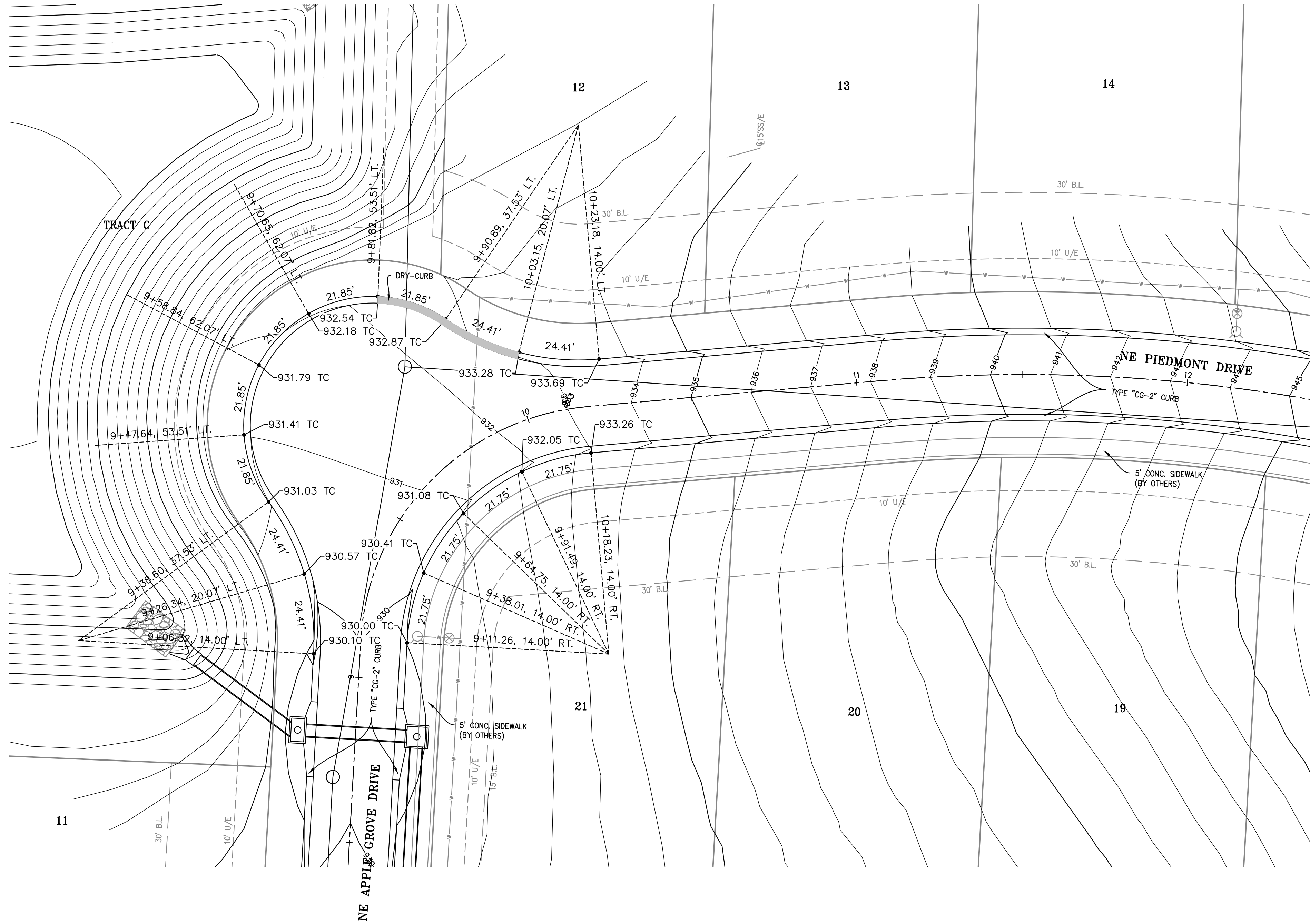
STREET PLAN & PROFILE
ORCHARD WOODS
LEE'S SUMMIT, JACKSON COUNTY, MISSOURI

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DATE: 10-21-2022	DRAWN: BAG	1.	2-27-23	JMO	DEU
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CORPORATE OF AUTHORIZATION		3.	6-15-23	BJG	DEU
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ENGINEERING - 200700209					

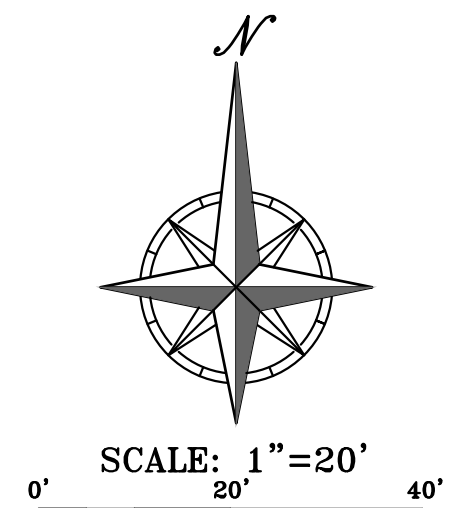
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\\PHILIPS-SERVER\Projects\211142\Drawings\STREET AND STORM\INTERSECTIONS.dwg Layout:3 Jun 16, 2023 - 9:21am Kyle Delers



LEGEND
"DRY" CURB



PROJECT NO.	211142	No.	Date	Revisions:	By	App.
DATE: 10-21-2022	DRAWN: BAG	1.	2-27-23	REVISED PER CITY COMMENTS	JMO	DEU
CHECKED: DEU	APPROVED: DEU	2.	4-24-23	REVISED PER CITY COMMENTS	JMO	DEU
CORPORATE OF AUTHORIZATION		3.	6-15-23	REVISED PER CITY COMMENTS	BJG	DEU
LAND SURVEYING - LS-82						
ENGINEERING - E-361						
CERTIFICATE OF AUTHORIZATION						
LAND SURVEYING - 2007001028						
ENGINEERING - 2007000028						

INTERSECTION DETAILS
ORCHARD WOODS
LEE'S SUMMIT, JACKSON COUNTY, MISSOURI



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PHELPS ENGINEERING, INC.
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Olathe, Kansas 66061
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Fax (913) 993-1165
www.phelpsjengineering.com





USE FOR
RESIDENTIAL —
LOCAL STREETS

USE FOR
RESIDENTIAL

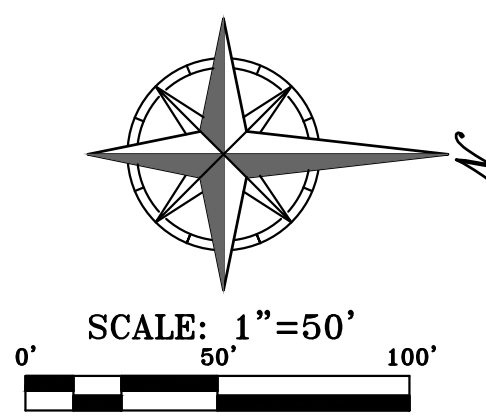


STREET DETAILS
ORCHARD WOODS
LEE'S SUMMIT, JACKSON COUNTY, MISSOURI

SHEET

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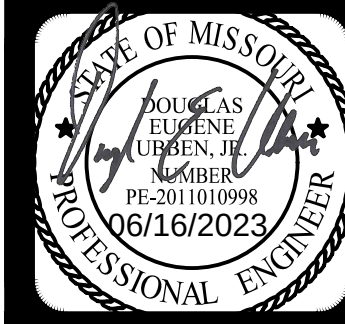
PROJECT NO.	211142	No.	Date	Revisions:	By	App.
DATE: 10-21-2022	DRAWING:	1.	2-27-23	REVISED PER CITY COMMENTS	JMO	DEU
CHECKED: DEU	APPROVED: DEU	2.	4-24-23	REVISED PER CITY COMMENTS	JMO	DEU
CERTIFICATE OF AUTHORIZATION		3.	6-15-23	REVISED PER CITY COMMENTS	BAG	DEU
CERTIFICATE OF AUTHORIZATION						
CERTIFICATE OF AUTHORIZATION						
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CERTIFICATE OF AUTHORIZATION						

STORM SEWER GENERAL LAYOUT
ORCHARD WOODS
LEE'S SUMMIT, JACKSON COUNTY, MISSOURI

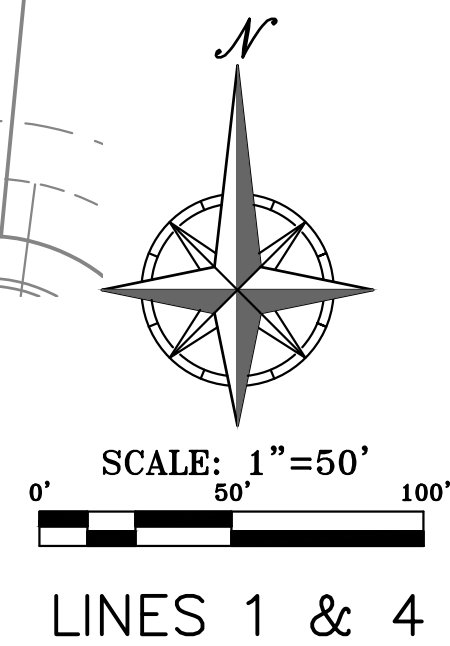
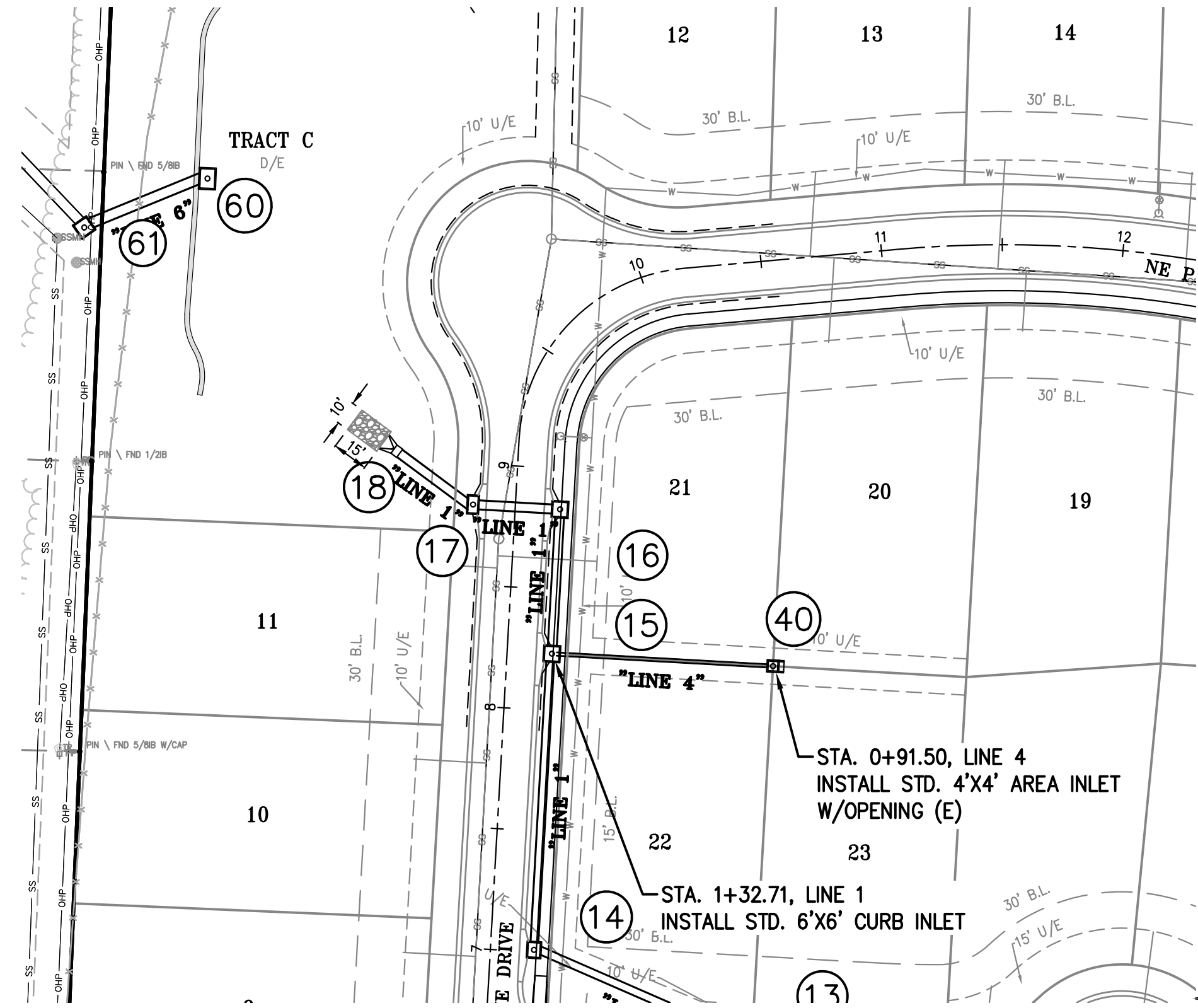
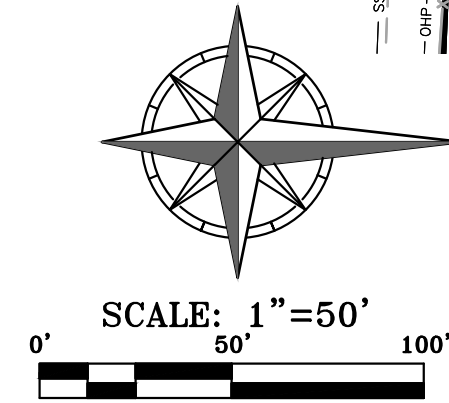
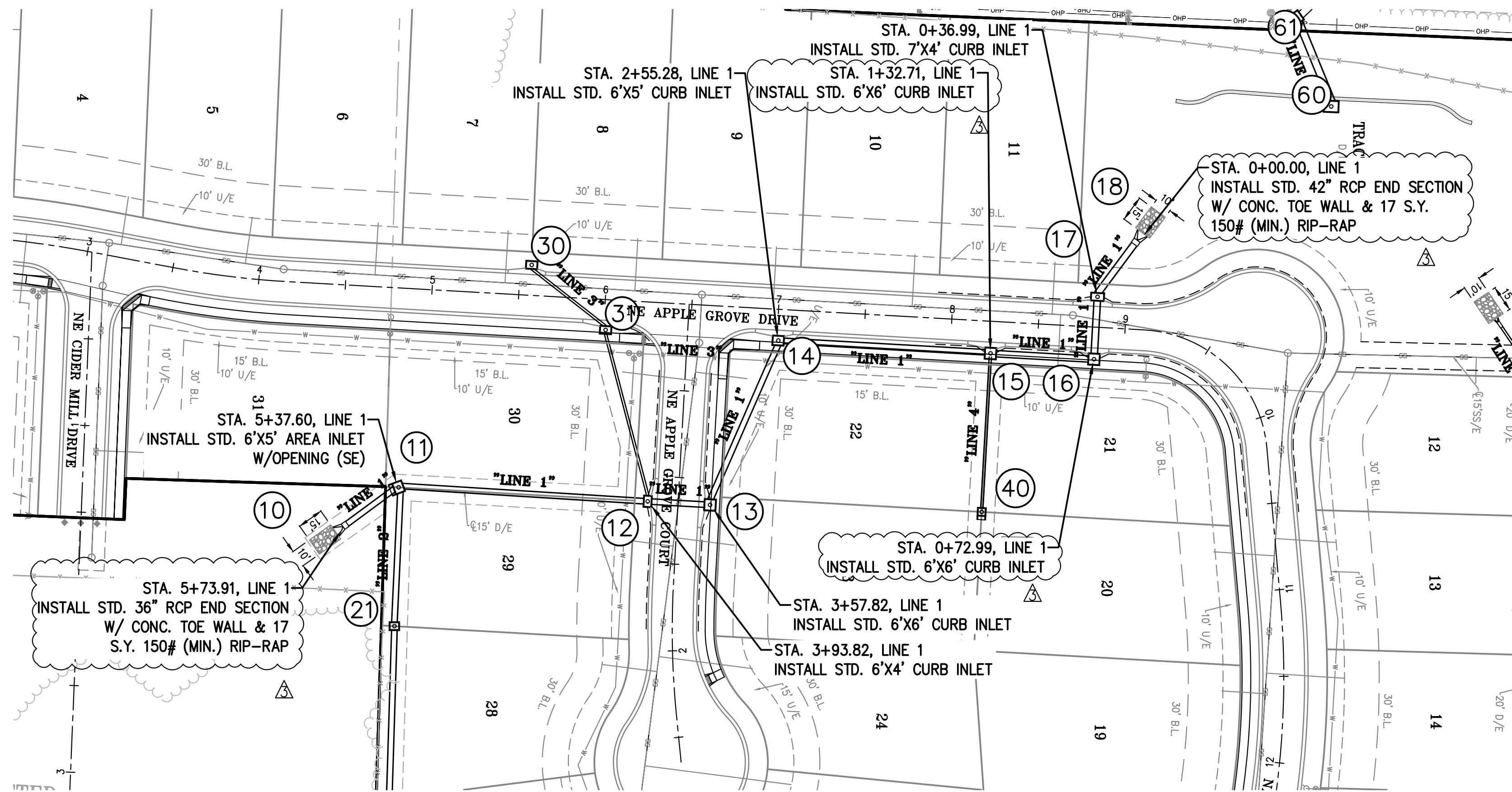


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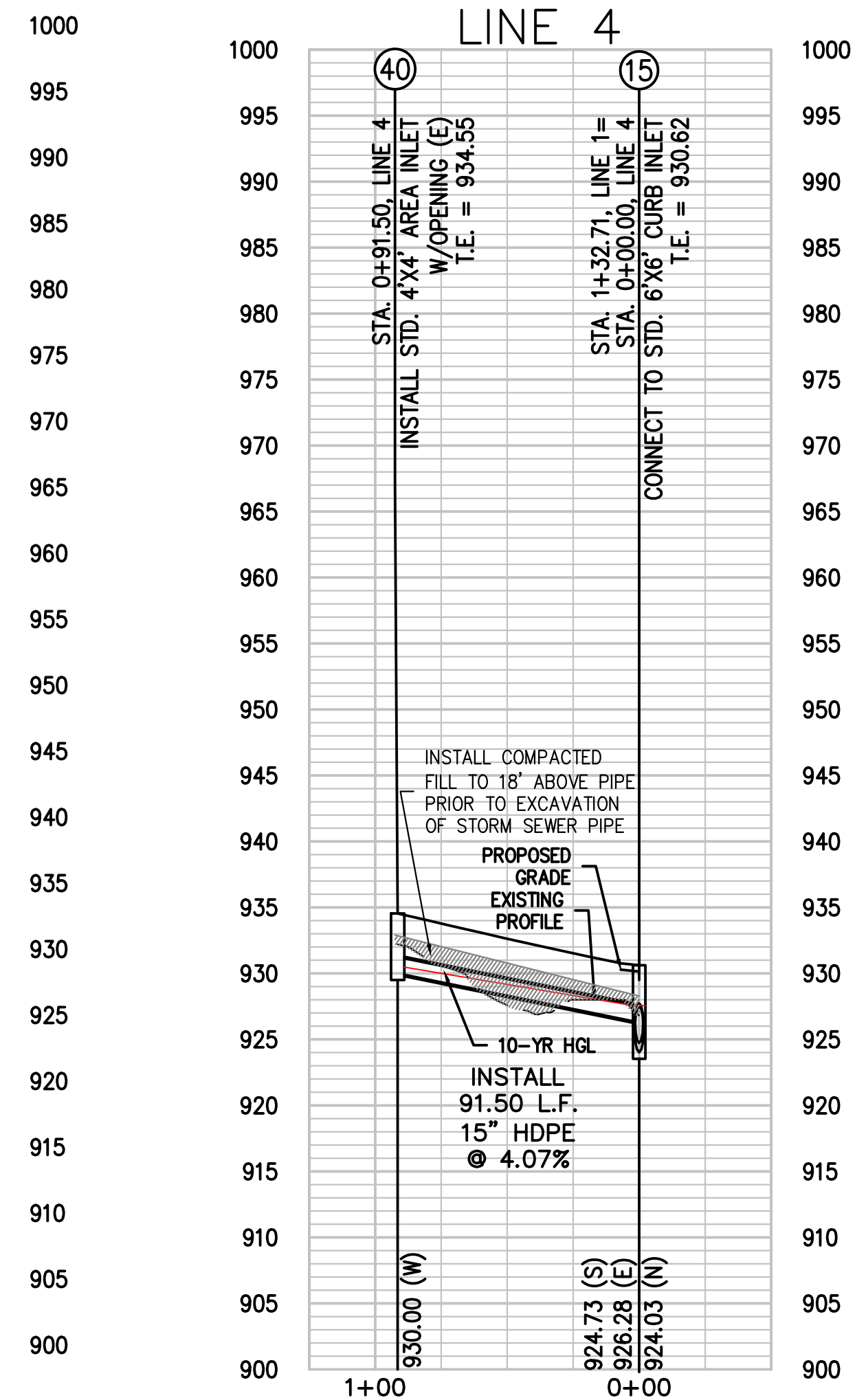
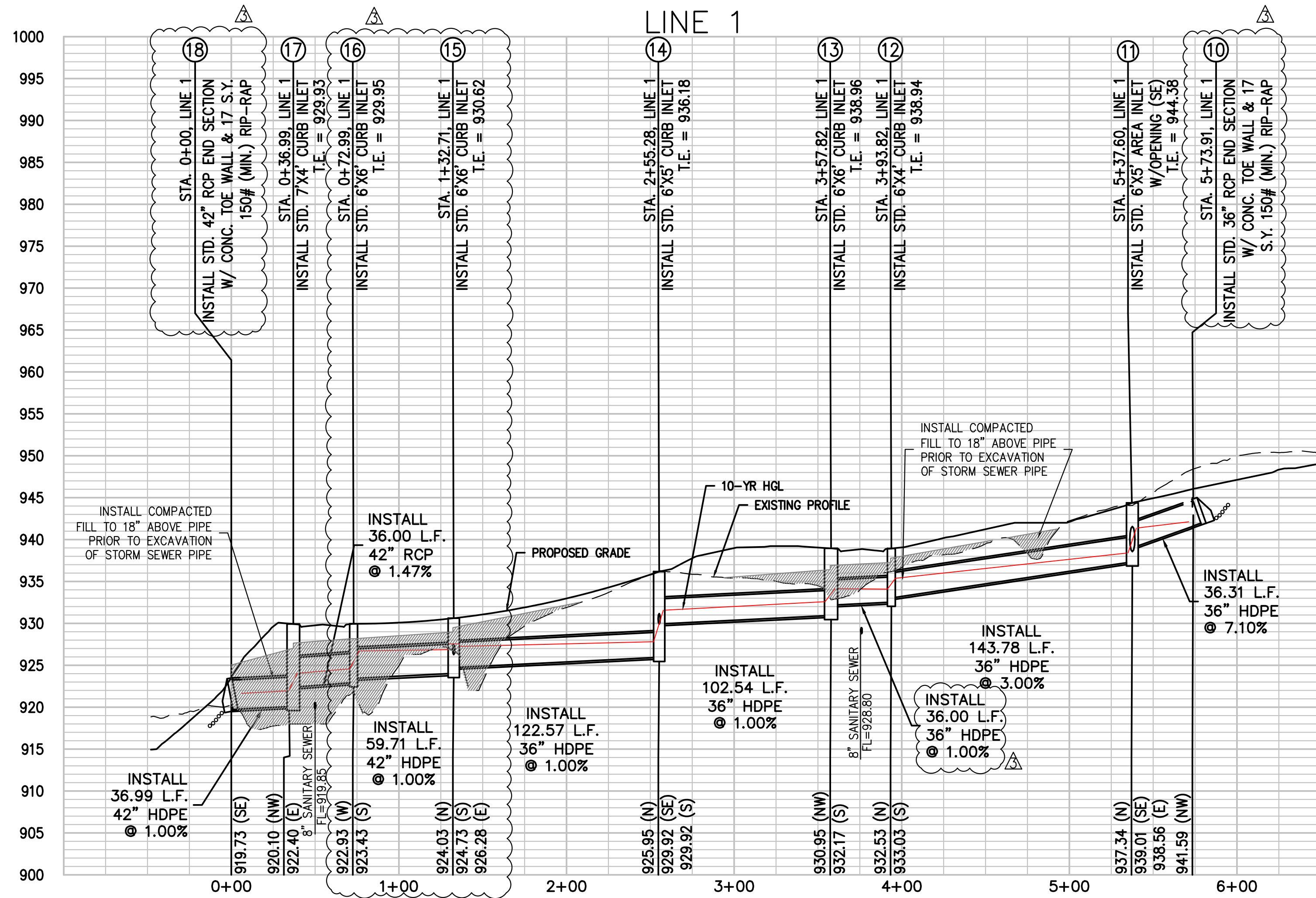
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\\PHILIPS-SERVER\Projects\14\141142\DWG\STREET AND STORM\STORM SEWER PROFILE.dwg Layout LINES 1-4 Jun 16, 2023 - 1:33pm Kyle Deters



SCALE: 1"=50' HORIZ.
1"=10' VERT.



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STORM SEWER PLAN & PROFILE

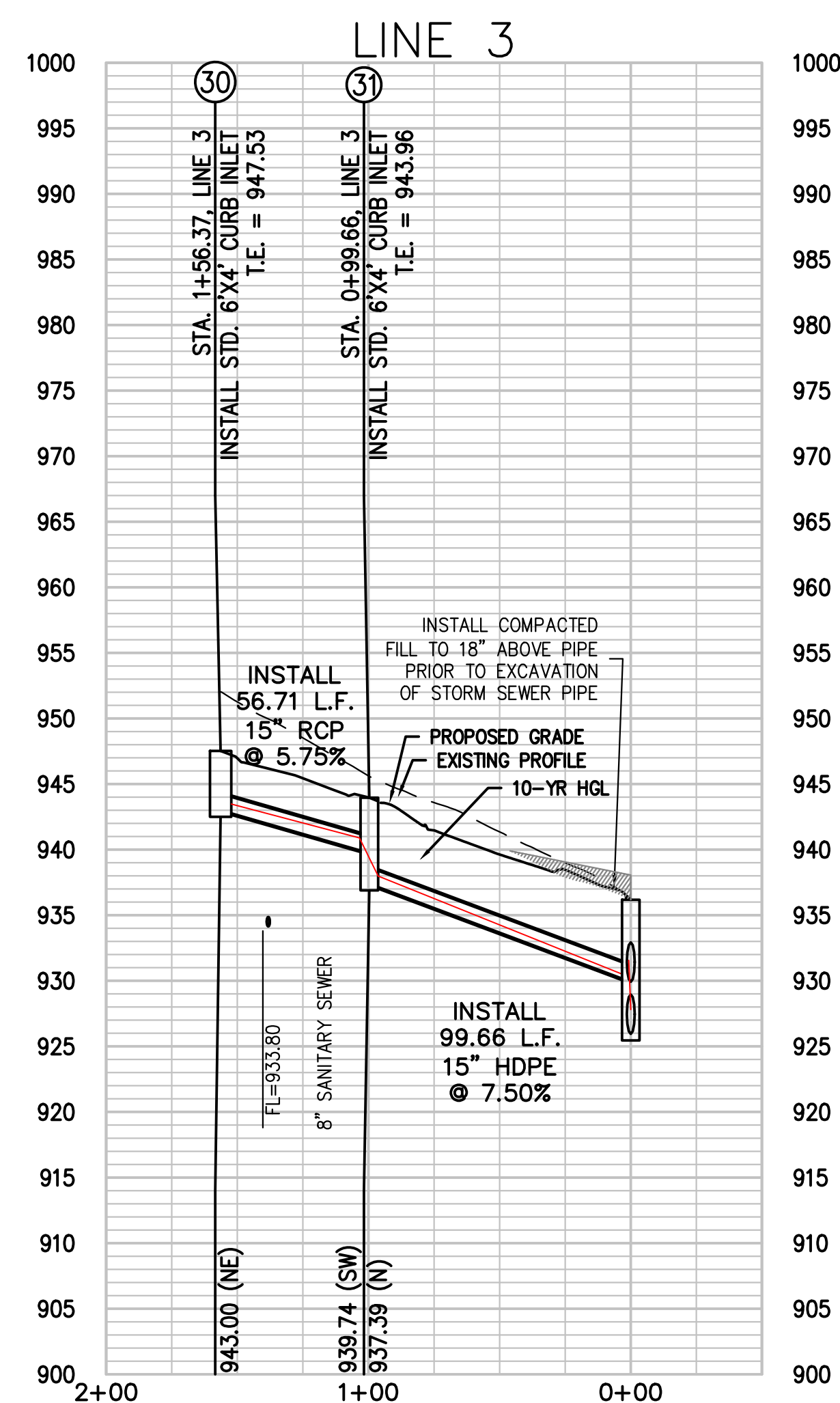
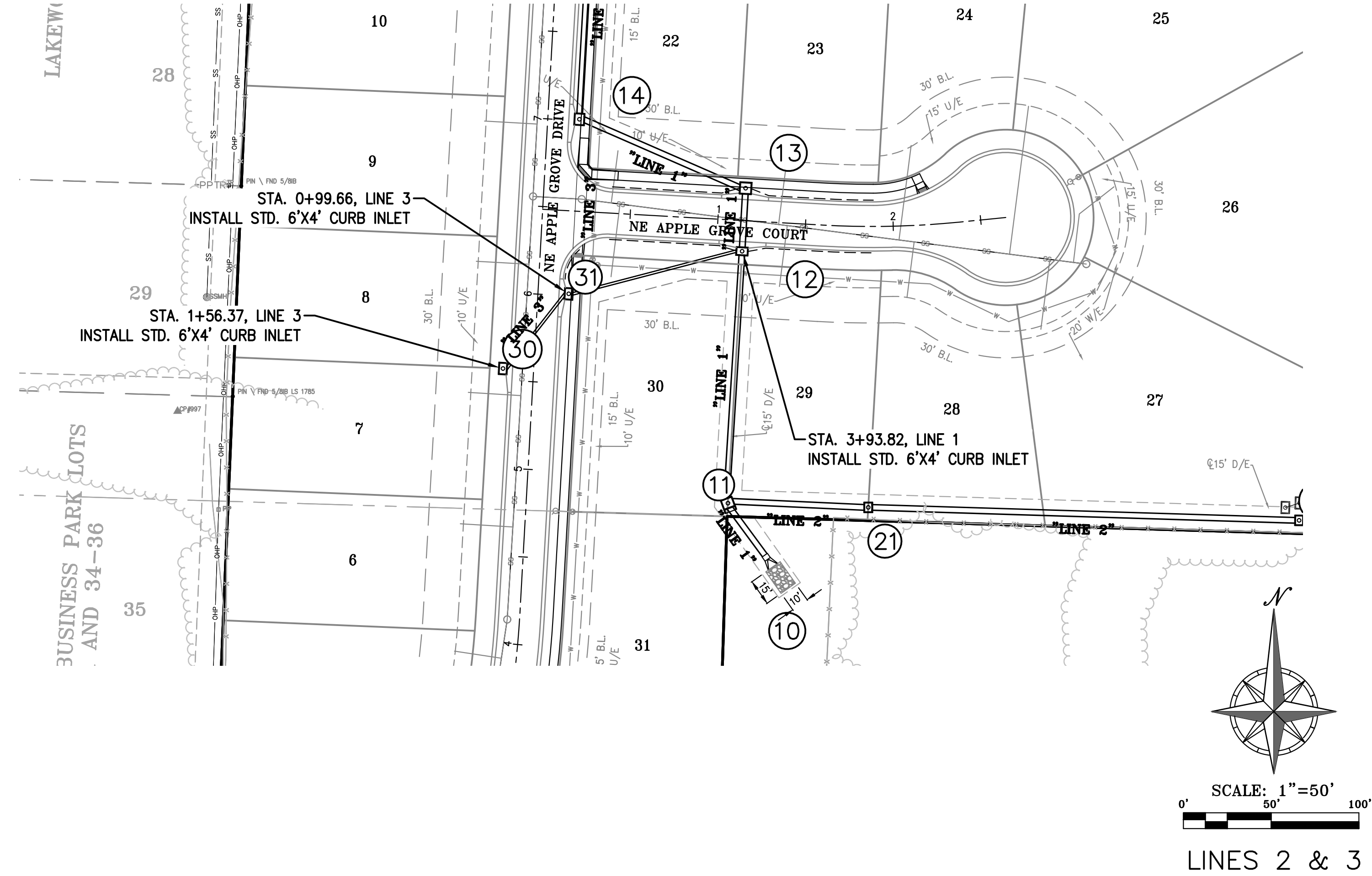
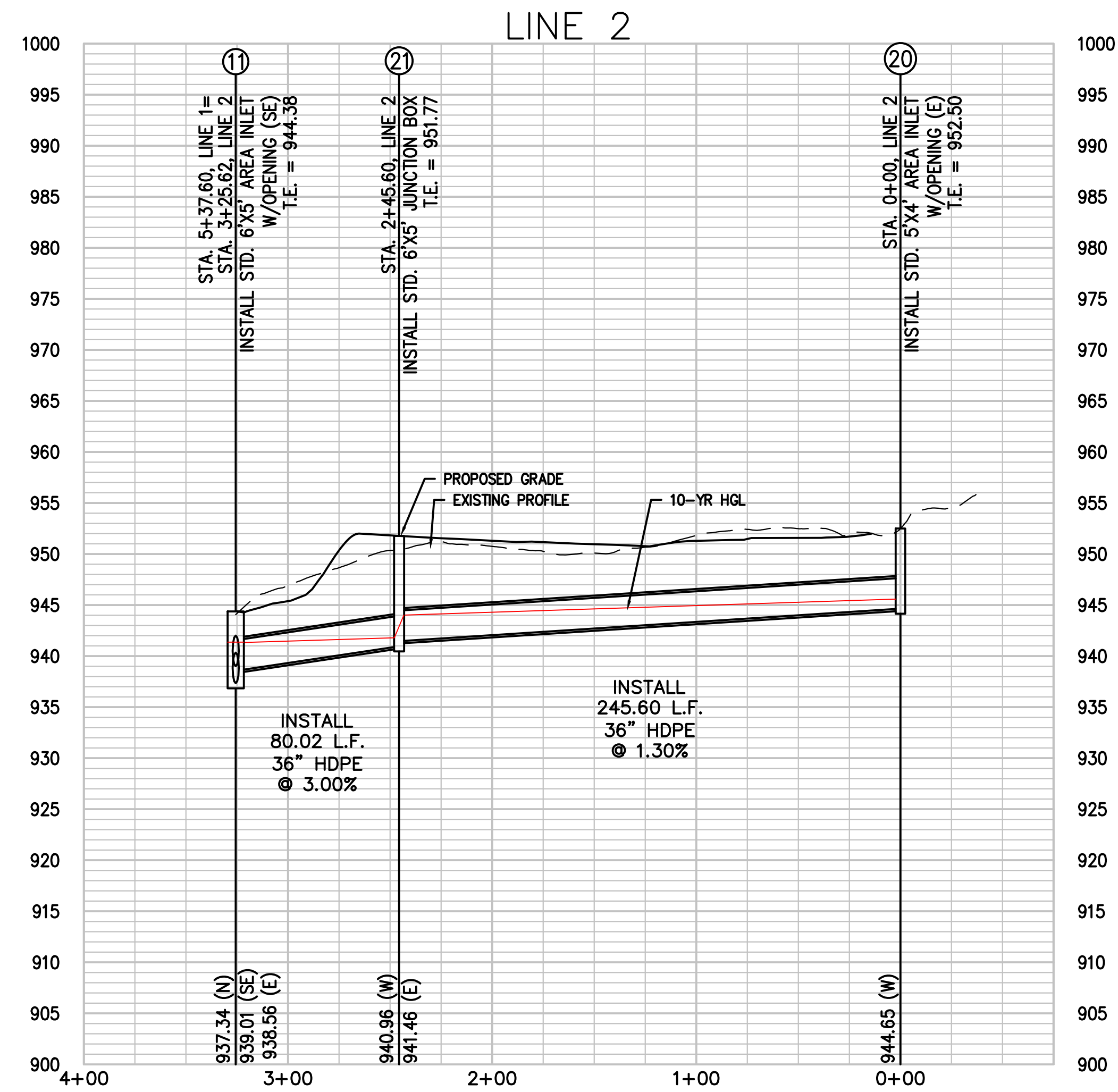
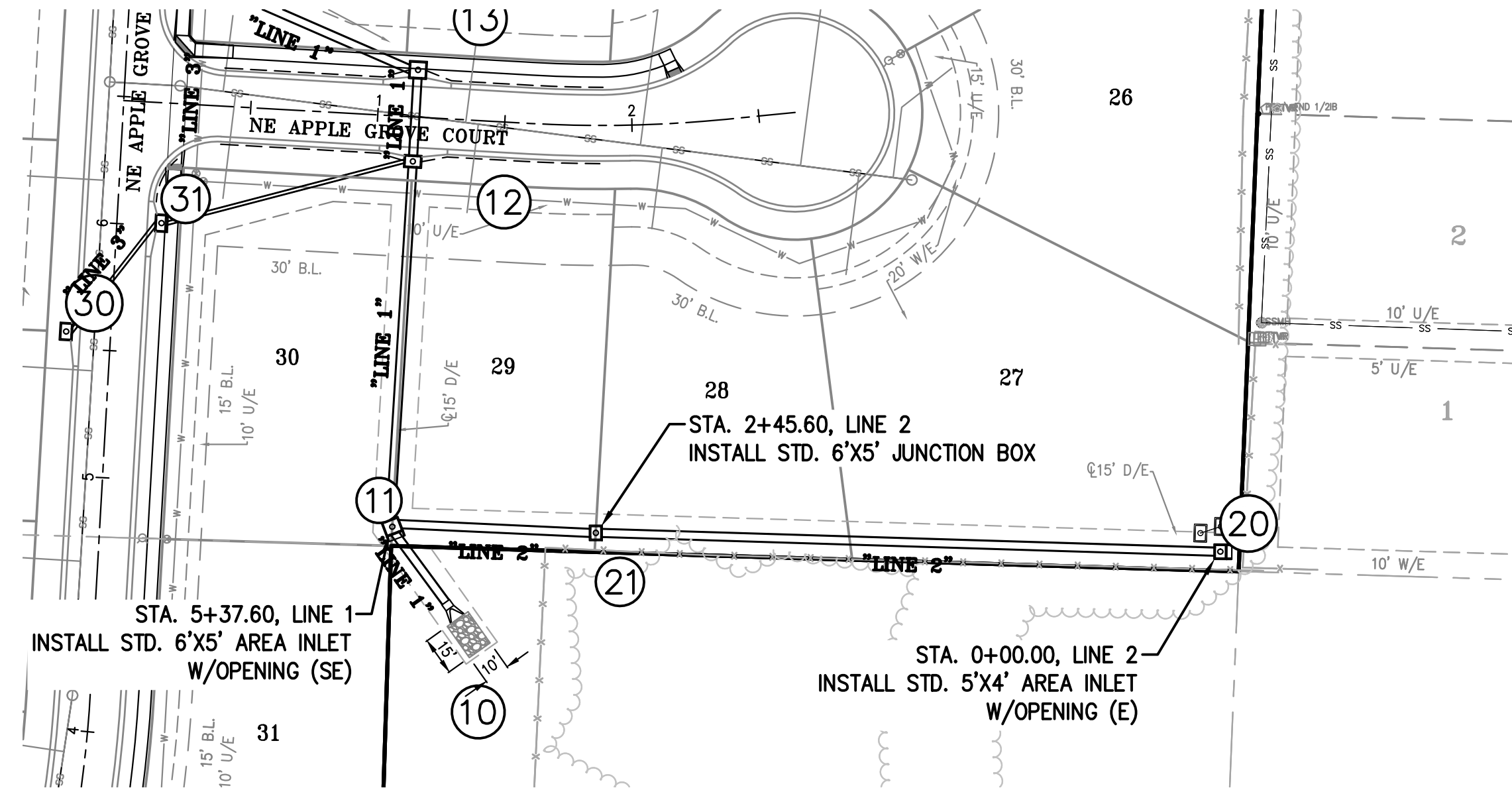
ORCHARD WOODS
LEE'S SUMMIT, JACKSON COUNTY, MISSOURI

PROJECT NO.	211142	No.	Date	By	App.
DATE	10-21-2022	DRAWING	1.	2-27-23	JMO DEU
CHECKED	DEU	APPROVED	DEU	2.	4-24-23
CERTIFICATE OF AUTHORIZATION					
LAND SURVEYING					
ENGINEERING					
DESIGN					
CONSTRUCTION					

SHEET

13

\\PHILIPS-SERVER\Projects\211142\Drawings\STORM SEWER PROFILE.dwg Layout: LINES 2-3 Jun 16, 2023 9:23am Kyle Delers



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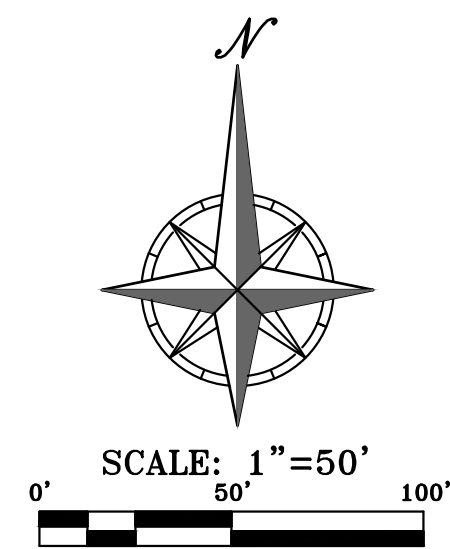
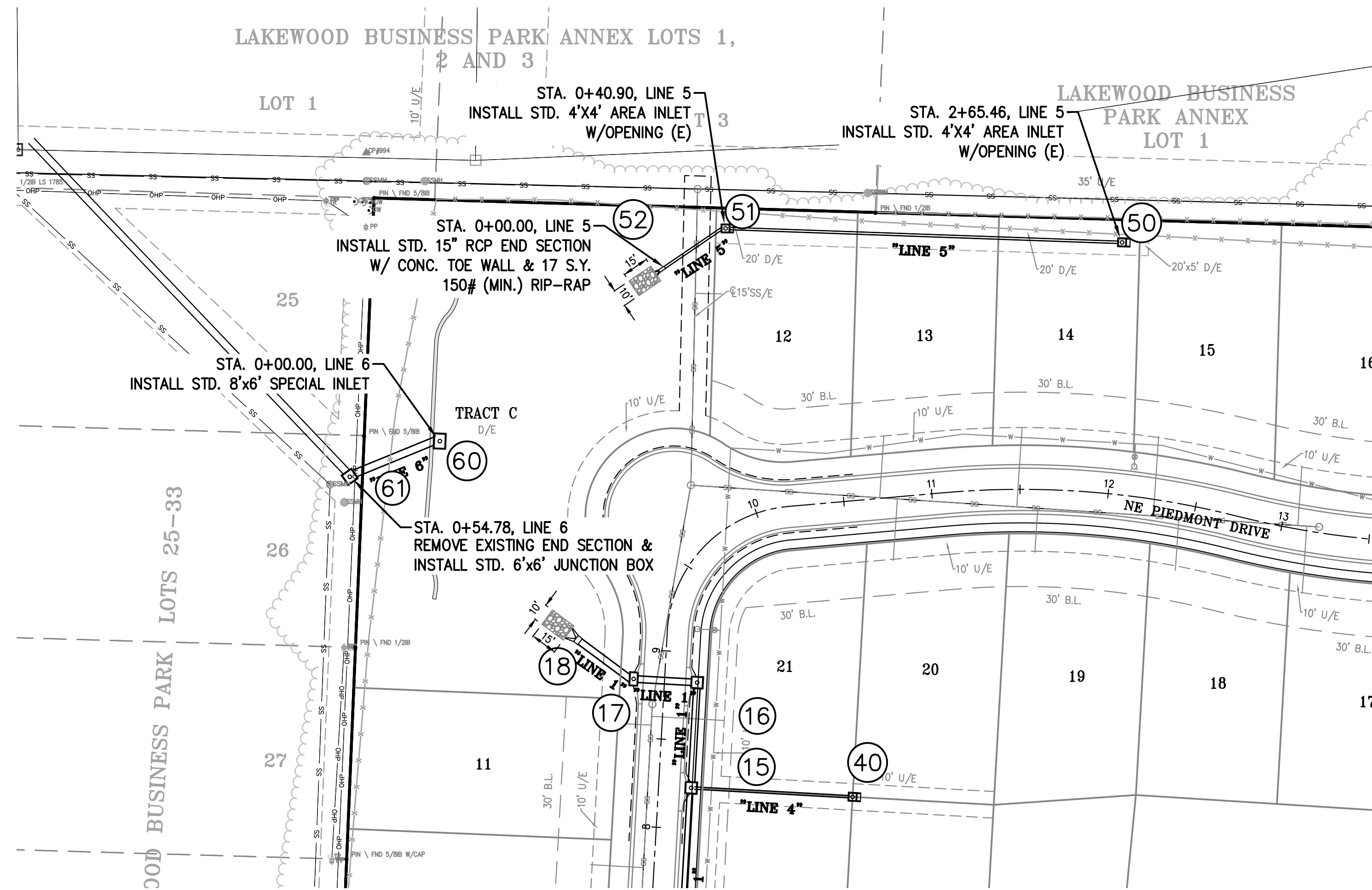


STORM SEWER PLAN & PROFILE
ORCHARD WOODS
LEE'S SUMMIT, JACKSON COUNTY, MISSOURI

PROJECT NO.	211142	No.	Date	By	App.
DATE: 10-21-2022	DRAWN: B.J.G.	1.	2-27-23	JMO	DEU
CHECKED: DEU	APPROVED: DEU	2.	4-24-23	JMO	DEU
CORPORATE SEAL OF AUTHORIZATION		3.	6-15-23	B.J.G.	DEU
LAND SURVEYING - LS-82					
ENGINEERING - E-361					
CREATED: 10-21-2022					
LAST SAVE: 06-20-2023					
LAST PRINT: 06-20-2023					

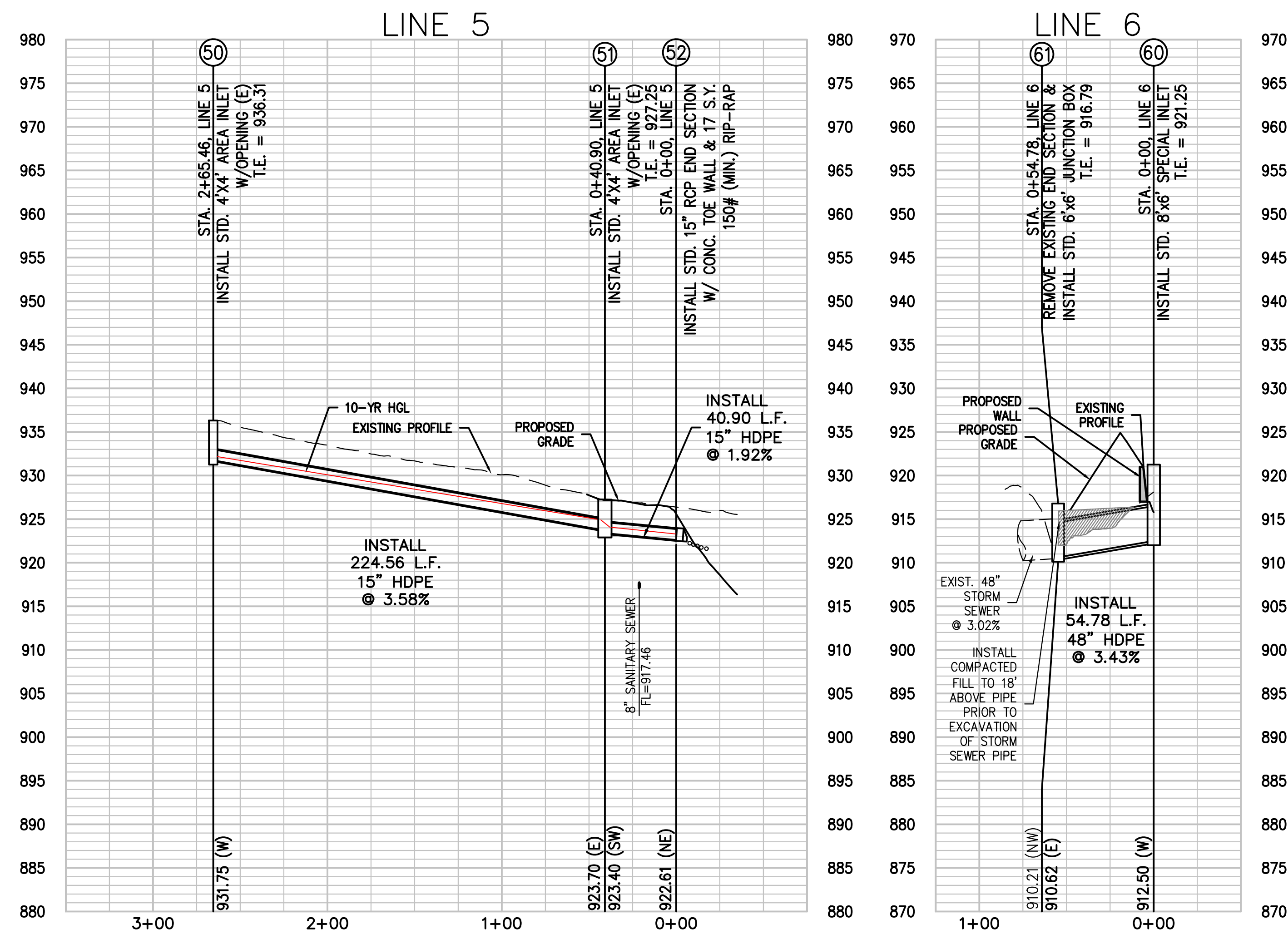
SHEET

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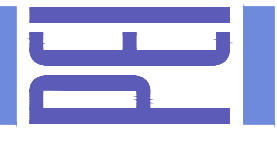
LINES 5 & 6

SCALE: 1"=50' HORIZ.
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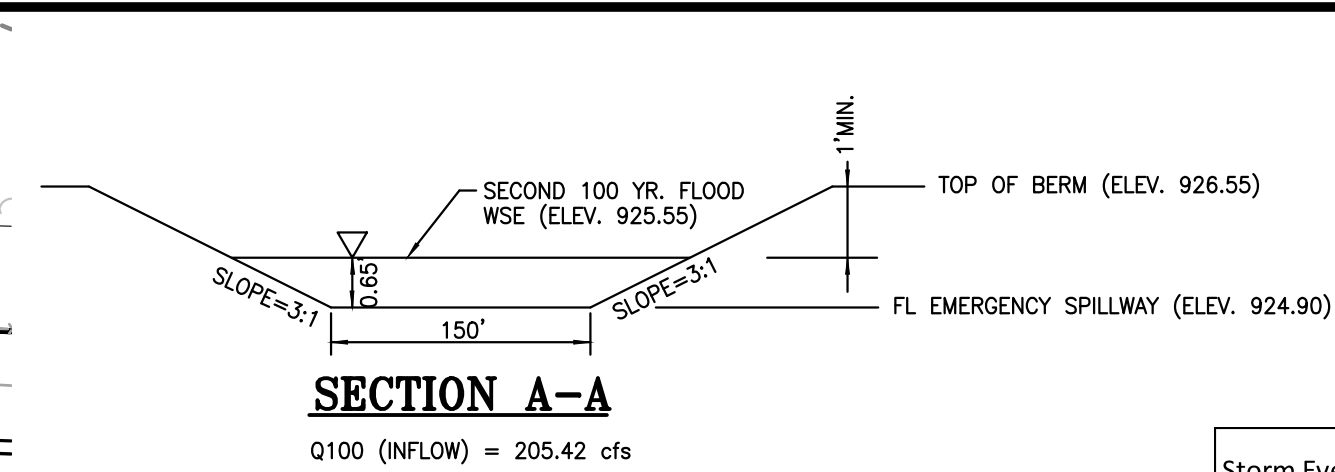
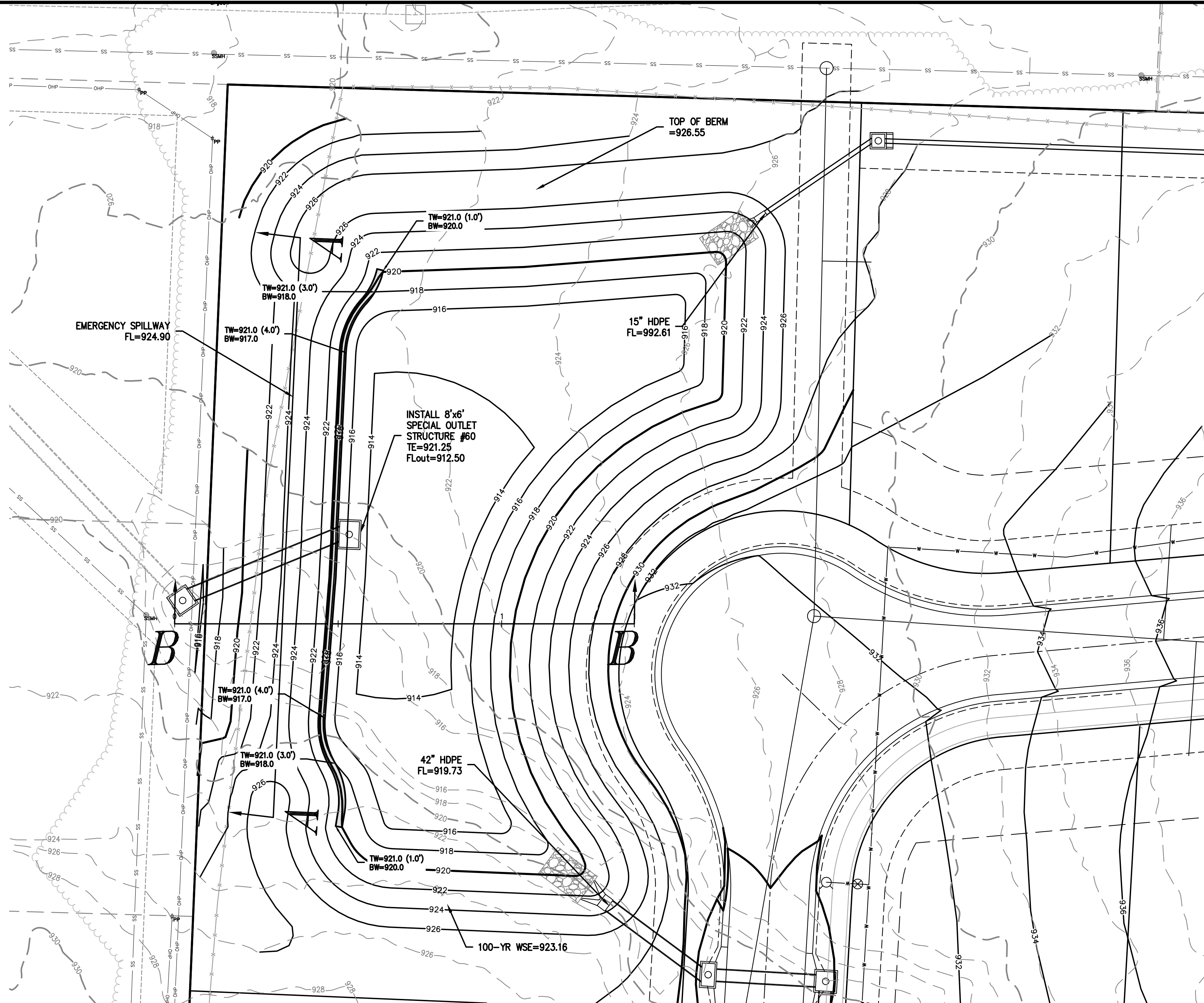
STORM SEWER PLAN & PROFILE
ORCHARD WOODS
LEE'S SUMMIT, JACKSON COUNTY, MISSOURI

PROJECT NO.	21142	No.	Date	By	App.
DATE: 10-21-2022	DRAWING: 1.	2-27-23	JMO	DEU	
CHECKED: DEU	APPROVED: DEU	2.	4-24-23	JMO	DEU
CERTIFICATE OF AUTHORIZATION		3.	6-15-23	BAG	DEU
LAND SURVEYING - LS-82					
ENGINEERING - E-36					
DATE OF AUTHORIZATION					
AND SIGNATURE: 06/07/2023					
PROJECT NO. 21142					

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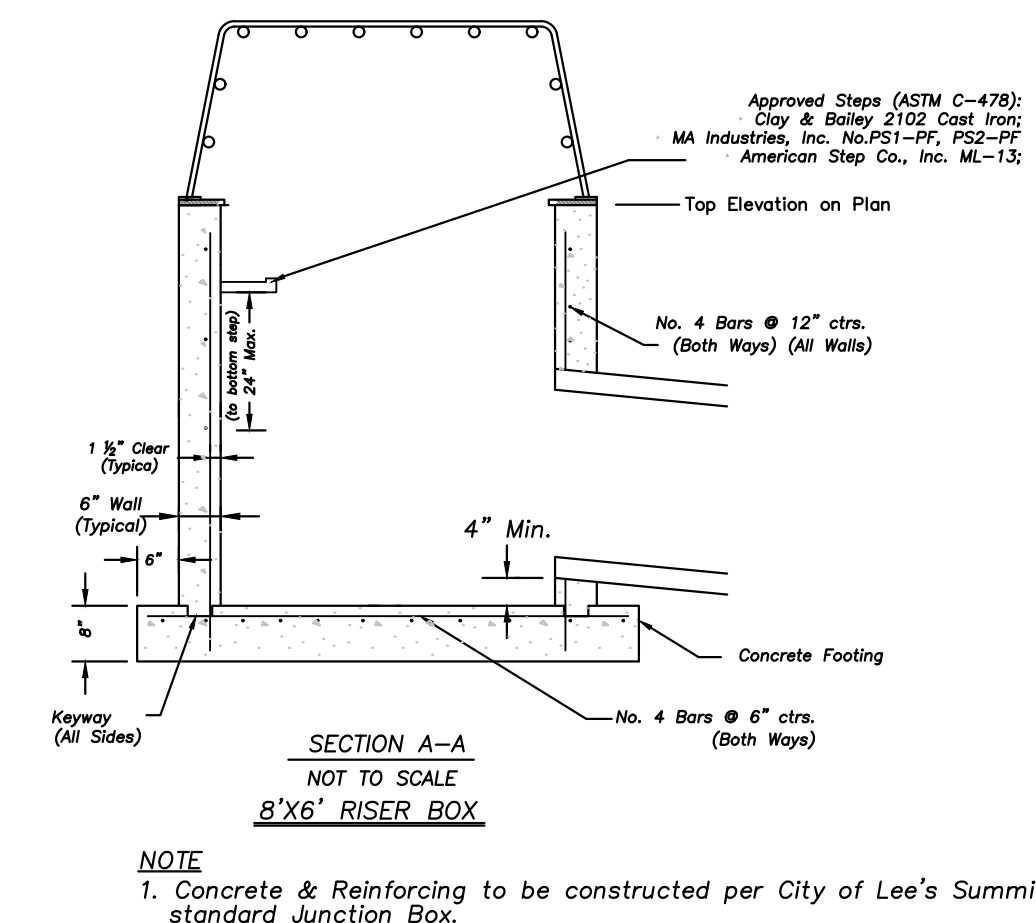
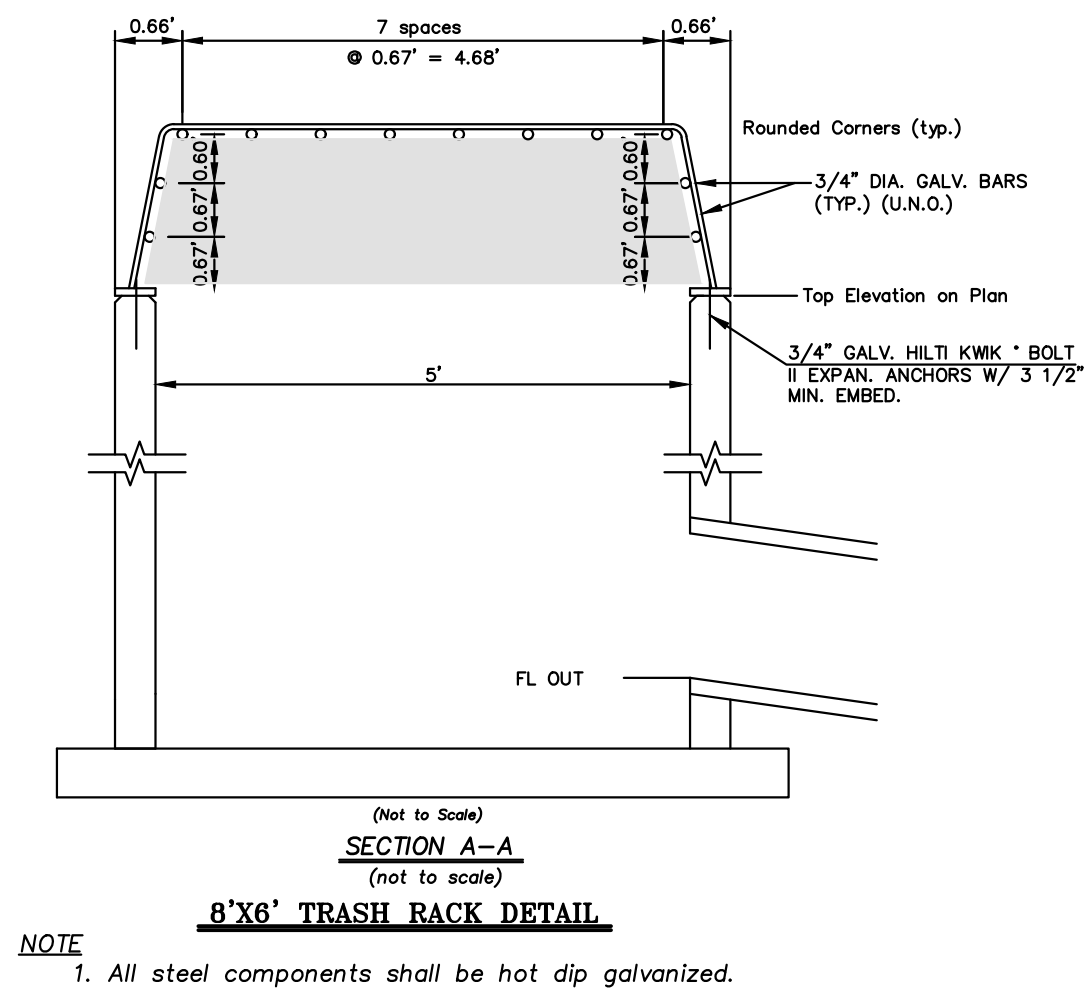
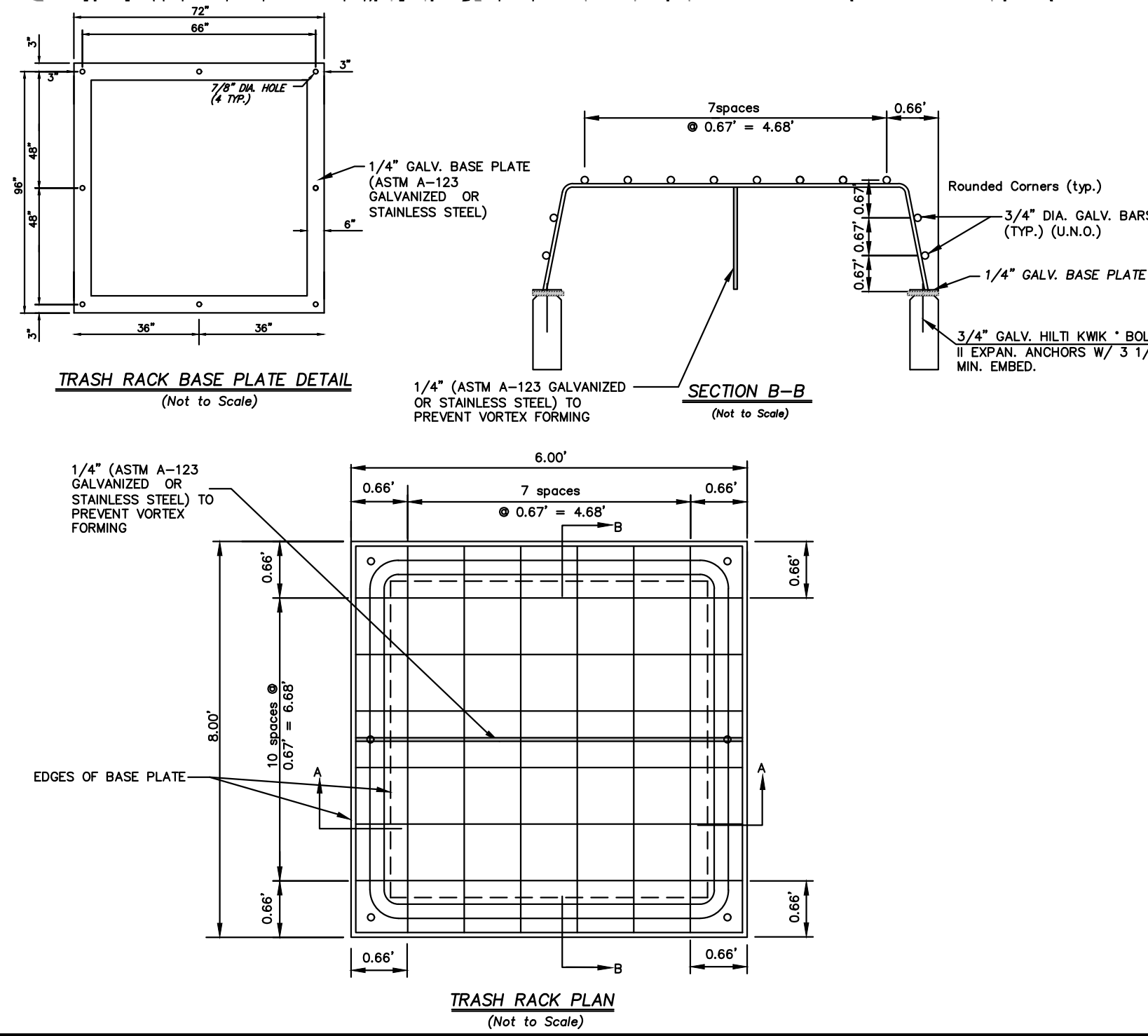
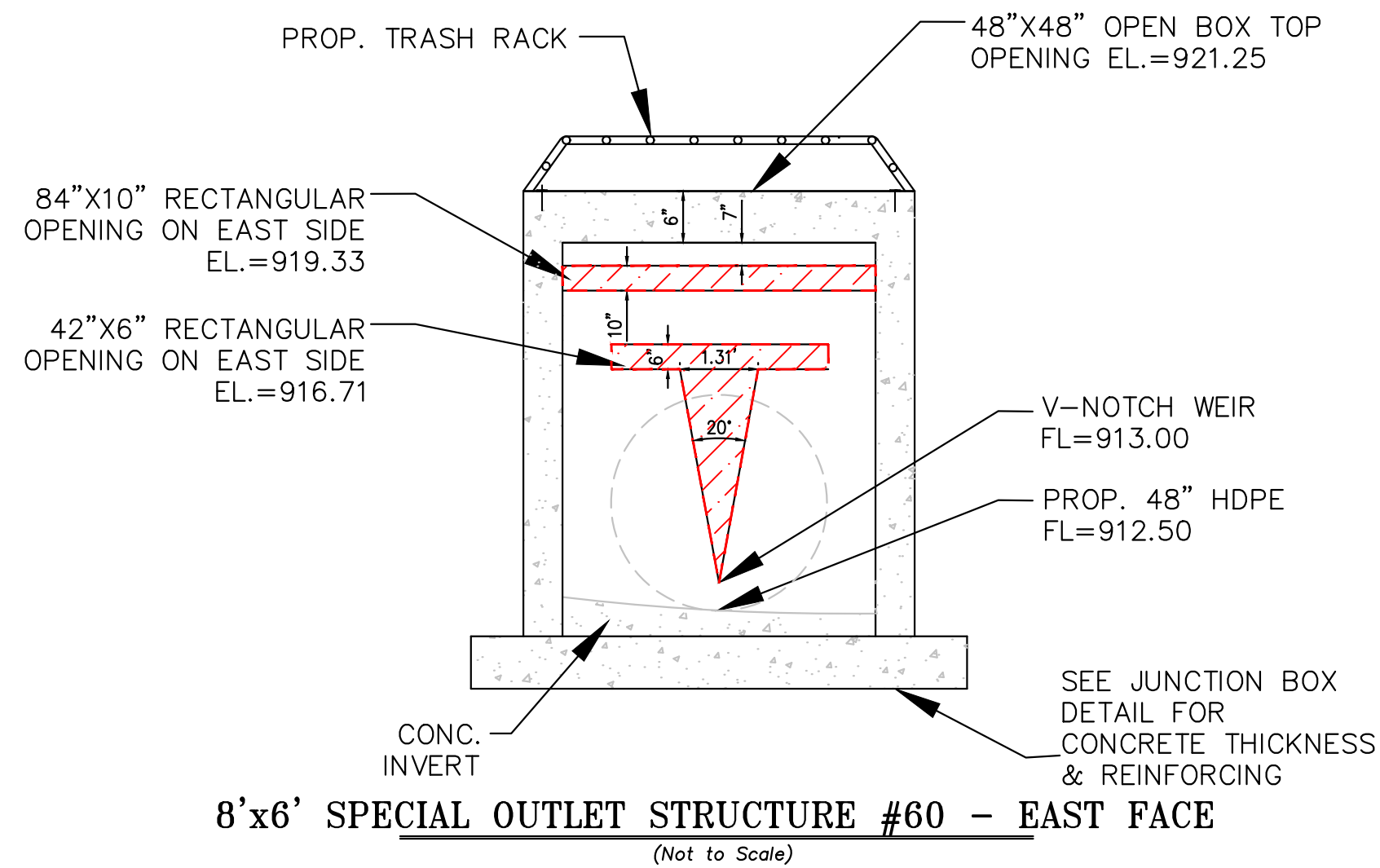
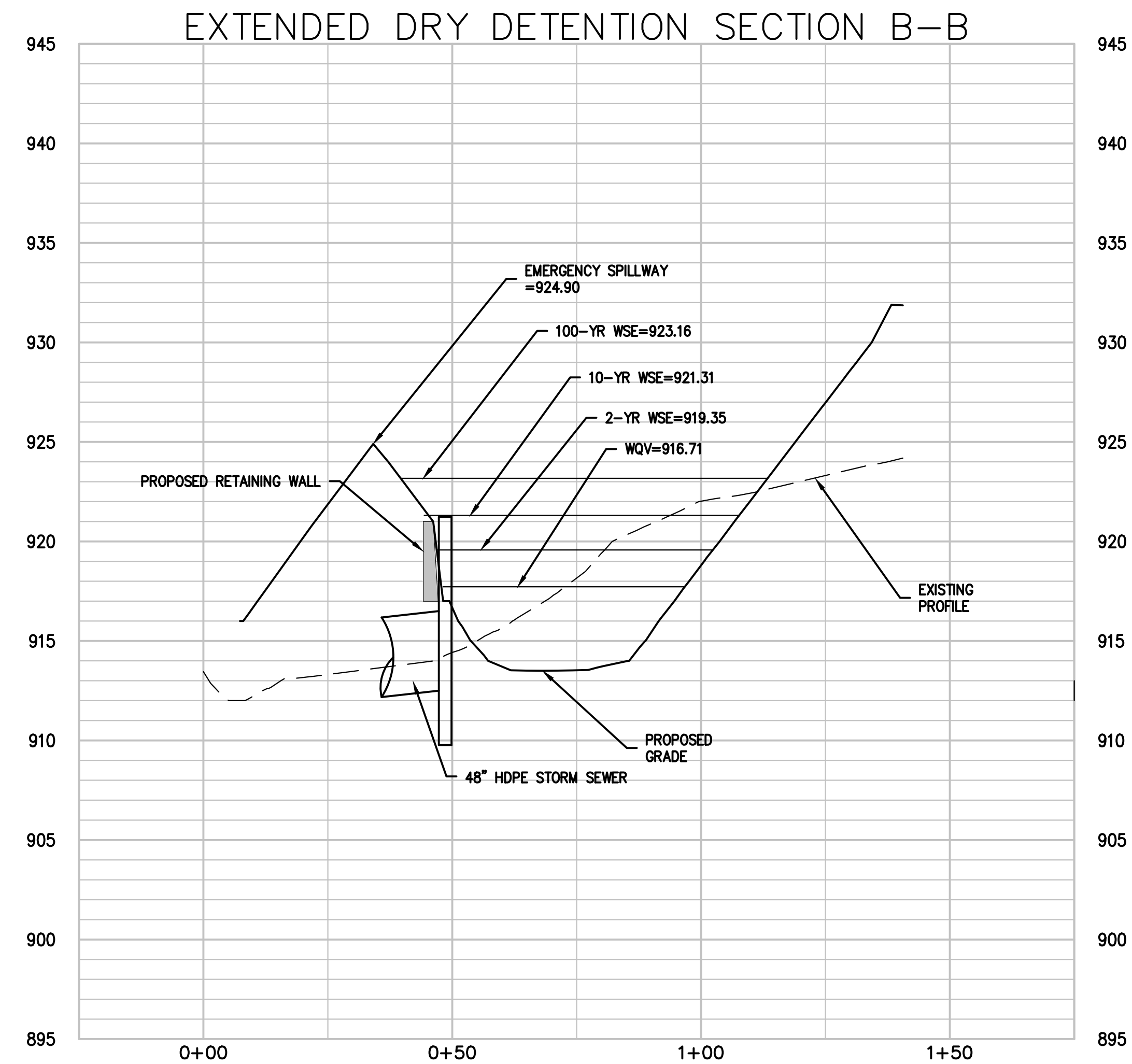
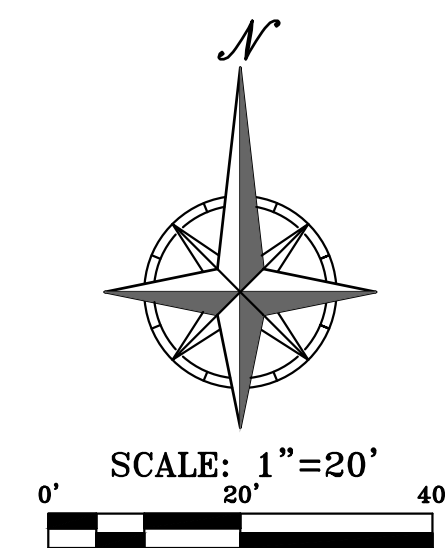
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Storm Event	Inflow (cfs)	Water Surface Elevation	Storage (c.f.)	Outflow (cfs)
2-Year	76.14	919.35	53,365	36.48
10-Year	131.27	921.31	82,469	82.27
100-Year	204.63	923.16	155,888	132.05

PROPOSED BASIN PERFORMANCE



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06/16/2023

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DETENTION PLAN
ORCHARD WOODS
LEE'S SUMMIT, JACKSON COUNTY, MISSOURI

PROJECT NO.	211142	Date	2-27-23
By	JMO	App.	DEU
Revisions:			
1.	2-27-23	REVISOR	PER CITY COMMENTS
2.	4-24-23	REVISOR	PER CITY COMMENTS
3.	6-15-23	REVISOR	PER CITY COMMENTS
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99.	6-15-23	REVISOR	PER CITY COMMENTS
100.	6-15-23	REVISOR	PER CITY COMMENTS

SHEET
17

\\PHILIPS-SERVER\Projects\PEI\211142\Draw\STREET AND STORM\DRAINAGE MAP.dwg Jun 16, 2023 9:24am Kyle Deters

STORM DRAINAGE CALCULATIONS NOTE: 10-YR DESIGN

DESIGN CRITERIA: K25 = 1.1; K100 = 1.25; n = 0.013 (RCP); STORM FREQUENCY = 25 YEAR; A.I.= AREA INLET; J.B.= JUNCTION BOX; C.I. = CURB INLET; C.C. = CURB CUT; G.I. = GRATE INLET; HEIGHT OF STRUCTURE=RIM ELEV MINUS FLOWLINE OUT.																										
N U M B E R	S T R U C T U R E	I. RUNOFF									III. PIPE DESIGN													REMARKS		
		INCREMENTAL			CUMULATIVE		SYSTEM TIME OF CONCENTRATION "T _c " AT STRUCTURE (MIN)	RAINFALL INTENSITY "I ₁₀ " / I _{100"} (IN/HR)	ANTECEDENT PRECIPITATION FACTOR "K ₁₅ / K ₁₀₀ "	RUNOFF "Q ₁₀ / Q ₁₀₀ " (CFS)	STRUCTURE				PIPE											
		RUNOFF COEFFICIENT "C"	AREA "A" (ACRES)	C x A	AREA "A" (ACRES)	C x A					Upstream Structure Number	Downstream Structure Number	Upstream Structure Rim Elevation	Height of Structure (FT)	Diameter "D" (IN)	Length "L" (FT)	Upstream Invert Elevation	Downstream Invert Elevation	Slope "S" (FT/FT)	Travel Time in Pipe "TT" (min)	Velocity Full V ₁₀ (FPS)	Runoff Q ₁₀ (CFS)	Runoff Q ₁₀₀ (CFS)	Full Flow Q ₂ (CFS)	DESIGN CHECK	
1	10	0.30	6.65	2.00	6.65	2.00	10.60	5.95	1.00	11.9	10	N/A	N/A	N/A	36	36.31	941.59	939.01	0.0711	0.02	25.2	11.9	21.1	177.8	GOOD	
								8.42	1.25	21.1																
	11	0.51	0.12	0.06	16.04	6.09	15.40	5.12	1.00	31.2	11	12	944.38	7.04	36	143.78	937.34	933.03	0.0300	0.15	16.4	31.2	55.4	115.5	GOOD	
								7.27	1.25	55.4																
	12	0.51	1.58	0.81	17.62	6.90	15.55	5.09	1.00	35.2	12	13	938.94	6.41	36	36.00	932.53	932.17	0.0100	0.06	9.5	35.2	62.5	66.7	GOOD	
								7.24	1.25	62.5																
	13	0.51	1.32	0.67	18.94	7.57	15.61	5.09	1.00	38.5	13	14	938.96	8.01	36	102.54	930.95	929.92	0.0100	0.18	9.5	38.5	68.4	66.8	GOOD	
								7.23	1.25	68.4																
	14	0.51	0.06	0.03	21.11	8.68	15.79	5.06	1.00	43.9	14	15	936.18	10.23	36	122.57	925.95	924.73	0.0100	0.22	9.4	43.9	78.1	66.5	GOOD	
2								7.19	1.25	78.1																
	15	0.51	0.33	0.17	22.59	9.44	16.01	5.03	1.00	47.5	15	16	930.61	6.58	42	59.71	924.03	923.43	0.0100	0.09	10.5	47.5	84.4	100.8	GOOD	
								7.15	1.25	84.4																
	16	0.51	1.36	0.69	23.95	10.13	16.11	5.01	1.00	50.8	16	17	929.94	7.01	42	36.00	922.93	922.40	0.0147	0.05	12.7	50.8	90.3	122.1	GOOD	
								7.13	1.25	90.3																
	17	0.51	1.73	0.88	25.68	11.01	16.15	5.01	1.00	55.1	17	18	929.93	9.83	42	36.99	920.10	919.73	0.0100	0.06	10.5	55.1	98.0	100.6	GOOD	
								7.12	1.25	98.0																
	20	0.36	6.13	2.21	7.75	3.45	15.00	6.01	1.00	20.7	20	21	952.50	7.85	36	245.60	944.65	941.46	0.0130	0.38	10.8	20.7	31.8	76.0	GOOD	
								7.36	1.25	31.8																
3	21	0.38	1.52	0.58	9.27	4.03	15.38	5.94	1.00	24.0	21	11	951.77	10.81	36	80.02	940.96	938.56	0.0300	0.08	16.4	24.0	36.7	115.5	GOOD	
								7.28	1.25	36.7																
	30	0.51	1.54	0.79	1.54	0.79	8.40	6.43	1.00	5.1	30	31	947.53	4.53	15	56.71	943.00	939.74	0.0575	0.07	12.7	5.1	9.2	15.5	GOOD	
								9.31	1.25	9.2																
	31	0.51	0.57	0.29	2.11	1.08	8.47	7.44	1.00	8.0	31	12	943.96	6.57	15	99.66	937.39	929.92	0.0750	0.11	14.5	8.0	12.2	17.7	GOOD	
								9.05	1.25	12.2																
	40	0.51	1.15	0.59	1.15	0.59	6.20	7.00	1.00	4.1	40	15	934.55	4.55	15	91.50	930.00	926.28	0.0407	0.14	10.7	4.1	6.9	13.0	GOOD	
								9.31	1.25	6.9																
	50	0.51	0.82	0.42	0.82	0.42	5.90	7.09	1.00	3.0	50	51	936.31	4.56	15	224.56	931.75	923.70	0.0358	0.37	10.0	3.0	4.9	12.2	GOOD	
5								9.31	1.25	4.9																
	51	0.51	0.63	0.32	1.45	0.74	6.27	6.98	1.00	5.2	51	52	927.25	3.85	15	40.90	923.40	922.61	0.0193	0.09	7.4	5.2	9.1	9.0	GOOD	
								9.82	1.25	9.1																
	60	0.51	0.86	0.44	27.99	10.99	16.21	5.80	1.00	63.7	60	61	921.25	8.75	48	54.78	912.50	910.62	0.0343	0.04	21.2	63.7	97.7	266.1	GOOD	Detention Outlet
								7.11	1.25	97.7																
	61																									

GUTTER SPREAD CALCULATIONS

Project: Orchard Woods (PEI #211142) Date: Thursday, June 15, 2023 By: KAD									"K" = 1.0																		
INLET NO.	INLET TIME CALCS								RUNOFF				GUTTER DISCHARGE/INLET DESIGN													REMARKS	
	C	DISTANCE (FT) (<100')	SLOPE (%)	Ti	Travel Dist (FT)	Velocity	TT	TC	I 10 (in/hr)	C	Incr. A (Acres)	Incremental Runoff Q10 (cfs)	Street Slope (%)	Cross Slope (%)	Curb Type	Allow. Street Spread from Bk C&G	Actual Street Spread from Bk C&G	Depth of Water at Curb (ft)	Inlet Opening Length (ft)	Gutter Capacity (cfs)	Inlet Interception (cfs)	Bypass From Upstream (cfs)	Total Discharge to Inlet (cfs)	check	Bypass to Downstream (cfs)		Downstream Bypass Structure #
30	0.51	100	2.00	8.4	500	10	0.8	8.4	6.43	0.51	1.54	5.05	8.00	2.08	A	12.0	7.9	0.25	6	14.48	1.80		5.05	OK	3.25	17	CURB INLET
31	0.51	60	2.00	6.5	500	10	0.8	7.3	6.70	0.51	0.57	1.95	8.00	2.08	A	12.0	5.5	0.25	6	14.48	1.25		1.95	OK	0.70	14	CURB INLET
12	0.51	100	2.00	8.4	300	10	0.5	8.9	6.32	0.51	1.58	5.09	SUMP	2.08	A	12.0	SUMP	0.25	6	SUMP	SUMP	0.70	5.79	OK	0.00	N/A	CURB INLET
13	0.51	100	2.00	8.4	380	10	0.6	9.0	6.29	0.51	1.32	4.24	SUMP	2.08	A	12.0	SUMP	0.25	6	SUMP	SUMP	0.00	4.24	OK	0.00	N/A	CURB INLET
14	0.51	25	2.00	5.0	300	10	0.5	5.5	7.20	0.51	0.06	0.22	8.00	2.08	A	12.0	2.0	0.25	6	14.48	0.21		0.22	OK	0.01	15	CURB INLET
15	0.51	100	2.00	8.4	100	10	0.2	8.6	6.39	0.51	0.66	2.15	5.00	2.08	A	12.0	6.2	0.25	6	11.45	1.51	0.01	2.16	OK	0.65	16	CURB INLET
16	0.51	40	2.00	5.3	30	10	0.1	5.4	7.23	0.51	0.98	3.61	SUMP	2.08	A	12.0	SUMP	0.25	6	SUMP	SUMP	0.65	4.26	OK	0.00	N/A	CURB INLET
17	0.51	40	2.00	5.3	200	10	0.3	5.6	7.17	0.51	1.11	4.06	SUMP	2.08	A	12.0	SUMP	0.25	6	SUMP	SUMP	3.25	7.31	OK	0.00	N/A	CURB INLET



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DRAINAGE CALCULATIONS
ORCHARD WOODS
LEE'S SUMMIT, JACKSON COUNTY, MISSOURI

Revisions:		By	App.
PROJECT NO. 211142	No.	Date	
DATE: 10-21-2022 DRAWN: B.J.G. 1.	1.	2-27-23	JMO DEU
CHECKED: DEU APPROVED: DEU 2.	2.	4-24-23	JMO DEU
CORRODATE OF AUTHORIZATION	3.	6-15-23	B.J.G. DEU
LAND SURVEYING - LS-82			
ENGINEERING - E-361			
CERTIFICATE OF AUTHORIZATION			
LAND SURVEYING-2007001028			
ENGINEERING-2007000209			

\\PHILIPS-SERVER\Projects\211142\Drawings\Storm\Master Drainage Plan.dwg Layout:1 Jun 16, 2023 - 9:24am Kyle Delers



Know what's below.
Call before you dig.

UTILITY NOTES:
VISUAL INDICATIONS OF UTILITIES ARE AS SHOWN.
UNDERGROUND LOCATIONS SHOWN, AS FURNISHED BY THEIR
LESSORS, ARE APPROXIMATE AND SHOULD BE VERIFIED IN
THE FIELD AT THE TIME OF CONSTRUCTION. FOR ACTUAL
FIELD LOCATIONS OF UNDERGROUND UTILITIES CALL 811.



TRM HAS NOT BEEN PROVIDED PER THE SHEAR STRESS CALCULATIONS BELOW

Maximum Shear Stress Calculations

$$\tau_c = \gamma * d * s$$

Where:

$$\tau_c = \text{Maximum Shear Stress}$$
$$\gamma = \text{Density of Water} \left(\frac{62.4 \text{ Lb}}{\text{ft}^3} \right)$$
$$d = \text{Depth of Water (ft.)}$$
$$s = \text{Channel Slope} \left(\frac{\text{ft}}{\text{ft}} \right)$$

Swale A-A

$$\tau_c = 62.4 * 0.96 * .0188$$

$$\tau_c = 1.13 \text{ psf}$$

Conclusion: All disturbed areas within Swale A-A will be required to re-establish vegetation. The vegetation within Swale A-A is classified as Class "B" vegetation. This has a permissible shear stress of 2.1 psf. Therefore, the shear stress with the swale is permissible.

Swale B-B

$$\tau_c = 62.4 * 0.39 * .036$$

$$\tau_c = 0.88 \text{ psf}$$

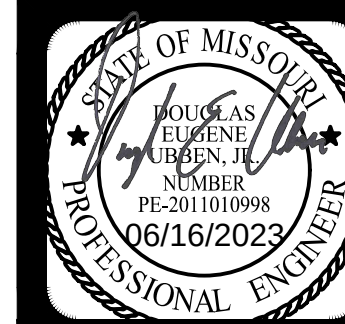
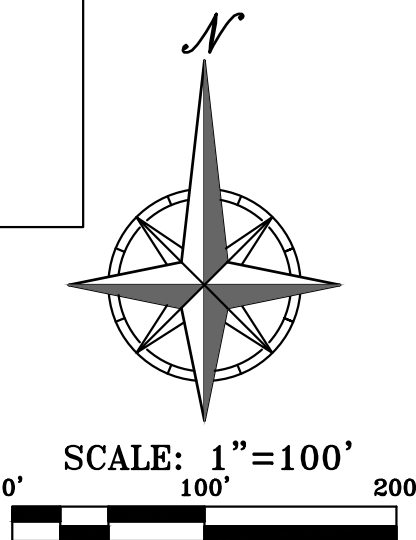
Conclusion: All disturbed areas within Swale B-B will be required to re-establish vegetation. The vegetation within Swale B-B is classified as Class "C" vegetation. This has a permissible shear stress of 1.0 psf. Therefore, the shear stress with the swale is permissible.

Swale C-C

$$\tau_c = 62.4 * 0.24 * .040$$

$$\tau_c = 0.60 \text{ psf}$$

Conclusion: All disturbed areas within Swale C-C will be required to re-establish vegetation. The vegetation within Swale C-C is classified as Class "C" vegetation. This has a permissible shear stress of 1.0 psf. Therefore, the shear stress with the swale is permissible.



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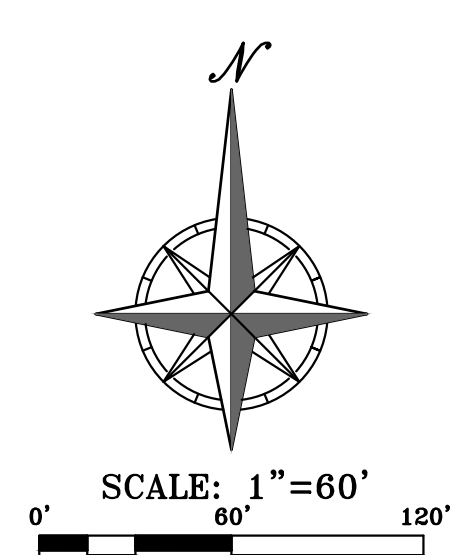


MASTER DRAINAGE PLAN
ORCHARD WOODS
LEE'S SUMMIT, JACKSON COUNTY, MISSOURI

PROJECT NO.	211142	No.	Date	Revisions:	By	App.
DATE: 10-21-2022	DRAWN: BAG	1.	2-27-23	REVISED PER CITY COMMENTS	JMO	DEU
CHECKED: DEU	APPROVED: DEU	2.	4-24-23	REVISED PER CITY COMMENTS	JMO	DEU
CORPORATE OF AUTHORIZATION		3.	6-15-23	REVISED PER CITY COMMENTS	BUG	DEU
LAND SURVEYING - LS-62						
ENGINEERING - E-361						
CERTIFICATE OF AUTHORIZATION						
LAND SURVEYING - 2007001028						
ENGINEERING - 2007000038						

SHEET

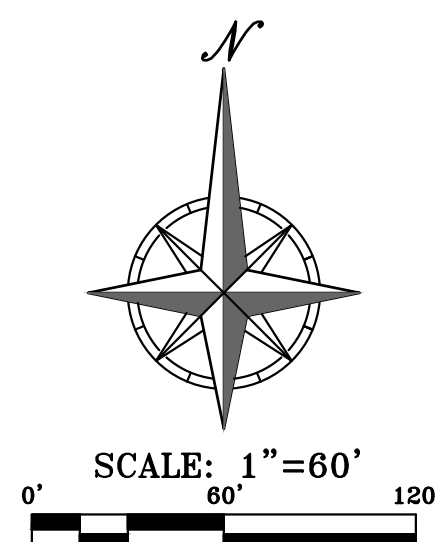
20



Know what's **below**.
Call before you dig.

SHEET
21

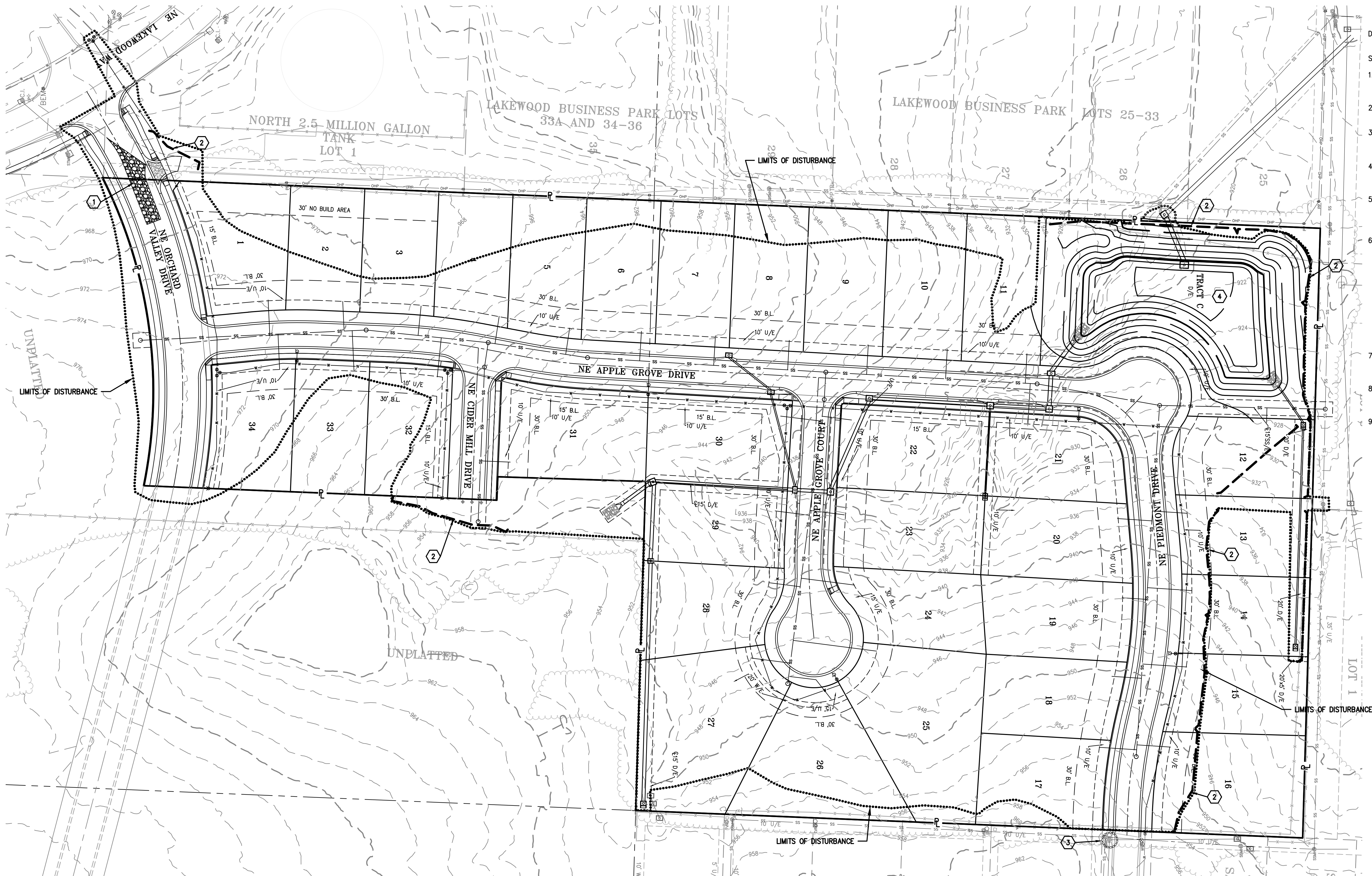
UTILITY NOTES:
VISUAL INDICATIONS OF UTILITIES ARE AS SHOWN.
UNDERGROUND LOCATIONS SHOWN, AS FURNISHED BY THEIR
LESSORS, ARE APPROXIMATE AND SHOULD BE VERIFIED IN
THE FIELD AT THE TIME OF CONSTRUCTION. FOR ACTUAL
FIELD LOCATIONS OF UNDERGROUND UTILITIES CALL 811.



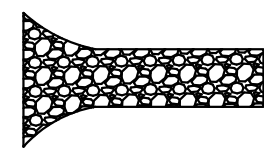


CHECKED: DEU	CERTIFICATE OF AUTHORIZATION KANSAS LAND SURVEYING - LS-82 ENGINEERING - E-391	APPROVED: DB
	CERTIFICATE OF AUTHORIZATION MISSOURI LAND SURVEYING-2007001128 ENGINEERING-2007005058	

\\PHILIPS-SERVER\Projects\1\211142\Drawn\STORM\VERSION.dwg Layout1 Jun 16, 2023 9:25am Kyle Detert



CONTRACTOR TO CONSTRUCT STORM WATER MANAGEMENT FACILITIES, SPECIFICALLY THOSE FEATURES RELATED TO DETENTION PRIOR TO ANY LAND DISTURBANCE OF THE SITE AND PRIOR TO THE CONSTRUCTION OF ANY OTHER SITE DEVELOPMENT WORK AS NOT TO EFFECT DOWNSTREAM NEIGHBORS WITH UNDETAINED STORM WATER DISCHARGE



Stabilized Rock Entrance



Silt Fence with Woven Wire (Prior to Disturbance)



Silt Fence (During Construction)



Limits of Disturbed Area



Existing Inlet Protection



Proposed Curb Inlet Protection



Proposed Area Inlet Protection



Rock Ditch Check

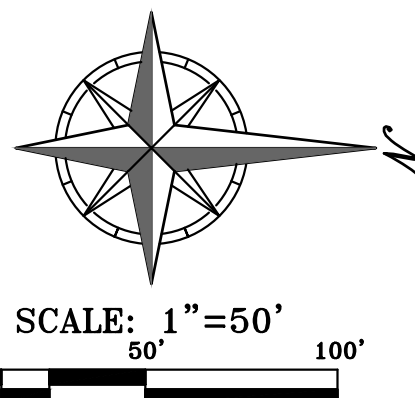


Existing Inlet Protection

DISTURBED AREA = 11.0 ACRES

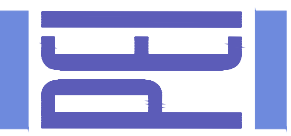
SITE SPECIFIC NOTES:

- THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL EXISTING UTILITY LOCATIONS PRIOR TO EXCAVATION.
- THERE ARE NO WETLANDS, NATURAL WATER STORAGE DETENTION AREAS IN THE PROJECT AREA.
- NO PART OF THE PROJECT LIES WITHIN THE 100 YEAR FLOOD PLAIN PER FEMA FLOOD INSURANCE RATE MAP NUMBER 29095C0430G DATED 1/20/2017
- ALL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE IMPLEMENTED ACCORDING TO THE BMP STAGING CHART.
- ADDITIONAL EROSION CONTROL MAY BE REQUIRED BY THE CITY ENGINEER AT ANY TIME EXISTING MEASURES ARE FOUND TO BE INEFFECTIVE OR PROBLEMATIC AREAS ARE NOTED IN THE FIELD.
- STABILIZATION OF DISTURBED AREAS MUST, AT A MINIMUM, BE INITIATED IMMEDIATELY WHENEVER ANY CLEARING, GRADING, EXCAVATING, OR OTHER SOIL-DISTURBING ACTIVITIES HAVE PERMANENTLY CEASED ON ANY PORTION OF THE SITE, OR TEMPORARILY CEASED ON ANY PORTION OF THE SITE AND WILL NOT RESUME FOR A PERIOD EXCEEDING 14 CALENDAR DAYS. THE DISTURBED AREAS SHALL BE PROTECTED FROM EROSION BY STABILIZING THE AREA WITH MULCH OR OTHER SIMILARLY EFFECTIVE SOIL STABILIZING BMP'S. INITIAL STABILIZATION ACTIVITIES MUST BE COMPLETED WITHIN 14 DAYS AFTER DISTURBING ACTIVITIES CEASE.
- ALL PERIMETER SILT FENCE, EARTH DIKES, SEDIMENT BASINS, AND ROCK CONSTRUCTION ENTRANCES WILL BE INSTALLED BEFORE GRADING OPERATIONS BEGIN.
- SILT FENCE AND EARTH DIKES THAT ARE PLACED BEFORE GRADING BEGINS WILL BE MAINTAINED BY THE GRADING CONTRACTOR.
- ARES WITHIN PUBLIC RIGHT-OF-WAY SHALL BE SODDED IMMEDIATELY AFTER CONSTRUCTION IS COMPLETE.



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PRE CONSTRUCTION EROSION CONTROL PLAN

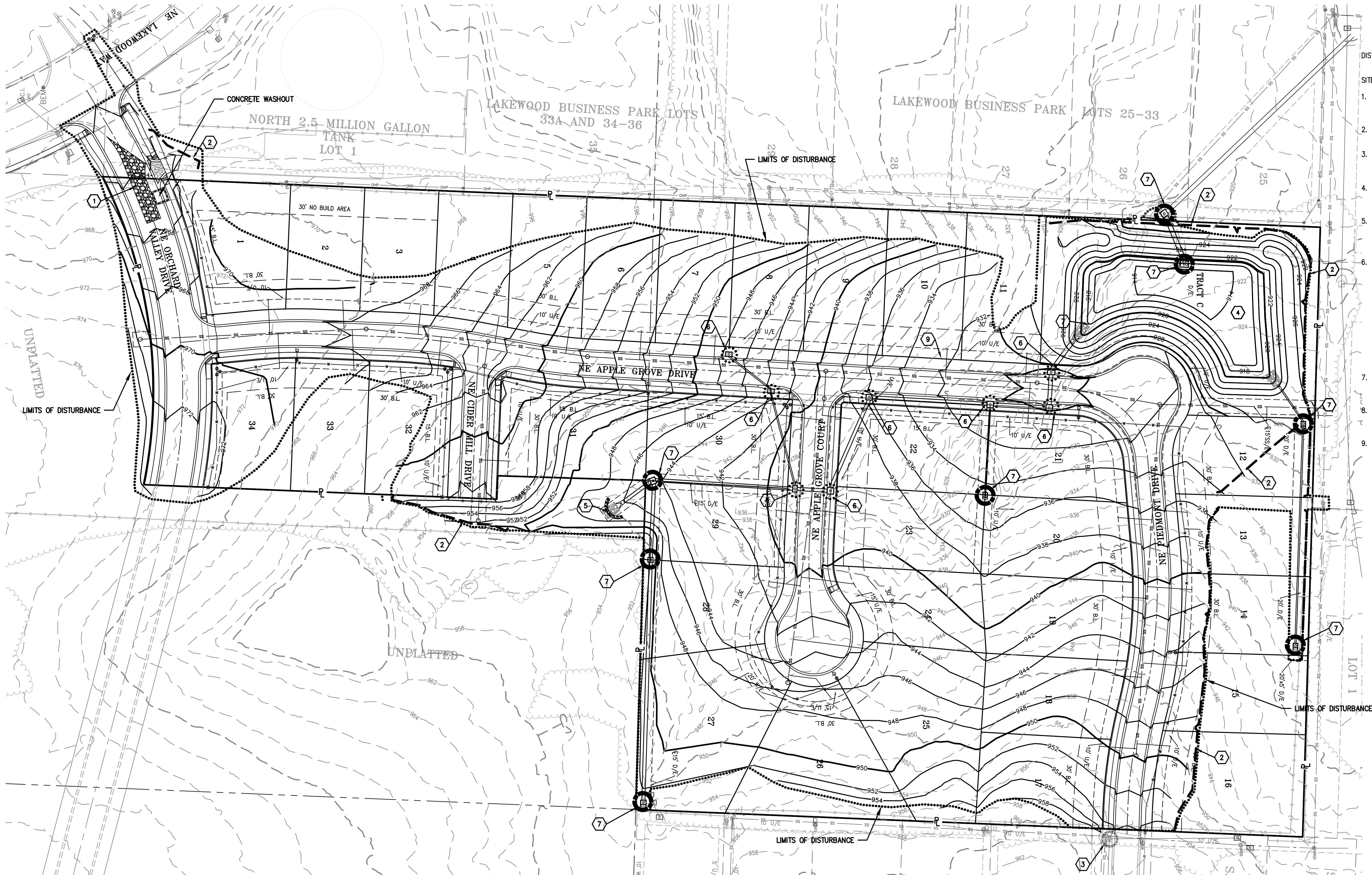
ORCHARD WOODS
LEE'S SUMMIT, JACKSON COUNTY, MISSOURI

PROJECT NO.	211142	DATE	10-21-2022	DATE	10-21-2022	DATE	10-21-2022	DATE	10-21-2022
BY	JMO	APP.	JMO	REVISED PER CITY COMMENTS	1.	REVISED PER CITY COMMENTS	2.	REVISED PER CITY COMMENTS	3.
DATE: 10-21-2022	DRAWN: BAG	CHECKED: DEU	APPROVED: DEU	CERTIFICATE OF AUTHORIZATION	DATE: 10-21-2022	DATE: 10-21-2022	DATE: 10-21-2022	DATE: 10-21-2022	DATE: 10-21-2022
ENGINEER: E-S-82	LAND SURVEYING: E-S-82	ENGINEERING: E-S-82	ENGINEERING: E-S-82	ENGINEERING: E-S-82	ENGINEERING: E-S-82	ENGINEERING: E-S-82	ENGINEERING: E-S-82	ENGINEERING: E-S-82	ENGINEERING: E-S-82

SHEET

24

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DISTURBED AREA = 11.0 ACRES

SITE SPECIFIC NOTES:

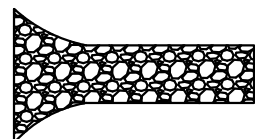
1. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL EXISTING UTILITY LOCATIONS PRIOR TO EXCAVATION.
2. THERE ARE NO WETLANDS, NATURAL WATER STORAGE DETENTION AREAS IN THE PROJECT AREA.
3. NO PART OF THE PROJECT LIES WITHIN THE 100 YEAR FLOOD PLAIN PER FEMA FLOOD INSURANCE RATE MAP NUMBER 29095C0430G DATED 1/20/2017
4. ALL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE IMPLEMENTED ACCORDING THE BMP STAGING CHART.
5. ADDITIONAL EROSION CONTROL MAY BE REQUIRED BY THE CITY ENGINEER AT ANY TIME EXISTING MEASURES ARE FOUND TO BE INEFFECTIVE OR PROBLEMATIC AREAS ARE NOTED IN THE FIELD.
6. STABILIZATION OF DISTURBED AREAS MUST, AT A MINIMUM, BE INITIATED IMMEDIATELY WHENEVER ANY CLEARING, GRADING, EXCAVATING, OR OTHER SOIL DISTURBING ACTIVITIES HAVE PERMANENTLY CEASED ON ANY PORTION OF THE SITE, OR TEMPORARILY CEASED ON ANY PORTION OF THE SITE AND WILL NOT RESUME FOR A PERIOD EXCEEDING 14 CALENDAR DAYS. THE DISTURBED AREAS SHALL BE PROTECTED FROM EROSION BY STABILIZING THE AREA WITH MULCH OR OTHER SIMILARLY EFFECTIVE SOIL STABILIZING BMPs. INITIAL STABILIZATION ACTIVITIES MUST BE COMPLETED WITHIN 14 DAYS AFTER DISTURBING ACTIVITIES CEASE.
7. ALL PERIMETER SILT FENCE, EARTH DIKES, SEDIMENT BASINS, AND ROCK CONSTRUCTION ENTRANCES WILL BE INSTALLED BEFORE GRADING OPERATIONS BEGIN.
8. SILT FENCE AND EARTH DIKES THAT ARE PLACED BEFORE GRADING BEGINS WILL BE MAINTAINED BY THE GRADING CONTRACTOR.
9. AREAS WITHIN PUBLIC RIGHT-OF-WAY SHALL BE SODDED IMMEDIATELY AFTER CONSTRUCTION IS COMPLETE.

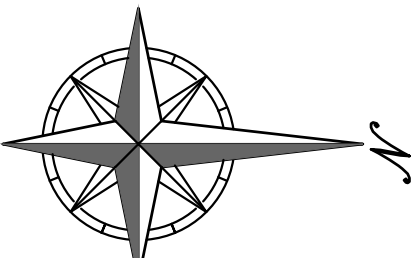
STAGING CHART

	Project Stage	BMP Plan Ref No.	BMP Description	Remove after Stage:	Notes:
Pre-Clearing Phase	A. Prior to Land Disturbance	①	Construction Entrance & Staging Area	D	Maintain, repair, or replace as necessary.
		②	Silt Fence with Woven Wire Fencing	D	Place downstream project site perimeter.
		③	Existing Inlet Protection	D	Install gravel filter bags prior to land disturbance.
Construction Phase	B. Mass Grading	④	Construct Sediment Basin	E	Sediment Basin to be fully constructed and operational prior to any other land disturbance operations. (Transition to Detention Basin upon stabilization of disturbed area.)
		⑤	Rock Ditch Check	C	
	C. Utility Construction	⑥	Inlet Protection	E	Install silt fence inlet protection with wire support.
Final Stabilization Phase	D. After Paving	⑦	Area Inlet Protection	N/A	Install silt fence inlet protection with wire support.
		⑧	Inlet Protection	E	Install gravel filter bags.
	E. Until closure of Land Disturbance Permit	⑨	Silt Fence	E	Place sediment fence back of curb.
			Seed	N/A	Seed & Landscape Disturbed Area upon completion of construction.

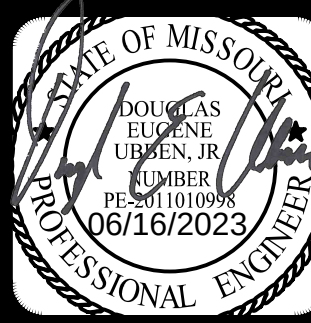
CONTRACTOR TO CONSTRUCT STORM WATER MANAGEMENT FACILITIES, SPECIFICALLY THOSE FEATURES RELATED TO DETENTION PRIOR TO ANY LAND DISTURBANCE OF THE SITE AND PRIOR TO THE CONSTRUCTION OF ANY OTHER SITE DEVELOPMENT WORK AS NOT TO EFFECT DOWNSTREAM NEIGHBORS WITH UNDETAINED STORM WATER DISCHARGE

LEGEND

-  Stabilized Rock Entrance
-  Silt Fence with Woven Wire (Prior to Disturbance)
-  Silt Fence (During Construction)
-  Limits of Disturbed Area
-  Existing Inlet Protection
-  Proposed Curb Inlet Protection
-  Proposed Area Inlet Protection
-  Rock Ditch Check
-  CONCRETE WASHOUT



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



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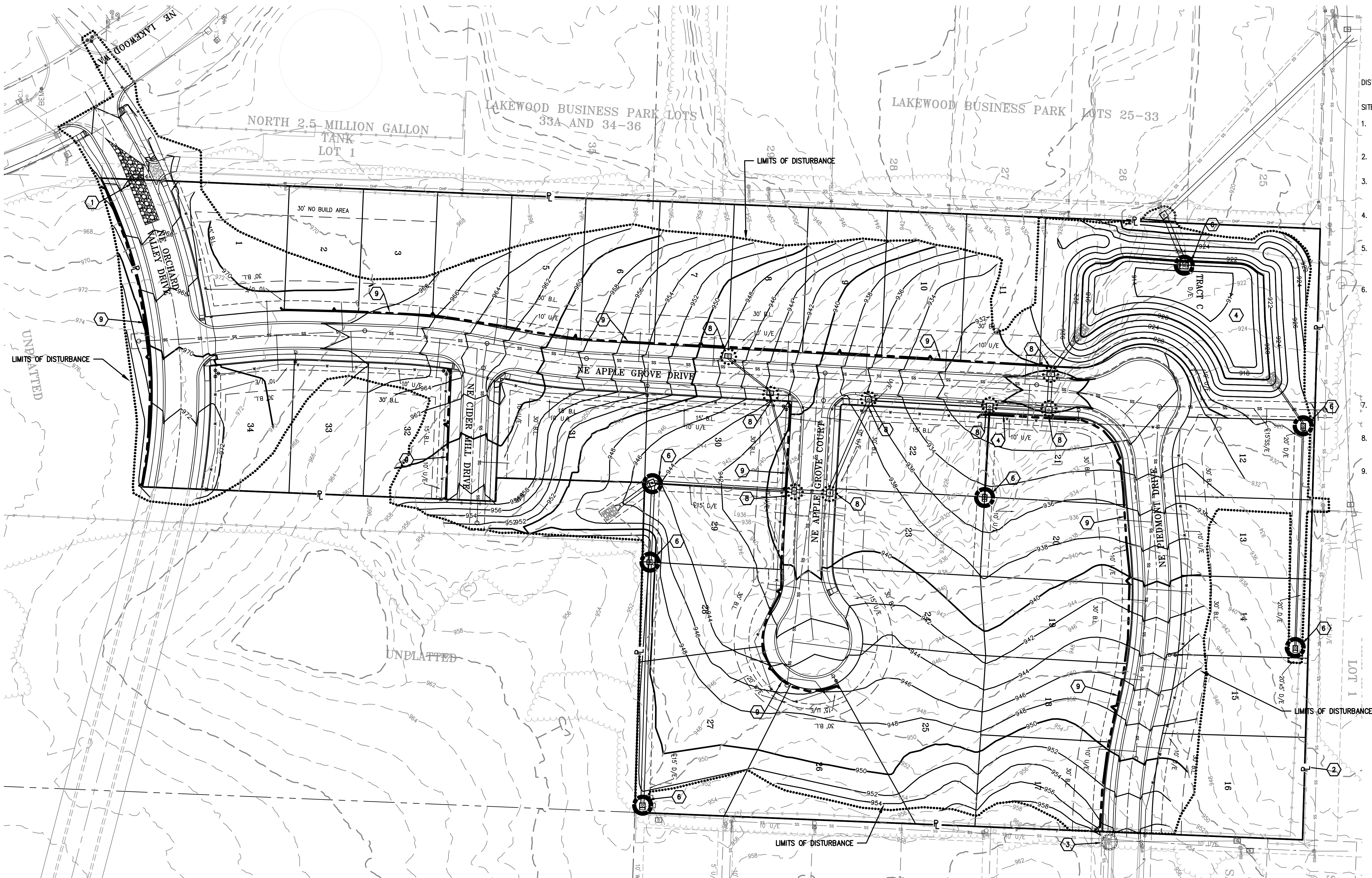
EROSION CONTROL PLAN
ORCHARD WOODS
LEE'S SUMMIT, JACKSON COUNTY, MISSOURI

PROJECT NO.	211142	Date	Revisions:	BY	App.
DATE 10-21-2022	1. REVISED PER CITY COMMENTS	1.	REVISED PER CITY COMMENTS	JMO	DEU
CHECKED DEU	2. REVISED PER CITY COMMENTS	2.	REVISED PER CITY COMMENTS	JMO	DEU
APPROVED DEU	3. REVISED PER CITY COMMENTS	3.	REVISED PER CITY COMMENTS	BAG	DEU
CERTIFICATE OF AUTHORIZATION					
LAND SURVEYING - LS-82					
ENGINEERING - E-361					
CERTIFICATE OF AUTHORIZATION					
LAND SURVEYING-200701028					
ENGINEERING-200700208					

SHEET

25

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DISTURBED AREA = 11.0 ACRES

SITE SPECIFIC NOTES:

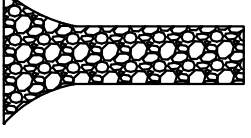
1. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL EXISTING UTILITY LOCATIONS PRIOR TO EXCAVATION.
2. THERE ARE NO WETLANDS, NATURAL WATER STORAGE DETENTION AREAS IN THE PROJECT AREA.
3. NO PART OF THE PROJECT LIES WITHIN THE 100 YEAR FLOOD PLAIN PER FEMA FLOOD INSURANCE RATE MAP NUMBER 29095C04306 DATED 1/20/2017
4. ALL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE IMPLEMENTED ACCORDING TO THE BMP STAGING CHART.
5. ADDITIONAL EROSION CONTROL MAY BE REQUIRED BY THE CITY ENGINEER AT ANY TIME EXISTING MEASURES ARE FOUND TO BE INEFFECTIVE OR PROBLEMATIC AREAS ARE NOTED IN THE FIELD.
6. STABILIZATION OF DISTURBED AREAS MUST, AT A MINIMUM, BE INITIATED IMMEDIATELY WHENEVER ANY CLEARING, GRADING, EXCAVATING, OR OTHER SOIL DISTURBING ACTIVITIES HAVE PERMANENTLY CEASED ON ANY PORTION OF THE SITE, OR TEMPORARILY CEASED ON ANY PORTION OF THE SITE AND WILL NOT RESUME FOR A PERIOD EXCEEDING 14 CALENDAR DAYS. THE DISTURBED AREAS SHALL BE PROTECTED FROM EROSION BY STABILIZING THE AREA WITH MULCH OR OTHER SIMILARLY EFFECTIVE SOIL STABILIZING BMPs. INITIAL STABILIZATION ACTIVITIES MUST BE COMPLETED WITHIN 14 DAYS AFTER DISTURBING ACTIVITIES CEASE.
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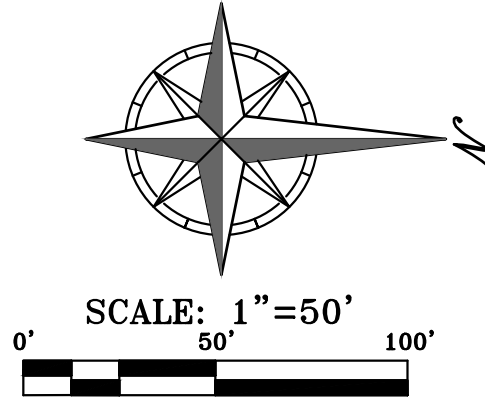
STAGING CHART

	Project Stage	BMP Plan Ref No.	BMP Description	Remove after Stage:	Notes:
Pre-Clearing Phase	A. Prior to Land Disturbance	①	Construction Entrance & Staging Area	D	Maintain, repair, or replace as necessary.
		②	Silt Fence with Woven Wire Fencing	D	Place downstream project site perimeter.
		③	Existing Inlet Protection	D	Install gravel filter bags prior to land disturbance.
Construction Phase	B. Mass Grading	④	Construct Sediment Basin	E	Sediment Basin to be fully constructed and operational prior to any other land disturbance operations. (Transition to Detention Basin upon stabilization of disturbed area.)
		⑤	Diversion Berm	C	
	C. Utility Construction	⑥	Inlet Protection	E	Install silt fence inlet protection with wire support.
Final Stabilization Phase	D. After Paving	⑦	End-Section Protection	N/A	Install rip-rap at end-section immediately after installation.
		⑧	Inlet Protection	E	Install gravel filter bags.
	E. Until closure of Land Disturbance Permit	⑨	Silt Fence	E	Place sediment fence back of curb.
			Seed	N/A	Seed & Landscape Disturbed Area upon completion of construction.

CONTRACTOR TO CONSTRUCT STORM WATER MANAGEMENT FACILITIES, SPECIFICALLY THOSE FEATURES RELATED TO DETENTION PRIOR TO ANY LAND DISTURBANCE OF THE SITE AND PRIOR TO THE CONSTRUCTION OF ANY OTHER SITE DEVELOPMENT WORK AS NOT TO EFFECT DOWNSTREAM NEIGHBORS WITH UNDETAINED STORM WATER DISCHARGE

LEGEND

-  Stabilized Rock Entrance
-  Silt Fence with Woven Wire (Prior to Disturbance)
-  Silt Fence (During Construction)
-  Limits of Disturbed Area
-  Existing Inlet Protection
-  Proposed Curb Inlet Protection
-  Proposed Area Inlet Protection
-  Rock Ditch Check
-  Existing Inlet Protection



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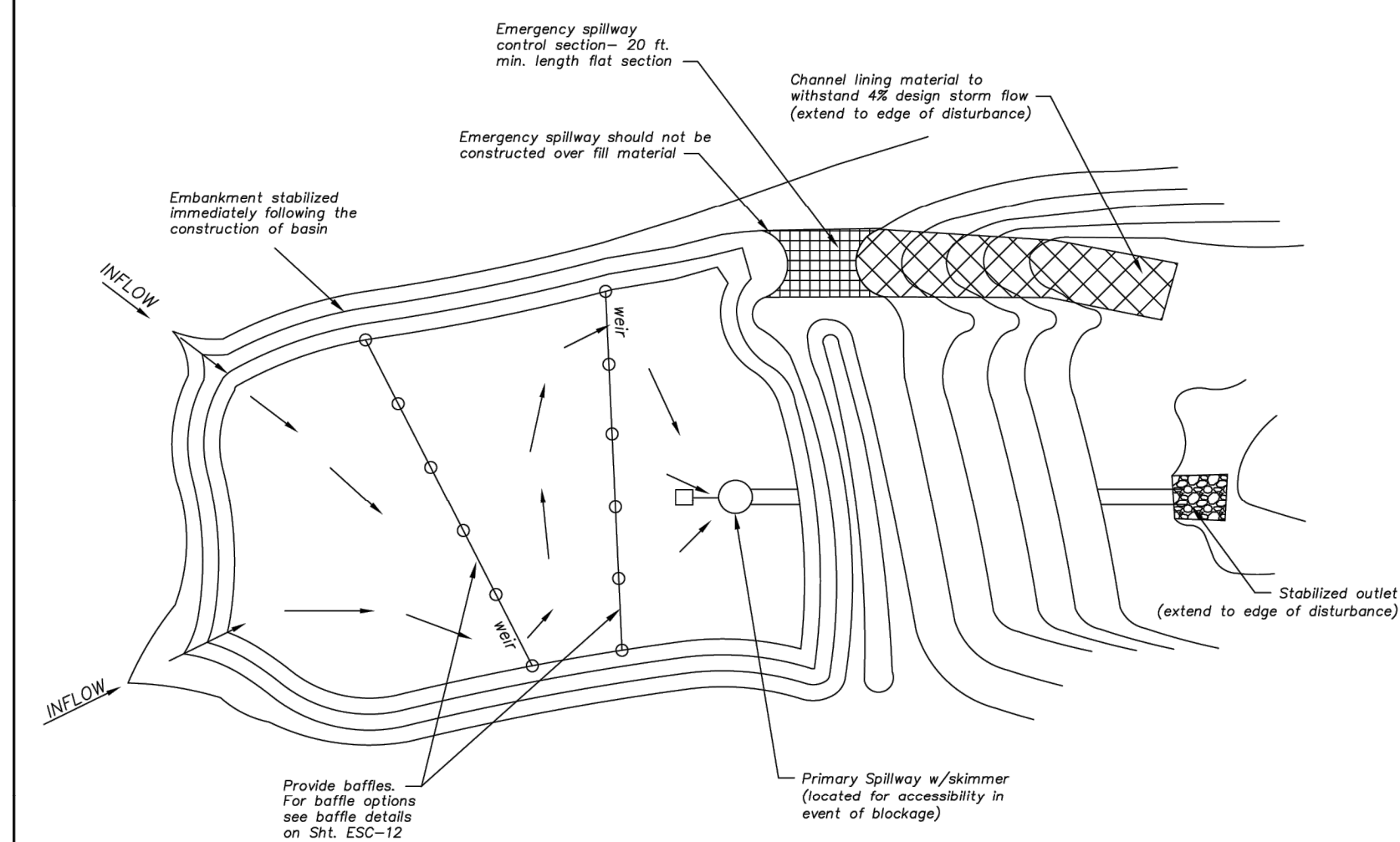


POST CONSTRUCTION EROSION CONTROL PLAN
ORCHARD WOODS
LEE'S SUMMIT, JACKSON COUNTY, MISSOURI

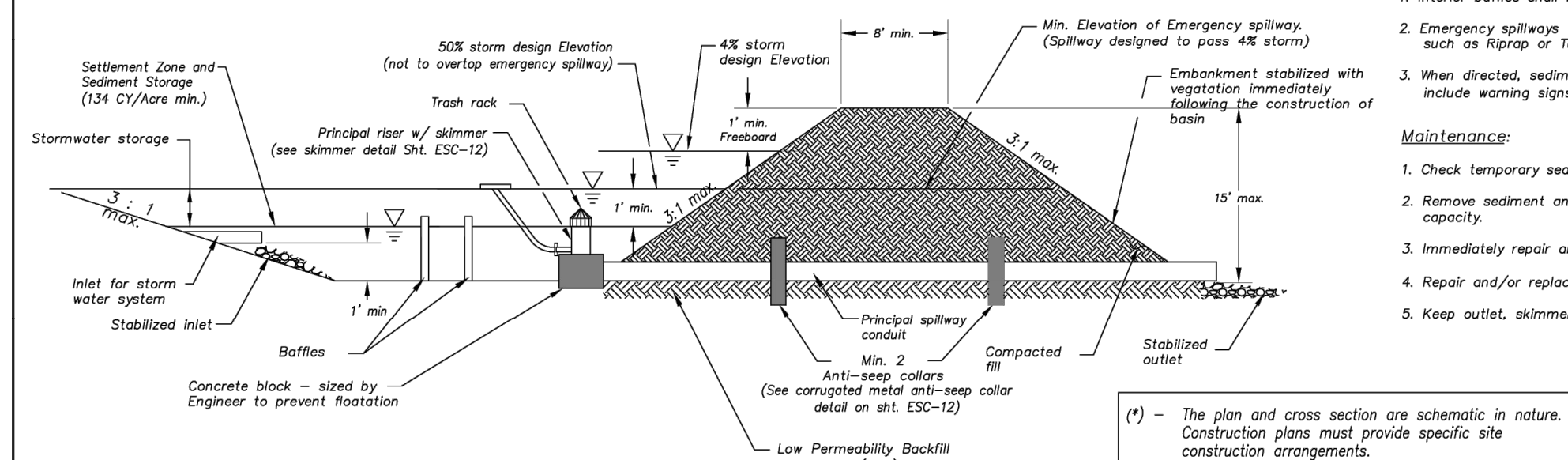
PROJECT NO.	211142	No.	Date	By	App.
DATE 10-21-2022	DRAWING	1.	2-27-23 <td>JMO</td> <td>DEU</td>	JMO	DEU
CHECKED	DEU	2.	4-24-23 <td>JMO</td> <td>DEU</td>	JMO	DEU
APPROVED	DEU	3.	6-15-23 <td>BAG</td> <td>DEU</td>	BAG	DEU
CITY DATE OF AUTHORIZATION	KANSAS				
ENGINEER NAME	ENGINEER NAME				
CERTIFICATE OF AUTHORIZATION	CERTIFICATE OF AUTHORIZATION				
10/21/2022	10/21/2022				
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SHEET

26



Plan View (*)
Not to Scale



Cross Section (*)
Not to Scale

<u>Sediment Basin Design Summary (**)</u>				
Design Item	Basin #1	Basin #2	Units	Notes
Site Data:				
Tributary Drainage Area to Pond	23.5		Acres	
50% (2 yr) Design Flow	47.1		cfs	
4% (25 yr) Design Flow	83.7		cfs	
Pond Data:				
Minimum Sediment Storage Volume	3148		cu yd	134 cu/acre required minimum
Provided Sediment Storage Volume	4939		cu yd	
Bottom Elevation	913		ft	
Sediment Cleanout Elevation	917.15		ft	Elevation equal to 20% of original design volume
Top of Riser Elevation	921.25		ft	Top of dry storage volume
Emergency Spillway Elevation	924.9		ft	at or above 0-2' elevation, 1.0 ft min above principal spillway
Top of Dam Elevation	926.55		ft	1.0 ft min above 0-25' elevation
Basin Shape Data:				
A = Area of Normal Pool	3406		SF	
L = Length of Flow Path	105		ft	
We = Effective Width = A/L	32.4		ft	
Length to Width Ratio = L/We	3.24			
Principal Spillway Data:				
Riser Pipe dia	4'x4'		in	15" min. Size for 2 year flow minimum
Barrel Pipe dia	48		in	15" min. size for 2 year flow minimum
Concrete Base size for Riser Pipe	NA		CY	Size to prevent flotation, 1.25 safety factor required
Skimmer Size	6"			Designer to provide specific details and calculations per application to dewater in 48 to 72 hours
Emergency Spillway Data:				
Design Depth in Spillway	0.36		ft	
Design Velocity in Spillway	5.9		ft/sec	
Lining Material	TRM			Designer to provide specific details and calculations per application

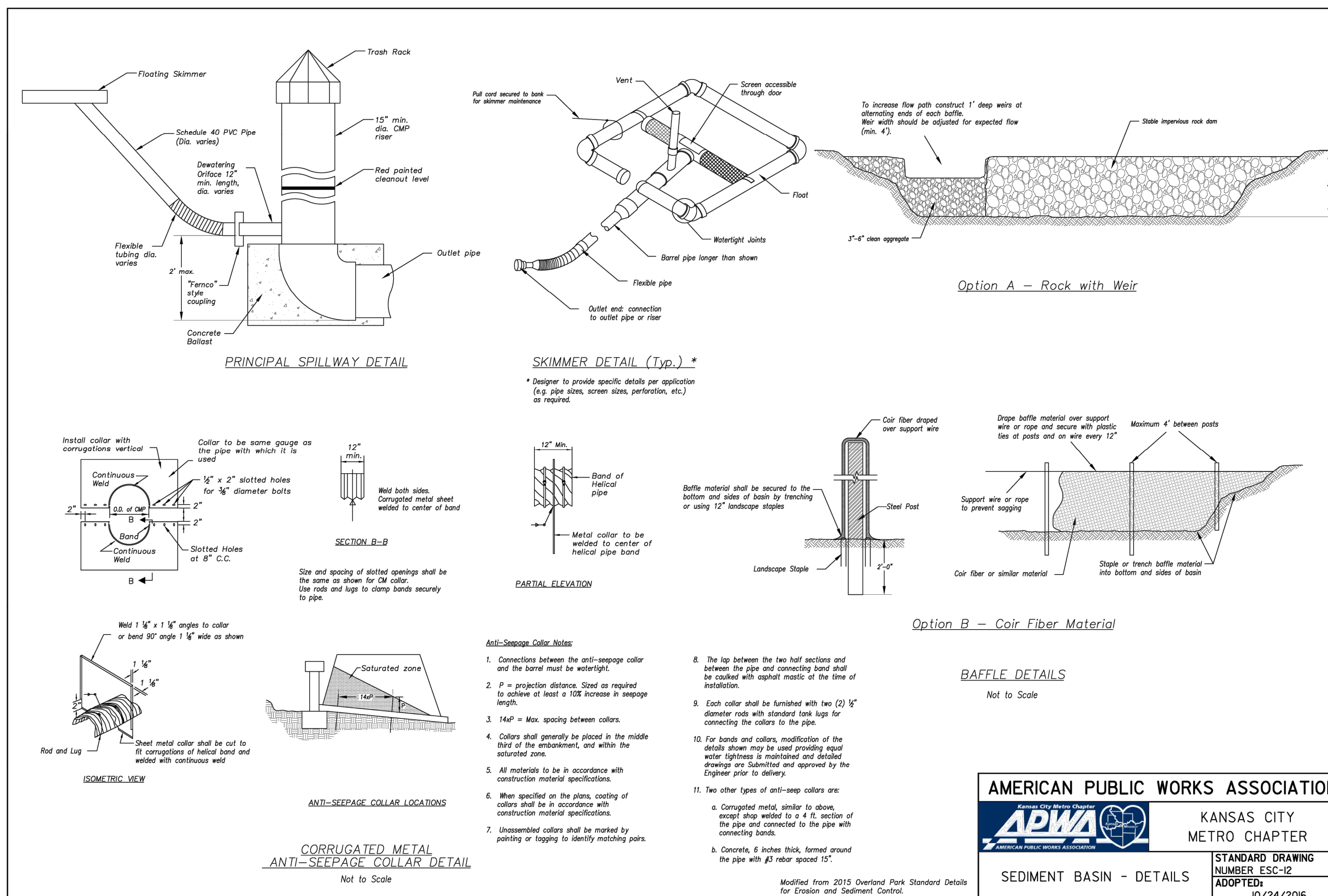
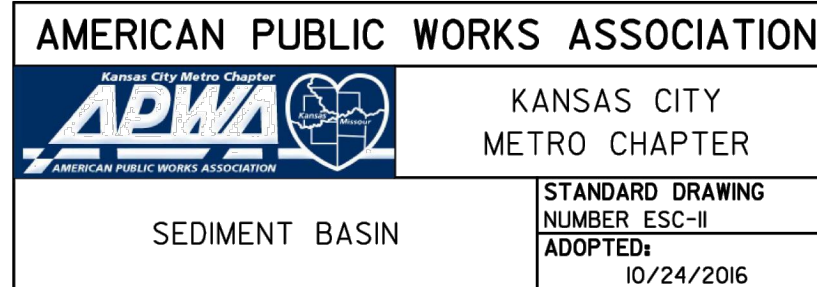
(**) - Required on all Sediment Basin Plan Sheets

Sediment Basin Notes:

1. Interior baffles shall be provided to reduce short-circuiting of the basin. See Sht. ESC-12 for approved baffle options.
2. Emergency spillways to be located in a non-fill location when feasible and shall be lined with a non-erodible material such as Riprap or Turf Reinforcement Mat.
3. When directed, sediment basins shall be fenced using construction fence or other material for safety reasons and include warning signs, reading: "Danger - KEEP OUT".

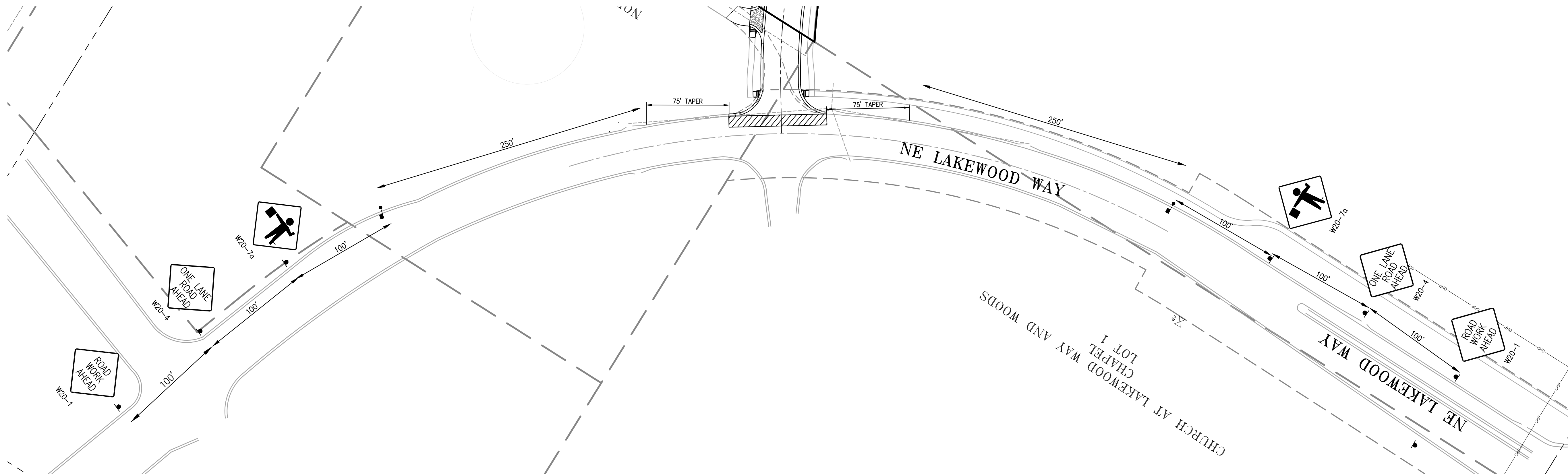
Maintenance:

1. Check temporary sediment basins after periods of significant runoff.
2. Remove sediment and restore the basin to its original dimensions when sediment accumulates to 20% of the storage capacity.
3. Immediately repair any erosion damage to the embankment and outlets.
4. Repair and/or replace baffles as necessary to maintain function and integrity of installation.
5. Keep outlet, skimmer and pool area free of oil trash and other debris.

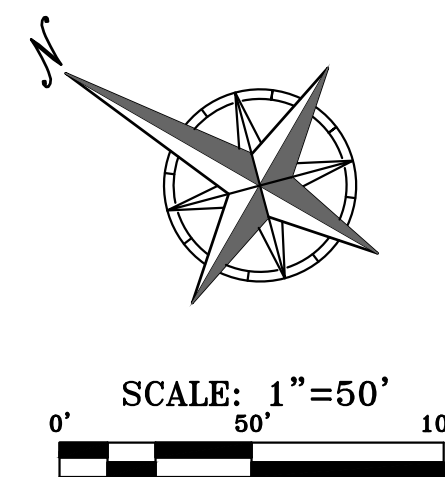


By	Date	No.	Revisions:
JMO	2-27-23	1	REVISED PER CITY COMMENTS
DEL	4-24-23	2	CHANGED: DEUI APPROVED DEUI
JMO	6-15-23	3	GENERATE PER CITY COMMENTS
DEL			LAND SURVEYING - LS-80
			ENGINEERING - E-391
			CERTIFICATE OF AUTHORIZATION
			LAND SURVEYING - LS-007001/28
			ENGINEERING - E-007001/28

\\PHILIPS-SERVER\Projects\1\211142\Drawings\TRAFFIC CONTROL.dwg Layout:1 Jun 16, 2023 9:26am Kyle Delers



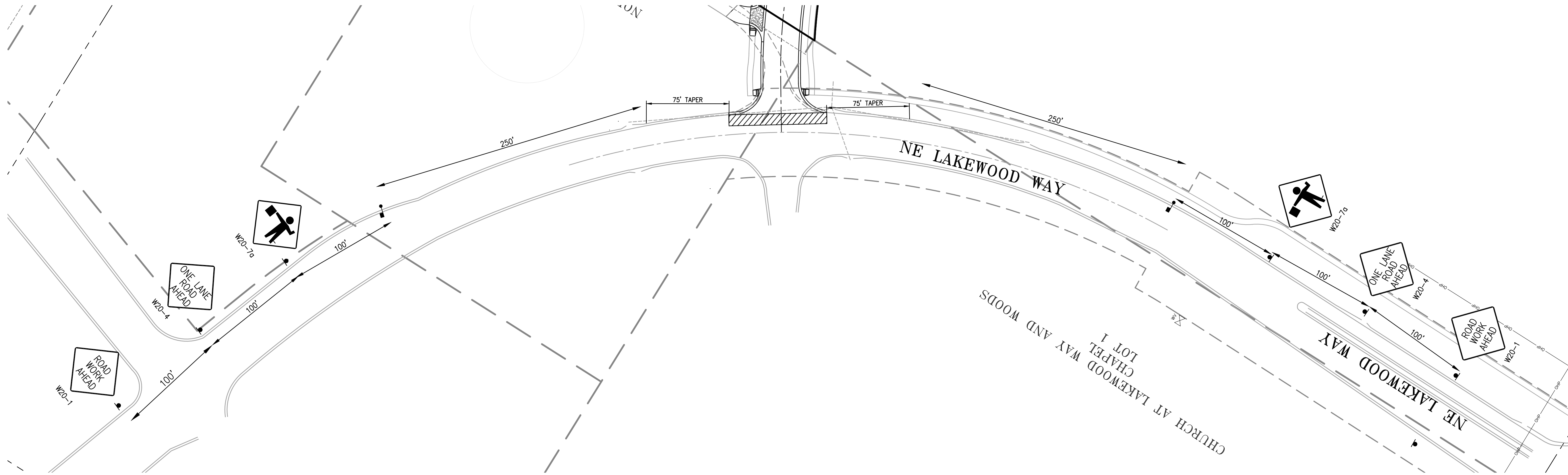
DURING NON-CONSTRUCTION PERIODS



LEGEND

- CHANNELIZATION DEVICE
- ▨ WORK AREA OR CLOSED LANE
- TRAFFIC CONTROL SIGN ON PORTABLE SUPPORT
- FLAGGER WITH STOP/SLOW SIGN PADDLE
- ◀◀◀ ARROW DISPLAY

CONTRACTOR TO SUBMIT A "SPECIFIC" TRAFFIC CONTROL PLAN TO THE CITY OF OLATHE TRAFFIC DIVISION FOR A LANE CLOSURE OR INTERSECTION CLOSURE A MINIMUM OF 7 DAYS PRIOR TO PLANNED CLOSURE



DURING CONSTRUCTION PERIODS

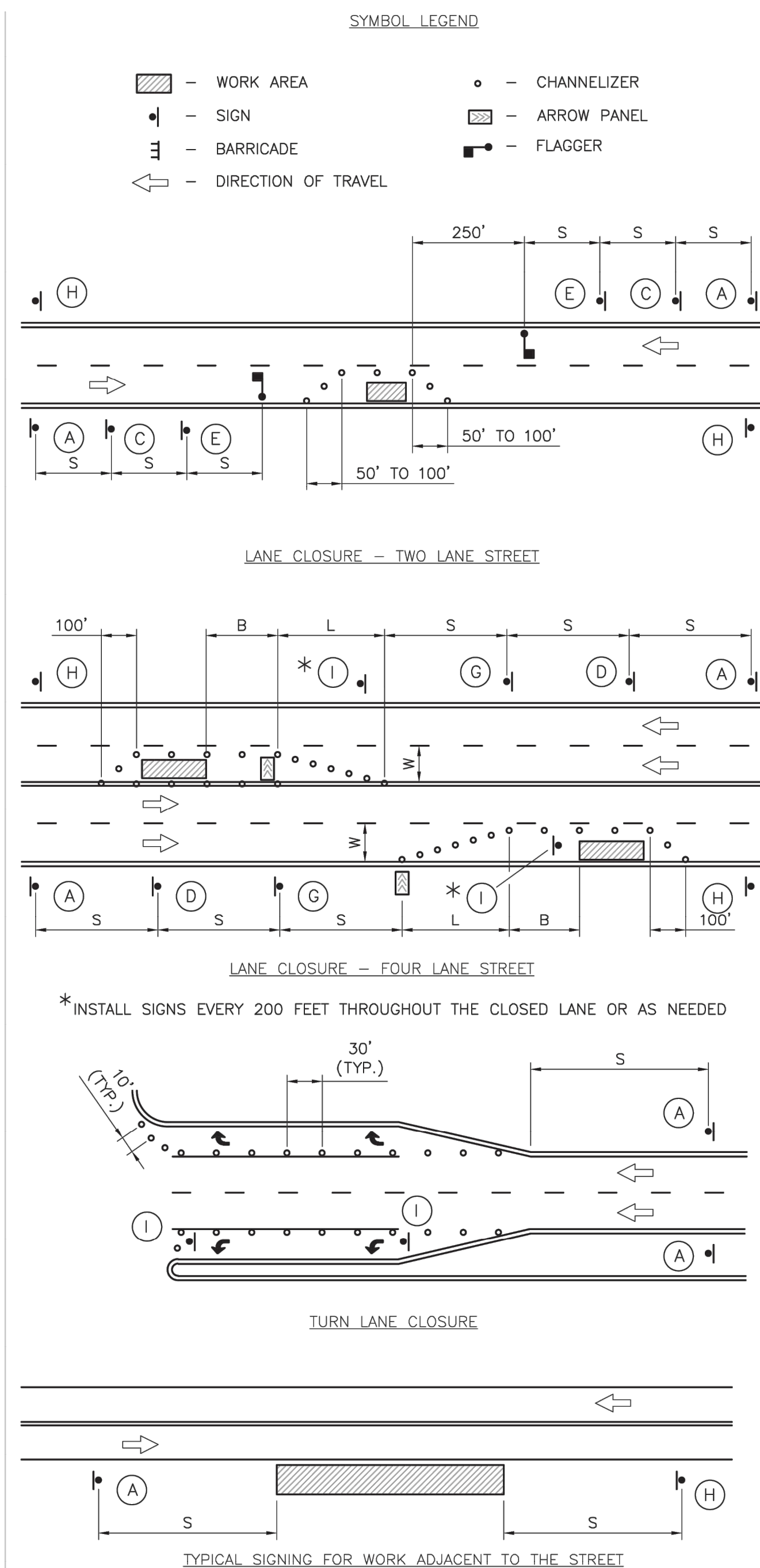
PROJECT NO.	211142	No.	Date	Revisions:	By	App.
DATE: 10-21-2022	DRAWN: B.J.G.	1.	2-27-23	REVISED PER CITY COMMENTS	J.M.O.	DEU
CHECKED: DEU	APPROVED: DEU	2.	4-24-23	REVISED PER CITY COMMENTS	J.M.O.	DEU
CERTIFICATE OF AUTHORIZATION		3.	6-15-23	REVISED PER CITY COMMENTS	B.J.G.	DEU
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PLANNING
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IMPLEMENTATION

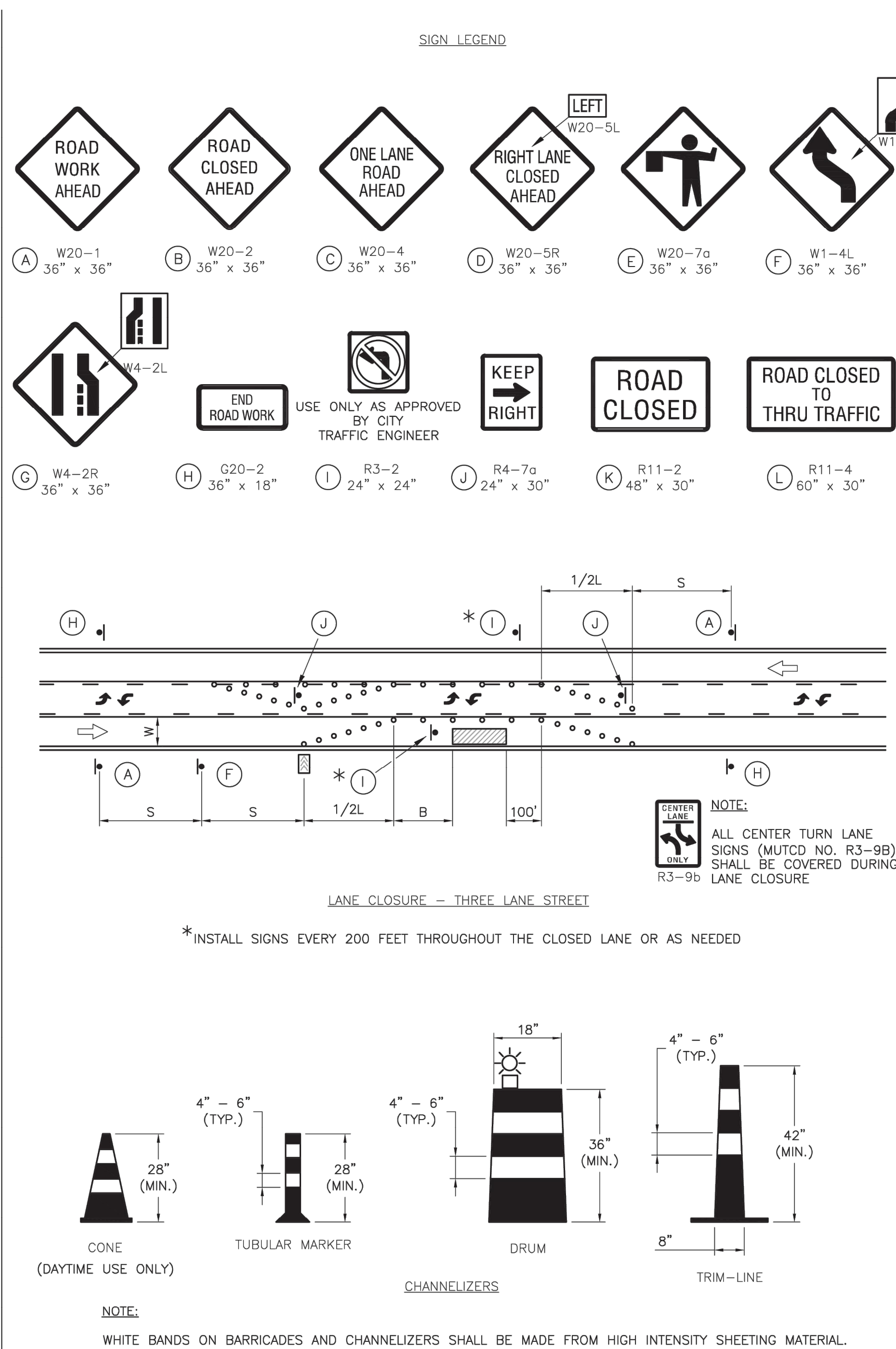
PHELPS ENGINEERING, INC.
1270 N. Winchester
Olathe, Kansas 66061
(913) 993-1155
Fax (913) 993-1166
www.phelpsen지니어링.com



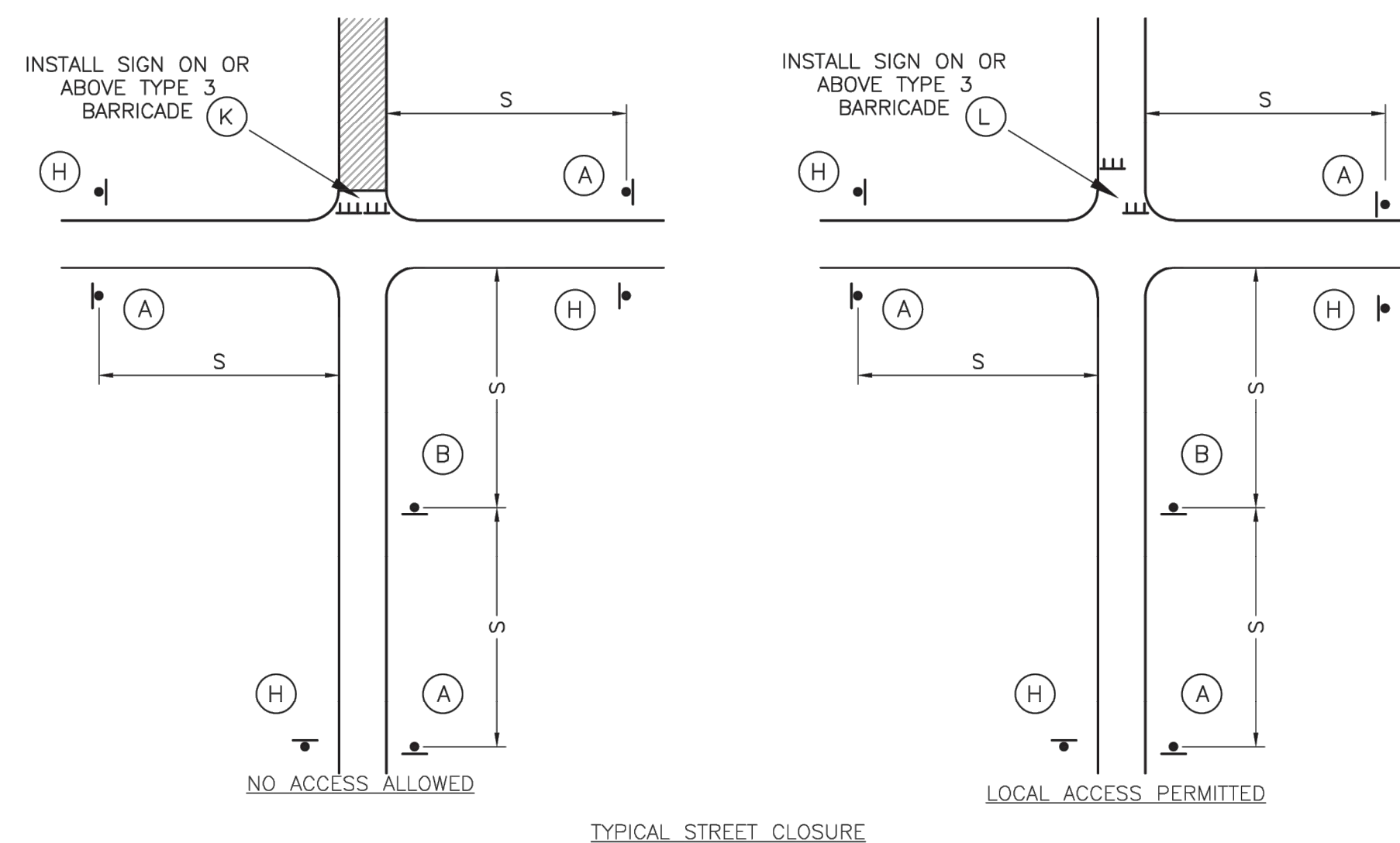


GUIDELINES FOR LENGTH OF LONGITUDINAL BUFFER SPACE "B"				MAXIMUM CHANNELIZER SPACING		
SPEED LIMIT (MPH)		LENGTH (FEET)		SPEED LIMIT (MPH)	WITHIN TAPER (FEET)	OUTSIDE TAPER (FEET)
25		35		25	25	50
30		55		30	30	60
35		85		35	35	70
40		120		40	40	80
45		170		45	45	90

TAPER DIMENSIONS (FEET)					SIGN SPACING "S"	
SPEED LIMIT (MPH)	MINIMUM TAPER LENGTH "L", PER LANE WIDTH "W"			MINIMUM NUMBER OF CHANNELIZERS	SPEED LIMIT (MPH)	SPACING (FEET)
	10	11	12			
25	105	115	125	6	25	100
30	150	165	180	7	30—35	250
35	205	225	245	8	•• 40	350
40	270	295	320	9		
45	450	495	540	13		



1. ALL SIGNS, BARRICADES, CHANNELIZERS, MARKINGS AND OTHER TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
2. ALL TRAFFIC CONTROL DEVICES SHALL BE STANDARD IN SIZE, SHAPE, COLOR, AND MESSAGE, IN GOOD CONDITION, AND RETRO-REFLECTORIZED. ALL SIGNS SHALL BE SECURELY MOUNTED WITH HEIGHT AND LATERAL LOCATION AS DESCRIBED IN THE MUTCD.
3. WARNING LIGHTS SHALL BE USED ON BARRICADES IN PLACE AT NIGHT AND ON WARNING SIGNS WHICH ALERT DRIVERS ABOUT A CHANGE IN ALIGNMENT, TRAFFIC CONTROL, LANE CLOSURE, OR ROAD CLOSURE.
4. FLAGGERS SHALL BE USED WHERE INDICATED ON THE PLANS, WHERE CONSTRUCTION VEHICLES INTERACT WITH NORMAL TRAFFIC, OR WHERE CONSTRUCTION ACTIVITIES IMPOSE A RESTRICTION ON TRAFFIC, AS DIRECTED BY THE CITY TRAFFIC ENGINEER. WHERE FLAGGERS ARE USED, ADVANCE SIGNING SHALL BE ERRECTED AS SHOWN IN THE DETAILS OR AS SPECIFIED IN THE MUTCD. FLAGGERS SHALL MEET THE REQUIREMENTS IN THE MUTCD IN REGARD TO CHARACTER, TRAINING, ATTIRE, AND BEHAVIOR.
5. TRIM-LINES ARE THE CITY'S PREFERRED CHANNELIZING DEVICE. CONES MAY NOT BE USED AT NIGHTTIME.
6. TRAFFIC CONTROL DEVICES NOT IN USE OR NOT APPLICABLE SHALL BE EITHER COVERED OR REMOVED FROM THE WORK AREA.
7. THE CONTRACTOR SHALL USE BARRICADES, STREET PLATES, OR FENCING AS NEEDED TO EFFECTIVELY SHIELD PEDESTRIAN AND VEHICULAR TRAFFIC FROM EXPOSED OBJECTS, EXCAVATIONS, AND CONSTRUCTION ACTIVITIES.
8. ACCESS SHALL BE MAINTAINED TO ALL DRIVEWAYS AND SIDE STREETS UNLESS NOTED OTHERWISE ON THE PLANS.
9. NO STREET SHALL BE CLOSED WITHOUT THE APPROVAL OF THE CITY TRAFFIC ENGINEER. THE CONTRACTOR SHALL NOTIFY THE CITY TRAFFIC ENGINEER AT LEAST 7 DAYS IN ADVANCE OF ANY STREET CLOSURE. IF A DETOUR ROUTE AROUND THE CLOSURE IS TO BE PROVIDED, ALL DETOUR SIGNING SHALL BE AS SHOWN ON A PLAN APPROVED BY THE CITY TRAFFIC ENGINEER.
10. CONSTRUCTION VEHICLES PARKED ALONG STREETS SHALL BE LOCATED WITHIN THE WORK AREA (TRAFFIC CONTROL) OR WHERE OTHERWISE NORMALLY PERMITTED. CONSTRUCTION MATERIALS, INCLUDING TRAFFIC CONTROL AND VEHICLES SHALL NOT RESTRICT SIGHT DISTANCE FOR VEHICLES EXITING AT STREETS OR DRIVES.
11. CONSTRUCTION MATERIALS SHALL BE KEPT OFF OF SIDEWALKS, CONSOLIDATED IN ONE LOCATION WITHIN CITY RIGHT-OF-WAY, AND REMOVED DAILY UNLESS OTHERWISE APPROVED BY THE INSPECTOR. DIRT, MUD, AND OTHER CONSTRUCTION DEBRIS ON STREETS AND SIDEWALKS SHALL BE REMOVED IMMEDIATELY.
12. THE CONTRACTOR SHALL NOT PERFORM ANY WORK THAT WILL RESTRICT VEHICULAR TRAFFIC IN ANY WAY BETWEEN THE HOURS OF 7:00 A.M. AND 9:00 A.M. OR 4:00 P.M. AND 6:00 P.M. MONDAY THROUGH FRIDAY UNLESS OTHERWISE INDICATED IN THE SPECIFICATIONS.
13. ALL TRAVEL LANES SHOULD BE AT LEAST 11 FEET WIDE UNLESS OTHERWISE AUTHORIZED BY THE CITY TRAFFIC ENGINEER. A "NARROW LANES" SIGN SHALL BE INSTALLED IN ADVANCE OF A LANE WIDTH REDUCTION TO LESS THAN 11 FEET.
14. ALL EDGE DROP-OFFS OF MORE THAN 2 INCHES AND LESS THAN 4 INCHES SHOULD BE PROTECTED BY A WEDGE OR BARRIER AND ALL EDGE DROP-OFFS GREATER THAN 4 INCHES SHALL HAVE EDGE PROTECTION (SEE TRAFFIC CONTROL SPECIFICATIONS FOR EDGE TREATMENT REQUIREMENTS).
15. THE "WORKERS" SYMBOLIC SIGN (MUTCD NO. W21-1A) MAY BE USED INSTEAD OF THE "ROAD WORK AHEAD" SIGN FOR WORK WITH A DURATION OF 12 HOURS OR LESS. THE "END ROAD WORK" SIGN IS NOT REQUIRED TO BE INSTALLED AFTER THE "WORKERS" SIGN.
16. NO TRAFFIC SIGNAL SHALL BE ALTERED OR MODIFIED IN ANY WAY WITHOUT A PLAN APPROVED BY THE CITY TRAFFIC ENGINEER.
17. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL TRAFFIC CONTROL DEVICES ON AN AROUND-THE-CLOCK BASIS, WHETHER OR NOT WORK IS ACTIVELY BEING PURSUED AND ANY DEFICIENCIES NOTED SHALL BE CORRECTED IMMEDIATELY.
18. THE TRAFFIC CONTROL REQUIREMENTS SHOWN ON THESE PLANS ARE MINIMUM REQUIREMENTS ONLY AND DO NOT ATTEMPT TO ADDRESS IN DEPTH THE VARIETY OF SITUATIONS THAT MAY OCCUR ONCE CONSTRUCTION HAS STARTED. IN NO WAY DO THE REQUIREMENTS SHOWN ON THESE PLANS RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITY FOR SELECTING THE PROPER TRAFFIC CONTROL DEVICES AND IMPLEMENTATION PROCEDURES THAT WILL ASSURE THE SAFETY OF DRIVERS, PEDESTRIANS, AND WORKERS AT ALL TIMES.
19. SHOULD THE CONTRACTOR FAIL TO ENFORCE THE TRAFFIC CONTROL PLAN OR FAIL TO CLEAN, REPLACE OR OTHERWISE MAINTAIN THE TRAFFIC CONTROL DEVICES WHEN DIRECTED TO DO SO BY THE CITY TRAFFIC ENGINEER OR REPRESENTATIVE, THE CITY MAY TAKE ONE OR MORE OF THE FOLLOWING ACTIONS:
 - A. EMPLOY ANOTHER AGENCY TO CORRECT DEFICIENCIES IN TRAFFIC CONTROL DEVICES AND DEDUCT THE COST FROM THE CONTRACTOR'S PAY ESTIMATE.
 - B. STOP THE WORK UNTIL DEFICIENCIES ARE CORRECTED.
 - C. SUSPEND ALL PAY ESTIMATES UNTIL DEFICIENCIES ARE CORRECTED, OR
 - D. PLACE THE CONTRACTOR IN DEFAULT.

LS
LEE'S SUMMIT
MISSOURI

PUBLIC WORKS ENGINEERING DIVISION | 220 SE GREEN STREET | LEE'S SUMMIT, MO 64063

POLE AND LUMINAIRE DETAILS
CITY OF LEE'S SUMMIT, MO
LEE'S SUMMIT, JACKSON COUNTY, MO

TRAFFIC CONTROL DETAILS

Drawn By: BWC
Checked By: MP
Date: 01/2020
Proj. #:

TC-1