

THE RIDGE AT WINTERSET SUMMIT
LOTS 1601-1605
STREET AND STORM CONSTRUCTION PLAN
Part of Section 2 & 3, Township 47 North, Range 32 West
Lee's Summit, Jackson County, Missouri

CONSTRUCTION AND DESIGN NOTES:

STREET & STORM SEWERS:

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

	RESIDENTIAL LOCAL STREET SEE BELOW FOR TYPICAL SECTION.
OPTION 1)	4" TYPE 5 ASPHALT BASE AND 2" TYPE 5 or 6 ASPHALT SURFACE OVER A 6" MoDOT TYPE 5 BASE AND A SUBGRADE MIXTURE OF 6" FLY ASH SUBGRADE IN ACCORDANCE WITH THE CITY OF LEE'S SUMMIT DESIGN AND CONSTRUCTION MANUAL.
STABILIZED	
OPTION 2)	4" TYPE 5 ASPHALT BASE AND 2" TYPE 5 or 6 ASPHALT SURFACE OVER 10" MoDOT TYPE 5 BASE OVERTOP A BIAXIAL GEOGRID MEETING THE REQUIREMENTS OF TABLE 2201.6-1

2 ~ STORM SEWER PIPE SHALL BE HIGH DENSITY POLYETHYLENE (HDPE) AS APPROVED BY CITY OF LEES SUMMIT DESIGN AND CONSTRUCTION MANUAL.

3 - JUNCTION BOXES SHALL BE PER CITY OF LEES SUMMIT STANDARD DRAWING NO. JB-1. FIELD INLETS SHALL BE PER CITY OF LEES SUMMIT STANDARD DRAWING FI-1. TOEWALLS SHALL BE PER CITY OF LEES SUMMIT STANDARD NO. SD-35. STORM MANHOLES SHALL BE PER CITY OF LEES SUMMIT DETAIL SD-27. ROCK LINING AND RIP RAP SHALL BE PER CITY OF LEES SUMMIT.

GENERAL NOTES:

- 1 - ALL CONSTRUCTION SHALL CONFORM TO THE CITY OF LEE'S SUMMIT DESIGN AND CONSTRUCTION MANUAL AS ADOPTED BY ORDINANCE 5813.
- 2 - ALL REQUIRED EASEMENTS WITHIN THE BOUNDARY OF THIS PROJECT SHALL BE PROVIDED FOR ON THE FINAL PLAN.
- 3 - ANY REQUIRED EASEMENT LOCATED OUTSIDE OF THE BOUNDARY OF THIS PROJECT SHALL BE PROVIDED FOR BY SEPARATE INSTRUMENT PRIOR TO ISSUANCE OF CONSTRUCTION PERMIT.
- 4 - THE CONTRACTOR SHALL NOTIFY THE CITY OF LEE'S SUMMIT DEVELOPMENT ENGINEERING INSPECTION AT 816.969.1200 AT LEAST 48 HOURS PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION.
- 5 - THE CONTRACTOR SHALL NOTIFY ENGINEERING SOLUTIONS AT 816.623.9888 OF ANY CONFLICT WITH THE IMPROVEMENTS PROPOSED BY THESE PLANS AND SITE CONDITIONS.
- 6 - THE CONTRACTOR SHALL NOTIFY THE CITY ENGINEER AND OBTAIN THE APPROPRIATE BLASTING PERMITS FOR A REQUIRED BLASTING. IF BLASTING IS ALLOWED, ALL BLASTING SHALL CONFORM TO STATE REGULATIONS AND LOCAL ORDINANCES.

UTILITY COMPANIES:

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

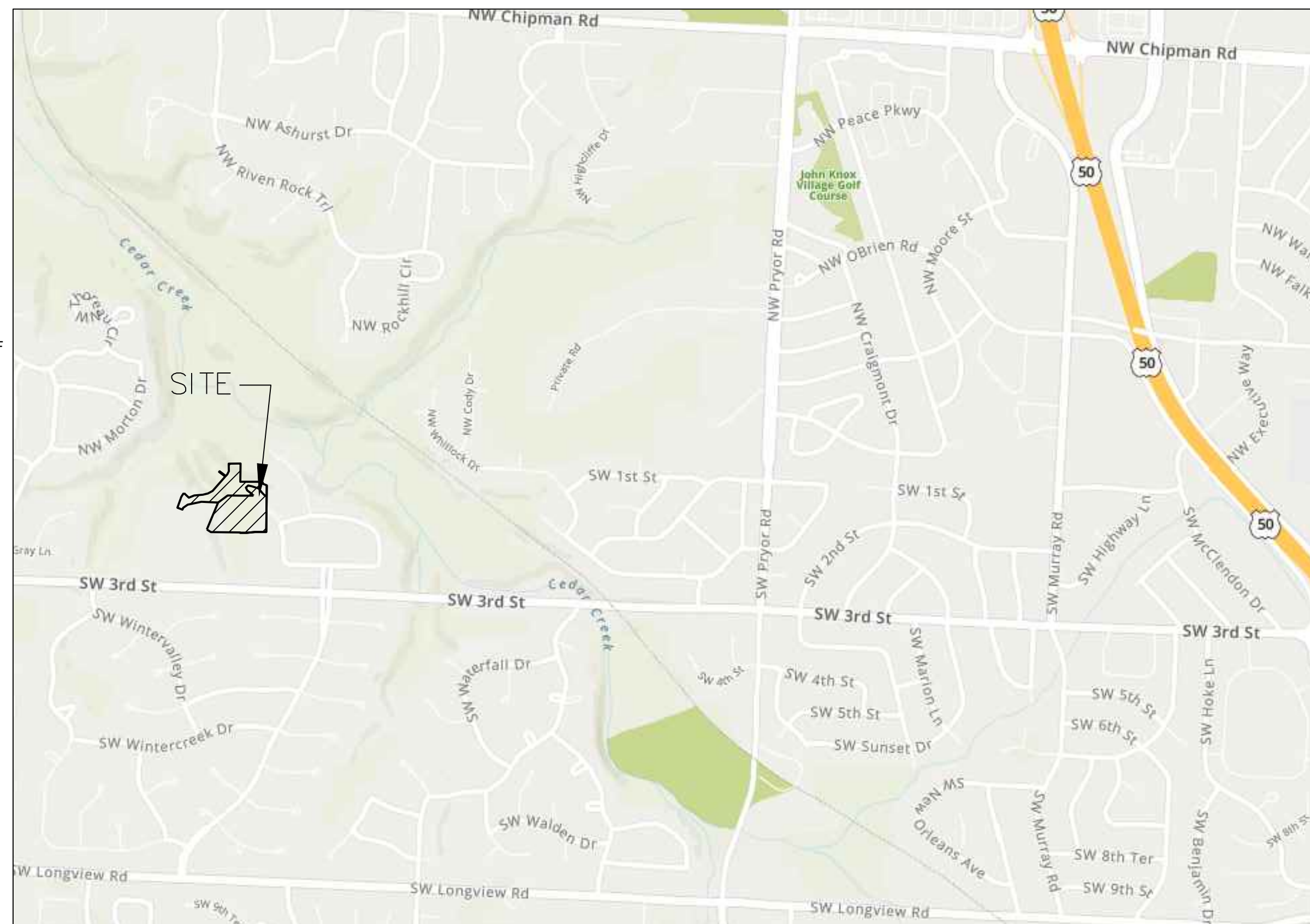
ENERGY ~ 298-1196
MISSOURI GAS ENERGY ~ 756-5261
SOUTHWESTERN BELL TELEPHONE ~ 761-5011
COMCAST CABLE ~ 795-1100
WILLIAMS PIPELINE ~ 422-6300
CITY OF LEE'S SUMMIT PUBLIC WORKS ~ 969-1800
CITY OF LEE'S SUMMIT PUBLIC WORKS INSPECTIONS ~ 969-1800
CITY OF LEE'S SUMMIT WATER UTILITIES ~ 969-1900
MISSOURI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

OIL - GAS WELLS

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

FLOOD INFORMATION:

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



SITE LOCATION MAP

Summary of Quantities:

ITEM AND DESCRIPTION	UNIT	ESTIMATE QUANTITY
ASPHALT PAVING	S.Y.	1,497.07
CURBING	FT	1,015.17
MoDOT Type 5 Base	S.Y.	1,853.00
GEOGRID	S.Y.	1,853.00
ADA SIDEWALK RAMP	UNIT	1
CLEARING, GRADING & GRUBBING	LS	1
SILT FENCE	FT	1,368.00
INLET PROTECTION	UNIT	5.00
SEEDING / MULCHING/ FERTILIZING	AC	2,992.99
CONST. ENTRANCE	UNIT	1.00
RIP RAP W/ FABRIC	S.Y.	3.20
DITCH CHECK	UNIT	3.00
STORM		
15" HDPE	FT	83.10
15" HDPE END SECTION / TOE WALL	LS	1.00
4' x 3' STORM CURB INI FT	FA	2.00

ENGINEER'S CERTIFICATION:

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

RECORD DRAWING

The information provided on this drawing conforms to construction records; it is not intended for construction, implementation or recording purposes; and it is solely based on information obtained by my firm.

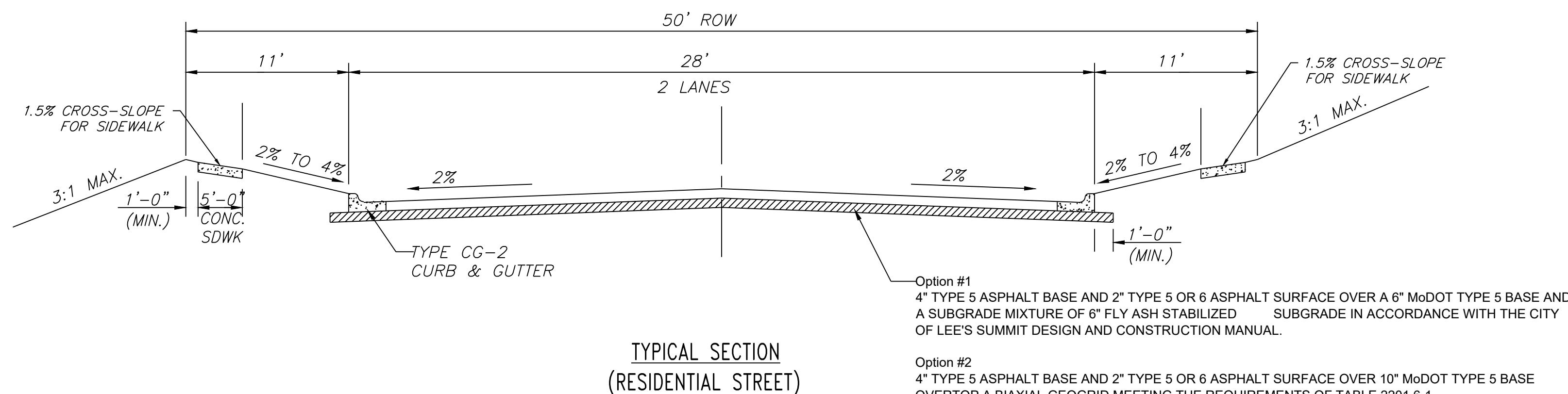
"400-90 100.10", "4+60% 1.15% slope", or "8-inch HDPE-PV pipe" are all typical examples of revisions that indicate that design data has been replaced with "as-built" information. All other data is as designed and has not been field verified.

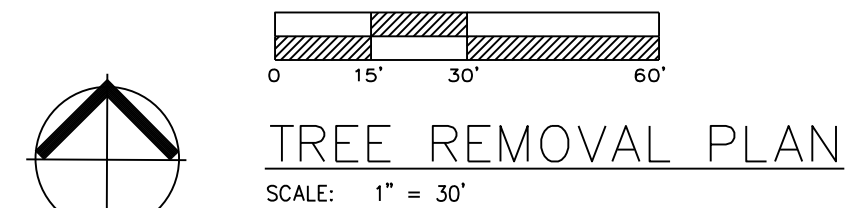
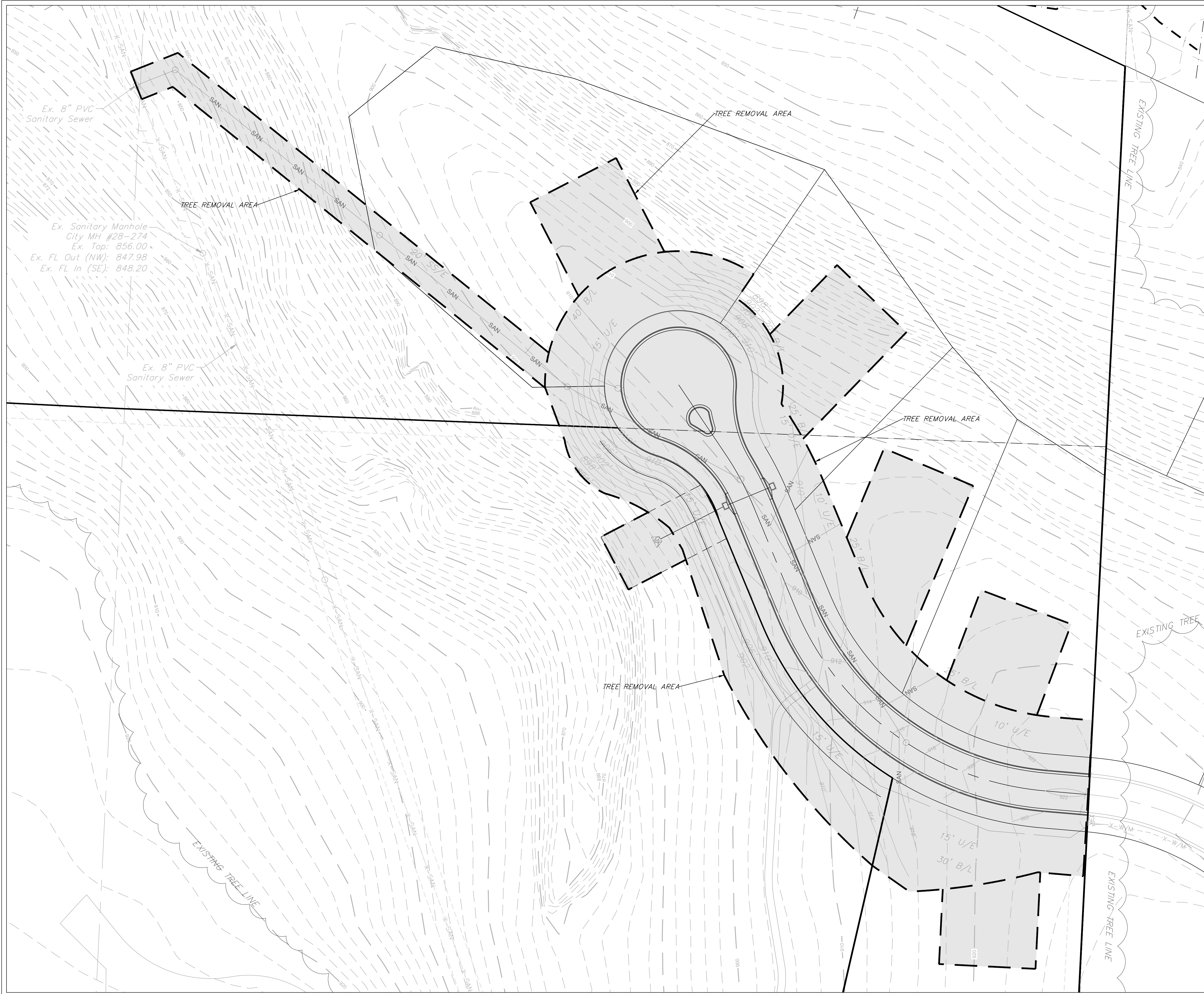
Date: 1/28/2022

Certified by: Matthew J. Schlicht

Title: Engineer

Firm: Engineering Solutions





Notes:

1. Contractor To Clear and Remove Hatched Area Approx. 96,000 s.f. Certain Marked Trees To Remain.

**Accepted
Record Drawings**

These plans have been reviewed for accuracy and are accepted for basic conformance to the approved construction drawings.

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Date: 1/28/2022
Certified by: Matthew J. Schlicht
Title: Engineer
Firm: Engineering Solutions

ENGINEERING SOLUTIONS
ENGINEERING & SURVEYING
50 SE 30TH STREET
LEES SUMMIT, MO 64082
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Professional Registration
Missouri
Engineering 2005002188-D
Surveying 2005005189-D
Kansas
Engineering E-1695
Surveying LS-218
Oklahoma
Engineering 6254
Nebraska
Engineering CA2821

The Ridge at Winterset Summit
Lee's Summit, Jackson County, Missouri

Project Engineer
Creek
Issue Date
December 9, 2020

Tree Removal Plan
Construction Plans for:
The Ridge at Winterset Summit
Lee's Summit, Jackson County, Missouri

STATE OF MISSOURI
MATTHEW J. SCHLICHT
NUMBER
PE000019708
PROFESSIONAL ENGINEER

Matthew J. Schlicht
MO PE 2006019708
KS PE 19071
OK PE 25226

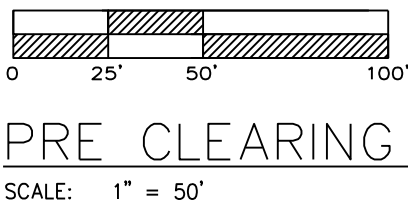
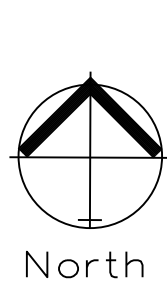
REVISIONS
1/28/2022 As-Built

C.010

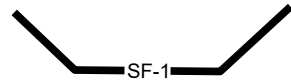


**Accepted
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NOTES: The Land Disturbance Plans indicates the Final placement of erosion control devices. The contractor(s) may proceed with construction prior to the final placement of these devices by providing additional devices to control erosion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



SILT FENCE PROTECTION
TO BE MAINTAINED BY CONTRACTOR

LEGEND

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

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

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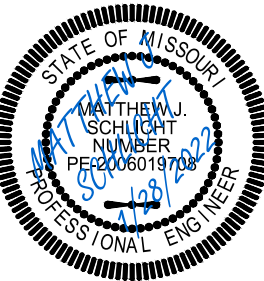


Professional Registration
Missouri
Engineering 2005002188-D
Surveying 2005000519-D
Kansas
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Engineering CA2821

The Ridge at Winterset Summit
Lee's Summit, Jackson County, Missouri

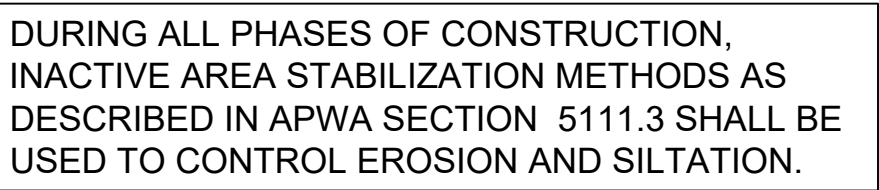
Project
Winterset Creek
Issue Date
December 3, 2020

ESC PHASE 1 - Pre Clearing Plan
Construction Plans for:
The Ridge at Winterset Summit
Lee's Summit, Jackson County, Missouri



Matthew J. Schlicht
MO PE 2006019708
KS PE 19071
OK PE 25226

REVISIONS
1/28/2022 As-Built



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

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

STRUCTURAL CONTROLS: FILTER FABRIC FENCES AND ALL OTHER EROSION AND SEDIMENT CONTROL MEASURES IDENTIFIED IN THE PLAN WILL BE INSPECTED REGULARLY FOR PROPER POSITIONING, ANCHORING, AND EFFECTIVENESS IN TRAPPING SEDIMENTS. SEDIMENT WILL BE REMOVED FROM THE UPSTREAM OR UPLOFT SIDE OF THE FILTER FABRIC. CONTRACTOR CAN CONTACT ENGINEERING SOLUTIONS FOR COPIES OF THE EROSION CONTROL PLAN TO BE USED FOR NEARLATIONAL SITES.

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

RECORD DRAWING

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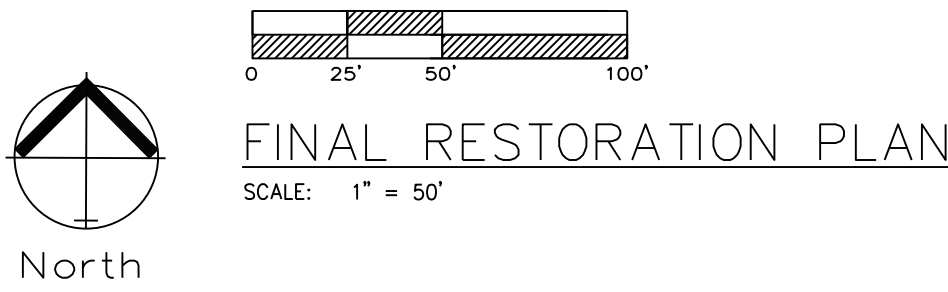
"4-66-96 100 10", "4-66-96 1.15% slope", or "8-inch HDPE-PVC pipe" are all typical examples of revisions that indicate that design data has been replaced with "as-built" information. All other data is as designed and has not been field verified.

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Title: Engineer

Firm: Engineering Solutions



SILT FENCE PROTECTION
TO BE MAINTAINED BY CONTRACTOR

LEGEND		
PHASE 1 SILT FENCE	— SF-1 —	— SF-1 —
PHASE 2 SILT FENCE	— SF-2 —	— SF-2 —
INLET PROTECTION GUTTER BUDDY OR EQUIVALENT	—	

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

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

SEED AND MULCH NOTES:

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

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

During the dates December 15th through May 31 ALL lime fertilizer,
seed and mulch shall be applied to finished slopes of disturbed areas.
During the months of June, July, October and November 1st through
December 15th, lime fertilizer, seed and mulch shall be applied at the
following rates:
Lime - 100% of specified quantity
Fertilizer - 75% of the specified quantity
Seed - 50% of the specified quantity
Mulch - 100% of the specified quantity

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

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

Accepted
Record Drawings

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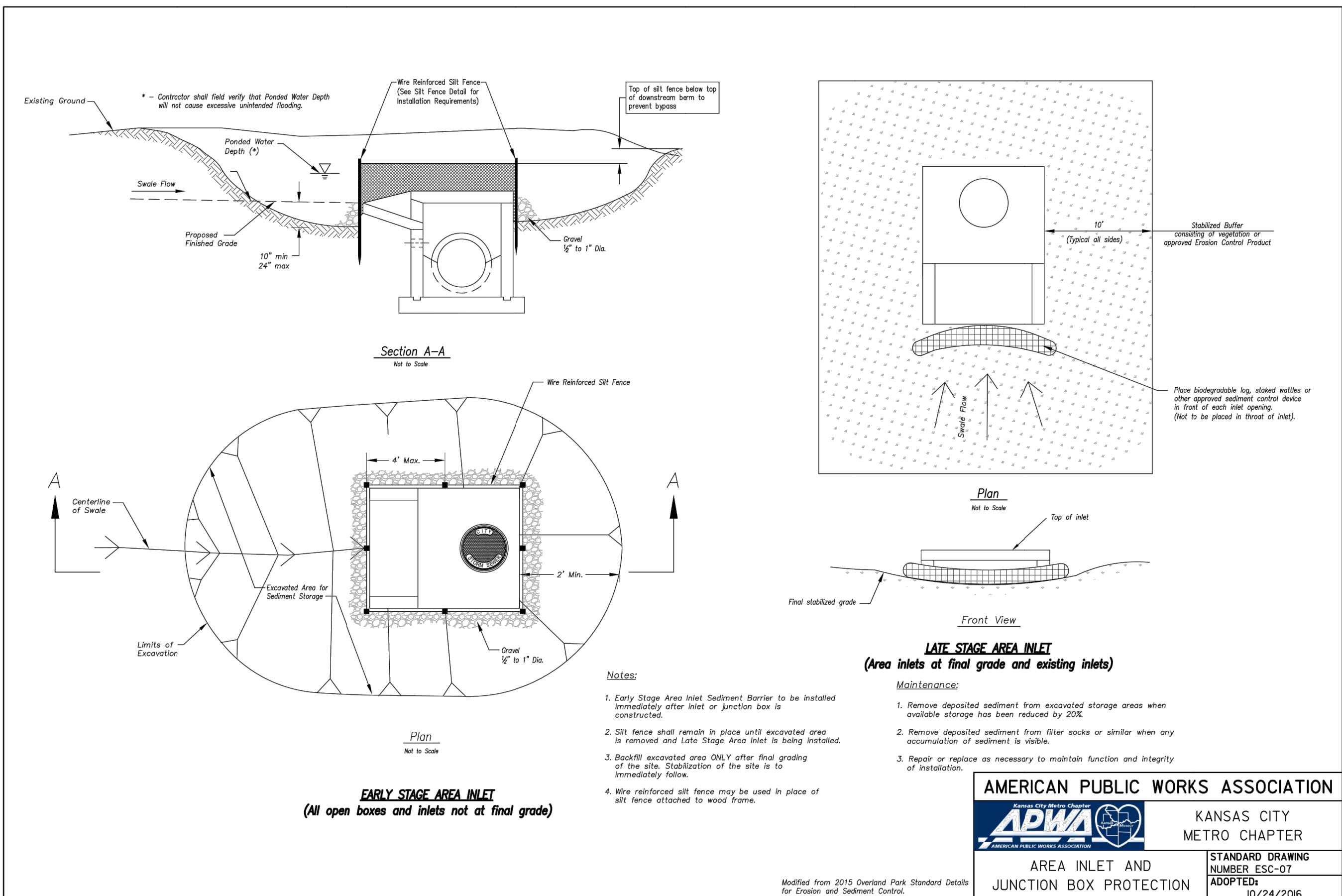
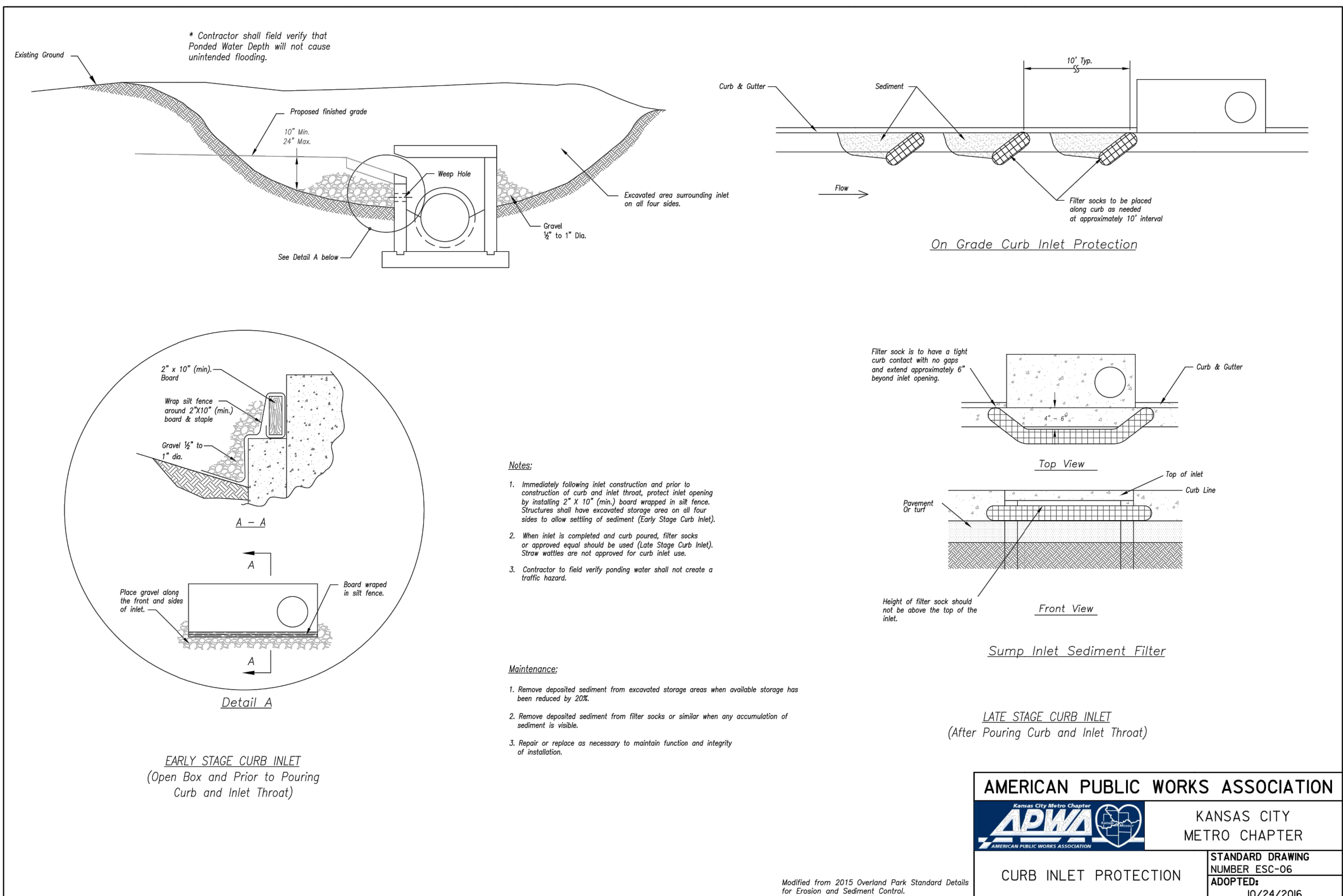
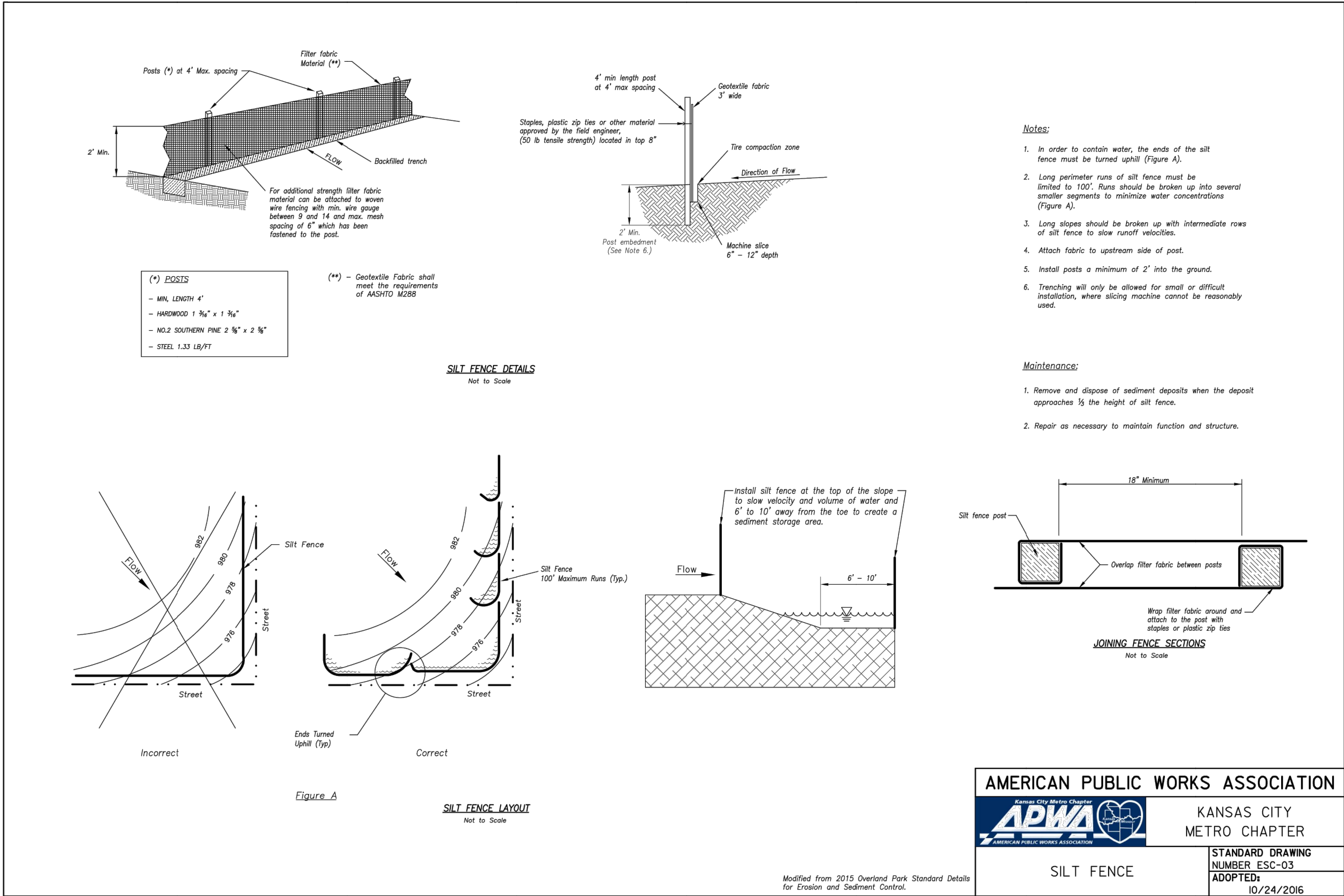
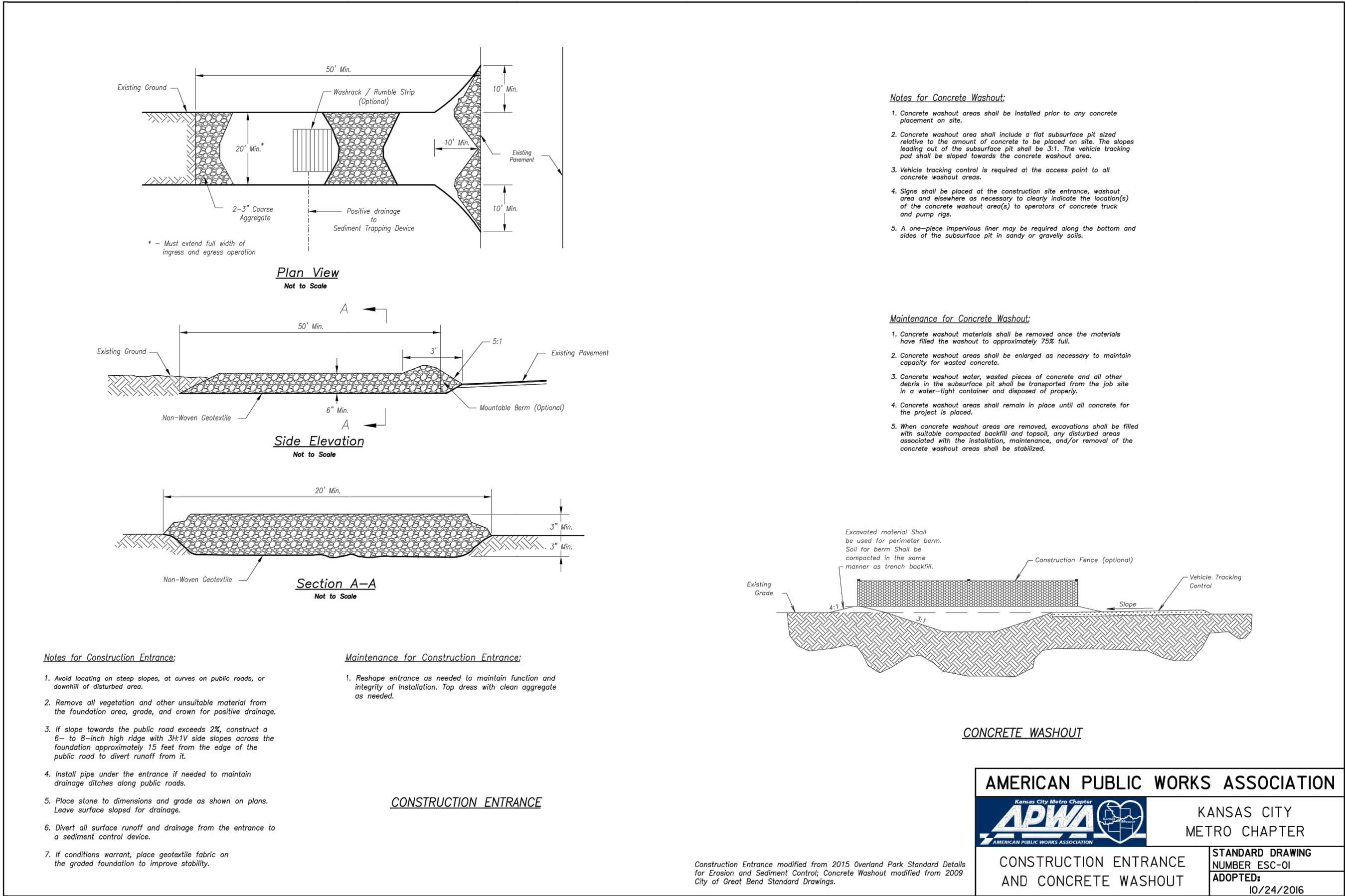
The Ridge at Winterset Summit
Lee's Summit, Jackson County, Missouri

Project:
Creek:
Issue Date:
December 3, 2020

ESC PHASE 3 - Final Restoration Plan
Construction Plans for:
The Ridge at Winterset Summit
Lee's Summit, Jackson County, Missouri

Matthew J. Schlicht
MO PE 2006019708
KS PE 19071
OK PE 25526
REVISIONS
1/28/2022 As-Built

C.052



Accepted
Record Drawings

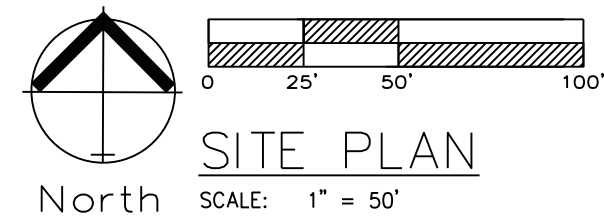
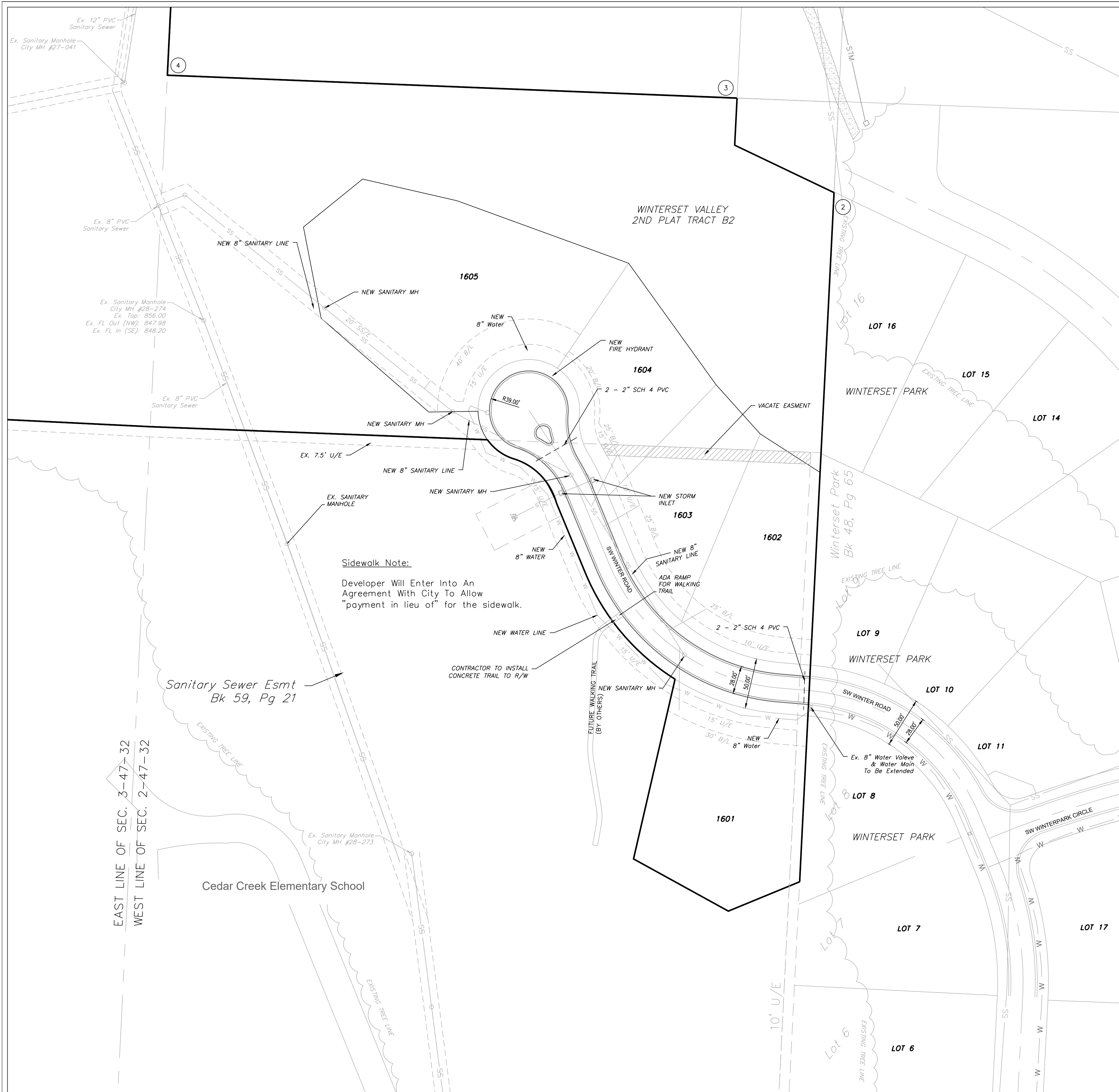
These plans have been reviewed for accuracy and are accepted for basic conformance to the approved construction drawings.

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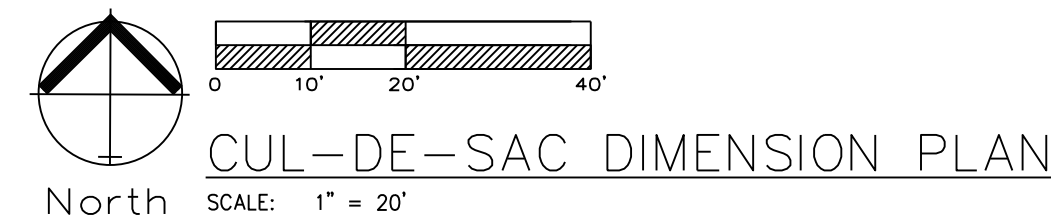
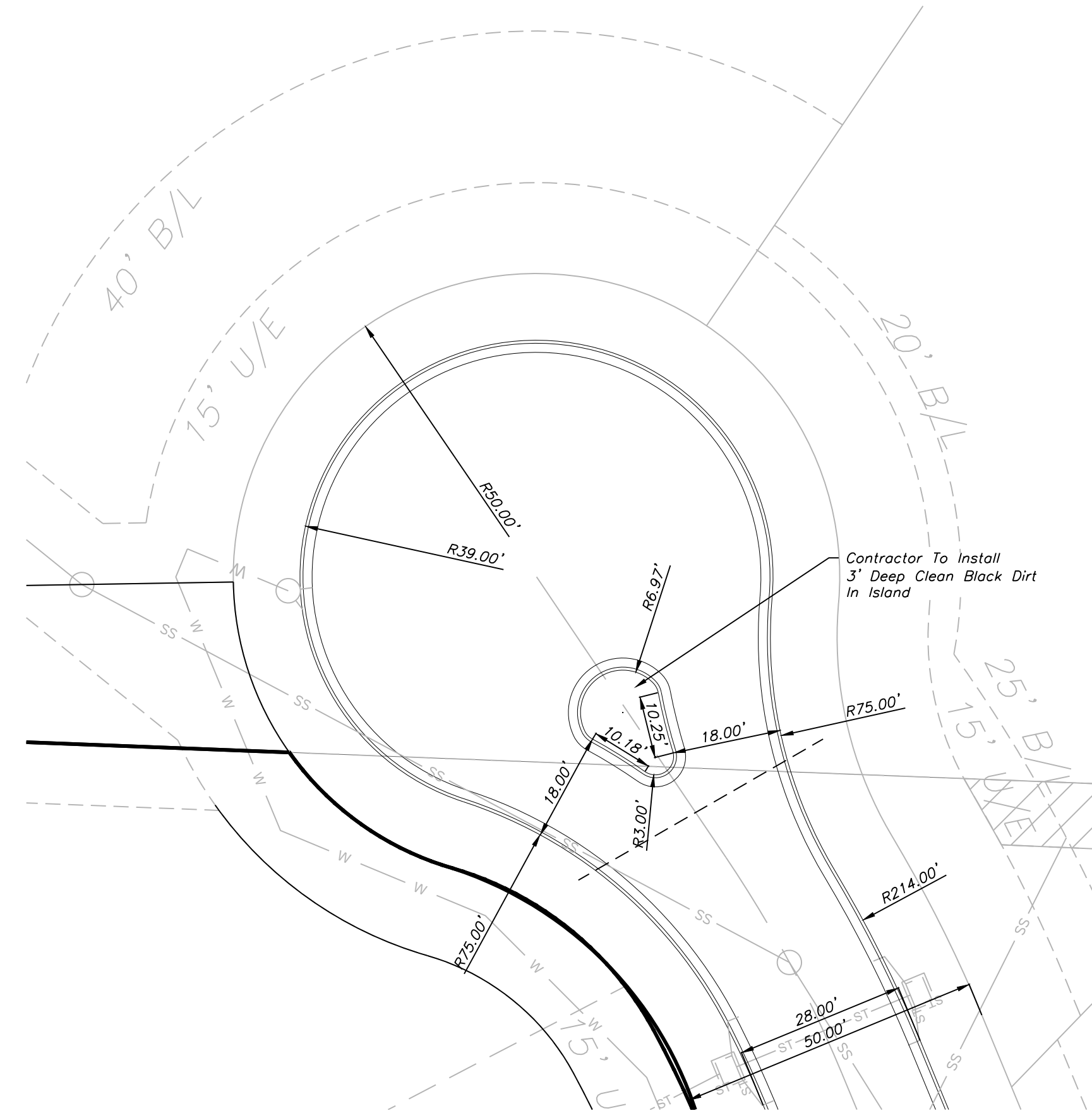
Date: 1/28/2022
Certified by: Matthew J. Schlicht
Title: Engineer
Firm: Engineering Solutions



- Notes:
- Developer Will Enter Into An Agreement With City To Allow Cul-De-Sac.
 - No Sidewalk Will Be Installed With This Development.
 - Contractor to Install 550' of 2" SCH 40 PVC Conduit for Evergy.

**Accepted
Record Drawings**

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RECORD DRAWING

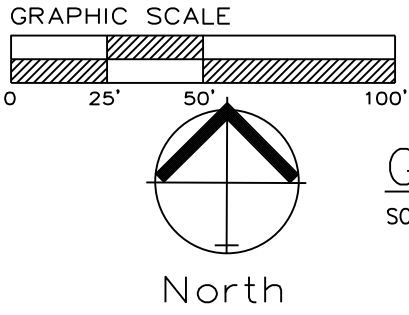
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Certified by: Matthew J. Schlicht
Title: Engineer
Firm: Engineering Solutions

Notes

1. Contractor is responsible for verifying all existing utility locations prior to excavation
2. There are no known natural or artificial water storage detention areas, or wetlands in the area designated for construction
3. No part of the project lies within the 100 year flood plain
4. All erosion and sediment control measures need to be implemented prior to construction
5. Additional erosion control may be required by the City Engineer, Design Engineer or Owner at any time problematic areas are noted in the field or existing measures are found to be ineffective
6. Soil Stabilization of disturbed areas shall be completed within 14 days of construction inactivity
7. Contractor responsible for all density testing of roadway subgrade and granular base.



GRADING PLAN
SCALE: 1" = 50'

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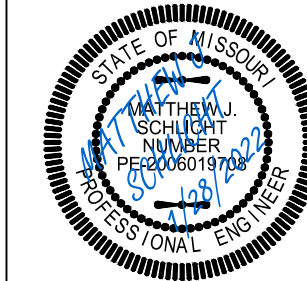
Date: 1/28/2022
Certified by: Matthew J. Schlicht
Title: Engineer
Firm: Engineering Solutions

Master Drainage Plan 1 of 3:
Grading Plan
Construction Plans for:
The Ridge at Winterset Summit
Lee's Summit, Jackson County, Missouri

Project:
Creek:
Issue Date:
December 3, 2020

The Ridge at Winterset Summit
Lee's Summit, Jackson County, Missouri

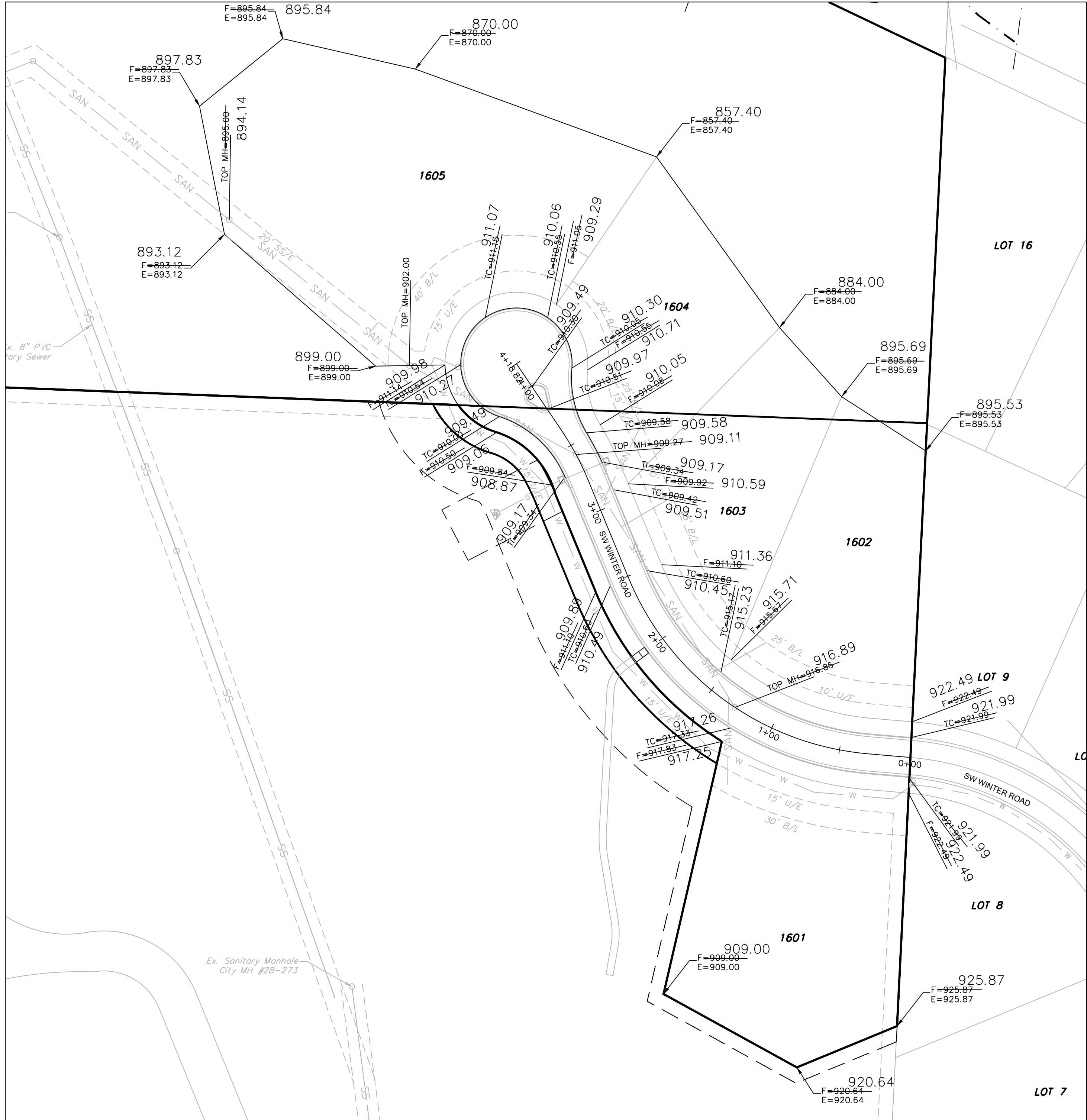
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REVISIONS
1/28/2022 As-Built

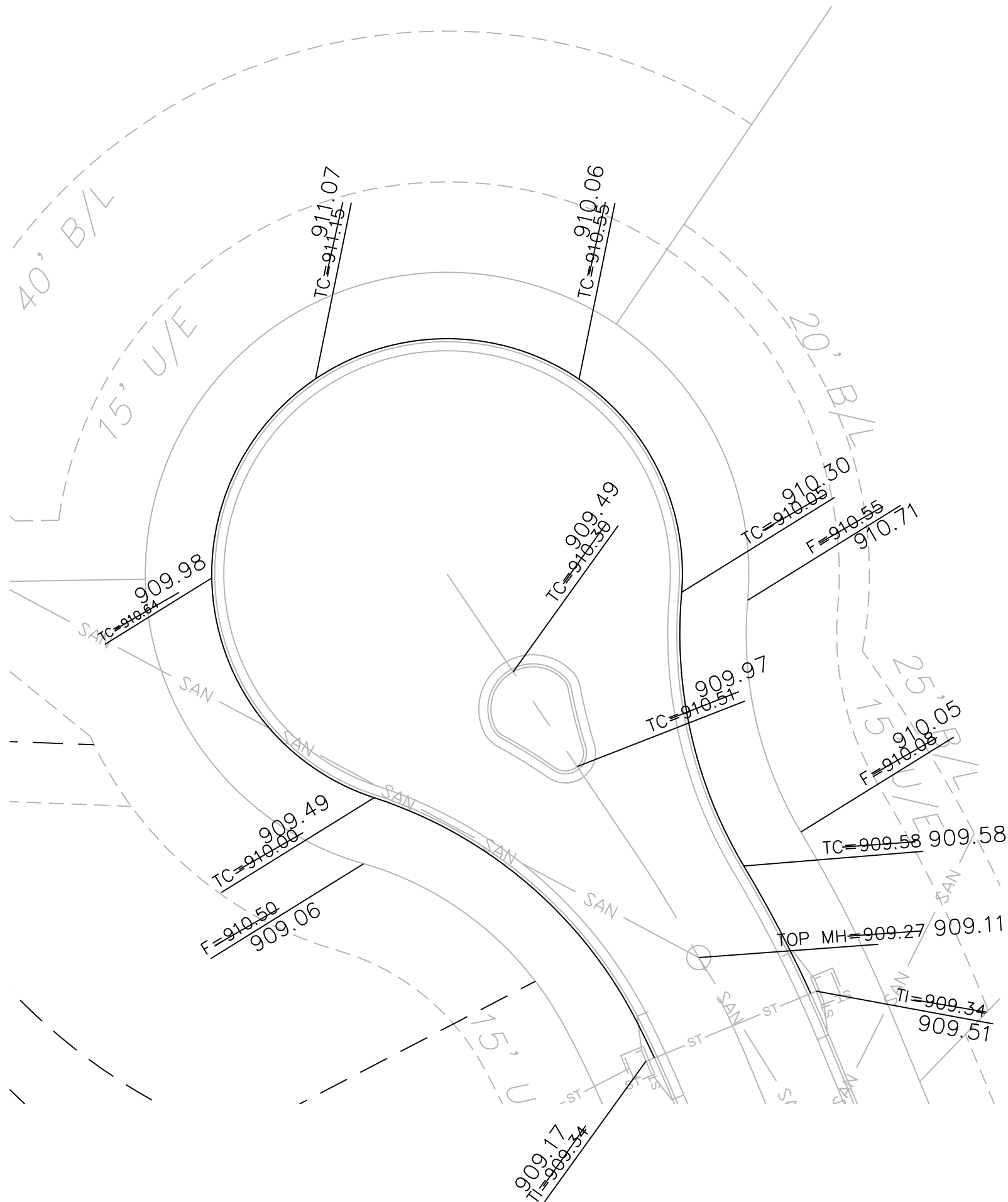
REV. 11-14-19



Lot Number	Basement Type	MBOE Lt. Front	MBOE Rt. Front	MBOE Lt. Rear	MBOE Rt. Rear
1601	Walkout	922.09	918.33	926.87	910.00
1602	Walkout	916.17	922.99	896.69	896.53
1603	Walkout	910.42	916.17	885.00	896.69
1604	Walkout	911.55	910.42	888.40	885.00
1605	Walkout	911.64	911.55	898.83	896.84

**Accepted
Record Drawings**

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CUL-DE-SAC DIMENSION PLAN

North SCALE: 1" = 20'

RECORD DRAWING

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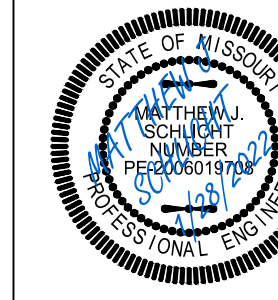
Date: 1/28/2022
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Title: Engineer
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Master Drainage Plan 2 of 3:
Spot Elevations
Construction Plans for:
The Ridge at Winterset Summit
Lee's Summit, Jackson County, Missouri

Project:
Creek:
Sheet:
December 3, 2020

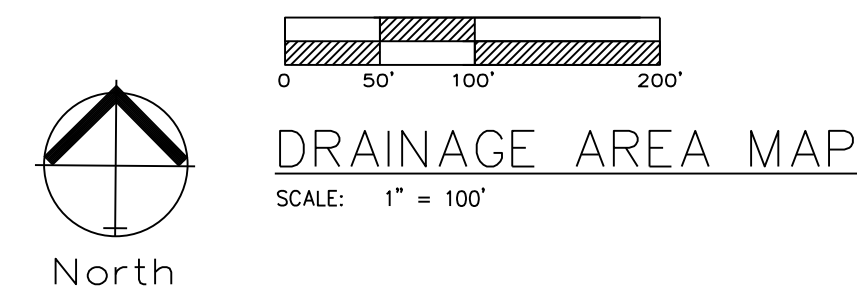
The Ridge at Winterset Summit
Lee's Summit, Jackson County, Missouri

Professional Registration
Missouri
Engineering 200502188-D
Surveying 200500518-D
Kansas
Engineering E-1695
Surveying LS-218
Oklahoma
Engineering 6254
Nebraska
Engineering CA2821



Matthew J. Schlicht
MO PE 2006019708
KS PE 19071
OK PE 25226

REVISIONS
1/28/2022 As-Built



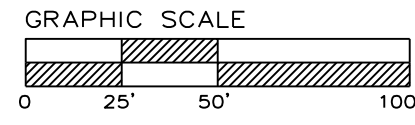
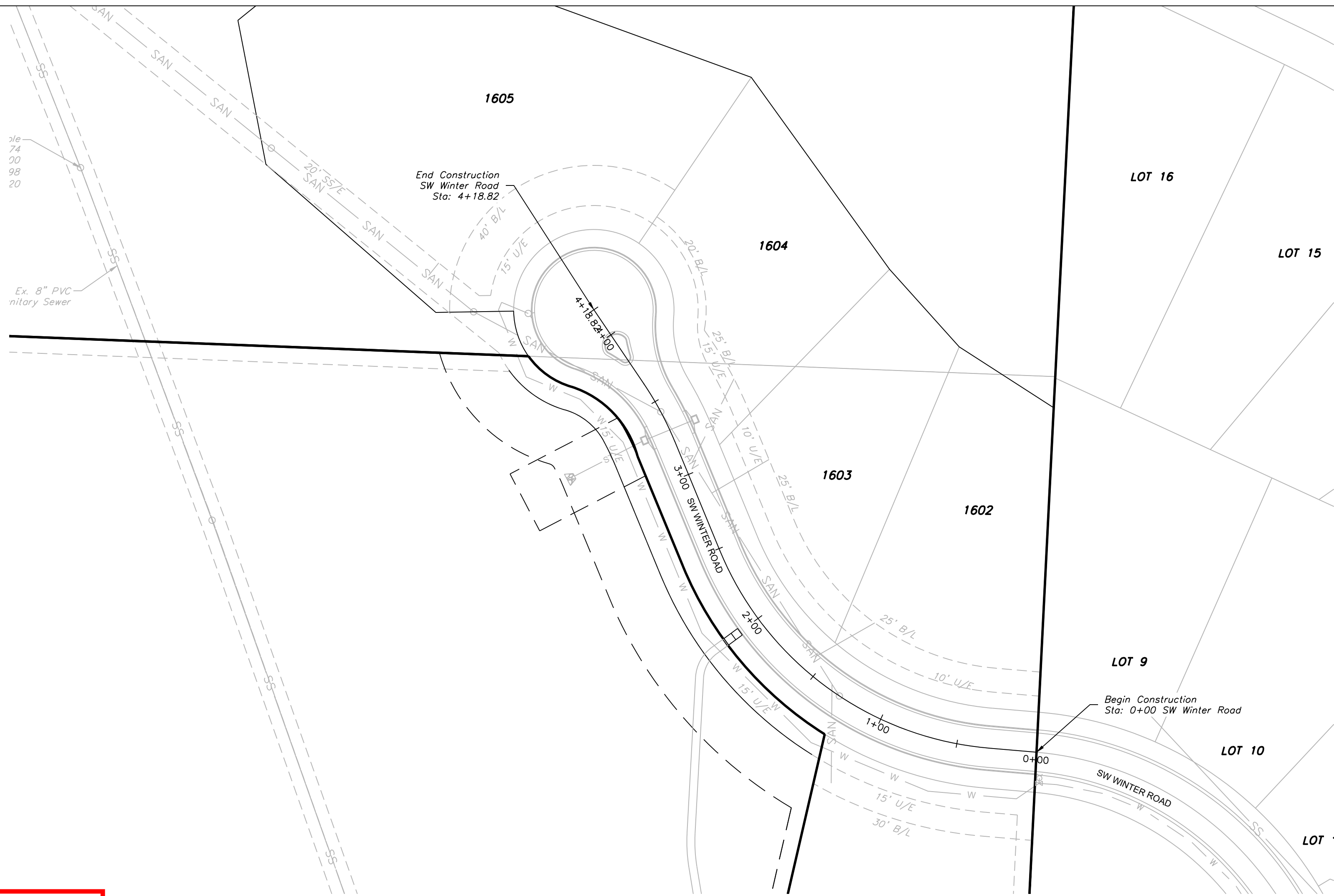
These plans have been reviewed for accuracy and are accepted for basic conformance to the approved construction drawings.

AREAS 19, 20 AND 21 ARE LOCATED IN THE RESERVE AT STONEY CREEK 4TH PLAT



1/28/2022 As-Buil

C.202



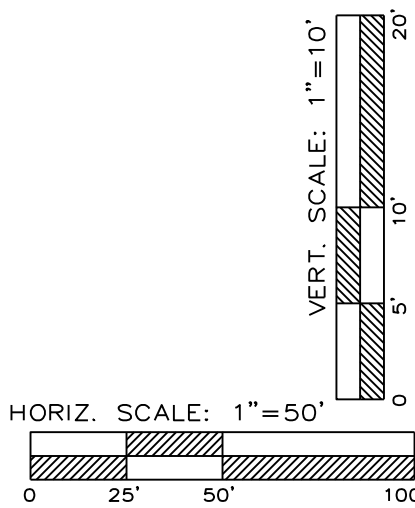
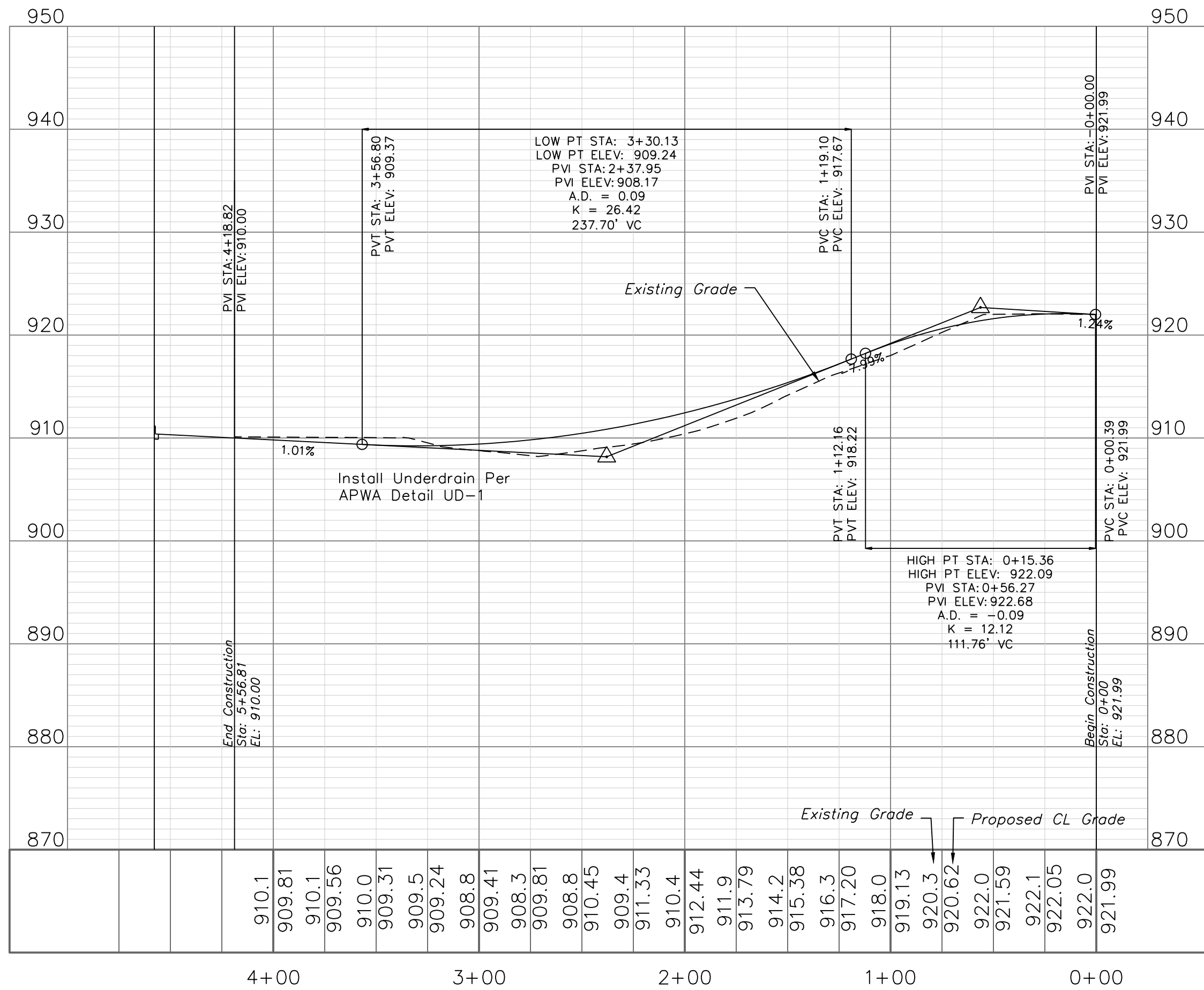
STREET PLAN & PROFILE

SCALE: 1" = 50'

Accepted
Record Drawings

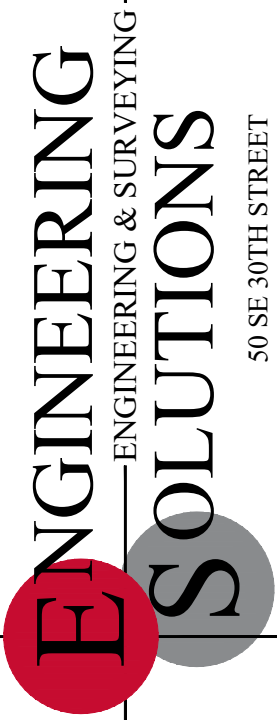
These plans have been reviewed for
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SW WINTER ROAD



RECORD DRAWING
The information provided on this drawing conforms to construction records; it is not intended for construction, implementation or recording purposes; and it is solely based on information obtained by my firm.

Date: 1/28/2022
Certified by: Matthew J. Schlicht
Title: Engineer
Firm: Engineering Solutions

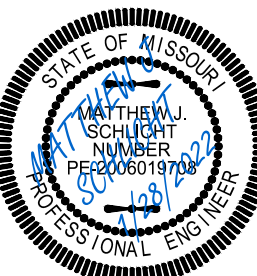


Professional Registration
Missouri
Engineering 2005002188-D
Surveying 2005005189-D
Kansas
Engineering E-1695
Surveying LS-218
Oklahoma
Engineering 6254
Nebraska
Engineering CA2821

The Ridge at Winterset Summit
Lee's Summit, Jackson County, Missouri

Project: Winterset Summit
Creek
Issue Date:
December 3, 2020

Street Plan and Profile
Construction Plans for:
The Ridge at Winterset Summit
Lee's Summit, Jackson County, Missouri

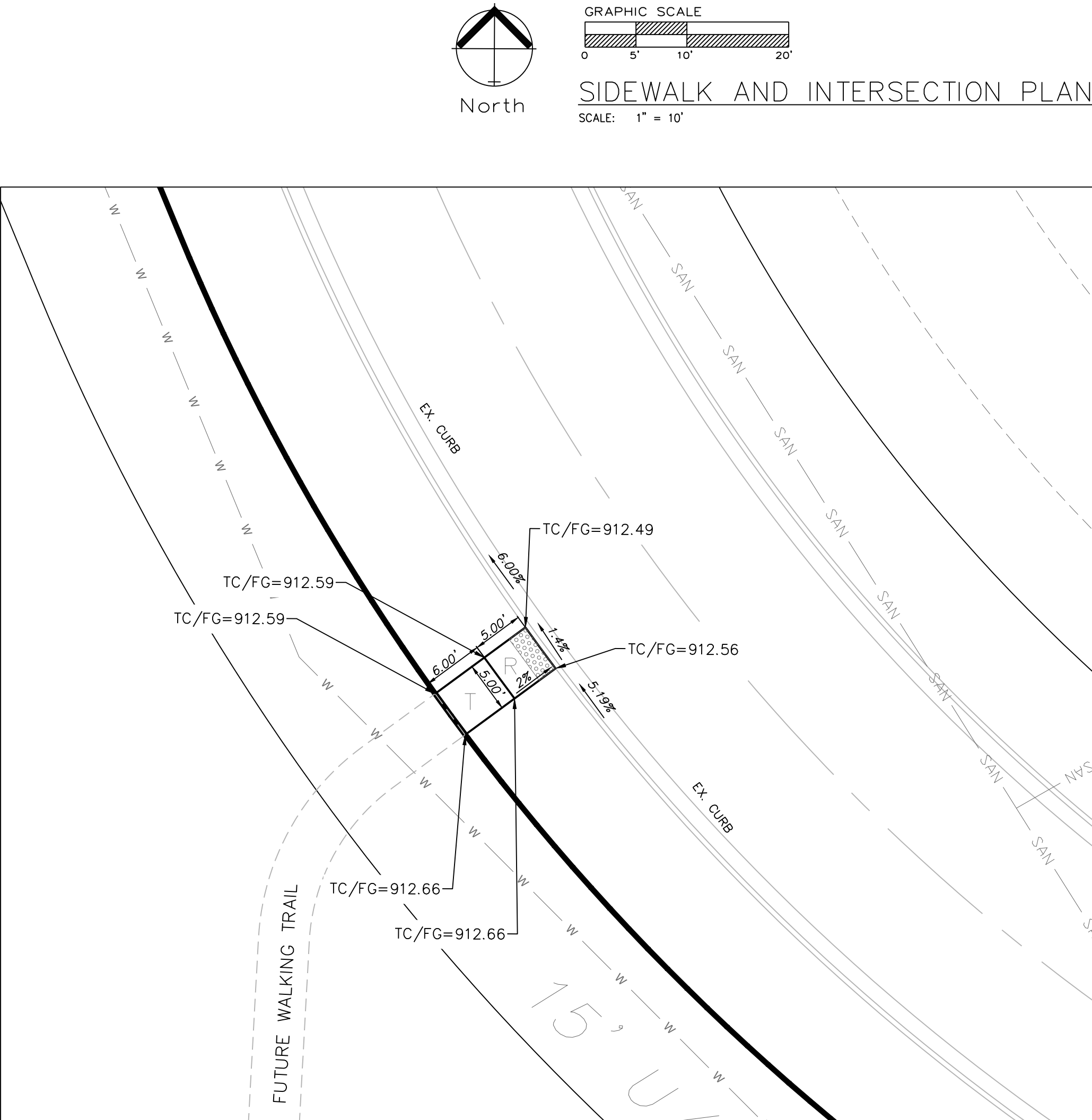


Matthew J. Schlicht
MO PE 2006019708
KS PE 19071
OK PE 25526

REVISIONS
1/28/2022 As-Built

Accepted
Record Drawings

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RECORD DRAWING

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"400-00 100.10", "4.00% 1.15% slope", or "8-inch HDPE-PVC pipe" are all typical examples of revisions that indicate that design data has been replaced with "as-built" information. All other data is as designed and has not been field verified.

Date: 1/28/2022
Certified by: Matthew J. Schlicht
Title: Engineer
Firm: Engineering Solutions

Sidewalk and
Intersection Plan
Construction Plans for:
The Ridge at Winterset Summit
Lee's Summit, Jackson County, Missouri

Project:
Creek
Issue Date:
December 3, 2020

ENGINEERING
ENGINEERING & SURVEYING
SOLUTIONS

Professional Registration
Missouri
Engineering 2005002188-D
Surveying 2005005119-D
Kansas
Engineering E-1695
Surveying LS-218
Oklahoma
Engineering 6254
Nebraska
Engineering CA2821

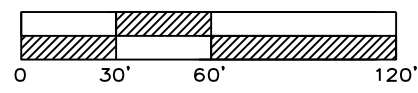
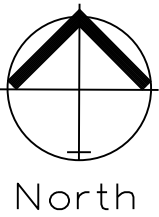
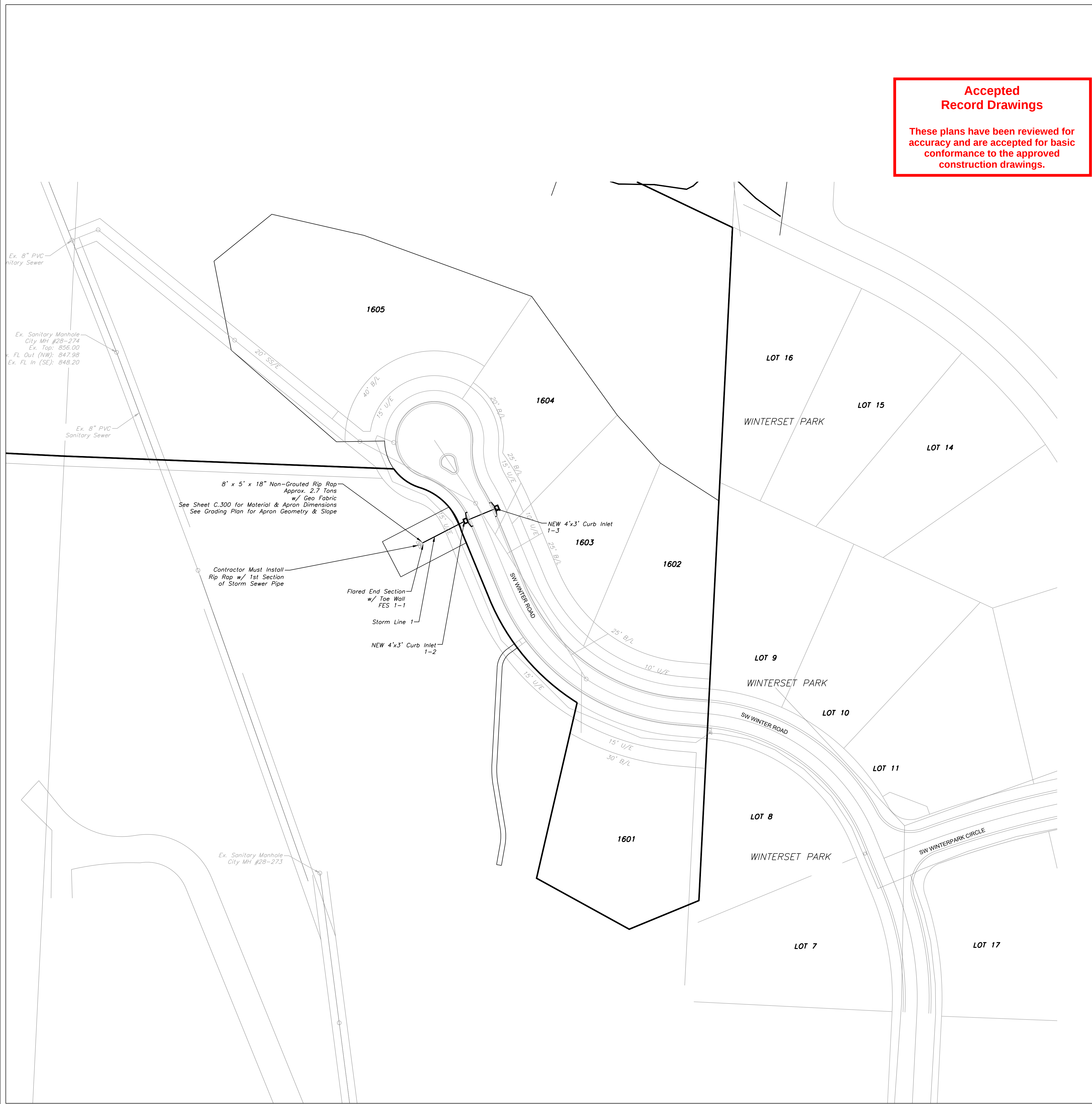
50 SE 30TH STREET
LEES SUMMIT, MO 64082
P:(816) 623-9888 F:(816) 623-9849

Matthew J. Schlicht
MO PE 2006019708
KS PE 19071
OK PE 25526

REVISIONS

1/28/2022 As-Built

c. 204



STORM SEWER GENERAL LAYOUT

SCALE: 1" = 60'

Accepted
Record Drawings

These plans have been reviewed for
accuracy and are accepted for basic
conformance to the approved
construction drawings.

EXAMPLE RIPRAP APRON CALCULATIONS

Field End Section #	1-1
Q =	4.44 cfs
D =	1.25 ft
Tw =	0.5 ft
g =	32.2 ft/s^2

D50 = 2.57 inches

S =	0.1324 ft/ft
n =	0.01
Qcap =	30.42 ft^3/s
Q/Qcap =	0.15
d/D =	0.25
d =	0.31 ft
Central <	71.34 deg
Aseg =	0.29 ft^2
V =	15.37 ft/s
Fr =	4.85
Flow =	Supercritical

D' =	0.78 ft
yn =	0.31 ft
D50 =	4.81 inches
Classify	4.81 inches

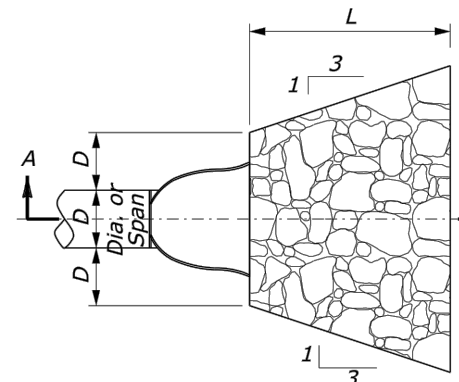
D50 = riprap size, m(ft)
Q = design discharge, m^3/s (ft^3/s)
D = culvert diameter (circular), m(ft)
Tw = tailwater depth, m(ft), if unknown use 0.4*D
g = acceleration due to gravity, 9.81 m/s^2 (32.2 ft/s^2)
Subcritical Flow

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

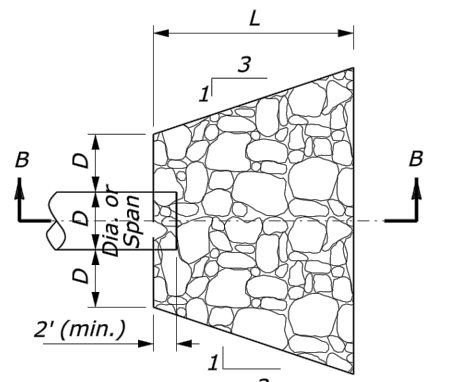
Class 1	Use D50 = 5				
Apron Length =	4 * D	5.00 ft	Use	5.00 ft	
Apron Depth =	3.5 * D50	17.50 inches	Use	18.00 inches	
Apron Width =	3*D+(2/3)L	7.08 ft	Use	8.00 ft	

RipRap Apron							
RipRap Apron Area (ac.)	Q100 (cfs)	Dia. (ft)	Class	D50 (in)	Length (ft)	Depth (in)	Width (ft)
1-1	0.92	4.44	1.25	1	5	18	8

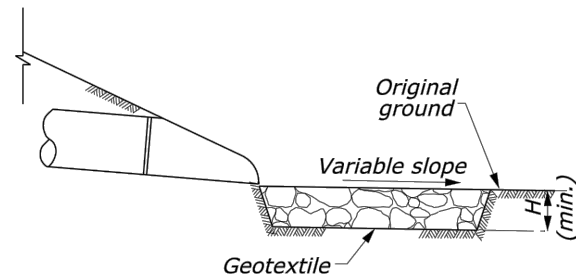
STANDARD RIPRAP APRON DETAIL



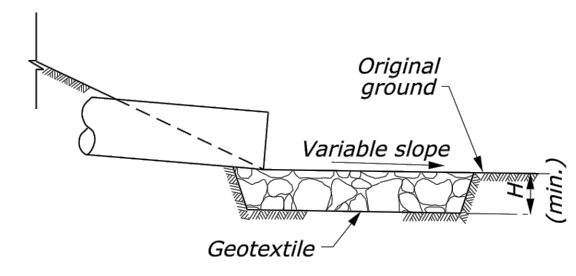
PLAN VIEW
CULVERT WITH STANDARD
END SECTION



PLAN VIEW
CULVERT WITHOUT STANDARD
END SECTION



SECTION A-A



SECTION B-B

- NOTES:
1. ALL RIPRAP APRONS SHALL CONFORM TO THE STANDARD CONFIGURATION SHOWN IN THE STANDARD DETAIL ABOVE UNLESS OTHERWISE NOTED. PLAN VIEW DIMENSIONS SHOWN SHALL BE MET OR EXCEEDED INCLUDING AREAS OF LONGITUDINAL AND/OR TRANSVERSE SLOPE.
 2. DIMENSIONS FOR EACH RIPRAP APRON AND ASSOCIATED RIPRAP ARE DETAILED IN THE TABLE ABOVE.
 3. WIDTH REFERS TO DIMENSION OPPOSITE PIPE AND DEPTH IS DIMENSION H.
 4. GEOTEXTILE SHALL BE "GEL WORKS 4 OUNCE" NON-WOVEN FILTER FABRIC DESIGNED FOR FILTRATION, STABILIZATION AND SEPARATION. WRAPPED CONTINUOUSLY ALONG THE SIDEWALLS AND BOTTOM OF THE PREPARED AREA OR SLOPE.
 - WATER FLOW = 120 GPM/SF
 - GRAB STRENGTH (MIN) = 400 N
 - PUNCTURE STRENGTH (MIN) = 178 N
 - TRAPEZOIDAL TEAR (MIN) = 133 N
 - ELONGATION (MIN) = 15%

RECORD DRAWING
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Certified by: Matthew J. Schlicht
Title: Engineer
Firm: Engineering Solutions

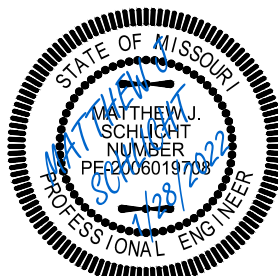


Professional Registration
Missouri
Engineering 2005002198-D
Surveying 2005000519-D
Kansas
Engineering E-1695
Surveying LS-218
Oklahoma
Engineering 6254
Nebraska
Engineering CA2821

The Ridge at Winterset Summit
Lee's Summit, Jackson County, Missouri

Project
Creek
Issue Date
December 3, 2020

Storm Sewer General Layout
Construction Plans for:
The Ridge at Winterset Summit
Lee's Summit, Jackson County, Missouri

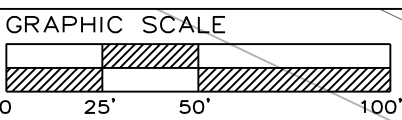


Matthew J. Schlicht
MO PE 2006019708
KS PE 19071
OK PE 25226

REVISIONS
1/28/2022 As-Built



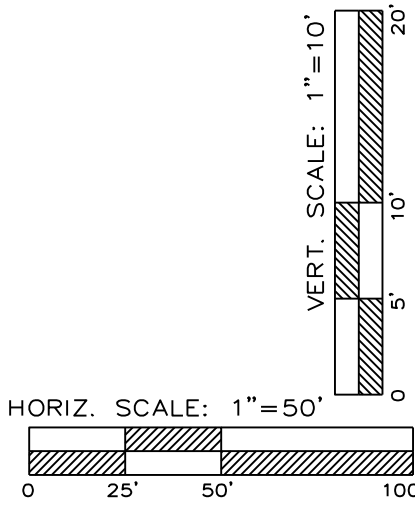
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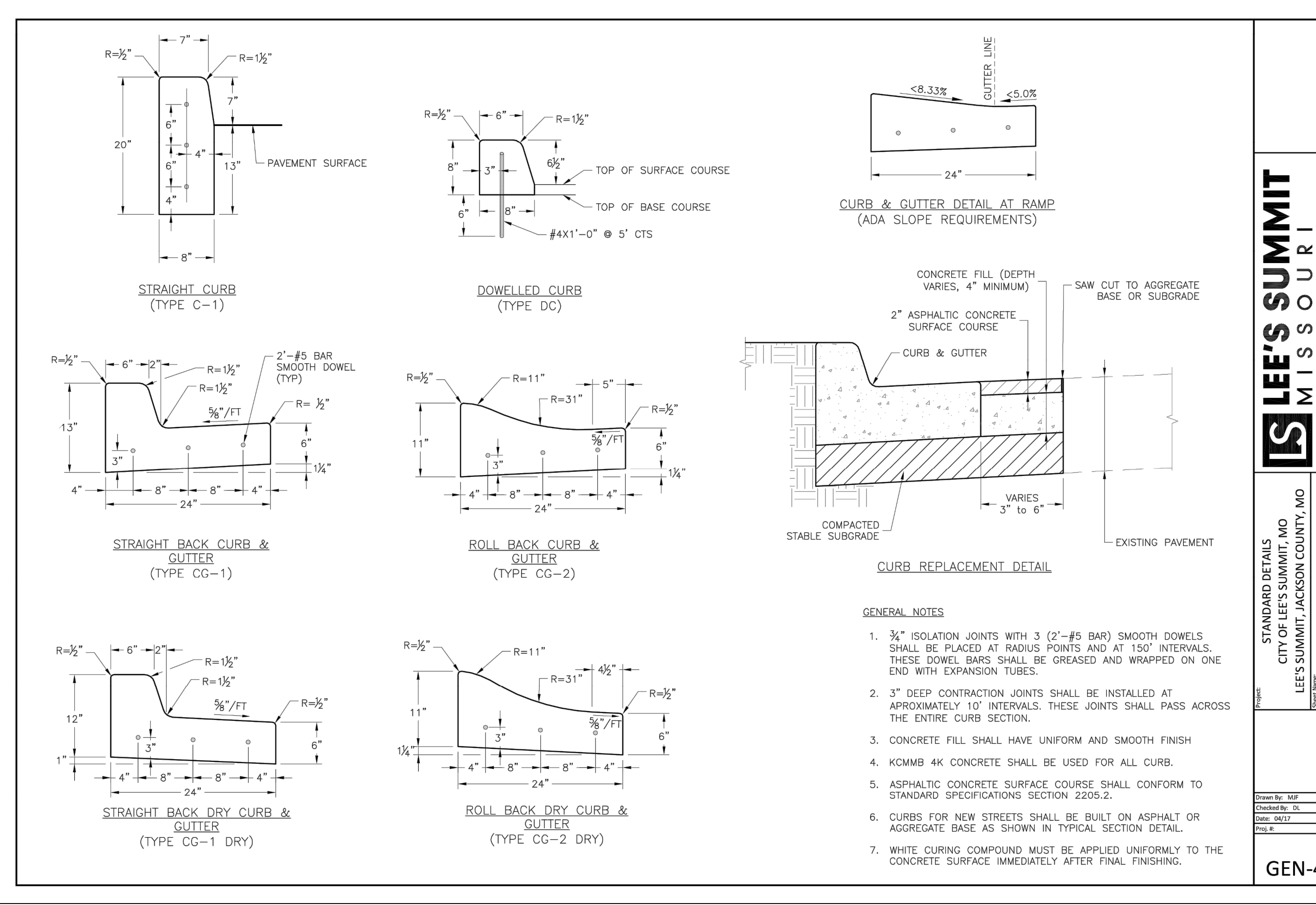
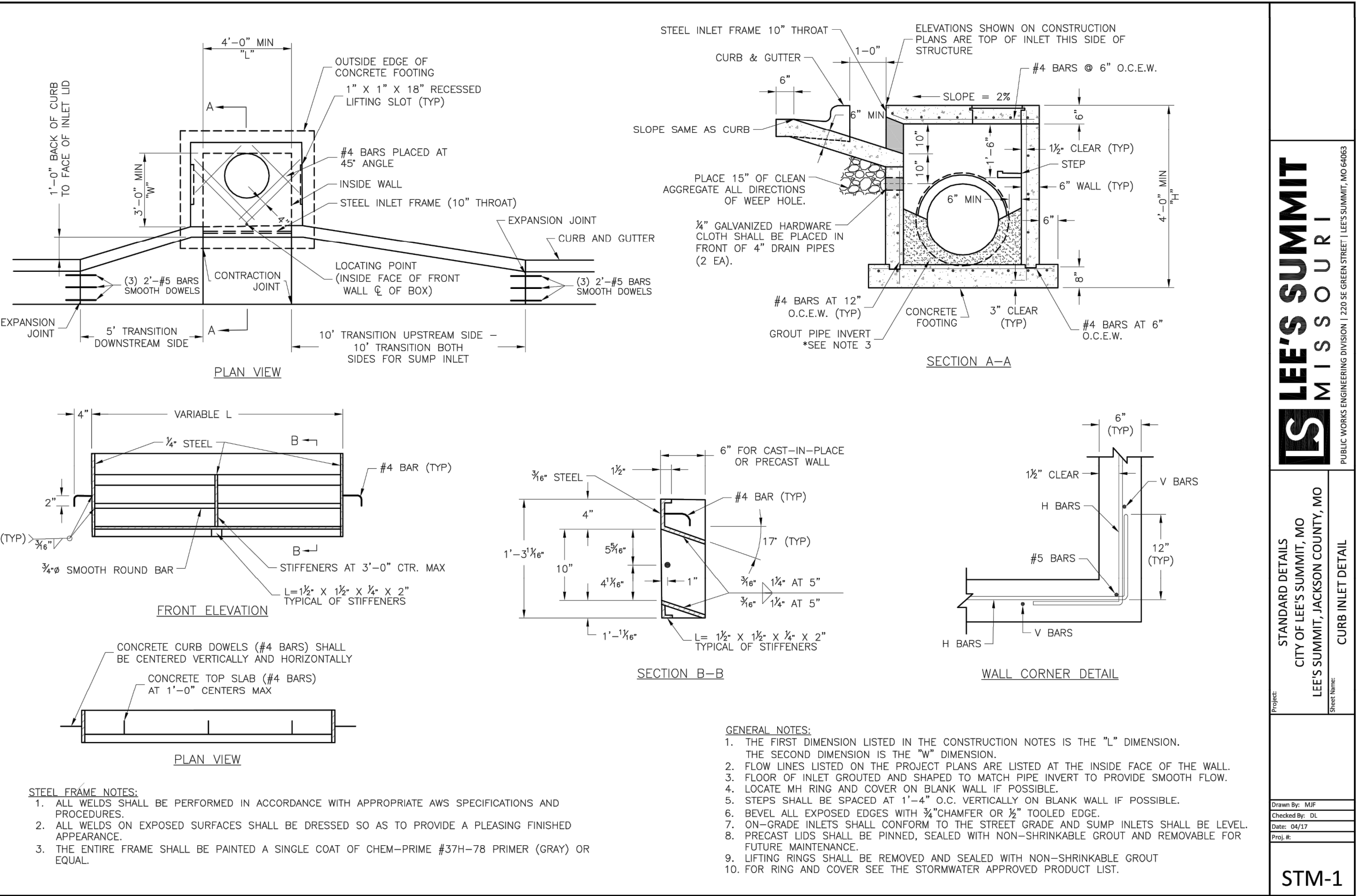
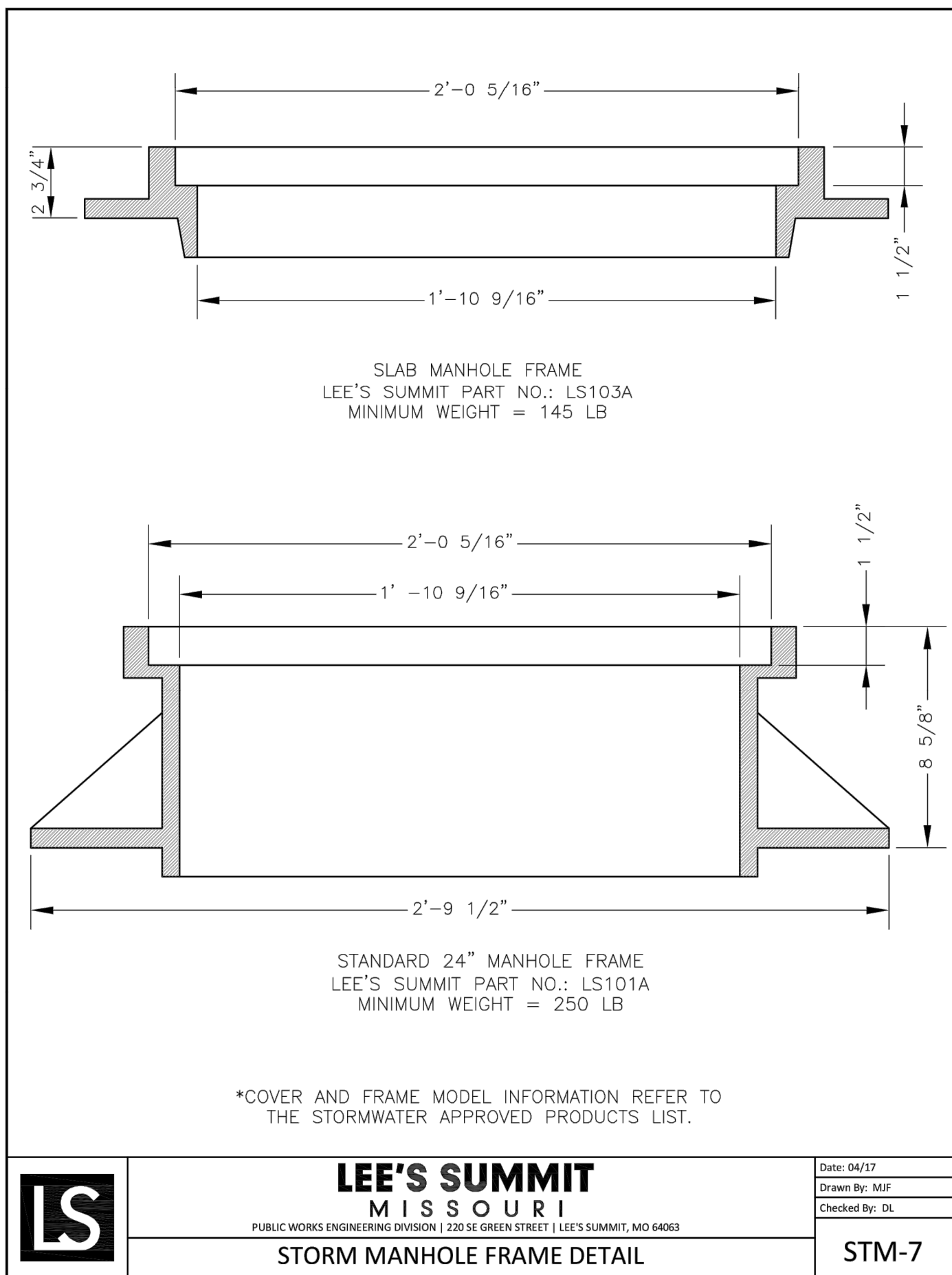
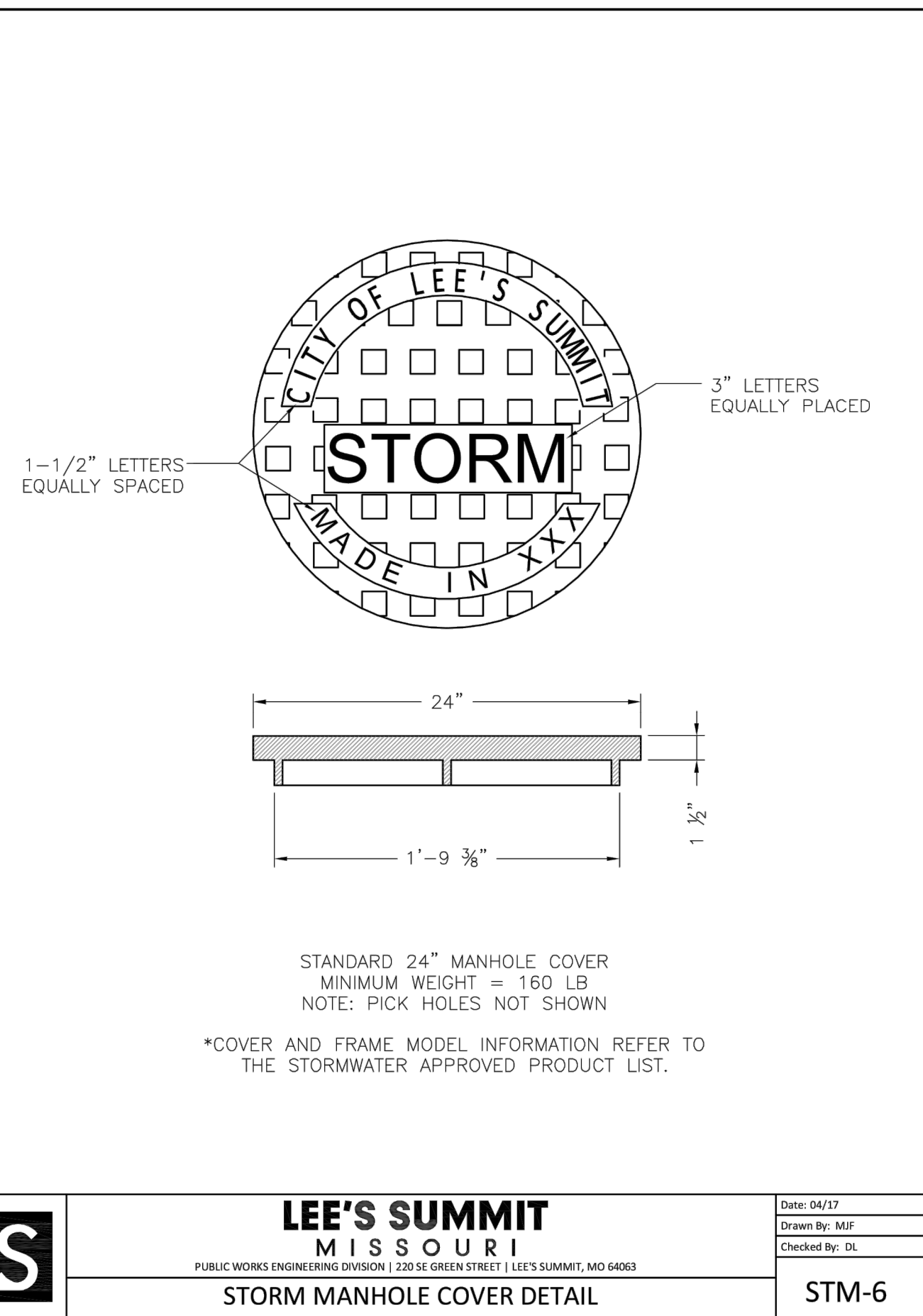
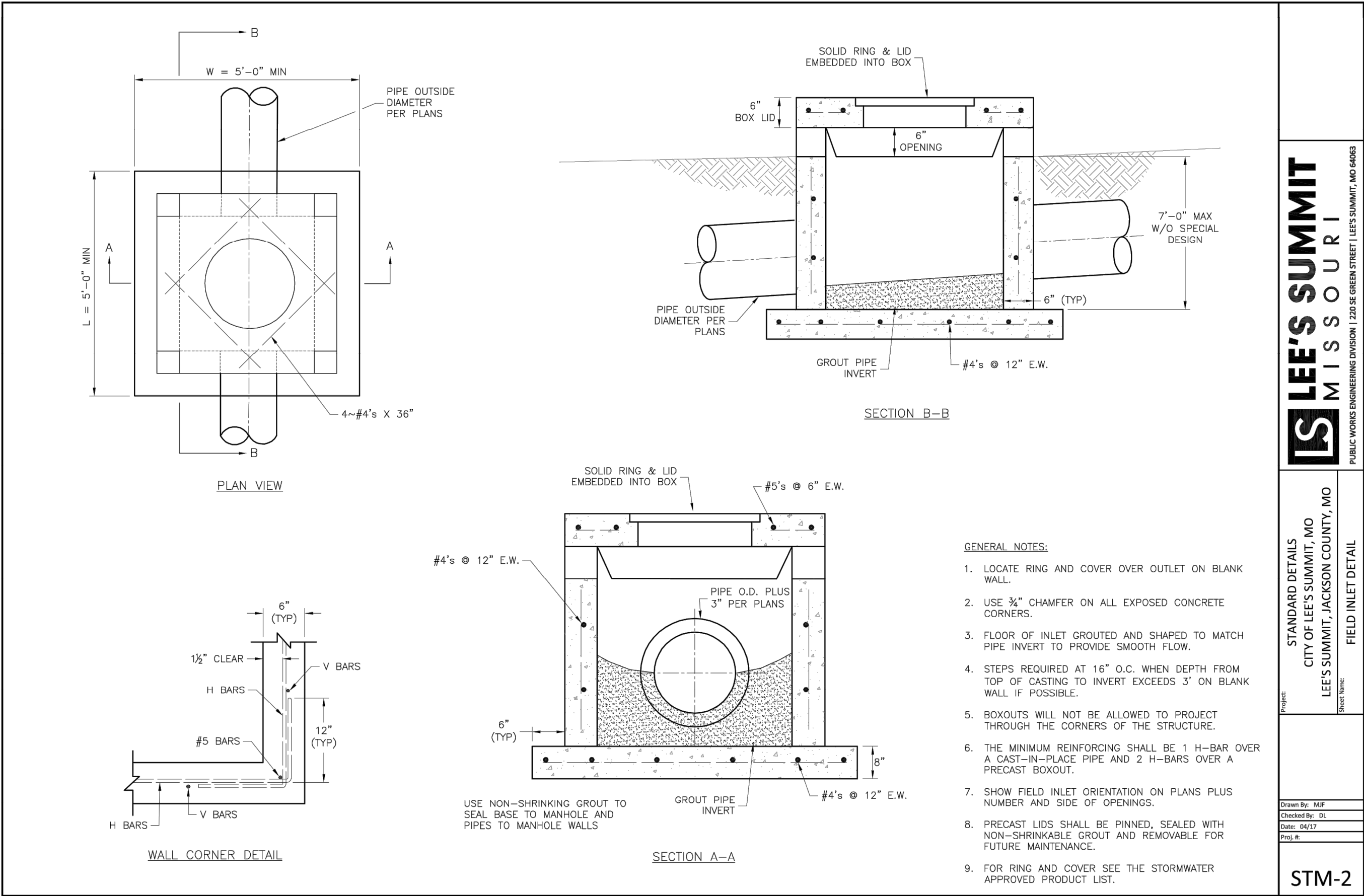
SCALE: 1" = 50'



100-YR PIPE																						
DS Str.	US Str.	LineLength (ft)	Incr.Area (ac)	TotalArea (ac)	RunoffCoeff. (C)	IncrC x A	TotalC x A	InletTime (min)	TimeConc (min)	RnfallIn (in/hr)	TotalRunoff (cfs)	TotalFlow (cfs)	CapacFull (cfs)	Veloc (ft/s)	PipeSize (in)	PipeSlope (%)	Inn ElevDn (ft)	Inv ElevUp (ft)	HGLDn (ft)	HGLUp (ft)	Grnd/RimDn (ft)	Grnd/RimUp (ft)
1-1	1-2	49.1	0.31	0.92	0.51	0.16	0.47	6	6.1	9.5	4.44	4.44	30.54	11.35	15	1.47	897.00	903.50	897.32	904.35	0.00	909.34
1-2	1-3	34	0.44	0.61	0.51	0.22	0.31	6	6	9.5	2.95	2.95	10.18	5.72	15	1.47	904.00	904.50	904.46	905.19	909.34	909.34



Date: 1/28/2022
 Certified by: Matthew J. Schlicht
 Title: Engineer
 Firm: Engineering Solutions



**Accepted
Record Drawings**

These plans have been reviewed for
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conformance to the approved
construction drawings.

RECORD DRAWING

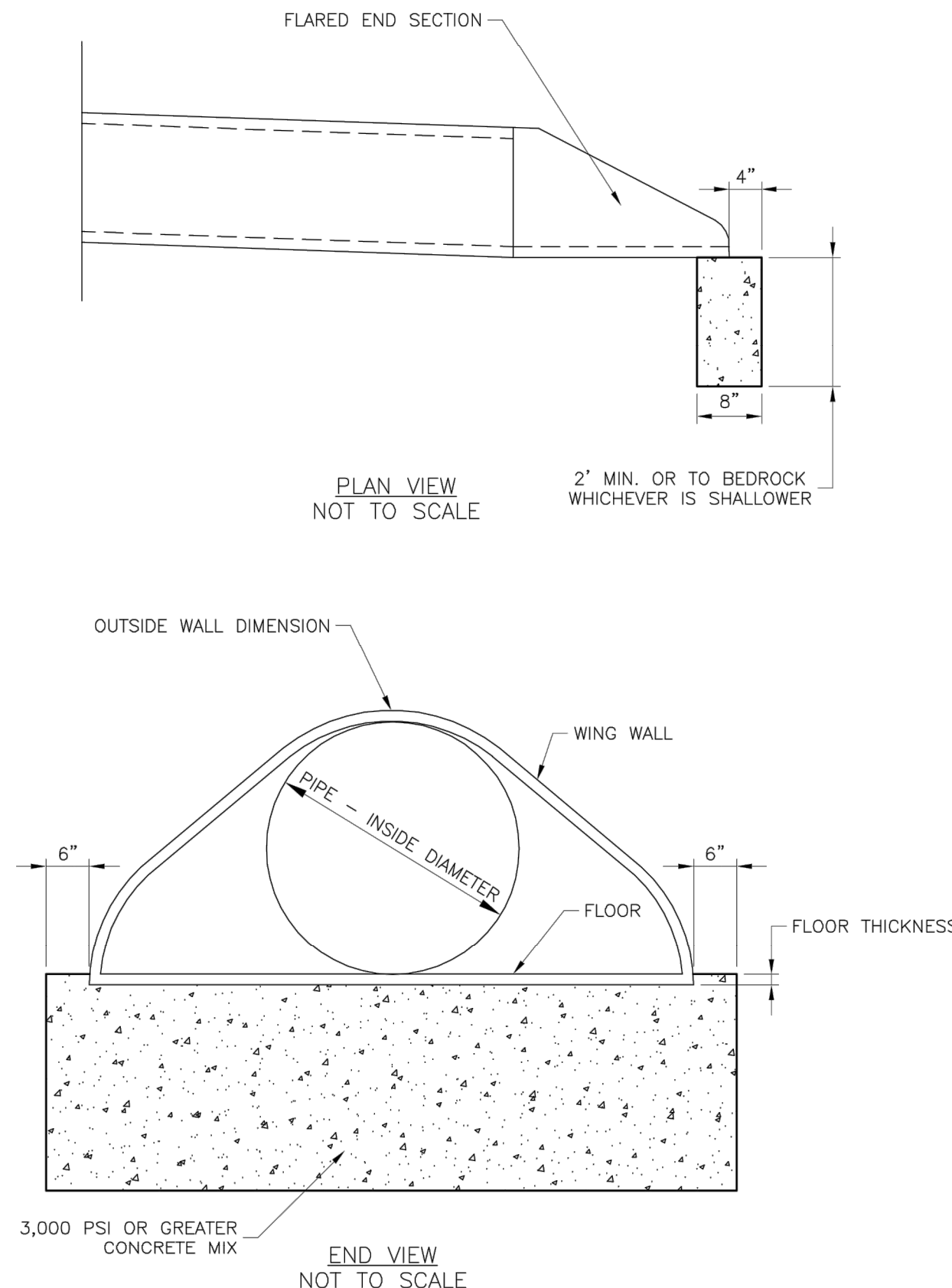
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*100-00 100.10", "4-00% 1.15% slope", or "8-inch HDPE-PVC pipe" are all typical examples of revisions that indicate that design data has been replaced with "as-built" information. All other data is as designed and has not been field verified.

Date: 1/28/2022
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Title: Engineer
Firm: Engineering Solutions

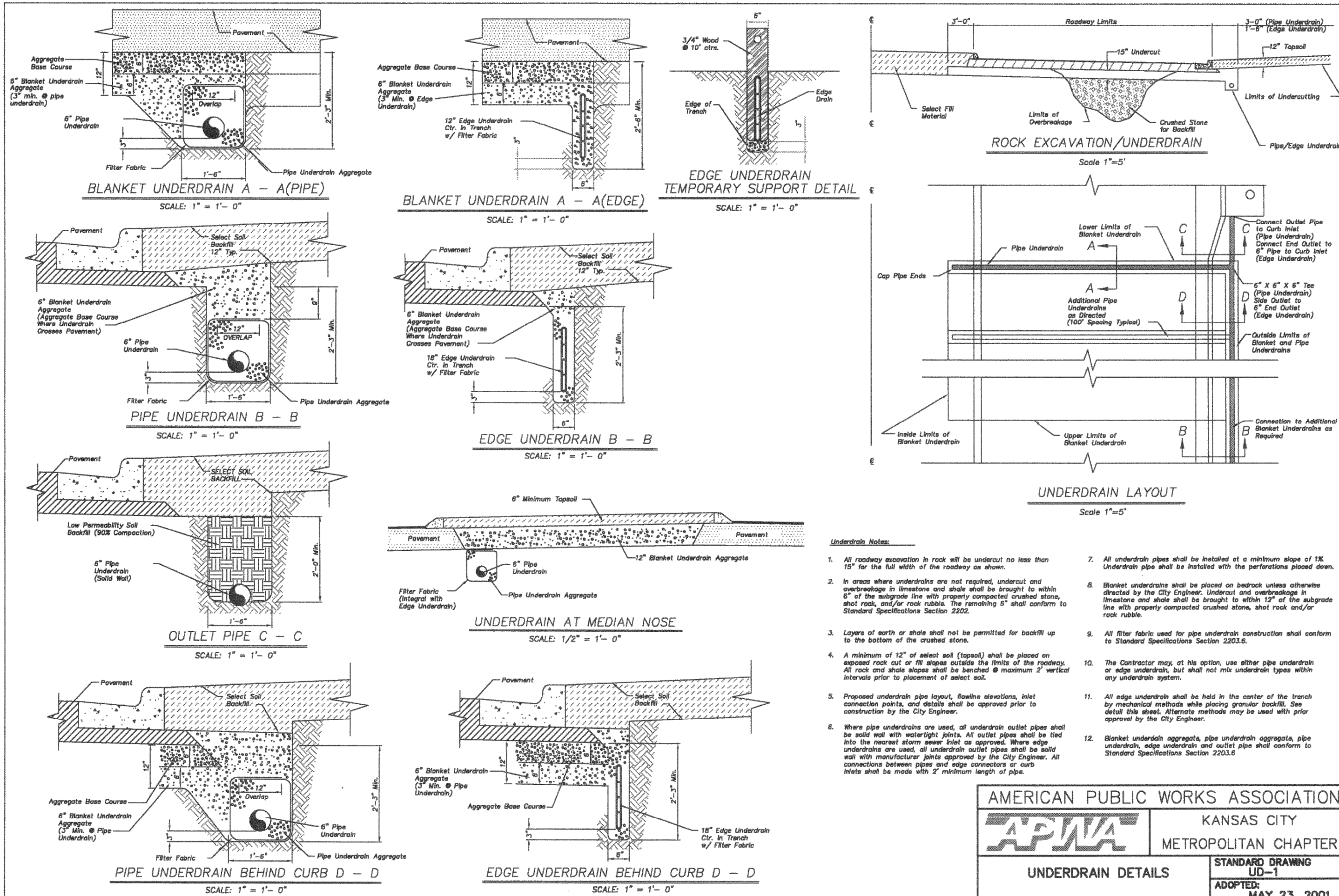
Accepted
Record Drawings

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LEE'S SUMMIT
MISSOURI
PUBLIC WORKS ENGINEERING DIVISION | 220 SE GREEN STREET | LEE'S SUMMIT, MO 64063
FLARED END SECTION SUPPORT DETAIL

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



RECORD DRAWING
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"406-00 100.10", "4-00% 1.15% slope", or "8-inch HDPE-PVC pipe" are all typical examples of revisions that indicate that design data has been replaced with "as-built" information. All other data is as designed and has not been verified.

Date: 1/28/2022
Certified by: Matthew J. Schlicht
Title: Engineer
Firm: Engineering Solutions

AMERICAN PUBLIC WORKS ASSOCIATION
KANSAS CITY
METROPOLITAN CHAPTER
STANDARD DRAWING
UD-1
ADOPTED: MAY 23, 2001