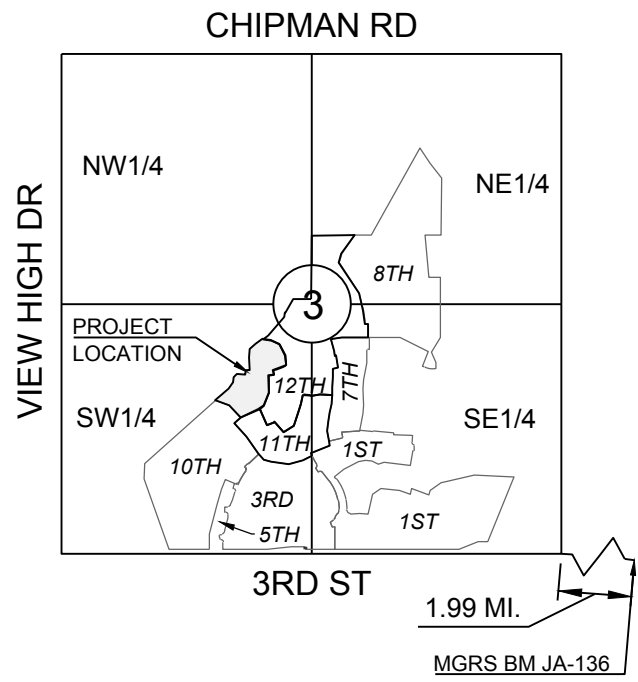


LEGEND:

- A/E - ACCESS EASEMENT
- BC - BACK OF CURB
- B/B - BACK TO BACK
- BM - BENCHMARK
- BL or B.L. - BUILDING LINE
- CO - CLEANOUT
- TJB - TELEPHONE JUNCTION BOX
- C&G - CURB AND GUTTER
- D/E - DRAINAGE EASEMENT
- E/E - ELECTRICAL EASEMENT
- EL - ELEVATION
- FL - FLOW LINE
- G/E - GAS LINE EASEMENT
- HDPE - HIGH-DENSITY POLYETHYLENE
- L/E - LANDSCAPE EASEMENT
- MSFE - MINIMUM SERVICEABLE FLOOR ELEVATION
- PVC - POLYVINYL CHLORIDE
- P/L - PROPERTY LINE
- PUB/E - PUBLIC EASEMENT
- RCP - REINFORCED CONCRETE PIPE
- ROW or R/W - RIGHT-OF-WAY
- S/E - SANITARY SEWER EASEMENT
- SL - SERVICE LINE
- S/W - SIDEWALK
- TE - TOP ELEVATION
- U/E - UTILITY EASEMENT
- WSE - WATER SURFACE ELEVATION
- W/E - WATERLINE EASEMENT

- ASPHALT PAVEMENT - EXISTING
- ASPHALT PAVEMENT - PROPOSED
- CONCRETE PAVEMENT - EXISTING
- CONCRETE SIDEWALK - EXISTING
- CONCRETE SIDEWALK - PROPOSED
- CURB & GUTTER
- CURB & GUTTER - EXISTING
- TREELINE
- EXISTING LOT AND R/W LINES
- EXISTING PLAT LINES
- P/L - PROPERTY LINES
- RIGHT-OF-WAY
- SANITARY SEWER MAIN
- SANITARY SEWER MAIN - EXIST.
- STO - STORM SEWER
- STORM SEWER - EXISTING
- CABLE TV - EXISTING
- FIBER OPTIC CABLE - EXISTING
- TELEPHONE LINE - EXIST.
- ELECTRIC LINE - EXISTING
- OVERHEAD POWER LINE - EXIST.
- UNDERGROUND ELECTRIC - EX.
- GAS LINE - EXISTING
- WATERLINE - EXISTING
- LIGHT - EXISTING
- EXISTING MANHOLE
- CLEANOUT
- EXISTING SANITARY MANHOLE
- PROPOSED SANITARY MANHOLE
- EXISTING AREA INLET
- EXISTING CURB INLET
- EXISTING GRATE INLET
- EXISTING JUNCTION BOX
- EXISTING STORM MANHOLE



SECTION 3-47N-32W
LOCATION MAP
SCALE 1" = 2000'

UTILITY CONTACTS:

MISSOURI DEPARTMENT OF TRANSPORTATION (MODOT)

Steve Holloway
600 NE Colbern Road
Lee's Summit, MO 64086
(816) 607-2186

MISSOURI GAS ENERGY (MGE)

Brent Jones
3025 SE Clover Drive
Lee's Summit, MO 64082
(816) 399-9633
brent.jones@spireenergy.com

KANSAS CITY POWER & LIGHT COMPANY (KCP&L)

Ron Dejanette
1300 SE Hamblin Road
Lee's Summit, MO 64081
Office: (816) 347-4316
Cell: (816) 810-5234
ron.dejanette@kcpl.com

CITY OF LEES SUMMIT PUBLIC WORKS

Dena Mezger
220 SE Green Street
Lee's Summit, MO 64063
(816) 969-1800

AT&T

Mark Manion or Marty Loper
500 E. 8th Street, Room 370
Kansas City, MO 64106
Cell: (816) 275-2341 or (816) 275-1550

COMCAST CABLE

John Meadows
4700 Little Blue Parkway
Independence, MO 64057
(816) 795-2257

PUBLIC WATER SUPPLY DISTRICT

Mark Schaufier
220 SE Green Street
Lee's Summit, MO 64063
(816) 969-1900

STREET, STORMWATER, MASTER DRAINAGE PLAN AND EROSION AND SEDIMENT CONTROL FOR WINTERSET VALLEY, 13TH PLAT IN THE CITY OF LEE'S SUMMIT JACKSON COUNTY, MISSOURI

GENERAL NOTES:

- ALL CONSTRUCTION TO FOLLOW THE CITY OF LEE'S SUMMIT DESIGN AND CONSTRUCTION MANUAL AS ADOPTED BY ORDINANCE 5813.
- ALL WORKMANSHIP AND MATERIALS SHALL BE SUBJECT TO THE INSPECTION AND APPROVAL OF THE ENGINEERING DEPARTMENT OF THE CITY OF LEE'S SUMMIT, MISSOURI.
- LINEAL FOOT MEASUREMENTS SHOWN ON THE PLANS ARE HORIZONTAL MEASUREMENTS, NOT SLOPE MEASUREMENTS. ALL PAYMENTS SHALL BE MADE ON HORIZONTAL MEASUREMENTS.
- NO GEOLOGICAL INVESTIGATION HAS BEEN PERFORMED ON THE SITE.
- 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.
- 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.
- 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 CITY INSPECTOR UPON REQUEST.
- THE CONTRACTOR SHALL PROTECT ALL MAJOR TREES FROM DAMAGE. NO TREE SHALL BE REMOVED WITHOUT PERMISSION OF THE OWNER, UNLESS SHOWN OTHERWISE.
- 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.
- ALL WASTE MATERIAL RESULTING FROM THE PROJECT SHALL BE DISPOSED OF OFF-SITE BY THE CONTRACTOR, OR AS DIRECTED BY THE OWNER.
- ALL EXCAVATIONS SHALL BE UNCLASSIFIED. NO SEPARATE PAYMENT WILL BE MADE FOR ROCK EXCAVATION.
- THE CONTRACTOR SHALL CONTROL THE EROSION AND SILTATION DURING ALL PHASED OF CONSTRUCTION, AND SHALL KEEP THE STREETS CLEAN OF MUD AND DEBRIS.
- ALL MANHOLES, CATCH BASINS, UTILITY VALVES AND METER PITS TO BE ADJUSTED OR REBUILT TO GRADE AS REQUIRED.
- THE CONTRACTOR SHALL CONTACT DEVELOPMENT SERVICES INSPECTIONS AT: 816-969-1800 TO OBTAIN A DEVELOPMENT SERVICES CONSTRUCTION PERMIT. A MINIMUM 48 HOUR NOTICE SHALL BE GIVEN PRIOR TO PERMIT ISSUANCE.
- THE CONTRACTOR SHALL CONTACT THE CITY'S EROSION CONTROL SPECIALIST AT: 816-969-1800 PRIOR TO ANY LAND DISTURBANCE.
- 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.
- 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).

STREET NOTES:

- 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.
- ALL INSPECTION OF STREET CONSTRUCTION TO BE PERFORMED BY THE CITY OF LEE'S SUMMIT PUBLIC WORKS DEPARTMENT.
- CURB RETURN RADII SHALL BE 25' AT BACK OF CURB UNLESS OTHERWISE NOTED.
- SUBGRADE TO BE COMPACTED TO 95% STANDARD PROCTOR DENSITY.
- ASSUMED DESIGN SPEED = 25 MPH (COLLECTOR).
- MINIMUM STOPPING SIGHT DISTANCE = 155 FEET.
- MINIMUM K, SAG CURVE = 26 (14 WITH LIGHTING), CREST CURVE = 12.
- GRADE INTERSECTIONS TO DRAIN AS SHOWN.
- SSD = STOPPING SIGHT DISTANCE.

EARTHWORK:

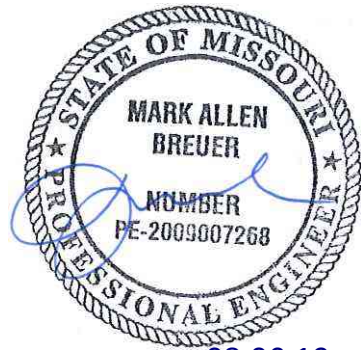
- IT IS RECOMMENDED THAT A GEOTECHNICAL ENGINEER OBSERVE AND DOCUMENT ALL EARTHWORK ACTIVITIES.
- CONTOURS HAVE BEEN SHOWN AT 1-FOOT OR 2-FOOT INTERVALS, AS INDICATED. GRADING SHALL CONSIST OF COMPLETING THE EARTHWORK REQUIRED TO BRING THE PHYSICAL GROUND ELEVATIONS OF THE EXISTING SITE TO THE FINISHED GRADE (OR SUB-GRADE) ELEVATIONS PROVIDED ON THE PLANS AS SPOT GRADES, CONTOURS OR OTHERS MEANS AS INDICATED ON THE PLANS.
- 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 APRIL 2018. 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. PROPOSED CONTOURS ARE TO APPROXIMATE FINISHED GRADE.
- 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.
- UNLESS OTHERWISE NOTED, ALL EARTHWORK IS CONSIDERED UNCLASSIFIED. NO ADDITIONAL COMPENSATION WILL BE PROVIDED FOR ROCK OR SHALE EXCAVATION, UNLESS SPECIFICALLY STATED OTHERWISE.
- 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.
- 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.
- 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).
- FILL MATERIALS SHALL BE PER GEOTECHNICAL REPORT AND SHALL NOT INCLUDE ORGANIC MATTER, DEBRIS OR TOPSOIL. ALL FILLS PLACED ON SLOPES GREATER THAN 5:1 SHALL BE BENCHED.
- 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.
- ALL AREAS SHALL BE GRADED FOR POSITIVE DRAINAGE. UNLESS NOTED OTHERWISE THE FOLLOWING GRADES SHALL APPLY:
 - TURF AREAS - 2.5% MINIMUM, 4H:1V MAXIMUM
 - PAVED AREAS - 1.2% MINIMUM, 5% MAXIMUM
- 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.
- ALL DISTURBED AREAS IN THE RIGHT-OF-WAY SHALL BE SODDED.
- UNDERDRAINS ARE RECOMMENDED FOR ALL PAVED AREAS ADJACENT TO IRRIGATED TURF AND LANDSCAPED BEDS.
- 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.

UTILITIES:

- 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.
- 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.
- 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.
- UTILITY SEPARATION: WATERLINES SHALL HAVE A MINIMUM OF 10 FEET HORIZONTAL AND 2 FEET VERTICAL SEPARATION FROM ALL SANITARY AND STORM SEWER LINES. IF MINIMUM SEPARATIONS CAN NOT BE OBTAINED, A CONTINUOUS CASING PIPE MUST BE USED ON THE WATER LINE AND EXTEND NO LESS THAN 10 FEET IN EACH DIRECTION FROM THE CROSSING OF THE SANITARY OR STORM SEWER LINE IN CONFLICT.
- 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.
- 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.
- 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.

Sheet List Table	
Sheet Number	Sheet Title
1	COVER SHEET
2	PRE-CLEARING PLAN
3	ECP-CONSTRUCTION
4	FINAL STABILIZATION PLAN
5	EROSION CONTROL DETAILS
6	EROSION CONTROL DETAILS
7	GENERAL LAYOUT
8	MASTER DRAINAGE PLAN - GRADING PLAN
9	MASTER DRAINAGE PLAN - SPOT ELEVATIONS
10	MASTER DRAINAGE PLAN - DRAINAGE MAP
11	MASTER DRAINAGE PLAN-DRAINAGE MAP CONT'D
12	NW THOREAU DRIVE PLAN AND PROFILE
13	THOREAU PLACE AND THOREAU LANE PLAN AND PROFILE
14	INTERSECTION DETAILS
15	INTERSECTION DETAILS
16	STORM PLAN
17	STORM PROFILES
18	DETENTION BASIN
19	STREET AND STORM DETAILS
20	STREET AND STORM DETAILS
21	STREET AND STORM DETAILS
22	STREET AND STORM DETAILS
23	SIGNING PLAN
24	STREET SIGN DETAILS

PREPARED AND SUBMITTED BY:



SCHLAGEL & ASSOCIATES, P.A.

APPROVED BY:

CITY ENGINEER
APPROVED FOR ONE YEAR FROM THIS DATE

DATE

OWNER/DEVELOPER:

GALE COMMUNITIES, INC.
DAVID GALE
400 SW LONGVIEW BLVD, STE 109
LEE'S SUMMIT, MO 64081
p 816.645.2336 (CELL) 816.761.9292 (OFFICE)
f -
DGALE@GALECOMMUNITIES.COM



MISSOURI GEOGRAPHIC REFERENCE SYSTEM
BENCH MARK:

BM JA-136, LOCATED AT INTERSECTION OF SW OLDHAM PARKWAY AND SW WARD ROAD, 61 FT SOUTH OF CL OF OLDHAM PARKWAY AND 28.9 FT EAST OF THE EAST EDGE OF WARD ROAD.

ELEV. 993.11'

PROJECT BENCH MARK:

SANITARY MANHOLE H2 AT NW CORNER OF LOT 1153 WINTERSET VALLEY 1ST PLAT, APPROX. 39' RT. OF CL OF NW PEALE BLVD.

ELEV.935.45'

SCHLAGEL & ASSOCIATES, P.A.
Engineers-Planners-Surveyors-Landscape Architects
14920 West 107th Street • Lenexa, Kansas 66215
(913) 492-5158 • Fax: (913) 492-8400
WWW.SCHLAGELASSOCIATES.COM
Missouri State Certificates of Authority
#E2002003600-F #AC2001005237 #LS200200859-F

WINTERSET VALLEY, 13TH PLAT
STREET, STORMWATER, MASTER DRAINAGE PLAN AND
EROSION AND SEDIMENT CONTROL
NW THOREAU DRIVE AND AUDUBON LANE
LEE'S SUMMIT, MISSOURI

REVISION	DATE	DESCRIPTION
1	4-10-19	CITY COMMENTS
2	8-1-19	CITY COMMENTS
3		
4		
5		
6		
7		
8		

DRAWN BY:	KSC
CHECKED BY:	MAB
DATE PREPARED:	2-15-19
PROJ. NUMBER:	18-230

COVER SHEET

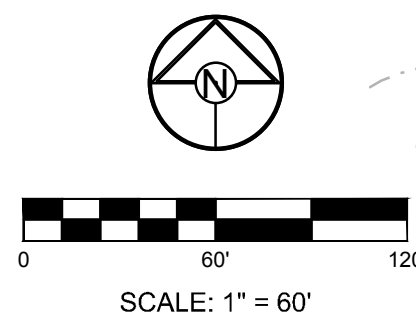
SHEET

* NOTE:
MULCH BERMS ARE AN ACCEPTABLE
ALTERNATIVE TO SILT FENCE REQUIRED
PRIOR TO LAND DISTURBANCE AND ADJACENT
TO WOODED/UNDEVELOPED AREAS.

SITE SPECIFIC NOTES:

1. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL EXISTING UTILITY LOCATIONS PRIOR TO EXCAVATION.
2. THERE ARE NO WETLANDS, NATURAL OR ARTIFICIAL 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 29095C0412G DATED JANUARY 20, 2017.
4. ALL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE IMPLEMENTED ACCORDING TO THE BMP STAGING CHART.
5. ADDITIONAL EROSION CONTROL MAY BE REQUIRED BY THE CITY ENGINEER AT ANY TIME EXISTING MEASURES ARE FOUND TO BE INEFFECTIVE OR PROBLEMATIC AREAS ARE NOTED IN THE FIELD.

6. STABILIZATION OF DISTURBED AREAS MUST, AT A MINIMUM BE INITIATED IMMEDIATELY WHENEVER ANY CLEARING, GRADING, EXCAVATING, OR OTHER SOIL DISTURBING ACTIVITIES HAVE PERMANENTLY CEASED ON ANY PORTION OF THE SITE, OR TEMPORARILY CEASED ON ANY PORTION OF THE SITE AND WILL NOT RESUME FOR A PERIOD EXCEEDING 14 CALENDAR DAYS. THE DISTURBED AREAS SHALL BE PROTECTED FROM EROSION BY STABILIZING THE AREA WITH MULCH OR OTHER SIMILARLY EFFECTIVE SOIL STABILIZING BMPs. INITIAL STABILIZATION ACTIVITIES MUST BE COMPLETED WITHIN 14 DAYS AFTER SOIL DISTURBING ACTIVITIES CEASE.
7. ALL PERIMETER SILT FENCE, EARTH DIKES, SEDIMENT BASINS, AND ROCK CONSTRUCTION ENTRANCES WILL BE INSTALLED BEFORE GRADING OPERATIONS BEGIN.
8. SILT FENCE AND EARTH DIKES THAT ARE PLACED BEFORE GRADING BEGINS WILL BE MAINTAINED BY THE GRADING CONTRACTOR.
9. AREAS WITHIN PUBLIC RIGHT-OF-WAY SHALL BE SODDED IMMEDIATELY AFTER CONSTRUCTION IS COMPLETE.



WINTERSET VALLEY, 13TH PLAT
STREET, STORMWATER, MASTER DRAINAGE PLAN AND
EROSION AND SEDIMENT CONTROL
NW THOREAU DRIVE AND AUDUBON LANE
LEE'S SUMMIT, MISSOURI

REVISION	DATE	DESCRIPTION
1	4-10-19	
2		
3		
4		
5		
6		
7		
8		
9		

PRE-CLEARING
PLAN

SHEET

2

OF 24

I:\PROJECTS\2018\18-230\3.0 DWG Plans\6.0 SS-EROS CONT PLAN.dwg, 8/12/2019 10:03:31 AM, 11

LEGEND			
	TEMPORARY STORAGE AREA FOR EXCESS MATERIAL		SILT FENCE (PRIOR TO LAND DISTURBANCE)
	TEMP. CONSTRUCTION ENTRANCE AND STAGING AREA		SILT FENCE (DURING CONSTRUCTION)
	CONCRETE WASHOUT AREA		SILT SOCK / ROCK SOCK / SOCK WATTLE
	SILT FOAM DIKE - STAKED & INSTALL PER MFR'S RECOMMENDATIONS		LIMITS OF DISTURBANCE
	ROCK DITCH CHECK		EXISTING CONTOURS
			PROPOSED CONTOURS
			GRAVEL FILTER FOR STORM SEWER STRUCTURES ONLY
			BMP PLAN REF. NO.

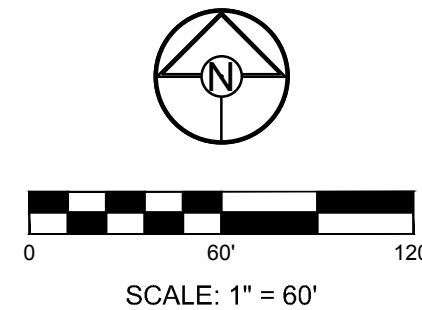
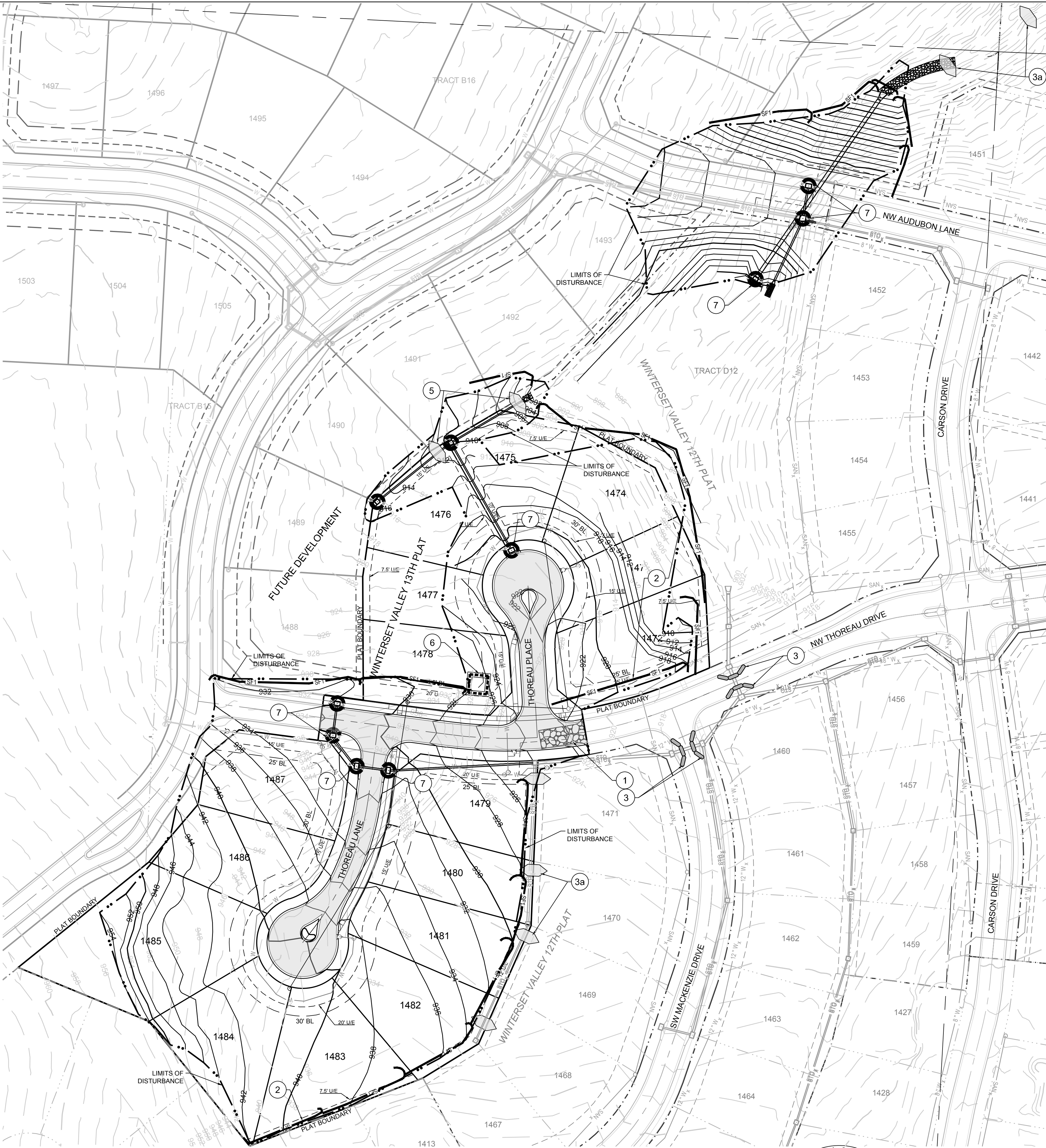
PHASE	EROSION AND SEDIMENT CONTROL STAGING CHART				
	PROJECT STAGE	BMP PLAN REF. NO.	BMP DESCRIPTION	REMOVE AFTER STAGE	NOTES:
PRE-CLEARING PHASE	A - PRIOR TO LAND DISTURBANCE	1	CONSTRUCTION ENTRANCE & STAGING AREA	D	MAINTAIN, REPAIR, OR REPLACE AS NECESSARY
		2	SILT FENCE 1 (PRIOR TO LAND DISTURBANCE)	E	PLACE WHERE INDICATED, REPAIR OR REPLACE AS NECESSARY AND REMOVE ONLY WHEN GRADED AREAS HAVE SUFFICIENT GROUND COVER ESTABLISHED
		3	EXISTING INLET PROTECTION	E	PLACE WHERE INDICATED, REPAIR OR REPLACE AS NECESSARY AND REMOVE ONLY WHEN GRADED AREAS HAVE SUFFICIENT GROUND COVER ESTABLISHED
		3a	FOAM SILT DIKE OR ROCK DITCH CHECK AND SEDIMENT TRAPS	E	PLACE WHERE INDICATED AT EXISTING SWALES AND DRAINAGE COURSES
CONSTRUCTION PHASE	B - MASS GRADING	4	SILT FENCE 2 (DURING CONSTRUCTION)	E	PLACE WHERE INDICATED, REPAIR OR REPLACE AS NECESSARY AND REMOVE ONLY WHEN GRADED AREAS HAVE SUFFICIENT GROUND COVER ESTABLISHED
		5	FOAM SILT DIKE OR ROCK DITCH CHECK AND SEDIMENT TRAPS	E	PLACE WHERE INDICATED AS SOON AS SWALE IS ESTABLISHED, REPAIR OR REPLACE AS NECESSARY
	C - UTILITY CONSTRUCTION	6	CONCRETE WASHOUT AREA	E	MAINTAIN, REPAIR, OR REPLACE AS NECESSARY
		7	INLET PROTECTION (SILT FENCE)	D/E	PLACE SILT FENCE AROUND ALL STORM SEWER STRUCTURES / YARD AREA STORM STRUCTURES TO HAVE SILT FENCE REMOVED ONLY WHEN GRADED AREAS HAVE SUFFICIENT GROUND COVER ESTABLISHED
FINAL STABILIZATION PHASE	D - AFTER PAVING OPERATIONS	8	INLET PROTECTION (GRAVEL FILTER BAGS)	E	BOARDS SHALL BE PLACED IN FRONT OF INLET OPENING FROM THE TIME SILT FENCE IS REMOVED UNTIL SUCH TIME THAT THE CURB / THROAT IS POURED. PLACE GRAVEL FILTER BAGS AT THE OPENING OF ALL CURB INLETS IMMEDIATELY AFTER THE INLET THROATS ARE POURED
		9	SILT FENCE 2 (AFTER CURB CONSTRUCTION)	E	PLACE WHERE INDICATED, REPAIR OR REPLACE AS NECESSARY AND REMOVE ONLY WHEN GRADED AREAS HAVE SUFFICIENT GROUND COVER ESTABLISHED
		10	SEEDING AND MULCHING	E	ALL DISTURBED AREAS AFTER 14 DAYS OF CONSTRUCTION INACTIVITY
	E - UNTIL CLOSURE OF LAND DISTURBANCE PERMIT				ADDITIONAL SEDIMENT AND EROSION CONTROL MEASURES MAY BE REQUIRED ANY TIME CURRENT MEASURES ARE FOUND TO BE INEFFECTIVE.

DISTURBED AREA = 6.77 A.C.

SITE SPECIFIC NOTES:

- THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL EXISTING UTILITY LOCATIONS PRIOR TO EXCAVATION.
- THERE ARE NO WETLANDS, NATURAL OR ARTIFICIAL WATER STORAGE DETENTION AREAS IN THE PROJECT AREA.
- NO PART OF THE PROJECT LIES WITHIN THE 100 YEAR FLOOD PLAIN PER FEMA FLOOD INSURANCE RATE MAP NUMBER 29095C0412G DATED JANUARY 20, 2017.
- ALL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE IMPLEMENTED ACCORDING TO THE BMP STAGING CHART.
- ADDITIONAL EROSION CONTROL MAY BE REQUIRED BY THE CITY ENGINEER AT ANY TIME EXISTING MEASURES ARE FOUND TO BE INEFFECTIVE OR PROBLEMATIC AREAS ARE NOTED IN THE FIELD.

- STABILIZATION OF DISTURBED AREAS MUST, AT A MINIMUM, BE INITIATED IMMEDIATELY WHENEVER ANY CLEARING, GRADING, EXCAVATING, OR OTHER SOIL DISTURBING ACTIVITIES HAVE PERMANENTLY CEASED ON ANY PORTION OF THE SITE, OR TEMPORARILY CEASED ON ANY PORTION OF THE SITE AND WILL NOT RESUME FOR A PERIOD EXCEEDING 14 CALENDAR DAYS. THE DISTURBED AREAS SHALL BE PROTECTED FROM EROSION BY STABILIZING THE AREA WITH MULCH OR OTHER SIMILARLY EFFECTIVE SOIL STABILIZING BMPs. INITIAL STABILIZATION ACTIVITIES MUST BE COMPLETED WITHIN 14 DAYS AFTER SOIL DISTURBING ACTIVITIES CEASE.
- ALL PERIMETER SILT FENCE, EARTH DIKES, SEDIMENT BASINS, AND ROCK CONSTRUCTION ENTRANCES WILL BE INSTALLED BEFORE GRADING OPERATIONS BEGIN.
- SILT FENCE AND EARTH DIKES THAT ARE PLACED BEFORE GRADING BEGINS WILL BE MAINTAINED BY THE GRADING CONTRACTOR.
- AREAS WITHIN PUBLIC RIGHT-OF-WAY SHALL BE SODDED IMMEDIATELY AFTER CONSTRUCTION IS COMPLETE.



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Missouri State Certificates of Authority
#E2002003600 F #LAC2001005237 #LS200200859-F

STATE OF MISSOURI
MARK ALLEN BREUER
MEMBER
PE-2005007268
08.06.19

WINTERSET VALLEY, 13TH PLAT
STREET, STORMWATER, MASTER DRAINAGE PLAN AND
EROSION AND SEDIMENT CONTROL
NW THOREAU DRIVE AND AUDUBON LANE
LEE'S SUMMIT, MISSOURI

REVISION DATE	DESCRIPTION
4-10-19	CITY COMMENTS
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ECP-CONSTRUCTION

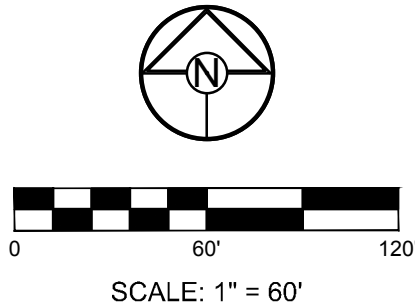
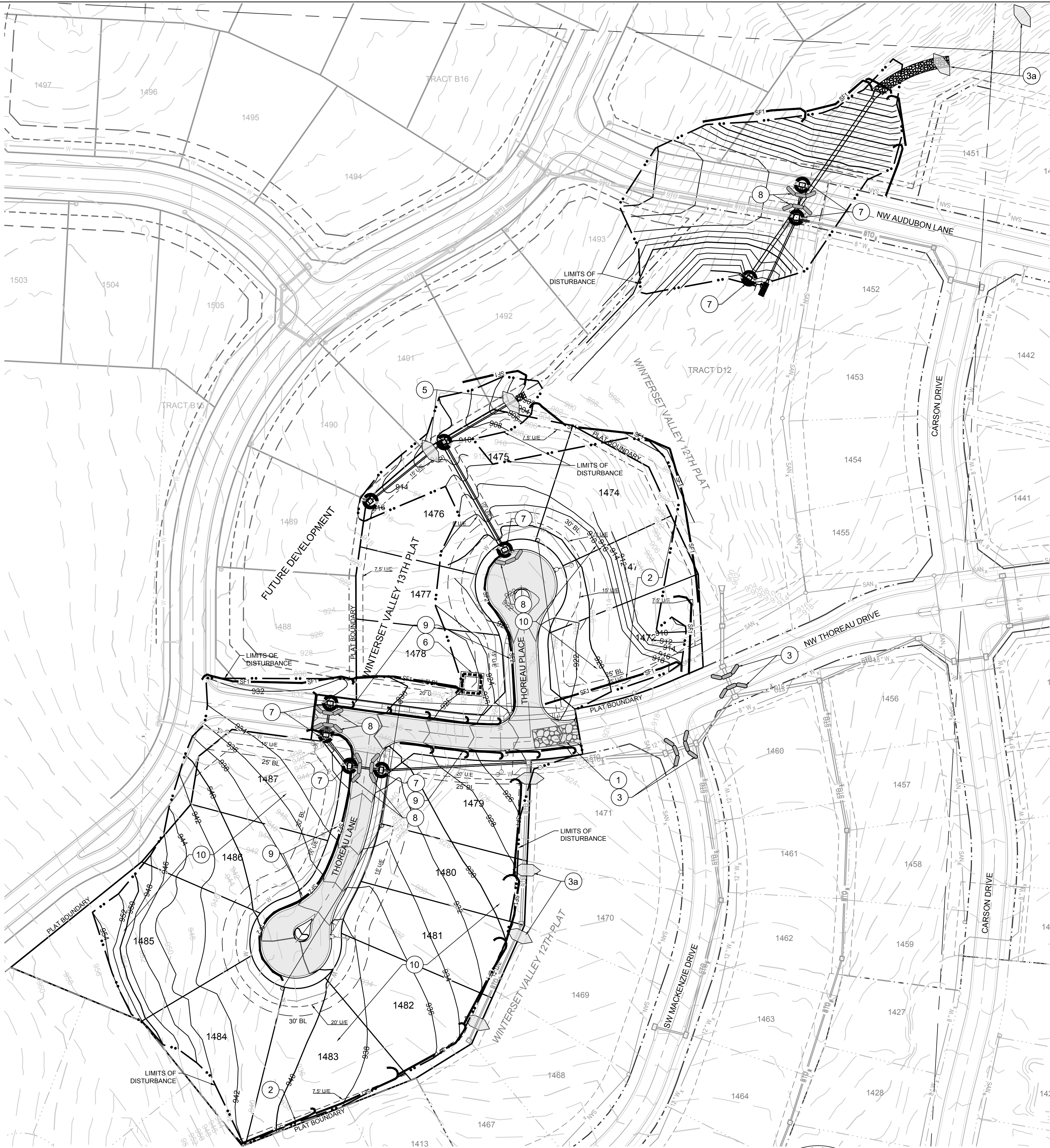
LEGEND	
	TEMPORARY STORAGE AREA FOR EXCESS MATERIAL
	TEMP. CONSTRUCTION ENTRANCE AND STAGING AREA
	CONCRETE WASHOUT AREA
	SILT FOAM DIKE - STAKED & INSTALL PER MFR'S RECOMMENDATIONS
	ROCK DITCH CHECK
	SILT FENCE (PRIOR TO LAND DISTURBANCE)
	SILT FENCE (DURING CONSTRUCTION)
	SILT SOCK / ROCK SOCK / SOCK WATTLE
	LIMITS OF DISTURBANCE
	EXISTING CONTOURS
	PROPOSED CONTOURS
	GRAVEL FILTER FOR STORM SEWER STRUCTURES ONLY
	BMP PLAN REF. NO.

		EROSION AND SEDIMENT CONTROL STAGING CHART			
		PROJECT STAGE	BMP PLAN REF. NO	BMP DESCRIPTION	REMOVE AFTER STAGE
PRE-CLEARING PHASE	A - PRIOR TO LAND DISTURBANCE	1	CONSTRUCTION ENTRANCE & STAGING AREA	D	MAINTAIN, REPAIR, OR REPLACE AS NECESSARY
		2	SILT FENCE 1 (PRIOR TO LAND DISTURBANCE)	E	PLACE WHERE INDICATED, REPAIR OR REPLACE AS NECESSARY AND REMOVE ONLY WHEN GRADED AREAS HAVE SUFFICIENT GROUND COVER ESTABLISHED
		3	EXISTING INLET PROTECTION	E	PLACE WHERE INDICATED, REPAIR OR REPLACE AS NECESSARY AND REMOVE ONLY WHEN GRADED AREAS HAVE SUFFICIENT GROUND COVER ESTABLISHED
		3a	FOAM SILT DIKE OR ROCK DITCH CHECK AND SEDIMENT TRAPS	E	PLACE WHERE INDICATED AT EXISTING SWALES AND DRAINAGE COURSES
CONSTRUCTION PHASE	B - MASS GRADING	4	SILT FENCE 2 (DURING CONSTRUCTION)	E	PLACE WHERE INDICATED, REPAIR OR REPLACE AS NECESSARY AND REMOVE ONLY WHEN GRADED AREAS HAVE SUFFICIENT GROUND COVER ESTABLISHED
		5	FOAM SILT DIKE OR ROCK DITCH CHECK AND SEDIMENT TRAPS	E	PLACE WHERE INDICATED AS SOON AS SWALE IS ESTABLISHED, REPAIR OR REPLACE AS NECESSARY
FINAL STABILIZATION PHASE	C - UTILITY CONSTRUCTION	6	CONCRETE WASHOUT AREA	E	MAINTAIN, REPAIR, OR REPLACE AS NECESSARY
		7	INLET PROTECTION (SILT FENCE)	D/E	PLACE SILT FENCE AROUND ALL STORM SEWER STRUCTURES / YARD AREA STORM STRUCTURES TO HAVE SILT FENCE REMOVED ONLY WHEN GRADED AREAS HAVE SUFFICIENT GROUND COVER ESTABLISHED
	D - AFTER PAVING OPERATIONS	8	INLET PROTECTION (GRAVEL FILTER BAGS)	E	BOARDS SHALL BE PLACED IN FRONT OF INLET OPENING FROM THE TIME SILT FENCE IS REMOVED UNTIL SUCH TIME THAT THE CURB / THROAT IS POURED. PLACE GRAVEL FILTER BAGS AT THE OPENING OF ALL CURB INLETS IMMEDIATELY AFTER THE INLET THROATS ARE POURED
		9	SILT FENCE 2 (AFTER CURB CONSTRUCTION)	E	PLACE WHERE INDICATED, REPAIR OR REPLACE AS NECESSARY AND REMOVE ONLY WHEN GRADED AREAS HAVE SUFFICIENT GROUND COVER ESTABLISHED
		10	SEEDING AND MULCHING	E	ALL DISTURBED AREAS AFTER 14 DAYS OF CONSTRUCTION INACTIVITY
	E - UNTIL CLOSURE OF LAND DISTURBANCE PERMIT				ADDITIONAL SEDIMENT AND EROSION CONTROL MEASURES MAY BE REQUIRED ANY TIME CURRENT MEASURES ARE FOUND TO BE INEFFECTIVE.

DISTURBED AREA = 6.77 A.C.

SITE SPECIFIC NOTES:

- THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL EXISTING UTILITY LOCATIONS PRIOR TO EXCAVATION.
- THERE ARE NO WETLANDS, NATURAL OR ARTIFICIAL WATER STORAGE DETENTION AREAS IN THE PROJECT AREA.
- NO PART OF THE PROJECT LIES WITHIN THE 100 YEAR FLOOD PLAIN PER FEMA FLOOD INSURANCE RATE MAP NUMBER 29095C0412G DATED JANUARY 20, 2017.
- ALL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE IMPLEMENTED ACCORDING TO THE BMP STAGING CHART.
- ADDITIONAL EROSION CONTROL MAY BE REQUIRED BY THE CITY ENGINEER AT ANY TIME EXISTING MEASURES ARE FOUND TO BE INEFFECTIVE OR PROBLEMATIC AREAS ARE NOTED IN THE FIELD.
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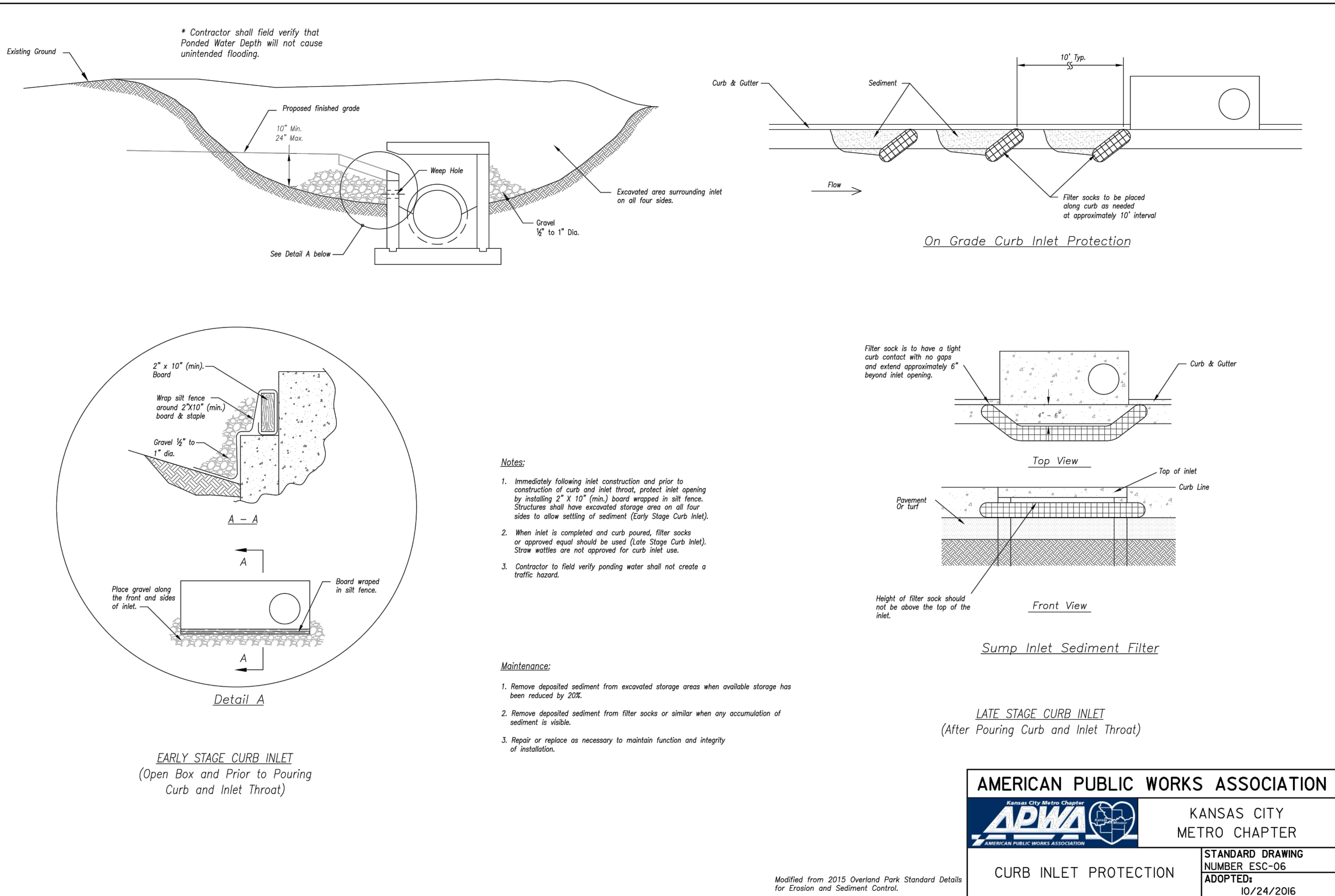
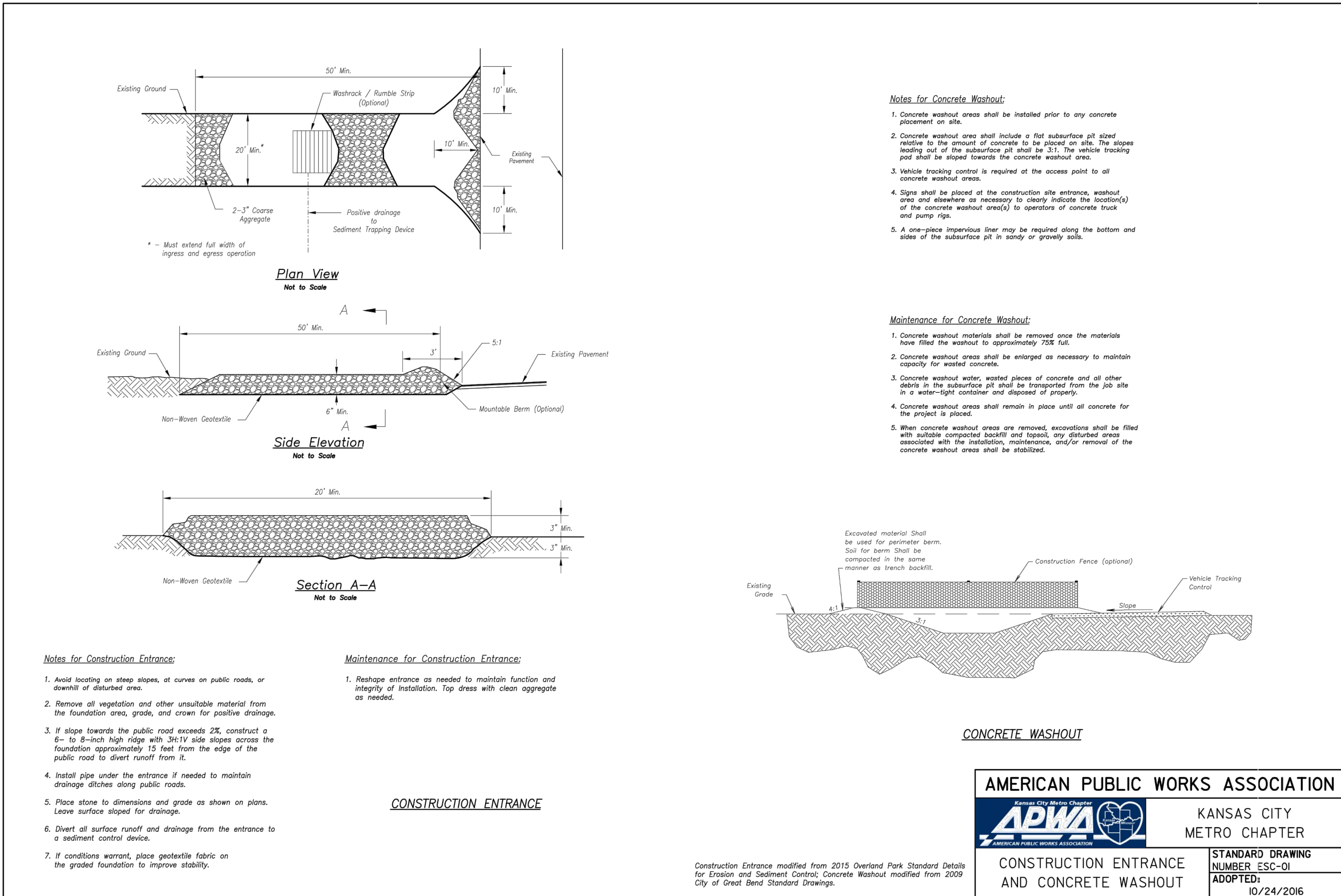
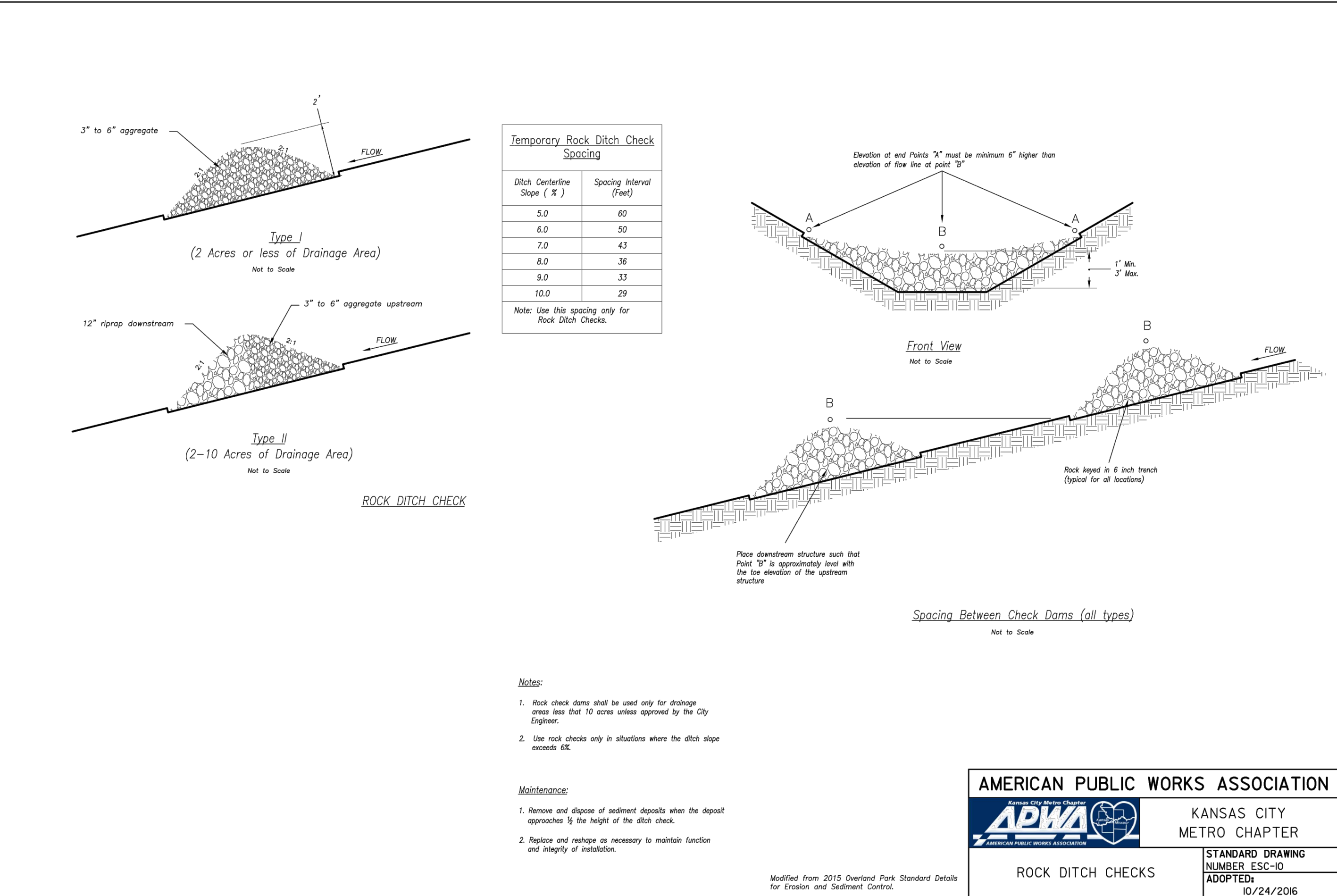
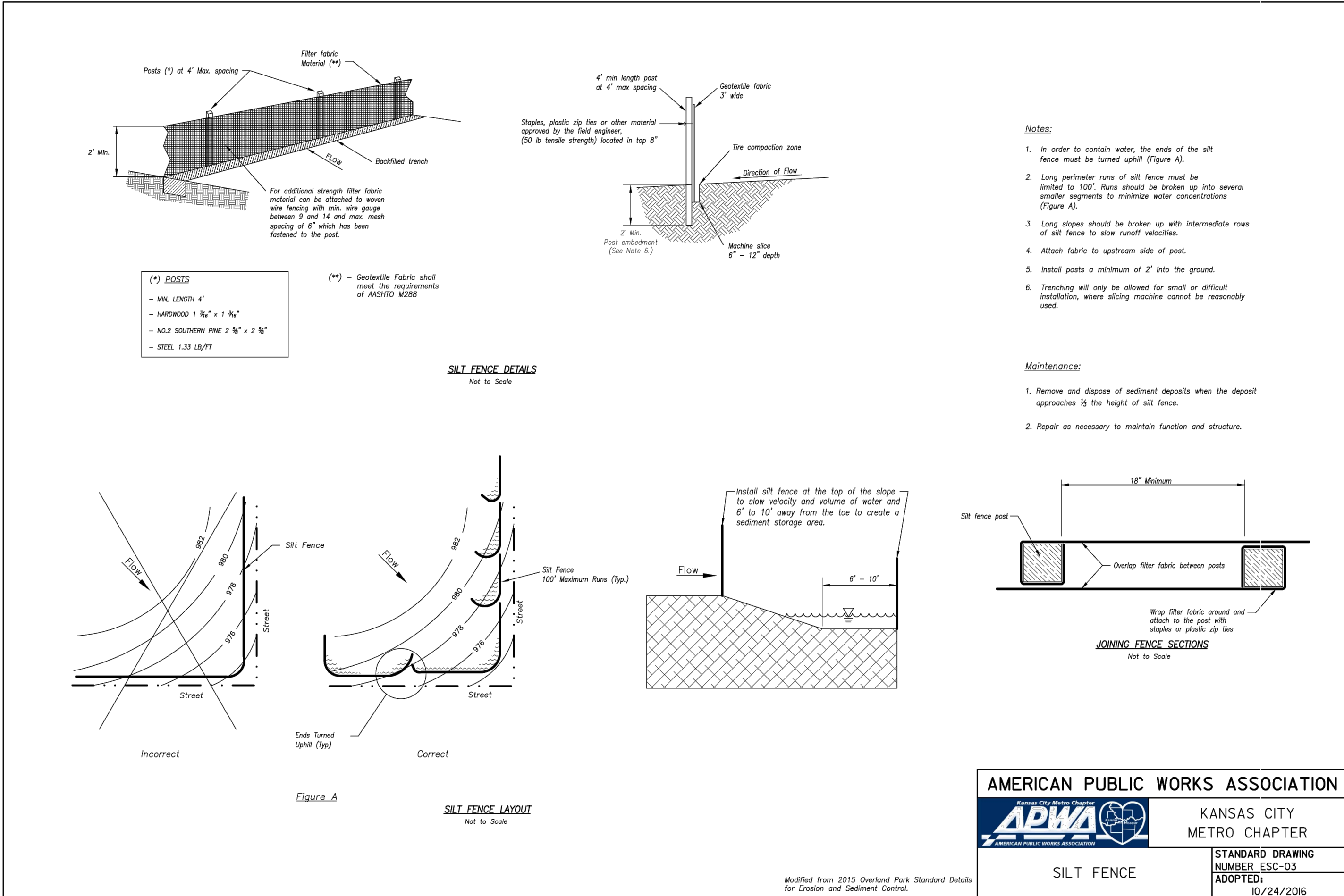
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FINAL STABILIZATION PLAN

SHEET

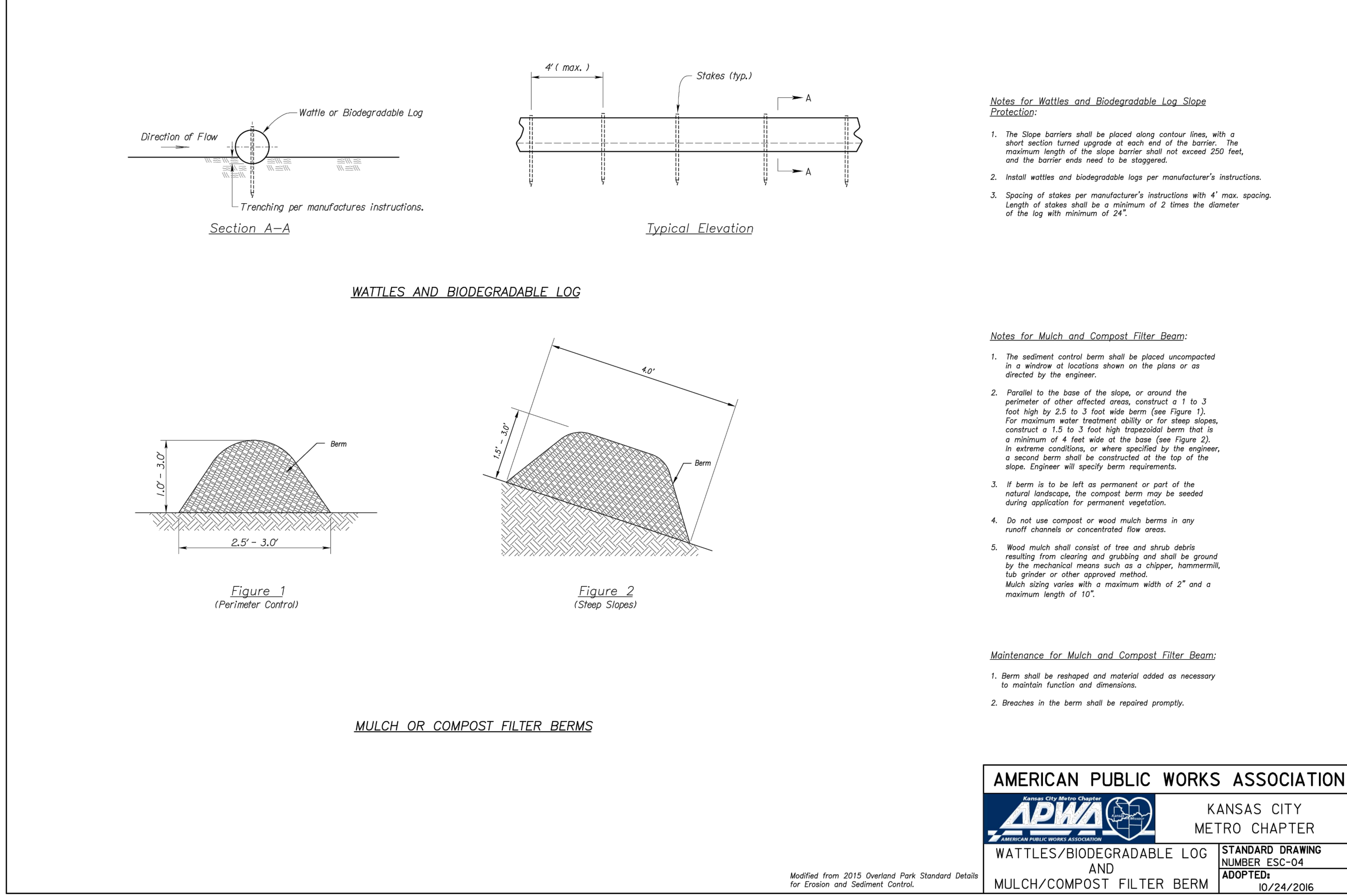
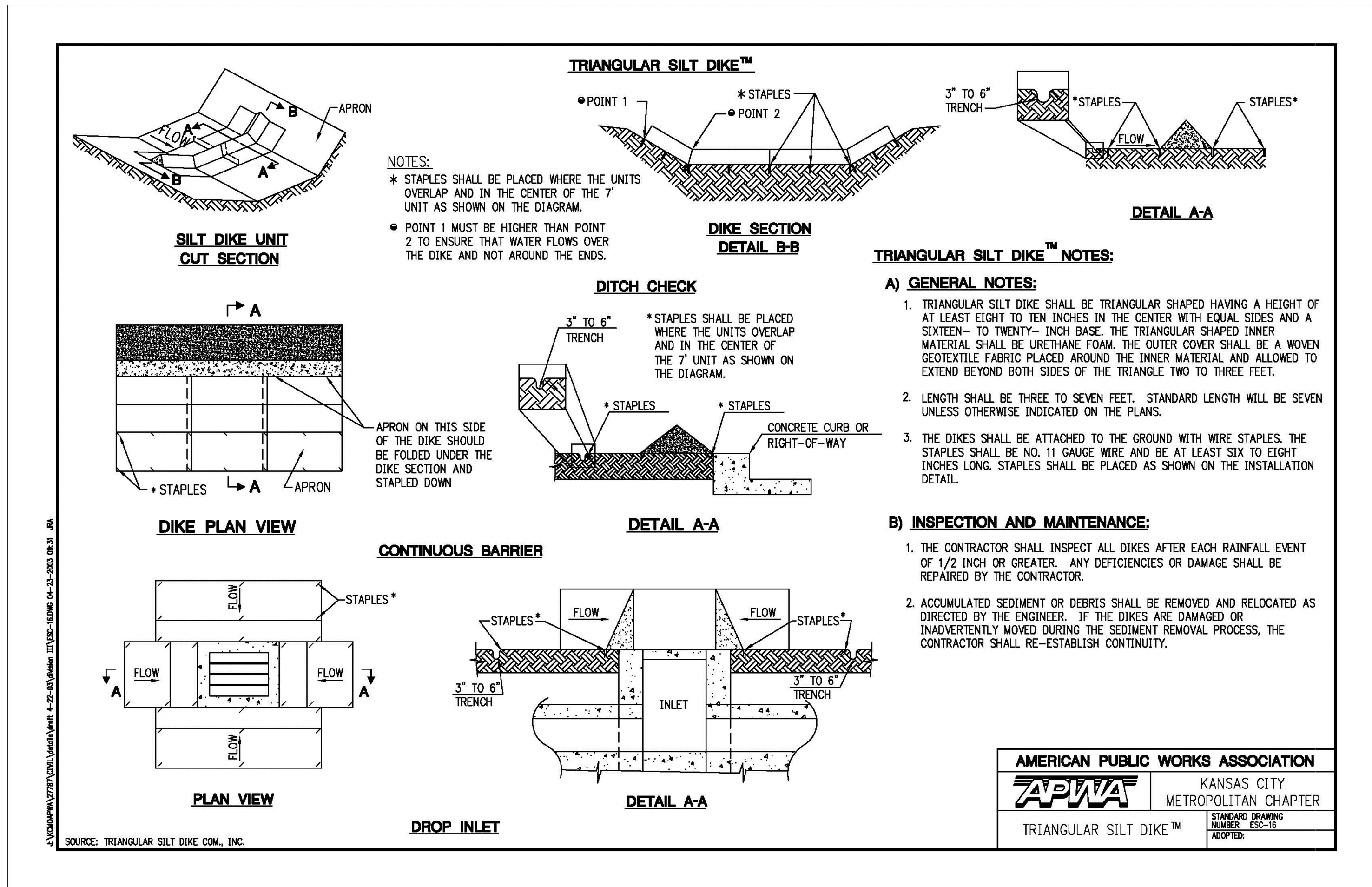
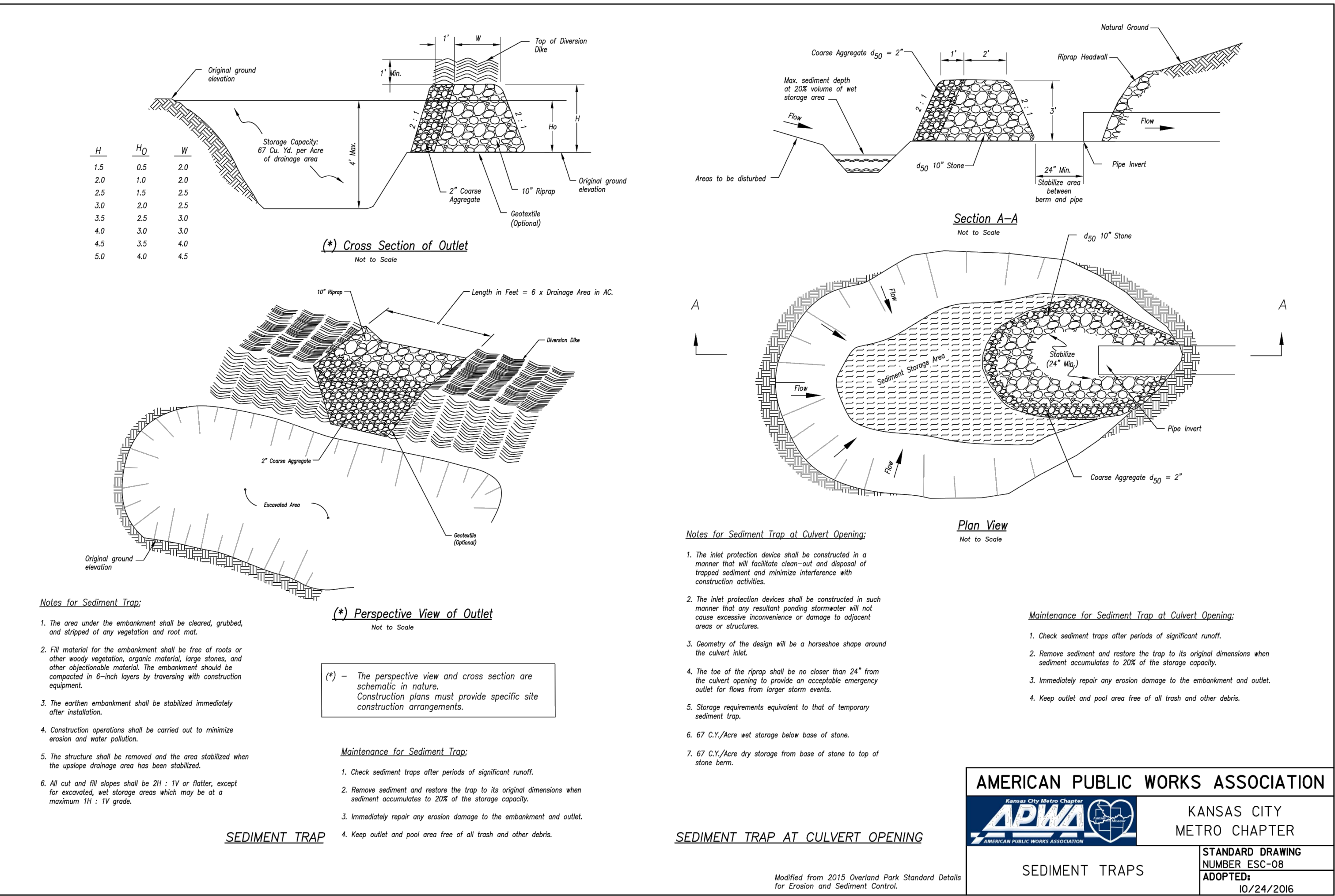
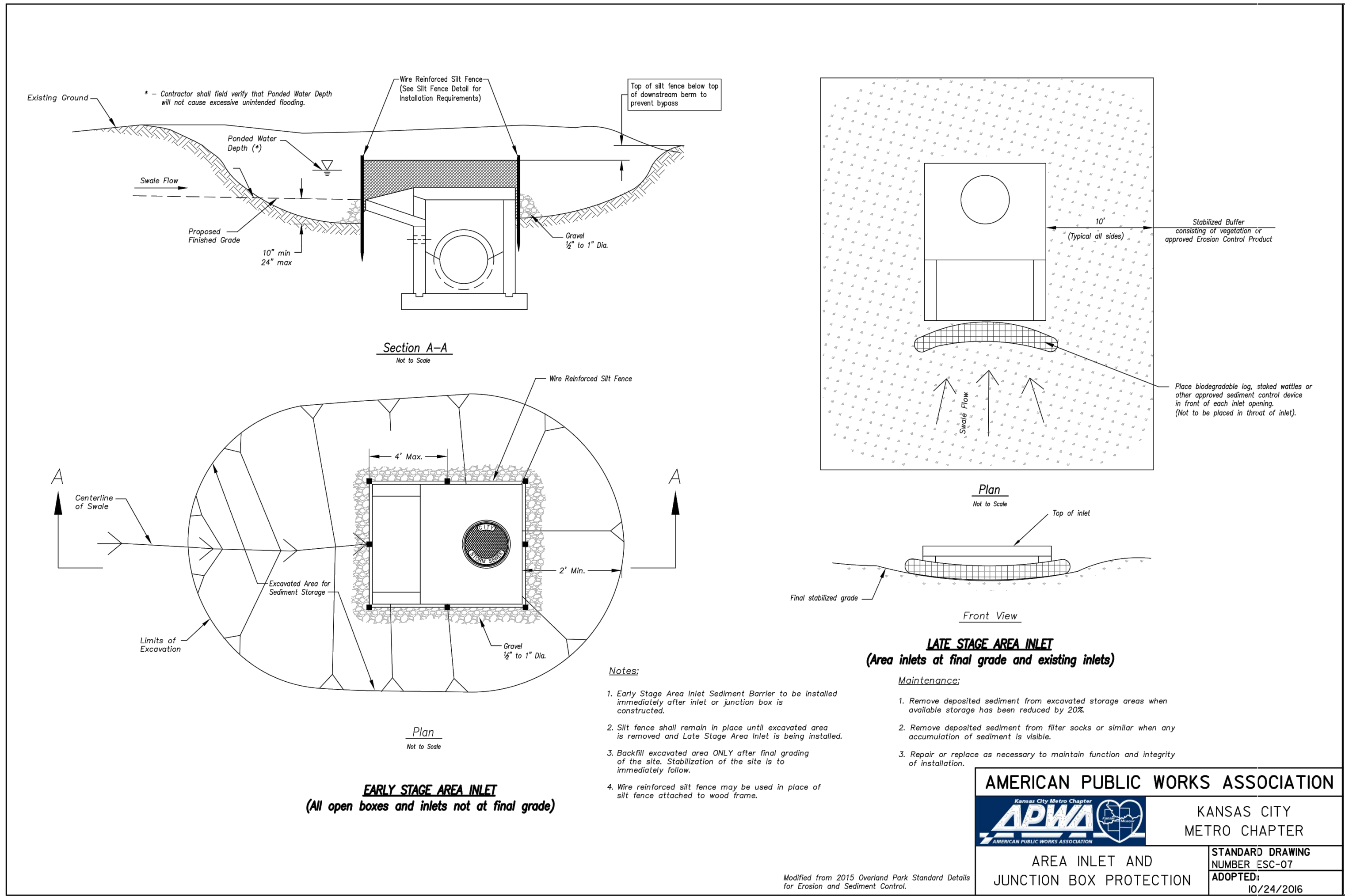
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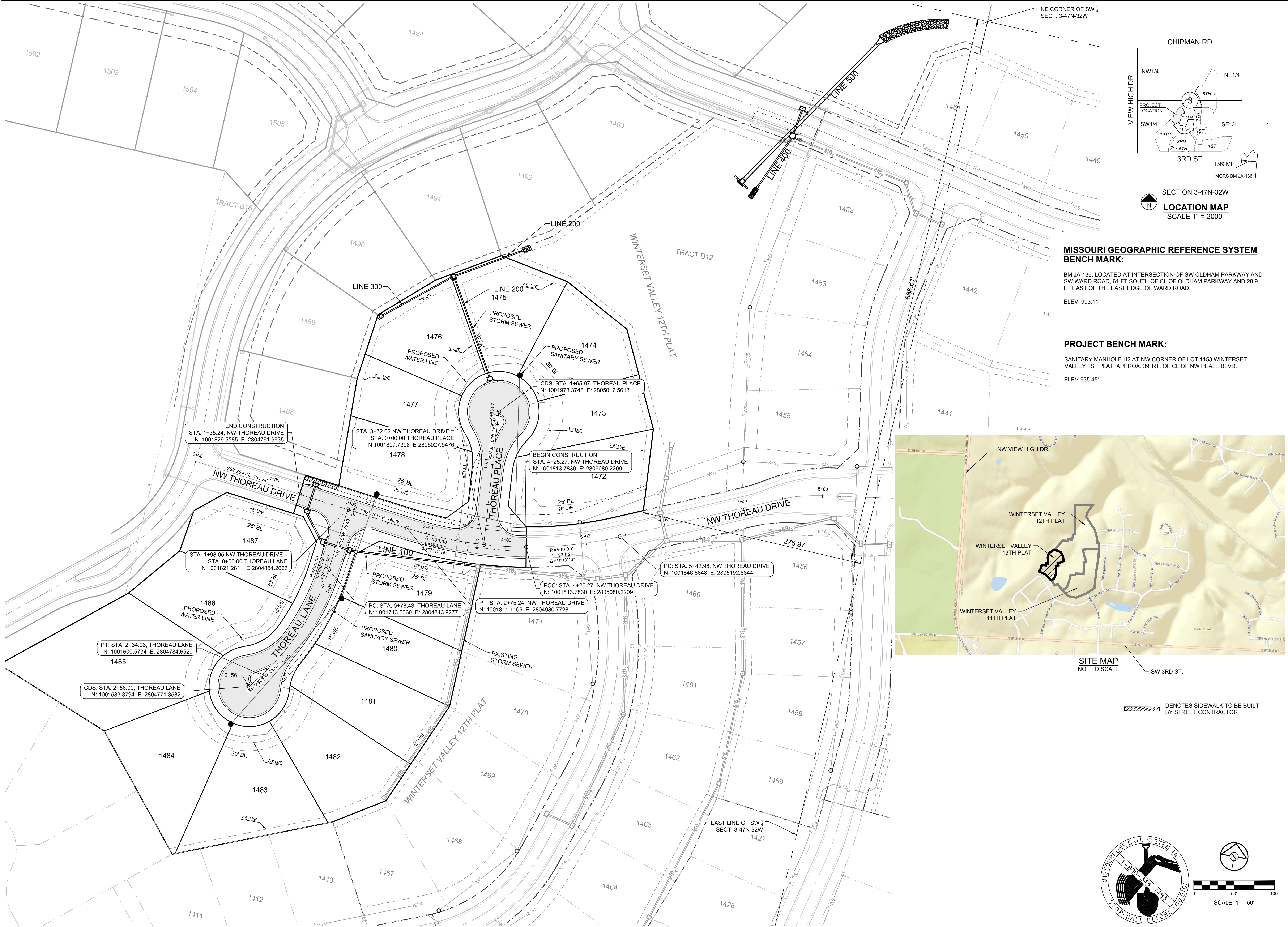


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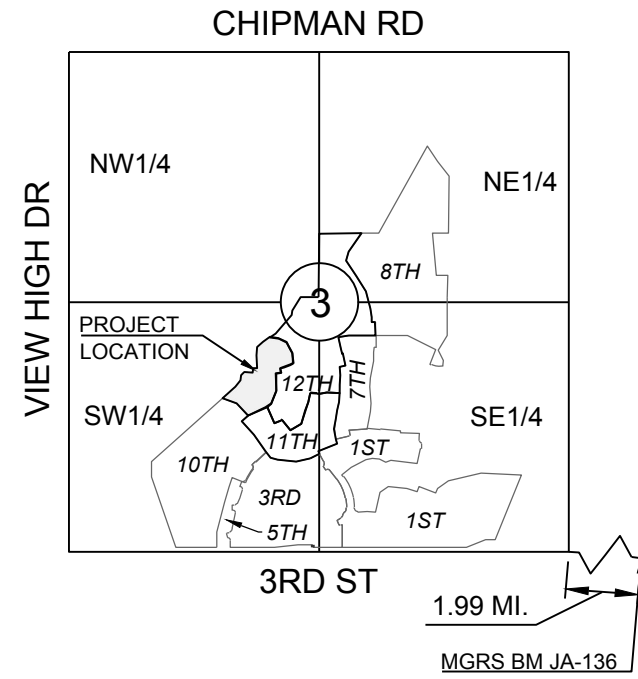
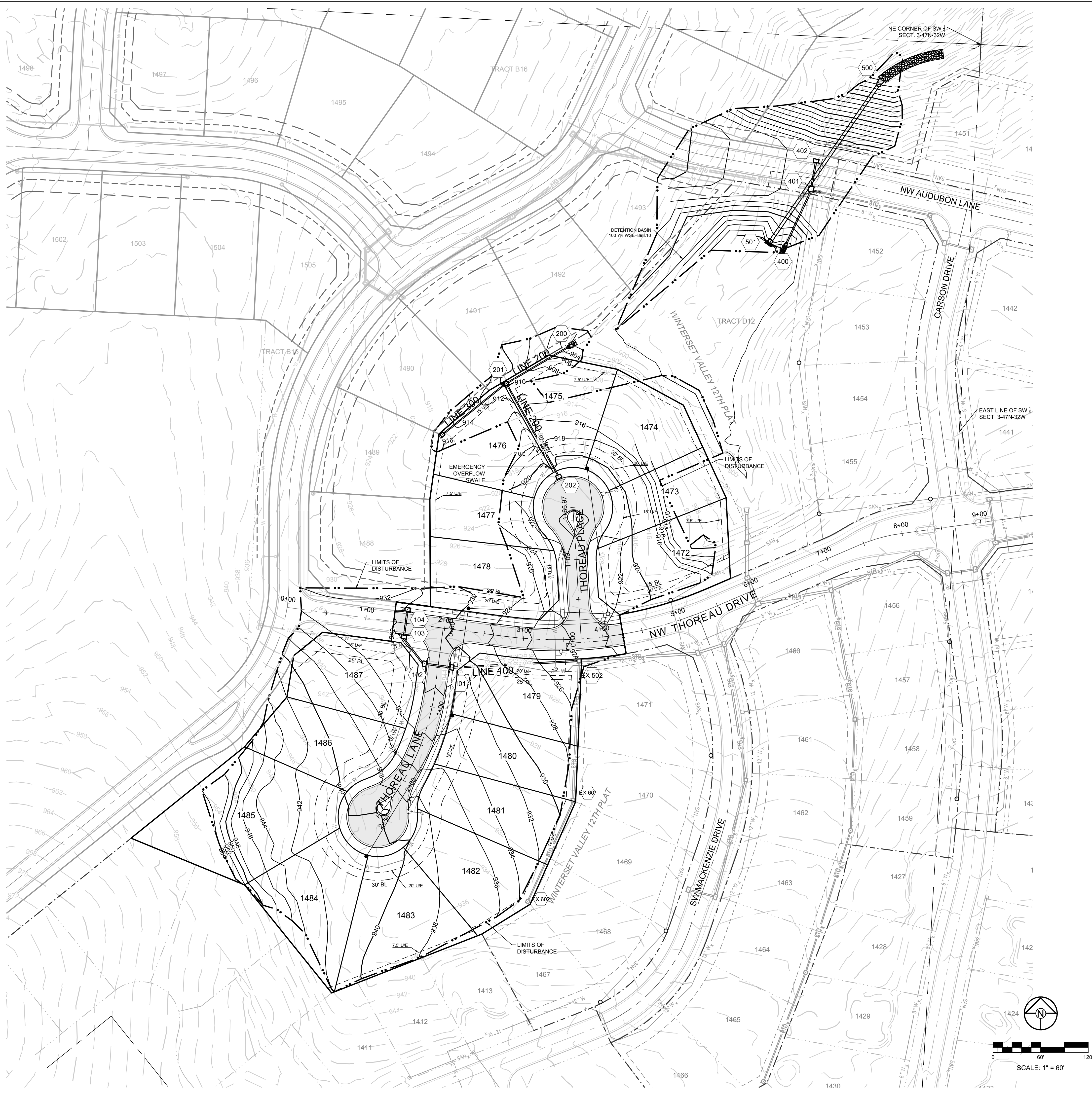
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CHECKED BY:	MAB
DATE PREPARED:	2-15-19
PROJ. NUMBER:	18-230



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SECTION 3-47N-32W
LOCATION MAP
SCALE 1" = 2000'

NOTE:
THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL EXISTING UTILITY LOCATIONS PRIOR TO EXCAVATIONS.

- DENOTES LIMITS OF DISTURBANCE
- DENOTES PROPOSED MAJOR CONTOUR
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MISSOURI GEOGRAPHIC REFERENCE SYSTEM BENCH MARK:

BM JA-136, LOCATED AT INTERSECTION OF SW OLDHAM PARKWAY AND SW WARD ROAD, 61 FT SOUTH OF CL OF OLDHAM PARKWAY AND 28.9 FT EAST OF THE EAST EDGE OF WARD ROAD.
ELEV. 993.11'

PROJECT BENCH MARK:

SANITARY MANHOLE H2 AT NW CORNER OF LOT 1153 WINTERSET VALLEY 1ST PLAT, APPROX. 39' RT. OF CL OF NW PEALE BLVD.
ELEV. 935.45'



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LOT TYPE TABLE		
LOT #	BASEMENT	MBOE
1472	WALKOUT	N/A
1473	WALKOUT	N/A
1474	WALKOUT	N/A
1475	WALKOUT	905.73
1476	WALKOUT	913.30
1477	DAYLIGHT	N/A
1478	STANDARD	N/A
1479	DAYLIGHT	926.11
1480	DAYLIGHT	927.88
1481	DAYLIGHT	931.08
1482	DAYLIGHT	N/A
1483	DAYLIGHT	N/A
1484	STANDARD	N/A
1485	STANDARD	N/A
1486	STANDARD	N/A
1487	STANDARD	N/A

NOTE:
1. DAYLIGHT BASED ON ADJACENT GRADE 4 FT BELOW TOP OF FOUNDATION WHILE MAINTAINING 2.5% (MIN) GRADE TO LOT CORNERS
2. WALKOUT BASED ON ADJACENT GRADE AT BASEMENT FLOOR ELEVATION WHILE MAINTAINING 2.5% (MIN) GRADE TO LOT CORNERS.

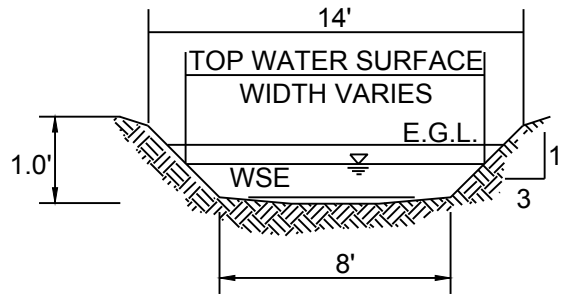
NOTES:

- MBOE = MINIMUM BUILDING OPENING ELEVATION FOR HOUSES ADJACENT TO ENGINEERED OVERFLOW SWALES SHALL BE MINIMUM 2 FEET ABOVE THE 100 YR WATER SURFACE ELEVATION.
- EGL = ENERGY GRADE LINE (100 YR)
- WSE = WATER SURFACE ELEVATION (100 YR)
- ENGINEERED SWALES TO BE GRADED TO NORMAL DEPTH OF FLOW (WATER SURFACE ELEVATION) OR 1.0 FT, WHICHEVER IS GREATER. MINIMUM SLOPE OF ENGINEERED SWALES SHALL BE AS NOTED.
- MBOE'S ADJACENT TO SUMPED INLETS SHALL BE A MINIMUM OF 1' ABOVE TOP OF ADJACENT BERM

EL-933.8 EX DENOTES EXISTING GRADE ELEVATION
EL-936.48 FG DENOTES FINISHED GRADE ELEVATION

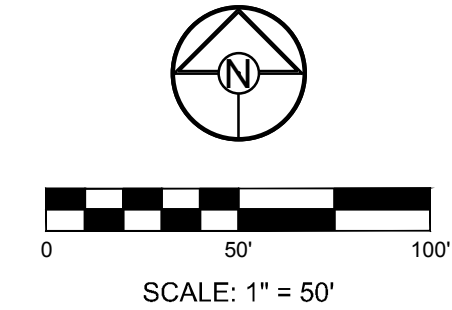


DENOTES CONCEPTUAL BUILDING FOOTPRINT



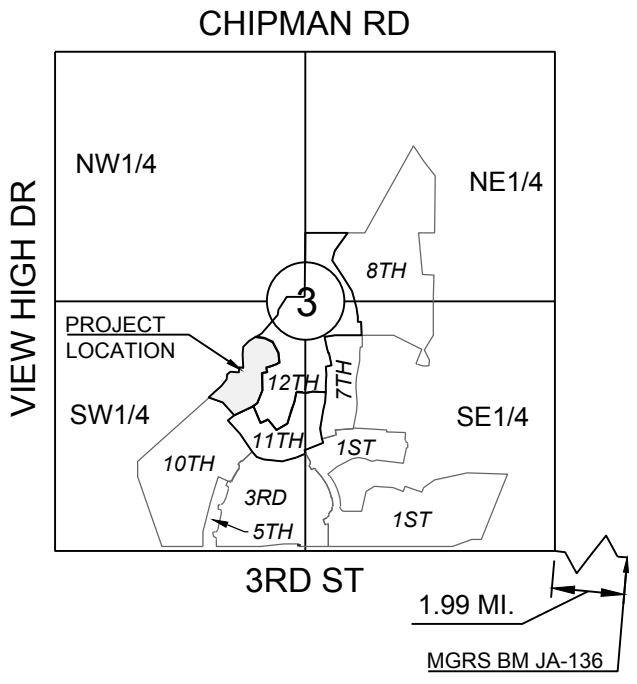
100 YR OVERFLOW SWALE SECTIONS
SECTION A-A, B-B, C-C, D-D, E-E, F-F
(SEE ADJACENT CHART)

RUNOFF CALCULATIONS:
 $Q = K \cdot C \cdot I \cdot A$
 $K_{10} = 1.0 \quad K_{100} = 1.25 \quad C = 0.51 \quad I = \text{INTENSITY}$
 $\text{DESIGN OVERFLOW} = Q_{\text{OVERFLOW}} = Q_{100} - Q_{10}$
MANNINGS "n" = .030 FOR SWALES



100 YEAR OVERFLOW SWALES												
SECTION	DRAINAGE AREA (AC.)	Q100 (CFS)	Q10 (CFS)	DESIGN OVERFLOW (CFS)	BED SLOPE (%)	BASE WIDTH (FT.)	SIDE SLOPE	TOP WATER SURFACE WIDTH (FT.)	NORMAL DEPTH (FT.)	VELOCITY (FPS)	VELOCITY HEAD (FT.)	EGL (FT.)
A-A	1.61	10.59	7.00	3.59	2.60	8	3:1	9.1	0.18	2.36	0.09	0.27
B-B	0.91	5.99	3.96	2.03	2.50	8	3:1	8.8	0.13	1.88	0.05	0.18
C-C	1.14	7.50	4.96	2.54	2.50	8	3:1	8.9	0.15	2.02	0.06	0.21
D-D	0.51	3.36	2.39	3.36	8.34	8	3:1	8.7	0.12	3.35	0.17	0.29
E-E	0.99	6.51	4.31	2.21	5.64	8	3:1	8.7	0.11	2.43	0.09	0.20
F-F	0.52	3.42	2.26	1.16	7.66	8	3:1	8.4	0.07	2.03	0.06	0.13
G-G	0.11	0.72	0.48	0.72	2.38	8	3:1	8.4	0.07	1.25	0.02	0.09

* EMERGENCY OVERFLOW SWALE - ASSUME INLET CLOGGED, Q_{DESIGN}=100YR



SECTION 3-47N-32W
LOCATION MAP
SCALE 1" = 2000'

MISSOURI GEOGRAPHIC REFERENCE SYSTEM
BENCH MARK:

BM JA-136, LOCATED AT INTERSECTION OF SW OLDHAM PARKWAY AND SW WARD ROAD, 61 FT SOUTH OF CL OF OLDHAM PARKWAY AND 28.9 FT EAST OF THE EAST EDGE OF WARD ROAD.

ELEV. 993.11'

PROJECT BENCH MARK:

SANITARY MANHOLE H2 AT NW CORNER OF LOT 1153 WINTERSET VALLEY 1ST PLAT, APPROX. 39' RT. OF CL OF NW PEALE BLVD.

ELEV. 935.45'



WINTERSET VALLEY, 13TH PLAT
STREET, STORMWATER, MASTER DRAINAGE
PLAN AND EROSION AND SEDIMENT CONTROL
NW THOREAU DRIVE AND AUDUBON LANE
LEE'S SUMMIT, MISSOURI



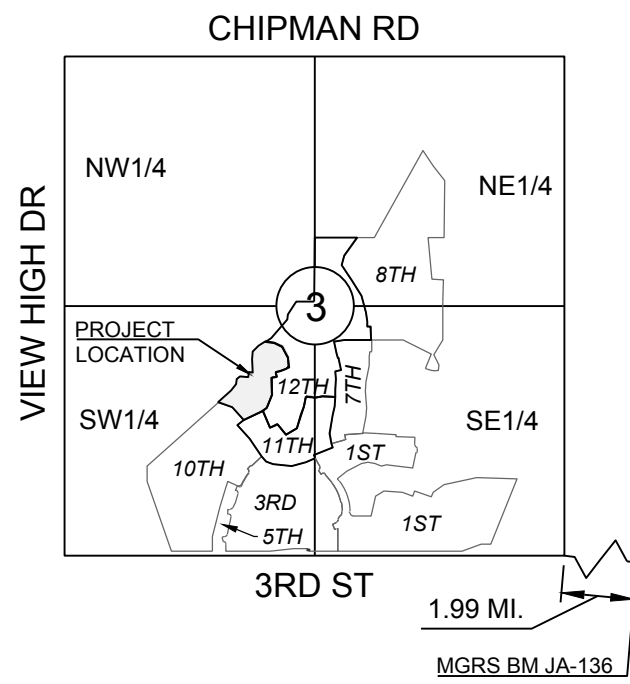
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REVISION DATE		DESCRIPTION			
1	4-10-19	CITY COMMENTS			
2	8-1-19	CITY COMMENTS			
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DRAWN BY: KSC		CHECKED BY: MAB			
DATE PREPARED: 2-15-19		PROJ. NUMBER: 18-230			
MASTER DRAINAGE PLAN - SPOT ELEVATIONS					
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9					
OF 24					

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MATCHLINE



SECTION 3-47N-32W

LOCATION MAP
SCALE 1" = 2000'

**MISSOURI GEOGRAPHIC REFERENCE SYSTEM
BENCH MARK:**

BM JA-136, LOCATED AT INTERSECTION OF SW OLDHAM PARKWAY AND SW WARD ROAD, 61 FT SOUTH OF CL OF OLDHAM PARKWAY AND 28.9 FT EAST OF THE EAST EDGE OF WARD ROAD.

ELEV. 993.11'

PROJECT BENCH MARK:

SANITARY MANHOLE H2 AT NW CORNER OF LOT 1153 WINTERSET VALLEY 1ST PLAT, APPROX. 39' RT. OF CL OF NW PEALE BLVD.

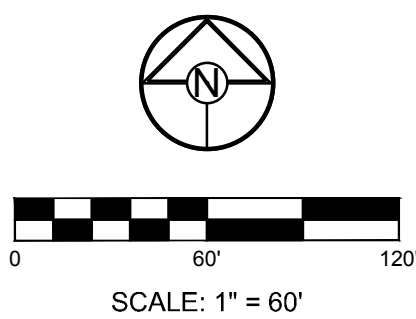
ELEV. 935.45'

10 YR STORM SEWER CALCULATIONS

Runoff Calculations														Pipe Properties												
Inlet #	Area (acres)	"C" Value	Cumul. Area (acres)	Cumul. Cx A	Tc	Intensity	Runoff To Inlet	Cumul. Runoff	Pipe Cap.	Pipe Vel.	Up Piped Inlet 1	Up Piped Inlet 2	Up Area (acres)	Up Cx A	Up Inlet	Down Inlet	Pipe Type	"n" Value	Pipe Size	Length	Slope %	Drop In Inlet	FL Up	FL Down	Inlet Top	HGL Elev
DS TAILWATER @ STR #EX 502																									FREE	
LINE 100																										
101	0.47	0.51	4.22	2.15	5.2	7.30	1.75	15.71	24.87	7.92			0.00	0.00	101	EX502	HDPE	0.012	24	160.03	1.03	0.50	920.15	918.50	931.32	921.91
102	1.51	0.51	3.75	1.91	5.1	7.31	5.63	13.98	52.56	16.73			0.00	0.00	102	101	HDPE	0.012	24	35.00	4.60	0.50	922.26	920.65	931.32	923.90
103	0.91	0.51	2.24	1.14	5.1	7.34	3.40	8.38	16.09	9.11			0.00	0.00	103	102	HDPE	0.012	18	42.40	2.00	0.50	923.61	922.76	931.88	925.00
104	1.33	0.51	1.33	0.68	5.0	7.35	4.99	4.99	13.09	10.67			0.00	0.00	104	103	HDPE	0.012	15	35.00	3.50	N/A	925.33	924.11	931.88	926.45
DS TAILWATER @ STR #200																									FREE	
LINE 200																										
201	0.52	0.51	1.07	0.55	5.2	7.30	1.94	3.98	13.59	11.07			0.00	0.00	201	200	HDPE	0.012	15	88.31	3.77	0.50	905.50	902.17	909.74	906.48
202	0.55	0.51	0.55	0.28	5.0	7.35	2.06	2.06	15.70	12.79			0.00	0.00	202	201	HDPE	0.012	15	134.61	5.03	N/A	912.77	906.00	920.76	913.45
Drop in Inlet 201																									0.50	
LINE 300																										
301	0.99	0.51	0.99	0.50	5.0	7.35	3.71	3.71	16.18	13.18			0.00	0.00	301	201	HDPE	0.012	15	102.91	5.34	N/A	911.50	906.00	915.00	912.44
DS TAILWATER @ STR #400																									FREE	
LINE 400																										
401	8.09	0.51	9.05	4.62	5.0	7.34	30.27	33.87	42.73	13.60			0.00	0.00	401	400	HDPE	0.012	24	74.07	3.04	1.50	894.25	892.00	905.75	897.15
402	0.96	0.51	0.96	0.49	5.0	7.35	3.60	3.60	14.89	12.14			0.00	0.00	402	401	HDPE	0.012	15	36.00	4.53	N/A	897.38	895.75	905.75	898.31
DS TAILWATER @ STR #500																									FREE	
LINE 500																										
501	39.85	0.51	39.85	20.32	5.0	7.35	149.44	149.44	270.87	21.56			0.00	0.00	501	500	HDPE	0.012	48	237.26	3.03	N/A	878.00	870.81	895.50	882.82

100 YR STORM SEWER CALCULATIONS

Runoff Calculations											Pipe Properties																
Inlet #	Area (acres)	"C" Value	Cumul. Area (acres)	Cumul. Cx A	Tc	Intensity	Runoff To Inlet	Cumul. Runoff	Pipe Cap.	Pipe Vel.	Up Piped Inlet 1	Up Piped Inlet 2	Up Area (acres)	Up Cx A	Up Inlet	Down Inlet	Pipe Type	"n" Value	Pipe Size	Length	Slope %	Drop In Inlet	FL Up	FL Down	Inlet Top	HGL Elev	
LINE 100																											
101	0.47	0.51	4.22	2.15	5.2	10.25	3.07	27.58	24.87	7.92			0.00	0.00	101	EX 502	HDPE	0.012	24	160.03	1.03				DS TAILWATER @ STR #EX 502	FREE	
102	1.51	0.51	3.75	1.91	5.1	10.27	9.88	24.55	52.56	16.73			0.00	0.00	102	101	HDPE	0.012	24	35.00	4.60	0.50	920.15	918.50	931.32	922.99	
103	0.91	0.51	2.24	1.14	5.1	10.30	5.98	14.71	16.09	9.11			0.00	0.00	103	102	HDPE	0.012	18	42.40	2.00	0.50	922.26	920.65	931.32	924.56	
104	1.33	0.51	1.33	0.68	5.0	10.32	8.75	8.75	13.09	10.67			0.00	0.00	104	103	HDPE	0.012	15	35.00	3.50	N/A	923.61	922.76	931.88	925.81	
LINE 200																											
201	0.52	0.51	1.07	0.55	5.2	10.25	3.40	6.99	13.59	11.07			0.00	0.00	201	200	HDPE	0.012	15	88.31	3.77	0.50	905.50	902.17	909.74	906.87	
202	0.55	0.51	0.55	0.28	5.0	10.32	3.62	3.62	15.70	12.79			0.00	0.00	202	201	HDPE	0.012	15	134.61	5.03	N/A	912.77	906.00	920.76	913.70	
LINE 300																											
301	0.99	0.51	0.99	0.50	5.0	10.32	6.51	6.51	16.18	13.18			0.00	0.00	301	201	HDPE	0.012	15	102.91	5.34				Drop in Inlet 201	0.50	
LINE 400																											
401	8.09	0.51	9.05	4.62	5.0	10.30	53.13	59.44	42.73	13.60			0.00	0.00	401	400	HDPE	0.012	24	74.07	3.04	1.50	894.25	892.00	905.75	901.13	
402	0.96	0.51	0.96	0.49	5.0	10.32	6.32	6.32	14.89	12.14			0.00	0.00	402	401	HDPE	0.012	15	36.00	4.53	N/A	897.38	895.75	905.75	901.63	
LINE 500																											
501	39.85	0.51	39.85	20.32	5.0	10.32	262.24	262.24	270.87	21.56			0.00	0.00	501	500	HDPE	0.012	48	237.26	3.03	N/A	878.00	870.81	895.50	885.38	



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STATE OF MISSOURI
MARK ALLEN BREUER
NUMBER
PE-2005007208
PROFESSIONAL ENGINEER
08.06.19

WINTERSET VALLEY, 13TH PLAT
STREET, STORMWATER, MASTER DRAINAGE
PLAN AND EROSION AND SEDIMENT CONTROL
NW THOREAU DRIVE AND AUDUBON LANE
LEE'S SUMMIT, MISSOURI

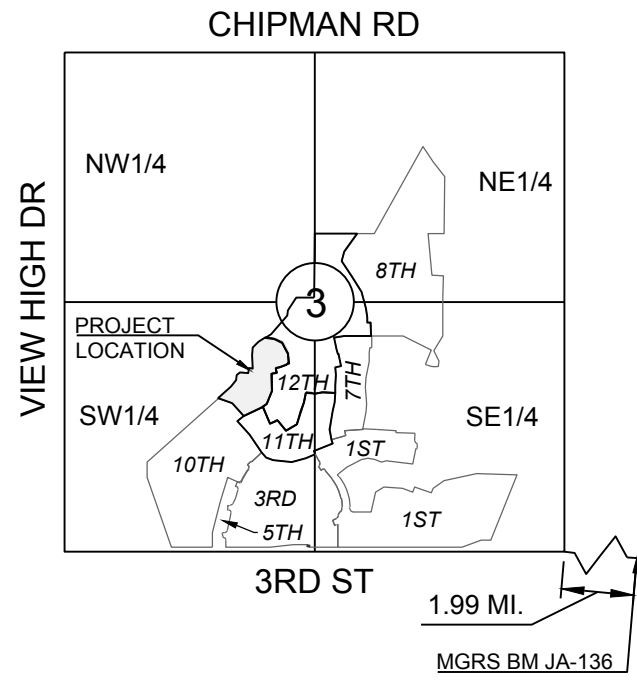
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DRAWN BY:	KSC
CHECKED BY:	MAB
DATE PREPARED:	2-15-19
PROJ. NUMBER:	18-230

MASTER
DRAINAGE PLAN
- DRAINAGE MAP

SHEET

10
OF 24



SECTION 3-47N-32W
LOCATION MAP
SCALE 1" = 2000'

**MISSOURI GEOGRAPHIC REFERENCE SYSTEM
BENCH MARK:**

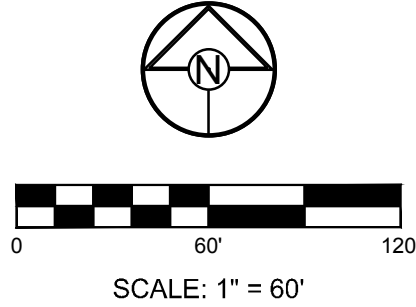
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ELEV. 993.11'

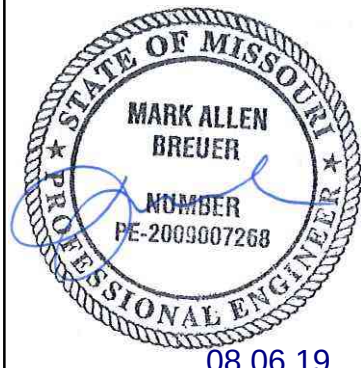
PROJECT BENCH MARK:

SANITARY MANHOLE H2 AT NW CORNER OF LOT 1153 WINTERSET VALLEY 1ST PLAT, APPROX. 39' RT. OF CL OF NW PEALE BLVD.

ELEV. 935.45'



MATCHLINE

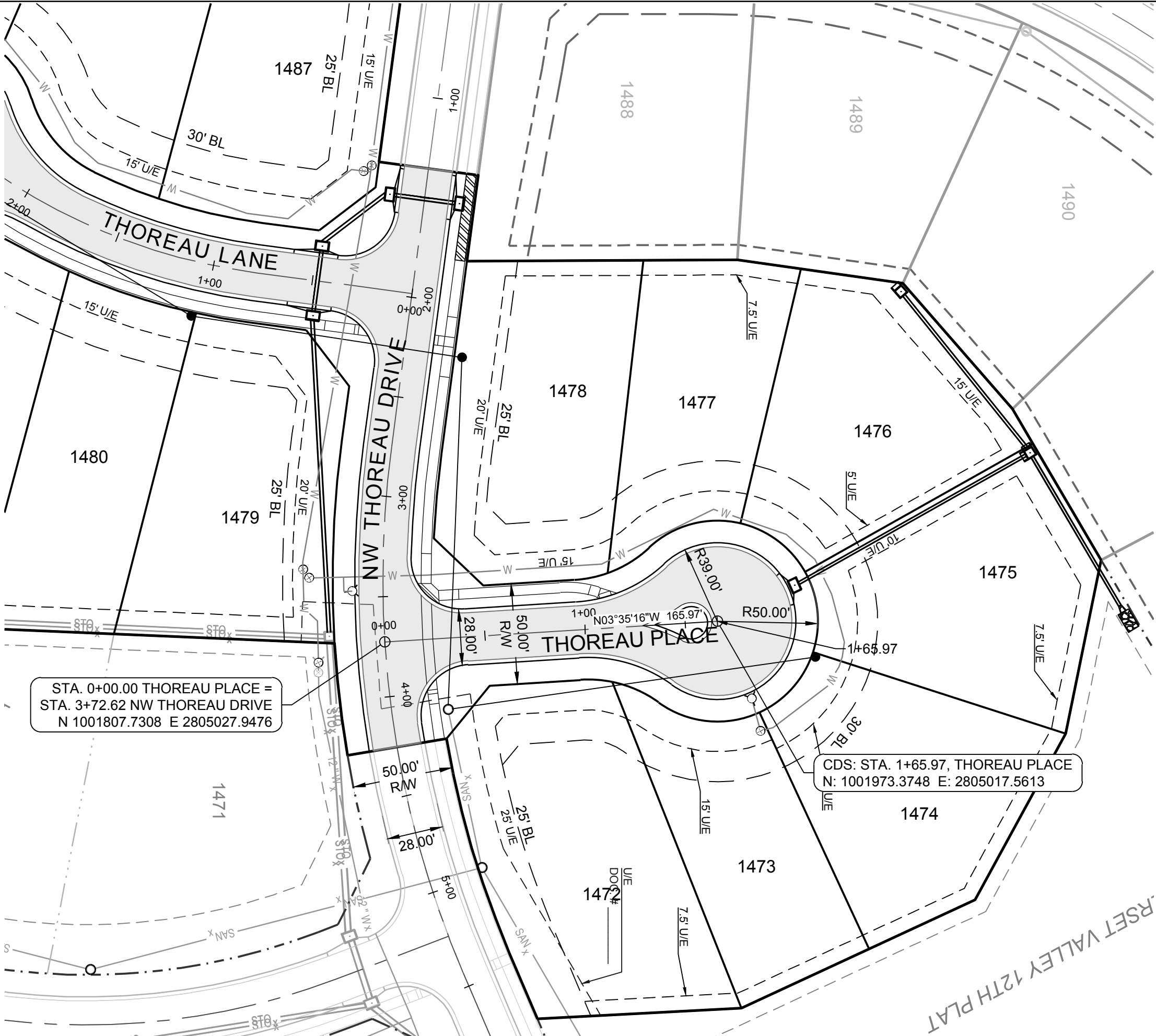
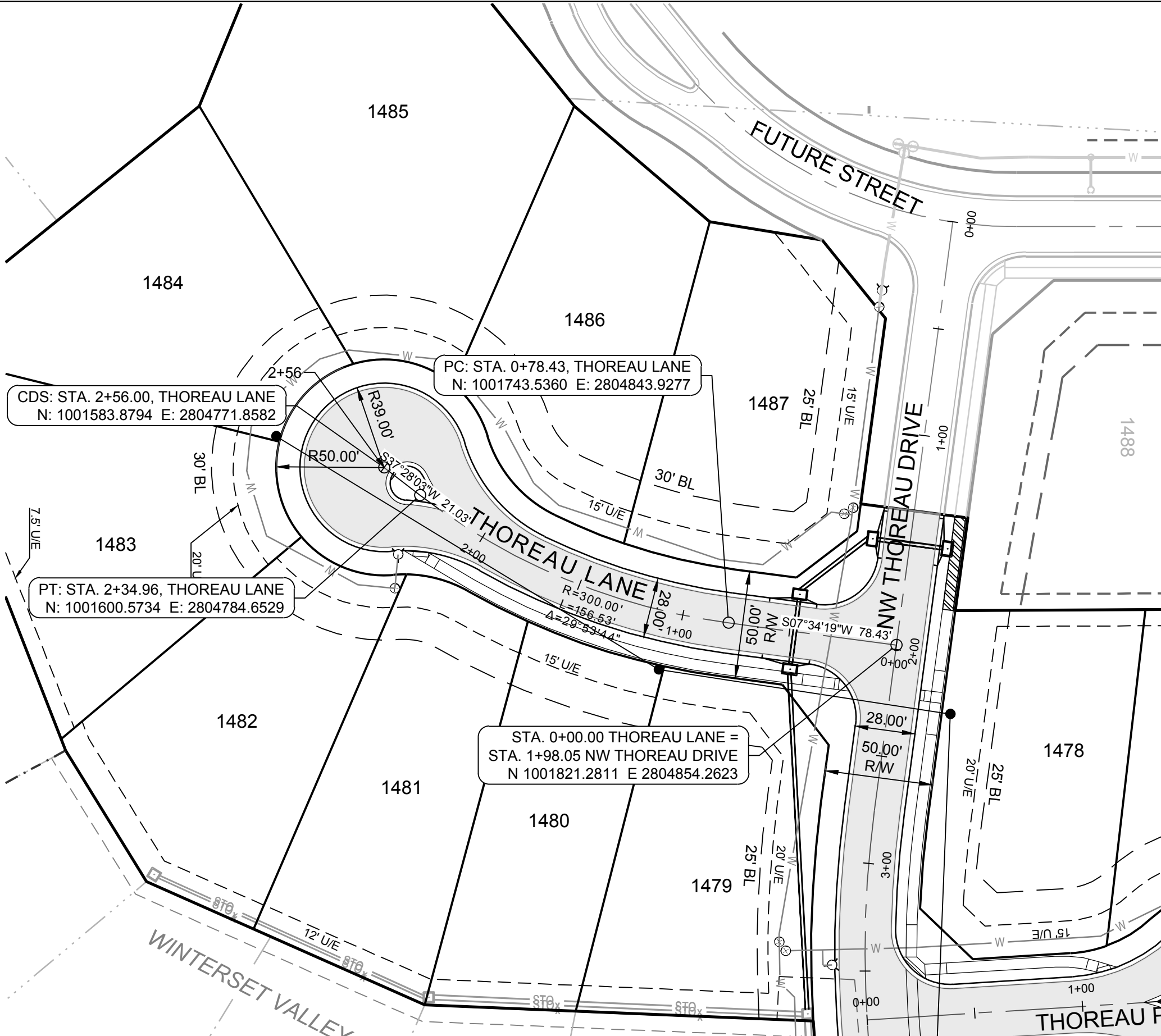


WINTERSET VALLEY, 13TH PLAT
STREET, STORMWATER, MASTER DRAINAGE
PLAN AND EROSION AND SEDIMENT CONTROL
NW THOREAU DRIVE AND AUDUBON LANE
LEE'S SUMMIT, MISSOURI

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MASTER
DRAINAGE
PLAN-DRAINAGE
MAP CONT'D

SHEET



MISSOURI GEOGRAPHIC REFERENCE SYSTEM BENCH MARK:

BM JA-136, LOCATED AT INTERSECTION OF SW OLDHAM PARKWAY AND SW WARD ROAD, 61 FT SOUTH OF CL OF OLDHAM PARKWAY AND 28.9 FT EAST OF THE EAST EDGE OF WARD ROAD.

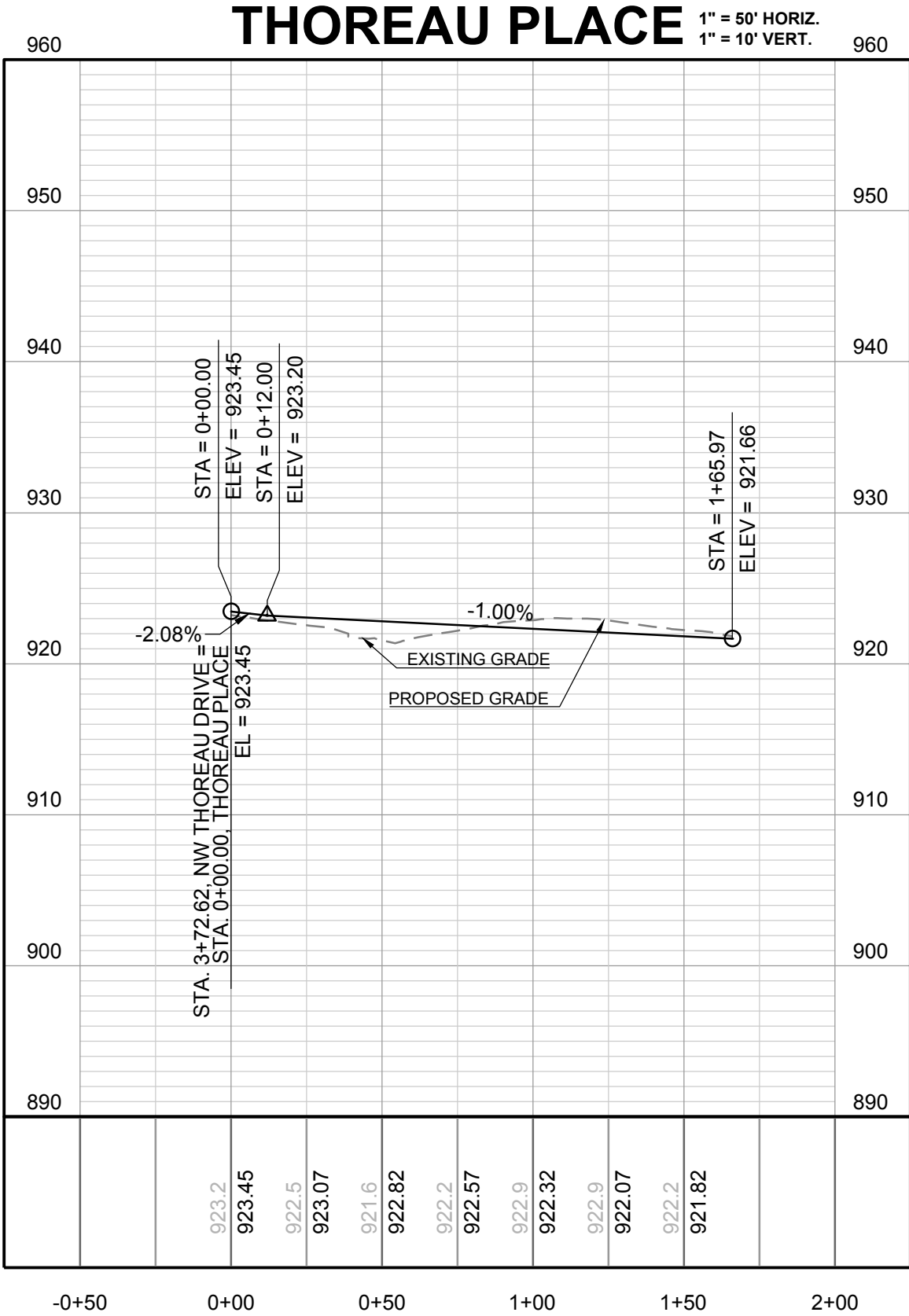
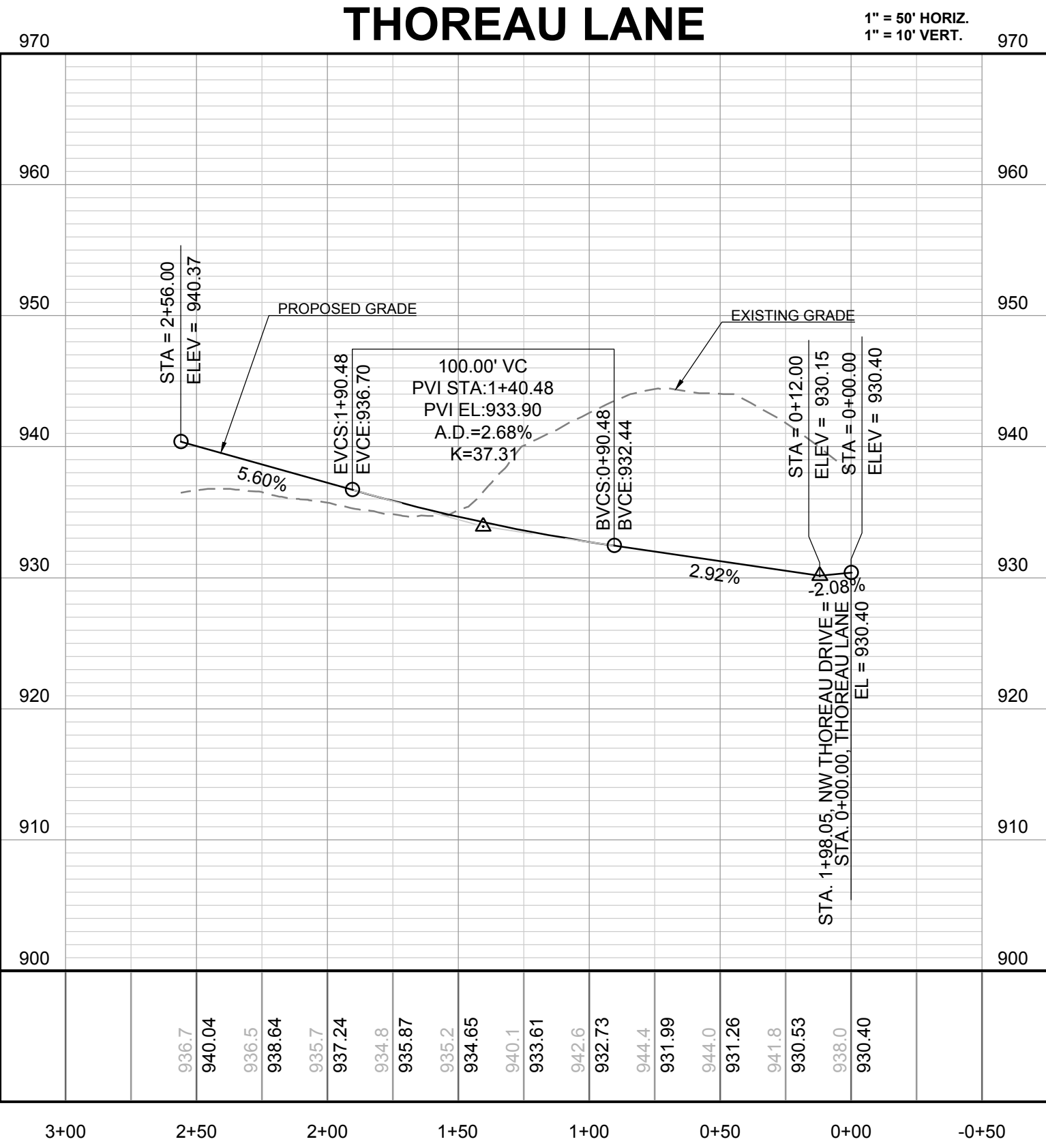
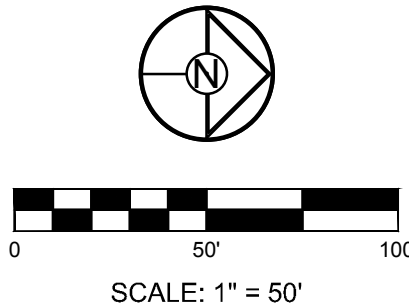
ELEV. 993.11'

PROJECT BENCH MARK:

SANITARY MANHOLE H2 AT NW CORNER OF LOT 1153 WINTERSET VALLEY 1ST PLAT, APPROX. 39' RT. OF CL OF NW PEALE BLVD.

ELEV. 935.45'

////// DENOTES SIDEWALK TO BE BUILT BY STREET CONTRACTOR



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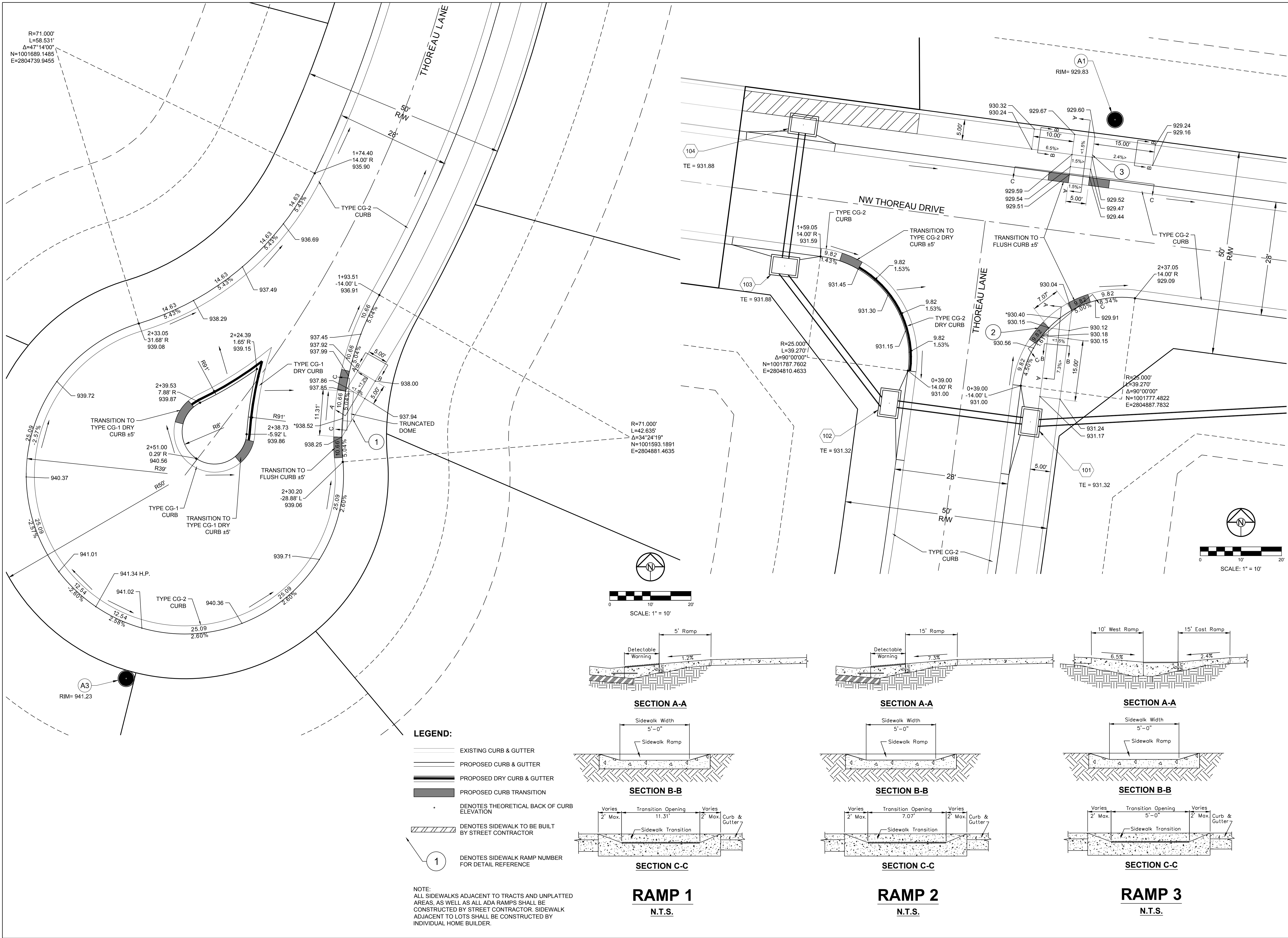
STATE OF MISSOURI
MARK ALLEN BREUER
LANDSCAPE ARCHITECT
NUMBER
RE-2005007268
08.06.19

WINTERSET VALLEY, 13TH PLAT
STREET, STORMWATER, MASTER DRAINAGE
PLAN AND EROSION AND SEDIMENT CONTROL
NW THOREAU DRIVE AND AUDUBON LANE
LEE'S SUMMIT, MISSOURI

REVISION	DATE	DESCRIPTION
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THOREAU PLACE
AND THOREAU
LANE PLAN AND
PROFILE

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WINTERSET VALLEY, 13TH PLAT
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PLAN AND EROSION AND SEDIMENT CONTROL
NW THOREAU DRIVE AND AUDUBON LANE
LEE'S SUMMIT, MISSOURI

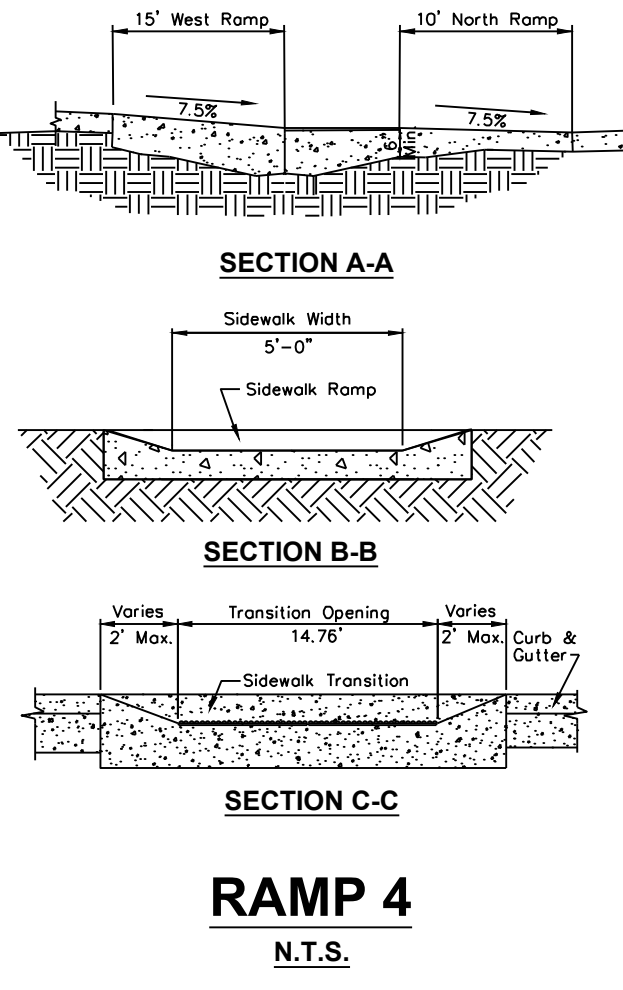
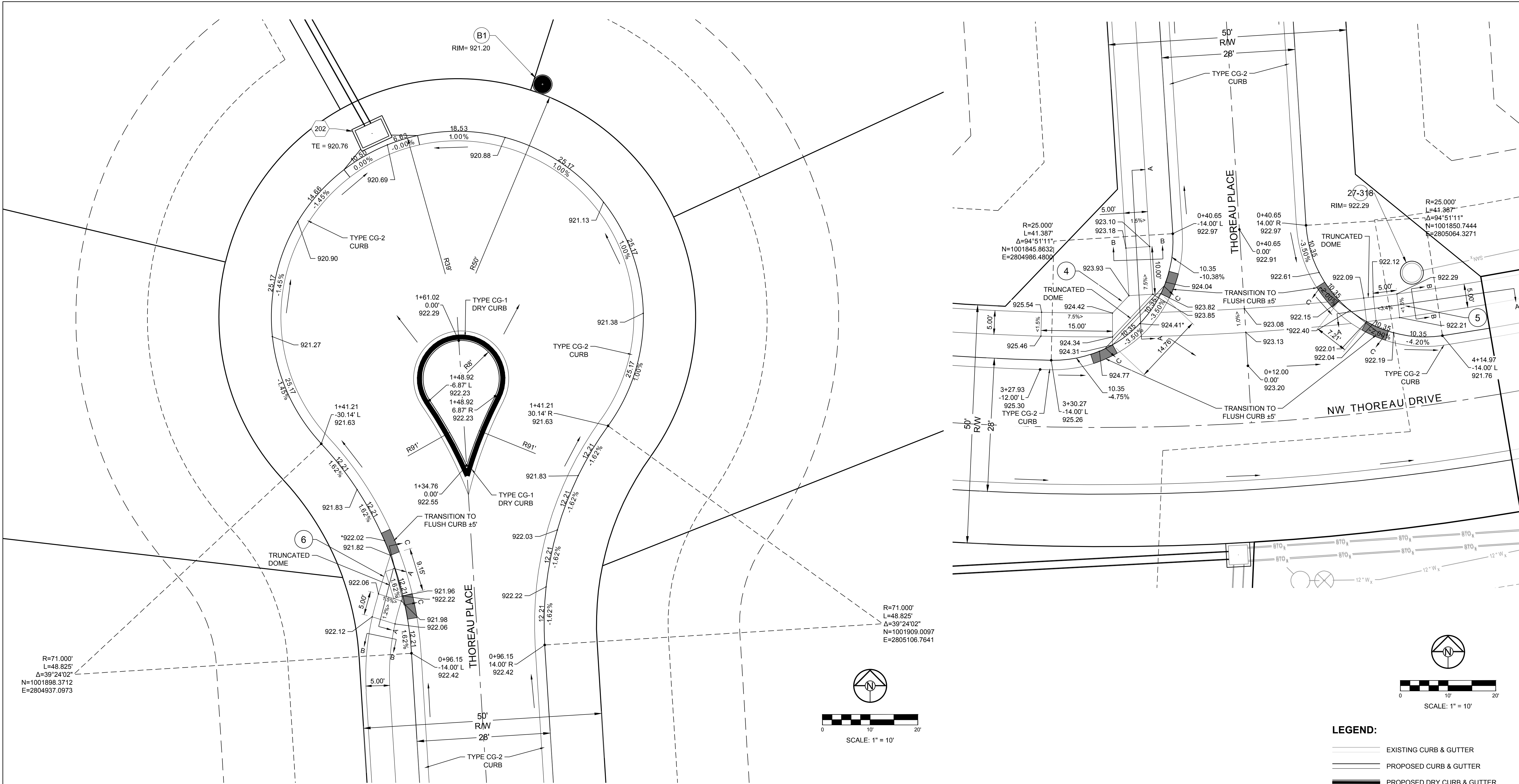
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CHECKED BY: MAB
DATE PREPARED: 2-15-19
PROJ. NUMBER: 18-230

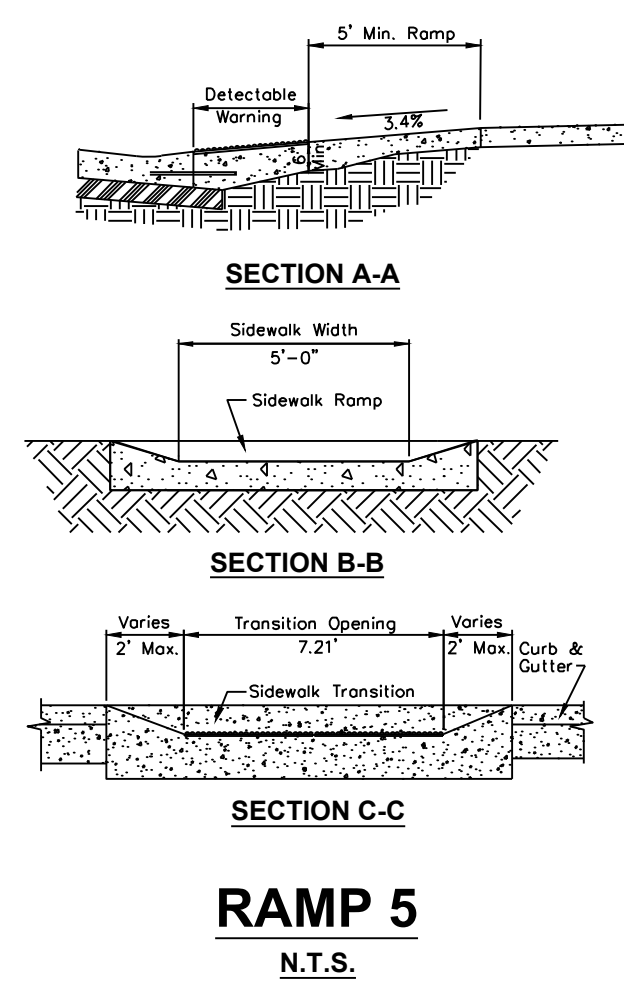
INTERSECTION
DETAILS

SHEET
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OF 24

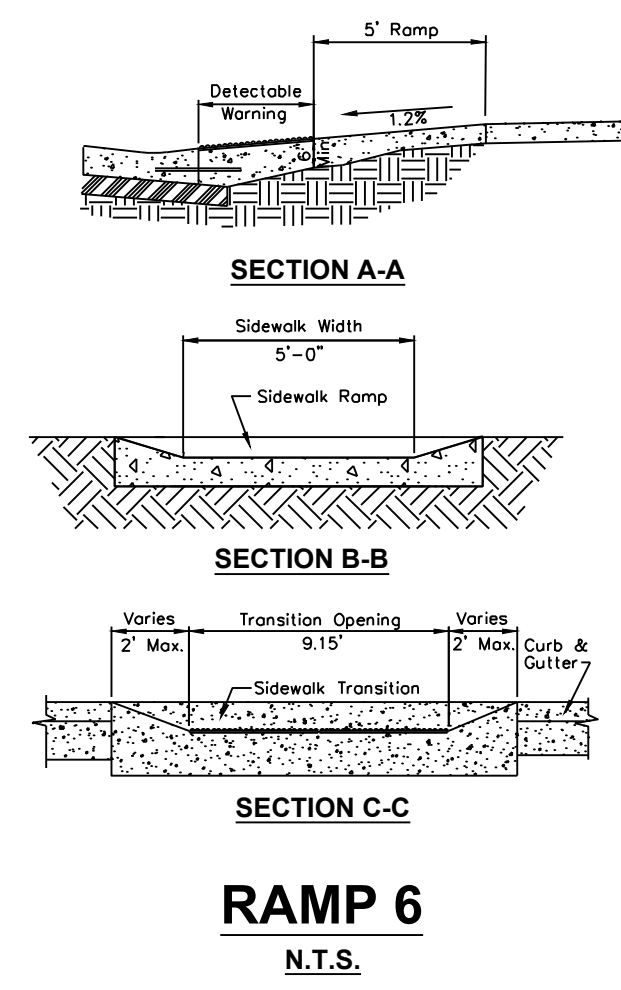
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RAMP 4
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RAMP 5
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RAMP 6
N.T.S.

LEGEND:

- EXISTING CURB & GUTTER
- PROPOSED CURB & GUTTER
- PROPOSED DRY CURB & GUTTER
- PROPOSED CURB TRANSITION
- DENOTES THEORETICAL BACK OF CURB ELEVATION
- DENOTES SIDEWALK TO BE BUILT BY STREET CONTRACTOR

NOTE:
ALL SIDEWALKS ADJACENT TO TRACTS AND UNPLATTED AREAS, AS WELL AS ALL ADA RAMP SHALL BE CONSTRUCTED BY STREET CONTRACTOR. SIDEWALK ADJACENT TO LOTS SHALL BE CONSTRUCTED BY INDIVIDUAL HOME BUILDER.

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WINTERSET VALLEY, 13TH PLAT
STREET, STORMWATER, MASTER DRAINAGE
PLAN AND EROSION AND SEDIMENT CONTROL
NW THOREAU DRIVE AND AUDUBON LANE
LEE'S SUMMIT, MISSOURI

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INTERSECTION
DETAILS

SHEET
15
OF 24

MISSOURI GEOGRAPHIC REFERENCE SYSTEM
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BM JA-136, LOCATED AT INTERSECTION OF SW OLDHAM PARKWAY AND SW WARD ROAD, 61 FT SOUTH OF CL OF OLDHAM PARKWAY AND 28.9 FT EAST OF THE EAST EDGE OF WARD ROAD.

ELEV. 993.11'

PROJECT BENCH MARK:

SANITARY MANHOLE H2 AT NW CORNER OF LOT 1153 WINTERSET VALLEY 1ST PLAT, APPROX. 39' RT. OF CL OF NW PEALE BLVD.

ELEV. 935.45'

Storm Sewer Construction Notes	
Structure	Notes
101	STA 1+60.03, LINE 100 INSTALL 6 X 4 CURB INLET N 1001771.8893 E 2804865.3506
102	STA 1+95.03, LINE 100 INSTALL 6 X 4 CURB INLET N 1001776.5013 E 2804830.6558
103	STA 2+37.43, LINE 100 INSTALL 6 X 4 CURB INLET N 1001810.1882 E 2804804.9060
104	STA 2+72.43, LINE 100 INSTALL 6 X 4 CURB INLET N 1001844.8828 E 2804809.5179
200	STA -0+00.04, LINE 200 INSTALL 18 INCH HDPE END SECTION W/ TOEWALL AND 5 CY STONE RIP RAP N 1002174.0148 E 2805009.7732
201	STA 0+88.27, LINE 200 INSTALL 4 X 4 AREA INLET WITH OPENING TO SOUTHEAST F.F.B. S30°27'54"E N 1002129.2388 E 2804933.6522
202	STA 2+22.88, LINE 200 INSTALL 6 X 4 CURB INLET N 1002011.9194 E 2804999.6569
301	STA 1+02.91, LINE 300 INSTALL 4 X 4 AREA INLET WITH OPENING TO SOUTHEAST F.F.B. S41°03'59"E N 1002064.8666 E 2804853.3638
400	STA 0+00.00, LINE 400 INSTALL 42" HDPE END SECTION W/ TOEWALL AND 8 CY STONE RIP RAP N 1002306.4992 E 2805286.6945
401	STA 0+74.07, LINE 400 INSTALL 6 X 6 CURB INLET N 1002373.9490 E 2805317.2915
402	STA 1+10.07, LINE 400 INSTALL 6 X 4 CURB INLET N 1002409.3973 E 2805323.5696
500	STA 0+16.27, LINE 500 INSTALL 42" HDPE END SECTION W/ TOEWALL AND SCOUR BASIN N 1002503.0403 E 2805400.4139
501	STA 2+53.53, LINE 500 INSTALL 5 X 5 DETENTION STRUCTURE W/ ORIFICE TO SOUTHWEST F.F.B. S55°25'42"E N 1002307.7744 E 2805265.6422

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MARK ALLEN
BREWER
NUMBER
PE-2003507208
08.06.19

WINTERSET VALLEY, 13TH PLAT
STREET, STORMWATER, MASTER DRAINAGE
PLAN AND EROSION AND SEDIMENT CONTROL
NW THOREAU DRIVE AND AUDUBON LANE
LEE'S SUMMIT, MISSOURI

	REVISION DATE		DESCRIPTION
	CITY COMMENTS		
DRAWN BY:	1	4-10-19	
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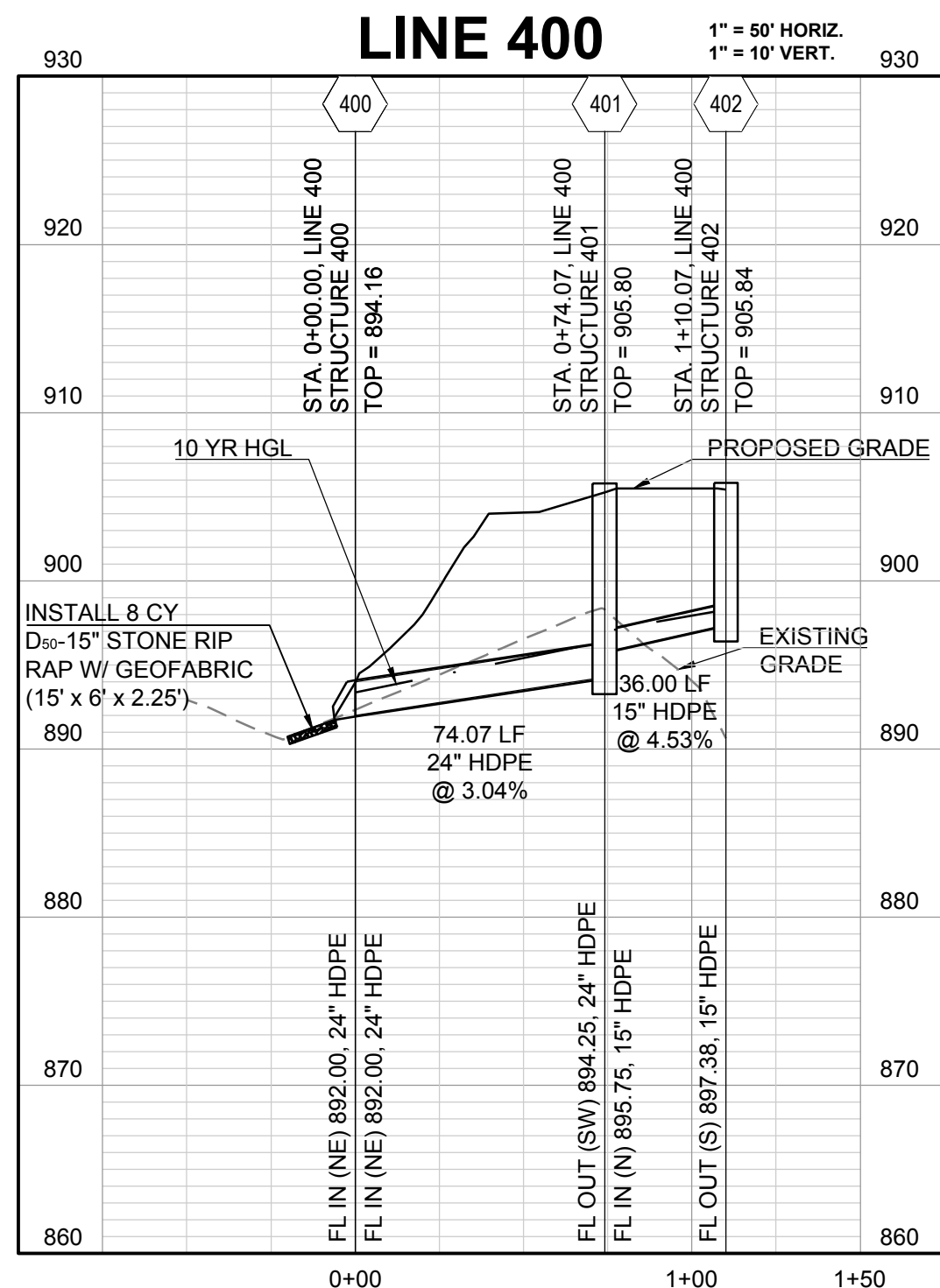
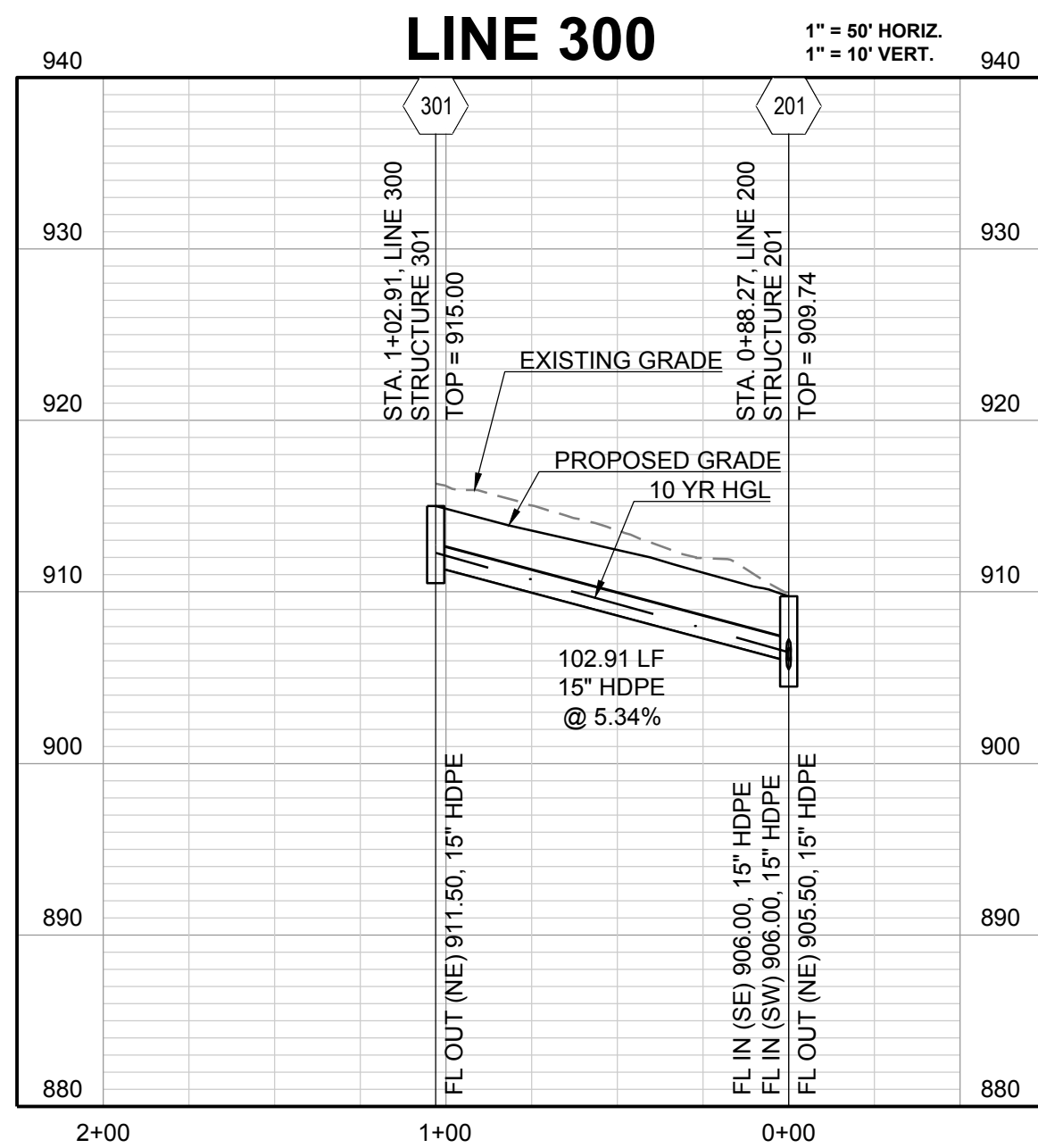
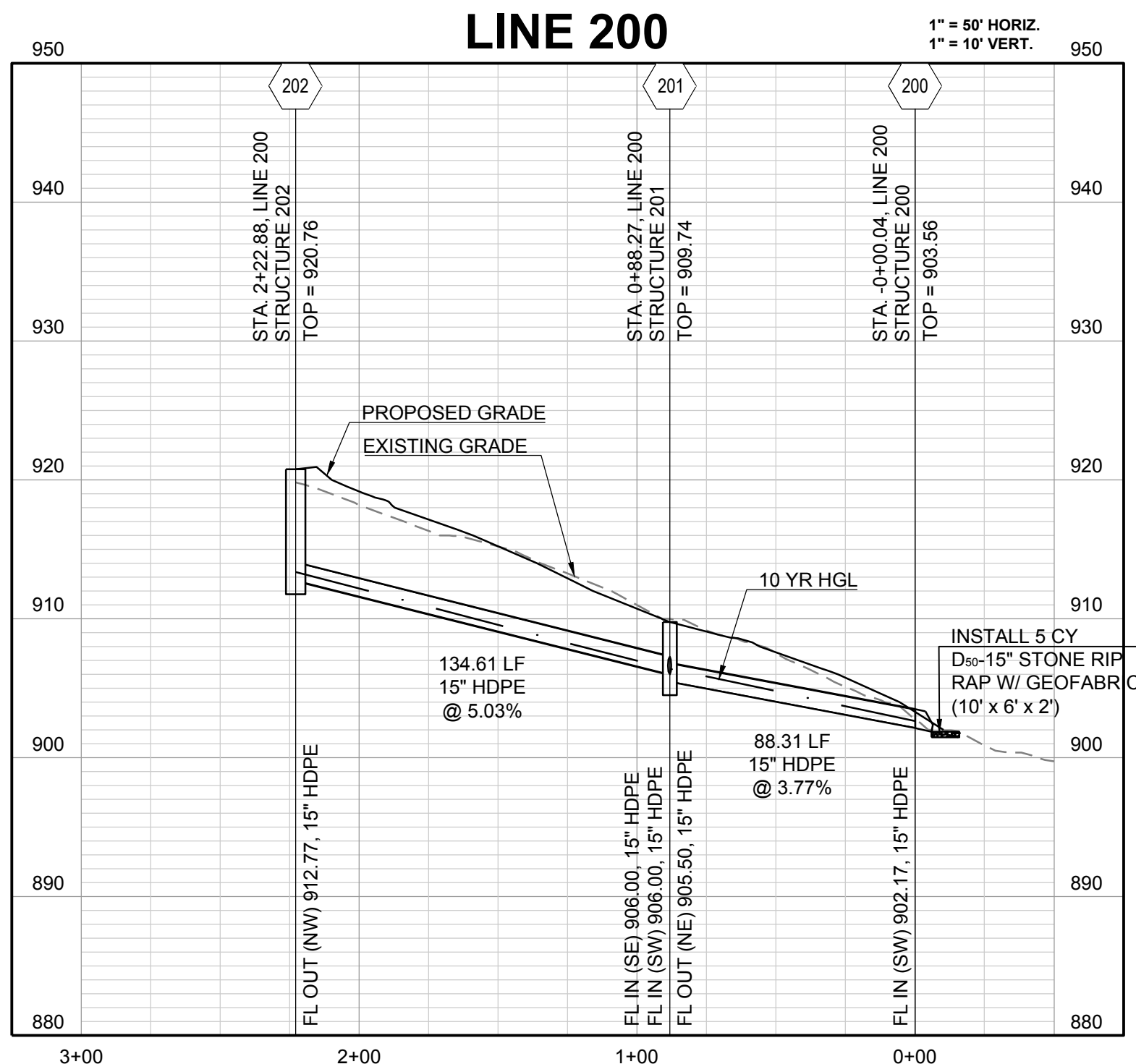
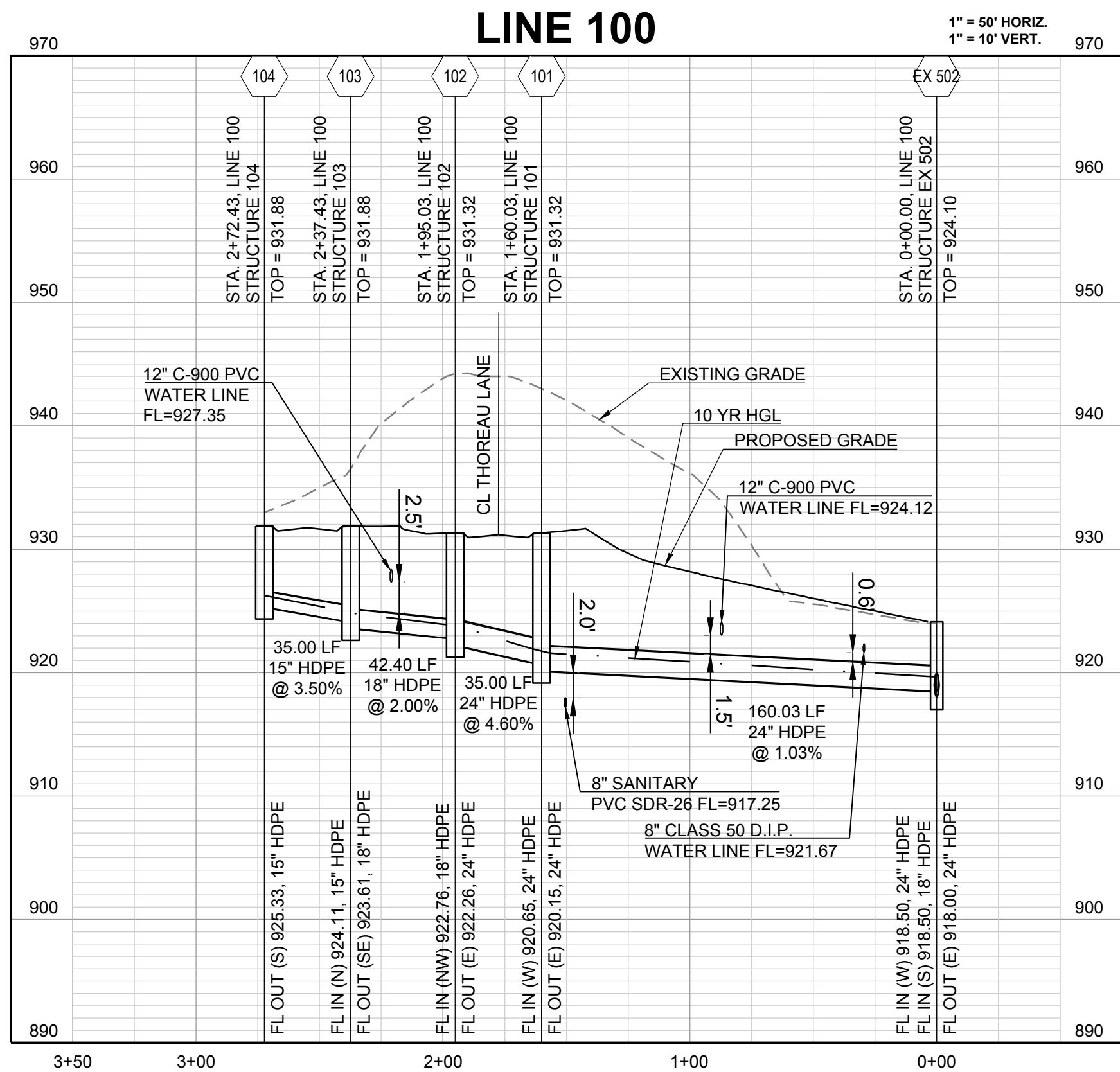
STORM PLAN

SHEET

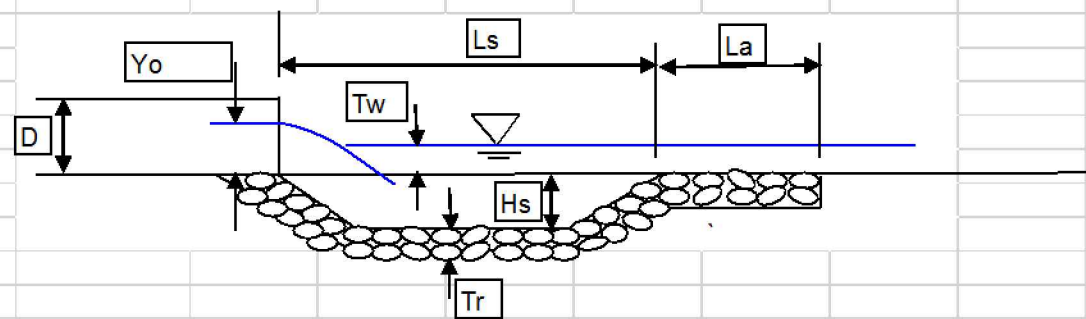
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SCOUR BASIN DESIGN SHEET v1.1



DESIGN NOTES:

1. Tailwater is considered low if $Yo/Tw < 0.75$. When this ratio is greater than 0.75, it is considered a HIGH tailwater condition and additional design considerations are necessary.
2. It is necessary to refer to Figure XI-2 in HEC-14 to obtain the value for Hs/Ye .
3. Acceptable range of values for $Hs/d50$ is between 2 and 4.
4. Basin width shall be defined by receiving swale width, or $3 \cdot D$ if no swale
5. Outlet section type must be specified as either a PIPE (circular) or BOX (rectangular).
6. This Design is only applicable to outlets with Froude #'s < 3 and > 1 . For Froude #'s less than 1, a scour basin is generally not needed. For Froude #'s greater than 3, Energy dissipators may be required.

OUTLET STRUCTURE	Velocity (ft/s)	Diameter (ft)	Section Type	Tw (ft)	Tailwater Condition	Ye (ft)	d50 (ft)	Tr (ft)	d50/Ye	Froude#	Hs/Ye (figure XI-2) HEC-14	Hs (ft)	Hs/d50 (>2, <4)	La (10*Hs or 3*D)	La (5*Hs or D)
500	21.56	4.00	PIPE	0.50	LOW	4.00	2.00	4.00	0.50	1.90	1.40	5.60	2.80	56.00	28.00

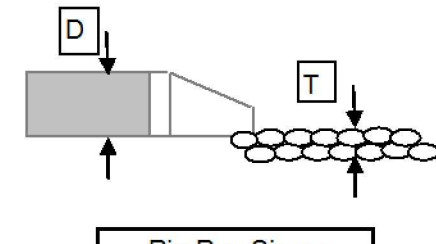
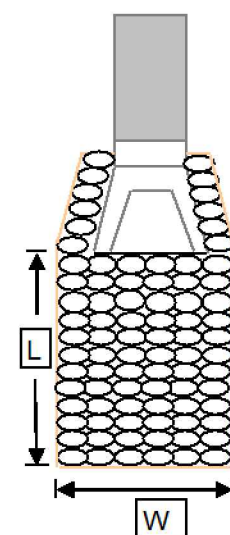
VARIABLES:

Hs=Depth of Scour Basin
Ls=Length of Basin
La=Length of Apron
Ws=Width of basin
d50=median riprap size
Q=discharge
Yo=Pipe flow Depth
Tw=Tail Water
D=box culvert height or Pipe Diameter
Ye=Effective flow depth($Ye=Yo$ for rectangular sections)
Tr=Thickness of Rip-Rap

Rip-Rap Sizes:

0.25 (ft)
0.50 (ft)
0.75 (ft)
1.00 (ft)
1.50 (ft)
2.00 (ft)

OUTLET RIP-RAP DESIGN WORKSHEET v1.0



Rip-Rap Sizes:	
0.50 (10#)	(ft)
0.75 (25#)	(ft)
1.00 (50#)	(ft)
1.50 (100#)	(ft)
2.00 (200#)	(ft)

DESIGN NOTES:

1. Rip-Rap width calculated to be either $D+4 \cdot 3 \cdot D$, or top width of channel, whichever is greater
2. Rip-Rap length calculated to be $1/(2 \cdot \tan(e)) \cdot (A/Yt-3)$, where $e=20^\circ$, A =flow area, and Yt =normal depth
3. $D50$ calculated using $(1/2) \cdot (1.384 \cdot V^2 / (s-1) \cdot 2g)$ (Eqn. 10, pg. 32, HEC-11), where V =Outlet Velocity, s =Specific Gravity of Stone=2.65, and $g=32.2$
4. Critical Shear Stresses provided by A.P.W.A. 5600
5. Rip-Rap thickness equals $2 \cdot D50$ for 12" and smaller rip-rap, and $1.5 \cdot D50$ for larger than 12"

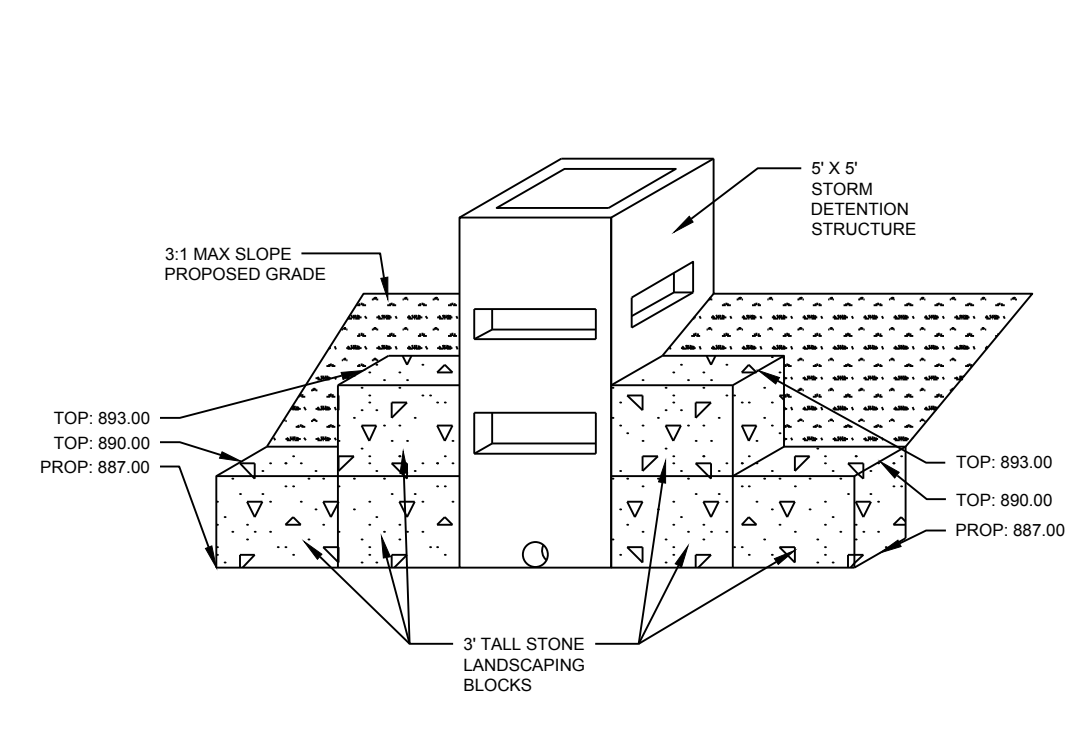
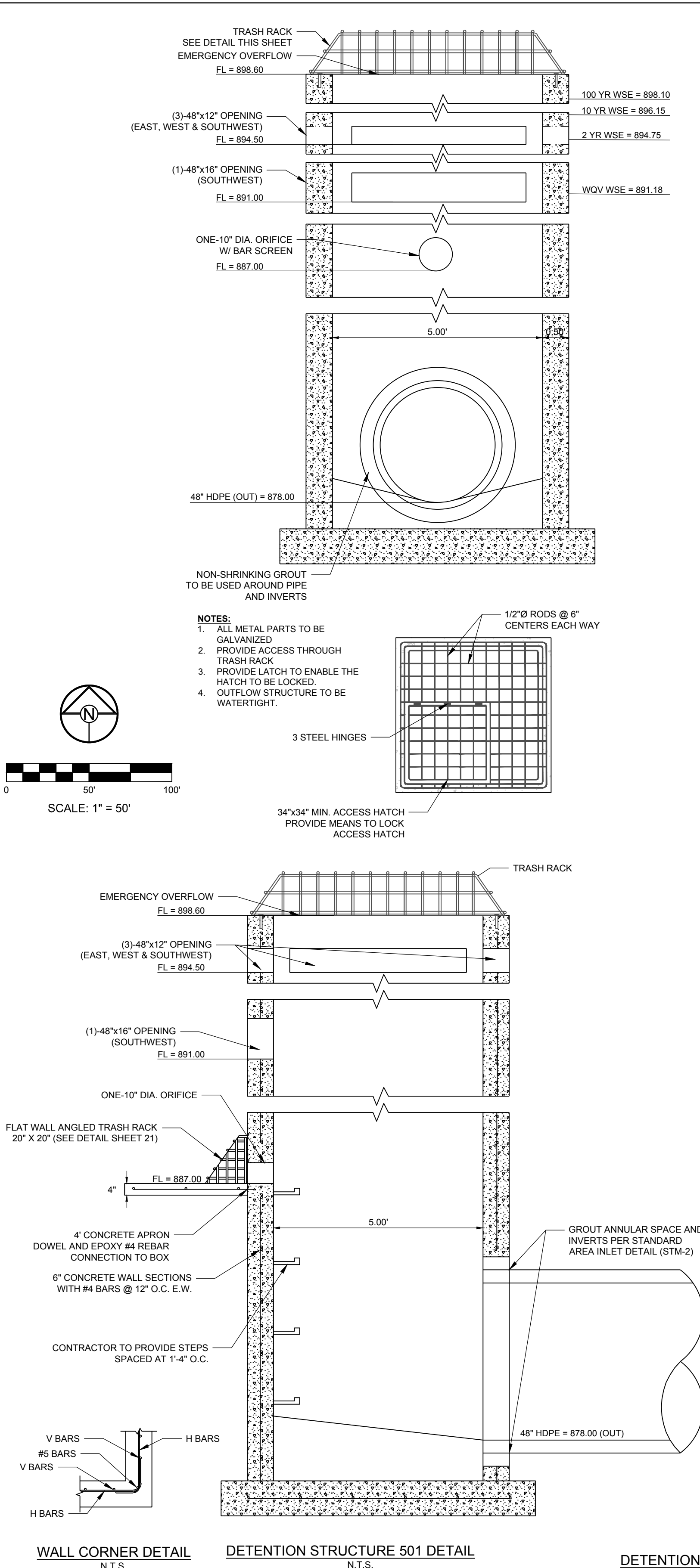
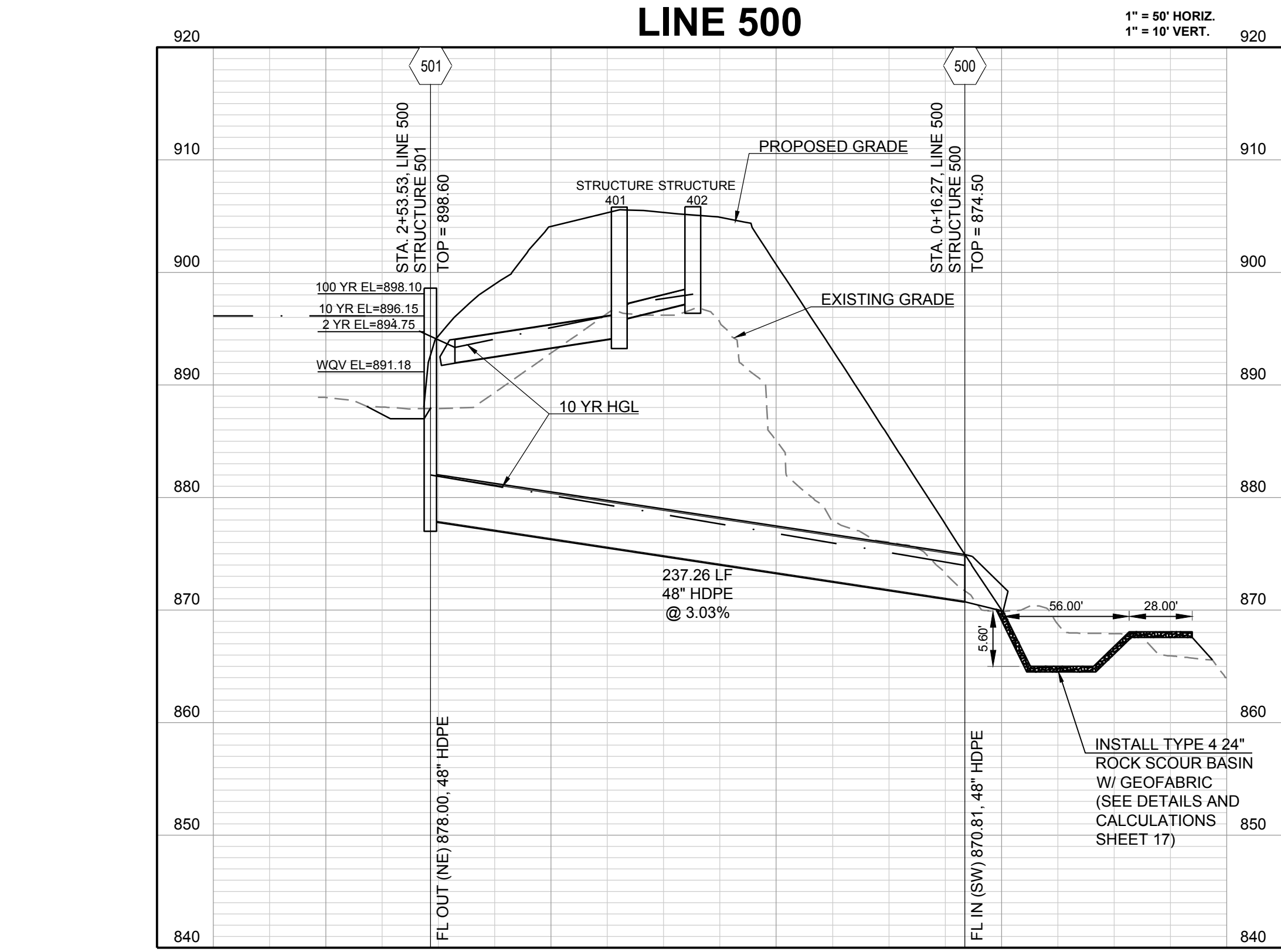
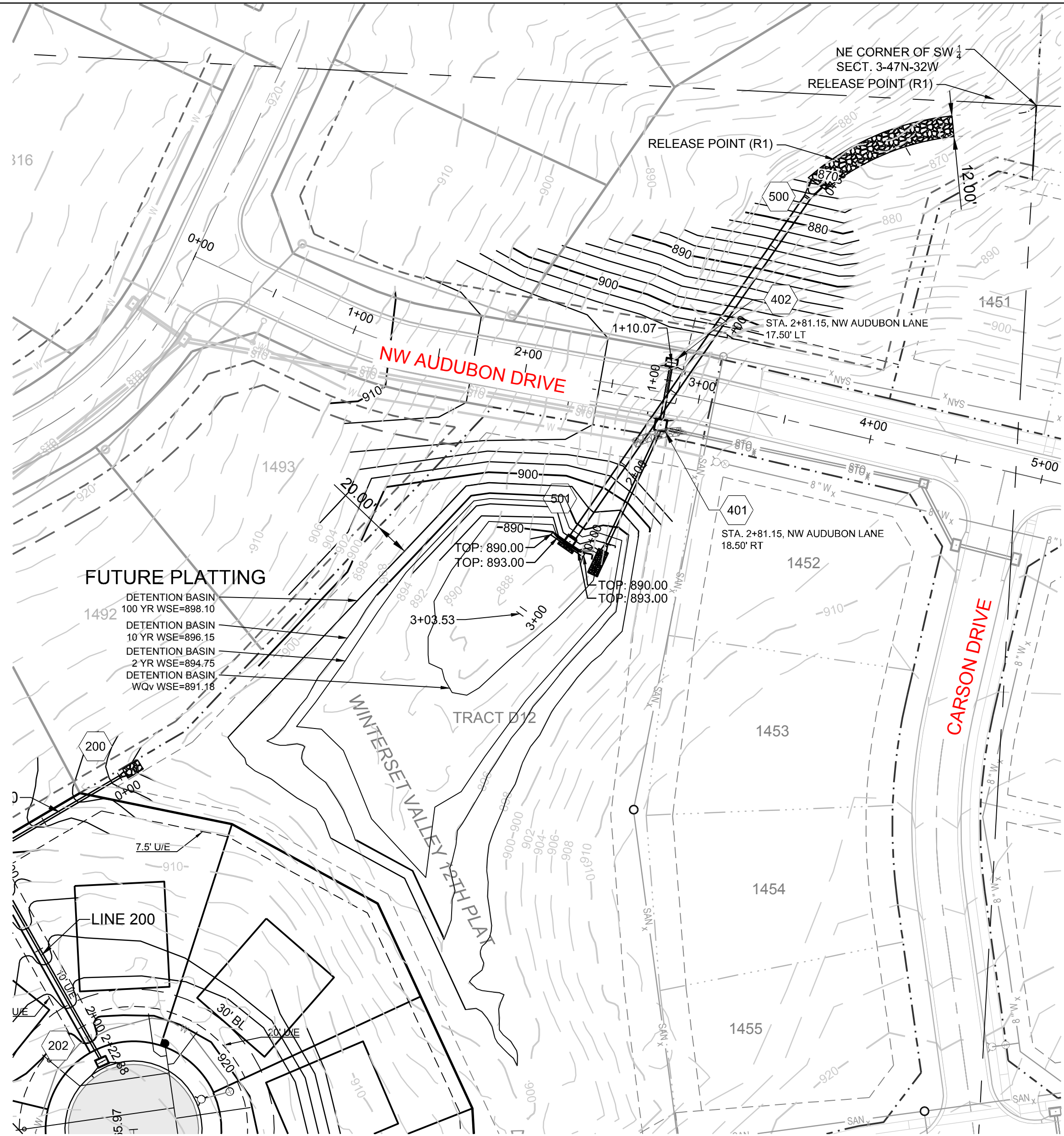
Outlet/Channel Properties						Rip-Rap Dimensions									
Outlet Structure	Pipe Size (ft)	Downstream Channel/Swale Section	V Pipe (ft/s)	V Swale (ft/s)	Average Shear Stress (lb/ft ²)	W Calculated (ft)	W USED (ft)	L Calculated (ft)	L (min.) 3'D (ft)	L (max.) 10'D (ft)	L USED (ft)	D50 Calculated (in)	Size (Wt.) USED (d50,in)	Critical Shear Stress (lb/ft ²)	T (ft)
200	1.25	N/A	11.07	N/A	N/A	5.25	6	n/a	3.75	12.50	10	0.80	1.00 (50#)	4.00	2.00
400	2.00	N/A	14.04	N/A	N/A	6.00	6	n/a	6.00	20.00	15	1.28	1.50 (100#)	5.16	2.25

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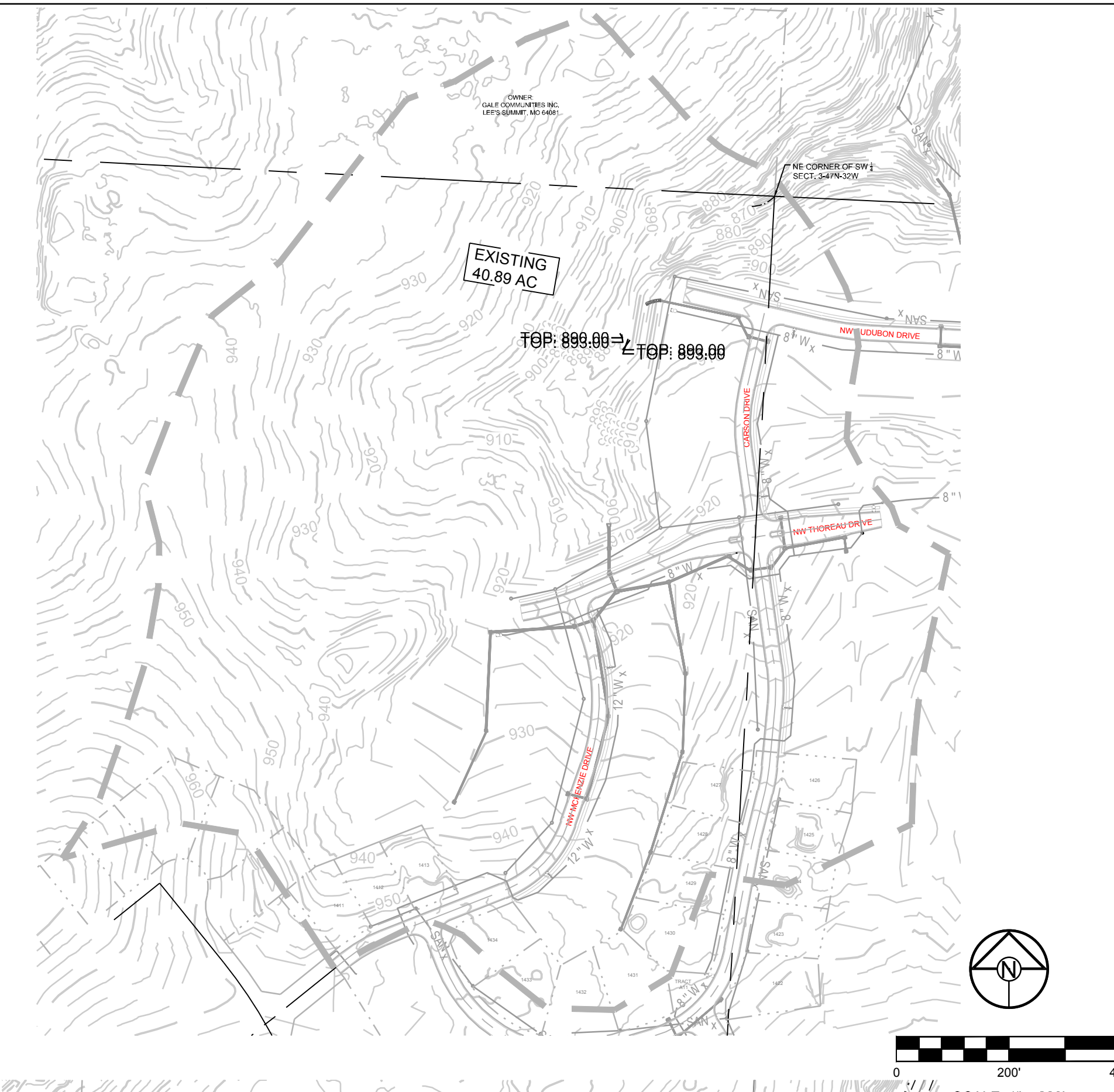
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STORM PROFILES

SHEET



DETENTION BASIN STORAGE/DISCHARGE TABLE			
STORAGE ELEVATION (FEET)	STORAGE AREA (SQUARE FEET)	STORAGE VOLUME (CUBIC FEET)	DISCHARGE (CFS)
887	376	536	0.00
888	732	912	2.01
889	2,318	3,230	3.30
890	3,903	5,547	4.22
891	6,038	11,585	4.97
892	8,472	17,622	18.46
893	11,222	28,844	35.53
894	14,272	40,066	45.83
895	18,728	58,794	67.66
896	23,184	77,522	118.24
897	27,683	105,205	148.89
898	32,181	132,887	173.10
899	39,096	171,983	207.18
900	46,011	211,079	270.59



DETENTION BASIN DESIGN INFORMATION				
	AREA (AC)	CN	Tc (MIN)	100 YR RUNOFF (CFS)
EXISTING DRAINAGE AREA	40.89	80	21.40	237.98
PROPOSED DRAINAGE AREA	35.42	86	16.10	262.19
PROPOSED ONSITE DETENTION BYPASS	4.34	86	12.90	35.42
DETENTION BASIN RELEASE RATE	---	---	---	175.19
FLOW AT RELEASE POINT	---	---	---	195.40

MAX. ALLOWABLE FLOW = EXISTING FLOW = 237.98 CFS
TOTAL DEVELOPED CONDITION 100 YR RELEASE RATE TO R1 = 195.40 CFS < 237.98 CFS
EXISTING WATER QUALITY = 7.09 CFS
PROPOSED WATER QUALITY = 6.71 CFS < 7.09 CFS

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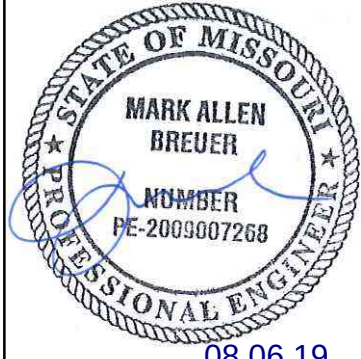
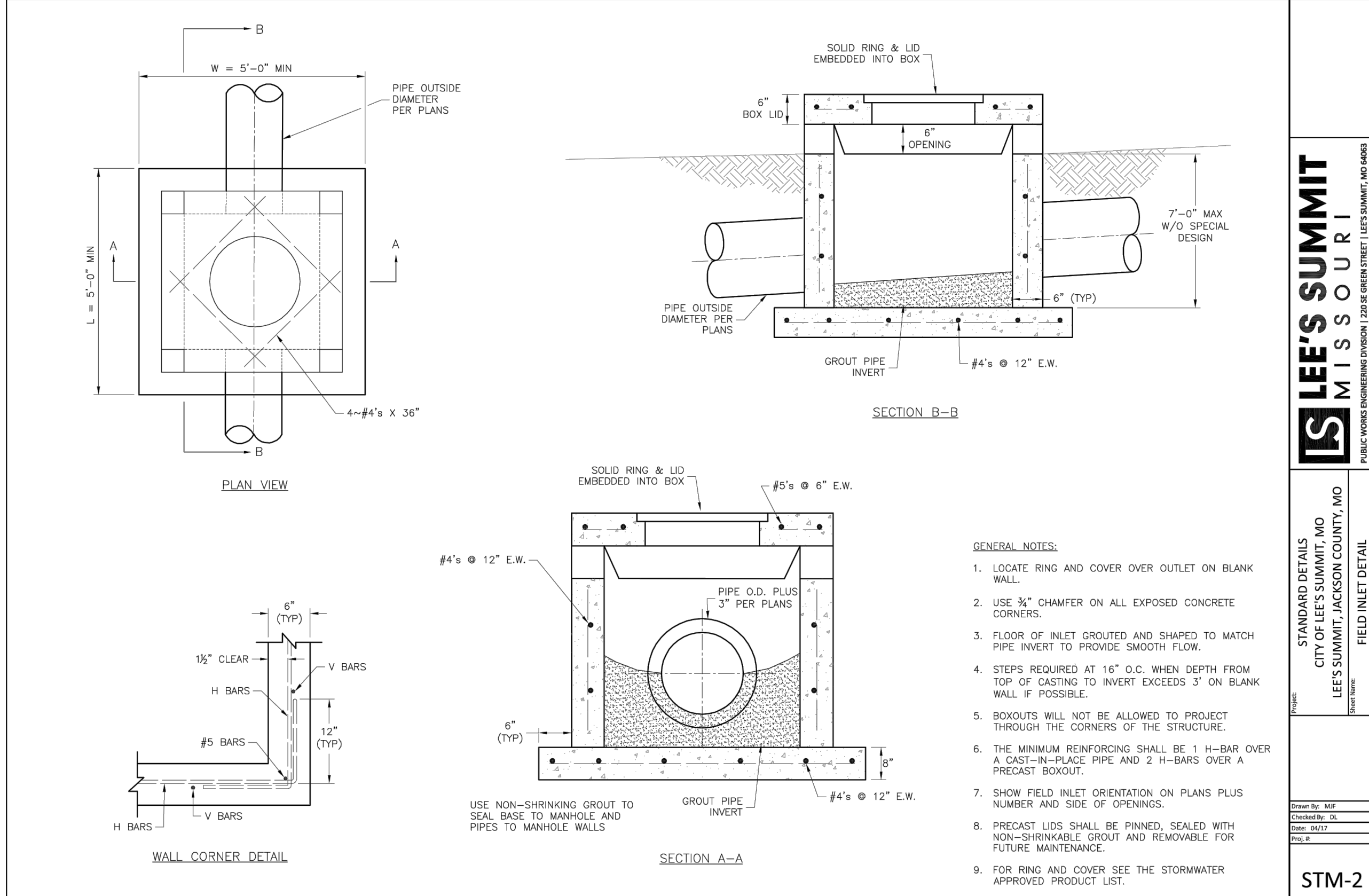
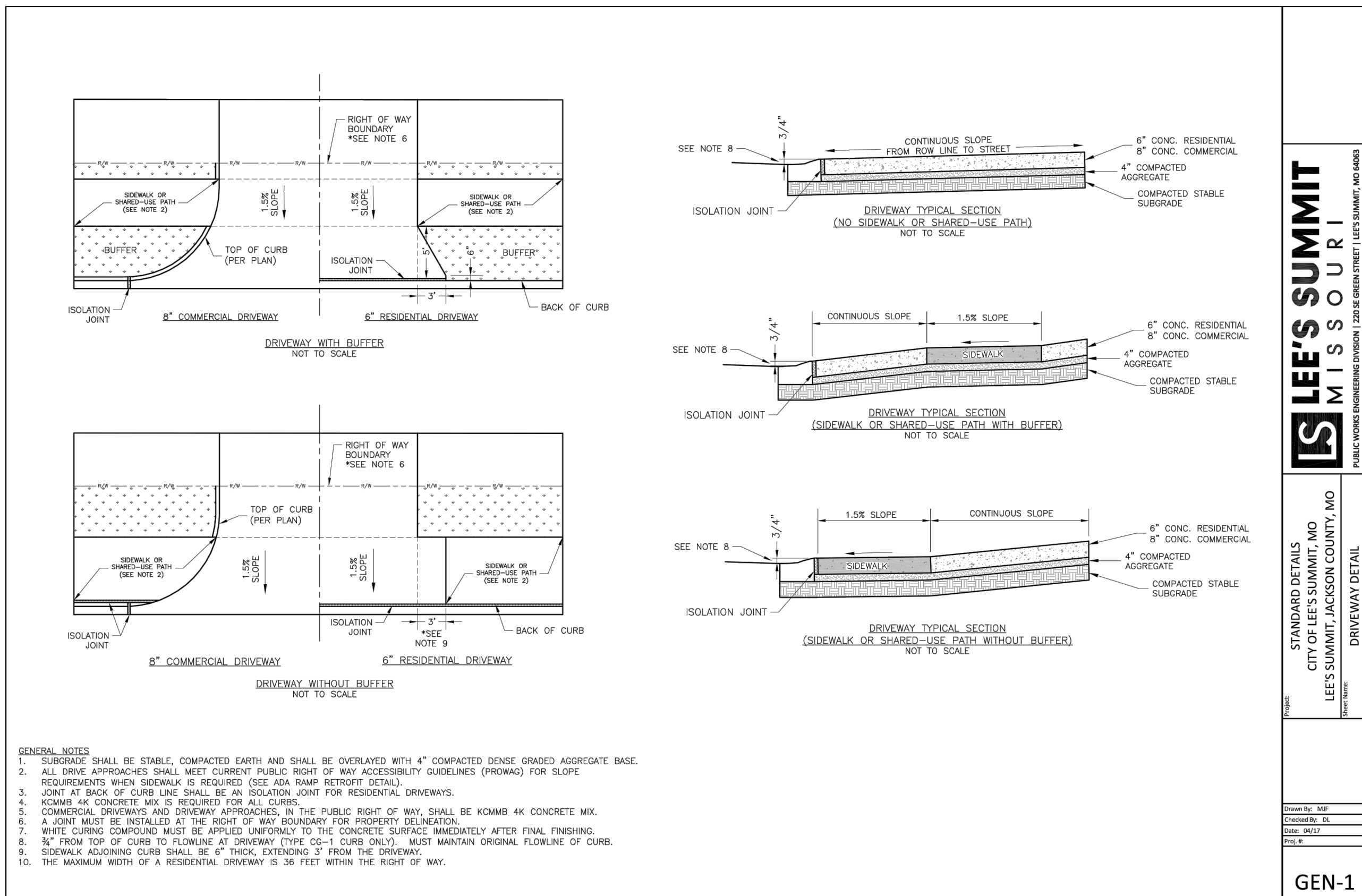
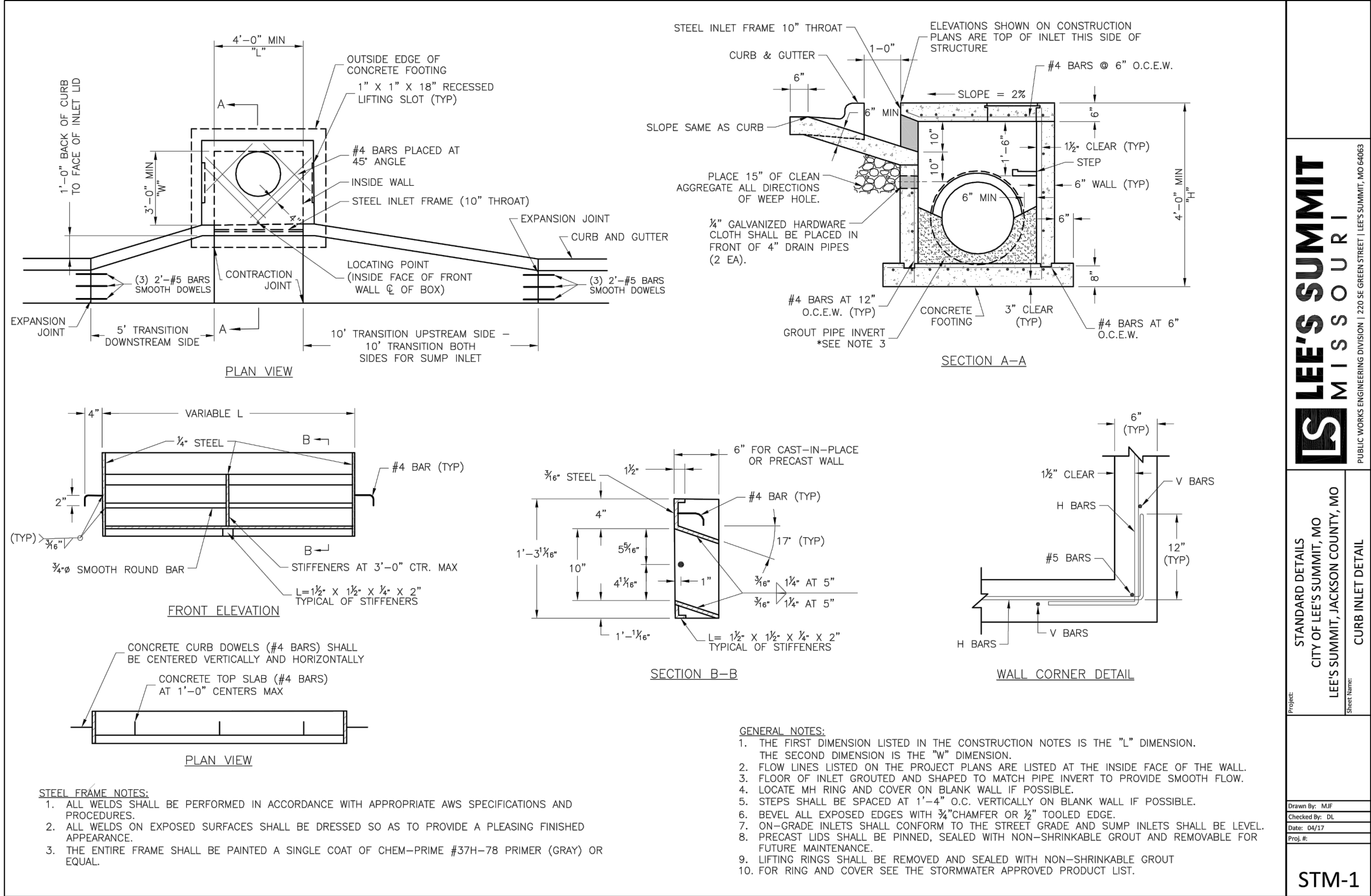
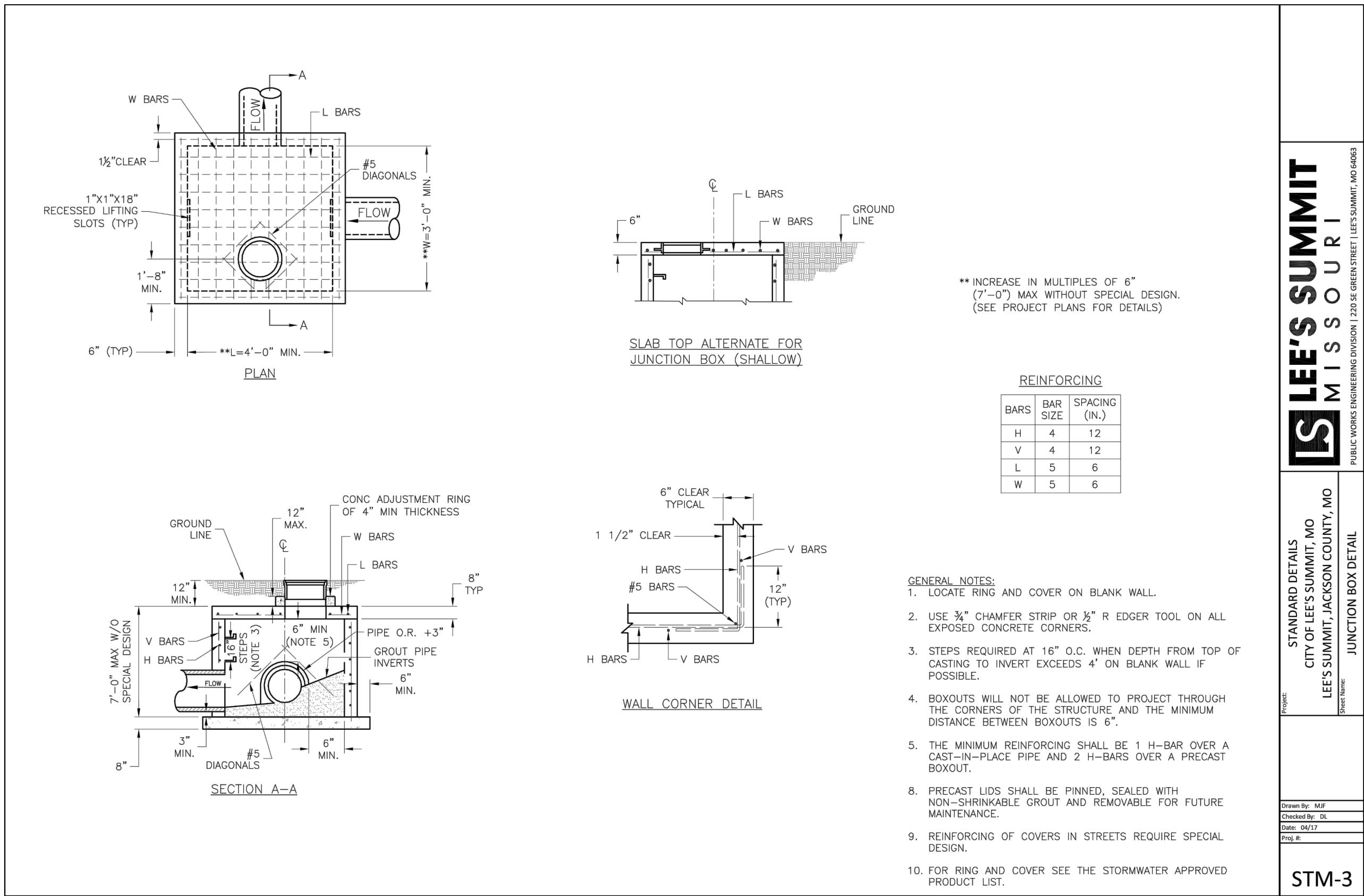
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DETENTION BASIN

SHEET

18

OF 24



WINTERSET VALLEY, 13TH PLAT
STREET, STORMWATER, MASTER DRAINAGE PLAN AND
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8	8-1-19	CITY COMMENTS

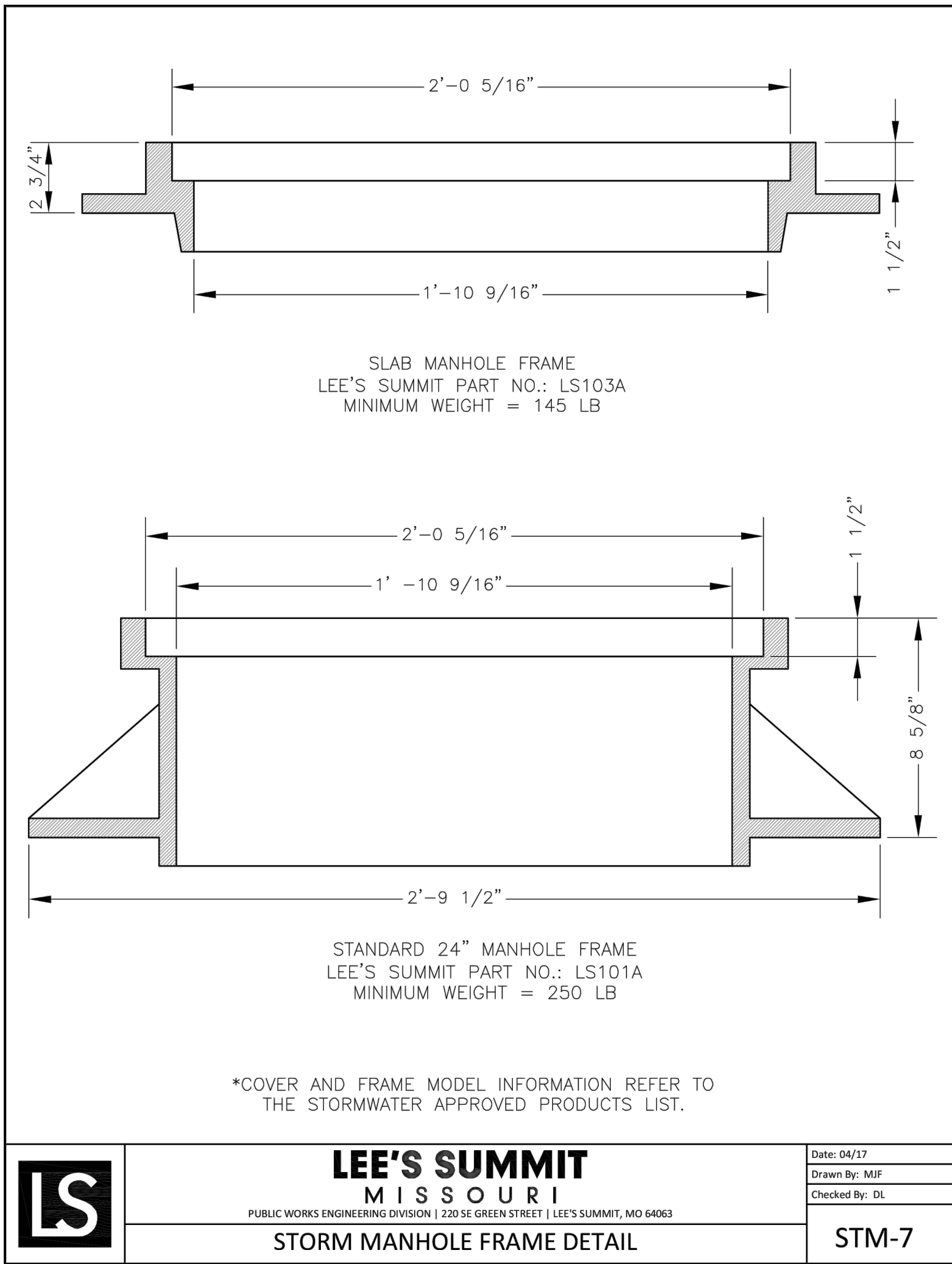
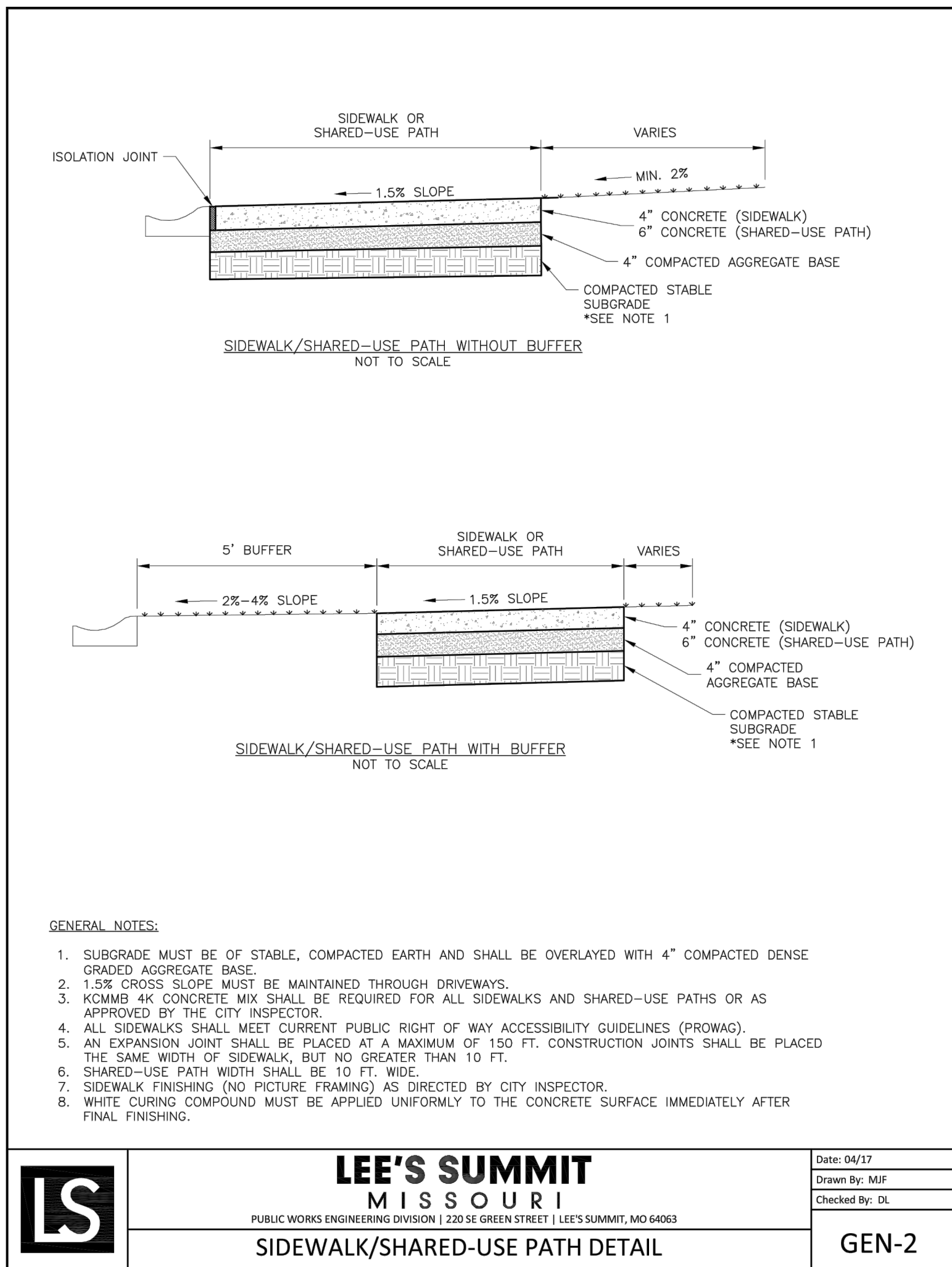
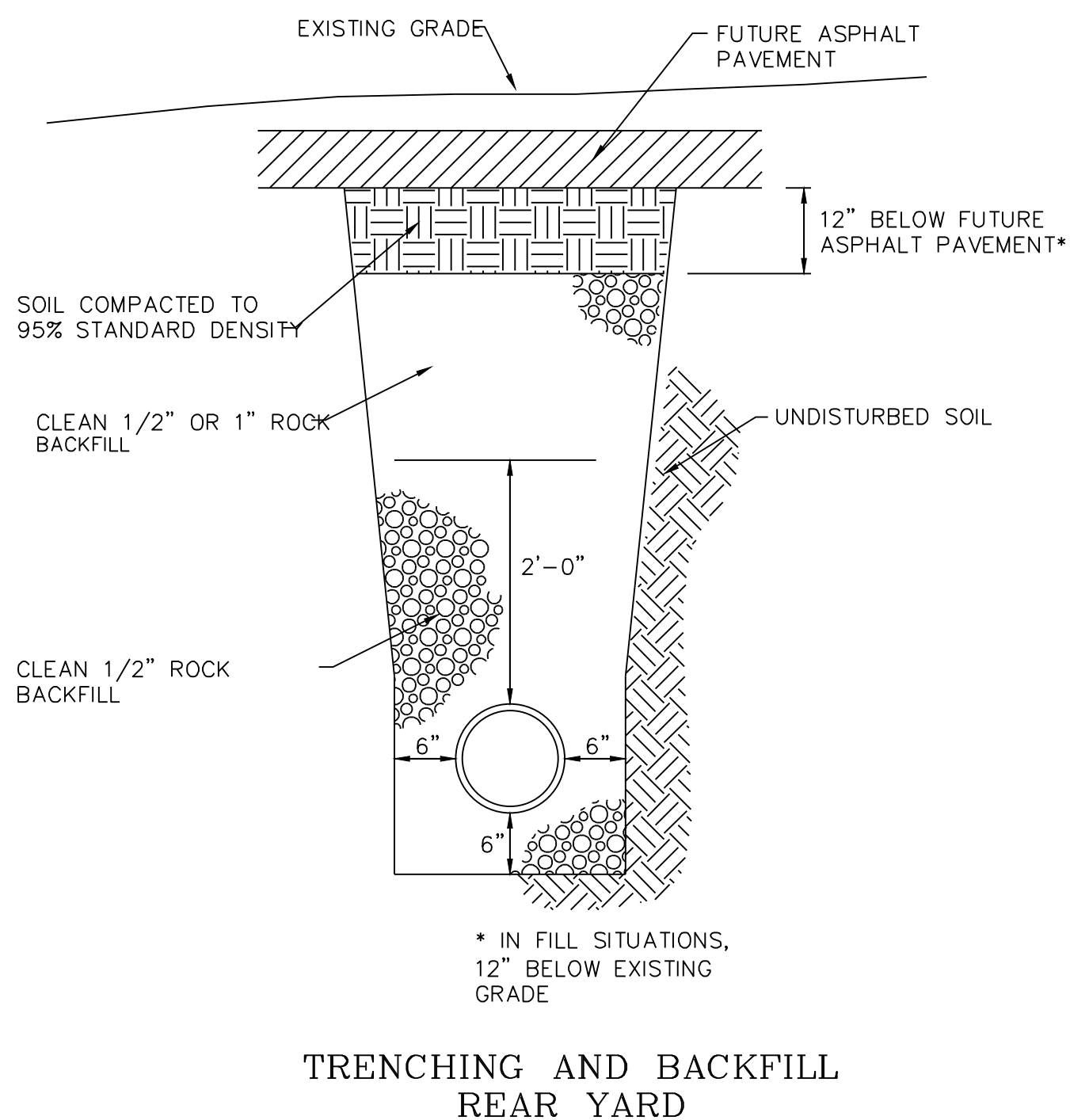
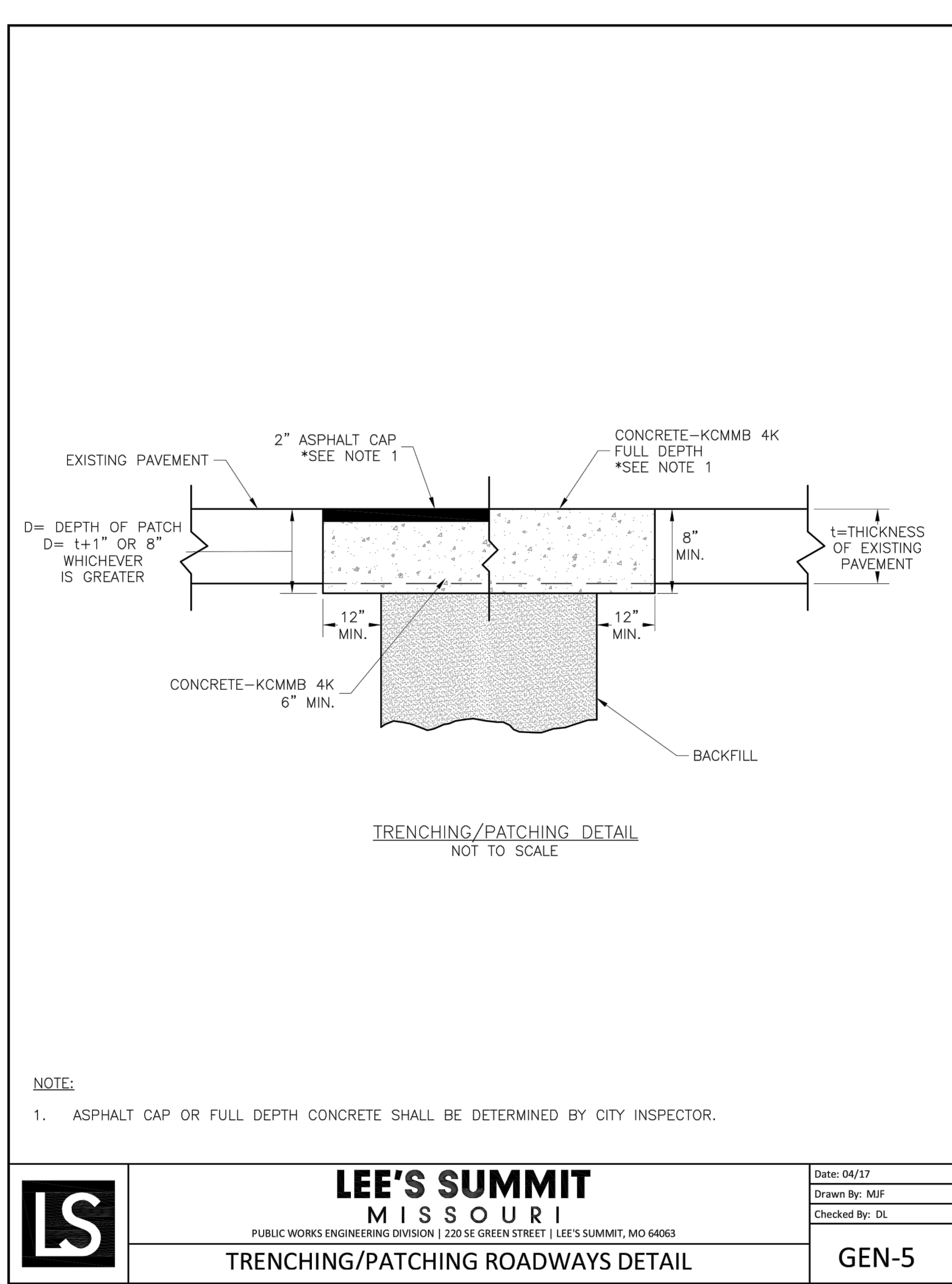
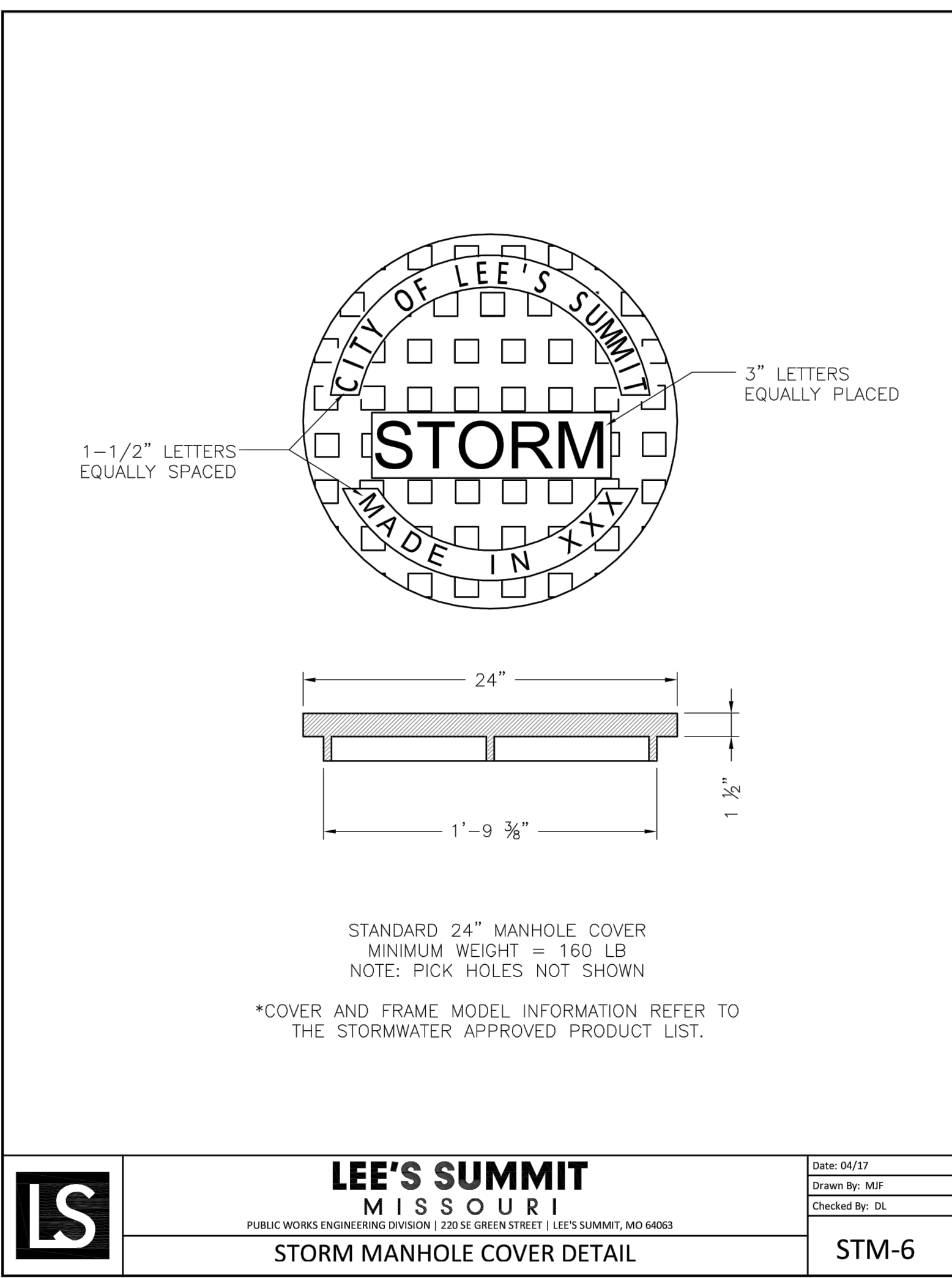
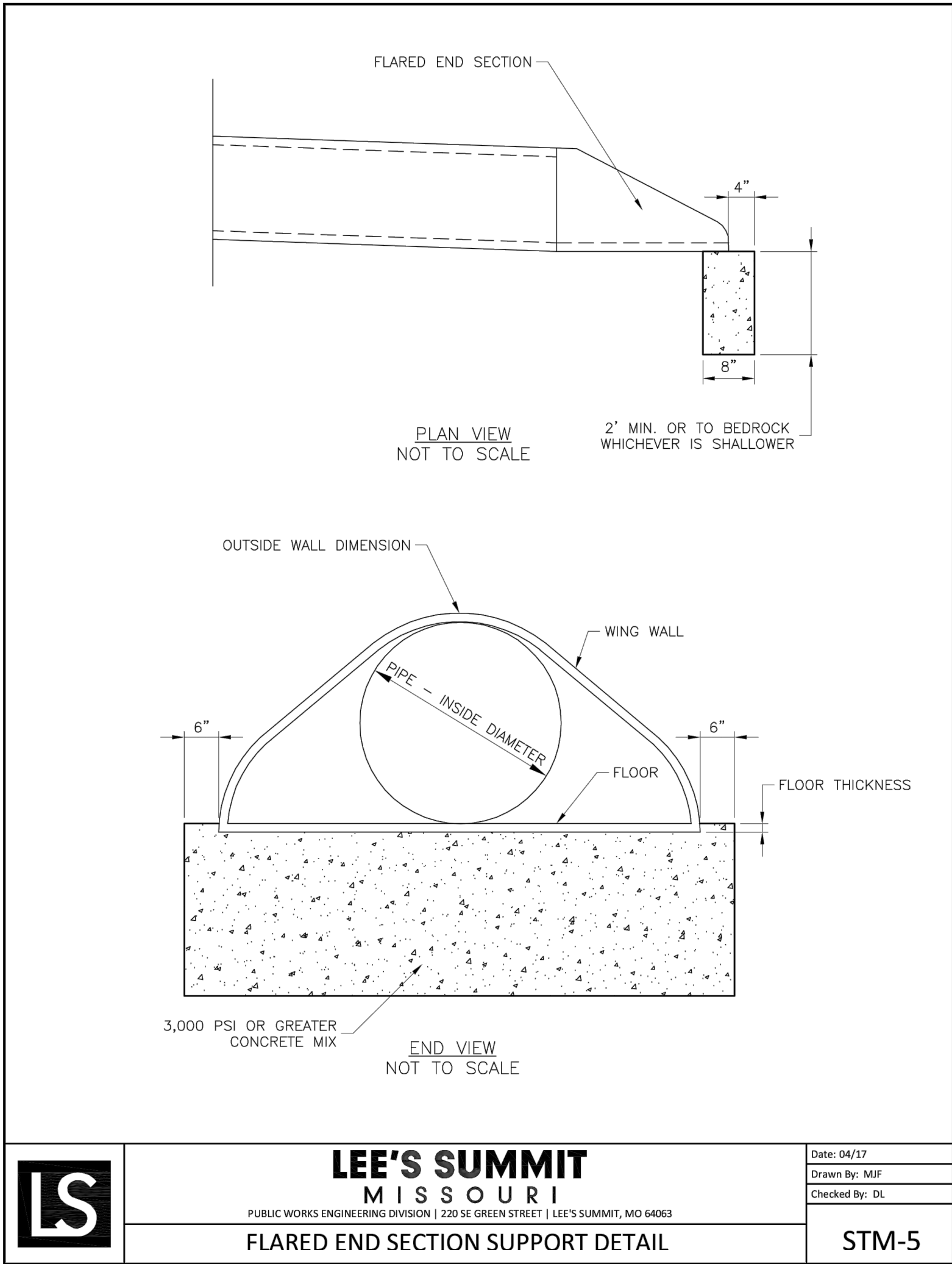
STREET AND
STORM DETAILS

SHEET

19
OF 24

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#E2002003600-F #LAC200100237 #LS200200859-F

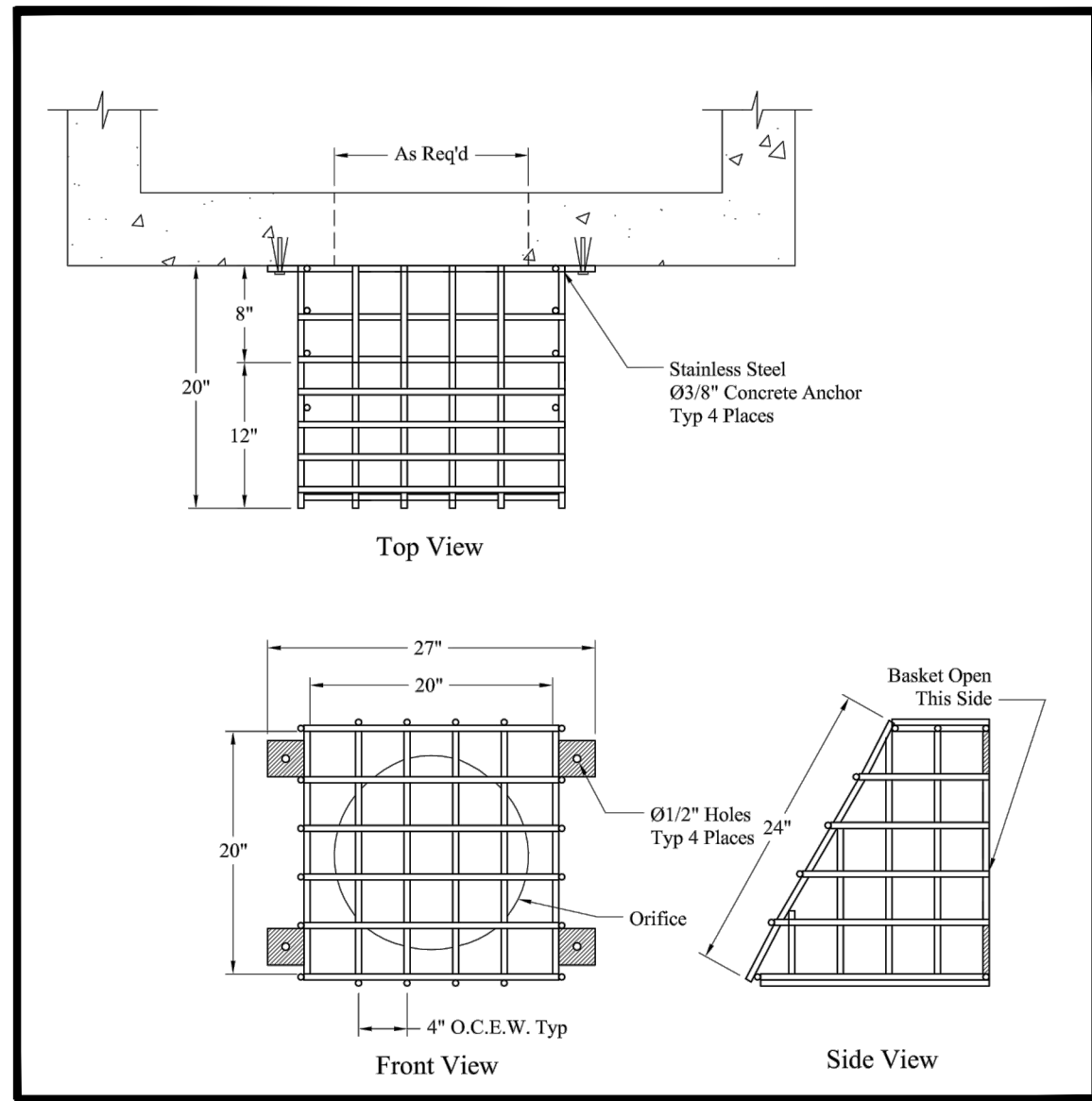
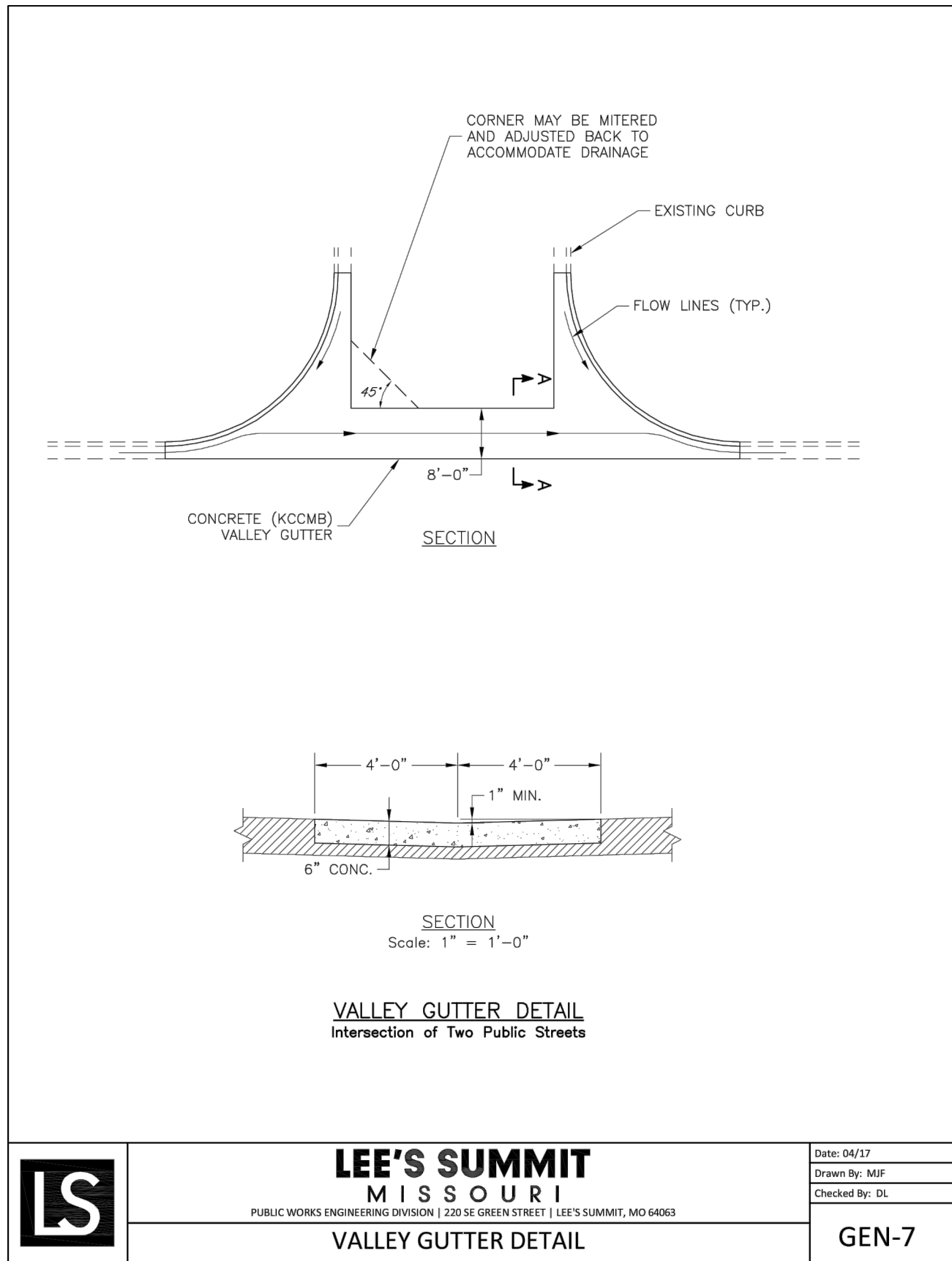
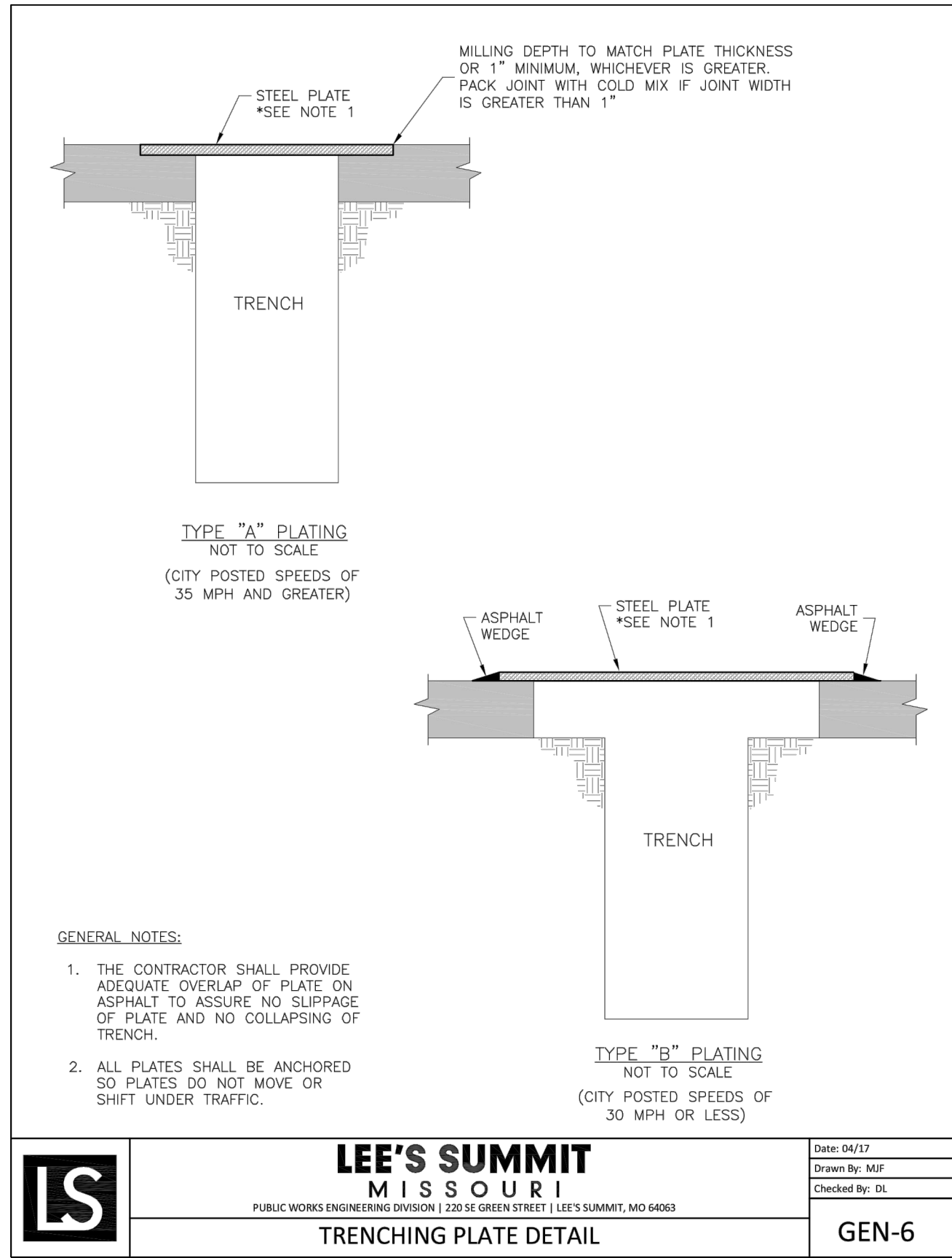
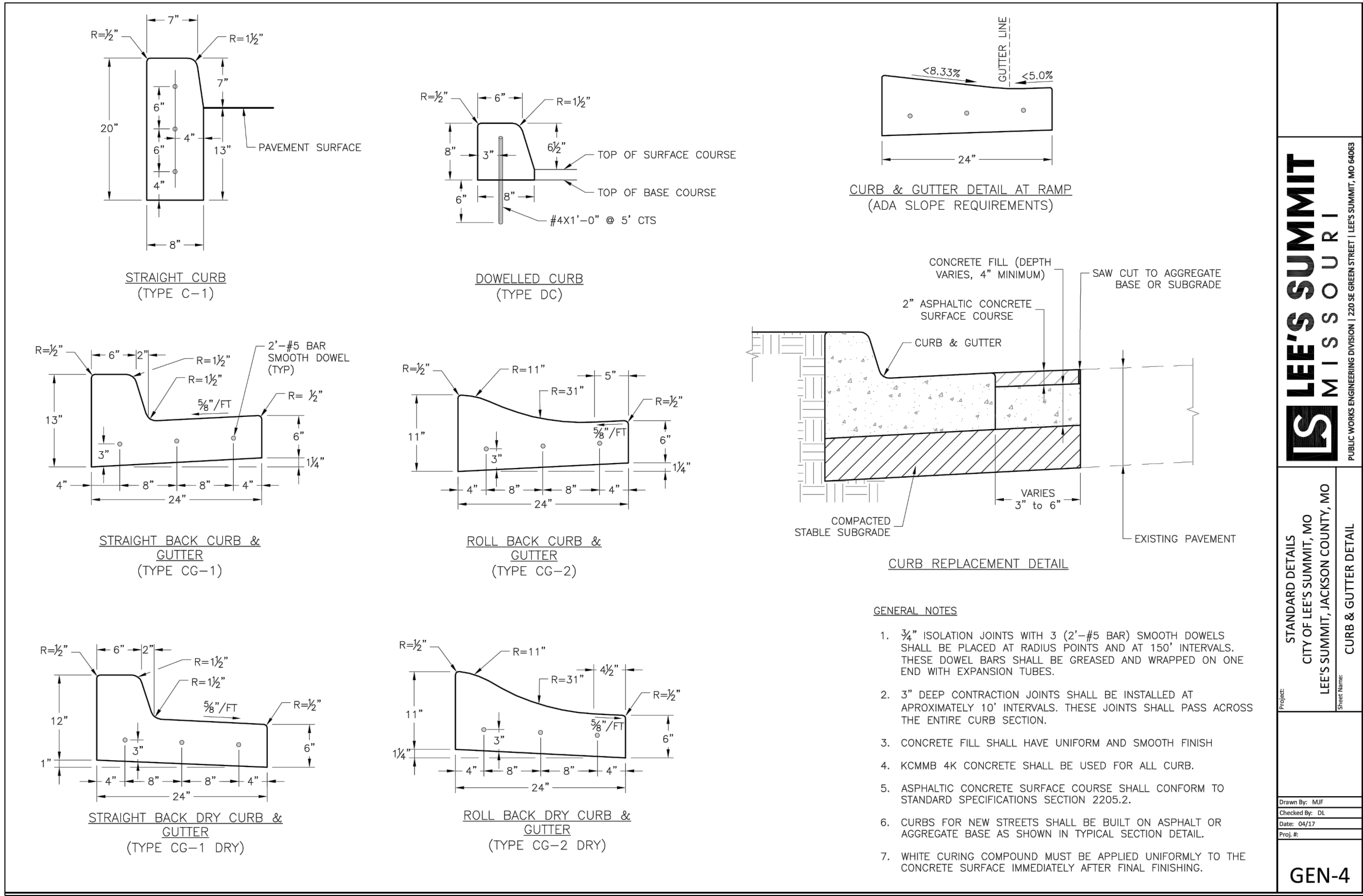
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REVISION	DATE	DESCRIPTION
1	4-10-19	CITY COMMENTS
2	8-1-19	CITY COMMENTS
3		
4		
5		
6		
7		
8		
9		

DRAWN BY:	KSC
CHECKED BY:	MAB
DATE PREPARED:	2-15-19
PROJ. NUMBER:	18-230

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REVISION DATE	DESCRIPTION
1 4-10-19	CITY COMMENTS
2 8-1-19	CITY COMMENTS
3 4-1-19	
4 4-1-19	
5 4-1-19	
6 4-1-19	
7 4-1-19	
8 4-1-19	

DRAWN BY:	KSC
CHECKED BY:	MAB
DATE PREPARED:	2-15-19
PROJ. NUMBER:	18-230

STREET AND STORM DETAILS

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.)
Residential Local/Access	A	2	4	6	--	6
	B	2	4	10	Geogrid	--
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	--

TABLE LS-3: MINIMUM PCC PAVEMENT THICKNESSES

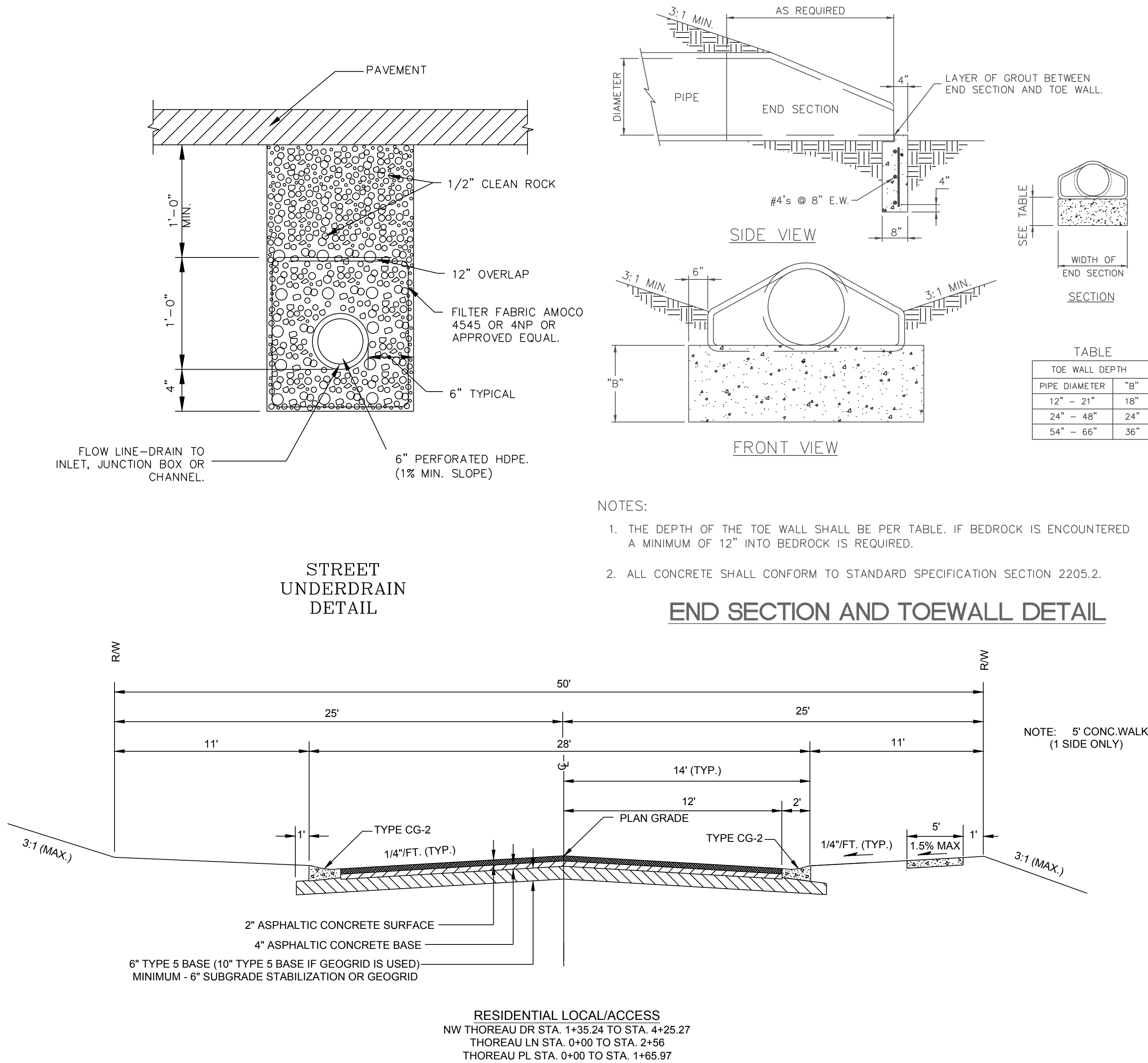
Street Classification	PCC (in.)	Aggregate Base (in.)	Subgrade Stabilization ⁽¹⁾ (in.)
Residential Local/Access	6	4	--
Residential Collector	6	4	6
Commercial Industrial Local/Collector	8	4	9

(1) Subgrade Stabilization and 4" aggregate base may be replaced by approved geogrid and 6" of aggregate base

LS5200

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October 2016



WINTERSET VALLEY, 13TH PLAT
STREET, STORMWATER, MASTER DRAINAGE PLAN AND
EROSION AND SEDIMENT CONTROL
NW THOREAU DRIVE AND AUDUBON LANE
LEE'S SUMMIT, MISSOURI

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MISSOURI GEOGRAPHIC REFERENCE SYSTEM
BENCH MARK:

BM JA-136, LOCATED AT INTERSECTION OF SW OLDHAM PARKWAY AND SW WARD ROAD, 61 FT SOUTH OF CL OF OLDHAM PARKWAY AND 28.9 FT EAST OF THE EAST EDGE OF WARD ROAD.

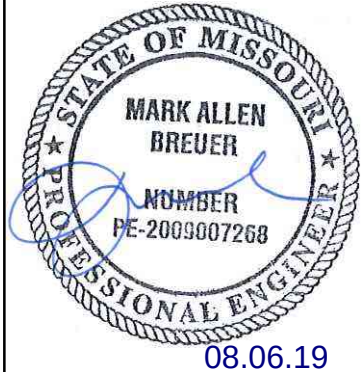
ELEV. 993.11'

PROJECT BENCH MARK:

SANITARY MANHOLE H2 AT NW CORNER OF LOT 1153 WINTERSET VALLEY 1ST PLAT, APPROX. 39' RT. OF CL OF NW PEALE BLVD.

ELEV. 935.45'

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WINTERSET VALLEY, 13TH PLAT
STREET, STORMWATER, MASTER DRAINAGE
PLAN AND EROSION AND SEDIMENT CONTROL
NW THOREAU DRIVE AND AUDUBON LANE
LEE'S SUMMIT, MISSOURI

REVISION DATE	DESCRIPTION
1. 4-10-19	CITY COMMENTS
2. 8-1-19	CITY COMMENTS
3. 8-1-19	CITY COMMENTS
4. 8-1-19	CITY COMMENTS
5. 8-1-19	CITY COMMENTS
6. 8-1-19	CITY COMMENTS
7. 8-1-19	CITY COMMENTS
8. 8-1-19	CITY COMMENTS

DRAWN BY: KSC	CHECKED BY: MAB	DATE PREPARED: 2-15-19	PROJ. NUMBER: 18-230
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SIGNING PLAN

SHEET
23
OF 24

