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 HAMBLEN 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. 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.

PRE–CONSTRUCTION MEETING NOTE:

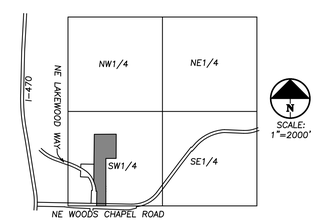
THE CONTRACTOR SHALL CONTACT THE CITY'S DEVELOPMENT SERVICES ENGINEERING INSPECTION TO SCHEDULE A PRE–CONSTRUCTION MEETING WITH A FIELD ENGINEERING INSPECTOR PRIOR TO ANY LAND DISTURBANCE WORK AT (816) 969–1200.

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



VICINITY MAP
SEC. 9–48–31

LEGEND
PROPERTY LINE

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.

811 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.

"AS-BUILT"
DATED: 11–13–23 BY: JTK

STATE OF MISSOURI
DOUGLAS EUGENE UBBEN, JR.
NUMBER PE-2011010998
PROFESSIONAL ENGINEER

PHELPS ENGINEERING, INC.
1270 N. Winchester
Olathe, Kansas 66061
(913) 393-1155
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PLANNING ENGINEERING IMPLEMENTATION

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

Revisions:

No.	Date		By	App.
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
4.	7–20–23	REVISED PER CITY COMMENTS	MRH	DEU
5.	10–11–23	REVISED TOP OF CURB ELEVATIONS	KAD	DEU

PROJECT NO. 211142
DATE: 10–21–2022 | DRAWN: BJG
CHECKED: DEU | APPROVED: DEU
CERTIFICATE OF AUTHORIZATION KANSAS SURVEYING – LS–82 KANSAS ENGINEERING – E–391
CERTIFICATE OF AUTHORIZATION MISSOURI SURVEYING–2007001128 ENGINEERING–2007005268

SHEET
1

\\PHELPS–SERVER\Projects\P\211142\Dwg\STREET AND STORM\COVER.dwg Layout:1 Jan 09, 2024 – 7:14am JEANETTE OPAT

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 then 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.

"AS-BUILT"

DATED: 11-13-23 BY: JTK

STATE OF MISSOURI
DOUGLAS EUGENE UBBEN, JR.
NUMBER PE-2011010998
PROFESSIONAL ENGINEER

PHELPS ENGINEERING, INC.
1320 N. Winchester
Olathe, Kansas 66061
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www.phelpsengineering.com

PLANNING
ENGINEERING
IMPLEMENTATION

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

Revisions:		By	App.
REVISED PER CITY COMMENTS	2-27-23	JMO	DEJ
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REVISED PER CITY COMMENTS	6-15-23	BJG	DEJ
REVISED PER CITY COMMENTS	7-20-23	MRH	DEJ
REVISED TOP OF CURB ELEVATIONS	10-11-23	KJD	DEJ

PROJECT NO. 211142
DATE: 10-21-2022 | DRAWN: BJG
CHECKED: DEJ | APPROVED: DEJ
CERTIFICATE OF AUTHORIZATION
KANSAS
LAND SURVEYING - LS-82
ENGINEERING - E-991
CERTIFICATE OF AUTHORIZATION
MISSOURI
LAND SURVEYING-2007001128
ENGINEERING-2007005938

SHEET
2

SUMMARY OF QUANITIES

PREPARED BY: MRH/KAD 7-20-2023

STREET & GRADING

ITEM		QUANITY	
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.
18	North American Green "RollMax BioNet S75BN" TRM	160	S.Y.

ANY DEMOLITION OR REMOVAL OF ANY STRUCTURES AND DEBRIS
SHALL BE CONSIDERED SUBSIDIARY TO THE WORK PERFORMED
BY THE GRADING CONTRACTOR

STORM SEWER

ITEM		QUANITY	
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

"AS-BUILT"

DATED: 11-13-23 BY: JTK

STATE OF MISSOURI
DOUGLAS EUGENE UBBEN, JR.
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PLANNING
ENGINEERING
IMPLEMENTATION

QUANTITIES

ORCHARD WOODS
LEE'S SUMMIT, JACKSON COUNTY, MISSOURI

Revisions:		By	App.
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2.	REVISED PER CITY COMMENTS	JMO	DEU
3.	REVISED PER CITY COMMENTS	BJG	DEU
4.	REVISED PER CITY COMMENTS	MRH	DEU
5.	REVISED TOP OF CURB ELEVATIONS	KAD	DEU

PROJECT NO. 211142
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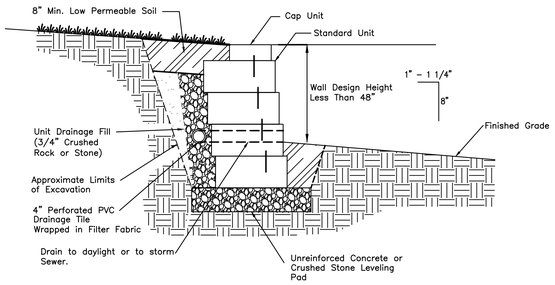
LAND SURVEYING - LS-82
ENGINEERING - E-391
CERTIFICATE OF AUTHORIZATION
MISSOURI
LAND SURVEYING-2007001128
ENGINEERING-2007005028

SHEET
3



LANDSCAPE RETAINING WALL

SCALE: N.T.S.

NOTE:

LOTS 11, 12, 17-25 & 27-30 HAVE BEEN IDENTIFIED AS LOTS REQUIRING AS-GRADED PLOT PLANS. THESE LOTS HAVE BEEN DISTINGUISHED WITH "AGPP" ON THE PLAN. AS-GRADED PLOT PLANS ARE REQUIRED DUE TO EITHER SPECIFIC GRADING THAT PART OF THE OVERALL STORMWATER DESIGN OR THE LOT'S PROXIMITY TO ENGINEERED SWALES, DRAINAGE WAYS, DETENTION BASINS, OR DRAINAGE BERMS.

OIL-GAS WELLS:

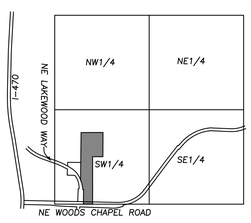
MISSOURI DEPARTMENT OF NATURAL RESOURCES, MISSOURI GEOLOGICAL SURVEY, GEOSTRAT WEBSITE INDICATES THERE ARE TWO WELLS DRILLED ON THIS PROPERTY. ID #095-00155 IS SHOWN AS A DRY HOLE, DATED 10/27/1938. ID# 0005120 IS SHOWN AS AN EXPLORATORY HOLE, DATED 10/28/1938. PHELPS ENGINEERING HAS MADE A FIELD INVESTIGATION 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. 29095C0430G, AND DATED JANUARY 20, 2017.

Earthwork Summary
Orchard Woods
4/25/2023

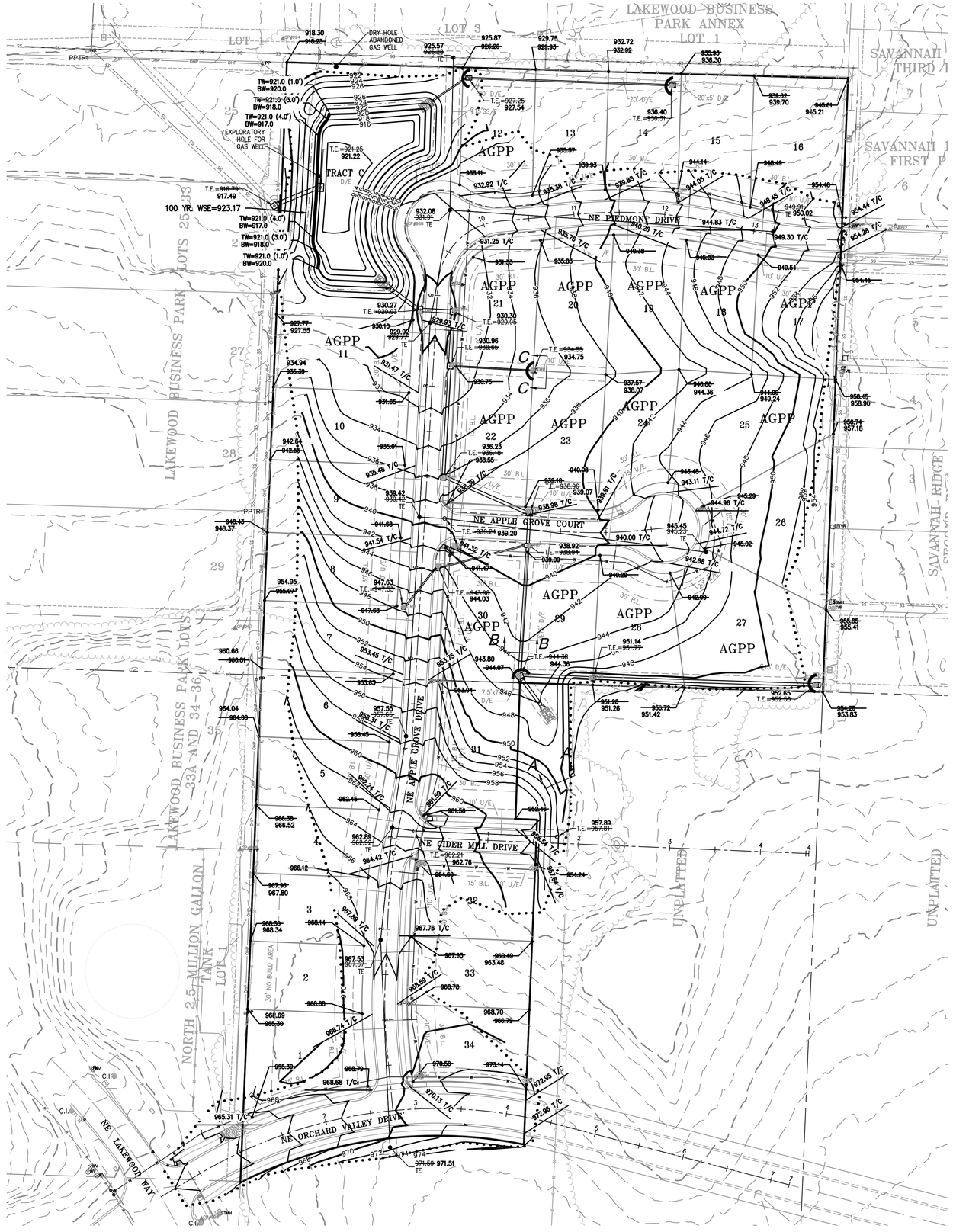
Raw Excavation	26,166 Cu. Yds.	
In Place Compaction (+15%)	-24,524 Cu. Yds.	
Pavement Adjustment	1,776 Cu. Yds.	(assume 9" of additional excavation)
On Site Net	3,418 Cu. Yds.	

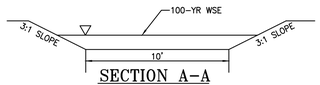


VICINITY MAP
SEC. 9-48-31

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.

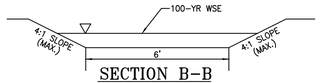
811 Know what's below. Call before you dig.





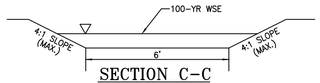
SECTION A-A

Q100 = 22.06 cfs
S = 1.88% min.
100 YR. DEPTH = 0.96'
V = 4.79 fps
V2/2G = 0.36'



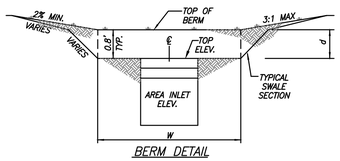
SECTION B-B

Q100 = 81.9 cfs
Q10 = 46.3 cfs
DIFF = 35.6 cfs
S = 3.6% min.
100 YR. DEPTH = 0.62'
V = 6.77 fps
V2/2G = 0.71'



SECTION C-C

Q100 = 6.9 cfs
S = 4.0% min.
100 YR. DEPTH = 0.24'
V = 4.1 fps
V2/2G = 0.27'



BERM DETAIL

"AS-BUILT"

DATED: 11-13-23 BY: JTK

LEGEND:

- LIMITS OF DISTURBANCE
- GRADING BERM

N

SCALE: 1"=60'
0' 60' 120'

STATE OF MISSOURI
DOUGLAS EUGENE UBBEN, JR.
NUMBER PE-2011010998
PROFESSIONAL ENGINEER

PHELPS ENGINEERING, INC.
1270 N. Winchester
Olathe, Kansas 66061
(913) 393-1155
Fax (913) 393-1164
www.phelpsengineering.com

PLANNING
ENGINEERING
IMPLEMENTATION

GRADING PLAN

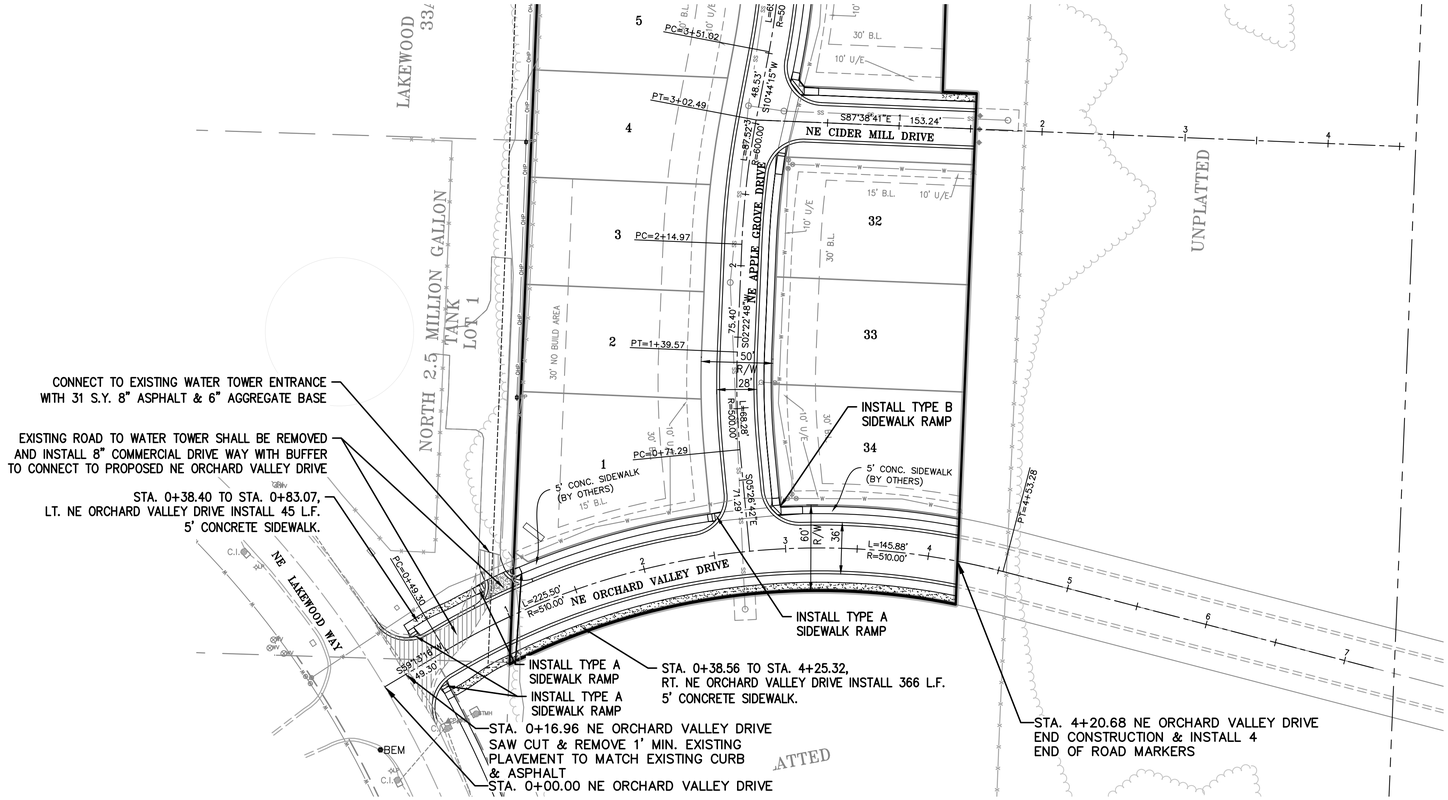
ORCHARD WOODS
LEE'S SUMMIT, JACKSON COUNTY, MISSOURI

No.	Date	Revisions:	By	App
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
4.	7-20-23	REVISED PER CITY COMMENTS	MRH	DEU
5.	10-11-23	REVISED TOP OF CURB ELEVATIONS	KAD	DEU

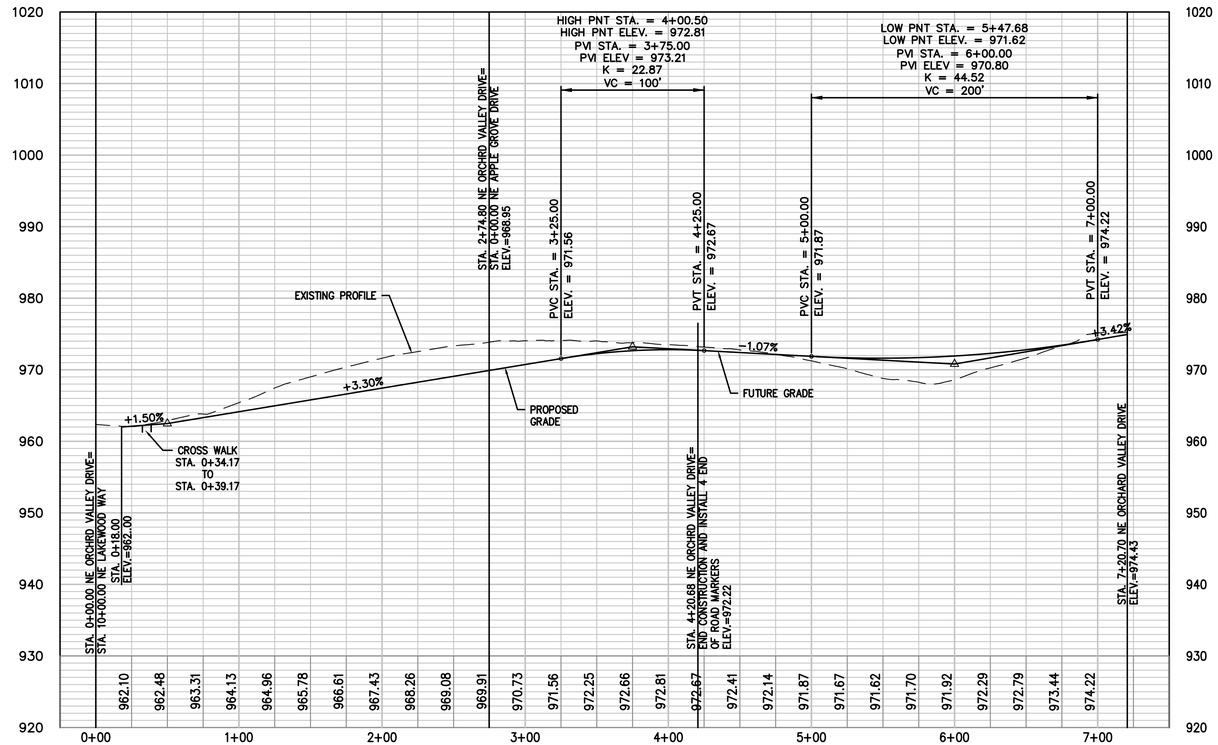
PROJECT NO. 211142
DATE: 10-21-2022 | DRAWN: B.J.G.
CHECKED: DEU | APPROVED: DEU
CERTIFICATE OF AUTHORIZATION
KANSAS
LAND SURVEYING - LS-82
ENGINEERING - E-391
CERTIFICATE OF AUTHORIZATION
MISSOURI
LAND SURVEYING-2007001128
ENGINEERING-2007005308

SHEET
4

\\PHELPS-SERVER\Projects\P\211142\Dwg\STREET AND STORM\GRADING.dwg Layout:1 Jan 23, 2024 - 5:23pm Kyle Deters



NE ORCHARD VALLEY DRIVE (RESIDENTIAL COLLECTOR)



SCALE: 1"=50'

"NE ORCHARD VALLEY DRIVE"

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

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

"AS-BUILT"

DATED: 11-13-23 BY: JTK

STATE OF MISSOURI
DOUGLAS EUGENE UBBEN, JR.
NUMBER PE-2011010998
PROFESSIONAL ENGINEER

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PLANNING
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IMPLEMENTATION

STREET PLAN & PROFILE

ORCHARD WOODS
LEE'S SUMMIT, JACKSON COUNTY, MISSOURI

Revisions:		By	App.
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3.	6-15-23
4.	7-20-23
5.	10-11-23

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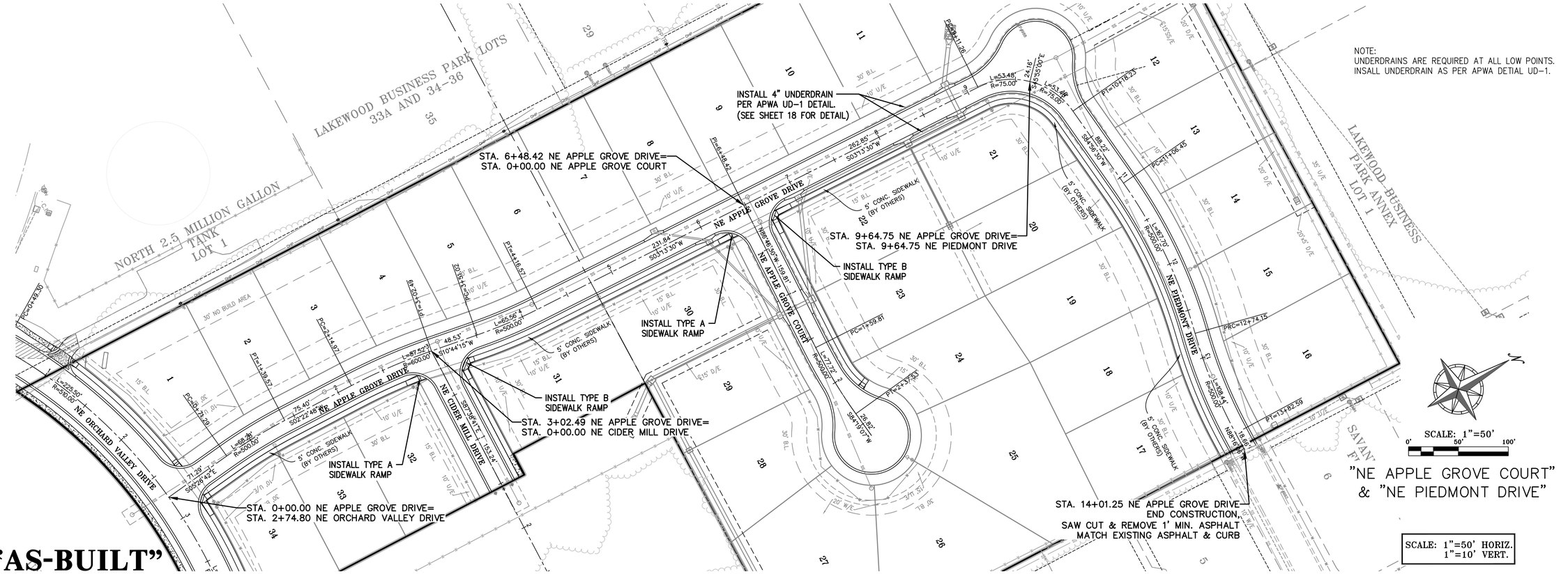
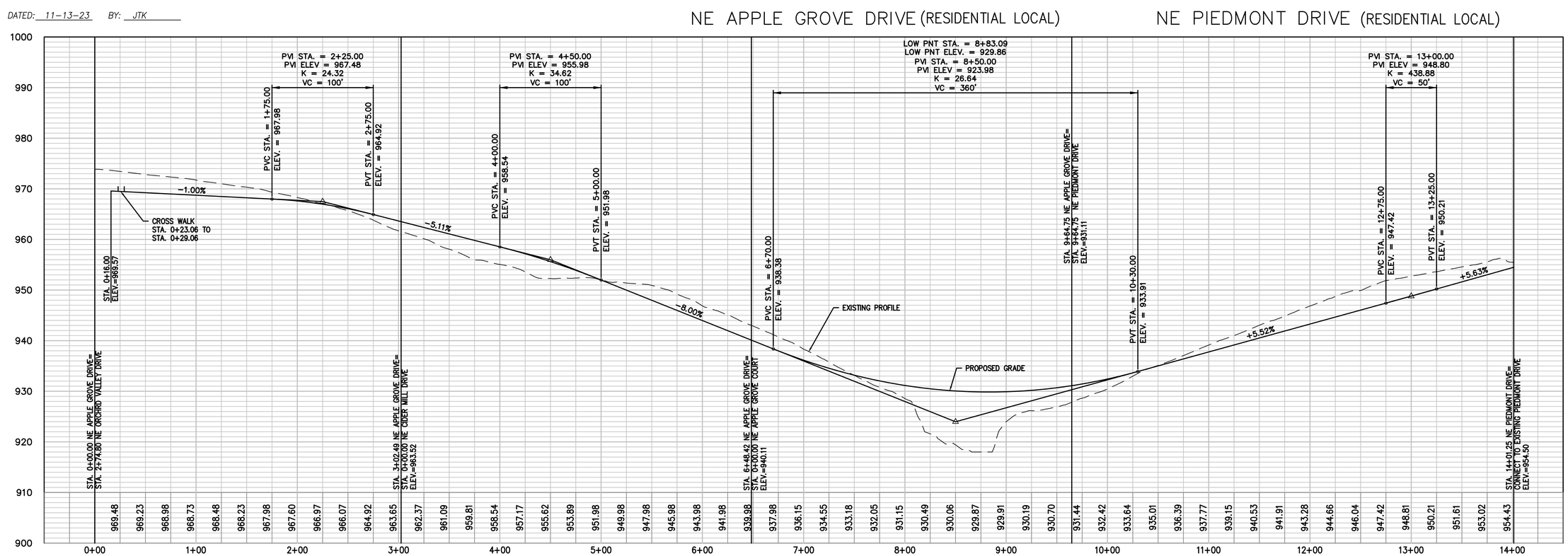
ENGINEERING - E-391
CERTIFICATE OF AUTHORIZATION MISSOURI SURVEYING-2007001128
ENGINEERING-2007005528

SHEET
5



"AS-BUILT"

DATED: 11-13-23 BY: JTK



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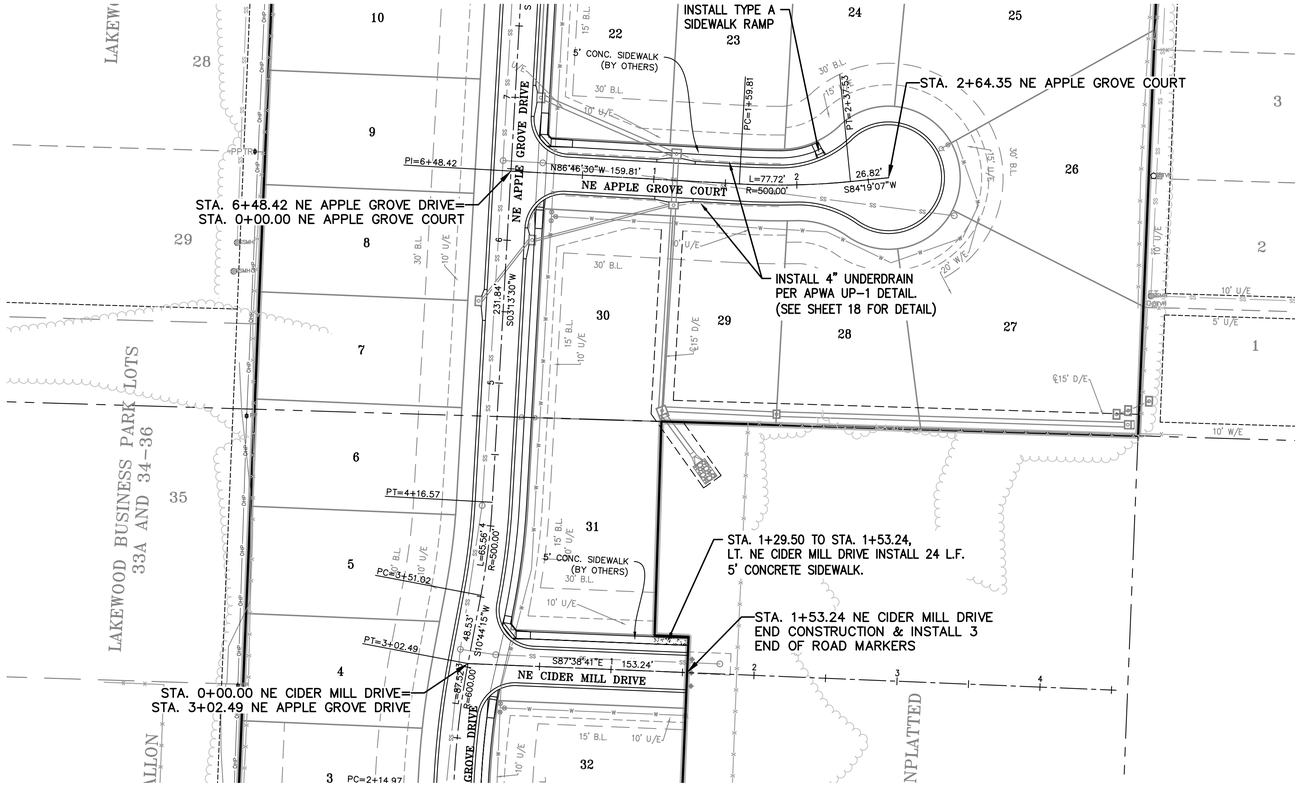
CERTIFICATE OF AUTHORIZATION KANSAS LAND SURVEYING - LS-82 LAND ENGINEERING - E-391
CERTIFICATE OF AUTHORIZATION MISSOURI LAND SURVEYING-2007001128 ENGINEERING-2007005259

SHEET
6

\\PHELPS-SERVER\Projects\P\211142\Dwg\STREET AND STORM\STREET.dwg Layout:2 Jan 09, 2024 - 7:15am JEANETTE OPAT



NE APPLE GROVE COURT
& NE CIDER MILL DRIVE

SCALE: 1"=50'

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

NOTE:
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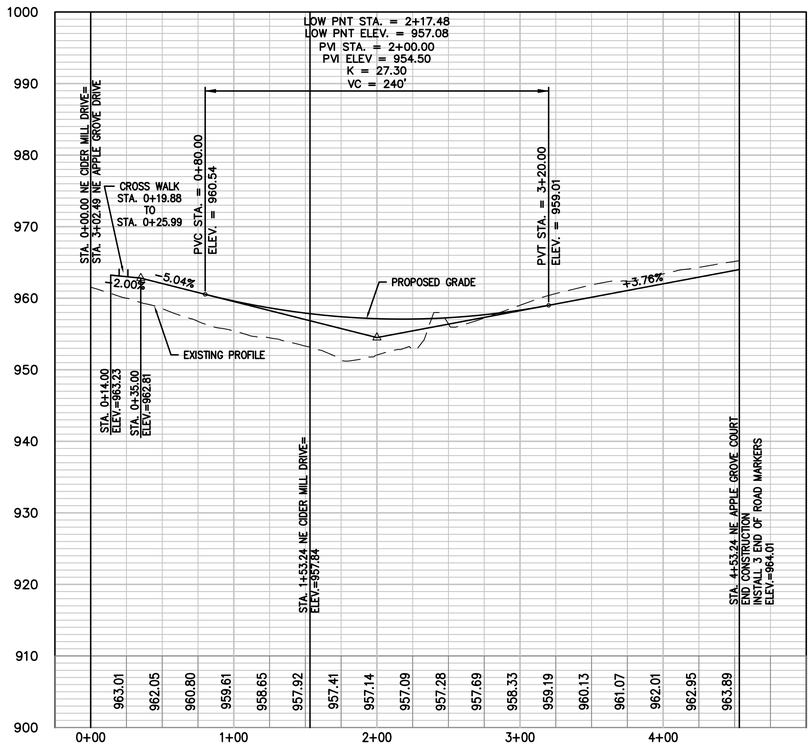
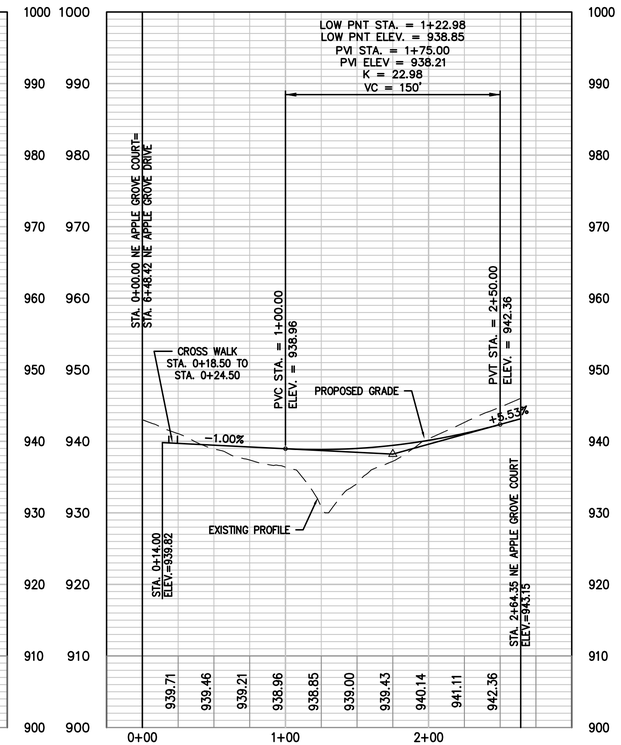


NE APPLE GROVE COURT (RESIDENTIAL LOCAL)



"AS-BUILT"

DATED: 11-13-23 BY: JTK

STATE OF MISSOURI
DOUGLAS EUGENE UBBEN, JR.
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STREET PLAN & PROFILE

ORCHARD WOODS
LEE'S SUMMIT, JACKSON COUNTY, MISSOURI

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REVISED PER CITY COMMENTS		MRH	DEU
REVISED TOP OF CURB ELEVATIONS		KAD	DEU

No.	Date
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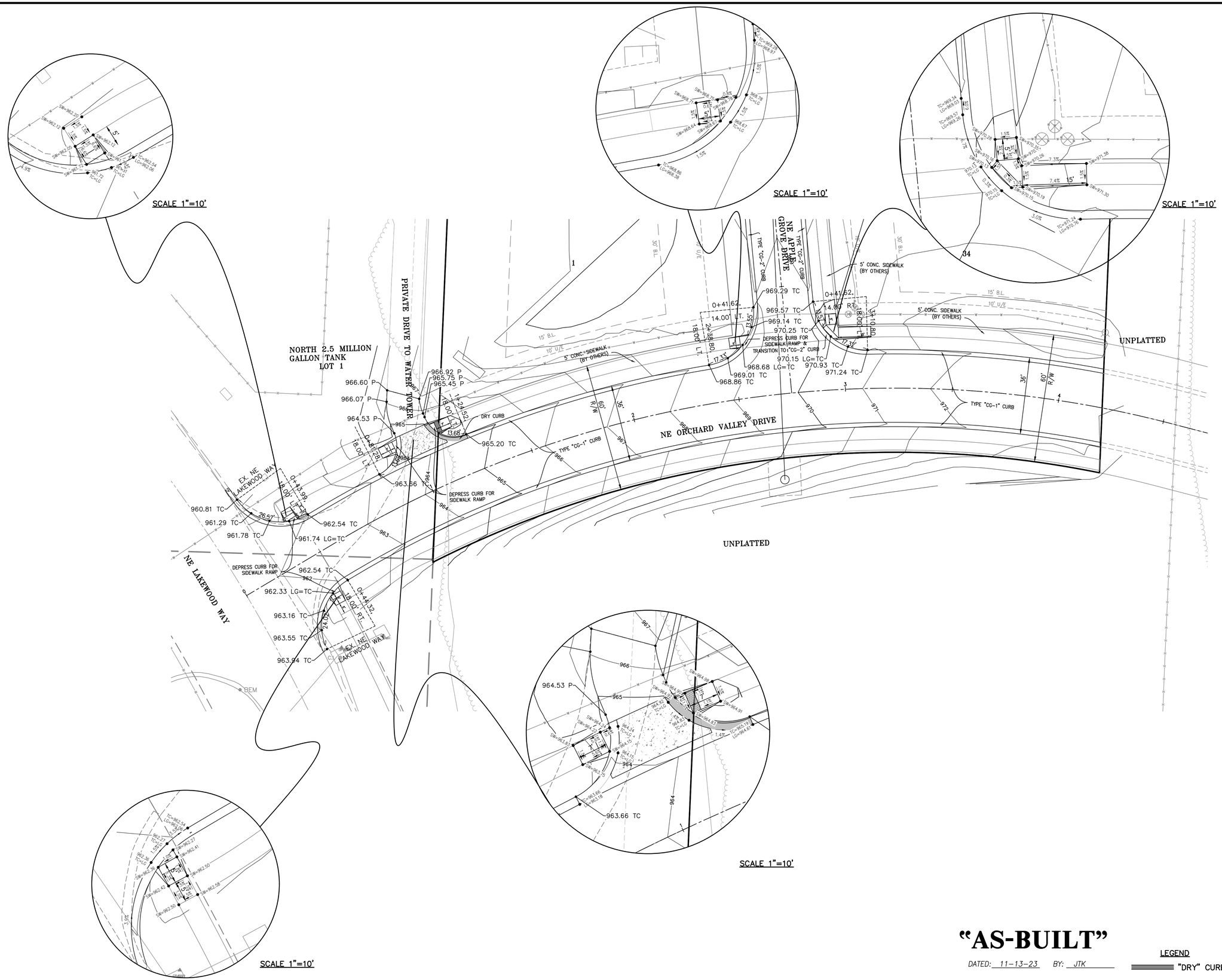
4.	7-20-23
5.	10-11-23

PROJECT NO. 211142
DATE: 10-21-2022 | DRAWN: BJG
CHECKED: DEU | APPROVED: DEU
CERTIFICATE OF AUTHORIZATION
KANSAS LANDSCAPE ARCHITECTURAL ENGINEERING - E-391
CERTIFICATE OF AUTHORIZATION
KANSAS LAND SURVEYING - LS-82
LAND SURVEYING-2007020128
ENGINEERING-2007005528

SHEET
7



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INTERSECTION DETAILS

ORCHARD WOODS

LEE'S SUMMIT, JACKSON COUNTY, MISSOURI

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KANSAS
LAND SURVEYING – LS-82
ENGINEERING – E-361
CERTIFICATE OF AUTHORIZATION
MISSOURI
LAND SURVEYING-2007002128
ENGINEERING-2007002508

SHEET
8

\\PHELPS-SERVER\Projects\P\211142\Dwg\STREET AND STORM\INTERSECTIONS.dwg Layout:1 Jan 09, 2024 - 7:15am JEANETTE OPAT

"AS-BUILT"

DATED: 11-13-23 BY: JTK

LEGEND

"DRY" CURB

SCALE: 1"=20'

0' 20' 40'

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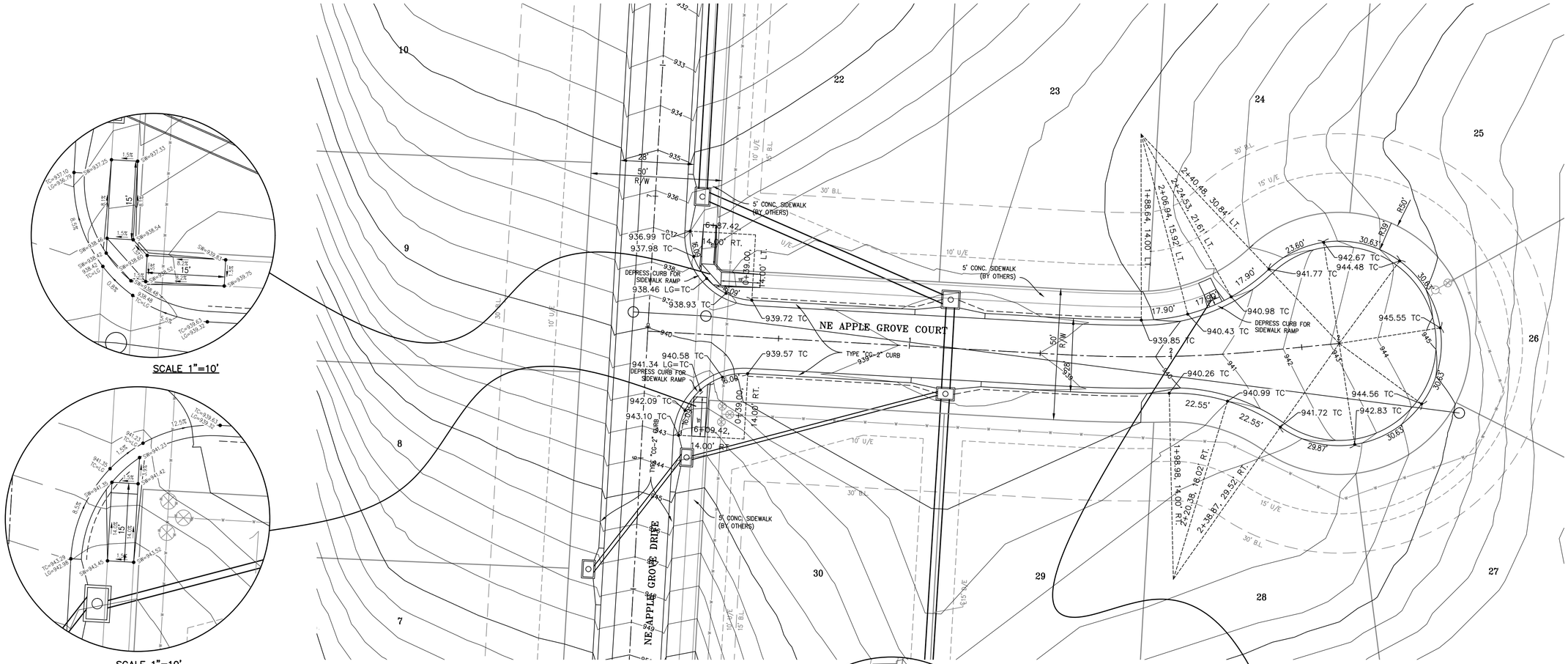
CERTIFICATE OF AUTHORIZATION MISSOURI LAND SURVEYING-2007021128 ENGINEERING-2007000508

SHEET
9



"AS-BUILT"

DATED: 11-13-23 BY: JTK

LEGEND

"DRY" CURB

SCALE: 1"=20'

0' 20' 40'

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LEE'S SUMMIT, JACKSON COUNTY, MISSOURI

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REVISED TOP OF CURB ELEVATIONS	5.	10-11-23	KAD	DEU

PROJECT NO. 211142
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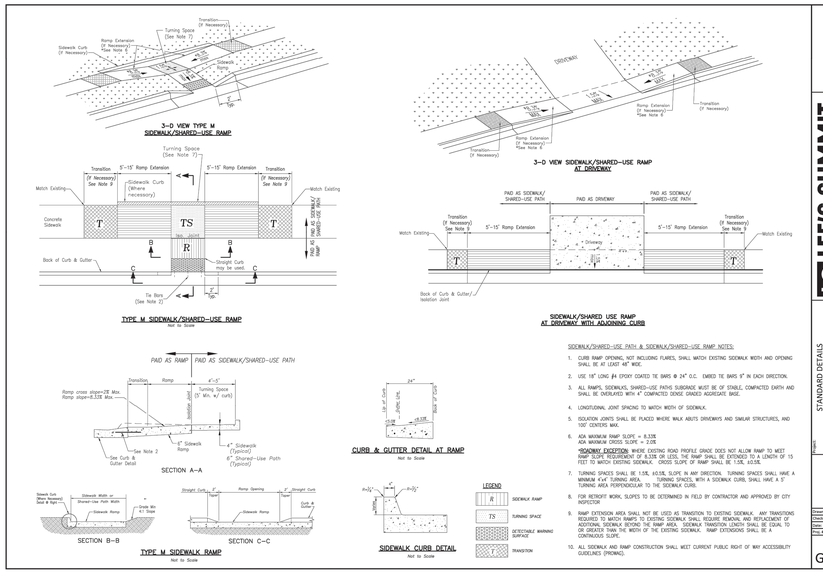
LAND SURVEYING - LS-82
ENGINEERING - E-391
CERTIFICATE OF AUTHORIZATION
MISSOURI
LAND SURVEYING-2007000128
ENGINEERING-2007000308

SHEET
10

\\PHELPS-SERVER\Projects\P\211142\Dwg\STREET AND STORM\INTERSECTIONS.dwg Layout:2 Jan 09, 2024 - 7:15am JEANETTE OPAT



SIDEWALK/SHARED-USE PATH & SIDEWALK/SHARED-USE RAMP NOTES:

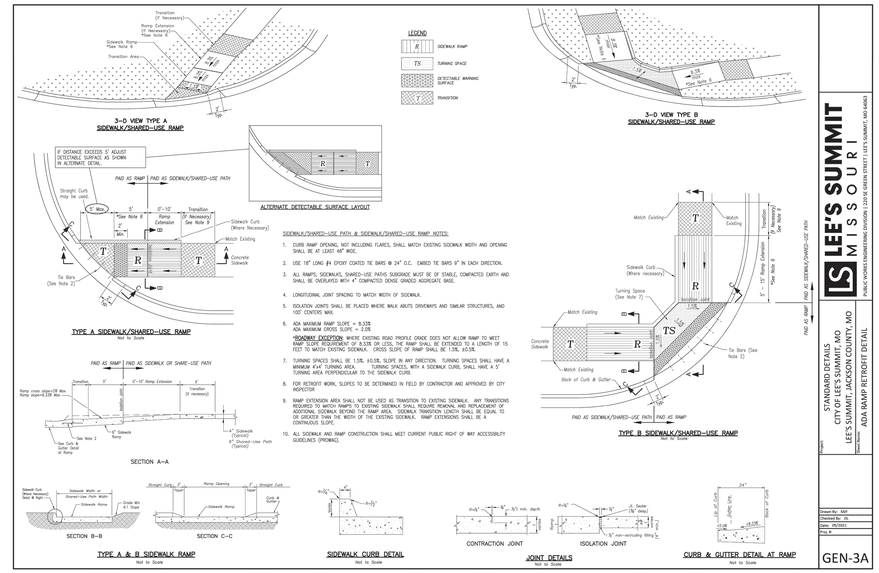
1. CURB RAMP OPENING, NOT INCLUDING FLARES, SHALL MATCH EXISTING SIDEWALK WIDTH AND OPENING SHALL BE AT LEAST 48" WIDE.
2. USE 18" LONG #4 EPOXY COATED TIE BARS @ 24" O.C. EMBED TIE BARS 9" IN EACH DIRECTION.
3. ALL RAMPS, SIDEWALKS, SHARED-USE PATHS SUBGRADE MUST BE OF STABLE, COMPACTED EARTH AND SHALL BE OVERLAYED WITH 4" COMPACTED DENSE GRADED AGGREGATE BASE.
4. LONGITUDINAL JOINT SPACING TO MATCH WIDTH OF SIDEWALK.
5. ISOLATION JOINTS SHALL BE PLACED WHERE WALK ABUTS DRIVEWAYS AND SIMILAR STRUCTURES, AND 100' CENTERS MAX.
6. ADA MAXIMUM RAMP SLOPE = 8.33%
   ADA MAXIMUM CROSS SLOPE = 2.0%
   ***ROADWAY EXCEPTION** WHERE EXISTING ROAD PROFILE GRADE DOES NOT ALLOW RAMP TO MEET RAMP SLOPE REQUIREMENT OF 8.33% OR LESS, THE RAMP SHALL BE EXTENDED TO A LENGTH OF 15 FEET TO MATCH EXISTING SIDEWALK. CROSS SLOPE OF RAMP SHALL BE 1.5%, ±0.5%.
7. TURNING SPACES SHALL BE 1.5%, ±0.5%, SLOPE IN ANY DIRECTION. TURNING SPACES SHALL HAVE A MINIMUM 4'x4' TURNING AREA. TURNING SPACES, WITH A SIDEWALK CURB, SHALL HAVE A 5' TURNING AREA PERPENDICULAR TO THE SIDEWALK CURB.
8. FOR RETROFIT WORK, SLOPES TO BE DETERMINED IN FIELD BY CONTRACTOR AND APPROVED BY CITY INSPECTOR
9. RAMP EXTENSION AREA SHALL NOT BE USED AS TRANSITION TO EXISTING SIDEWALK. ANY TRANSITIONS REQUIRED TO MATCH RAMPS TO EXISTING SIDEWALK SHALL REQUIRE REMOVAL AND REPLACEMENT OF ADDITIONAL SIDEWALK BEYOND THE RAMP AREA. SIDEWALK TRANSITION LENGTH SHALL BE EQUAL TO OR GREATER THAN THE WIDTH OF THE EXISTING SIDEWALK. RAMP EXTENSIONS SHALL BE A CONTINUOUS SLOPE.
10. ALL SIDEWALK AND RAMP CONSTRUCTION SHALL MEET CURRENT PUBLIC RIGHT OF WAY ACCESSIBILITY GUIDELINES (PROWAG).

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

STANDARD DETAILS
CITY OF LEE'S SUMMIT, MO
LEE'S SUMMIT, JACKSON COUNTY, MO
ADA RAMP RETROFIT DETAIL

Drawn By: MEF
Checked By: DL
Date: 05/2021
Proj. #:

GEN-3B



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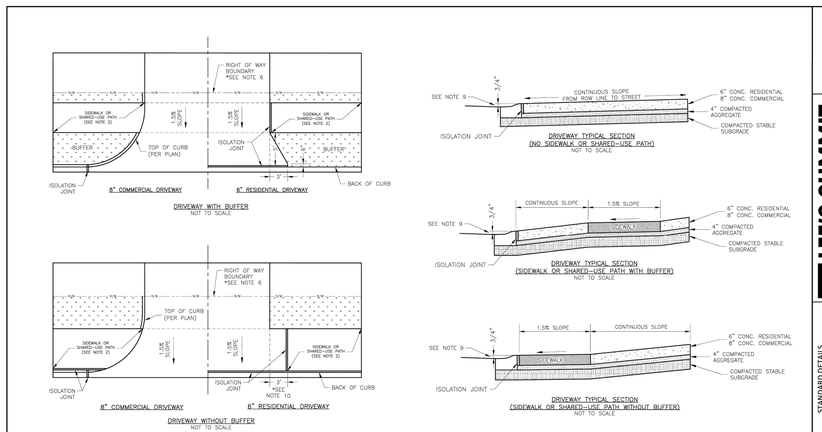
10. ALL SIDEWALK AND RAMP CONSTRUCTION SHALL MEET CURRENT PUBLIC RIGHT OF WAY ACCESSIBILITY GUIDELINES (PROWAG).

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

STANDARD DETAILS
CITY OF LEE'S SUMMIT, MO
LEE'S SUMMIT, JACKSON COUNTY, MO
ADA RAMP RETROFIT DETAIL

Drawn By: MEF
Checked By: DL
Date: 05/2021
Proj. #:

GEN-3A



GENERAL NOTES

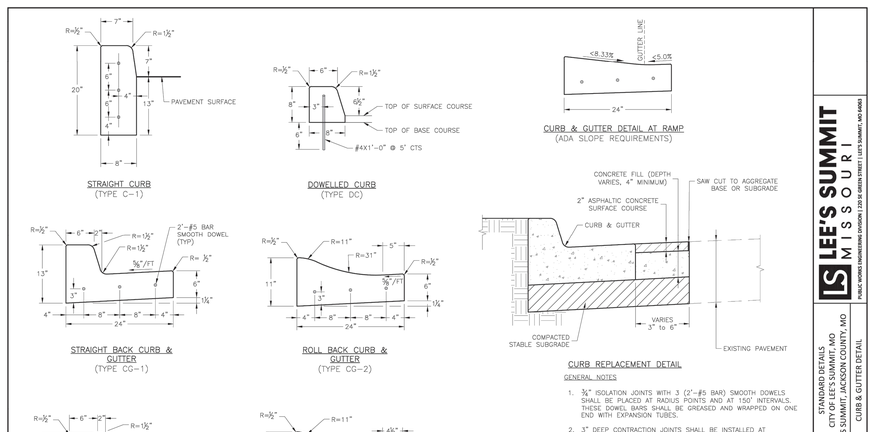
1. SUBGRADE SHALL BE STABLE, COMPACTED EARTH AND SHALL BE OVERLAYED WITH 4" COMPACTED DENSE GRADED AGGREGATE BASE.
2. ALL DRIVE APPROACHES SHALL MEET CURRENT PUBLIC RIGHT OF WAY ACCESSIBILITY GUIDELINES (PROWAG) FOR SLOPE REQUIREMENTS WHEN SIDEWALK IS REQUIRED (SEE ADA RAMP RETROFIT DETAIL GEN-3B, SIDEWALK/SHARED USE PATH RAMP AT DRIVEWAY DETAIL).
3. JOINT AT BACK OF CURB LINE SHALL BE AN ISOLATION JOINT FOR RESIDENTIAL DRIVEWAYS.
4. KCMMB 4K CONCRETE MIX IS REQUIRED FOR ALL CURBS.
5. COMMERCIAL DRIVEWAYS, IN THE PUBLIC RIGHT OF WAY, SHALL BE KCMMB 4K CONCRETE MIX.
6. RESIDENTIAL DRIVEWAYS, IN THE PUBLIC RIGHT OF WAY, KCMMB 4K CONCRETE MIX IS RECOMMENDED. OTHER CONCRETE MIXES MAY BE USED WITHOUT PRIOR APPROVAL.
7. A JOINT MUST BE INSTALLED AT THE RIGHT OF WAY BOUNDARY FOR PROPERTY DELINEATION.
8. WHITE CURING COMPOUND MUST BE APPLIED UNIFORMLY TO THE CONCRETE SURFACE IMMEDIATELY AFTER FINAL FINISHING.
9. ¾" FROM TOP OF CURB TO FLOWLINE AT DRIVEWAY (TYPE CG-1 CURB ONLY). MUST MAINTAIN ORIGINAL FLOWLINE OF CURB.
10. SIDEWALK ADJOINING CURB SHALL BE 6" THICK, EXTENDING 3' FROM THE DRIVEWAY.
11. THE MAXIMUM WIDTH OF A RESIDENTIAL DRIVEWAY IS 36 FEET WITHIN THE RIGHT OF WAY.

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

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

Drawn By: MEF
Checked By: DL
Date: 06/17
PWBID:

GEN-1



GENERAL NOTES

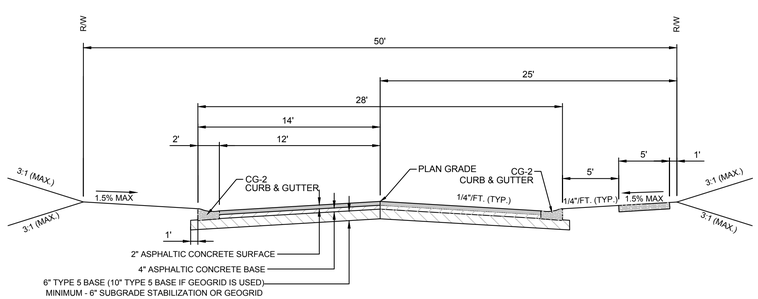
1. ¾" ISOLATION JOINTS WITH 3 (2"-#5 BAR) SMOOTH DOWELS SHALL BE PLACED AT RADIUS POINTS AND AT 150' INTERVALS. THESE DOWEL BARS SHALL BE GREASED AND WRAPPED ON ONE END WITH EXPANSION TUBES.
2. 1" DEEP CONTRACTION JOINTS SHALL BE INSTALLED AT APPROXIMATELY 10' INTERVALS. THESE JOINTS SHALL PASS ACROSS THE ENTIRE CURB SECTION.
3. CONCRETE FILL SHALL HAVE UNIFORM AND SMOOTH FINISH
4. KCMMB 4K CONCRETE SHALL BE USED FOR ALL CURB.
5. ASPHALTIC CONCRETE SURFACE COURSE SHALL CONFORM TO STANDARD SPECIFICATIONS SECTION 2205.2.
6. CURBS FOR NEW STREETS SHALL BE BUILT ON ASPHALT OR AGGREGATE BASE AS SHOWN IN TYPICAL SECTION DETAIL.
7. WHITE CURING COMPOUND MUST BE APPLIED UNIFORMLY TO THE CONCRETE SURFACE IMMEDIATELY AFTER FINAL FINISHING.
8. ALL DOWELS & TIE BARS SHALL BE EPOXY COATED.

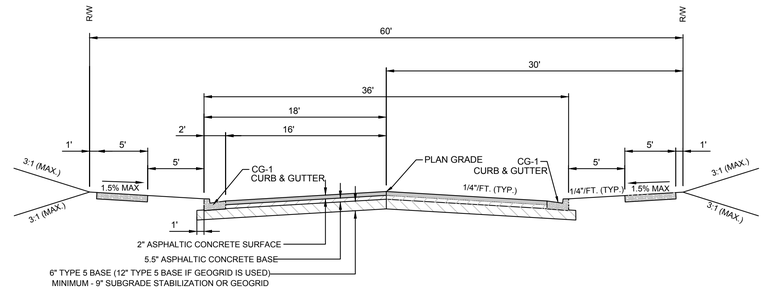
LEE'S SUMMIT MISSOURI — PUBLIC WORKS ENGINEERING DIVISION | 220 SE GREEN STREET | LEE'S SUMMIT, MO 64063

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

Drawn By: MEF
Checked By: DL
Date: 05/2021
Proj. #:

GEN-4





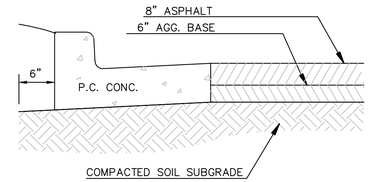
RESIDENTIAL COLLECTOR

TABLE LS-2: MINIMUM ASPHALT PAVEMENT THICKNESSES

	Street Classification	Pavement Option	AC Surface (in.)	AC Base (in.)	MoDOT Type 5 Base (in.)	Geogrid(1)	Chemical Subgrade Stabilization(2) (in.)
USE FOR RESIDENTIAL LOCAL STREETS	Residential Local/Access	A	2	4	6	--	6
		B	2	4	10	Geogrid	--
USE FOR RESIDENTIAL COLLECTOR STREETS	Residential Collector	A	2	5.5	6	--	9
		B	2	5.5	12	Geogrid	--
	Commercial Industrial Local/Collector	A	2	7.5	6	--	9
		B	2	7.5	12	Geogrid	--

"AS-BUILT"

DATED: 11-13-23 BY: JTK



DRIVEWAY ASPHALT PAVING SECTION

STATE OF MISSOURI
DOUGLAS EUGENE UBBEN, JR.
NUMBER PE-2011010998
PROFESSIONAL ENGINEER

PHELPS ENGINEERING, INC.
1270 N. Winchester
Olathe, Kansas 66061
(913) 393-1155
Fax (913) 393-1156
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STREET DETAILS

ORCHARD WOODS
LEE'S SUMMIT, JACKSON COUNTY, MISSOURI

No.	Date	Revisions:	By	App.
1.	2-27-23	REVISED PER CITY COMMENTS	JMO	DEU
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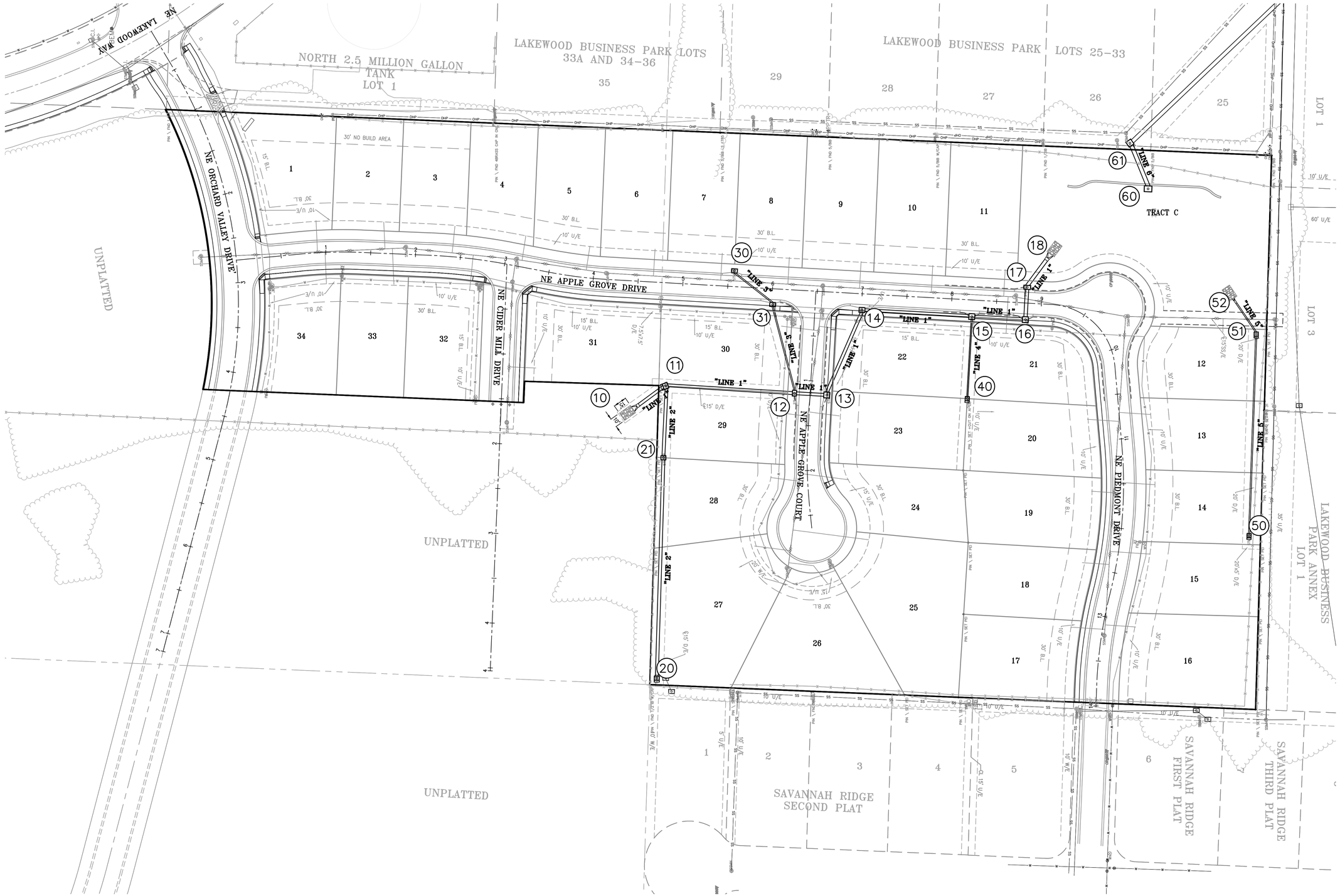
3.	6-15-23	REVISED PER CITY COMMENTS	BJG	DEU
4.	7-20-23	REVISED PER CITY COMMENTS	MRM	DEU
5.	10-11-23	REVISED TOP OF CURB ELEVATIONS	KAD	DEU

PROJECT NO. 211142
DATE: 10-21-2022 | DRAWN: BJG
CHECKED: DEU | APPROVED: DEU
CERTIFICATE OF AUTHORIZATION KANSAS SURVEYING - LS-82
ENGINEERING E-391
CERTIFICATE OF AUTHORIZATION LAND SURVEYING-200700128
ENGINEERING-200702598

SHEET
11



"AS-BUILT"

DATED: 11-13-23 BY: JTK

SCALE: 1"=50'

0' 50' 100'

STATE OF MISSOURI
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STORM SEWER GENERAL LAYOUT

ORCHARD WOODS

LEE'S SUMMIT, JACKSON COUNTY, MISSOURI

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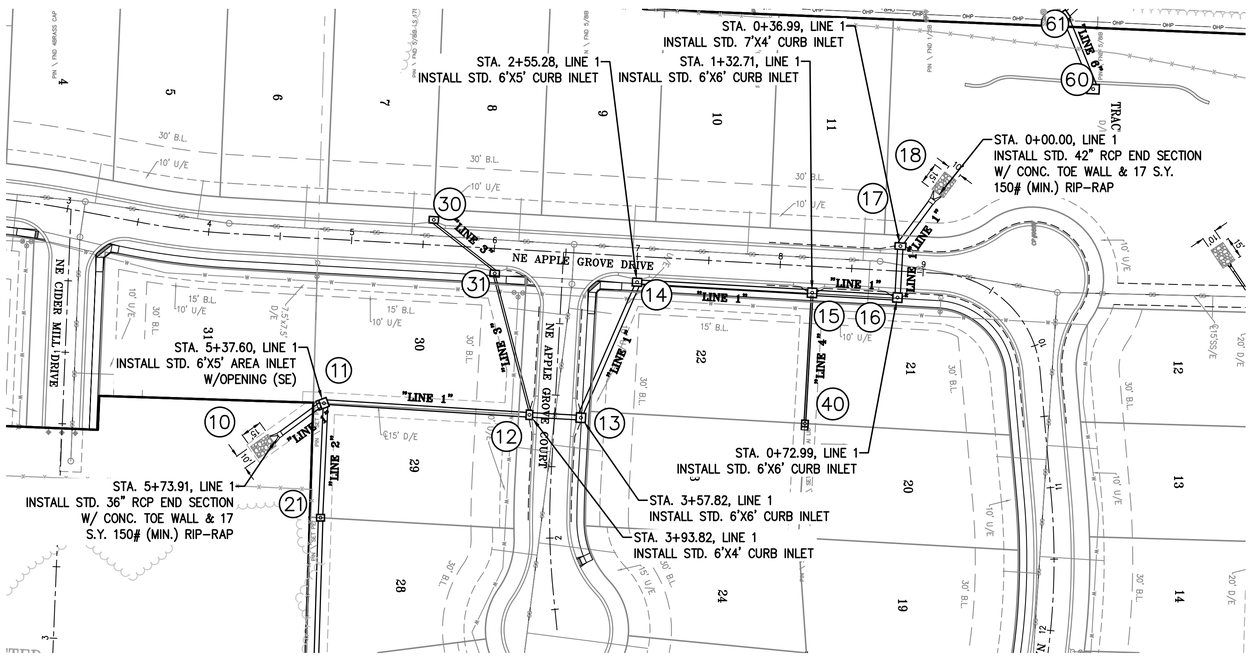
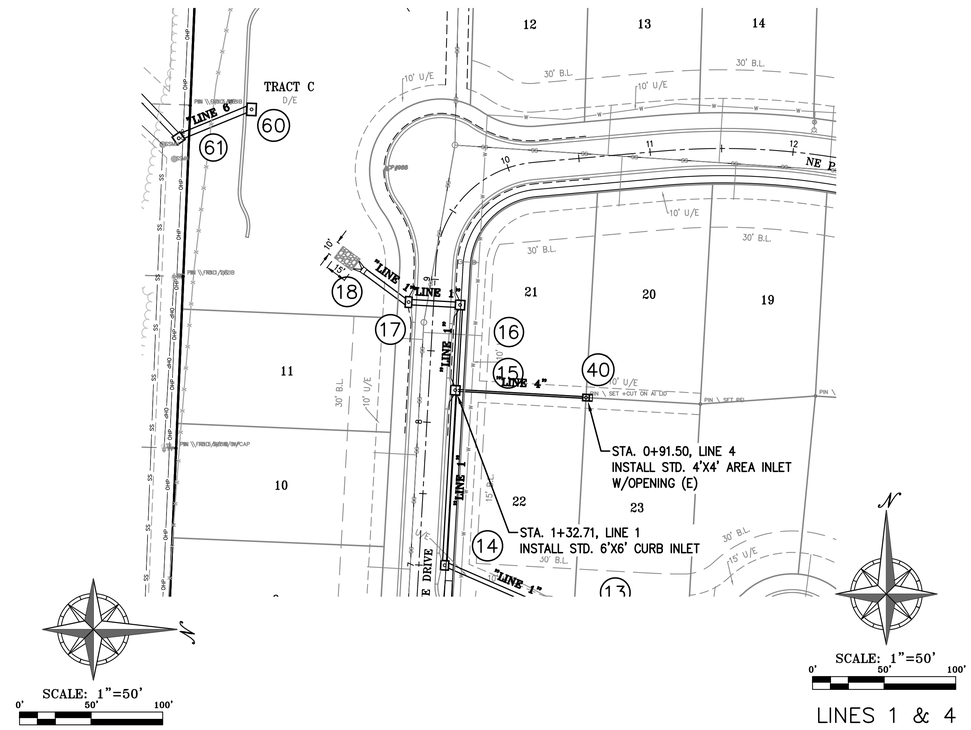
ENGINEERING – E-391
CERTIFICATE OF AUTHORIZATION LAND SURVEYING–2007020128
ENGINEERING–2007000308

SHEET
12

\\PHELPS-SERVER\Projects\P\211142\Dwg\STREET AND STORM\STORM SEWER general layout.dwg Layout:1 Jan 15, 2024 - 1:36pm JEANETTE OPAT





LINES 1 & 4

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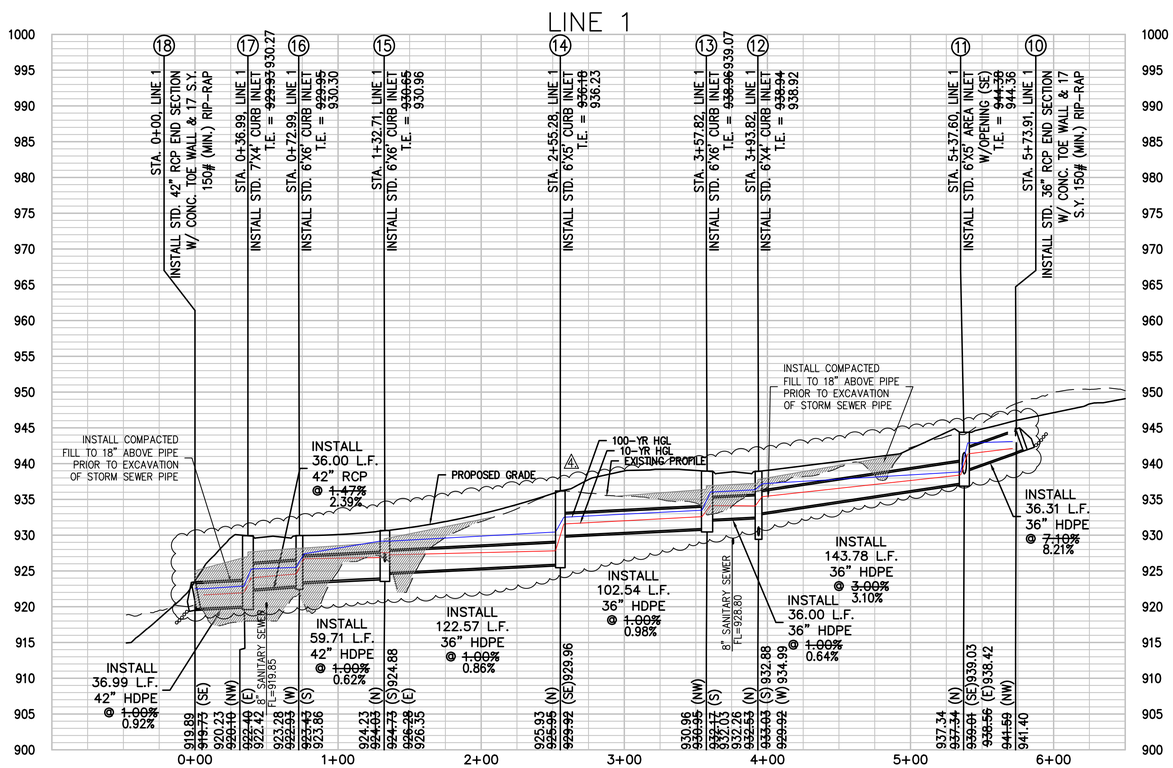

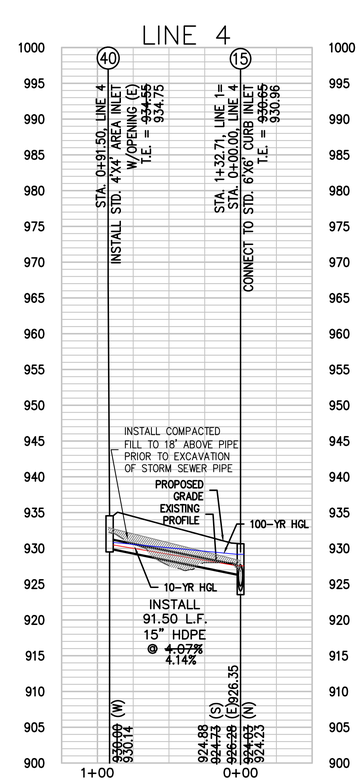

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DATED: 11-13-23 BY: JTK

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STORM SEWER PLAN & PROFILE

ORCHARD WOODS

LEE'S SUMMIT, JACKSON COUNTY, MISSOURI

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PROJECT NO. 211142
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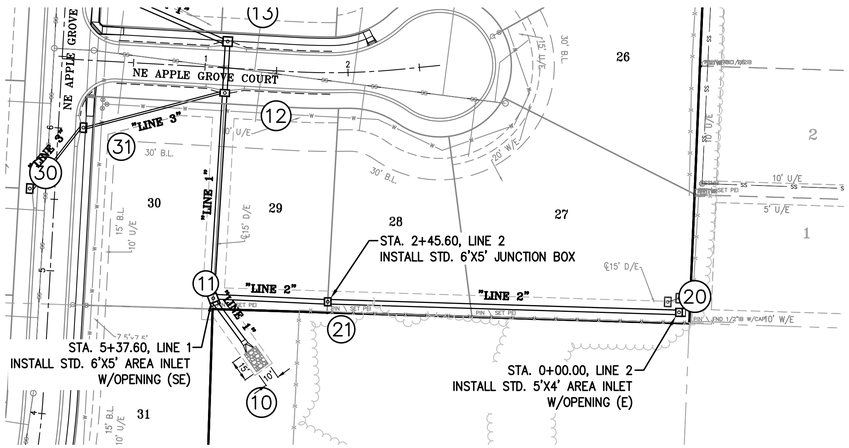
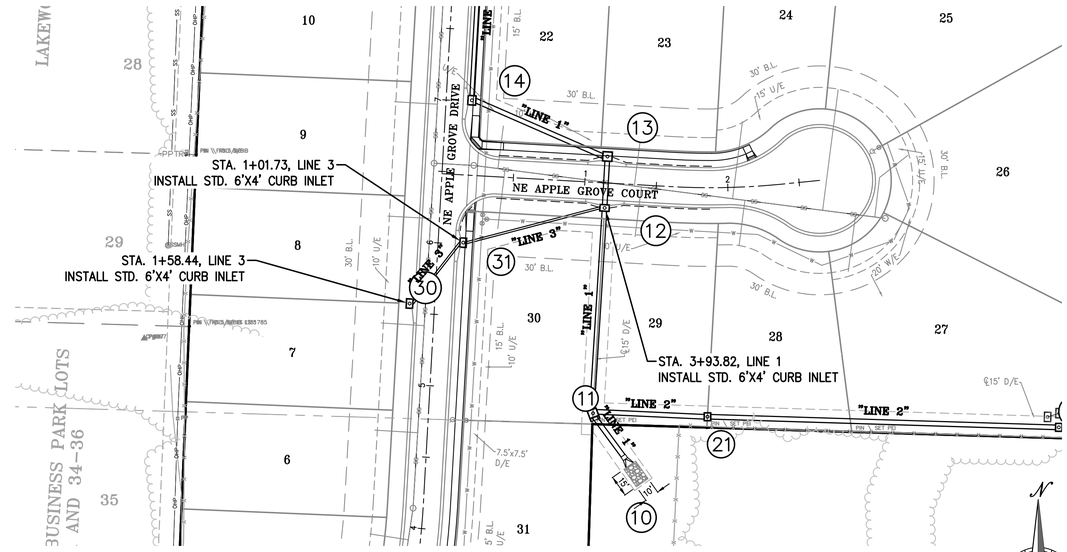
CERTIFICATE OF AUTHORIZATION
LANDS: 2007000128
ENGINEERING – E-391
CERTIFICATE OF AUTHORIZATION
LANDS: 2007000128
ENGINEERING-2007000128

SHEET
13





SCALE: 1"=50'

0' 50' 100'

LINES 2 & 3

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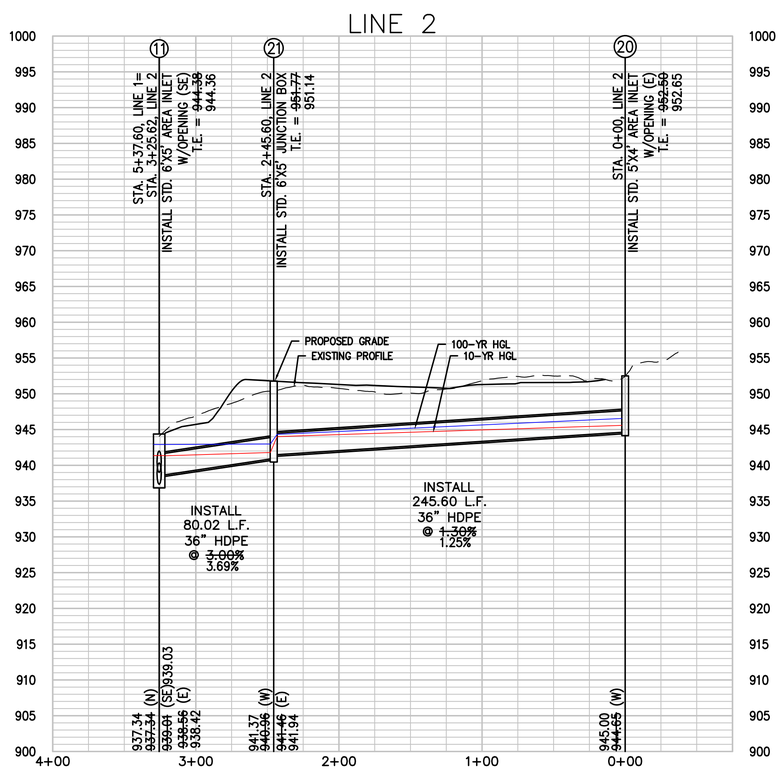
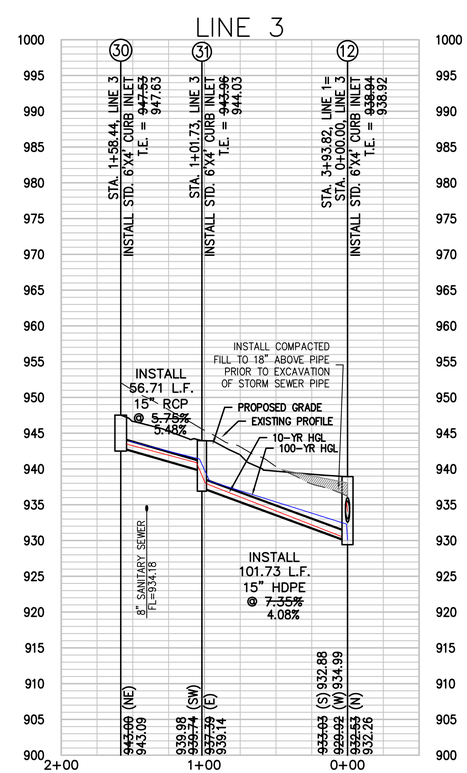
1"=10' VERT.





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STORM SEWER PLAN & PROFILE

ORCHARD WOODS

LEE'S SUMMIT, JACKSON COUNTY, MISSOURI

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PROJECT NO. 211142
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CHECKED: DEU | APPROVED: DEU
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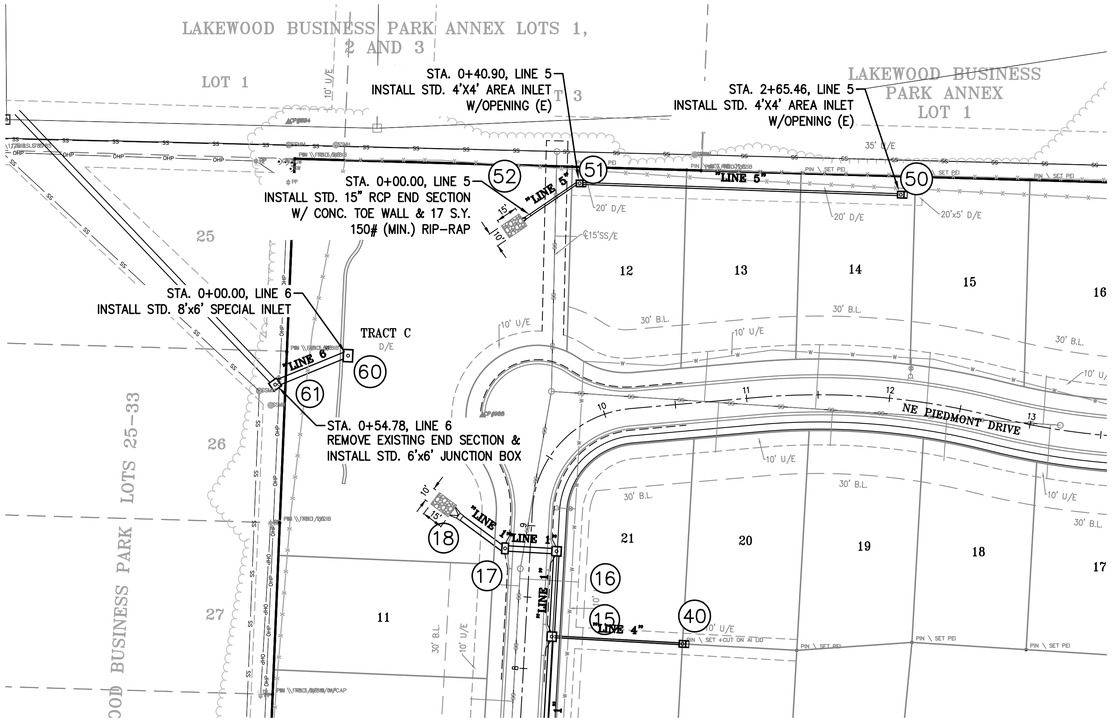
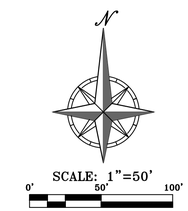
MISSOURI ENGINEERING - E-391
CERTIFICATE OF AUTHORIZATION MISSOURI LAND SURVEYING-2007001128
KANSAS ENGINEERING-2007000308

SHEET
14





LINES 5 & 6

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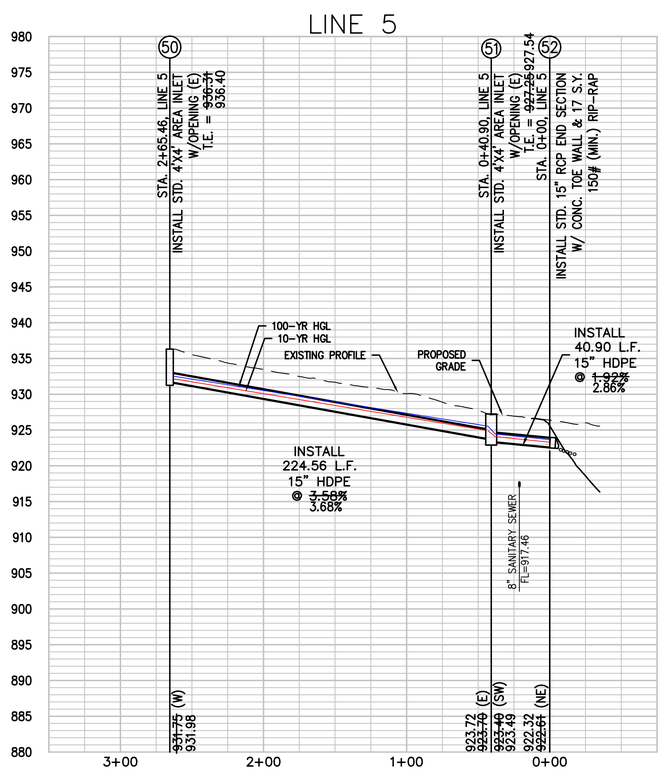
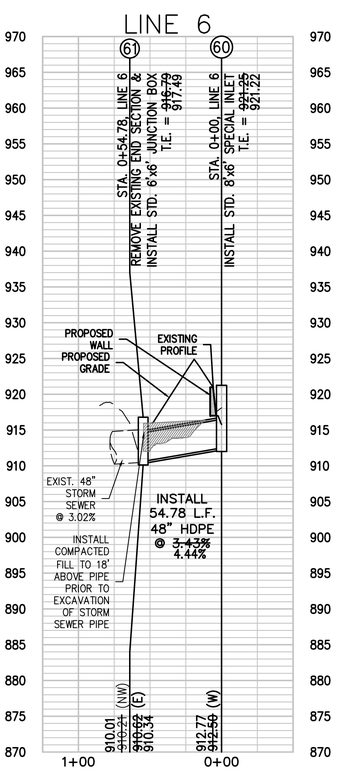
1"=10' VERT.





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STORM SEWER PLAN & PROFILE

ORCHARD WOODS
LEE'S SUMMIT, JACKSON COUNTY, MISSOURI

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PROJECT NO. 211142
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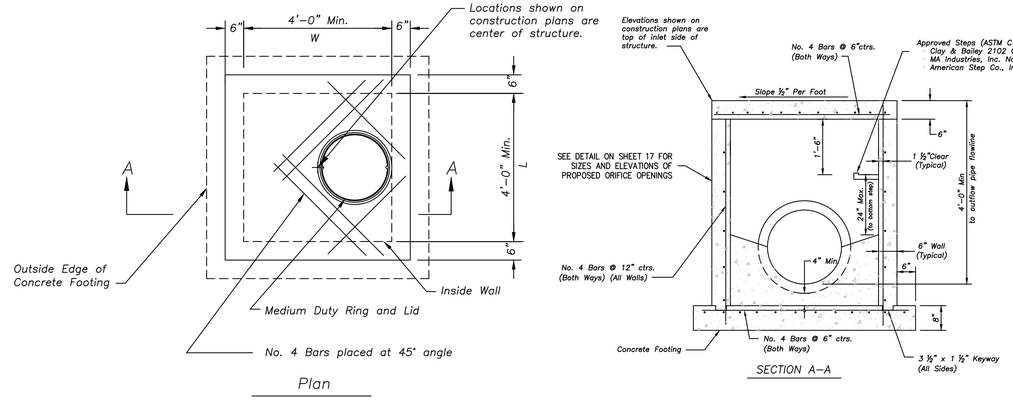
CHECKED: DEU | APPROVED: DEU
CERTIFICATE OF AUTHORIZATION LANDSCAPE ARCHITECTURE – LS-82
ENGINEERING – E-391
CERTIFICATE OF AUTHORIZATION LAND SURVEYING-2007001128
ENGINEERING-2007000308

SHEET
15

\\PHELPS-SERVER\Projects\P\211142\Dwg\STREET AND STORM\STORM SEWER PROFILE.dwg Layout:LINES 5-6 Jan 23, 2024 - 9:43am JEANETTE OPAT



OUTLET CONTROL DETAIL

SCALE: N.T.S.

Outlet Control Structure Notes

General

1. All storm sewer structures shall be pre-cast or poured in place. If pre-cast structures are used for publicly financed, maintained or administered construction, the tops shall be poured in place and the wall steel shall be left exposed to a height 2" below the finish top elevation, or as directed by the City Engineer.
2. Pre-cast shop drawings are to be approved by the City Engineer for publicly financed or administered projects. Pre-cast shop drawings for privately financed projects are to be submitted to the Engineering Services Division of the Planning and Development Services Department.
3. Do not scale these drawings for dimensions or clearances. Any questions regarding dimensions shall be brought to the attention of the City Engineer prior to construction.
4. The first dimension listed in the construction notes is the "L" dimension. The second dimension is the "W" dimension. The concrete thickness and reinforcement shown is for boxes with ("L"+"H") and ("W"+"H") less then or equal to 20. For boxes with either of these calculations greater than 20, a special design is required.

Concrete

5. Concrete used in this work shall be KCMMB4K, as approved by the Kansas City Metropolitan Materials Board, and shall meet the requirements of the **Lee's Summit** Municipal Code.
6. Concrete construction shall meet the applicable requirements of Standard Specifications for State Road and Bridge Construction, Kansas Department of Transportation, latest edition, except as modified in the **Lee's Summit** Municipal Code.
7. Inlet floors shall be shaped with non-reinforced concrete inverts to provide smooth flow.
8. Bevel all exposed edges with ¾" triangular molding.

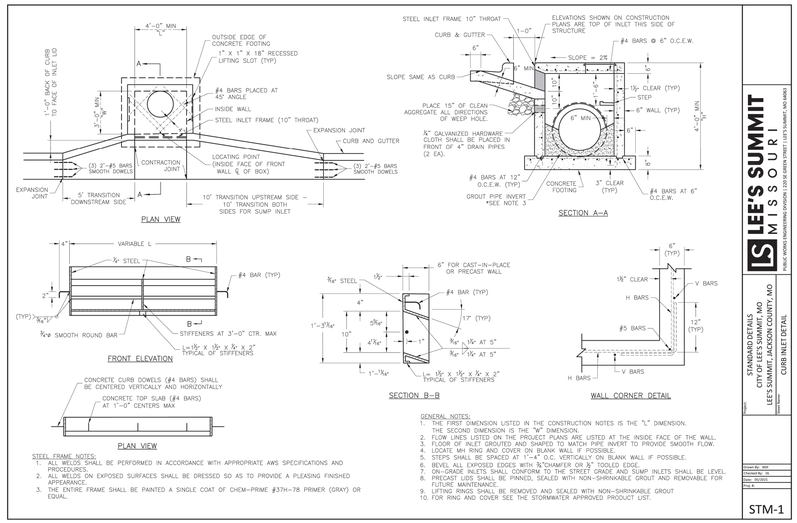
Reinforcing Steel

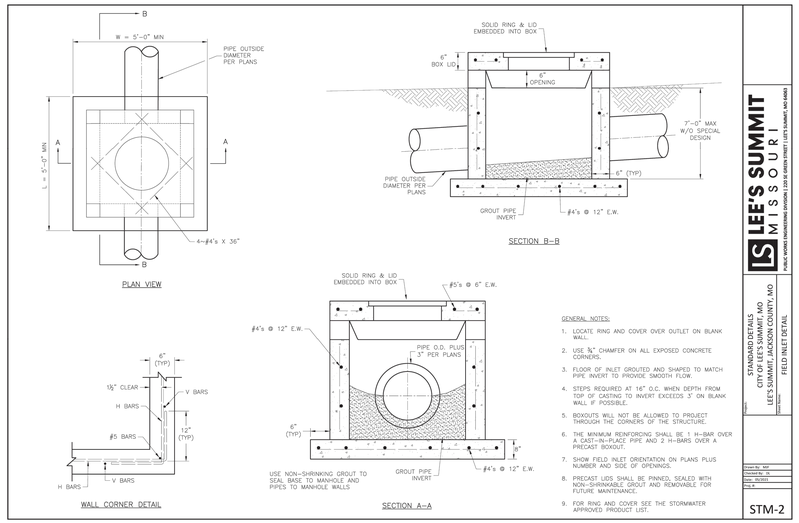
9. Reinforcing steel shall be new billet, minimum Grade 60 as per ASTM A615, and shall be bent cold.
10. All dimensions relative to reinforcing steel are to centerline of bars. 2" clearance shall be provided throughout unless noted otherwise. Tolerance of +/- ⅛" shall be permitted.
11. All lap splices not shown shall be a minimum of 40 bar diameters in length.
12. All reinforcing steel shall be supported on fabricated steel bar supports @ 3'-0" maximum spacing.
13. All dowels shall be accurately placed and securely tied in place prior to placement of bottom slab concrete. Sticking of dowels into fresh or partially hardened concrete will not be acceptable.

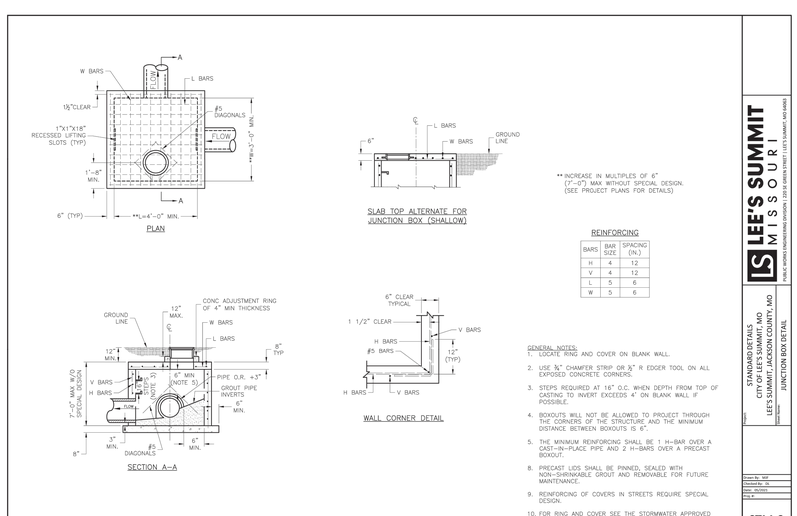
Construction

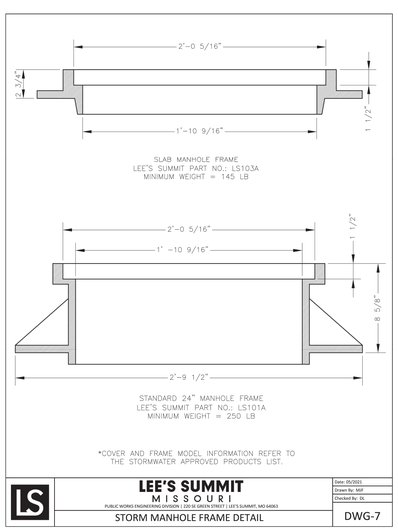
14. The bottom slab shall be at least 24 hours old before placing sidewall concrete. All sidewall forms shall remain in place a minimum of 24 hours after sidewalls are poured before removal, and after removal shall be immediately treated with membrane curing compound.
15. Pipe connections to pre-cast structures shall have a minimum of 6" of concrete around the entire pipe within 2' of the structure.
16. Material selection and compaction requirements for backfill around structures shall be as specified in the Manual of Infrastructure Standards, as promulgated by the City Engineer.

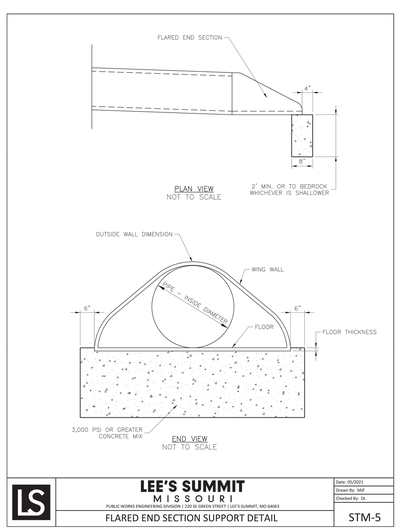
Missing or invalid reference
File: \\PHELPS-SERVER\Shared\STANDARD DETAILS\APWA\2023 APWA FULL DETAILS\Specifications_APWAStdDwgs_Revised April2019.pdf
Sheet: 15

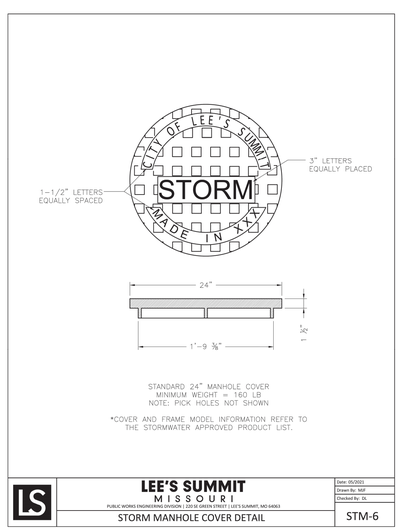












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STORM SEWER DETAILS

ORCHARD WOODS
LEE'S SUMMIT, JACKSON COUNTY, MISSOURI

"AS-BUILT"

DATED: 11-13-23 BY: JTK

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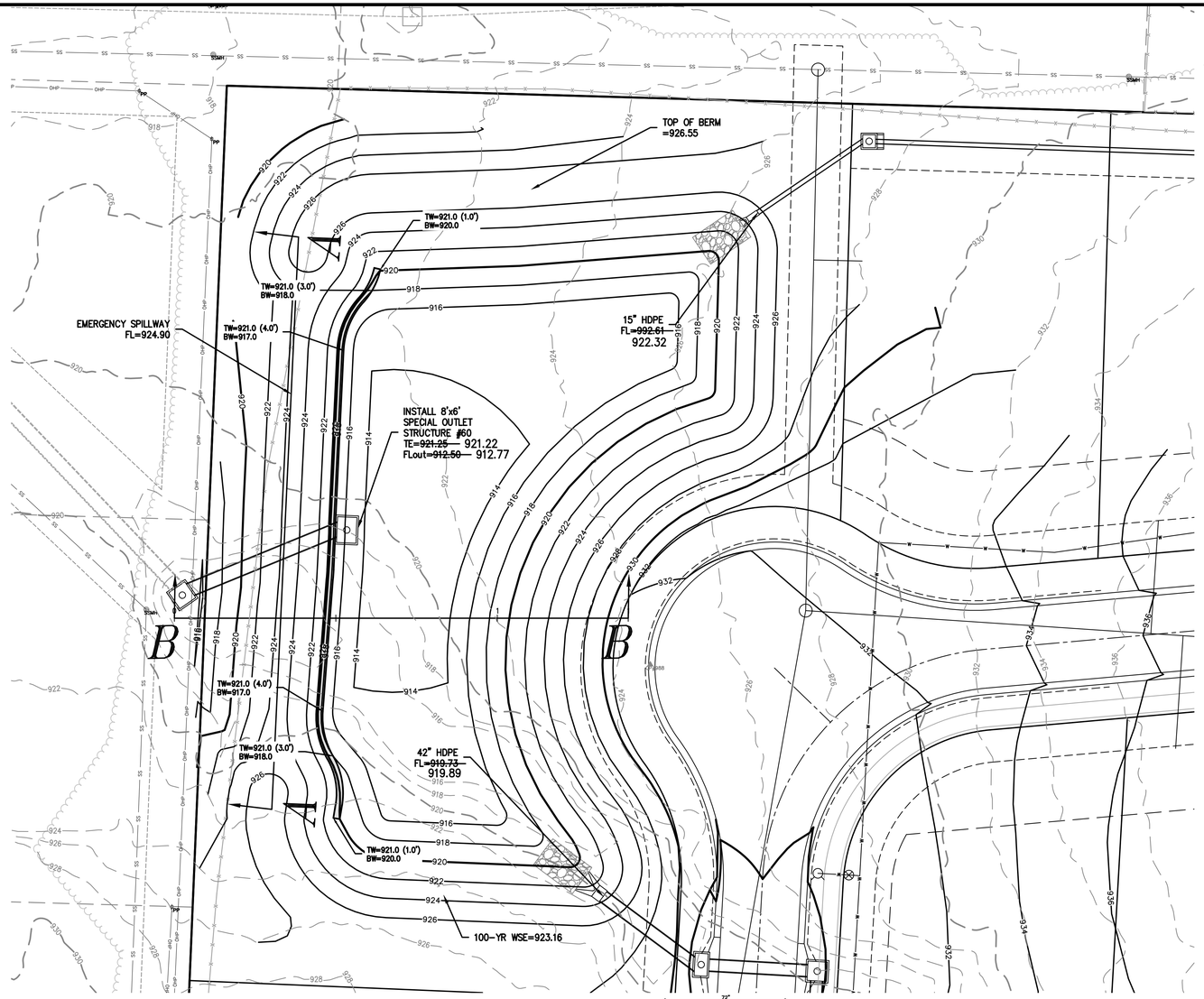
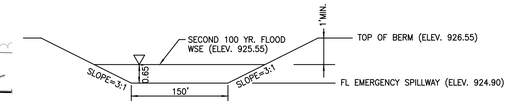
KANSAS
LAND SURVEYING - LS-82
ENGINEERING - E-391
CERTIFICATE OF AUTHORIZATION
MISSOURI
LAND SURVEYING-2007001128
ENGINEERING-2007005038

SHEET
16

\\PHELPS-SERVER\Projects\P\211142\Dwg\STREET AND STORM\DETAILS - PRIVATE.dwg Layout:STORM 1 Jan 09, 2024 - 7:18am JEANETTE OPAT





SECTION A-A

Q100 (INFLOW) = 205.42 cfs

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	115,888	132.05

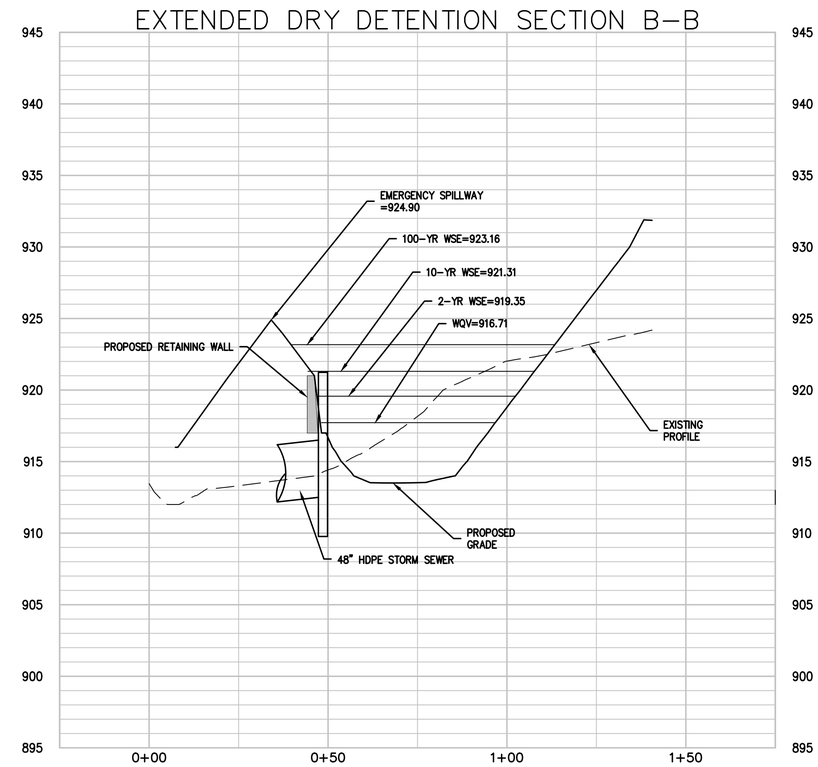
PROPOSED BASIN PERFORMANCE

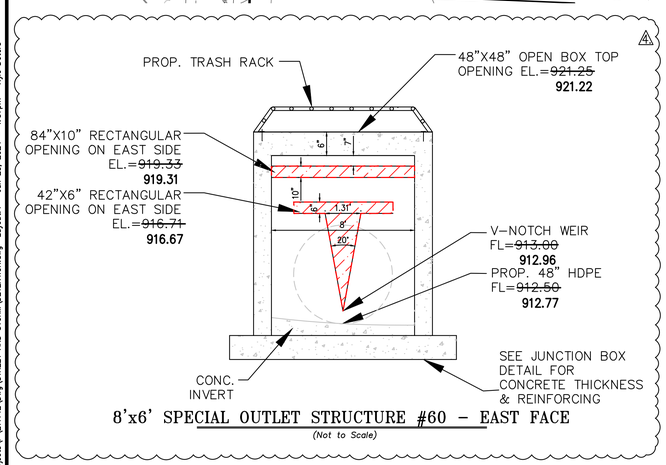
Detention Basin Storage Volume	
Required (100-Yr Volume)	115,888 C.F.
Designed (Volume to Spillway)	132,917 C.F.
Provided (Volume to Spillway	136,325 C.F.

N

SCALE: 1"=20'

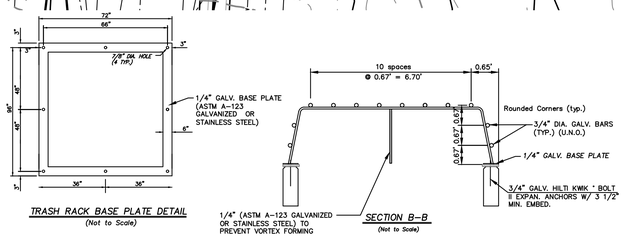
0' 20' 40'





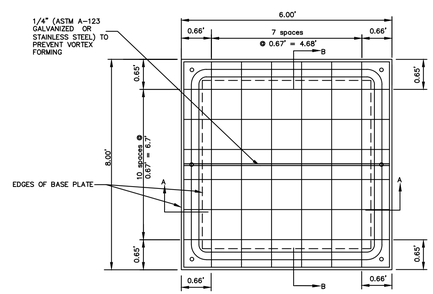
8'x6' SPECIAL OUTLET STRUCTURE #60 – EAST FACE

(Not to Scale)



TRASH RACK BASE PLATE DETAIL
(Not to Scale)

SECTION B-B
(Not to Scale)



TRASH RACK PLAN
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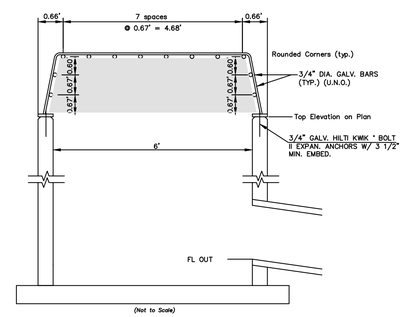


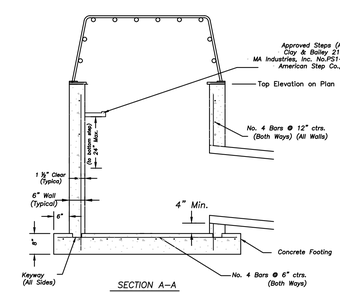
(Not to Scale)

SECTION A-A
(not to scale)

8'X6' TRASH RACK DETAIL

NOTE

1. All steel components shall be hot dip galvanized.



SECTION A-A
NOT TO SCALE
8'X6' RISER BOX

NOTE

1. Concrete & Reinforcing to be constructed per City of Lee's Summit standard Junction Box.

"AS-BUILT"

DATED: 11-13-23 BY: JTK

STATE OF MISSOURI
DOUGLAS EUGENE LIBBEN, JR. NUMBER PE-2011010998
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DETENTION PLAN

ORCHARD WOODS

LEE'S SUMMIT, JACKSON COUNTY, MISSOURI

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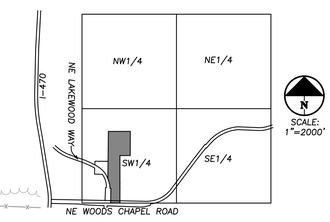
CERTIFICATE OF AUTHORIZATION LAND SURVEYING-2007001128 ENGINEERING-2007000258

SHEET
17



VICINITY MAP
SEC. 9-48-31

LEGEND

- XXX / XXX — EXISTING CONTOURS
- XXX / XXX — PROPOSED CONTOURS
- DENOTES DRAINAGE AREA
- DENOTES FLOW DIRECTION
- X.XX Ac. — DENOTES DRAINAGE AREA TO STRUCTURE
- XX — DENOTES STRUCTURE NUMBER

"AS-BUILT"

DATED: 11-13-23 BY: JTK

SCALE: 1"=60'
0' 60' 120'

STATE OF MISSOURI
DOUGLAS EUGENE UBBEN, JR.
NUMBER PE-2011010998
PROFESSIONAL ENGINEER

PHELPS ENGINEERING, INC.
1320 N. Winchester
Olathe, Kansas 66061
(913) 393-1155
Fax: (913) 393-1156
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PLANNING
ENGINEERING
IMPLEMENTATION

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

Revisions:			By	App.
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
4.	7-20-23	REVISED PER CITY COMMENTS	MRH	DEU
5.	10-11-23	REVISED TOP OF CURB ELEVATIONS	KAD	DEU

PROJECT NO. 211142
DATE: 10-21-2022 | DRAWN: BJG
CHECKED: DEU | APPROVED: DEU
CERTIFICATE OF AUTHORIZATION: KANSAS LANDSCAPE ARCHITECTURE - LS-82
LAND SURVEYING - E-391
ENGINEERING
CERTIFICATE OF AUTHORIZATION LAND SURVEYING-2007001128
ENGINEERING-2007005039

SHEET
18

\\PHELPS-SERVER\Projects\P\211142\Dwg\STREET AND STORM\DRAINAGE MAP.dwg Layout:1 Jan 09, 2024 - 7:19am JEANETTE OPAT

STORM DRAINAGE CALCULATIONS NOTE: 10-YR DESIGN

h

DESIGN CRITERIA: K25 = 1.1; K_{100} = 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.

I. RUNOFF												III. PIPE DESIGN														REMARKS	
		INCREMENTAL			CUMULATIVE							STRUCTURE				PIPE											
NUMBER OF INLINE STRUCTURE		RUNOFF COEFFICIENT "C"	AREA "A" (ACRES)	C x A	AREA "A" (ACRES)	C x A	SYSTEM TIME OF CONCENTRATION "T_c" AT STRUCTURE (MIN)	RAINFALL INTENSITY "I_{10} / I_{100}" (IN/HR)	ANTECEDENT PRECIPITATION FACTOR "K_{10} / K_{100}"	RUNOFF "Q_{10} / Q_{100}" (CFS)	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_f (FPS)	Runoff Q_{10} (CFS)	Runoff Q_{100} (CFS)	Full Flow Q_p (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	
								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																
2	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																
	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																
3	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																
4	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																
5	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	
								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																
6	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

GUTTER SPREAD CALCULATIONS

Project: Orchard Woods (PEI #211142)
Date: Thursday, June 15, 2023
By: KAD

"K" = 1.0

	INLET TIME CALCS								RUNOFF				GUTTER DISCHARGE/INLET DESIGN															
INLET NO.	**C**	**DISTANCE (FT) (<100')**	**SLOPE (%)**	**Ti**	**Travel Dist (FT)**	**Velocity**	**TT**	**TC**	**I 10 (in/hr)**	**C**	**Incr. A (Acres)**	**Incremental Runoff Q_{10} (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 #**	**REMARKS**
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

"AS-BUILT"

DATED: 11-13-23 BY: JTK

STATE OF MISSOURI
DOUGLAS EUGENE UBBEN, JR.
NUMBER PE-2011010998
PROFESSIONAL ENGINEER

PHELPS ENGINEERING, INC.
1320 N. Winchester
Olathe, Kansas 66061
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PLANNING ENGINEERING IMPLEMENTATION

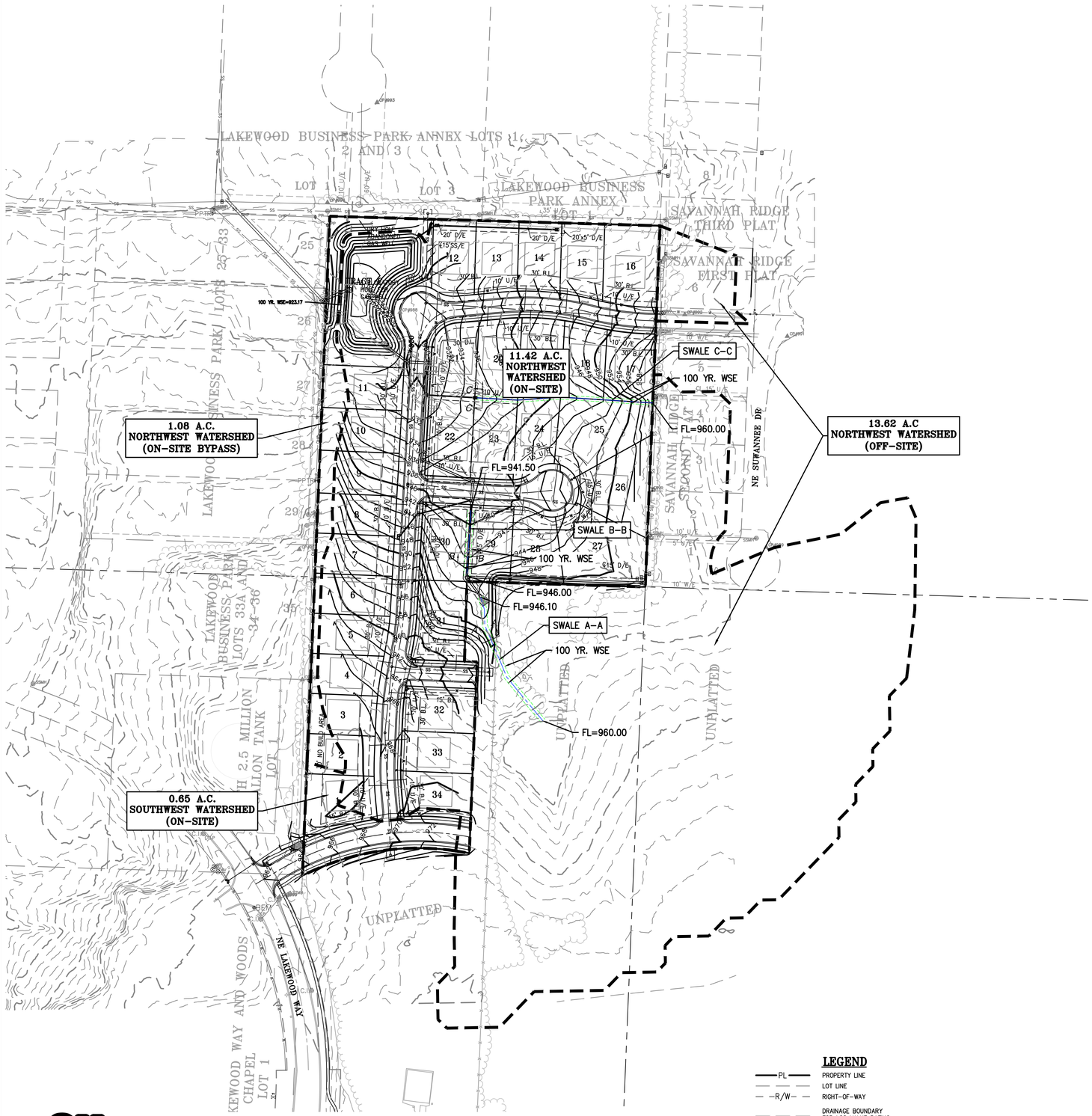
DRAINAGE CALCULATIONS

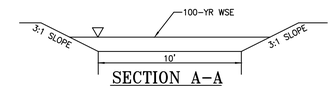
ORCHARD WOODS
LEE'S SUMMIT, JACKSON COUNTY, MISSOURI

Revisions:		By	App.
REVISED PER CITY COMMENTS		JMO	DEU
REVISED PER CITY COMMENTS		JMO	DEU
REVISED PER CITY COMMENTS		BJG	DEU
REVISED PER CITY COMMENTS		MRH	DEU
REVISED TOP OF CURB ELEVATIONS		KAD	DEU

PROJECT NO. 211142
DATE: 10-21-2022 | DRAWN: BJG
CHECKED: DEU | APPROVED: DEU
CERTIFICATE OF AUTHORIZATION KANSAS LAND SURVEYING – LS-82 ENGINEERING – E-391
CERTIFICATE OF AUTHORIZATION MISSOURI LAND SURVEYING-2007001128 ENGINEERING-2007002508

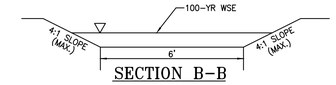
SHEET
19





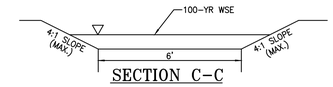
SECTION A-A

Q100 = 22.06 cfs
S = 1.88% min.
100 YR. DEPTH = 0.96'
V = 4.79 fps
V2/2G = 0.36'



SECTION B-B

Q100 = 81.9 cfs
Q10 = 46.3 cfs
DIFF = 35.6 cfs
S = 3.6% min.
100 YR. DEPTH = 0.62'
V = 6.77 fps
V2/2G = 0.71'



SECTION C-C

Q100 = 6.9 cfs
S = 4.0% min.
100 YR. DEPTH = 0.24'
V = 4.1 fps
V2/2G = 0.27'

NOTE:
SEE SHEET 25 FOR LIMITS OF TRM INSTALLATION WITHIN SWALES

Maximum Shear Stress Calculations

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

Where:

$\tau_c = Maximum\ Shear\ Stress$

$\gamma = Density\ of\ Water\ \left(62.4\ \frac{Lb}{Ft^3}\right)$

$d = Depth\ of\ Water\ (ft.)$

$s = Channel\ Slope\ \left(\frac{Ft}{Ft}\right)$

Swale A-A

$$\tau_c = 62.4 * 0.96 * .0188$$
$$\tau_c = 1.13\ psf$$

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

$$\tau_c = 62.4 * 0.39 * .036$$
$$\tau_c = 0.88\ psf$$

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

$$\tau_c = 62.4 * 0.24 * .040$$
$$\tau_c = 0.60\ psf$$

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.

LEGEND

—PL—	PROPERTY LINE
— — —	LOT LINE
—R/W—	RIGHT-OF-WAY
▬ ▬ ▬	DRAINAGE BOUNDARY FOR LOS VALUE RATING CALCULATION

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.

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

"AS-BUILT"

DATED: 11-13-23 BY: JTK

SCALE: 1"=100'
0' 100' 200'

STATE OF MISSOURI
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PLANNING
ENGINEERING
IMPLEMENTATION

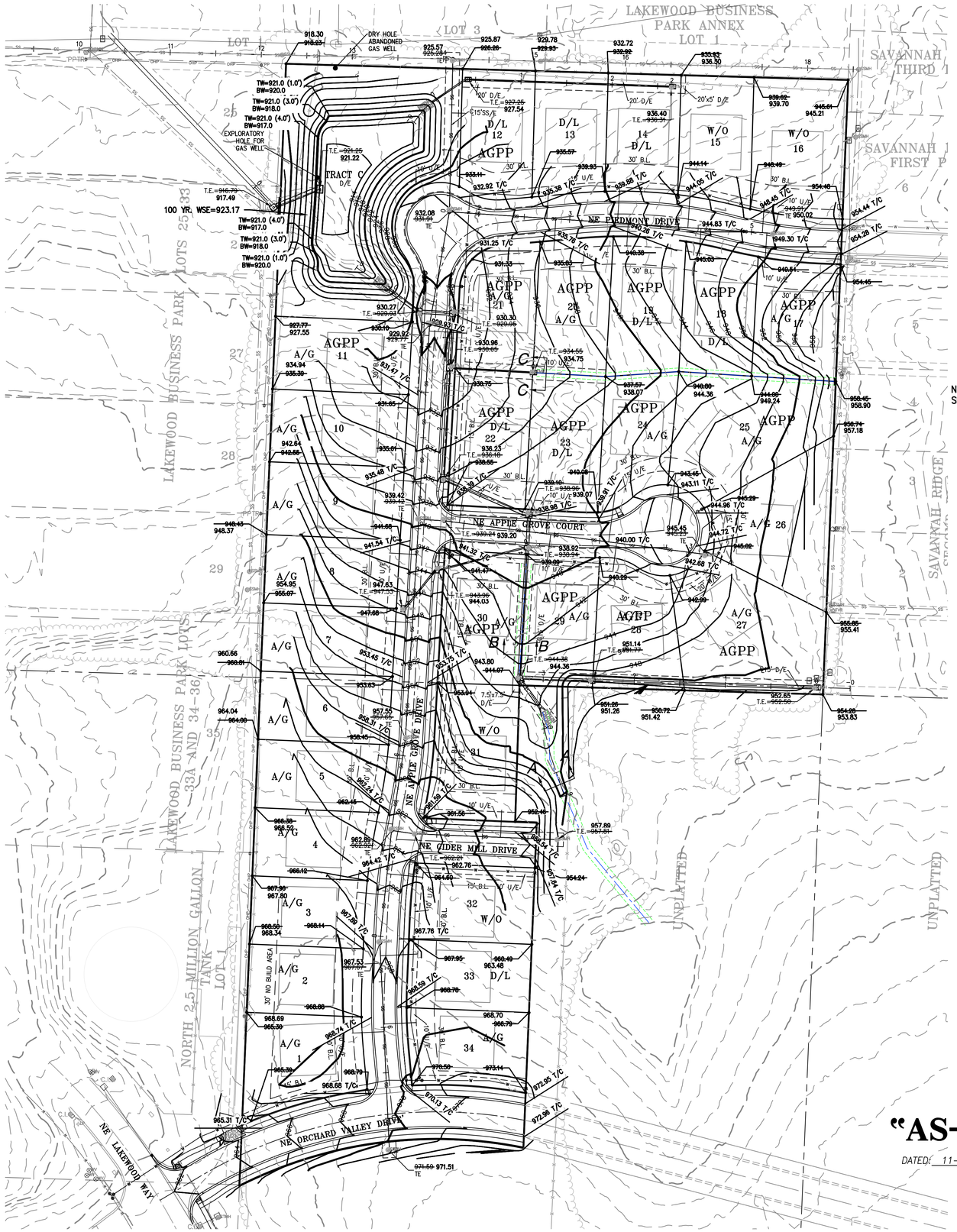
MASTER DRAINAGE PLAN

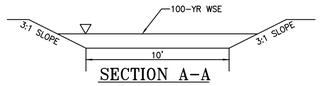
ORCHARD WOODS
LEE'S SUMMIT, JACKSON COUNTY, MISSOURI

No.	Date	Revisions:	By	App.
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
4.	7-20-23	REVISED PER CITY COMMENTS	MRH	DEU
5.	10-11-23	REVISED TOP OF CURB ELEVATIONS	KAD	DEU

PROJECT NO. 211142
DATE: 10-21-2022 | DRAWN: BJG
CHECKED: DEU | APPROVED: DEU
CERTIFICATE OF AUTHORIZATION KANSAS LAND SURVEYING – LS-92 ENGINEERING E-391
CERTIFICATE OF AUTHORIZATION MISSOURI LAND SURVEYING-2007001128 ENGINEERING-2007002508

SHEET
20





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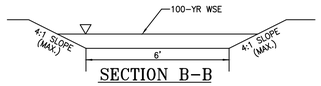

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V = 6.77 fps
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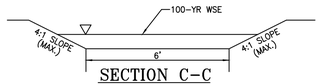

SECTION C-C

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S = 4.0% min.
100 YR. DEPTH = 0.24'
V = 4.1 fps
V2/2G = 0.27'

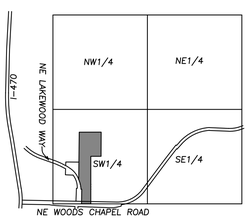
NOTE:
SEE SHEET 25 FOR LIMITS OF TRM INSTALLATION WITHIN SWALES

Orchard Woods Lot Type Table		
Lot #	Lot Type	MBOE
1	A/G	972.0
2	A/G	967.9
3	A/G	967.1
4	A/G	965.1
5	A/G	961.5
6	A/G	957.5
7	A/G	952.6
8	A/G	946.7
9	A/G	940.7
10	A/G	934.6
11	A/G	930.7
12	D/L	925.2
13	W/O	925.6
14	W/O	929.9
15	W/O	934.1
16	W/O	938.5
17	A/G	954.8
18	A/G	953.5
19	A/G	948.5
20	A/G	944.0
21	A/G	939.4
22	W/O	937.1
23	D/L	939.3
24	A/G	942.3
25	A/G	947.8
26	A/G	944.3
27	A/G	944.0
28	A/G	942.0
29	A/G	944.0
30	A/G	944.0
31	W/O	952.1
32	W/O	958.0
33	D/L	962.8
34	A/G	969.5

NOTE:
LOTS 11, 12, 17-25 & 27-30 HAVE BEEN IDENTIFIED AS LOTS REQUIRING AS-GRADED PLOT PLANS. THESE LOTS HAVE BEEN DISTINGUISHED WITH "AGPP" ON THE PLAN. AS-GRADED PLOT PLANS ARE REQUIRED DUE TO EITHER SPECIFIC GRADING THAT PART OF THE OVERALL STORMWATER DESIGN OR THE LOT'S PROXIMITY TO ENGINEERED SWALES, DRAINAGE WAYS, DETENTION BASINS, OR DRAINAGE BERMS.

OIL-GAS WELLS:
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. 29095C0430G, AND DATED JANUARY 20, 2017.



VICINITY MAP
SEC. 9-48-31

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

"AS-BUILT"
DATED: 11-13-23 BY: JTK

SCALE: 1"=60'
0' 60' 120'

STATE OF MISSOURI
DOUGLAS EUGENE LIBBEN, JR.
NUMBER PE-2011010998
PROFESSIONAL ENGINEER

PHELPS ENGINEERING, INC.
1270 N. Winchester
Olathe, Kansas 66061
(913) 393-1155
Fax: (913) 393-1156
www.phelpsengineering.com

PLANNING
ENGINEERING
IMPLEMENTATION

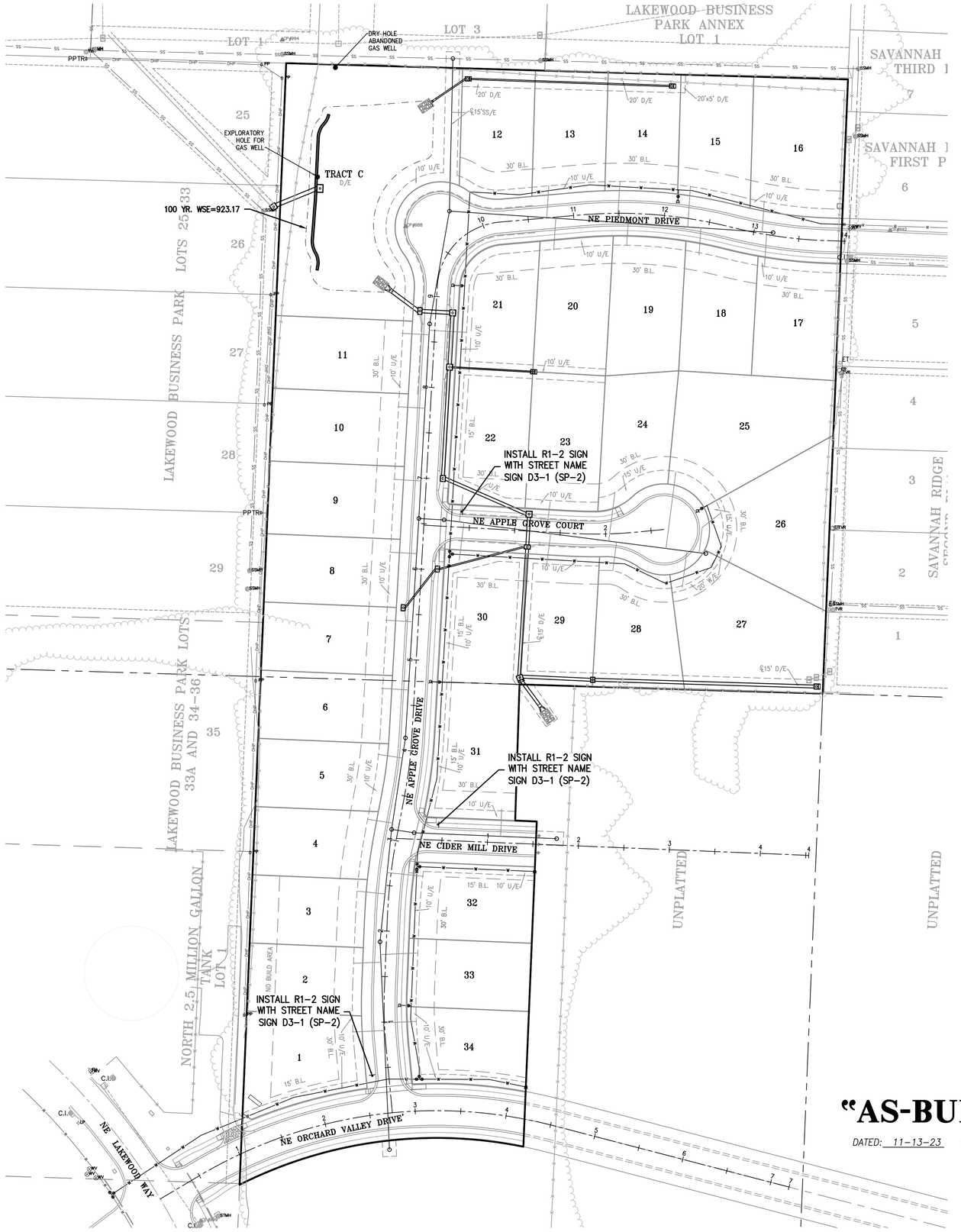
MASTER DRAINAGE PLAN
ORCHARD WOODS
LEE'S SUMMIT, JACKSON COUNTY, MISSOURI

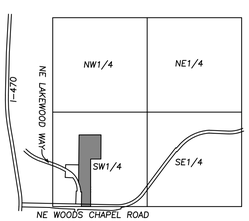
No.	Date	Revisions:	By	App.
1.	2-27-23	REVISED PER CITY COMMENTS	JMO	DEU
2.	4-24-23	REVISED PER CITY COMMENTS	JMO	DEU
3.	6-15-23	REVISED PER CITY COMMENTS	BJG	DEU
4.	7-20-23	REVISED PER CITY COMMENTS	MRH	DEU
5.	10-11-23	REVISED TOP OF CURB ELEVATIONS	KAD	DEU

PROJECT NO. 211142
DATE: 10-21-2022 DRAWN: BJG
CHECKED: DEU APPROVED: DEU
CERTIFICATE OF AUTHORIZATION:
KANSAS LAND SURVEYING - LS-82
ENGINEERING - E-391
CERTIFICATE OF AUTHORIZATION
MISSOURI
LAND SURVEYING-2007001128
ENGINEERING-2007005038

SHEET
21

\\PHELPS-SERVER\Projects\P\211142\Dwg\STREET AND STORM\Master Drainage Plan.dwg Layout:2 Jan 23, 2024 - 5:29pm Kyle Deters





VICINITY MAP
SEC. 9-48-31

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.

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

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DATED: 11-13-23 BY: JTK

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PLANNING
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SIGNAGE PLAN
ORCHARD WOODS
LEE'S SUMMIT, JACKSON COUNTY, MISSOURI

Revisions:

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CHECKED: DEU | APPROVED: DEU
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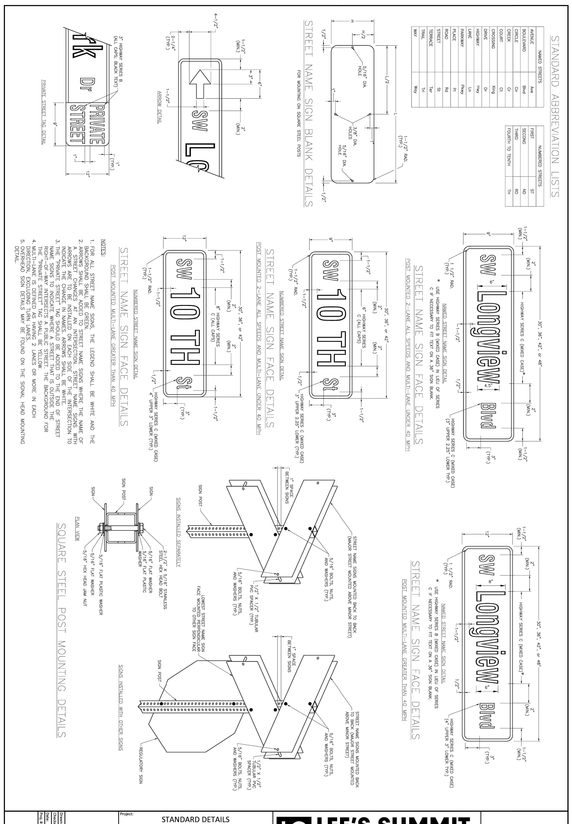
ENGINEERING – E-391
CERTIFICATE OF AUTHORIZATION MISSOURI LAND SURVEYING-2007001128
ENGINEERING-2007002508

SHEET
22

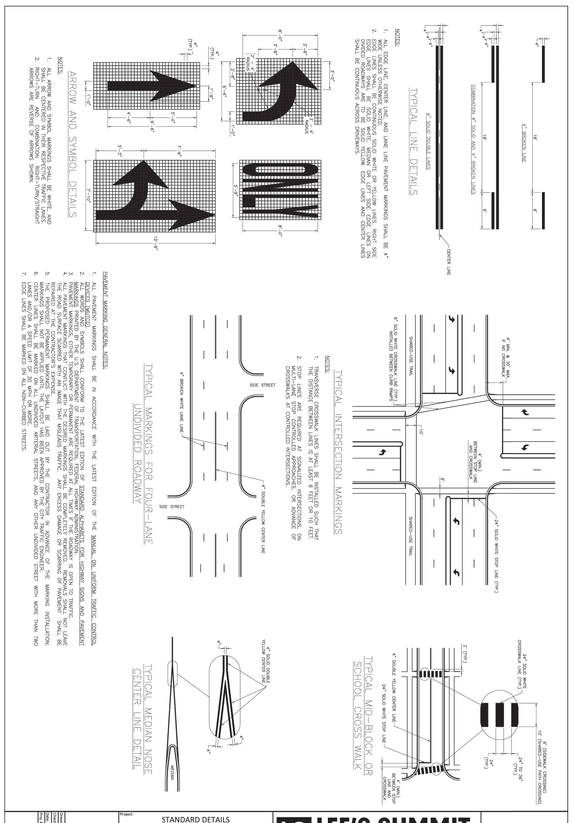


SN-3

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

Sheet Name: STREET NAME SIGN DETAILS

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

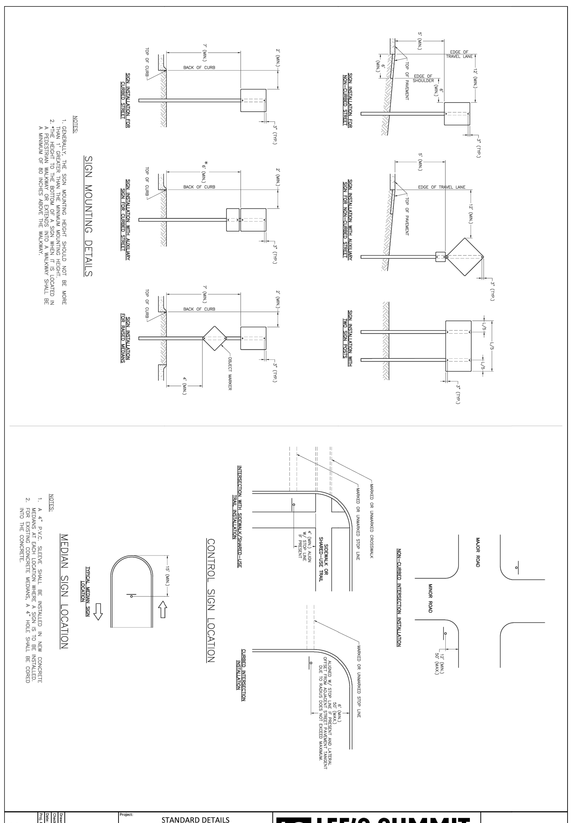


PM-1

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

Sheet Name: ROADWAY MARKING DETAILS

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

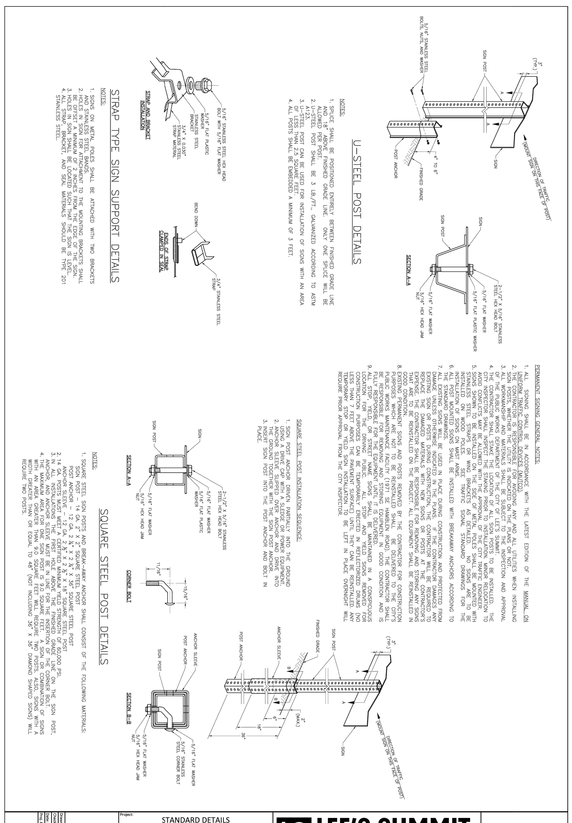


SN-1

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

Sheet Name: SIGN MOUNTING DETAILS

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



SN-2

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

Sheet Name: POST DETAILS

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

"AS-BUILT"

DATED: 11-13-23 BY: JTK

SHEET 23

PROJECT NO. 211142		No.	Date	Revisions:	By	App.
DATE:10-21-2022	DRAWN:BJG	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 KANSAS LAND SURVEYING - LS-82 ENGINEERING - E-387		3.	6-15-23	REVISED PER CITY COMMENTS	BJG	DEU
		4.	7-20-23	REVISED PER CITY COMMENTS	MRH	DEU
CERTIFICATE OF AUTHORIZATION MISSOURI LAND SURVEYING-2007001128 ENGINEERING-2007005058		5.	10-11-23	REVISED TOP OF CURB ELEVATIONS	KAD	DEU

SIGNAGE DETAILS

ORCHARD WOODS
LEE'S SUMMIT, JACKSON COUNTY, MISSOURI

PLANNING ENGINEERING IMPLEMENTATION

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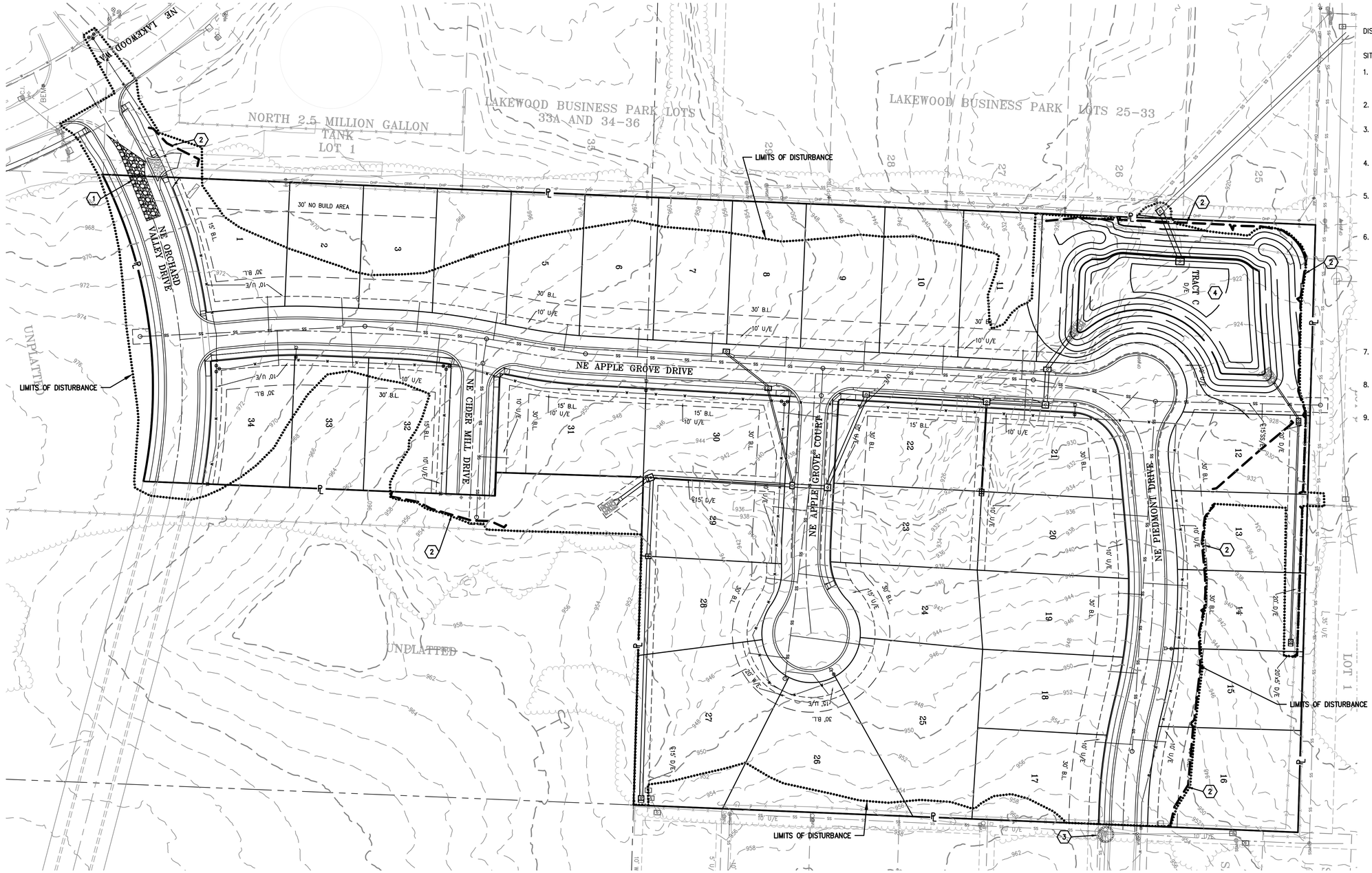
STATE OF MISSOURI
DOUGLAS URBICK, JR.
PE-2011010698
PROFESSIONAL ENGINEER



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 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. ARES 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.
		7	Area Inlet Protection	N/A	Install silt fence inlet protection with wire support.
		8	Turf Re-inforced Mat	N/A	Install North American Green RollMax BioNet s75BN TRM.
Final Stabilization Phase	D. After Paving	9	Inlet Protection	E	Install gravel filter bags.
		10	Silt Fence	E	Place sediment fence back of curb..
	E. Until closure of Land Disturbance Permit		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 Distrubance)
- 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

"AS-BUILT"

DATED: 11-13-23 BY: JTK

SCALE: 1"=50'

0' 50' 100'

STATE OF MISSOURI
DOUGLAS EUGENE UBIEN, JR.
NUMBER PE-2011010998
PROFESSIONAL ENGINEER

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PLANNING
ENGINEERING
IMPLEMENTATION

PRE CONSTRUCTION EROSION CONTROL PLAN

ORCHARD WOODS

LEE'S SUMMIT, JACKSON COUNTY, MISSOURI

Revisions:			By	App.
1.	2-27-23	REVISED PER CITY COMMENTS	JMO	DEU
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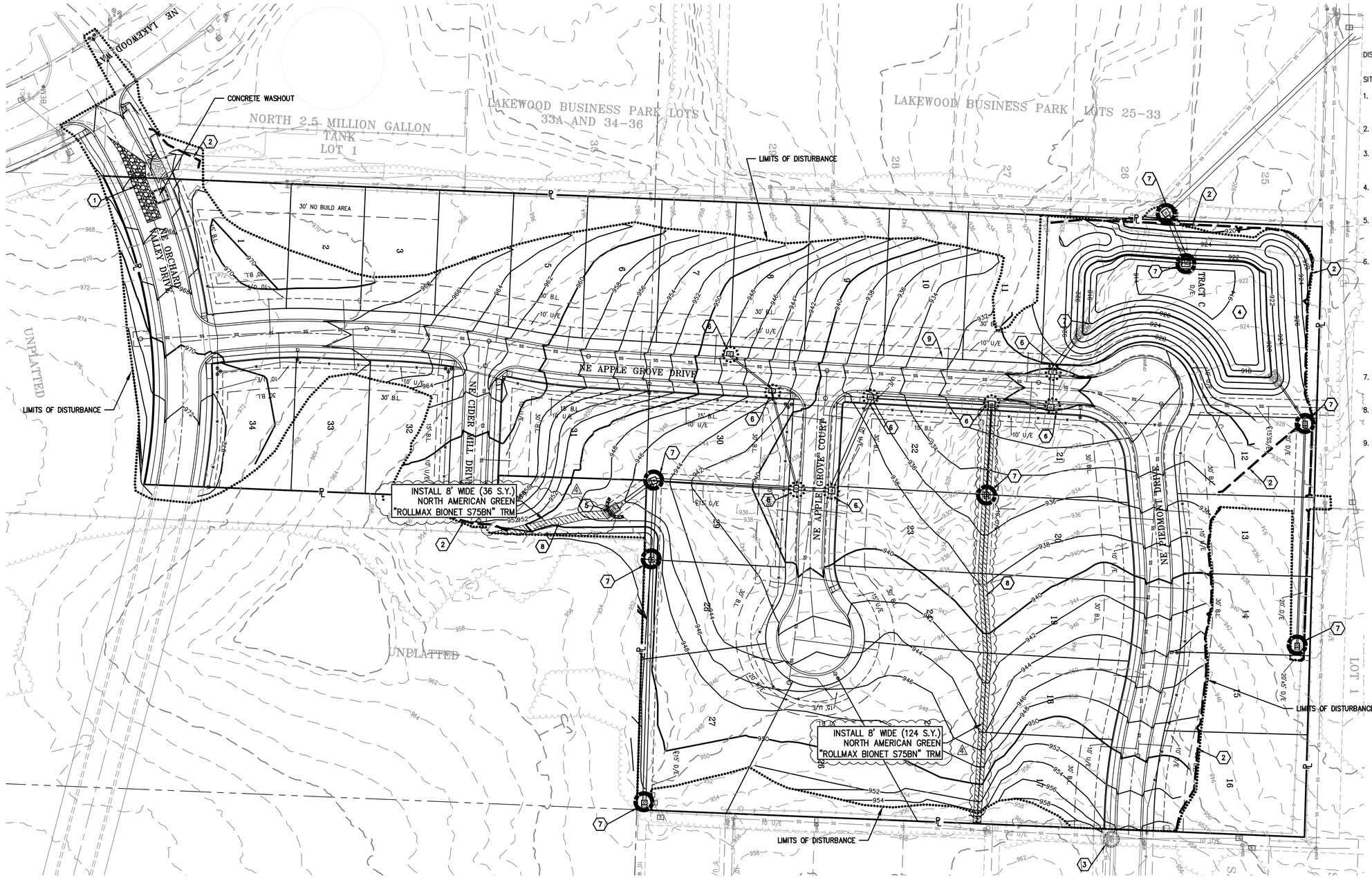
5.	10-11-23	REVISED TOP OF CURB ELEVATIONS	KAD	DEU

PROJECT NO. 211142
DATE: 10-21-2022 | DRAWN: BJG
CHECKED: DEU | APPROVED: DEU
CERTIFICATE OF AUTHORIZATION: KANSAS SURVEYING – LS-82, KANSAS ENGINEERING – E-391
CERTIFICATE OF AUTHORIZATION MISSOURI LAND SURVEYING-2007001128 ENGINEERING-2007005308

SHEET 24

\\PHELPS-SERVER\Projects\P\211142\Dwg\STREET AND STORM\EROSION.dwg Layout:1 Jan 09, 2024 - 7:21am JEANETTE OPAT



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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.)
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	C. Utility Construction	6	Inlet Protection	E	Install silt fence inlet protection with wire support.
		7	Area Inlet Protection	N/A	Install silt fence inlet protection with wire support.
		8	Turf Re-inforced Mat	N/A	Install North American Green RollMax BioNet s75BN TRM. 4
Final Stabilization Phase	D. After Paving	9	Inlet Protection	E	Install gravel filter bags.
		10	Silt Fence	E	Place sediment fence back of curb..
	E. Until closure of Land Disturbance Permit		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 Distrubance)
- Silt Fence (During Construction)
- Limits of Disturbed Area
- Existing Inlet Protection
- Proposed Curb Inlet Protection
- Proposed Area Inlet Protection
- Rock Ditch Check
- CONCRETE WASHOUT
- Turf Re-inforced Mat

"AS-BUILT"

DATED: 11-13-23 BY: JTK

SCALE: 1"=50'

0' 50' 100'

STATE OF MISSOURI
DOUGLAS EUGENE UBBEN, JR.
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PLANNING
ENGINEERING
IMPLEMENTATION

EROSION CONTROL PLAN

ORCHARD WOODS

LEE'S SUMMIT, JACKSON COUNTY, MISSOURI

Revisions:

No.	Date		By	App.
1.	2-27-23	REVISED PER CITY COMMENTS	JMO	DEJ
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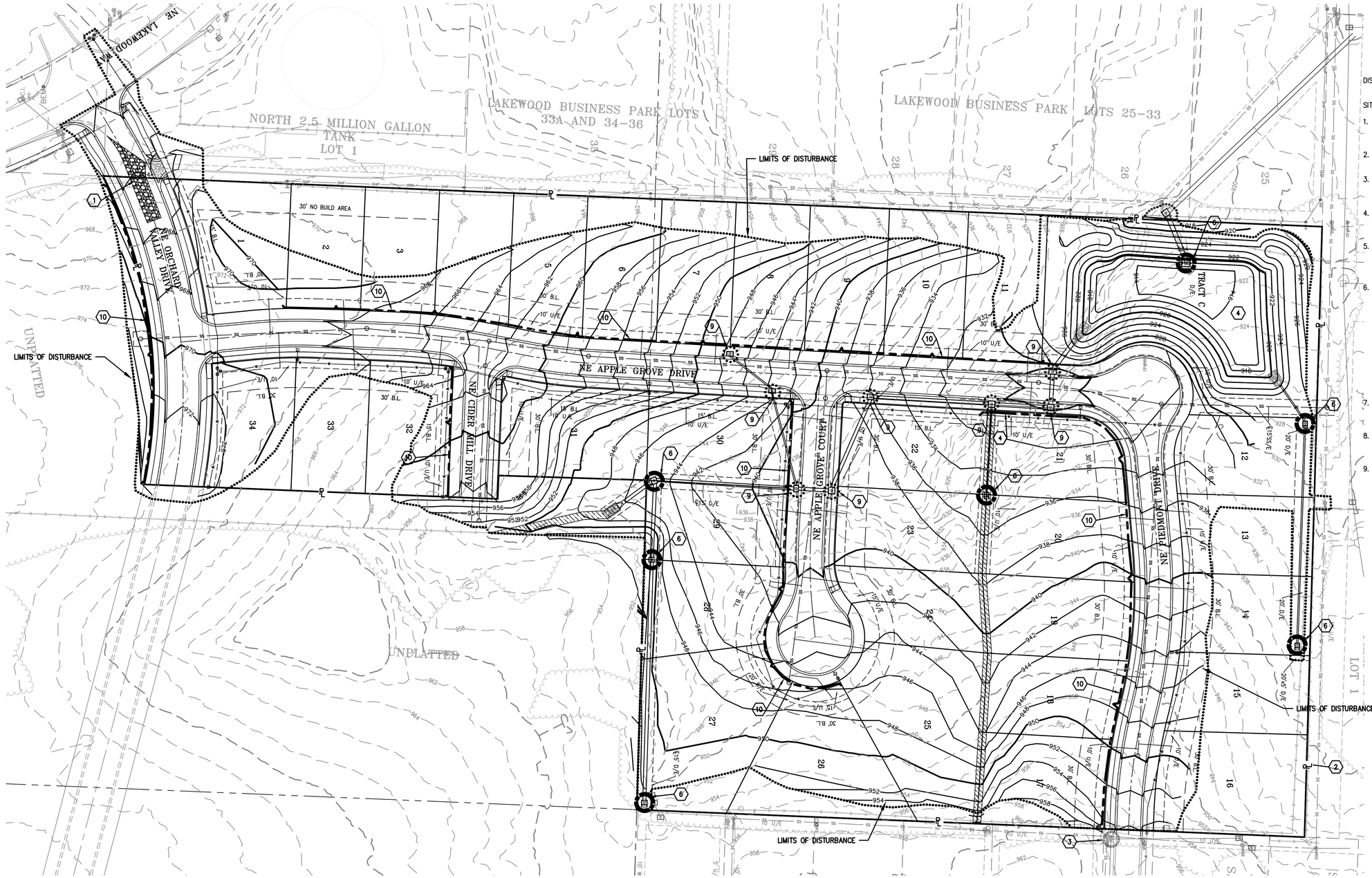
PROJECT NO. 211142
DATE: 10-21-2022 DRAWN: BJG
CHECKED: DEJ APPROVED: DEJ
CERTIFICATE OF AUTHORIZATION KANSAS LAND SURVEYING - LS-82 ENGINEERING - E-391
CERTIFICATE OF AUTHORIZATION MISSOURI LAND SURVEYING-2007001218 ENGINEERING-2007002508

SHEET
25



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"AS-BUILT"

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PLANNING
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IMPLEMENTATION

POST CONSTRUCTION EROSION CONTROL PLAN

ORCHARD WOODS
LEE'S SUMMIT, JACKSON COUNTY, MISSOURI

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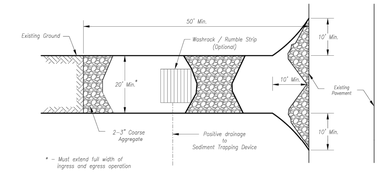
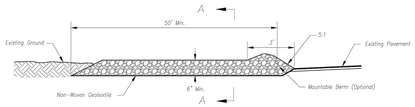
CERTIFICATE OF AUTHORIZATION MISSOURI LAND SURVEYING-2007001128 ENGINEERING-2007002508

SHEET
26

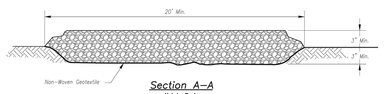
\\PHELPS-SERVER\Projects\P\211142\Dwg\STREET AND STORM\EROSION.dwg Layout:3 Jan 09, 2024 - 7:21am JEANETTE OPAT



Plan View
Not to Scale



Side Elevation
Not to Scale



Section A–A
Not to Scale

Notes for Construction Entrance:

1. Avoid locating on steep slopes, at curves on public roads, or downhill of disturbed area.
2. Remove all vegetation and other unsuitable material from the foundation area, grade, and crown for positive drainage.
3. 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 from it.
4. Install pipe under the entrance if needed to maintain drainage ditches along public roads.
5. Place stone to dimensions and grade as shown on plans. Leave surface sloped for drainage.
6. Divert all surface runoff and drainage from the entrance to a sediment control device.
7. If conditions warrant, place geotextile fabric on the graded foundation to improve stability.

Maintenance for Construction Entrance:

1. Reshape entrance as needed to maintain function and integrity of installation. Top dress with clean aggregate as needed.

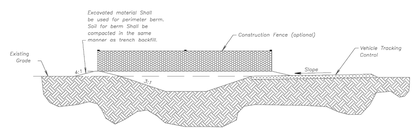
CONSTRUCTION ENTRANCE

Notes for Concrete Washout:

1. Concrete washout areas shall be installed prior to any concrete placement on site.
2. Concrete washout area shall include a flat subsurface pit sized relative to the amount of concrete to be placed on site. The slopes leading out of the subsurface pit shall be 3:1. The vehicle tracking pad shall be sloped towards the concrete washout area.
3. Vehicle tracking control is required at the access point to all concrete washout areas.
4. 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.
5. A one–piece impervious liner may be required along the bottom and sides of the subsurface pit in sandy or gravelly soils.

Maintenance for Concrete Washout:

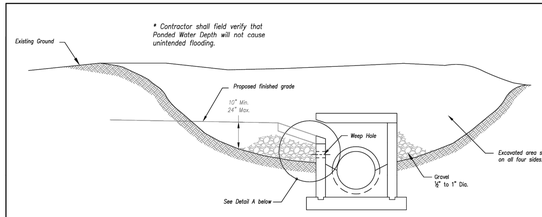
1. Concrete washout materials shall be removed once the materials have filled the washout to approximately 75% full.
2. Concrete washout areas shall be enlarged as necessary to maintain capacity for wasted concrete.
3. Concrete washout water, wasted pieces of concrete and all other debris in the subsurface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

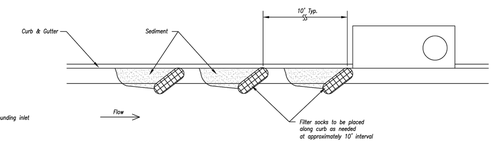


CONCRETE WASHOUT

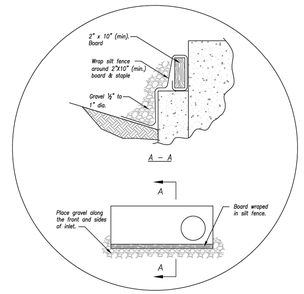
Construction Entrance modified from 2015 Overland Park Standard Details for Erosion and Sediment Control; Concrete Washout modified from 2009 City of Great Bend Standard Drawings.

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





On Grade Curb Inlet Protection



Detail A

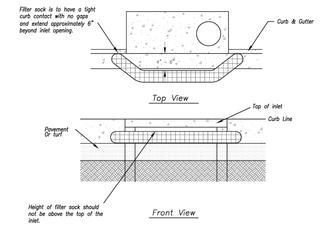
EARLY STAGE CURB INLET
(Open Box and Prior to Pouring Curb and Inlet Throat)

Notes:

1. 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).
2. When inlet is completed and curb poured, filter socks or approved equal should be used (Late Stage Curb Inlet). Straw wattles are not approved for curb inlet use.
3. Contractor to field verify ponding water shall not create a traffic hazard.

Maintenance:

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

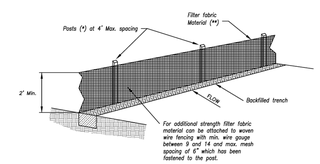


Sump Inlet Sediment Filter

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

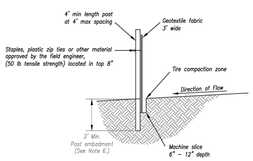
Modified from 2015 Overland Park Standard Details for Erosion and Sediment Control.

AMERICAN PUBLIC WORKS ASSOCIATION
Kansas City Metro Chapter APWA
KANSAS CITY METRO CHAPTER
CURB INLET PROTECTION
STANDARD DRAWING NUMBER ESC-06
ADOPTED: 10/24/2016



(*) POSTS
– MIN. LENGTH 4'
– HARDWOOD 1 ½" x 1 ½"
– NO.2 SOUTHERN PINE 2 ½" x 2 ½"
– STEEL 1.33 LB/FT

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



SILT FENCE DETAILS
Not to Scale

Notes:

1. In order to contain water, the ends of the silt fence must be turned uphill (Figure A).
2. 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).
3. Long slopes should be broken up with intermediate rows of silt fence to slow runoff velocities.
4. Attach fabric to upstream side of post.
5. Install posts a minimum of 2' into the ground.
6. Trenching will only be allowed for small or difficult installation, where slicing machine cannot be reasonably used.

Maintenance:

1. Remove and dispose of sediment deposits when the deposit approaches ½ the height of silt fence.
2. Repair as necessary to maintain function and structure.

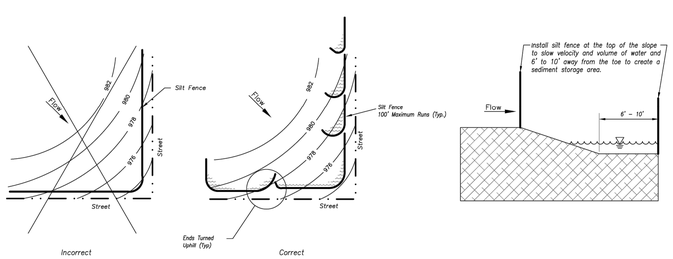
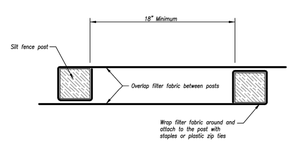


Figure A

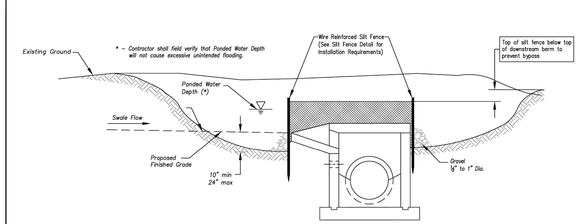
SILT FENCE LAYOUT
Not to Scale



JOINING FENCE SECTIONS
Not to Scale

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

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



Section A–A
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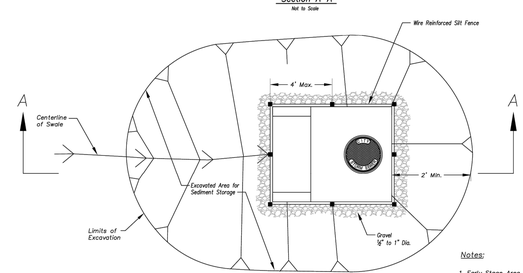
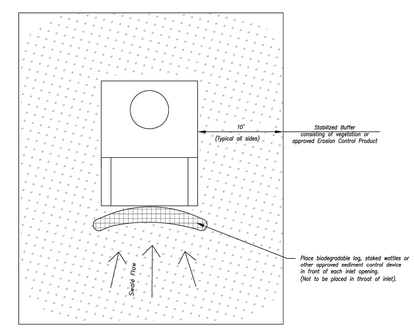


Plan
Not to Scale

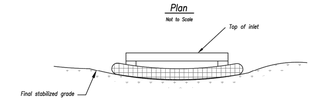
EARLY STAGE AREA INLET
(All open boxes and inlets not at final grade)

Notes:

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



Plan
Not to Scale



Front View

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

Maintenance:

1. Remove deposited sediment from excavated storage areas when available storage has been reduced by 20%.
2. Remove deposited sediment from filter socks or similar when any accumulation of sediment is visible.
3. 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 APWA
KANSAS CITY METRO CHAPTER
AREA INLET AND JUNCTION BOX PROTECTION
STANDARD DRAWING NUMBER ESC-07
ADOPTED: 10/24/2016

"AS-BUILT"
DATED: 11-13-23 BY: JTK

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PLANNING ENGINEERING IMPLEMENTATION

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

No.	Date	Revisions:	By	App
1.	2-27-23	REVISED PER CITY COMMENTS	JMO	DEU
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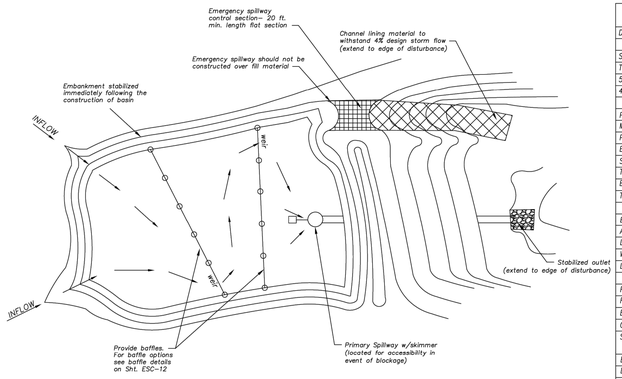
4.	7-20-23	REVISED PER CITY COMMENTS	MRH	DEU
5.	10-11-23	REVISED TOP OF CURB ELEVATIONS	KAD	DEU

PROJECT NO. 211142
DATE: 10-20-2022 | DRAWN: BJG
CHECKED: DEU | APPROVED: DEU
CERTIFICATE OF AUTHORIZATION
KANSAS SURVEYING – LS-82
ENGINEERING – E-391
CERTIFICATE OF AUTHORIZATION
MISSOURI
LAND SURVEYING-2007001128
ENGINEERING-2007005308

SHEET
27

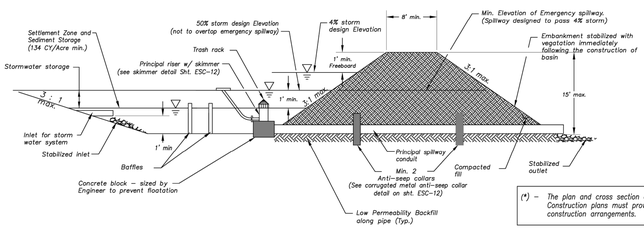


Plan View (*)
Not to Scale

Sediment Basin Design Summary (**)

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 cy/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 Q–2 elevation. 1.0 ft min above principal spillway
Top of Dam Elevation	926.55		Ft	1.0 ft min above Q–25 elevation
Basin Shape Data:				
A = Area at 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



Cross Section (*)
Not to Scale

(*) – The plan and cross section are schematic in nature. Construction plans must provide specific site construction arrangements.

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 all trash and other debris.

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

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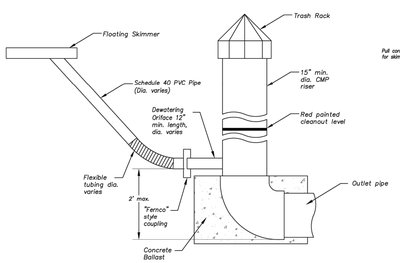
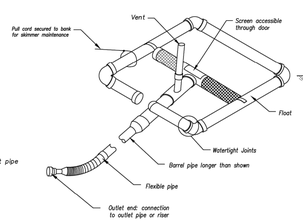
Kansas City Metro Chapter APWA AMERICAN PUBLIC WORKS ASSOCIATION
KANSAS CITY METRO CHAPTER
SEDIMENT BASIN
STANDARD DRAWING NUMBER ESC–11
ADOPTED: 10/24/2016

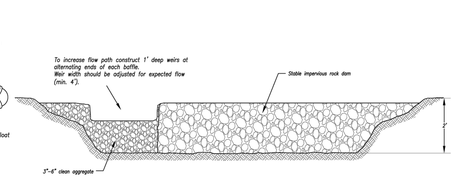


PRINCIPAL SPILLWAY DETAIL

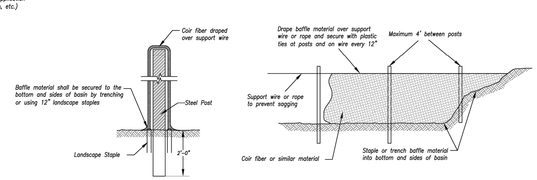


SKIMMER DETAIL (Typ.) *

* Designer to provide specific details per application (e.g. pipe sizes, screen sizes, perforation, etc.) as required.

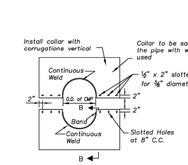


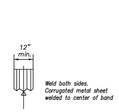
Option A – Rock with Weir



Option B – Coir Fiber Material

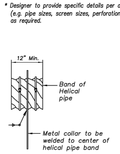
BAFFLE DETAILS
Not to Scale



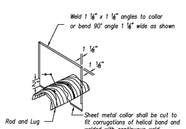


SECTION B–B

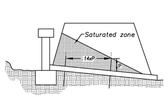
Size and spacing of slotted openings shall be the same as shown for CM collar. Use rods and lugs to clamp bands securely to pipe.



PARTIAL ELEVATION



ISOMETRIC VIEW



ANTI–SEEPAGE COLLAR LOCATIONS

CORRUGATED METAL ANTI–SEEPAGE COLLAR DETAIL
Not to Scale

Anti–Seepage Collar Notes:

1. Connections between the anti–seepage collar and the barrel must be watertight.
2. P = projection distance. Sized as required to achieve at least a 10% increase in seepage length.
3. 14d* = Max. spacing between collars.
4. Collars shall generally be placed in the middle third of the embankment, and within the saturated zone.
5. All materials to be in accordance with construction material specifications.
6. When specified on the plans, coating of collars shall be in accordance with construction material specifications.
7. Unassembled collars shall be marked by painting or tagging to identify matching pairs.
8. The lap between the two half sections and between the pipe and connecting band shall be caulked with asphalt mastic at the time of installation.
9. Each collar shall be furnished with two (2) 3/8" diameter rods with standard tank lugs for connecting the collars to the pipe.
10. For bands and collars, modification of the details shown may be used providing equal water tightness is maintained and detailed drawings are Submitted and approved by the Engineer prior to delivery.
11. Two other types of anti–seep collars are:
    a. Corrugated metal, similar to above, except shop welded to a 4 ft. section of the pipe and connected to the pipe with connecting bands.
    b. Concrete, 6 inches thick, formed around the pipe with #3 rebar spaced 15".

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

AMERICAN PUBLIC WORKS ASSOCIATION
Kansas City Metro Chapter APWA AMERICAN PUBLIC WORKS ASSOCIATION
KANSAS CITY METRO CHAPTER
SEDIMENT BASIN - DETAILS
STANDARD DRAWING NUMBER ESC–12
ADOPTED: 10/24/2016

"AS-BUILT"
DATED: 11–13–23 BY: JTK

PHELPS ENGINEERING, INC.
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PLANNING
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EROSION CONTROL DETAILS
ORCHARD WOODS
LEE'S SUMMIT, JACKSON COUNTY, MISSOURI

Revisions:

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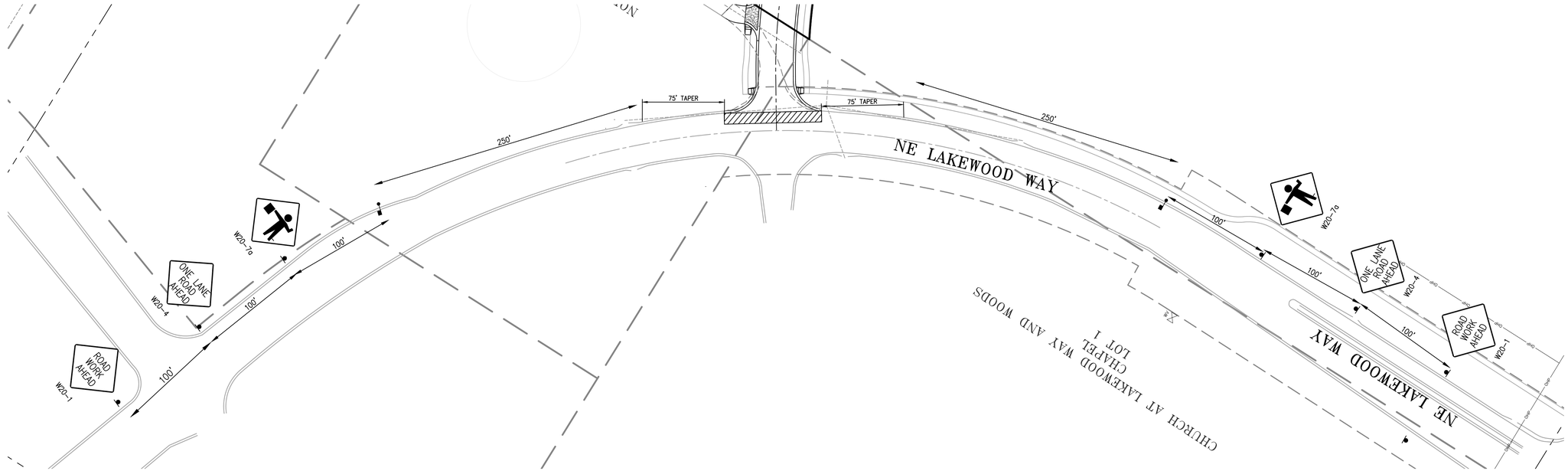
3.	6–15–23	REVISED PER CITY COMMENTS	BJG	DEJ
4.	7–20–23	REVISED PER CITY COMMENTS	MRH	DEJ
5.	10–11–23	REVISED TOP OF CURB ELEVATIONS	KAD	DEJ

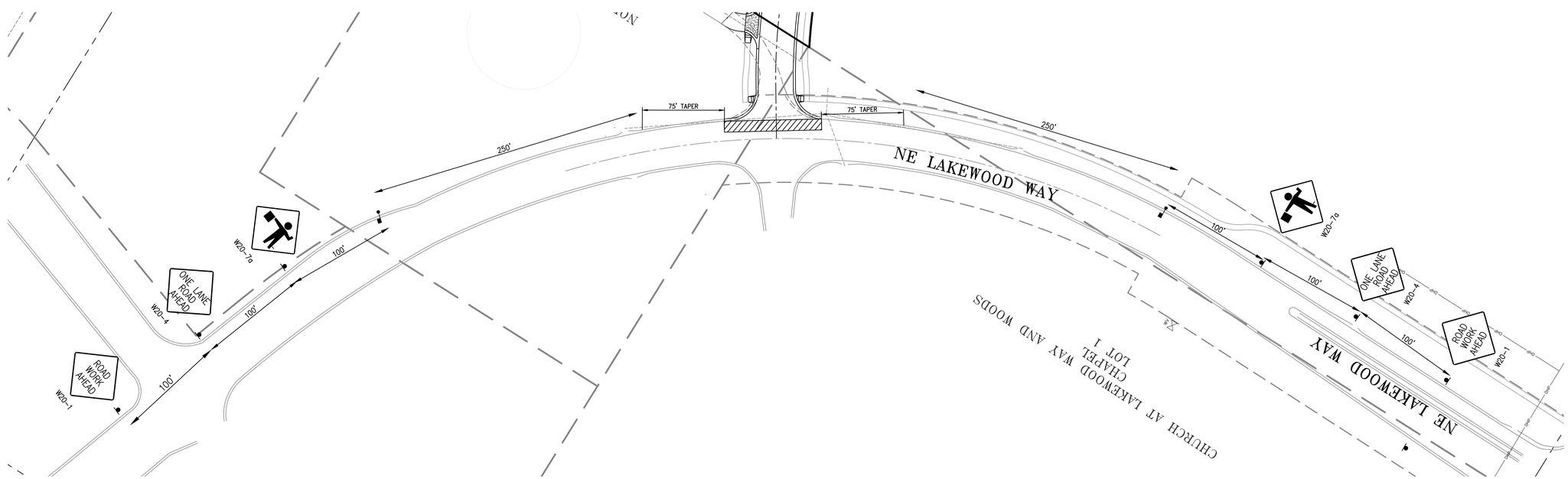
PROJECT NO. 211142
DATE: 10–21–2022 | DRAWN: BJG
CHECKED: DEJ | APPROVED: DEJ
CERTIFICATE OF AUTHORIZATION KANSAS ENGINEERING – LS–82
CERTIFICATE OF AUTHORIZATION LAND SURVEYING–2007001128 ENGINEERING–2007000938

SHEET
28

\\PHELPS-SERVER\Projects\P\211142\Dwg\STREET AND STORM\EROSION DETAILS.dwg Layout:2 Jan 09, 2024 – 7:21am JEANETTE OPAT



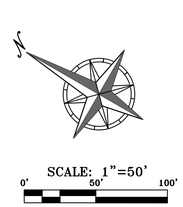
DURING CONSTRUCTION PERIODS



DURING NON-CONSTRUCTION PERIODS

"AS-BUILT"

DATED: 11-13-23 BY: JTK



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

STATE OF MISSOURI
DOUGLAS EUGENE UBBEN, JR.
NUMBER PE-2011010998
PROFESSIONAL ENGINEER

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Olathe, Kansas 66061
(913) 393-1155
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PLANNING
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IMPLEMENTATION

TRAFFIC CONTROL PLAN

ORCHARD WOODS
LEE'S SUMMIT, JACKSON COUNTY, MISSOURI

Revisions:

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1.	2-27-23	REVISED PER CITY COMMENTS	JMO	DEU
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4.	7-20-23	REVISED PER CITY COMMENTS	MRH	DEU
5.	10-11-23	REVISED TOP OF CURB ELEVATIONS	KAD	DEU

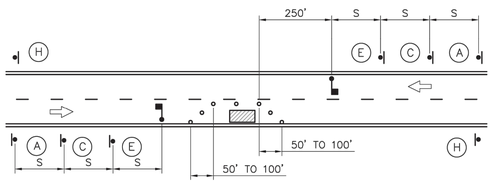
PROJECT NO. 211142
DATE: 10-21-2022 | DRAWN: BJG
CHECKED: DEU | APPROVED: DEU
CERTIFICATE OF AUTHORIZATION KANSAS LAND SURVEYING - LS-82 ENGINEERING - E-981
CERTIFICATE OF AUTHORIZATION MISSOURI LAND SURVEYING-2007001128 ENGINEERING-2007000928

SHEET
29

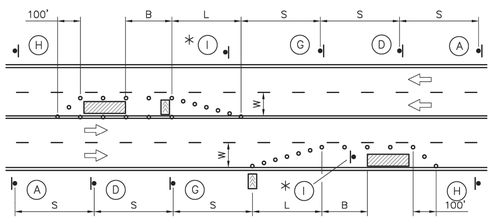
\\PHELPS-SERVER\Projects\P\211142\Dwg\STREET AND STORM\TRAFFIC CONTROL.dwg Layout:1 Jan 09, 2024 - 7:21am JEANETTE OPAT

SYMBOL LEGEND

- WORK AREA
- SIGN
- BARRICADE
- DIRECTION OF TRAVEL
- CHANNELIZER
- ARROW PANEL
- FLAGGER

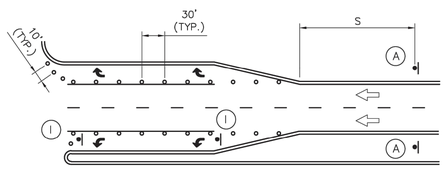


LANE CLOSURE – TWO LANE STREET

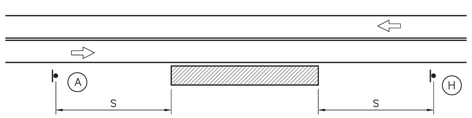


LANE CLOSURE – FOUR LANE STREET

*INSTALL SIGNS EVERY 200 FEET THROUGHOUT THE CLOSED LANE OR AS NEEDED



TURN LANE CLOSURE



TYPICAL SIGNING FOR WORK ADJACENT TO THE STREET

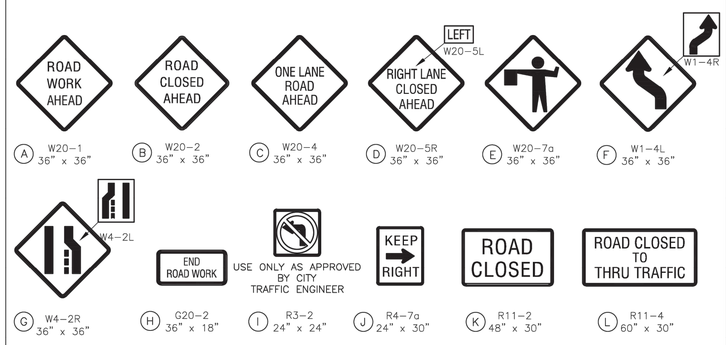
GUIDELINES FOR LENGTH OF LONGITUDINAL BUFFER SPACE "B"	
SPEED LIMIT (MPH)	LENGTH (FEET)
25	35
30	55
35	85
40	120
45	170

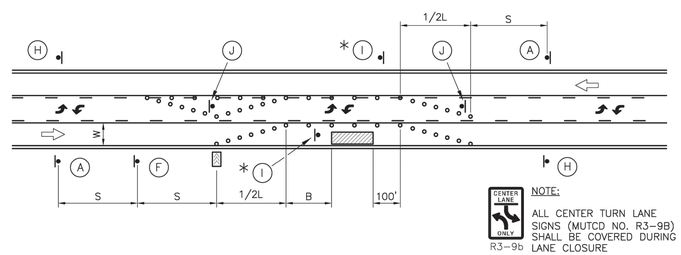
MAXIMUM CHANNELIZER SPACING		
SPEED LIMIT (MPH)	WITHIN TAPER (FEET)	OUTSIDE TAPER (FEET)
25	25	50
30	30	60
35	35	70
40	40	80
45	45	90

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

SIGN SPACING "S"	
SPEED LIMIT (MPH)	SPACING (FEET)
25	100
30–35	250
40	350

SIGN LEGEND



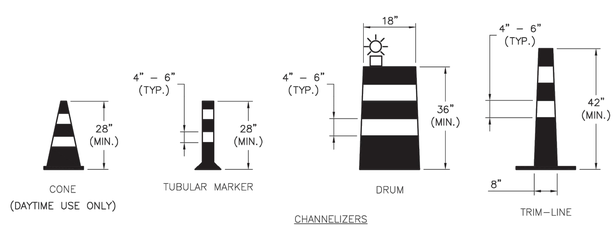


NOTE:

ALL CENTER TURN LANE SIGNS (MUTCD NO. R3-9B) SHALL BE COVERED DURING LANE CLOSURE

LANE CLOSURE – THREE LANE STREET

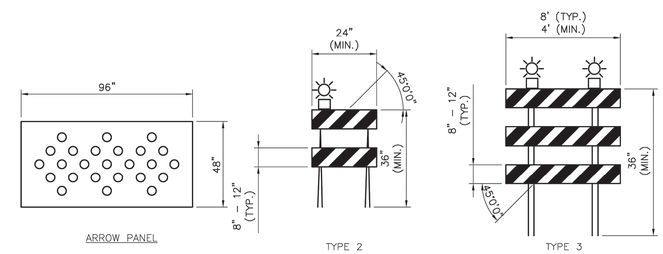
*INSTALL SIGNS EVERY 200 FEET THROUGHOUT THE CLOSED LANE OR AS NEEDED



CHANNELIZERS

NOTE:

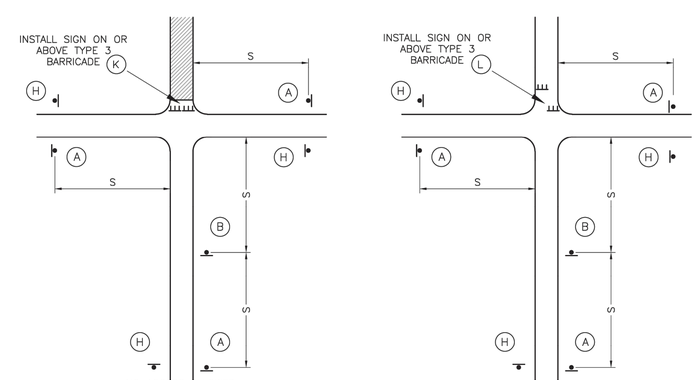
WHITE BANDS ON BARRICADES AND CHANNELIZERS SHALL BE MADE FROM HIGH INTENSITY SHEETING MATERIAL.



BARRICADES

GENERAL NOTES:

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 ERECTED 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.



NO ACCESS ALLOWED

LOCAL ACCESS PERMITTED

TYPICAL STREET CLOSURE

LEE'S SUMMIT MISSOURI

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

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

Sheet Name: TRAFFIC CONTROL DETAILS

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

TC-1

"AS-BUILT"

DATED: 11–13–23 BY: JTK

STATE OF MISSOURI
DOUGLAS EUGENE UBBEN, JR.
NUMBER PE-2011010998
PROFESSIONAL ENGINEER

PHELPS ENGINEERING, INC.
1320 N. Winchester
Olathe, Kansas 66061
(913) 393-1155
Fax: (913) 393-1164
www.phelpsengineering.com

PLANNING ENGINEERING IMPLEMENTATION

TRAFFIC CONTROL DETAILS
ORCHARD WOODS
LEE'S SUMMIT, JACKSON COUNTY, MISSOURI

No.	Date	Revisions:	By	App
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
4.	7–20–23	REVISED PER CITY COMMENTS	MRH	DEU
5.	10–11–23	REVISED TOP OF CURB ELEVATIONS	KAD	DEU

PROJECT NO. 211142
DATE: 10–21–2022 | DRAWN BY: JG
CHECKED: DEU | APPROVED: DEU
CERTIFICATE OF AUTHORIZATION KANSAS LAND SURVEYING – LS–82 ENGINEERING – E–391
CERTIFICATE OF AUTHORIZATION MISSOURI LAND SURVEYING–2007001128 ENGINEERING–2007005308

SHEET 30

\\PHELPS-SERVER\Projects\P\211142\Dwg\STREET AND STORM\TRAFFIC CONTROL DETAILS.dwg Layout:TRAFFIC CONTROL DETAILS Jan 09, 2024 – 7:21am JEANETTE OPAT