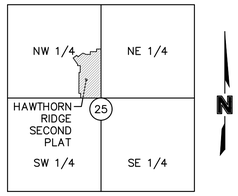
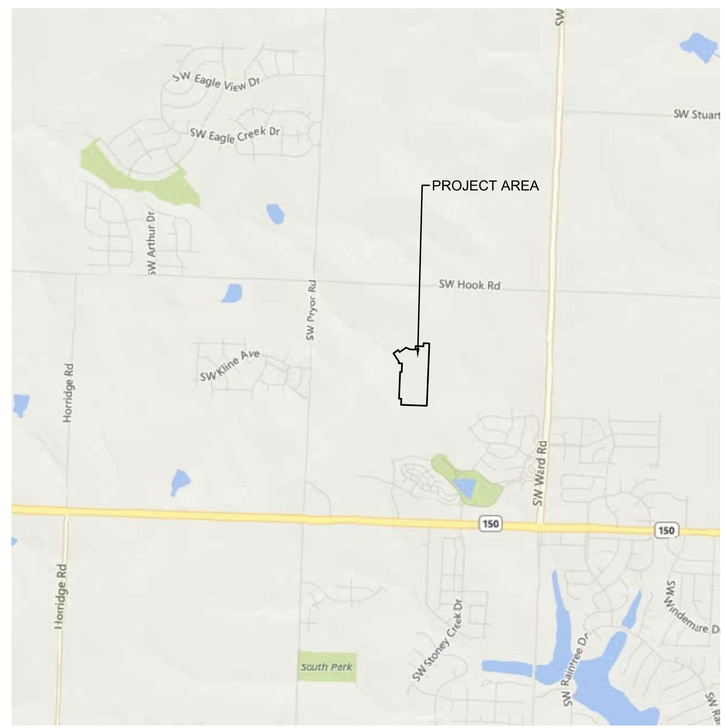
HAWTHORN RIDGE
SECOND PLAT
STREET & STORM SEWER PLANS

N/W 1/4 SECTION 25, TOWNSHIP 47 N, RANGE 32 W.
IN LEE'S SUMMIT, JACKSON COUNTY, MISSOURI



LOCATION MAP
Sec. 25, Twp. 47 N., Rge. 32 W.
(N.T.S.)



PROJECT TEAM & UTILITY CONTACT LIST	
OWNER / DEVELOPER CLAYTON PROPERTIES GROUP, INC. D.B.A. SUMMIT HOMES 120 SE 30TH STREET CONTACT: VINCENT WALKER LEE'S SUMMIT, MO 64082 PHONE: 816.246.6700 EMAIL: VINCENT@SUMMITHOMESKC.COM	UTILITY SERVICE NUMBERS NAME: LEE'S SUMMIT PUBLIC WORKS PHONE: 816-969-1800 NAME: LEE'S SUMMIT WATER & SERVICES DEPARTMENT PHONE: 816-969-1940 NAME: SPIRE (MGE) PHONE: 314-342-0500 NAME: AT&T PHONE: 800-286-8313 NAME: KCP&L PHONE: 816-471-5275 NAME: SPECTRUM (TWC) PHONE: 877-772-2253 NAME: GOOGLE FIBER PHONE: 877-454-6959
ENGINEER OLSSON 1301 BURLINGTON ST. SUITE 100 NORTH KANSAS CITY, MO 64116 CONTACT: MELISSA DEGONIA PHONE: 816.361.1177 EMAIL: MDEGONIA@OLSSON.COM	
SURVEYOR OLSSON 1301 BURLINGTON ST. SUITE 100 NORTH KANSAS CITY, MO 64116 CONTACT: JASON ROUDEBUSH PHONE: 816.361.1177 EMAIL: JROUDEBUSH@OLSSON.COM	

SHEET INDEX

☐ NOT FOR CONSTRUCTION

☒ REVIEWED FOR CONSTRUCTION

CALL BEFORE YOU DIG 1-800-DIG-RITE MISSOURI ONE CALL SYSTEM

PROPERTY DESCRIPTION:

A TRACT OF LAND IN THE NORTHWEST QUARTER OF SECTION 25, TOWNSHIP 47 NORTH, RANGE 32 WEST OF THE 5TH PRINCIPAL MERIDIAN IN LEE'S SUMMIT, JACKSON COUNTY, MISSOURI, AND A PORTION OF TRACT E, OF HAWTHORN RIDGE 1ST PLAT, A SUBDIVISION OF LAND RECORDED AS DOCUMENT 2019E0020897 IN BOOK 182 AT PAGE 83, IN THE OFFICE OF RECORDER OF DEEDS FOR JACKSON COUNTY, MISSOURI ALL BEING BOUNDED AND DESCRIBED AS FOLLOWS: COMMENCING AT THE SOUTHWEST CORNER OF SAID NORTHWEST QUARTER OF SECTION 25; THENCE SOUTH 87°46'49" EAST ON THE SOUTH LINE OF SAID NORTHWEST QUARTER, 2,653.29 FEET TO THE SOUTHEAST CORNER OF SAID NORTHWEST QUARTER, (CENTER OF SECTION) AND THE POINT OF BEGINNING OF THE TRACT OF LAND TO BE HEREIN DESCRIBED; THENCE ON SAID SOUTH LINE OF SAID NORTHWEST QUARTER, NORTH 87°46'49" WEST, 577.00 FEET; THENCE LEAVING SAID SOUTH LINE, NORTH 02°13'11" EAST, 135.00 FEET; THENCE NORTH 87°46'49" WEST, 50.79 FEET; THENCE NORTH 02°18'36" EAST, 596.57 FEET; THENCE SOUTH 87°41'24" EAST, 37.00 FEET; THENCE NORTH 02°18'36" EAST, 192.00 FEET; THENCE NORTH 87°41'24" WEST, 75.58 FEET; THENCE NORTH 02°18'36" EAST, 39.05 FEET; THENCE NORTH 33°13'50" WEST, 218.11 FEET TO THE SOUTHWESTERLY CORNER OF LOT 21 OF SAID HAWTHORN RIDGE 1ST PLAT; THENCE ON THE SOUTHERLY LINE OF SAID HAWTHORN RIDGE 1ST PLAT THE FOLLOWING 9 CALLS, NORTH 54°57'38" EAST, 130.00 FEET; THENCE SOUTH 35°02'22" EAST, 58.00 FEET; THENCE NORTH 54°57'38" EAST, 175.90 FEET; THENCE SOUTH 65°30'07" EAST, 95.33 FEET; THENCE SOUTH 87°41'24" EAST, 121.73 FEET; THENCE NORTH 02°18'36" EAST, 78.00 FEET; THENCE SOUTH 87°41'24" EAST, 175.00 FEET; THENCE NORTH 02°18'36" EAST, 72.00 FEET; THENCE SOUTH 87°41'24" EAST, 130.00 FEET TO THE SOUTHEASTERLY CORNER OF LOT 28 OF SAID HAWTHORN RIDGE 1ST PLAT AND A POINT ON THE EAST LINE OF SAID NORTHWEST QUARTER; THENCE ON SAID EAST LINE, SOUTH 02°18'36" WEST, 1,392.58 FEET TO THE POINT OF BEGINNING. CONTAINING 827,409 SQUARE FEET OR 19.00 ACRES, MORE OR LESS.

BENCHMARK

RR SPIKE IN SOUTH FACE OF POWER POLE ON NORTH SIDE OF SW. HOOK ROAD, IMMEDIATELY WEST OF DRIVEWAY FOR HOUSE#1622. ELEVATION= 1024.63'

OLSSON HAS BEEN RETAINED TO PROVIDE AS-BUILT DRAWINGS FOR THIS PROJECT.

JULIE E. SELLERS, P.E.
CIVIL ENGINEER
MO# 2017000367

10/1/20
DATE

olsson
OLSSON - CIVIL ENGINEERING
MO CERTIFICATE OF AUTHORITY #:001592
KS CERTIFICATE OF AUTHORITY #:E-2003
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STATE OF MISSOURI
JULIE ELAINE SELLERS
NUMBER PE-2017000367
10/1/20
PROFESSIONAL ENGINEER

JULIE E. SELLERS, P.E.
MO# 2017000367

NO. REV.	DATE	REVISIONS DESCRIPTION	BY
1	08-12-2019	REVISED PER CITY COMMENTS	
2	10-02-2020	STORM LINE 2 ALIGNMENT CHANGED	

REVISIONS

COVER SHEET
STREET & STORM SEWER PLANS

HAWTHORN RIDGE
SECOND PLAT

LEE'S SUMMIT, MISSOURI

2019

drawn by: D.A.H.O
checked by: M.G.D
designed by: B.M.W
QA/QC by: N.D.H
project no.: 019-1605
date: 07-12-2019

SHEET
C100

DWG: F:\2019\1501-2000\019-1605\40-Design\AutoCAD\Final Plans\Sheets\GNCV\STREET, STORM & SITE DISTURBANCE\C_TTL01_0191605.dwg USER: bworthley
DATE: Oct 01, 2020 2:25pm XREFS: C_PTBLK_0191605 C_PBNDY_0191605

GENERAL NOTES

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT THE PLANS IN THEIR POSSESSION ARE THE MOST CURRENT VERSION ISSUED, ARE FULLY COORDINATED WITH ALL SUBCONTRACTORS, AND PRESENT ON SITE AT ALL TIMES. CURRENT PLANS PREPARED BY OLSSON MAY BE OBTAINED AT THE DIRECTION OF OLSSON'S CLIENT. DIRECT REQUESTS TO OLSSON MAY REQUIRE ADDITIONAL AUTHORIZATIONS, AGREEMENTS, AND/OR FEES. PLEASE CONTACT THE ENGINEER FOR INFORMATION.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DEVIATIONS FROM THESE PLANS UNLESS WRITTEN APPROVAL FROM ENGINEER, OWNER, AND DEVELOPER.
3. ALL WORK AND MATERIALS SHALL BE SUBJECT TO INSPECTION AND APPROVAL BY THE OWNER OR THE OWNER'S REPRESENTATIVE.
4. ALL ESTIMATES OF QUANTITIES ARE FOR INFORMATIONAL PURPOSES ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING QUANTITIES AND ITEMS OF WORK.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL LABOR, MATERIALS, AND EQUIPMENT REQUIRED TO COMPLETE THE WORK SHOWN IN THE PLANS.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL REQUIRED PERMITS, PAYING ALL FEES, AND FOR OTHERWISE COMPLYING WITH ALL APPLICABLE REGULATIONS GOVERNING THE WORK.
7. THE CONTRACTOR SHALL NOT ENGAGE IN ACTIVITIES THAT MAY ENCROACH ON WATERS OF THE U.S., INCLUDING WETLANDS, UNTIL ANY NECESSARY PERMITS MAY BE OBTAINED. THE CONTRACTOR SHALL REVIEW AND COMPLY WITH ALL CONDITIONS DESCRIBED IN THE PERMIT.
8. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONDITIONS OF THE JOB SITE, THE SAFETY OF ALL PERSONS INCLUDING VISITORS AND THE GENERAL PUBLIC, AND PROPERTY DURING PERFORMANCE OF THE WORK. THIS REQUIREMENT WILL APPLY CONTINUOUSLY THROUGHOUT THE PROJECT AND NOT BE LIMITED BY WORKING HOURS. ANY CONSTRUCTION OBSERVATION BY THE ENGINEER OF THE CONTRACTOR'S PERFORMANCE IS NOT INTENDED TO INCLUDE REVIEW OF THE ADEQUACY OF THE CONTRACTOR'S SAFETY MEASURES.
9. PRIOR TO COMMENCEMENT OF WORK THE CONTRACTOR SHALL NOTIFY AND COORDINATE WITH ALL UTILITY COMPANIES AND OBTAIN ANY RELEVANT INFORMATION. NOTIFY ENGINEER OF ANY DISCREPANCIES.
10. THE CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION OF ALL BOUNDARY CORNERS AND SECTION CORNERS. ANY BOUNDARY CORNER AND/OR SECTION CORNER DISTURBED OR DAMAGED BY CONSTRUCTION ACTIVITIES SHALL BE RESET BY A LAND SURVEYOR LICENSED IN THE STATE OF MISSOURI, AT THE CONTRACTOR'S EXPENSE.
11. THE CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION OF ADJACENT PROPERTIES AND SHALL TAKE ALL PRECAUTIONS NECESSARY TO PREVENT DAMAGE DURING CONSTRUCTION. THE CONTRACTOR IS ALSO RESPONSIBLE FOR REPAIRING ANY DAMAGE RESULTING FROM CONSTRUCTION ACTIVITIES.
12. PRIOR TO MOVING OFF THE JOB THE CONTRACTOR SHALL NOTIFY THE OWNER AND ENGINEER TO PERFORM A FINAL WALK–THROUGH OF THE CONSTRUCTION SITE.

REFERENCES

1. UNLESS EXPLICITLY DESCRIBED OTHERWISE WITHIN THESE PLANS THE FOLLOWING SHALL APPLY;
   A. ALL CONSTRUCTION, INCLUDING THOSE LISTED BELOW, SHALL CONFORM TO THE LATEST CODES AND ORDINANCES OF LEE'S SUMMIT, MISSOURI.
   B. ALL CONSTRUCTION IN MODOT RIGHT–OF–WAY SHALL CONFORM TO THE LATEST SPECIFICATIONS ADOPTED BY U.S. DEPARTMENT OF TRANSPORTATION AND MODOT.
   C. ALL TRAFFIC CONTROL SIGNAGE SHALL CONFORM WITH THE CURRENT EDITION OF THE MANUAL FOR UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
   D. ALL UTILITY EXTENSIONS AND CONSTRUCTION SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE UTILITY COMPANIES..
   E. ALL EXTERIOR PAVEMENT (PCC, ASPHALT, ETC.) SHALL BE IN CONFORMANCE WITH THE SPECIFICATIONS OF LEE'S SUMMIT, MISSOURI AND THE RECOMMENDATIONS OF THE GEOTECHNICAL REPORT.
4. THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING THE DELIVERY MANAGER AND COORDINATING ANY MAILBOXES THAT MAY BE DISTURBED. FAILURE TO DO SO MAY SUBJECT THE CONTRACTOR TO PROSECUTION BY THE FEDERAL GOVERNMENT.

EXISTING CONDITIONS

1. THE CONTRACTOR SHALL VISIT THE SITE AND BECOME FAMILIAR WITH THE EXISTING CONDITIONS OF THE PROJECT AREA.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PERFORMING THEIR OWN INVESTIGATIONS AND MAKING THEIR OWN ASSUMPTIONS REGARDING SITE SURFACE AND SUBSURFACE CONDITIONS. THIS INCLUDES THE LOCATION AND CONSISTENCY OF ANY EXISTING ROCK LAYERS UNDERLYING THE PROJECT SITE. CONTACT THE ENGINEER REGARDING ANY DISCREPANCIES THAT MAY AFFECT THE ABILITY TO CONSTRUCT FROM THESE PLANS AS DESIGNED.
3. EXISTING CONDITIONS WERE DETERMINED THROUGH A VARIETY OF METHODS THAT MAY INCLUDE SURVEY, AERIAL IMAGERY, AVAILABLE RECORDS, GIS DATA, ETC. SUBSURFACE CONDITIONS ARE APPROXIMATE AND MAY NOT INCLUDE ALL UTILITIES AND OTHER SITE IMPROVEMENTS PRESENT ON SITE. THE CONTRACTOR SHALL MAKE EXPLORATION EXCAVATIONS AND LOCATE EXISTING UNDERGROUND UTILITIES SUFFICIENTLY AHEAD OF CONSTRUCTION TO PERMIT REVISIONS TO PLANS WHEN CONFLICTS AND DISCREPANCIES ARE FOUND.

CONSTRUCTION

1. THE CONTRACTOR SHALL INSTALL TRAFFIC CONTROL WHILE WORKING IN THE PUBLIC RIGHT–OF–WAY AS SHOWN IN THESE PLANS. IF PLANS ARE NOT PROVIDED, CONTRACTOR SHALL COORDINATE AND PROVIDE CONTROLS TO THE SATISFACTION OF THE RIGHT–OF–WAY OWNER.
2. THE CONTRACTOR SHALL PROTECT ALL TREES OVER 3" CALIPER FROM DAMAGE. NO TREE SHALL BE REMOVED WITHOUT PERMISSION OF THE OWNER, UNLESS SHOWN OTHERWISE ON THESE PLANS.
3. THE CONTRACTOR SHALL DISPOSE ALL WASTE MATERIAL RESULTING FROM THE PROJECT OFF–SITE AND IN STRICT CONFORMANCE WITH ALL LOCAL CODES AND ORDINANCES.
4. ALL MANHOLES, CATCH BASINS, UTILITY VALVES AND METER PITS ARE TO BE ADJUSTED OR REBUILT TO GRADE AS REQUIRED. NOT ALL ADJUSTMENTS ARE INDICATED IN THE PLANS.
5. THE CONTRACTOR SHALL STREET SWEEP OR OTHERWISE CLEAN ALL ACCESS ROUTES TO THE SITE AT CONCLUSION OF THE PROJECT.

SHOP DRAWINGS

1. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS A MINIMUM OF 7 DAYS PRIOR TO THE REQUESTED DATE OF APPROVAL. ENGINEER SHALL REVIEW SHOP DRAWINGS OR SAMPLES IN CONFORMANCE WITH THE DESIGN FOR THIS PROJECT AS DESCRIBED IN THE PLANS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ERRORS OR OMISSIONS IN SHOP DRAWINGS. THE ENGINEER'S REVIEW SHALL NOT EXTEND TO MEANS OR METHODS OF CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY VARIATION FROM THE REQUIREMENTS OF THE CONTRACT DOCUMENTS UNLESS CONTRACTOR HAS NOTIFIED ENGINEER OF EACH SUCH VARIATION AT THE TIME OF SUBMISSION, AND OBTAINED ENGINEER'S WRITTEN APPROVAL OF EACH SUCH VARIATION. PRIOR TO SUBMITTING EACH SHOP DRAWING OR SAMPLE, CONTRACTOR SHALL HAVE REVIEWED AND VERIFIED:
   A. ALL FIELD MEASUREMENTS, QUANTITIES, DIMENSIONS, SPECIFIED PERFORMANCE CRITERIA, INSTALLATION REQUIREMENTS, MATERIALS, CATALOG NUMBERS AND SIMILAR INFORMATION WITH RESPECT THERETO;
   B. ALL MATERIALS WITH RESPECT TO INTENDED USE, FABRICATION, SHIPPING, HANDLING, STORAGE, ASSEMBLY AND INSTALLATION PERTAINING TO THE PERFORMANCE OF THE WORK;
   C. ALL INFORMATION RELATIVE TO MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES OF CONSTRUCTION AND SAFETY PRECAUTIONS AND PROGRAMS INCIDENT THERETO;
   D. CONTRACTOR SHALL ALSO HAVE REVIEWED AND COORDINATED EACH SHOP DRAWING OR SAMPLE WITH OTHER SHOP DRAWINGS AND SAMPLES, AND WITH THE REQUIREMENTS OF THE WORK AND THE CONTRACT DOCUMENTS.
   E. ALL SUBMITTED SHOP DRAWINGS SHALL BEAR A STAMP OR SPECIFIC WRITTEN INDICATION AND SIGNATURE THAT CONTRACTOR HAS FULLY COMPLETED THE ABOVE TASKS.
2. SHOP DRAWINGS AS DESCRIBED ABOVE ARE REQUIRED FOR, BUT NOT LIMITED TO, THE FOLLOWING:
   A. ALL STORM SEWER STRUCTURES TO BE INSTALLED WITH THIS PROJECT.
   B. ANY ITEMS IN THESE PLANS THAT ALLOW FOR AN "APPROVED EQUAL" ALTERNATIVE.

STORM SEWER GENERAL NOTES:

1. STORM STRUCTURES SHALL BE PER CURRENT CITY DETAILS. IF CITY DOES NOT HAVE PUBLISHED DETAILS STRUCTURES SHALL BE PER CURRENT APWA SPECIFICATIONS.
2. PRIOR TO COMMENCEMENT OF WORK THE CONTRACTOR SHALL NOTIFY AND COORDINATE CONSTRUCTION WITH CITY OF LEE'S SUMMIT, MISSOURI.
3. ALL PIPE LENGTHS AND ELEVATIONS ARE CALCULATED LINEARLY FROM CENTER OF STRUCTURE TO CENTER OF STRUCTURE.
4. ALL STRUCTURE DIMENSIONS ARE TO INSIDE FACE OF STRUCTURE.
5. COORDINATES ARE PROVIDED AT THE CENTER OF STRUCTURE. ADDITIONAL COORDINATES PROVIDED ARE PER LOCAL CODES AND ORDINANCES OR AS AN AID WHEN ORIENTING THE BOX DURING INSTALLATION.
6. THE CONTRACTOR SHALL EXPOSE EXISTING UTILITIES AT LOCATIONS OF POSSIBLE CONFLICT AND POINTS OF CONNECTION PRIOR TO ANY CONSTRUCTION OF STORM SEWER.
7. STORM SEWER TRENCHES SHALL BE CONSTRUCTED SUCH THAT UNDISTURBED EXISTING SOIL OR FILL COMPACTED TO 95% PROCTOR DENSITY IS AT A DEPTH THAT IS 18" ABOVE TOP OF PROPOSED PIPE.
8. STRUCTURE INVERT CHANNELS SHALL BE SMOOTH, CIRCULAR, AND CONFORMING TO ½ THE ADJACENT PIPE SECTION (INVERT TO CENTER). CHANGES IN DIRECTION OF FLOW SHALL BE MADE WITH A SMOOTH CURVE AND MAINTAIN SHAPE THROUGHOUT. CHANGES IN GRADE OF ADJACENT PIPES SHALL BE TRANSITIONED SMOOTHLY AND EVENLY THROUGH THE STRUCTURE.
9. PIPE PENETRATIONS SHALL BE GROUTED TO ENSURE WATERTIGHT SEALS.
10. MAINTAIN MINIMUM DEPTH OF COVER PER APWA 5606.06

ESTIMATE OF QUANTITIES

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	AS-BUILT
	STREET			
1	EXCAVATION	C.Y.	42779	
2	EMBANKMENT	C.Y.	29854	
3	SUBGRADE STABILIZATION (6" FLYASH TREATMENT)	S.Y.	5724	
4	SUBGRADE STABILIZATION (9" FLYASH TREATMENT)	S.Y.	7659	
5	6" ASPHALT PAVEMENT	S.Y.	4776	
6	7.5" ASPHALT PAVEMENT	S.Y.	6501	
7	CONCRETE CURB & GUTTER (CG–1)	L.F.	3213	
8	CONCRETE CURB & GUTTER (CG–2)	L.F.	2959	
9	MILL & OVERLAY	S.Y.	31	
10	ADA RAMP	EA.	20	
11	STOP SIGNS	EA.	6	
12	STREET NAME SIGNS	EA.	12	
13	END OF ROAD TREATMENT	EA.	16	
	STORM			
14	STD. CURB INLET (5'x3' INSIDE)	EA.	11	
15	STD. CURB INLET (5'x4' INSIDE)	EA.	5	
16	STD. CURB INLET (5'x5' INSIDE)	EA.	3	
17	STD. CURB INLET (6'x6' INSIDE)	EA.	4	
18	STD. FIELD INLET (4'x4' INSIDE)	EA.	4	
19	STD. MANHOLE (5' DIA. INSIDE)	EA.	3	
20	STD. MANHOLE (6' DIA. INSIDE)	EA.	1	
21	STD. MANHOLE (7' DIA. INSIDE)	EA.	1	2
22	STD. JUNCTION BOX (6'x6' INSIDE)	EA.	0	
23	15" HDPE	L.F.	1046.87	
24	18" HDPE	L.F.	577.91	
25	24" HDPE	L.F.	778.43	
26	30" HDPE	L.F.	240.12	
27	36" HDPE	L.F.	515.73	
28	42" HDPE	L.F.	209.50	
29	48" HDPE	L.F.	120.00	2
30	54" HDPE	L.F.	0	
31	54" CMP END SECTION	EA.	0	
32	24" HDPE PLUG	EA.	1	
33	RIPRAP	S.Y.	80.60	2
34	CONNECTION TO EXISTING STRUCTURE	EA.	1	
	EROSION CONTROL			
35	VEHICLE TRACKING DEVICE	EA.	1	
36	SEDIMENT BASIN	EA.	1	
37	SILT FENCE	LF.	3971	
38	DIVERSION BERM	LF.	910	
39	ROCK CHECK DAM	EA.	6	
40	CURB INLET PROTECTION	EA.	25	
41	AREA INLET PROTECTION	EA.	6	
42	PERMANENT SEEDING	AC.	19	

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STATE OF MISSOURI
JULIE ELAINE SELLERS
NUMBER PE-2017000367
10/1/20
PROFESSIONAL ENGINEER
JULIE E. SELLERS, P.E.
MO# 2017000367

NO. REV.	DATE	REVISIONS DESCRIPTION	BY
1	08-12-2019	QUANTITIES UPDATED	
2	10-02-2020	QUANTITIES UPDATED	

REVISIONS

GENERAL NOTES
STREET & STORM SEWER PLANS

HAWTHORN RIDGE
SECOND PLAT

LEE'S SUMMIT, MISSOURI

2019

drawn by: D.A.H.O
checked by: M.G.D
designed by: B.M.W
QA/QC by: N.D.H
project no.: 019-1605
date: 07-12-2019

SHEET
C101

DWG: F:\2019\1501-2000\019-1605\40-Design\AutoCAD\Final Plans\Sheets\GNCV\STREET, STORM & SITE DISTURBANCE\C_TTL01_0191605.dwg USER: bworthley
DATE: Oct 01, 2020 2:25pm XREFS: C_PTBLK_0191605 C_PBNDY_0191605

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DATE: Oct 01, 2020 2:26pm XREFS: C_PTBLK_0191605 C_PBNDY_0191605 C_PBASE_0191605 C_XBASE_0191605 C_PUTIL_0191605

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STATE OF MISSOURI
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10/1/20
PROFESSIONAL ENGINEER

JULIE E. SELLERS, P.E.
MO# 2017000367

NO. REV.	DATE	REVISIONS DESCRIPTION	BY
2	10-02-2020	STORM LINE 7 ALIGNMENT CHANGED	

REVISIONS

GENERAL LAYOUT
STREET & STORM SEWER PLANS

HAWTHORN RIDGE
SECOND PLAT

LEE'S SUMMIT, MISSOURI

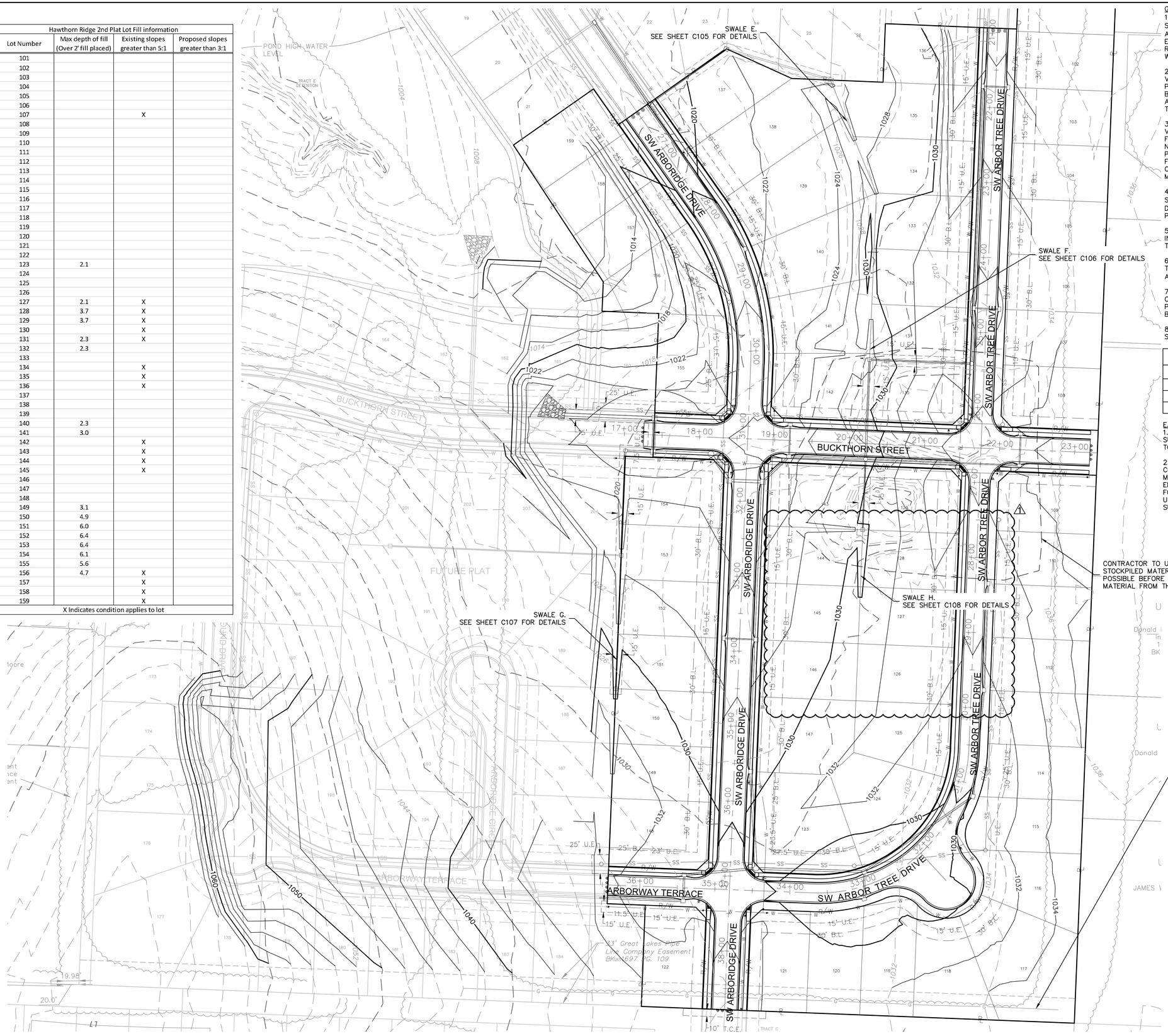
2019

drawn by: D.A.H.O
checked by: M.G.D
designed by: B.M.W
QA/QC by: N.D.H
project no.: 019-1605
date: 07-12-2019

SHEET
C102

Hawthorn Ridge 2nd Plat Lot Fill information			
Lot Number	Max depth of fill (Over 2' fill placed)	Existing slopes greater than 5:1	Proposed slopes greater than 3:1
101			
102			
103			
104			
105			
106			
107		X	
108			
109			
110			
111			
112			
113			
114			
115			
116			
117			
118			
119			
120			
121			
122			
123	2.1		
124			
125			
126			
127	2.1	X	
128	3.7	X	
129	3.7	X	
130		X	
131	2.3	X	
132	2.3		
133			
134		X	
135		X	
136		X	
137			
138			
139			
140	2.3		
141	3.0		
142		X	
143		X	
144		X	
145		X	
146			
147			
148			
149	3.1		
150	4.9		
151	6.0		
152	6.4		
153	6.4		
154	6.1		
155	5.6		
156	4.7	X	
157		X	
158		X	
159		X	

X Indicates condition applies to lot



GRADING NOTES:

1. CONTRACTOR SHALL ADHERE TO THE "STANDARDS, SPECIFICATIONS AND DESIGN CRITERIA" SECTION 2100 AS ADOPTED BY LEE'S SUMMIT, MO (LATEST EDITION), FOR EXCAVATION AND EMBANKMENT WORK WITHIN THE PROPOSED RIGHT-OF-WAY, OR SPECIFICATIONS IN THESE PLANS, WHICHEVER IS STRICTER.

2. AREAS OF CONSTRUCTION SHALL BE STRIPPED OF ALL VEGETATION, ORGANIC MATTER AND TOPSOIL, PRIOR TO PLACEMENT OF FILL MATERIAL. THE EXPOSED GRADES SHALL BE OBSERVED AND PROOF ROLLED USING A LOADED TANDEM AXLE DUMP TRUCK WITH A MINIMUM GROSS WEIGHT OF 20 TONS OR SIMILAR EQUIPMENT.

3. WHERE THE EXISTING GRADE IS STEEPER THEN ONE UNIT VERTICAL IN FIVE UNITS HORIZONTAL AND THE DEPTH OF FILL EXCEEDS 5 FEET, BENCHING OF THE FILL INTO THE NATURAL SLOPE SHALL BE PERFORMED. A KEY SHALL BE PROVIDED AT THE TOE OF THE FILL THAT IS AT LEAST 10 FEET WIDE AND 2 FEET IN DEPTH. BENCHES SHOULD BE CUT AS THE FILL PROGRESSES AND SHOULD HAVE A MAXIMUM BENCH HEIGHT OF 3 FEET.

4. MATERIAL FOR USE AS FILL SHALL BE IDENTIFIED AND SAMPLED FOR CLASSIFICATION, STANDARD PROCTOR (ASTM D-698) AND ATTERBERG LIMITS (ASTM D-4318) TESTING PRIOR TO COMMENCING FILL PLACEMENT.

5. ALL FILL OUTSIDE OF RIGHT-OF-WAY SHOULD BE PLACED IN CONTROLLED LIFTS HAVING A MAXIMUM LOOSE LIFT THICKNESS OF 9".

6. FILL SHOULD BE COMPACTED TO A MINIMUM OF 95% OF THE MATERIALS MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D-698 (STANDARD PROCTOR COMPACTION).

7. MOISTURE CONTENT OF THE FILL AT THE TIME OF COMPACTION SHALL BE WITHIN A RANGE OF -1 TO +3 PERCENT OF OPTIMUM MOISTURE CONTENT AS DETERMINED BY ASTM D-698.

8. SEE SHEET C141 FOR MINIMUM LOW OPENINGS AND THIS SHEET FOR FILL DEPTHS FOR EACH LOT.

EARTHWORK QUANTITIES		
LOCATION	CUT (C.Y.)	FILL (C.Y.)
STREET	7,977	2,205
SITE	34,802	27,649
TOTAL	42,779	29,854

EARTHWORK QUANTITIES NOTES:

1. EARTHWORK QUANTITIES BASED ON FINISHED GRADE SURFACE AND DO NOT INCLUDE ADJUSTMENTS FOR TOPSOIL AND SHRINKAGE.

2. EARTHWORK QUANTITIES DO NOT TAKE INTO CONSIDERATION EXCAVATION, REMOVAL AND DISPOSAL OF MATERIAL DEEMED UNSUITABLE BY A GEOTECHNICAL ENGINEER. THE EARTHWORK CONTRACTOR IS RESPONSIBLE FOR EXCAVATION, REMOVAL AND DISPOSAL OF UNSUITABLE MATERIAL AND FOR REPLACING IT WITH SUITABLE MATERIAL.

WARNING
HIGH-PRESSURE PIPELINE
EXCAVATION AND/OR CONSTRUCTION PROHIBITED WITHOUT COMPLIANCE WITH STATE ONE-CALL, AND WITHOUT WRITTEN PERMISSION FROM MAGELLAN PIPELINE COMPANY, L.P.

N

0' 30' 60' 120'
SCALE IN FEET

LEGEND

100	EXISTING INDEX CONTOURS
100	EXISTING INTERMEDIATE CONTOURS
100	PROPOSED INDEX CONTOURS
100	PROPOSED INTERMEDIATE CONTOURS

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www.olsson.com

STATE OF MISSOURI
JULIE ELAINE SELLERS
NUMBER PE-2017000367
10/1/20
PROFESSIONAL ENGINEER

JULIE E. SELLERS, P.E.
MO# 2017000367

NO. REV.	DATE	REVISIONS DESCRIPTION	BY
1	08-12-2019	SWALE H ADDED AND GRADING QUANTITIES UPDATED	

REVISIONS

GRADING PLAN
STREET & STORM SEWER PLANS

HAWTHORN RIDGE
SECOND PLAT

LEE'S SUMMIT, MISSOURI

2019

drawn by: D.A.H.O
checked by: M.G.D
designed by: B.M.W
QA/QC by: N.D.H
project no.: 019-1605
date: 07-12-2019

SHEET
C103

DWG: F:\2019\1501-2000\019-1605\40-Design\AutoCAD\Final Plans\Sheets\GNCV\STREET, STORM & SITE DISTURBANCE\C_GRD01_0191605.dwg USER: bworthley
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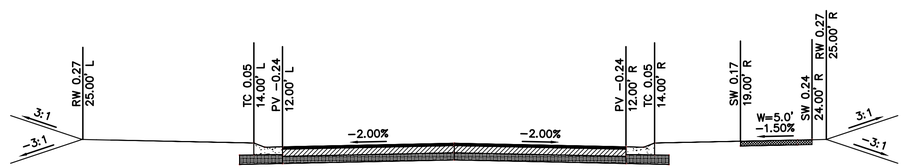
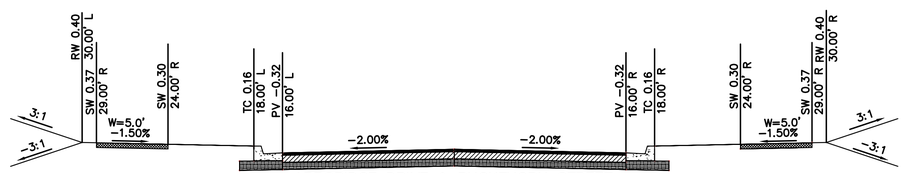


ARBOR TREE DRIVE, & ARBORWAY TERRACE
RESIDENTIAL LOCAL
N.T.S.

2" TYPE 6 ASPHALTIC CONCRETE SURFACE
4" TYPE 5 ASPHALTIC CONCRETE BASE COURSE
6" MIN. MODOT TYPE 5 STONE BASE
6" FLYASH STABILIZED SUBGRADE
CG-2 CURB & GUTTER

1 Scale: N.T.S.
RESIDENTIAL LOCAL STREET



ARBORIDGE DRIVE & BUCKTHORN STREET
RESIDENTIAL COLLECTOR
N.T.S.

2" TYPE 6 ASPHALTIC CONCRETE SURFACE
5.5" TYPE 5 ASPHALTIC CONCRETE BASE COURSE
6" MIN. MODOT TYPE 5 STONE BASE
9" FLYASH STABILIZED SUBGRADE
CG -1 CURB & GUTTER

2 Scale: N.T.S.
RESIDENTIAL COLLECTOR STREET

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JULIE ELAINE SELLERS
NUMBER PE-2017000367
10/1/20
PROFESSIONAL ENGINEER

JULIE E. SELLERS, P.E.
MO# 2017000367

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

TYPICAL SECTIONS
STREET & STORM SEWER PLANS

HAWTHORN RIDGE
SECOND PLAT

LEE'S SUMMIT, MISSOURI

2019

drawn by: D.A.H.Q
checked by: M.G.D
designed by: B.M.W
QA/QC by: N.D.H
project no.: 019-1605
date: 07-12-2019

SHEET
C104

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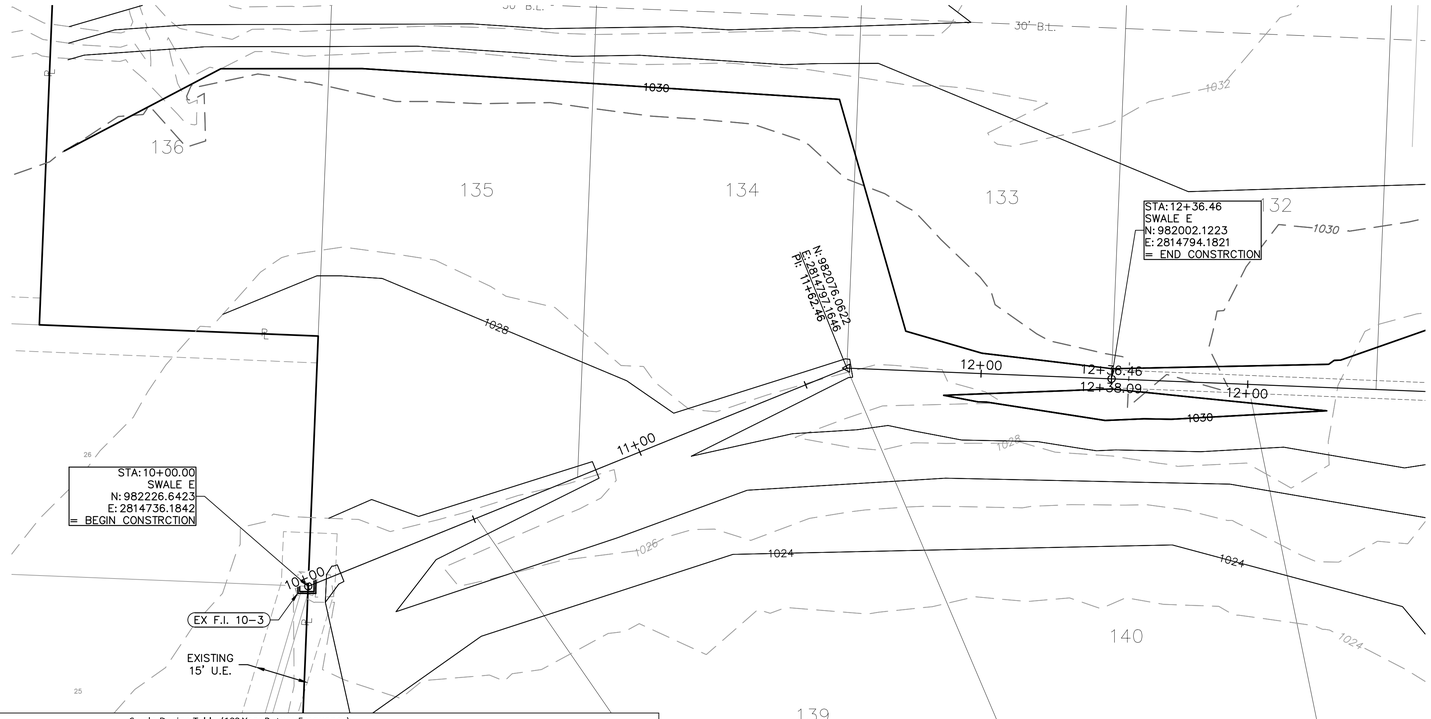


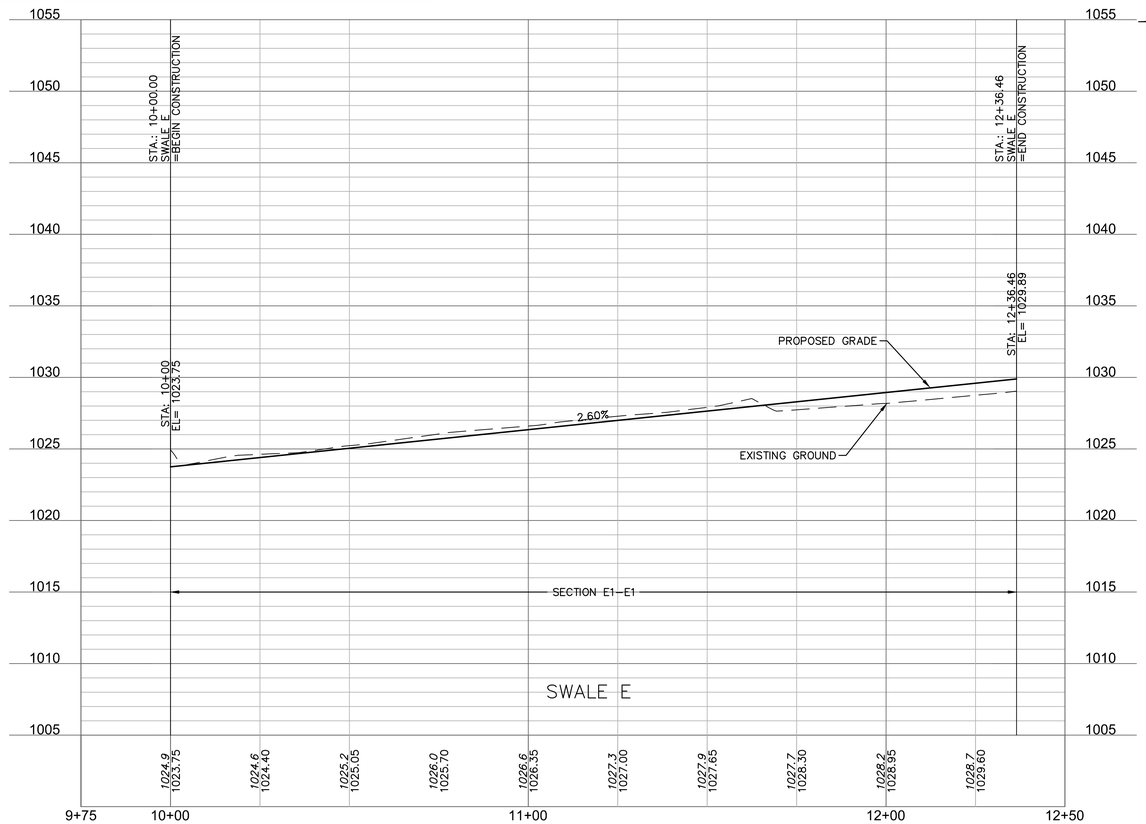
SWALE GRADING NOTES:
1. CONTRACTOR SHALL CONSTRUCT SWALES WITH MINIMUM SLOPE, WIDTH AND DEPTH AS SHOWN IN THE SWALE DESIGN TABLES.
2. CONTRACTOR SHALL CONSTRUCT ENTIRE DEPTH OF SWALES WITHIN THE RECORDED SURFACE DRAINAGE EASEMENTS AS SHOWN ON THE PLANS.
3. AS-BUILT SURVEY IS REQUIRED/APPROVED BY CITY FOR ALL SWALES AND PRIOR TO APPROVAL FOR ANY BUILDING FOUNDATION PERMIT. CONTRACTOR SHALL BE REQUIRED TO REGRADE SWALES AT CONTRACTOR'S EXPENSE IF ABOVE REQUIREMENTS ARE NOT MET.

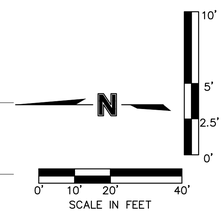
Swale Design Table (100 Year Return Frequency)

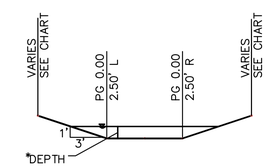
Section Data							Flow Data							
SECTION	Mannings Coefficient	Channel Slope (%)	Min. Swale Depth (ft)	Left Side Slope (H:V)	Right Side Slope (H:V)	Bottom Width (ft)	Discharge (cfs)	Water Depth (ft)	Flow Area (ft^2)	Velocity (ft/sec)	Wetted Perimeter (ft)	Top Width (ft)	Specific Energy (ft)	Shear Stress (lbs/ft^3)
E1-E1	0.03	2.60%	1.25	3:1	3:1	5.00	3.92	0.25	1.44	2.73	6.58	6.50	0.37	0.35

Swale Drainage Area Table (100 year Return Frequency)

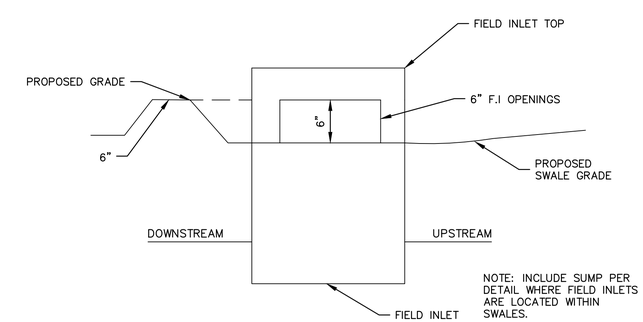
Section	Drainage Area (ac.)	C	Tc (min)	i (in/hr)	K	Peak Flow (cfs)
E1-E1	0.60	0.51	5	10.32	1.25	3.92







SWALE TYPICAL SECTION
* SEE TABLE FOR SWALE DEPTH
NTS



NOTE: INCLUDE SUMP PER DETAIL WHERE FIELD INLETS ARE LOCATED WITHIN SWALES.

FIELD INLET SUMP DETAIL
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STATE OF MISSOURI
JULIE ELAINE SELLERS
NUMBER PE-2017000367
10/1/20
PROFESSIONAL ENGINEER
JULIE E. SELLERS, P.E.
MO# 2017000367

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

SWALE PLAN & PROFILE
STREET & STORM SEWER PLANS

HAWTHORN RIDGE
SECOND PLAT

LEE'S SUMMIT, MISSOURI

2019

drawn by: D.A.H.O
checked by: M.G.D
designed by: B.M.W
QA/QC by: N.D.H
project no.: 019-1605
date: 07-12-2019

SHEET
C105

DWG: F:\2019\1501-2000\019-1605\40-Design\AutoCAD\Final Plans\Sheets\GNCV\STREET, STORM & SITE DISTURBANCE\C_SWP01_0191605.dwg USER: bworthley
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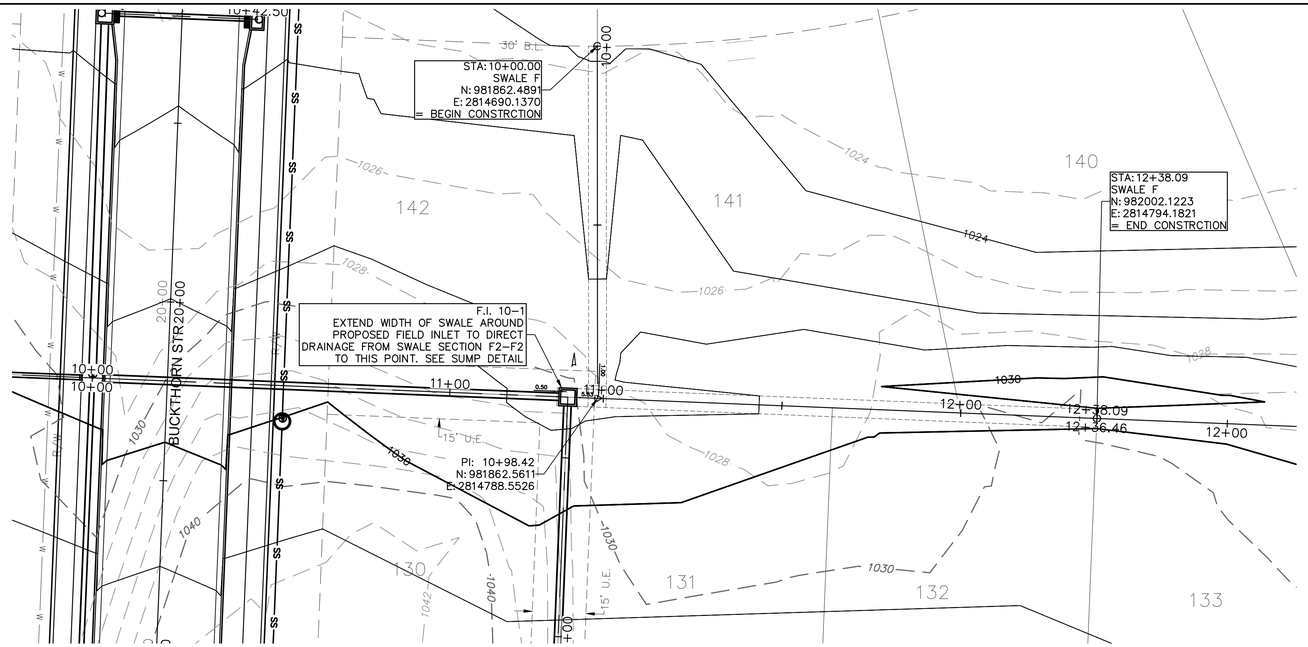

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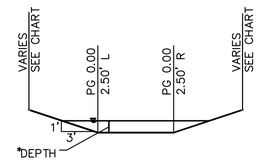


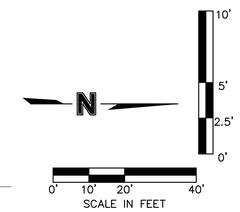
SWALE TYPICAL SECTION
* SEE TABLE FOR SWALE DEPTH
NTS

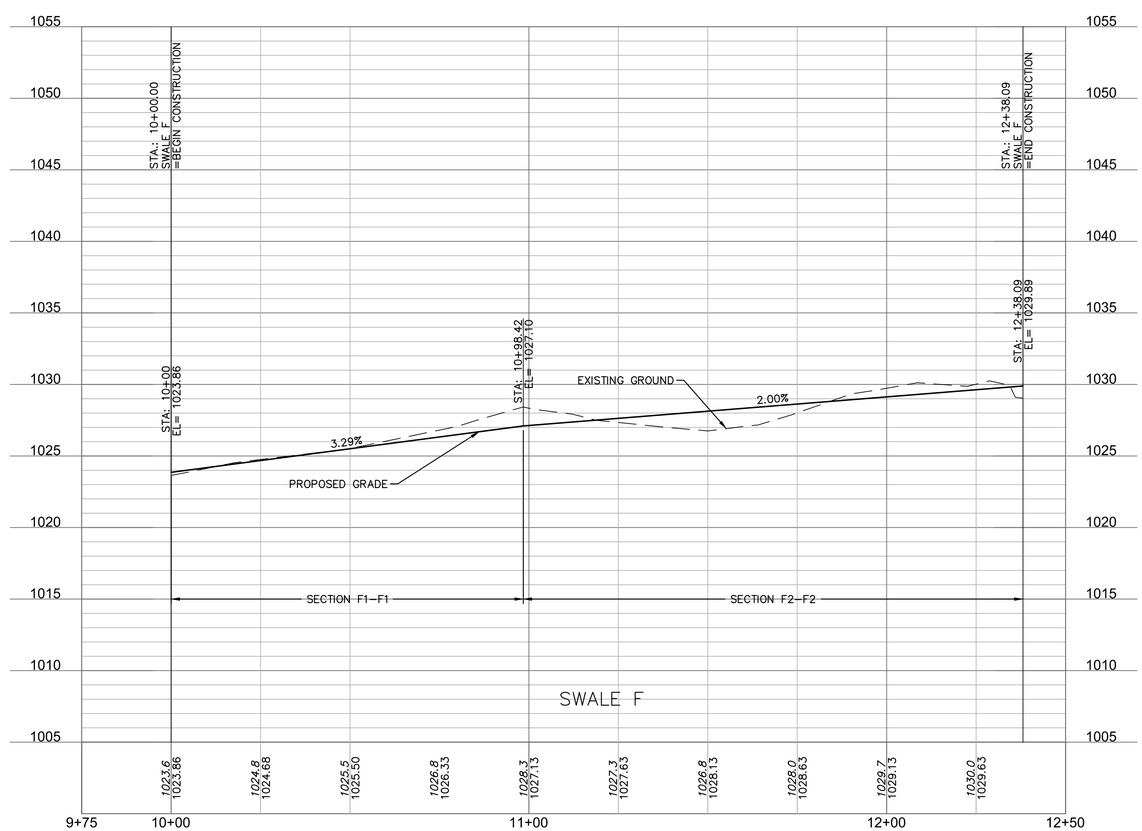
Swale Design Table (100 Year Return Frequency)

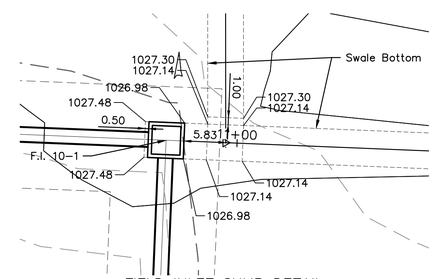
Section Data							Flow Data							
SECTION	Mannings Coefficient	Channel Slope (%)	Min. Swale Depth (ft)	Left Side Slope (H:V)	Right Side Slope (H:V)	Bottom Width (ft)	Discharge (cfs)	Water Depth (ft)	Flow Area (ft^2)	Velocity (ft/sec)	Wetted Perimeter (ft)	Top Width (ft)	Specific Energy (ft)	Shear Stress (lbs/ft^3)
F1-F1	0.03	3.29%	1.18	3:1	3:1	5.00	2.50	0.18	1.00	2.51	6.14	6.08	0.28	0.33
F2-F2	0.03	2.00%	1.12	3:1	3:1	5.00	0.92	0.12	0.64	1.43	5.76	5.72	0.15	0.14

Swale Drainage Area Table (100 year Return Frequency)

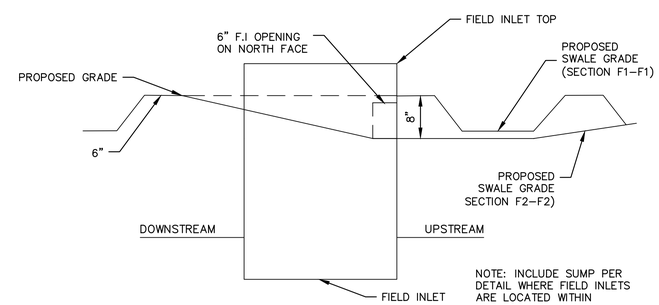
Section	Drainage Area	C	Tc	i	K	Peak Flow
	(ac.)		(min)	(in/hr)		(cfs)
F1-F1	0.38	0.51	5	10.32	1.25	2.50
F2-F2	0.14	0.51	5	10.32	1.25	0.92







FIELD INLET SUMP DETAIL
PLAN VIEW
SCALE = 1"=10'



NOTE: INCLUDE SUMP PER DETAIL WHERE FIELD INLETS ARE LOCATED WITHIN SWALES.

FIELD INLET SUMP DETAIL
PROFILE VIEW
N.T.S.

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STATE OF MISSOURI
JULIE ELAINE SELLERS
NUMBER PE-2017000367
10/1/20
PROFESSIONAL ENGINEER
JULIE E. SELLERS, P.E.
MO# 2017000367

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

SWALE PLAN & PROFILE
STREET & STORM SEWER PLANS

HAWTHORN RIDGE
SECOND PLAT

LEE'S SUMMIT, MISSOURI

2019

drawn by: D.A.H.O
checked by: M.G.D
designed by: B.M.W
QA/QC by: N.D.H
project no.: 019-1605
date: 07-12-2019

SHEET
C106

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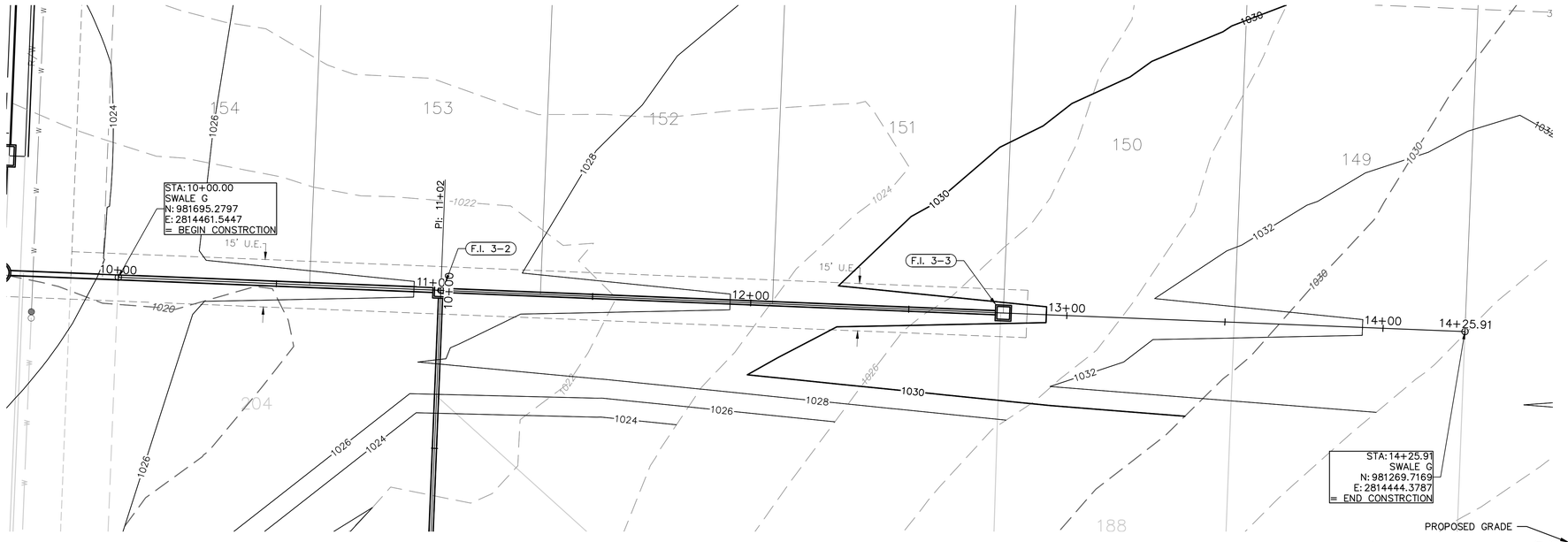

SWALE GRADING NOTES:
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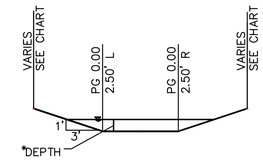
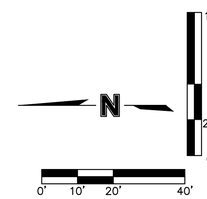
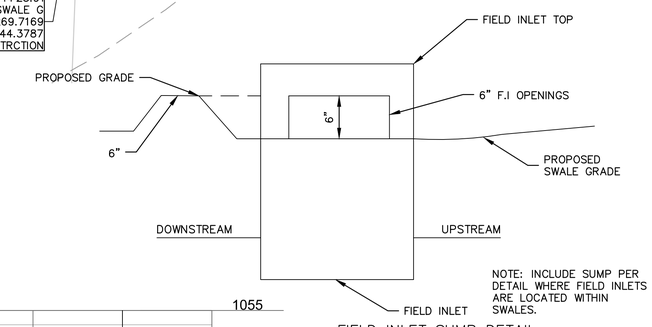


SWALE TYPICAL SECTION
* SEE TABLE FOR SWALE DEPTH
NTS

Swale Design Table (100 Year Return Frequency)													
Section Data							Flow Data						
SECTION	Mannings Coefficient	Channel Slope (%)	Min. Swale Depth (ft)	Left Side Slope (H:V)	Right Side Slope (H:V)	Bottom Width (ft)	Discharge (cfs)	Water Depth (ft)	Flow Area (ft^2)	Velocity (ft/sec)	Wetted Perimeter (ft)	Top Width (ft)	Specific Energy (ft)	Shear Stress (lbs/ft^2)
G1-G1	0.03	2.00%	1.07	3:1	3:1	5.00	0.34	0.07	0.37	0.93	5.44	5.42	0.08	0.08
G2-G2	0.03	2.00%	1.20	3:1	3:1	5.00	2.40	0.20	1.12	2.14	6.26	6.20	0.27	0.22
G3-G3	0.03	2.00%	1.24	3:1	3:1	5.00	3.28	0.24	1.37	2.39	6.52	6.44	0.33	0.26

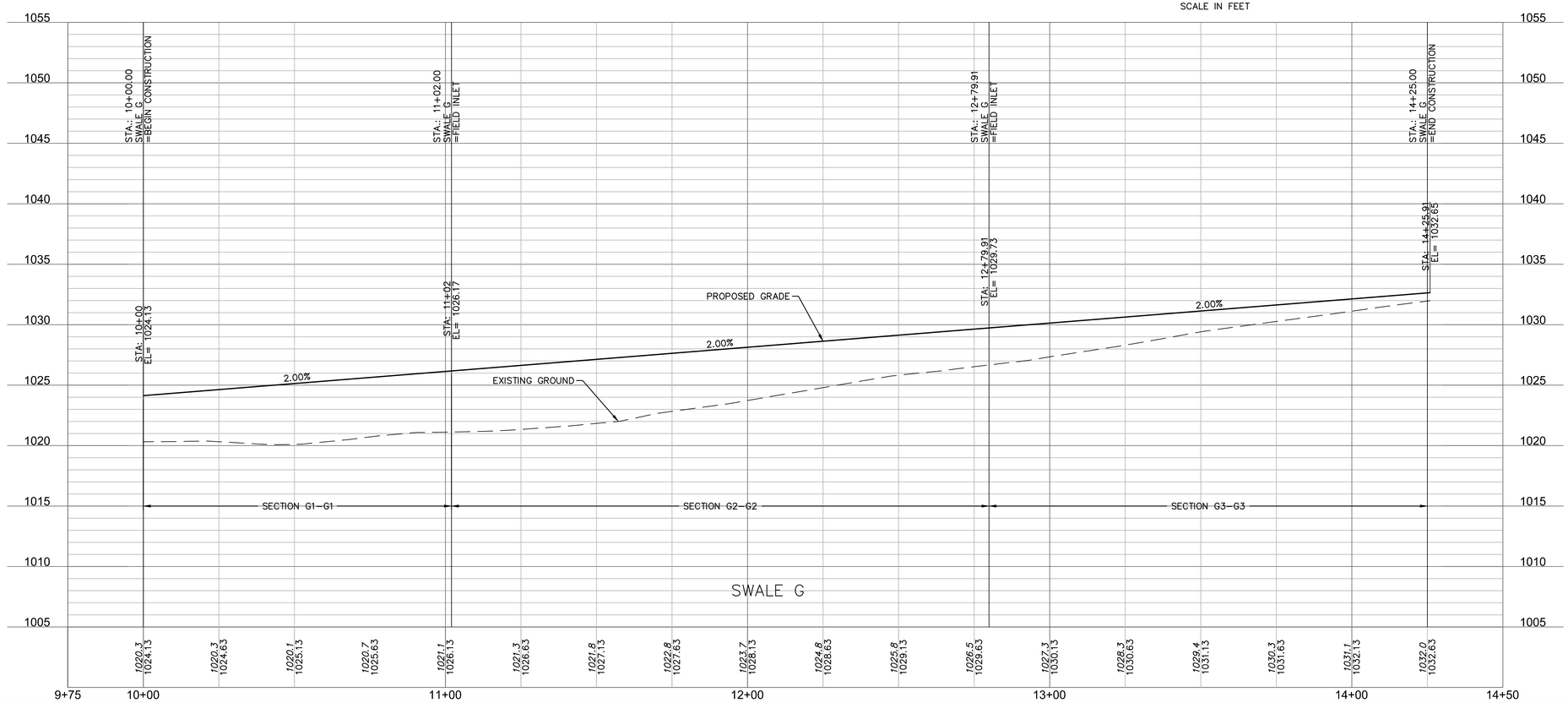
Swale Drainage Area Table (100 year Return Frequency)						
Section	Drainage Area (ac.)	C	Tc (min)	i (in/hr)	K	Peak Flow (cfs)
G1-G1	0.05	0.51	5	10.32	1.25	0.34
G2-G2	0.36	0.51	5	10.32	1.25	2.40
G3-G3	0.50	0.51	5	10.32	1.25	3.28





NOTE: INCLUDE SUMP PER DETAIL WHERE FIELD INLETS ARE LOCATED WITHIN SWALES.

FIELD INLET SUMP DETAIL
N.T.S.



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NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

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STREET & STORM SEWER PLANS

HAWTHORN RIDGE
SECOND PLAT

LEE'S SUMMIT, MISSOURI

2019

drawn by: D.A.H.O
checked by: M.G.D
designed by: B.M.W
QA/QC by: N.D.H
project no.: 019-1605
date: 07-12-2019

SHEET
C107

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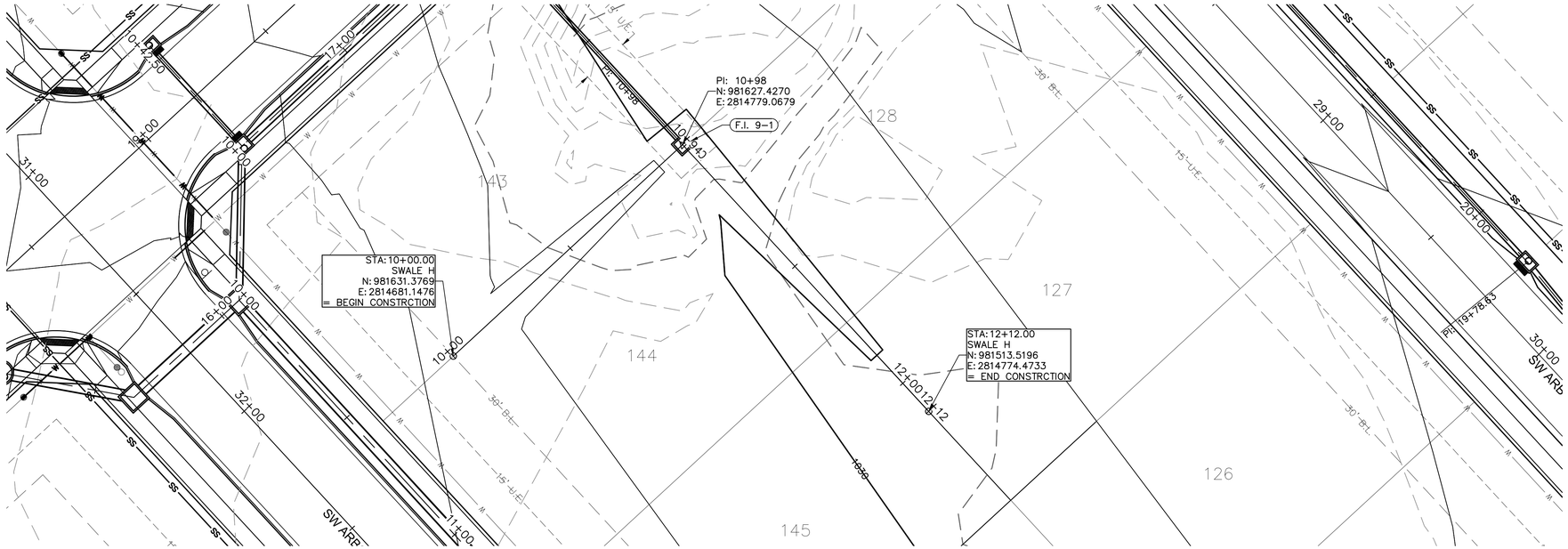

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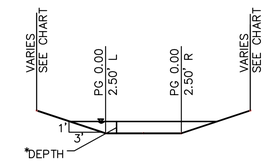


SWALE TYPICAL SECTION

* SEE TABLE FOR SWALE DEPTH

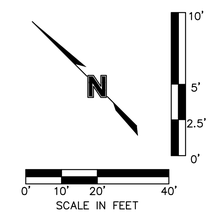
NTS

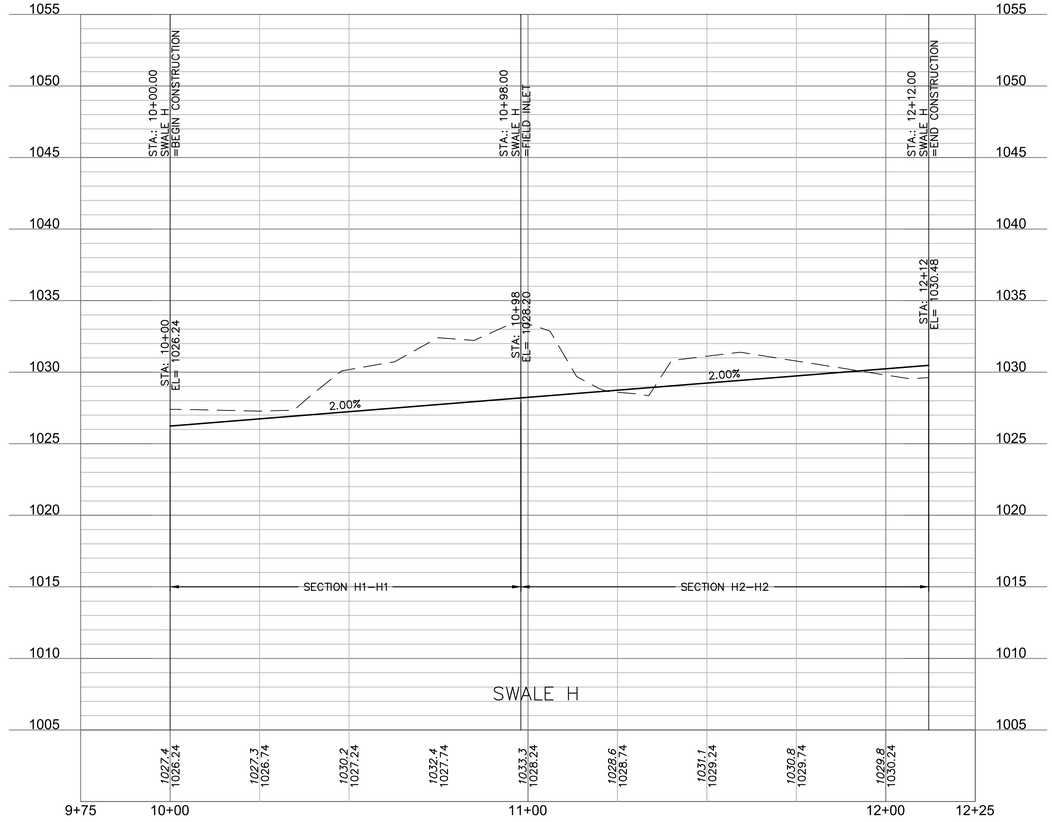
Swale Design Table (100 Year Return Frequency)

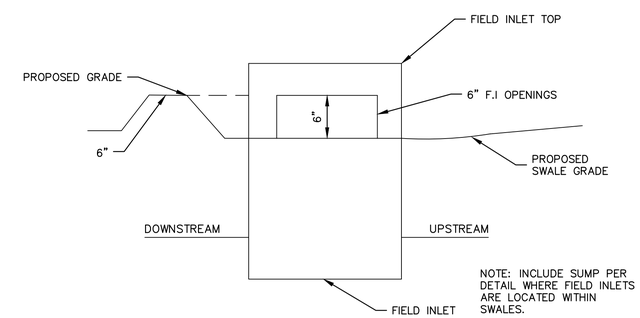
Section Data							Flow Data							
SECTION	Mannings Coefficient	Channel Slope (%)	Min. Swale Depth (ft)	Left Side Slope (H:V)	Right Side Slope (H:V)	Bottom Width (ft)	Discharge (cfs)	Water Depth (ft)	Flow Area (ft^2)	Velocity (ft/sec)	Wetted Perimeter (ft)	Top Width (ft)	Specific Energy (ft)	Shear Stress (lbs/ft^3)
H1-H1	0.03	2.00%	1.07	3:1	3:1	5.00	0.39	0.07	0.37	1.07	5.44	5.42	0.09	0.08
H2-H2	0.03	2.00%	1.20	3:1	3:1	5.00	2.37	0.20	1.12	2.12	6.26	6.20	0.27	0.22

Swale Drainage Area Table (100 year Return Frequency)

Section	Drainage Area (ac.)	C	Tc (min)	i (in/hr)	K	Peak Flow (cfs)
H1-H1	0.06	0.51	5	10.32	1.25	0.39
H2-H2	0.36	0.51	5	10.32	1.25	2.37







FIELD INLET SUMP DETAIL

N.T.S.

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STATE OF MISSOURI
JULIE ELAINE SELLERS
NUMBER PE-2017000367
10/1/20
PROFESSIONAL ENGINEER

JULIE E. SELLERS, P.E.
MO# 2017000367

NO. REV.	DATE	REVISIONS DESCRIPTION	BY
1	08-12-2019	SWALE H PLAN AND PROFILE ADDED	

REVISIONS

SWALE PLAN & PROFILE
STREET & STORM SEWER PLANS

HAWTHORN RIDGE
SECOND PLAT

LEE'S SUMMIT, MISSOURI

2019

drawn by: D.A.H.O
checked by: M.G.D
designed by: R.M.W
QA/QC by: N.D.H
project no.: 019-1605
date: 07-12-2019

SHEET
C108

DWG: F:\2019\1501-2000\019-1605\40-Design\AutoCAD\Final Plans\Sheets\GNCV\STREET, STORM & SITE DISTURBANCE\C_SWP01_0191605.dwg USER: bworthley
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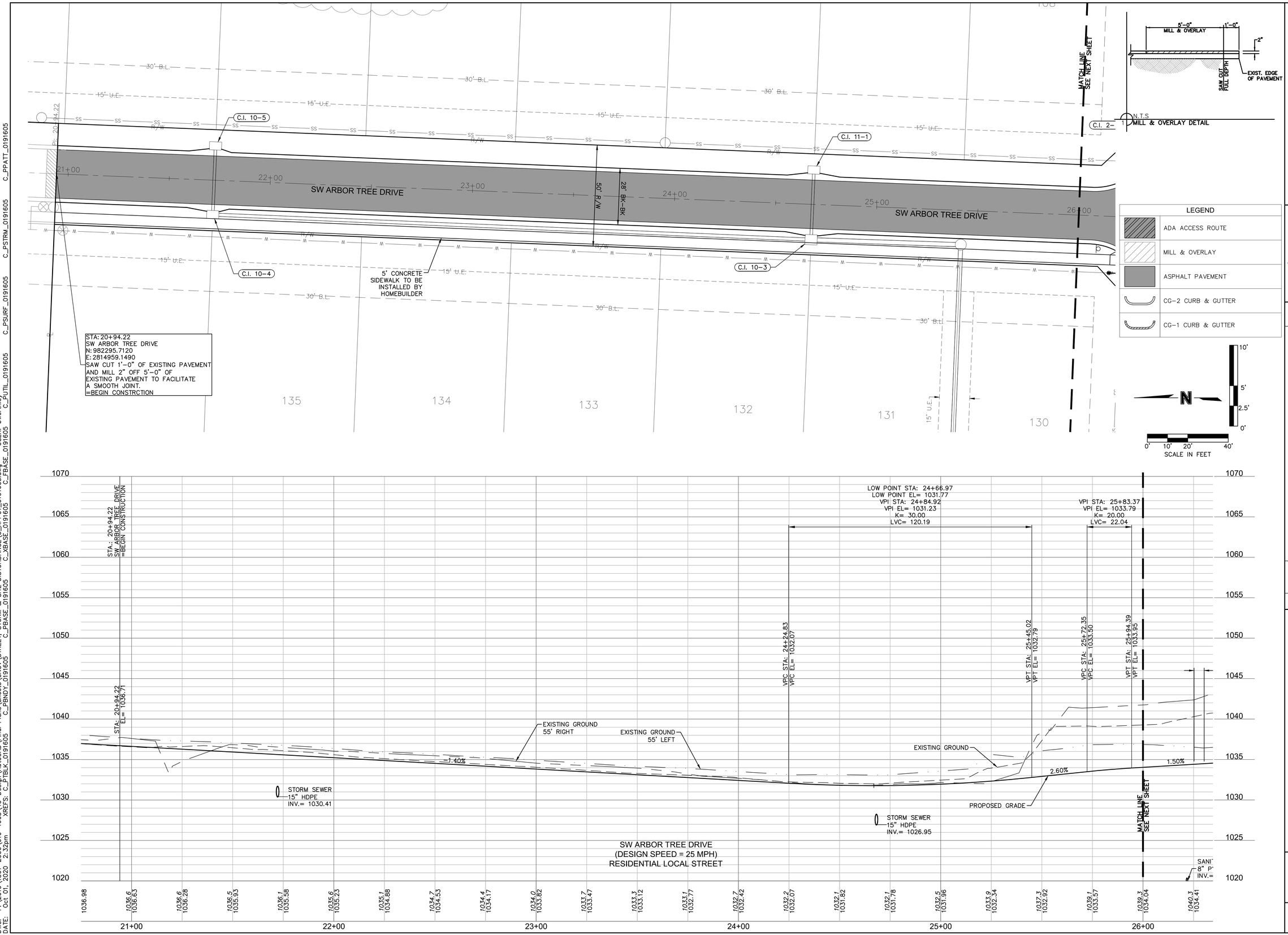

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MO CERTIFICATE OF AUTHORITY #-001592
1301 NORTH WALNUT, SUITE 200
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177

STATE OF MISSOURI
JULIE ELAINE SELLERS
NUMBER PE-2017000367
10/1/20
PROFESSIONAL ENGINEER

JULIE E. SELLERS, P.E.
MO# 2017000367

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

ROAD PLAN & PROFILE
STREET & STORM SEWER PLANS

HAWTHORN RIDGE
SECOND PLAT

LEE'S SUMMIT, MISSOURI

2019

drawn by: D.A.H.O
checked by: M.G.D
designed by: B.M.W
QA/QC by: N.D.H
project no.: 019-1605
date: 07-12-2019

SHEET
C109

DWG: F:\2019\1501-2000\019-1605\40-Design\AutoCAD\Final Plans\Sheets\GNCV\STREET, STORM & SITE DISTURBANCE\C_RPP01_0191605.dwg USER: bworthley
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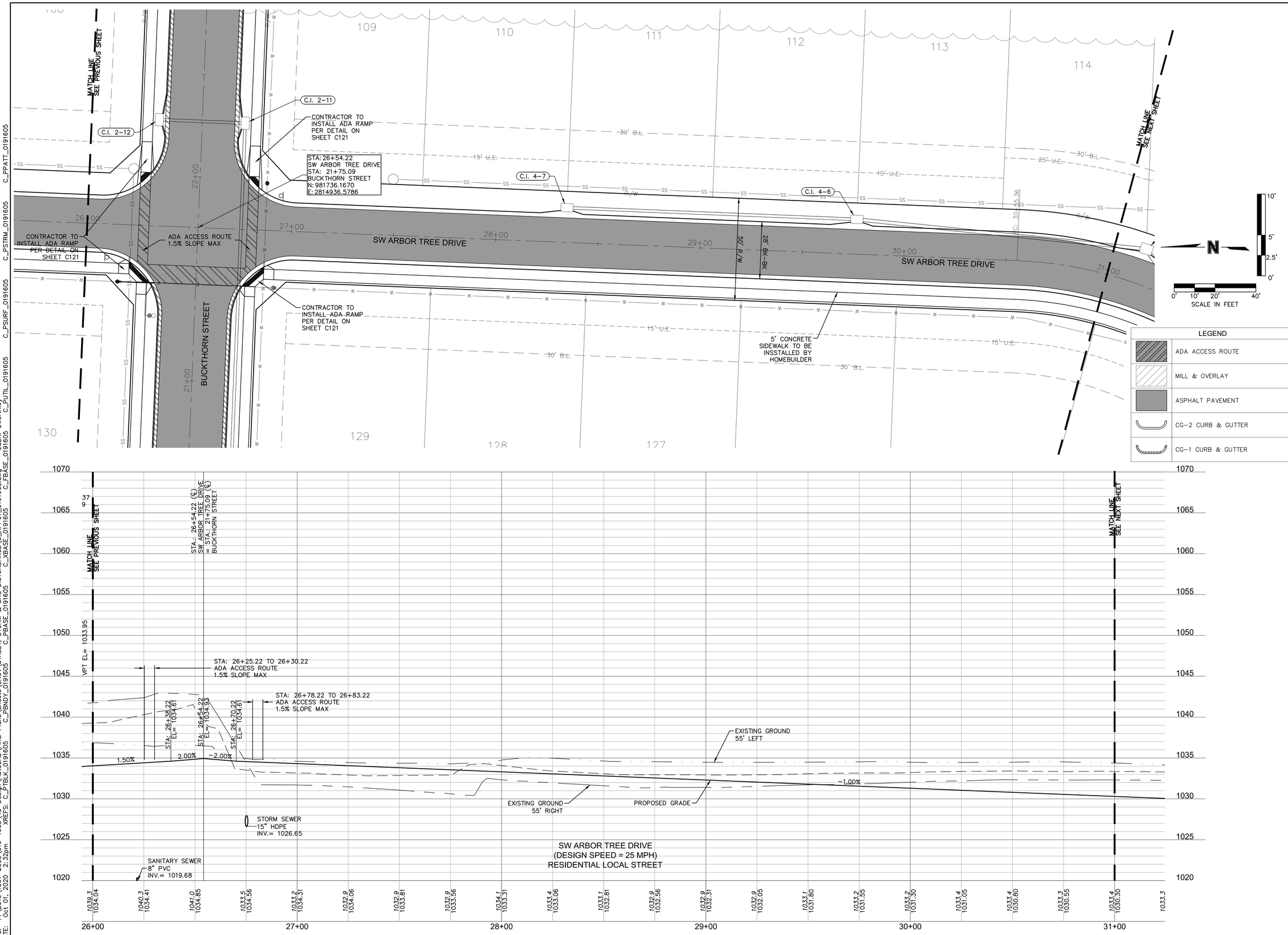

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STATE OF MISSOURI
JULIE ELAINE SELLERS
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10/1/20
PROFESSIONAL ENGINEER

JULIE E. SELLERS, P.E.
MO# 2017000367

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REVISIONS

ROAD PLAN & PROFILE
STREET & STORM SEWER PLANS

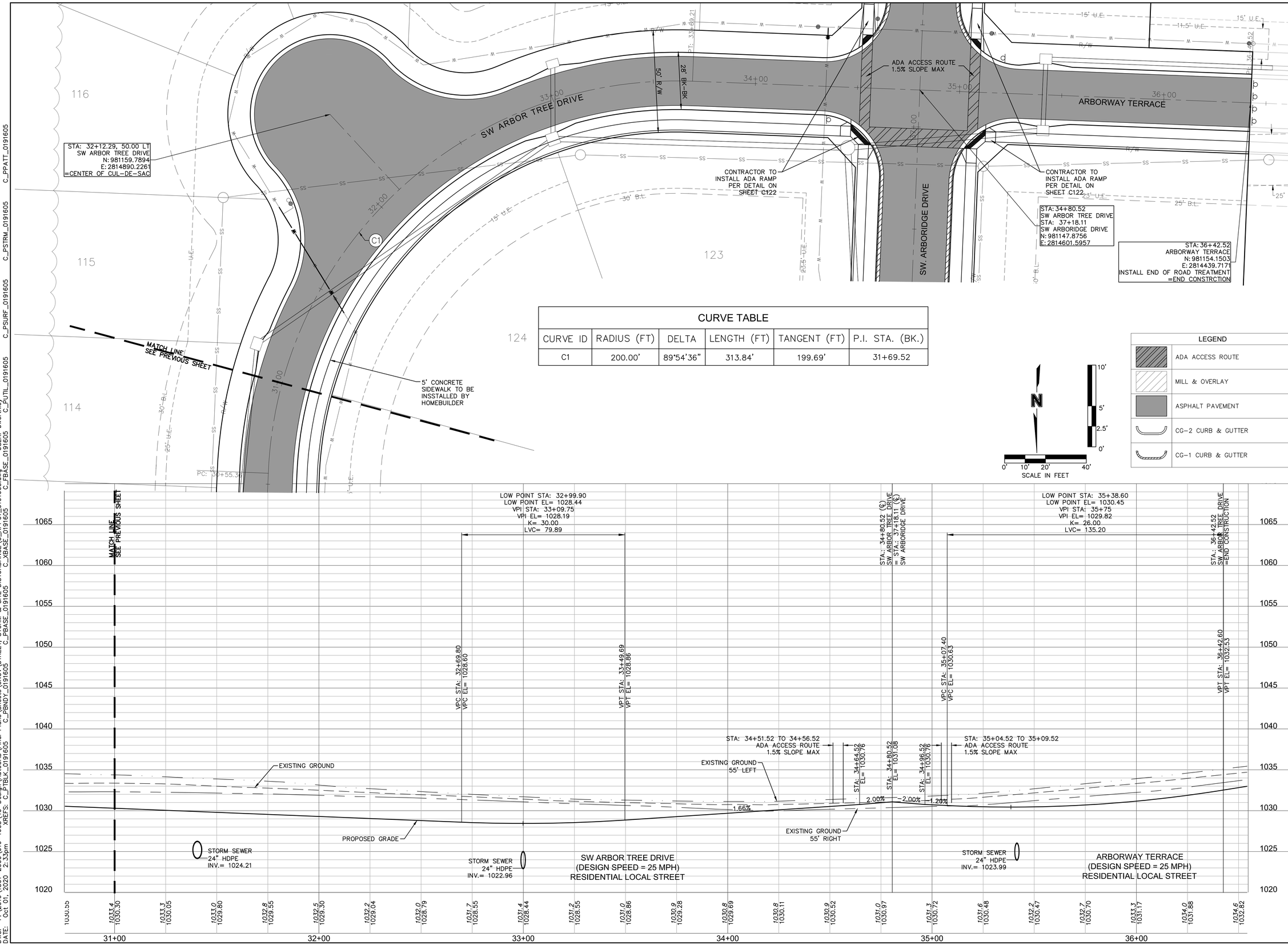
HAWTHORN RIDGE
SECOND PLAT

LEE'S SUMMIT, MISSOURI

2019

drawn by: D.A.H.O
checked by: M.G.D
designed by: B.M.W
QA/QC by: N.D.H
project no.: 019-1605
date: 07-12-2019

SHEET
C110



CURVE TABLE					
CURVE ID	RADIUS (FT)	DELTA	LENGTH (FT)	TANGENT (FT)	P.I. STA. (BK.)
C1	200.00'	89°54'36"	313.84'	199.69'	31+69.52

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MO CERTIFICATE OF AUTHORITY #-001592
1635 NE MAGNA DRIVE, SUITE 100
NORTH KANSAS CITY, MO 64116 TEL 816.361.1177

STATE OF MISSOURI
JULIE ELAINE SELLERS
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10/1/20
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JULIE E. SELLERS, P.E.
MO# 2017000367

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REVISIONS

ROAD PLAN & PROFILE
STREET & STORM SEWER PLANS

HAWTHORN RIDGE
SECOND PLAT

LEE'S SUMMIT, MISSOURI

2019

drawn by: D.A.H.O
checked by: M.G.D
designed by: B.M.W
QA/QC by: N.D.H
project no.: 019-1605
date: 07-12-2019

SHEET
C111

DWG: F:\2019\1501-2000\019-1605\40-Design\AutoCAD\Final Plans\Sheets\GNCV\STREET, STORM & SITE DISTURBANCE\C_RPP01_0191605.dwg USER: bworthley
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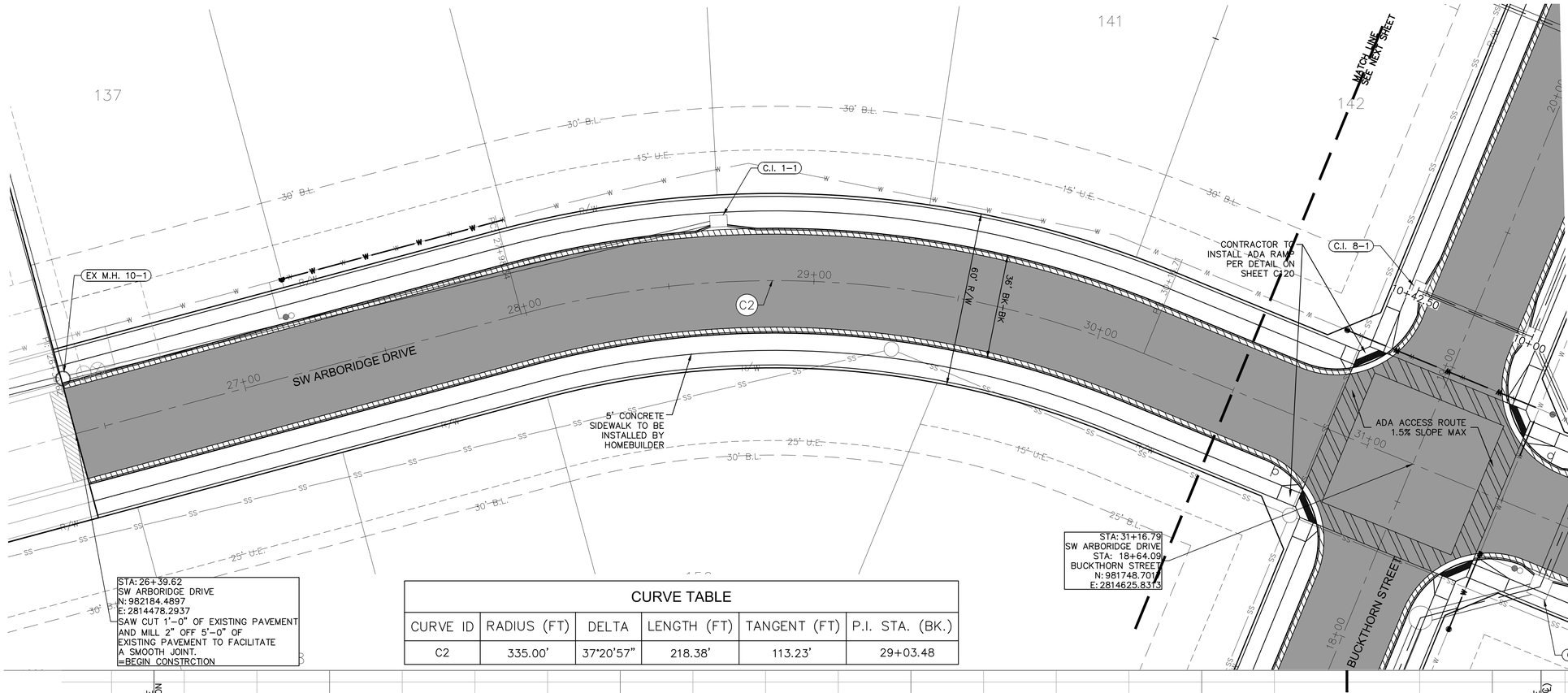
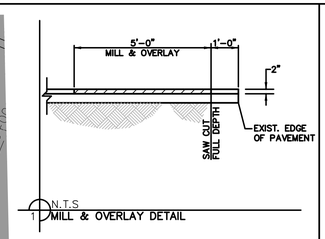
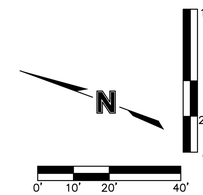


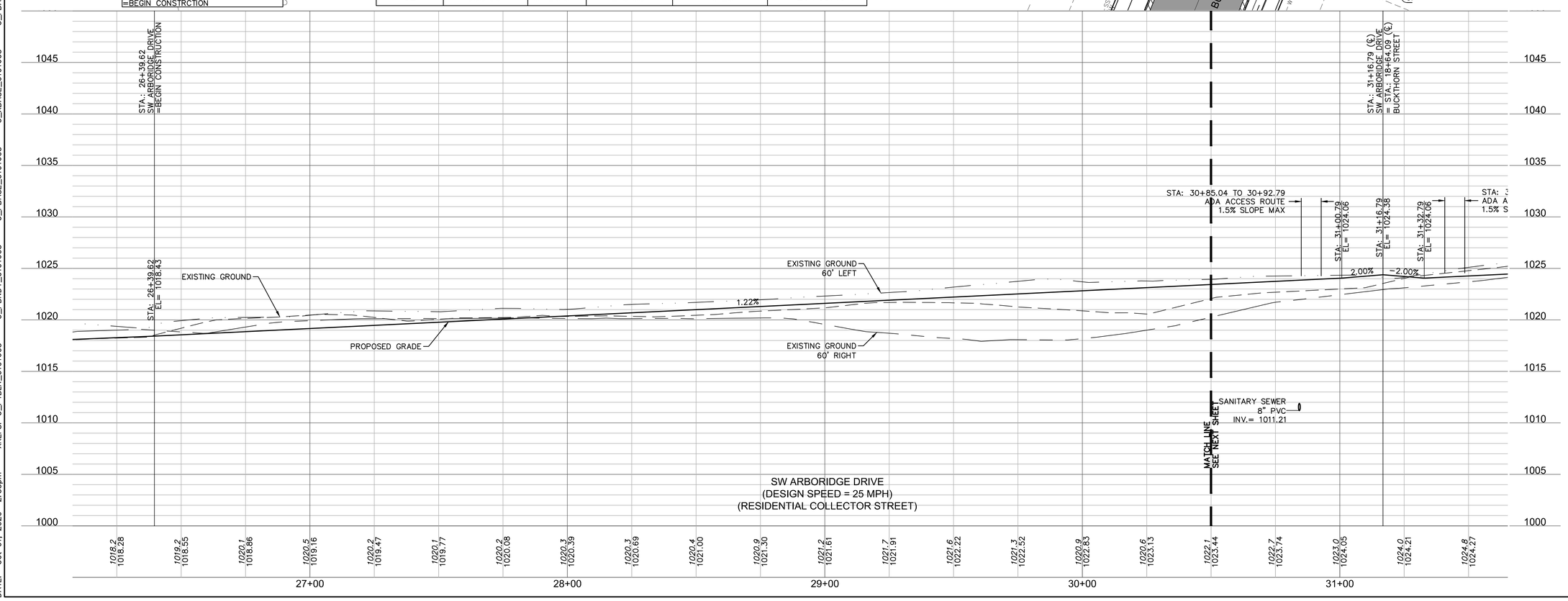




LEGEND
ADA ACCESS ROUTE
MILL & OVERLAY
ASPHALT PAVEMENT
CG-2 CURB & GUTTER
CG-1 CURB & GUTTER

CURVE TABLE

CURVE ID	RADIUS (FT)	DELTA	LENGTH (FT)	TANGENT (FT)	P.I. STA. (BK.)
C2	335.00'	37°20'57"	218.38'	113.23'	29+03.48



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MO CERTIFICATE OF AUTHORITY #-001592
1301 WEST KANSAS AVENUE, SUITE 100
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
www.olsson.com

STATE OF MISSOURI
JULIE ELAINE SELLERS
NUMBER PE-2017000367
10/1/20
PROFESSIONAL ENGINEER

JULIE E. SELLERS, P.E.
MO# 2017000367

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

ROAD PLAN & PROFILE
STREET & STORM SEWER PLANS

HAWTHORN RIDGE
SECOND PLAT

LEE'S SUMMIT, MISSOURI

2019

drawn by: D.A.H.Q
checked by: M.G.D
designed by: B.M.W
QA/QC by: D.J.H
project no.: 019-1605
date: 07-12-2019

SHEET
C112

DWG: F:\2019\1501-2000\019-1605\40-Design\AutoCAD\Final Plans\Sheets\GNCV\STREET, STORM & SITE DISTURBANCE\C_RPP02_0191605.dwg USER: bworthley
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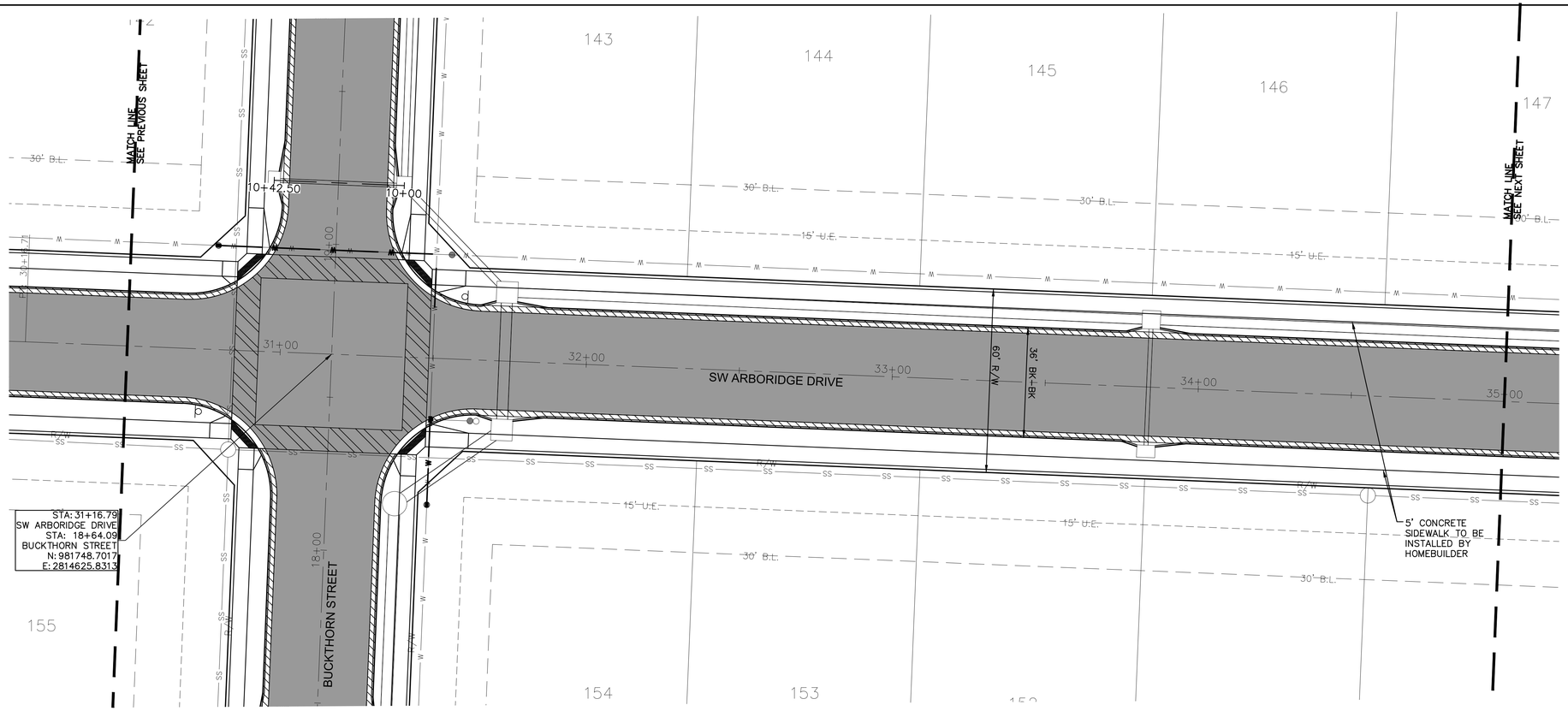
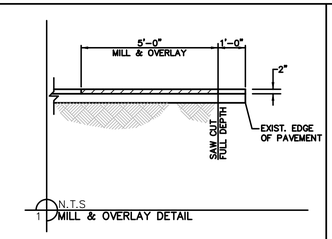
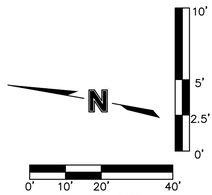
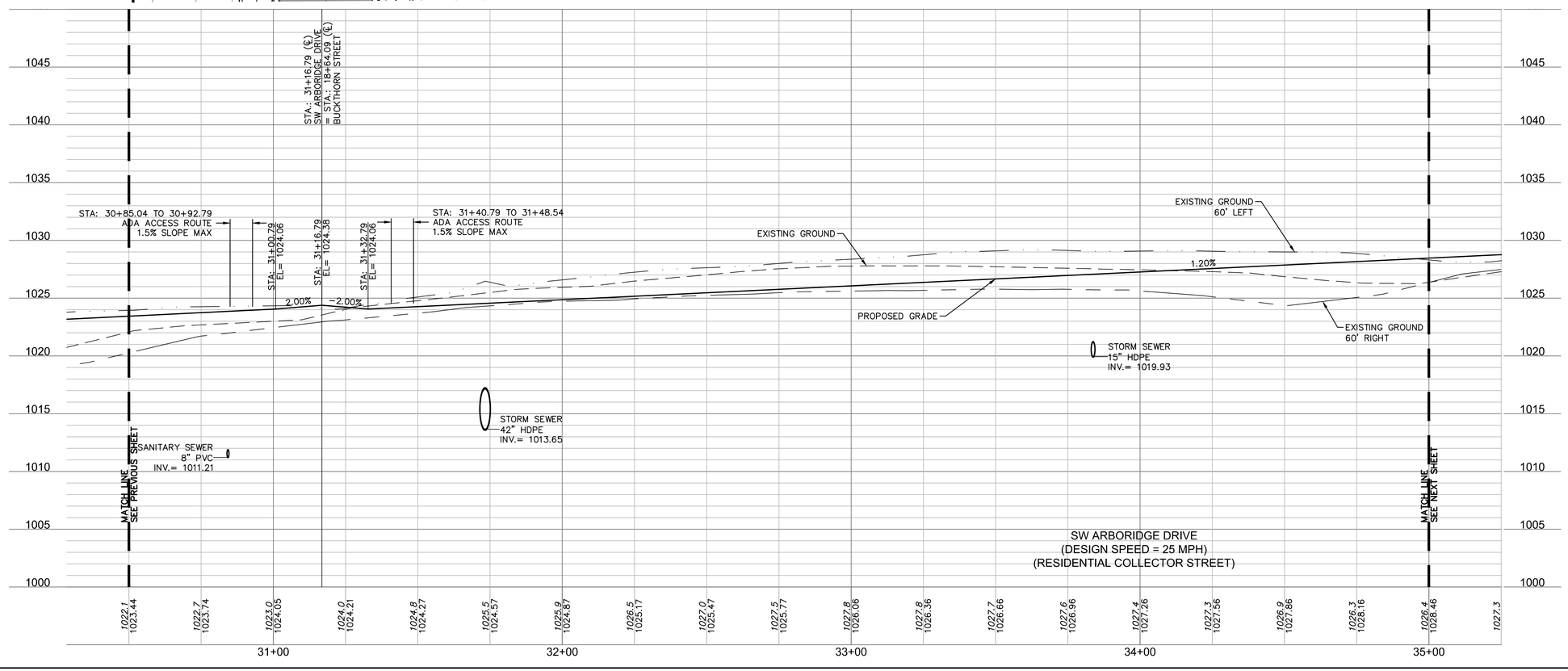




1 N.T.S
MILL & OVERLAY DETAIL



LEGEND	
	ADA ACCESS ROUTE
	MILL & OVERLAY
	ASPHALT PAVEMENT
	CG-2 CURB & GUTTER
	CG-1 CURB & GUTTER



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1301 BURLINGTON, SUITE 100
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
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STATE OF MISSOURI
JULIE ELAINE SELLERS
NUMBER PE-2017000367
10/1/20
PROFESSIONAL ENGINEER

JULIE E. SELLERS, P.E.
MO# 2017000367

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

ROAD PLAN & PROFILE
STREET & STORM SEWER PLANS

HAWTHORN RIDGE
SECOND PLAT

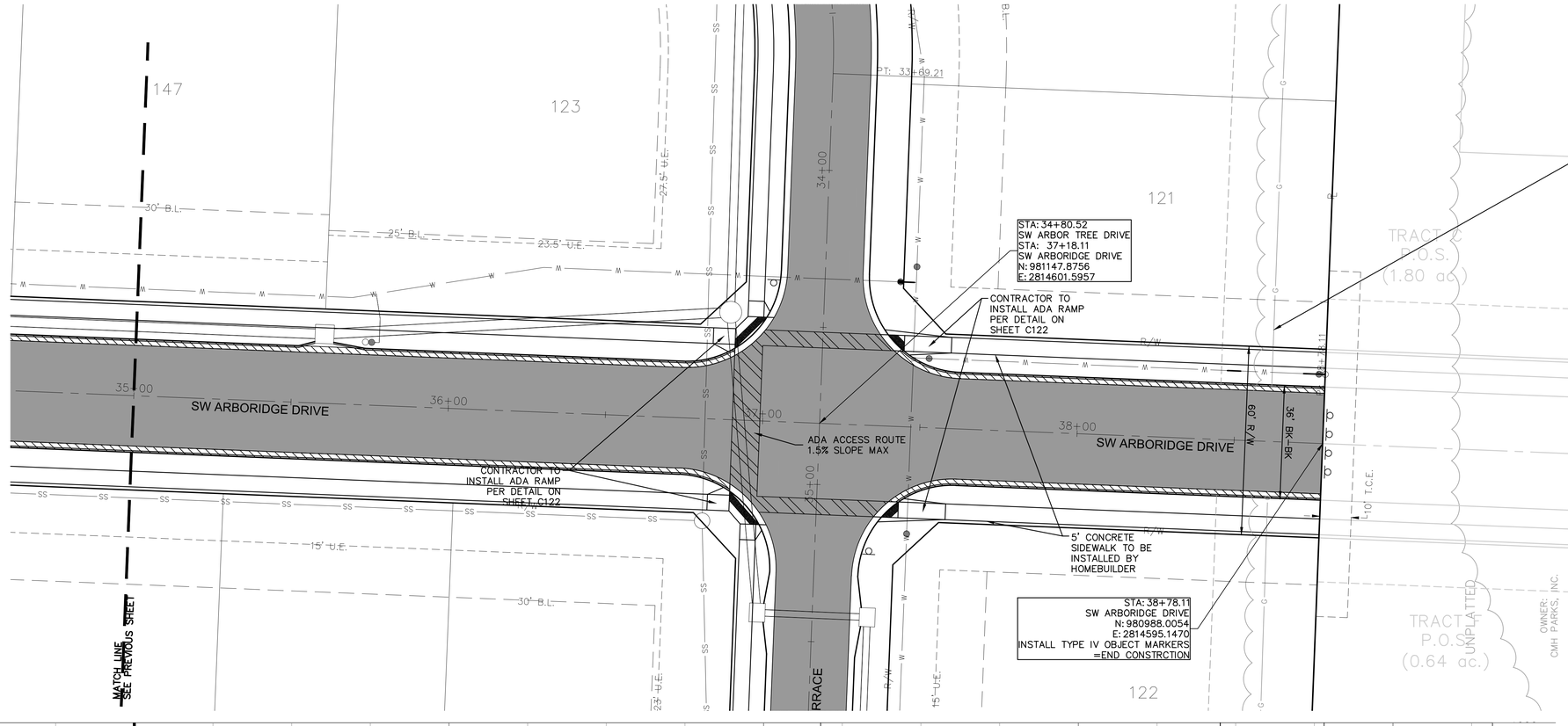
LEE'S SUMMIT, MISSOURI

2019

drawn by: D.A.H.O
checked by: M.G.D
designed by: B.M.W
QA/QC by: N.D.H
project no.: 019-1605
date: 07-12-2019

SHEET
C113

DWG: F:\2019\1501-2000\019-1605\40-Design\AutoCAD\Final Plans\Sheets\GNCV\STREET, STORM & SITE DISTURBANCE\C_RPP02_0191605.dwg USER: bworthley
DATE: Oct 01, 2020 2:35pm XREFS: C_PTBLK_0191605 C_PBNDY_0191605 C_PBASE_0191605 C_XBASE_0191605 C_PUTIL_0191605 C_PSURF_0191605 C_PSTRM_0191605 C_PPATT_0191605



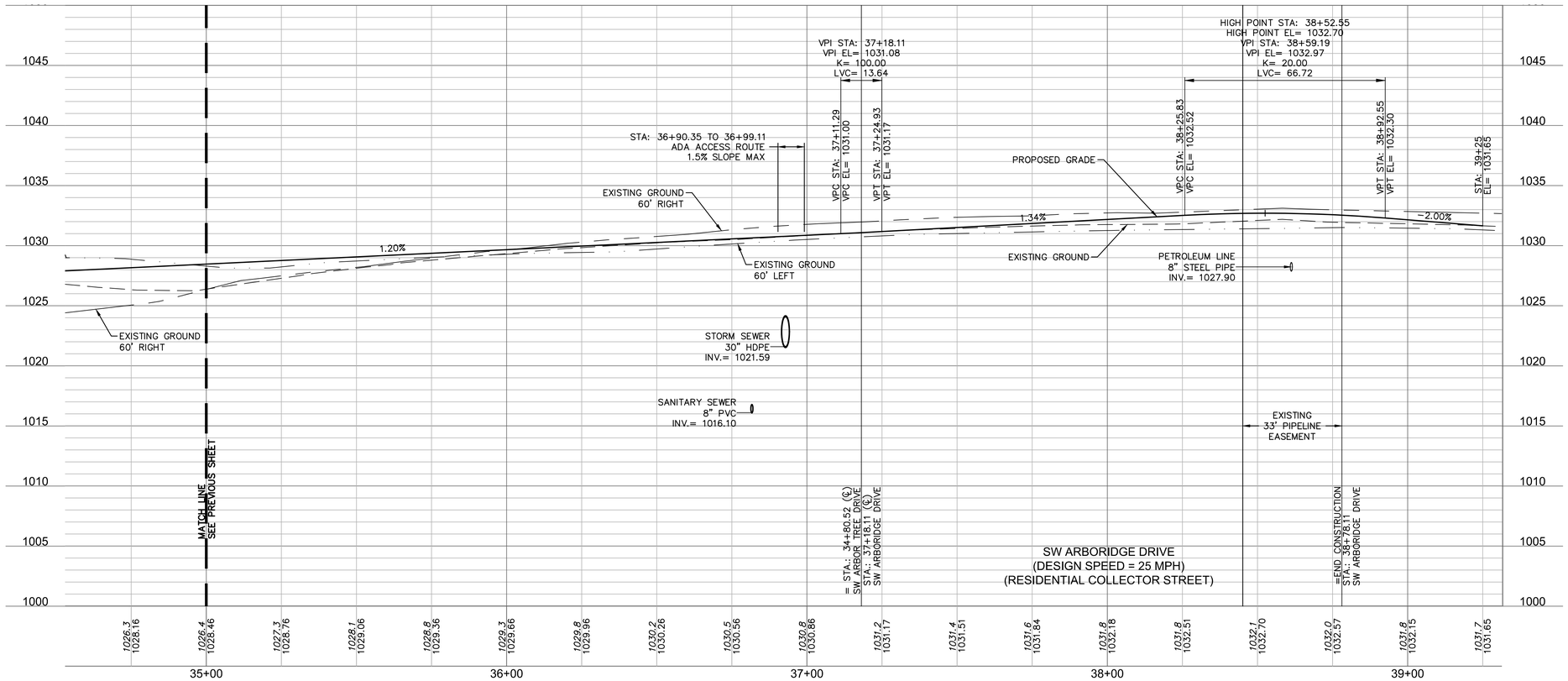
WARNING
HIGH-PRESSURE PIPELINE
EXCAVATION AND/OR CONSTRUCTION PROHIBITED WITHOUT COMPLIANCE WITH STATE ONE-CALL, AND WITHOUT WRITTEN PERMISSION FROM
MAGELLAN PIPELINE COMPANY, L.P.

N

0' 10' 20' 40'
SCALE IN FEET

0' 2.5' 5' 10'

LEGEND	
	ADA ACCESS ROUTE
	MILL & OVERLAY
	ASPHALT PAVEMENT
	CG-2 CURB & GUTTER
	CG-1 CURB & GUTTER



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DATE: Oct 01, 2020 2:35pm XREFS: C_PTBLK_0191605 C_PBNDY_0191605 C_PBASE_0191605 C_XBASE_0191605 C_PUTIL_0191605 C_PSURF_0191605 C_PSTRM_0191605 C_PPATT_0191605

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MO CERTIFICATE OF AUTHORITY #-001592
1405 NORTH WALNUT, SUITE 100
NORTH KANSAS CITY, MO 64116 TEL 816.361.1177
www.olsson.com

STATE OF MISSOURI
JULIE ELAINE SELLERS
NUMBER PE-2017000367
10/1/20
PROFESSIONAL ENGINEER
JULIE E. SELLERS, P.E.
MO# 2017000367

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

ROAD PLAN & PROFILE
STREET & STORM SEWER PLANS

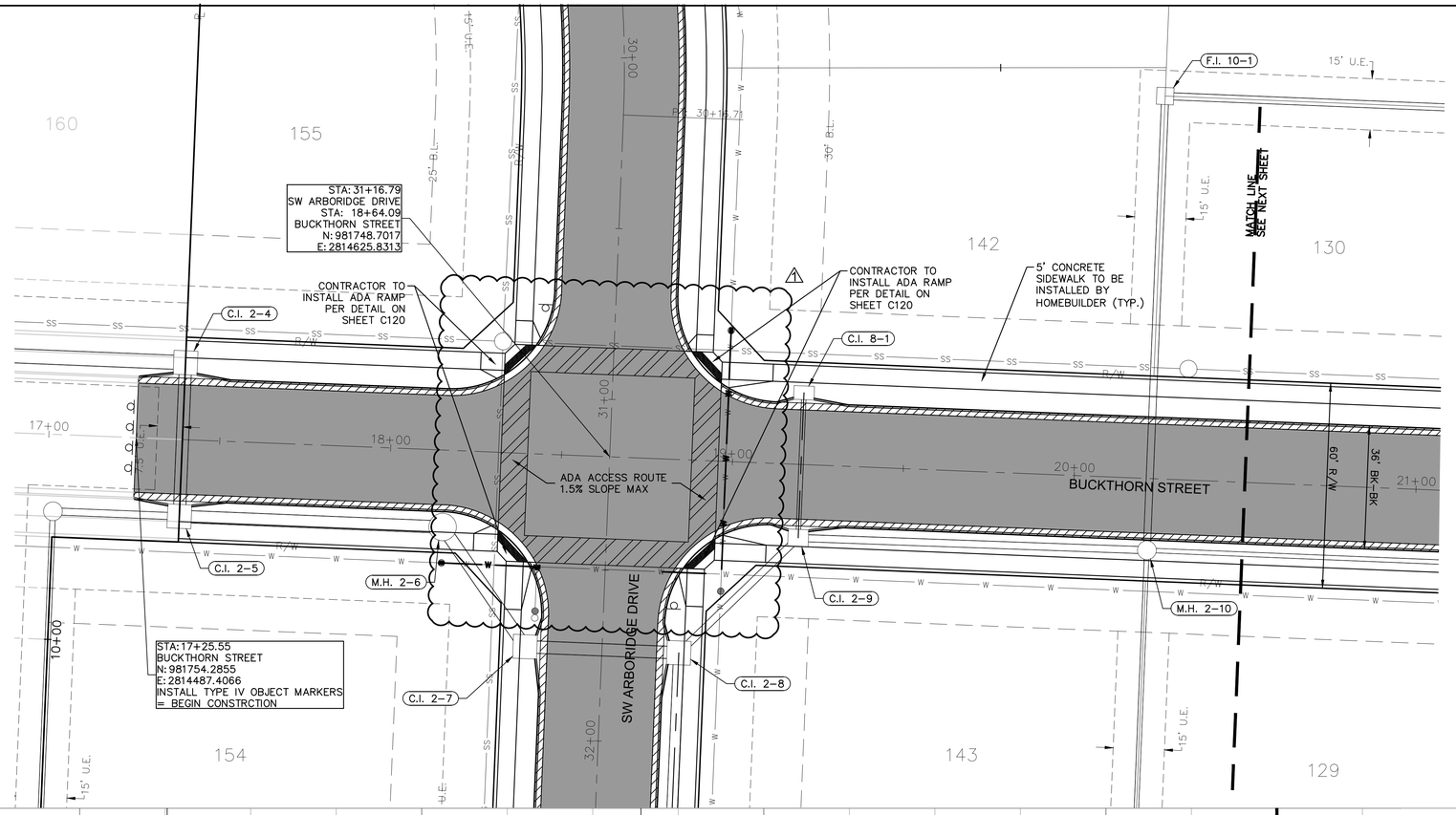
HAWTHORN RIDGE
SECOND PLAT

LEE'S SUMMIT, MISSOURI

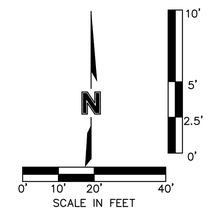
2019

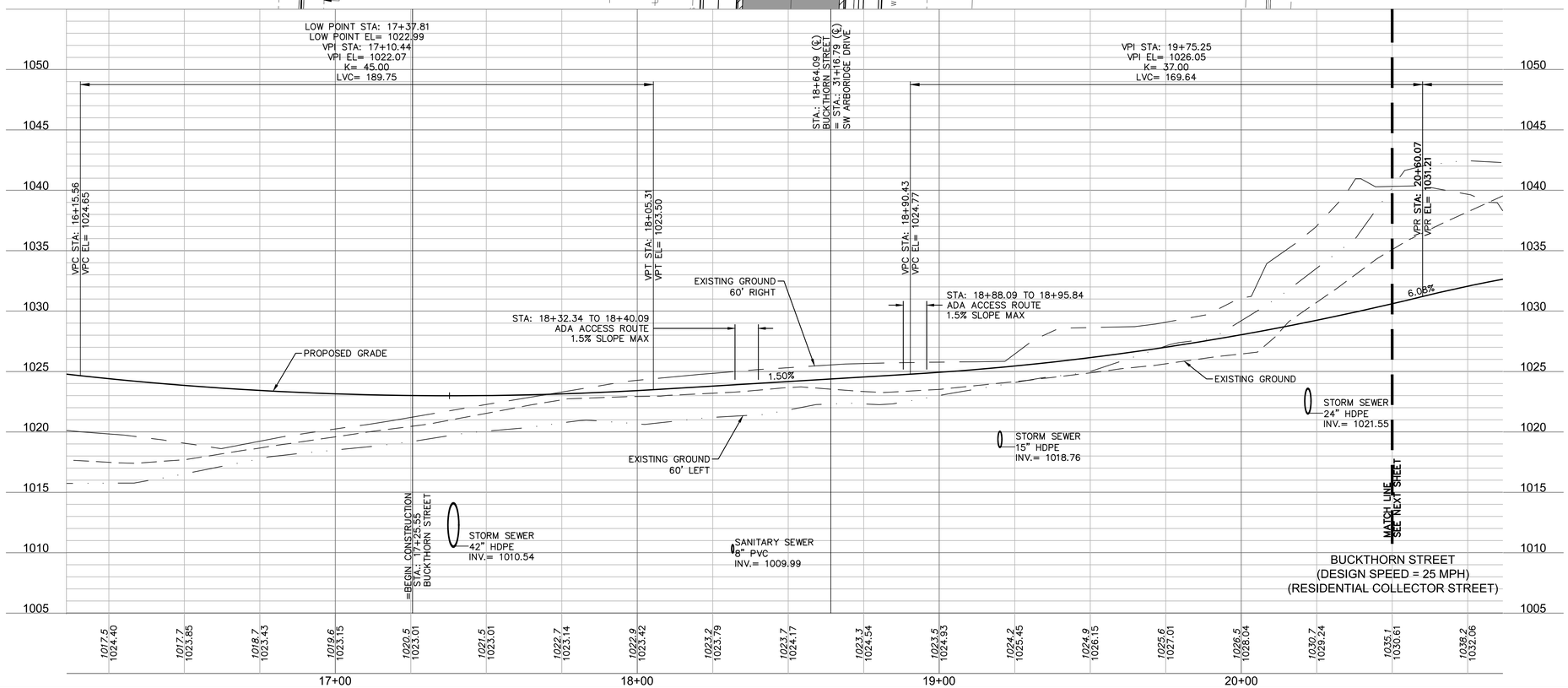
drawn by: D.A.H.O
checked by: M.G.D
designed by: B.M.W
QA/QC by: N.D.H
project no.: 019-1605
date: 07-12-2019

SHEET
C114



LEGEND	
	ADA ACCESS ROUTE
	MILL & OVERLAY
	ASPHALT PAVEMENT
	CG-2 CURB & GUTTER
	CG-1 CURB & GUTTER





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NORTH KANSAS CITY, MO 64116
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STATE OF MISSOURI
JULIE ELAINE SELLERS
NUMBER PE-2017000367
10/1/20
PROFESSIONAL ENGINEER

JULIE E. SELLERS, P.E.
MO# 2017000367

NO. REV.	DATE	REVISIONS DESCRIPTION	BY
1	08-12-2019	STOP SIGNS AND STREET NAME SIGNS REMOVED FROM BUCKTHORN STREET	

REVISIONS

ROAD PLAN & PROFILE
STREET & STORM SEWER PLANS

HAWTHORN RIDGE
SECOND PLAT

LEE'S SUMMIT, MISSOURI

2019

drawn by: D.A.H.O
checked by: M.G.D
designed by: B.M.W
QA/QC by: N.D.H
project no.: 019-1605
date: 07-12-2019

SHEET
C115

DWG: F:\2019\1501-2000\019-1605\40-Design\AutoCAD\Final Plans\Sheets\GNCV\STREET, STORM & SITE DISTURBANCE\C_RPP03_0191605.dwg USER: bworthley
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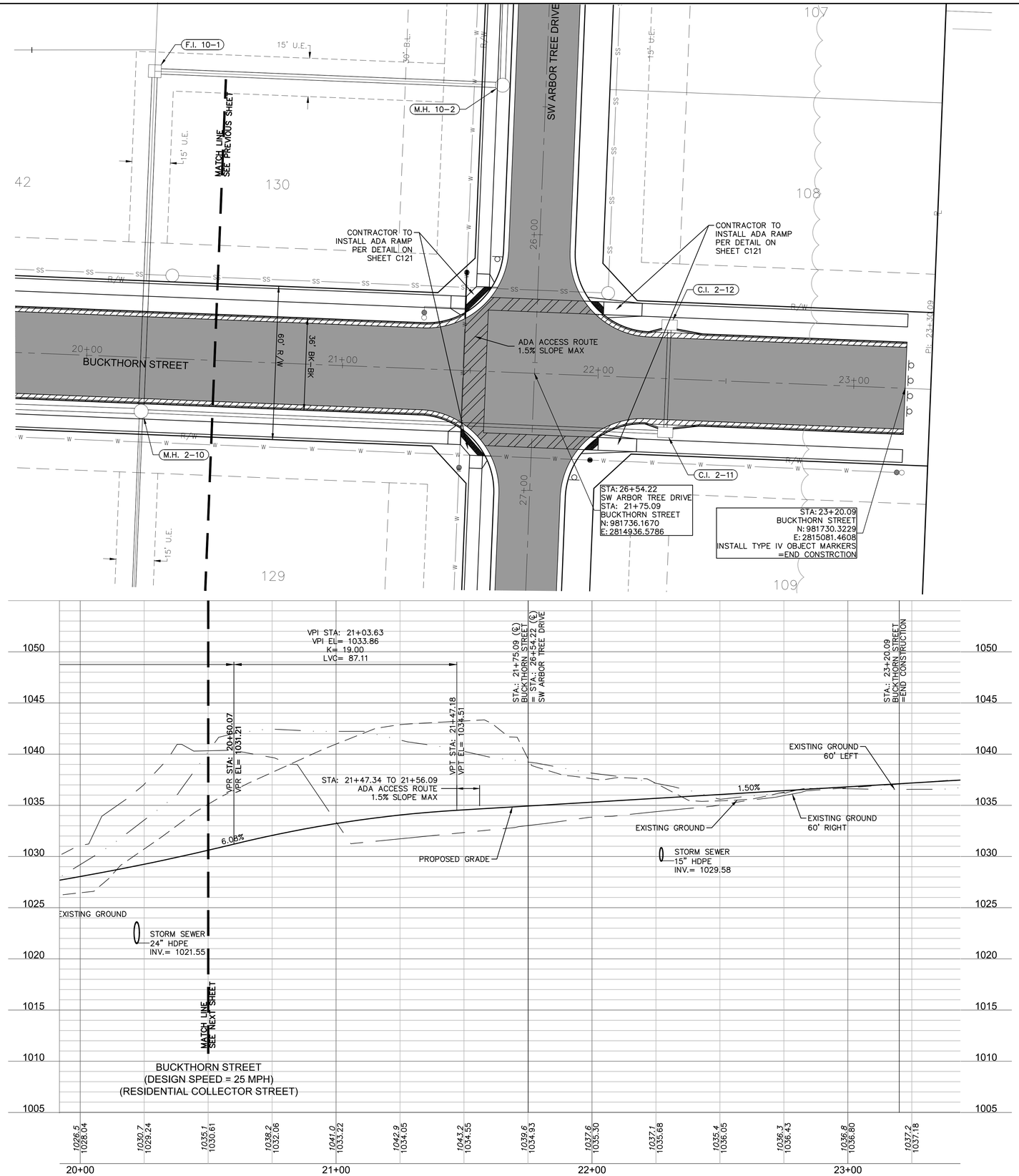

LEGEND	
	ADA ACCESS ROUTE
	MILL & OVERLAY
	ASPHALT PAVEMENT
	CG-2 CURB & GUTTER
	CG-1 CURB & GUTTER

N

0' 10' 20' 40'
SCALE IN FEET

10' 5' 2.5' 0'

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STATE OF MISSOURI
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10/1/20
PROFESSIONAL ENGINEER

JULIE E. SELLERS, P.E.
MO# 2017000367

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

ROAD PLAN & PROFILE
STREET & STORM SEWER PLANS

HAWTHORN RIDGE
SECOND PLAT

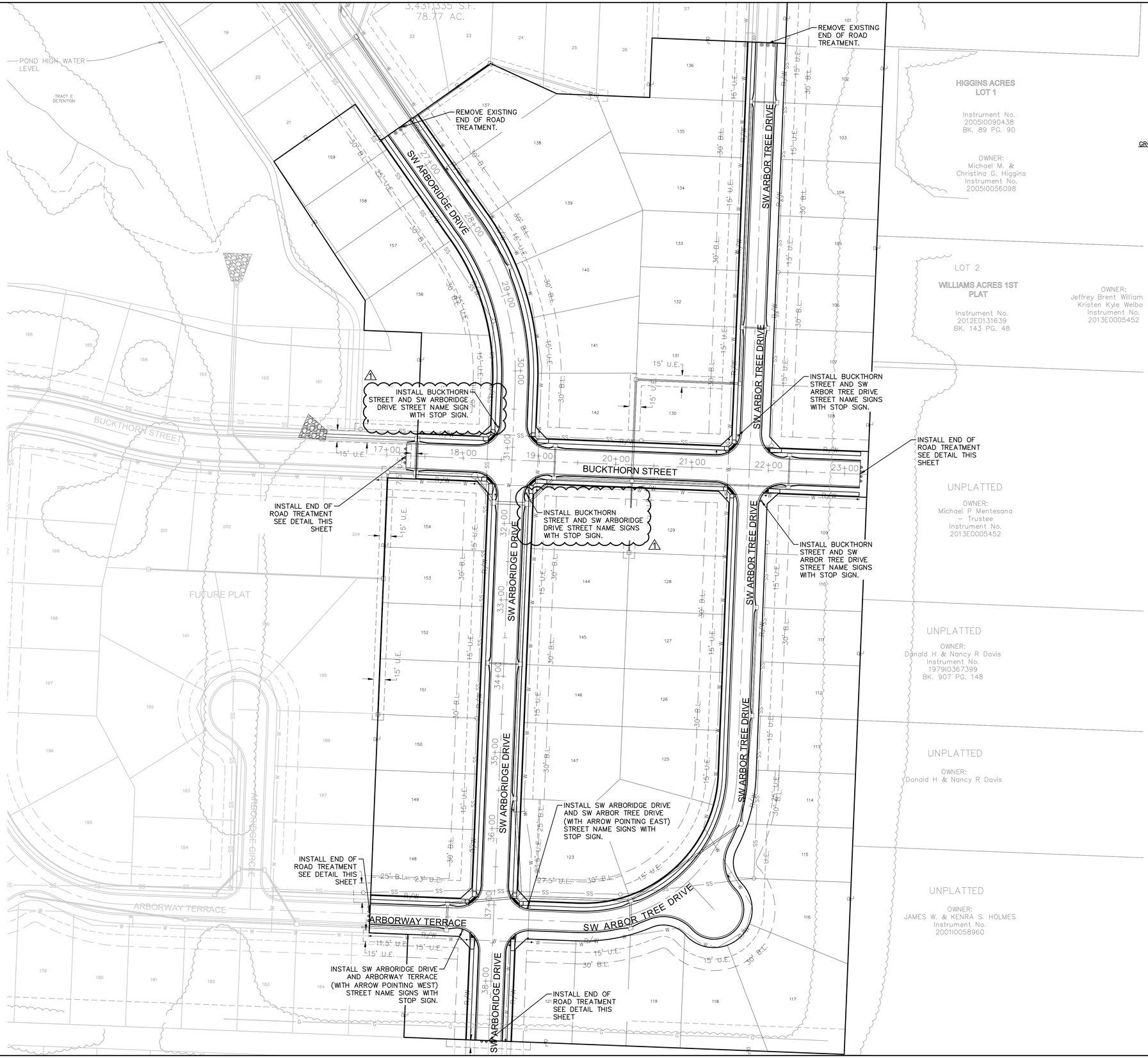
LEE'S SUMMIT, MISSOURI

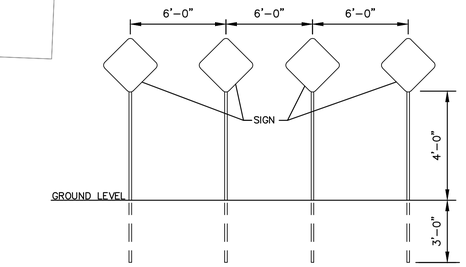
2019

drawn by: D.A.H.O
checked by: M.G.D
designed by: B.M.W
QA/QC by: N.D.H
project no.: 019-1605
date: 07-12-2019

SHEET
C116

DWG: F:\2019\1501-2000\019-1605\40-Design\AutoCAD\Final Plans\Sheets\GNCV\STREET, STORM & SITE DISTURBANCE\C_RPP03_0191605.dwg USER: bworthley
DATE: Oct 01, 2020 2:38pm XREFS: C_PTBLK_0191605 C_PBNDY_0191605 C_PBASE_0191605 C_XBASE_0191605 C_FBASE_0191605 C_PUTIL_0191605 C_PSURF_0191605 C_PSTRM_0191605 C_PPATT_0191605





END OF ROAD TREATMENT
N.T.S.

OBJECT MARKERS (TYPE OM4-3, 18"X18") ARE TO BE INSTALLED 2' FROM END OF PROPOSED PAVEMENT.

DWG: F:\2019\1501-2000\019-1605\40-Design\AutoCAD\Final Plans\Sheets\GNCV\STREET, STORM & SITE DISTURBANCE\C_TRC01_0191605.dwg USER: bworthley
DATE: Oct 01, 2020 2:38pm XREFS: C_PTBLK_0191605 C_PBNDY_0191605 C_PBASE_0191605 C_XBASE_0191605 C_PUTIL_0191605

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MO# 2017000367

NO. REV.	DATE	REVISIONS DESCRIPTION	BY
1	08-12-2019	STOP SIGNS AND STREET NAME SIGNS REMOVED FROM BUCKTHORN STREET	

REVISIONS

TRAFFIC CONTROL
STREET & STORM SEWER PLANS

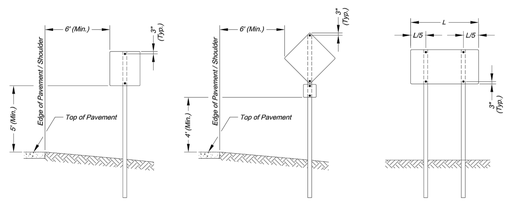
HAWTHORN RIDGE
SECOND PLAT

LEE'S SUMMIT, MISSOURI

2019

drawn by: D.A.H.Q
checked by: M.G.D
designed by: B.M.W
QA/QC by: N.D.H
project no.: 019-1605
date: 07-12-2019

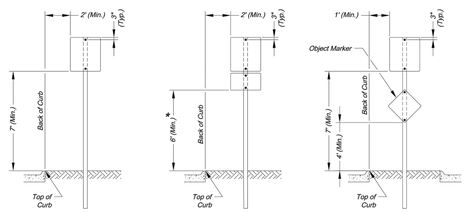
SHEET
C117



SIGN INSTALLATION FOR NON-CURBED STREET

SIGN INSTALLATION WITH AUXILARY SIGN FOR NON-CURBED STREET

SIGN INSTALLATION WITH TWO SIGN POSTS



SIGN INSTALLATION FOR CURBED STREET

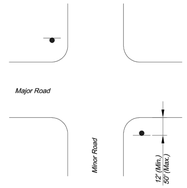
SIGN INSTALLATION WITH AUXILARY SIGN FOR CURBED STREET

SIGN INSTALLATION FOR RAISED MEDIANS

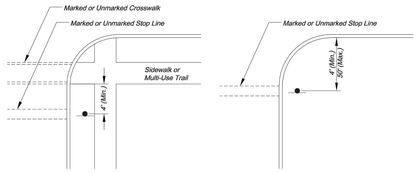
SIGN MOUNTING DETAILS

* The height to the bottom of a sign when it is located in a pedestrian walkway or extends into a walkway shall be a minimum of 80 inches above the walkway.

NOTE:
1. Generally, the sign mounting height should not be more than 1' greater than the minimum mounting height.



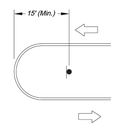
NON-CURBED INTERSECTION INSTALLATION



INTERSECTION WITH SIDEWALK / MULTI-USE TRAIL INSTALLATION

CURBED INTERSECTION INSTALLATION

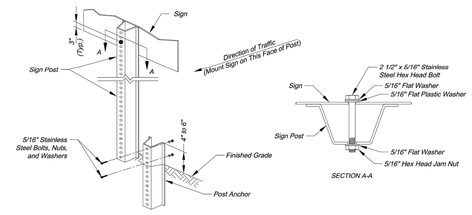
CONTROL SIGN LOCATION



TYPICAL MEDIAN SIGN LOCATION

MEDIAN SIGN LOCATION

NOTES:
1. A 4" P.V.C. sleeve shall be installed in new concrete medians at each location where a sign is to be installed.
2. For existing concrete medians, a 4" hole shall be cored into the concrete.

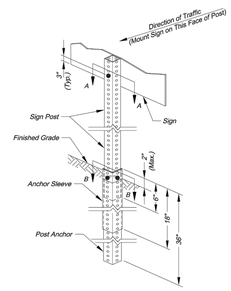


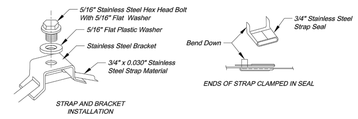
U-STEEL POST DETAILS

U-STEEL POST NOTES:
1. Splice shall be positioned entirely between finished grade line and 16" above finished grade line. Only one splice will be allowed per post.
2. U-Steel post shall be 3 lb./ft., galvanized according to ASTM A123.
3. U-Steel post can be used for installation of signs with an area of less than 2.5 square feet.
4. All posts shall be embedded a minimum of 3 feet.

PERMANENT SIGNING GENERAL NOTES:
1. All signing shall be in accordance with the latest edition of the Manual on Uniform Traffic Control Devices (MUTCD).
2. The Contractor is responsible for avoiding any and all utilities when installing sign posts, whether the utility is indicated on the plans or not.
3. All workmanship and materials shall be subject to the Inspection and approval of the Public Works Department of the City of Lee's Summit.
4. The Contractor shall stake the location of all sign posts to be installed. The City Inspector shall inspect the staking prior to installation. Minor relocation to avoid conflicts may be allowed with the approval of the City Traffic Engineer or designee.
5. Signs shown to be installed on the side of metal poles shall be mounted with stainless steel straps or wing brackets as detailed. No signs are to be installed on wood poles. See Traffic Signal Standard Drawings for the installation of signs on mast arms.
6. All post mounted signs shall be installed with breakaway anchors according to the Standard Drawings.
7. All existing signs will be used in place during construction and protected from damage unless otherwise indicated in the plans. If the Contractor damages any existing sign or posts during construction, the Contractor will be required to replace the damaged materials with new signs or posts of the same type and size at the Contractor's expense. The Contractor shall be responsible for removing and storing any signs that are to be reinstalled on the project. All equipment shall be reinstalled in good condition.
8. Existing permanent signs and posts removed by the Contractor for construction purposes which are not to be reinstalled shall be delivered to the City's Public Works Maintenance Facility (1971 SE Hamblen Road). The Contractor shall be responsible for removing and storing equipment in good condition and is fully responsible for the equipment until it is delivered.
9. All Stop, Yield, or street name signs shall be maintained in a conspicuous location for the driving public. All Stop and Yield signs removed for construction purposes can be temporarily erected in reflectorized drums (no less than 7 feet above the pavement surface) until they can be reinstalled. Any temporary Stop or Yield sign installation to be left in place overnight will require prior approval from the City Inspector.

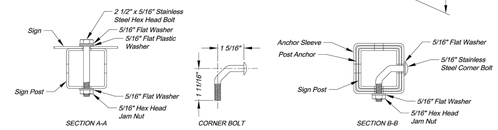
SQUARE STEEL POST INSTALLATION SEQUENCE:
1. Sign post anchor driven partially into the ground using a drive cap with a sledge or power equipment.
2. Anchor sleeve slipped over anchor and drive into the ground together with the sign post anchor.
3. Insert sign post into the post anchor and bolt in place.





STRAP TYPE SIGN SUPPORT DETAILS

METAL POLE SIGN MOUNTING NOTES:
1. Signs on metal poles shall be attached with two brackets and stainless steel bands.
2. Holes in sign for attachment to the mounting brackets shall be offset a minimum of 2 inches from the edge of the sign.
3. Holes in sign shall be located such that the sign is level.
4. All strap, bracket, and seal materials should be Type 201 stainless steel.



SQUARE STEEL POST DETAILS

SQUARE STEEL POST NOTES:
1. Square steel sign posts and break-away anchor shall consist of the following materials:
   Sign Post - 14 Ga. 2" x 2" Square Steel Post
   Post Anchor - 12 Ga. 2 1/2" x 2 1/2" x 36" Square Steel Post
   Anchor Sleeve - 12 Ga. 2 1/2" x 2 1/2" x 18" Square Steel Post
2. 14 Gauge posts must meet a certified minimum yield strength of 60,000 psi.
3. In all installations the first hole above the finished grade line on the sign post, anchor, and anchor sleeve must be in line for the insertion of the corner bolt.
4. The maximum area for one sign post is 9.0 square feet. A sign or combination of signs with an area greater than 9.0 square feet will require two posts. Also, signs with a width greater than 36" (not including 36" x 36" diamond shaped signs) will require two posts.

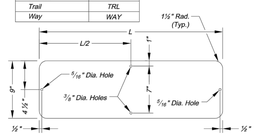
STANDARD ABBREVIATION LISTS

Named Streets	
Avenue	AVE
Boulevard	BLVD
Circle	CIR
Creek	CR
Court	CT
Crossing	XING
Drive	DR
Highway	HWY
Lane	LN
Parkway	PKWY
Place	PL
Road	RD
Street	ST
Terrace	TER
Trail	TRL
Way	WAY

Numbered Streets	
First	ST
Second	ND
Third	RD
Fourth to Tenth	TH

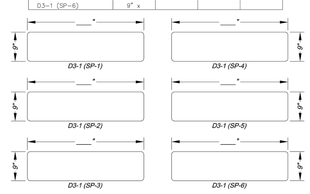
STREET NAME SIGN QUANTITIES

Sign Designation	Sign Size	Sign Area (Sq. Ft.)	Number	Quantity (Sq. Ft.)
D3-1 (SP-1)	9" x	Sq. Ft.	1	1
D3-1 (SP-2)	9" x			
D3-1 (SP-3)	9" x			
D3-1 (SP-4)	9" x			
D3-1 (SP-5)	9" x			
D3-1 (SP-6)	9" x			



STREET NAME SIGN BLANK DETAILS

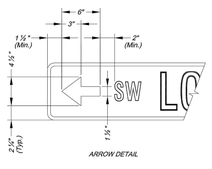
For Mounting on Square Steel Posts



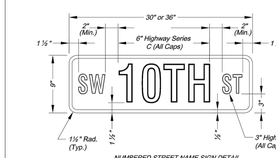
PROJECT SIGN DETAILS

NAMED STREET NAME SIGN DETAIL

* Use Highway Series B (All Caps) in lieu of series C if necessary to fit text on a 36" sign blank.



ARROW DETAIL

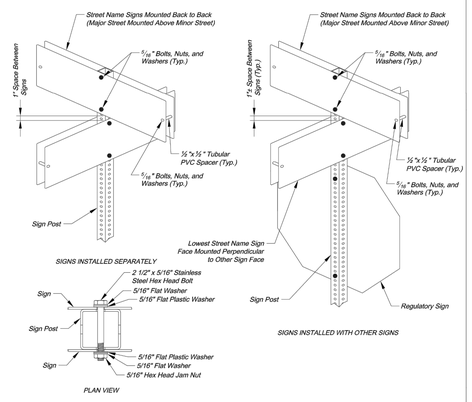


NUMBERED STREET NAME SIGN DETAIL

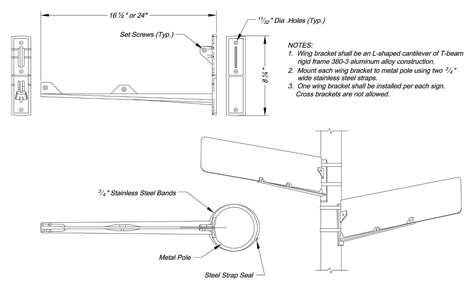
PRIVATE STREET TAG DETAIL

NOTES:
1. For all street name signs, the legend shall be white and the background shall be green.
2. Arrows shall be added to street name signs where the name of a street changes at an intersection. Street name signs with arrows are to be installed on each side of the intersection to indicate the change in names. Arrows shall be white.
3. The "PRIVATE STREET" tag should be added to the end of street name signs to indicate where a street that is outside the right-of-way intersects a public street. The background for the "PRIVATE STREET" tag shall be yellow.

STREET NAME SIGN FACE DETAILS



SQUARE STEEL POST MOUNTING DETAILS



NOTES:
1. Wing bracket shall be an L-shaped cantilever of T-beam rigid frame 380-3 aluminum alloy construction.
2. Mount each wing bracket to metal pole using two ¾" wide stainless steel straps.
3. One wing bracket shall be installed per each sign. Cross brackets are not allowed.

WING BRACKET MOUNTING DETAILS

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STATE OF MISSOURI
JULIE ELAINE SELLERS
NUMBER PE-2017000367
10/1/20
PROFESSIONAL ENGINEER

JULIE E. SELLERS, P.E.
MO# 2017000367

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

SIGN DETAILS
STREET AND STORM SEWER PLANS

HAWTHORN RIDGE
SECOND PLAT

LEE'S SUMMIT, MISSOURI

2019

drawn by: D.A.H.O
checked by: M.G.D
designed by: B.M.W
QA/QC by: N.D.H
project no.: 019-1605
date: 07-12-2019

SHEET
C118

DWG: F:\2019\1501-2000\019-1605\40-Design\AutoCAD\Final Plans\Sheets\GNCV\STREET, STORM & SITE DISTURBANCE\C_DTL01_0191605.dwg USER: bworthley
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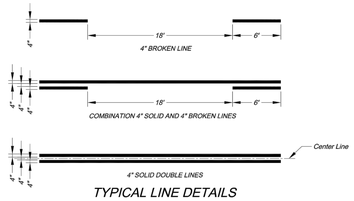
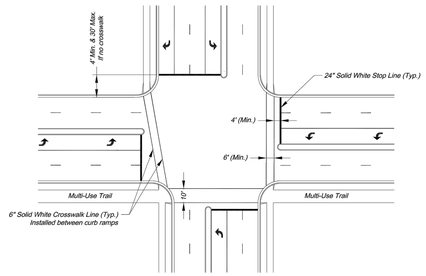


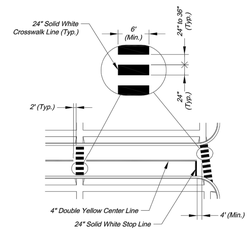
TYPICAL LINE DETAILS

NOTES:
1. All edge line, center line, and lane line pavement markings shall be 4" wide unless otherwise noted.
2. Edge lines shall be continuous solid white or yellow lines. Right side edge lines shall be solid white. Median or left side edge lines on divided roadways are to be solid yellow. Edge lines and center lines shall be continuous across driveways.

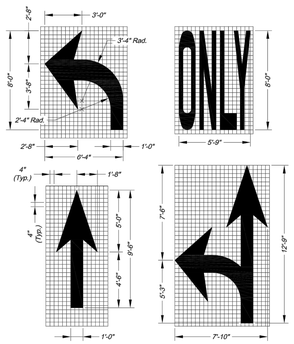


TYPICAL INTERSECTION MARKINGS

NOTES:
1. Transverse crosswalk lines shall be installed such that the distance between lines is at least 6 or 10 feet.
2. Stop lines are required at signalized intersections, on multi-lane stop controlled approaches, or in front of crosswalks at controlled intersections.

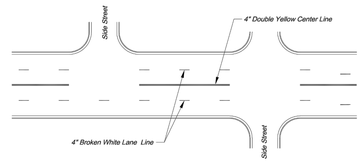


TYPICAL MIDBLOCK OR SCHOOL CROSS WALK

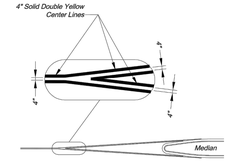


ARROW AND SYMBOL DETAILS

NOTES:
1. All arrow and symbol markings shall be white, and shall be centered in their respective traffic lanes.
2. Right-turn and combination right-turn/straight arrows are reverse of arrows shown.



TYPICAL MARKINGS FOR FOUR-LANE UNDIVIDED ROADWAY



TYPICAL MEDIAN NOSE CENTER LINE DETAIL

PAVEMENT MARKING GENERAL NOTES:
1. All pavement markings shall be in accordance with the latest edition of the Manual on Uniform Traffic Control Devices (MUTCD).
2. All words and symbols shall conform to the latest edition of Standard Alphabets for Highway Signs and Pavement Markings printed by the U.S. Department of Transportation, Federal Highway Administration.
3. Pavement markings, either temporary or permanent are required at all times if the roadway is open to traffic.
4. All pavement markings that conflict with the desired markings shall be completely removed. Removals shall not leave the road surface scarred with an image that misleads traffic. Any excess damage or scarring of pavement shall be repaired at the Contractor's expense.
5. The proposed permanent markings shall be laid out by the Contractor in advance of the marking installation. Markings shall not be applied until the layout has been approved by the City Traffic Engineer.
6. Center lines shall be marked on all undivided arterial streets, and any other undivided street with more than two lanes and/or a speed limit of 30 mph or more.
7. Edge lines shall be marked on all non-curbed streets.

CITY OF LEE'S SUMMIT
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION
220 SE GREEN STREET
LEE'S SUMMIT, MISSOURI 64063
PHONE: (816) 969-1800 FAX: (816) 969-1809

Project:

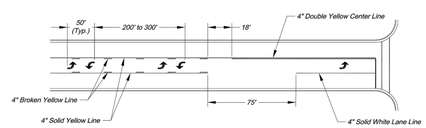
ROADWAY MARKING DETAILS

Sheet Name: STANDARD DRAWING PM-1

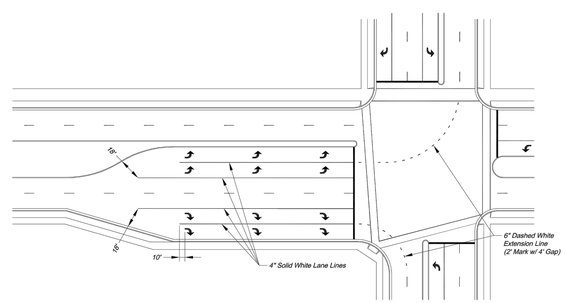
Drawn By: AS
Checked By: JW
Date: 09/09/2009
Project#

1 OF 2

1

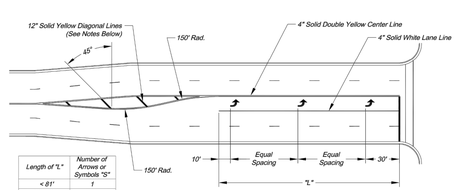


TYPICAL MARKINGS FOR TWO-WAY LEFT-TURN LANE



TYPICAL DUAL TURN LANE MARKINGS

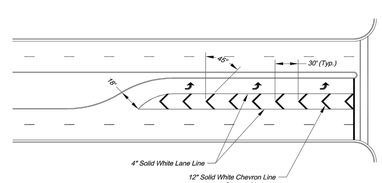
NOTE:
1. Dashed extension lines shall not extend through crosswalks.



Length of "L"	Number of Arrows or Symbols "S"
< 81'	1
81' - 120'	2
121' - 200'	3
201' - 280'	4
281' - 360'	5
361' - 440'	6

TYPICAL TURN LANE MARKINGS

NOTES:
1. Diagonal lines are required between centerlines if the width of the area between the center lines is greater than 12' and/or the length of the area between center lines is greater than 250'.
2. Diagonal lines should be spaced at 5' increments, equal to the posted speed limit.
3. Equal Spacing is calculated as (L - 40) / (S - 1).
4. When a through lane of traffic terminates as a mandatory turn lane, Arrow and "ONLY" symbols should be marked in the turn lane, in alternating order. The first and last symbols should be Arrows.



TYPICAL STRIPED OUT TURN LANE MARKINGS

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ENGINEERING DIVISION
220 SE GREEN STREET
LEE'S SUMMIT, MISSOURI 64063
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Project:

INTERSECTION MARKING DETAILS

Sheet Name: STANDARD DRAWING PM-2

Drawn By: AS
Checked By: JW
Date: 09/09/2009
Project#

2 OF 2

2

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NORTH KANSAS CITY, MO 64116 TEL: 816.361.1177

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JULIE ELAINE SELLERS
NUMBER PE-2017000367
10/1/20
PROFESSIONAL ENGINEER

JULIE E. SELLERS, P.E.
MO# 2017000367

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

ROADWAY MARKING DETAILS
STREET AND STORM SEWER PLANS

HAWTHORN RIDGE
SECOND PLAT

LEE'S SUMMIT, MISSOURI

2019

drawn by: D.A.H.O
checked by: M.G.D
designed by: B.M.W
QA/QC by: N.D.H
project no.: 019-1605
date: 07-12-2019

SHEET
C119

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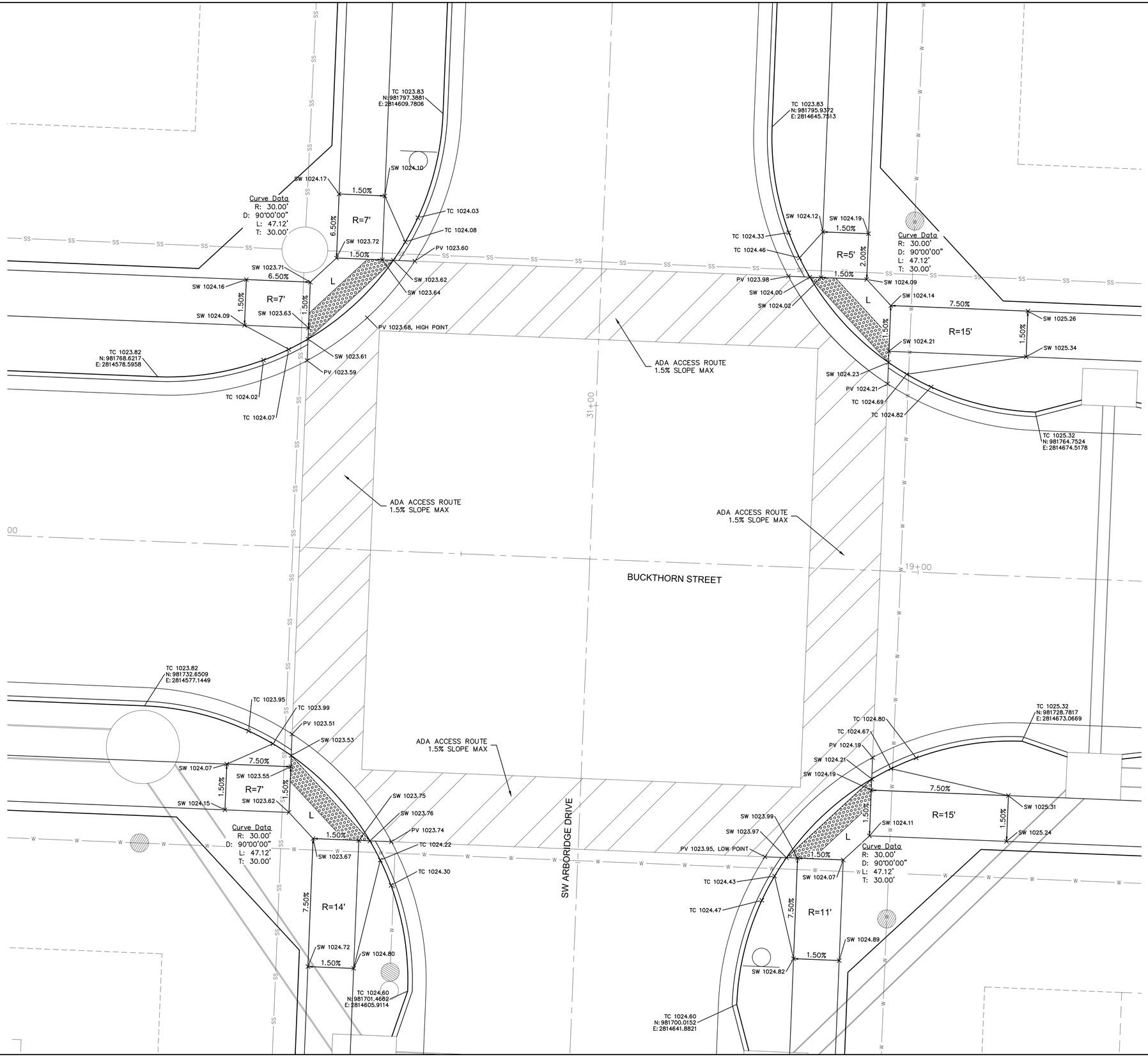

INTERSECTION AND ADA DETAIL NOTES:

1. ALL ADA CURB RAMPS SHALL BE BUILT PER CURRENT MUNICIPALITY ADOPTED ADA STANDARDS.
2. CURB RAMP FLARES SHALL NOT BE STEEPER THAN 1:10 MAX SLOPES.
3. LANDING SHALL BE PROVIDED WHERE INDICATED ON PLAN SHEET OR BY PROWAG STANDARDS. LANDING SHALL BE 4'X4' MINIMUM.
4. RAMP RUNS SHALL HAVE A MAXIMUM RUNNING SLOPE OF 1:12 UNLESS THE RAMP LENGTH IS OVER 15 FEET, THEN THE SLOPE CAN BE GREATER AS INDICATED IN DETAILS TO REACH STREET GRADES.
5. LANDINGS SHALL HAVE A MAXIMUM SLOPE OF 2% IN ANY DIRECTION.
6. CROSS SLOPE FOR RAMPS AND SIDEWALK SHALL NOT EXCEED 2%.
7. AFTER CURBS HAVE BEEN CONSTRUCTED, AND BEFORE ASPHALT OR CONCRETE PAVEMENT IS POURED, CURBS SHOULD BE MEASURED WITH A LEVEL TO ENSURE CURB ALONG ADA RAMPS AND LANDINGS WILL MEET ADA REQUIREMENTS.
8. ADA RAMP CONSTRUCTION WILL BE INSPECTED THOROUGHLY BY THE CITY INSPECTOR. CONTRACTOR SHALL BE REQUIRED TO RECONSTRUCT RAMPS, CURBS AND/OR PAVEMENT AT CONTRACTOR'S EXPENSE IF ADA RAMPS AND LANDINGS CANNOT MEET THE ADA REQUIREMENTS, PER APPROVED PLAN OR APPROVED ALTERNATIVE.
9. CURVE DATA IS FOR BACK OF CURB.

LEGEND	
TC–	TOP OF CURB
PV–	TOP OF PAVEMENT
SW–	SIDEWALK
L	LANDING AREA
R	RAMP AREA
T	TRANSITION AREA

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JULIE ELAINE SELLERS
NUMBER PE-2017000367
10/1/20
PROFESSIONAL ENGINEER

JULIE E. SELLERS, P.E.
MO# 2017000367

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

SPOT ELEVATIONS
STREET & STORM SEWER PLANS

HAWTHORN RIDGE
SECOND PLAT

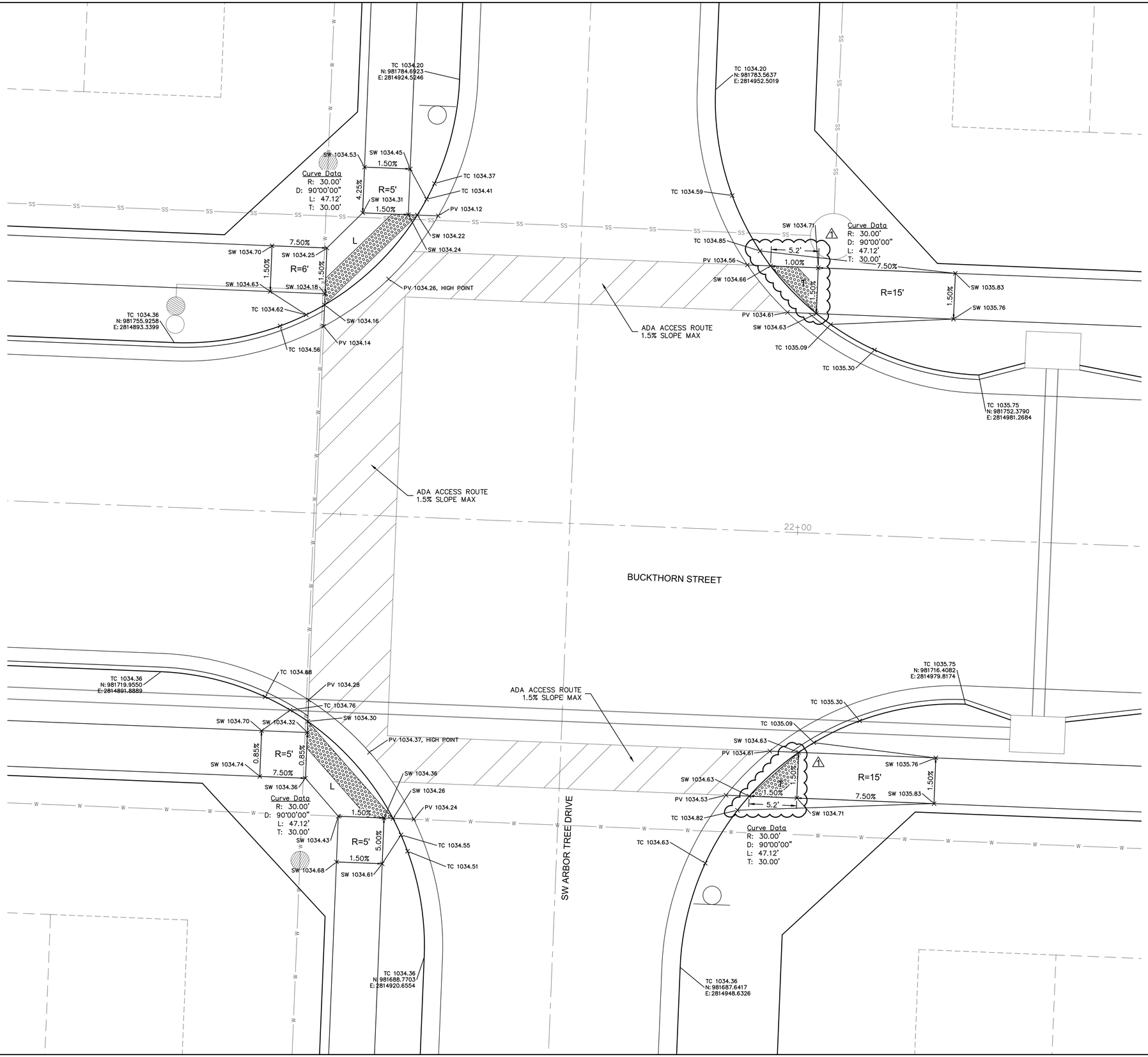
LEE'S SUMMIT, MISSOURI

2019

drawn by: D.A.H.O
checked by: M.G.D
designed by: B.M.W
QA/QC by: N.D.H
project no.: 019-1605
date: 07-12-2019

SHEET
C120

DWG: F:\2019\1501-2000\019-1605\40-Design\AutoCAD\Final Plans\Sheets\GNCV\STREET, STORM & SITE DISTURBANCE\C_SPT01_0191605.dwg USER: bworthley
DATE: Oct 01, 2020 2:39pm XREFS: C_PTBLK_0191605 C_PBNDY_0191605 C_PBASE_0191605 C_XBASE_0191605 C_FBASE_0191605 C_PUTIL_0191605 C_PSPOT_0191605



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PV–	TOP OF PAVEMENT
SW–	SIDEWALK
L	LANDING AREA
R	RAMP AREA
T	TRANSITION AREA

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10/1/20
PROFESSIONAL ENGINEER

JULIE E. SELLERS, P.E.
MO# 2017000367

NO. REV.	DATE	REVISIONS DESCRIPTION	BY
1	08-12-2019	TACTILE WARNING STRIP MOVED TO BACK OF CURB	

REVISIONS

SPOT ELEVATIONS
STREET & STORM SEWER PLANS

HAWTHORN RIDGE
SECOND PLAT

LEE'S SUMMIT, MISSOURI

2019

drawn by: D.A.H.O
checked by: M.G.D
designed by: B.M.W
QA/QC by: N.D.H
project no.: 019-1605
date: 07-12-2019

SHEET
C121

DWG: F:\2019\1501-2000\019-1605\40-Design\AutoCAD\Final Plans\Sheets\GNCV\STREET, STORM & SITE DISTURBANCE\C_SPT01_0191605.dwg USER: bworthley
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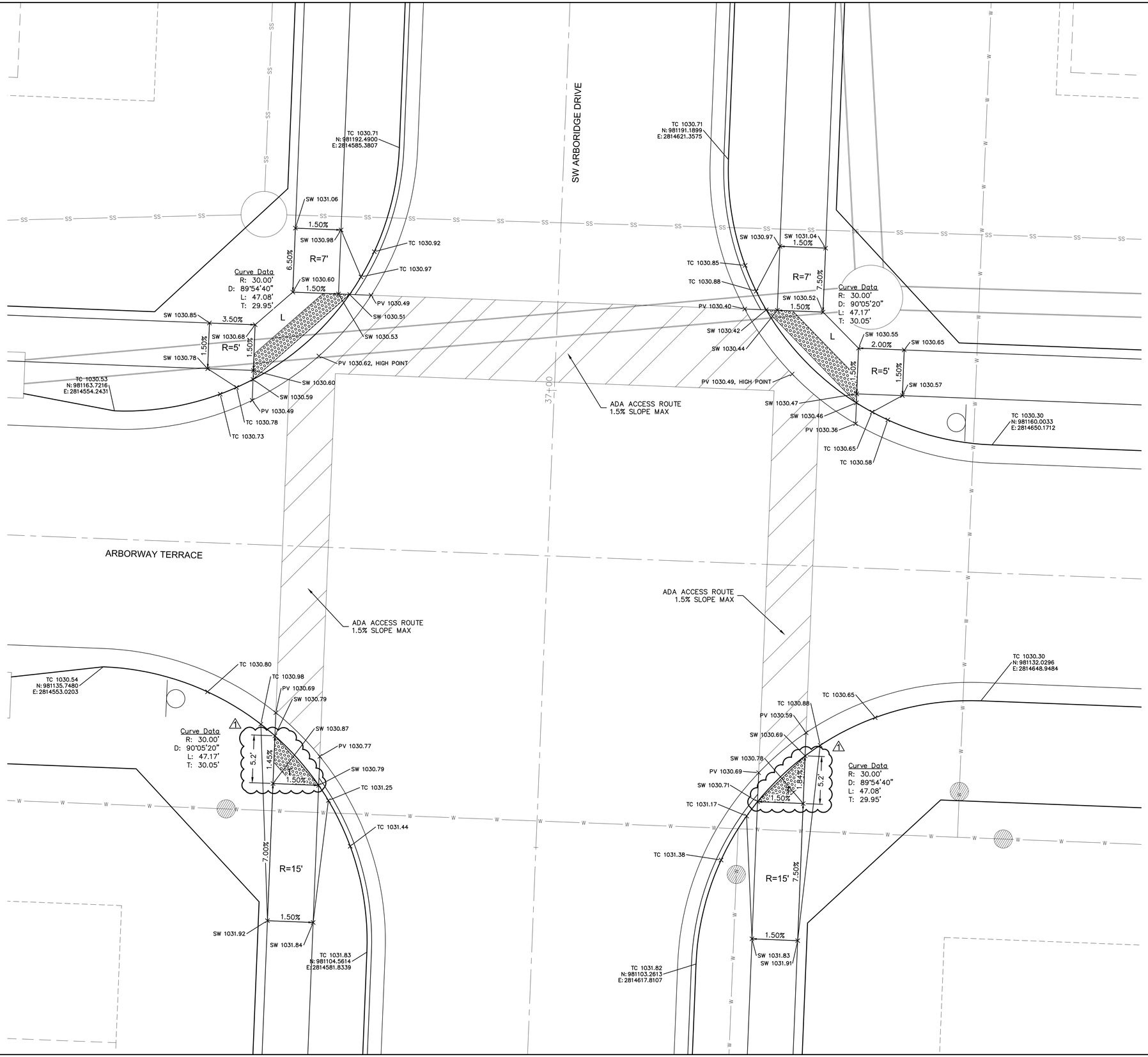

INTERSECTION AND ADA DETAIL NOTES:

1. ALL ADA CURB RAMPS SHALL BE BUILT PER CURRENT MUNICIPALITY ADOPTED ADA STANDARDS.
2. CURB RAMP FLARES SHALL NOT BE STEEPER THAN 1:10 MAX SLOPES.
3. LANDING SHALL BE PROVIDED WHERE INDICATED ON PLAN SHEET OR BY PROWAG STANDARDS. LANDING SHALL BE 4'X4' MINIMUM.
4. RAMP RUNS SHALL HAVE A MAXIMUM RUNNING SLOPE OF 1:12 UNLESS THE RAMP LENGTH IS OVER 15 FEET, THEN THE SLOPE CAN BE GREATER AS INDICATED IN DETAILS TO REACH STREET GRADES.
5. LANDINGS SHALL HAVE A MAXIMUM SLOPE OF 2% IN ANY DIRECTION.
6. CROSS SLOPE FOR RAMPS AND SIDEWALK SHALL NOT EXCEED 2%.
7. AFTER CURBS HAVE BEEN CONSTRUCTED, AND BEFORE ASPHALT OR CONCRETE PAVEMENT IS POURED, CURBS SHOULD BE MEASURED WITH A LEVEL TO ENSURE CURB ALONG ADA RAMPS AND LANDINGS WILL MEET ADA REQUIREMENTS.
8. ADA RAMP CONSTRUCTION WILL BE INSPECTED THOROUGHLY BY THE CITY INSPECTOR. CONTRACTOR SHALL BE REQUIRED TO RECONSTRUCT RAMPS, CURBS AND/OR PAVEMENT AT CONTRACTOR'S EXPENSE IF ADA RAMPS AND LANDINGS CANNOT MEET THE ADA REQUIREMENTS, PER APPROVED PLAN OR APPROVED ALTERNATIVE.
9. CURVE DATA IS FOR BACK OF CURB.

LEGEND	
TC–	TOP OF CURB
PV–	TOP OF PAVEMENT
SW–	SIDEWALK
L	LANDING AREA
R	RAMP AREA
T	TRANSITION AREA

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10/1/20
PROFESSIONAL ENGINEER

JULIE E. SELLERS, P.E.
MO# 2017000367

NO. REV.	DATE	REVISIONS DESCRIPTION	BY
1	08-12-2019	TACTILE WARNING STRIP MOVED TO BACK OF CURB	

REVISIONS

SPOT ELEVATIONS
STREET & STORM SEWER PLANS

HAWTHORN RIDGE
SECOND PLAT

LEE'S SUMMIT, MISSOURI

2019

drawn by: D.A.H.O
checked by: M.G.D
designed by: B.M.W
QA/QC by: N.D.H
project no.: 019-1605
date: 07-12-2019

SHEET
C122

DWG: F:\2019\1501-2000\019-1605\40-Design\AutoCAD\Final Plans\Sheets\GNCV\STREET, STORM & SITE DISTURBANCE\C_SPT01_0191605.dwg USER: bworthley
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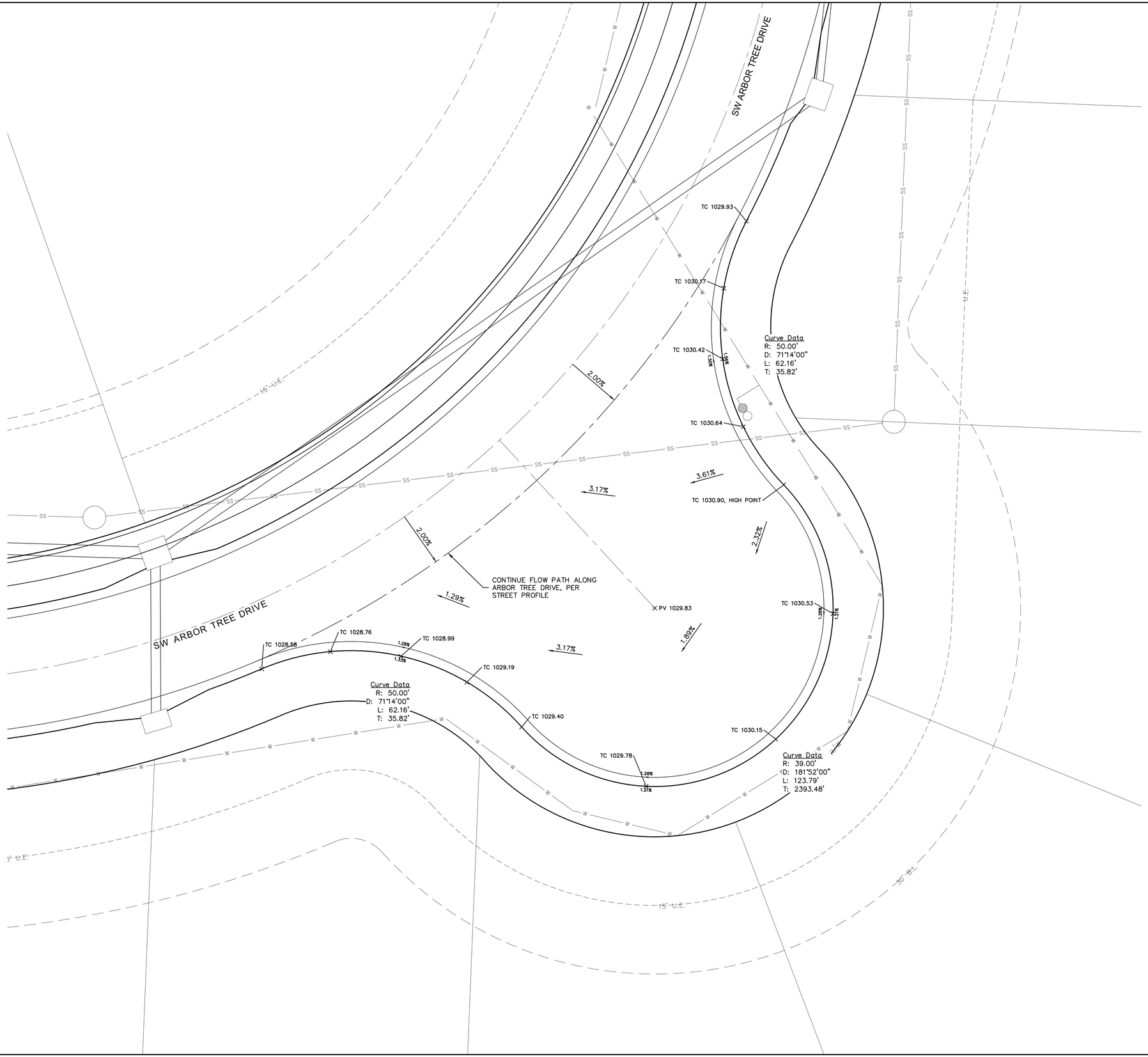

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LEGEND	
TC–	TOP OF CURB
PV–	TOP OF PAVEMENT
SW–	SIDEWALK
L	LANDING AREA
R	RAMP AREA
T	TRANSITION AREA

N

0' 5' 10' 20'
SCALE IN FEET

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PROFESSIONAL ENGINEER
10/1/20

JULIE E. SELLERS, P.E.
MO# 2017000367

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

SPOT ELEVATIONS
STREET & STORM SEWER PLANS

HAWTHORN RIDGE
SECOND PLAT

LEE'S SUMMIT, MISSOURI

2019

drawn by: D.A.H.O
checked by: M.G.D
designed by: B.M.W
QA/QC by: N.D.H
project no.: 019-1605
date: 07-12-2019

SHEET
C123

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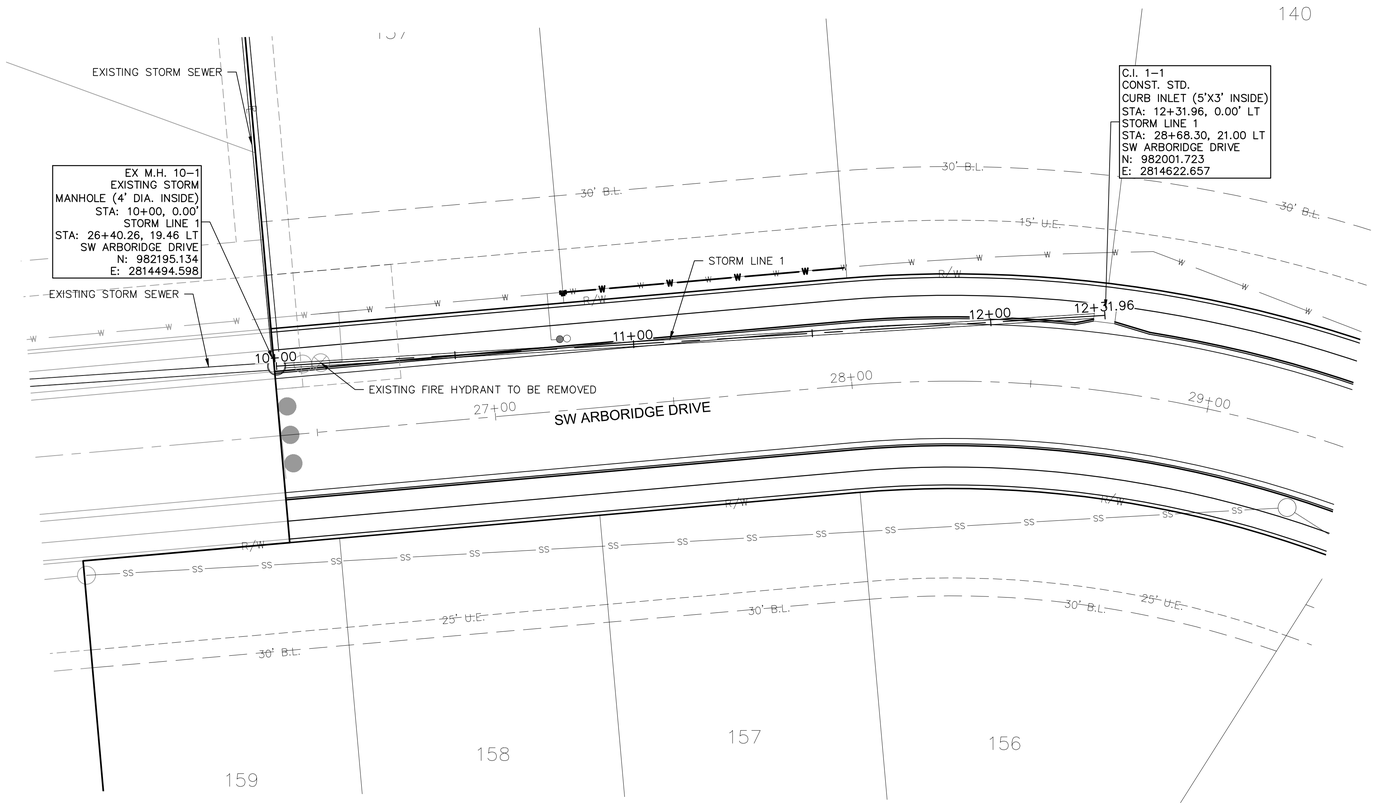

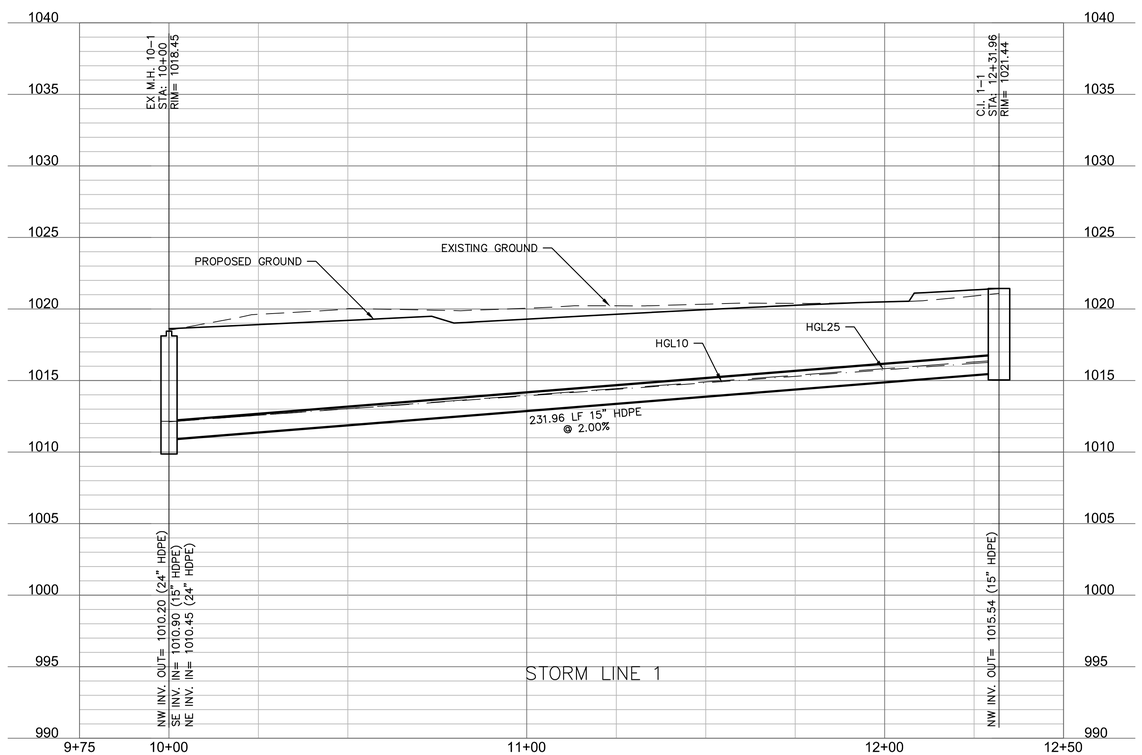

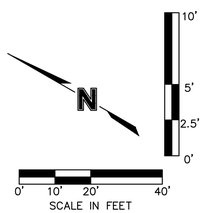

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JULIE E. SELLERS, P.E.
MO# 2017000367

NO. REV.	DATE	REVISIONS DESCRIPTION	BY
1	08-12-2019	10-YEAR STORM HGL ADDED TO PROFILE VIEW	

REVISIONS

STORM PLAN & PROFILE
STREET & STORM SEWER PLANS

HAWTHORN RIDGE
SECOND PLAT

LEE'S SUMMIT, MISSOURI

2019

drawn by: D.A.H.O
checked by: M.G.D
designed by: B.M.W
QA/QC by: N.D.H
project no.: 019-1605
date: 07-12-2019

SHEET
C124

DWG: F:\2019\1501-2000\019-1605\40-Design\AutoCAD\Final Plans\Sheets\GNCV\STREET, STORM & SITE DISTURBANCE\C_STM01_0191605.dwg USER: bworthley
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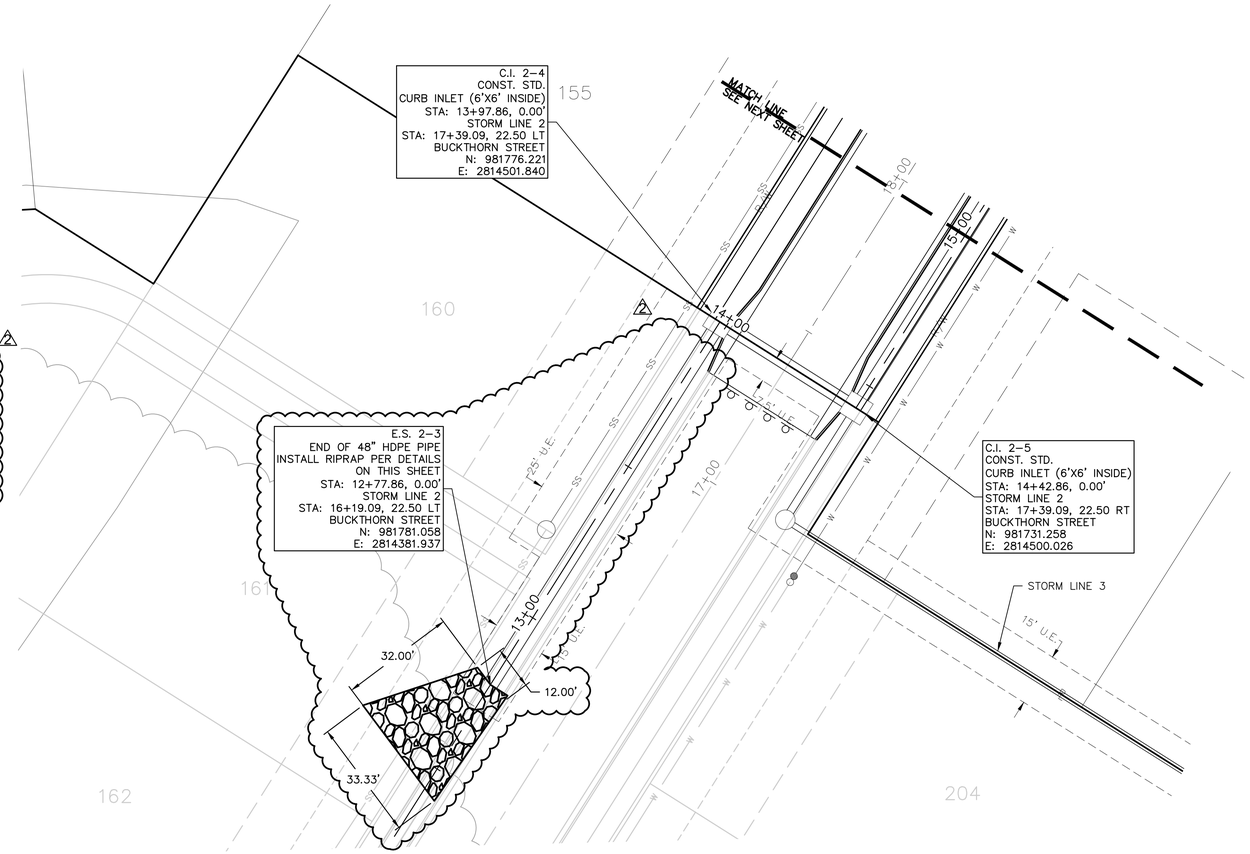
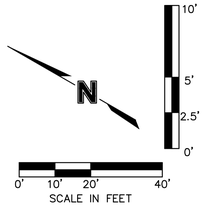
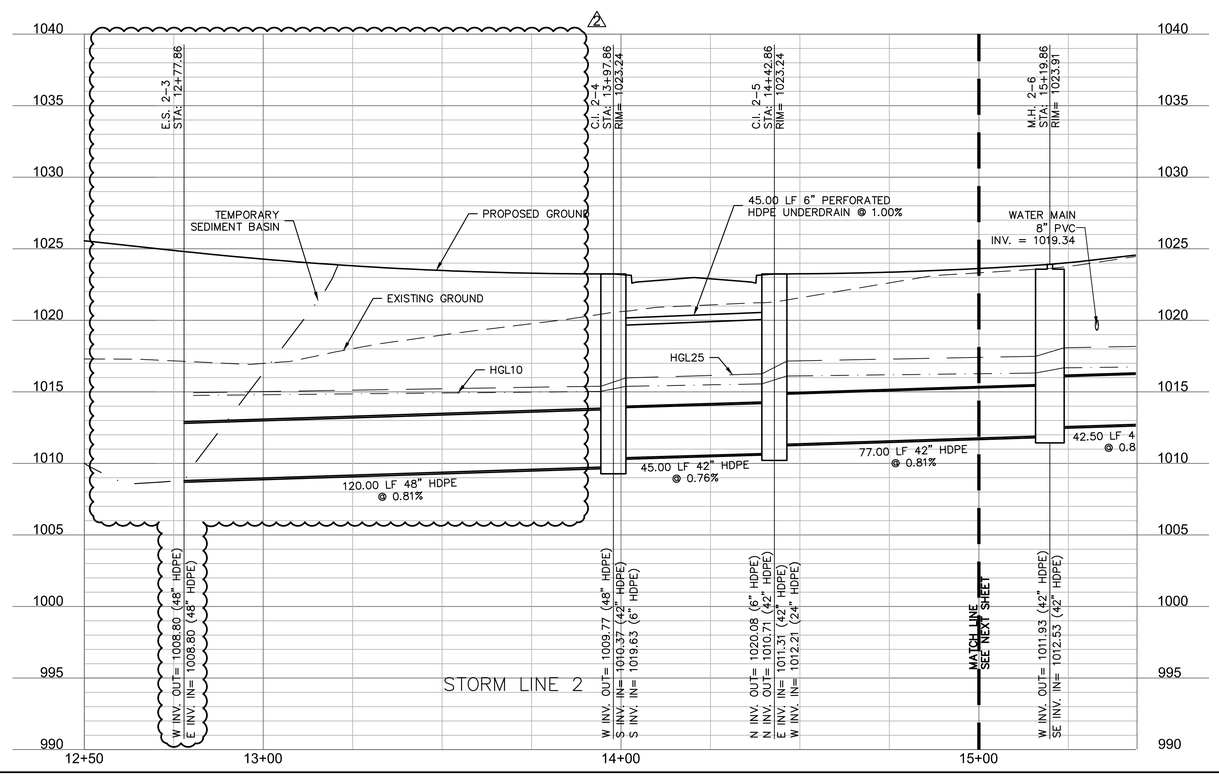
Riprap Calculations							
End Section	Q_{100} (cfs)	Pipe Diameter (ft)	Class*	D50* (in)	Apron Length (ft)	Apron Depth (ft)	Area (SY)
E.S. 2-3	164.18	4	6	22	32	3.67	80.6

*Per Table 10.1 HEC 14-FHWA-Energy Dissipators Pg. 10-18

NOTE: CONTRACTOR TO UTILIZE ON-SITE MATERIAL FOR TEMPORARY RIPRAP AT END OF PIPE. RIPRAP WILL BE REMOVED AND PIPE EXTENDED WITH HAWTHORN RIDGE 3RD PLAT CONSTRUCTION DOCUMENTS, CURRENTLY UNDER CITY REVIEW.







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JULIE E. SELLERS, P.E.
MO# 2017000367

REVISIONS

NO. REV.	DATE	REVISIONS DESCRIPTION	BY
1	08-12-2019	GEOFABRIC NOTE ADDED AND 10-YEAR STORM HGL ADDED TO PROFILE VIEW	
2	10-02-2020	STORM LINE 2 CHANGED TO DAYLIGHT INTO SEDIMENT BASIN	

STORM PLAN & PROFILE
STREET & STORM SEWER PLANS

HAWTHORN RIDGE
SECOND PLAT

LEE'S SUMMIT, MISSOURI

2019

drawn by: D.A.H.O
checked by: M.G.D
designed by: B.M.W
QA/QC by: N.D.H
project no.: 019-1605
date: 07-12-2019

SHEET
C125

DWG: F:\2019\1501-2000\019-1605\40-Design\AutoCAD\Final Plans\Sheets\GNCV\STREET, STORM & SITE DISTURBANCE\C_STM01_0191605.dwg USER: bworthley
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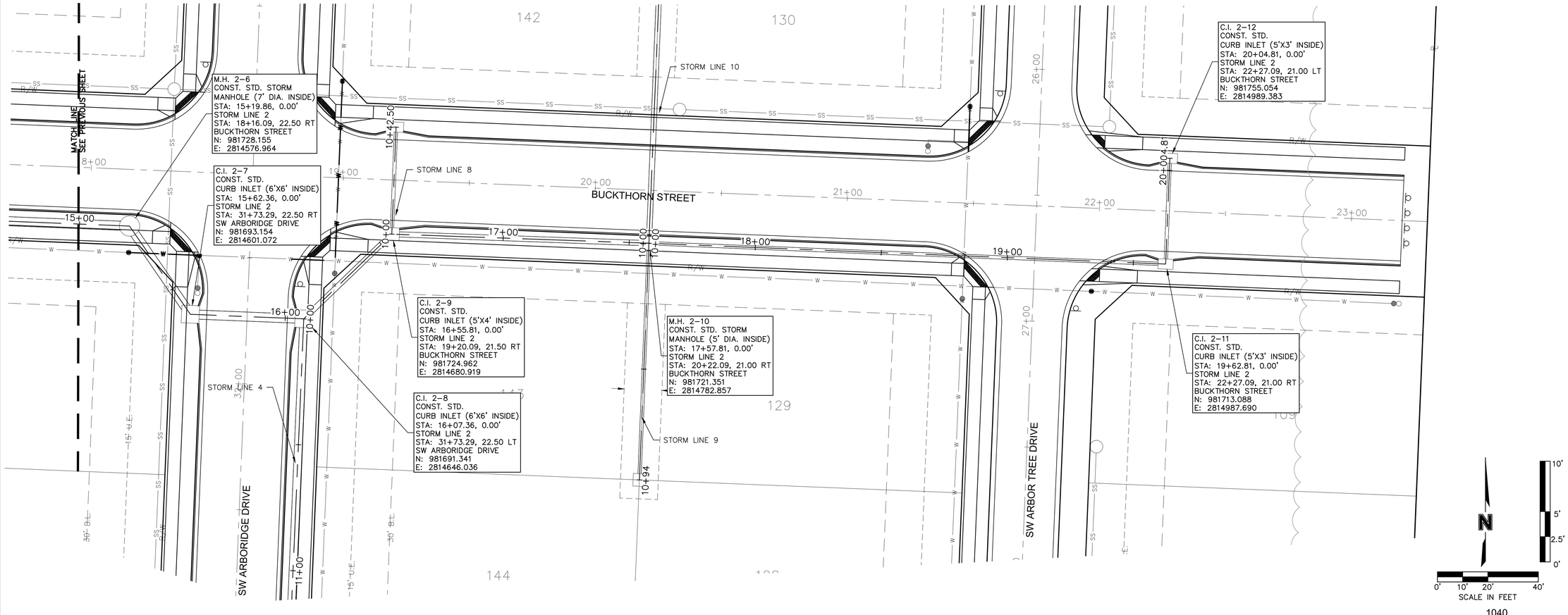

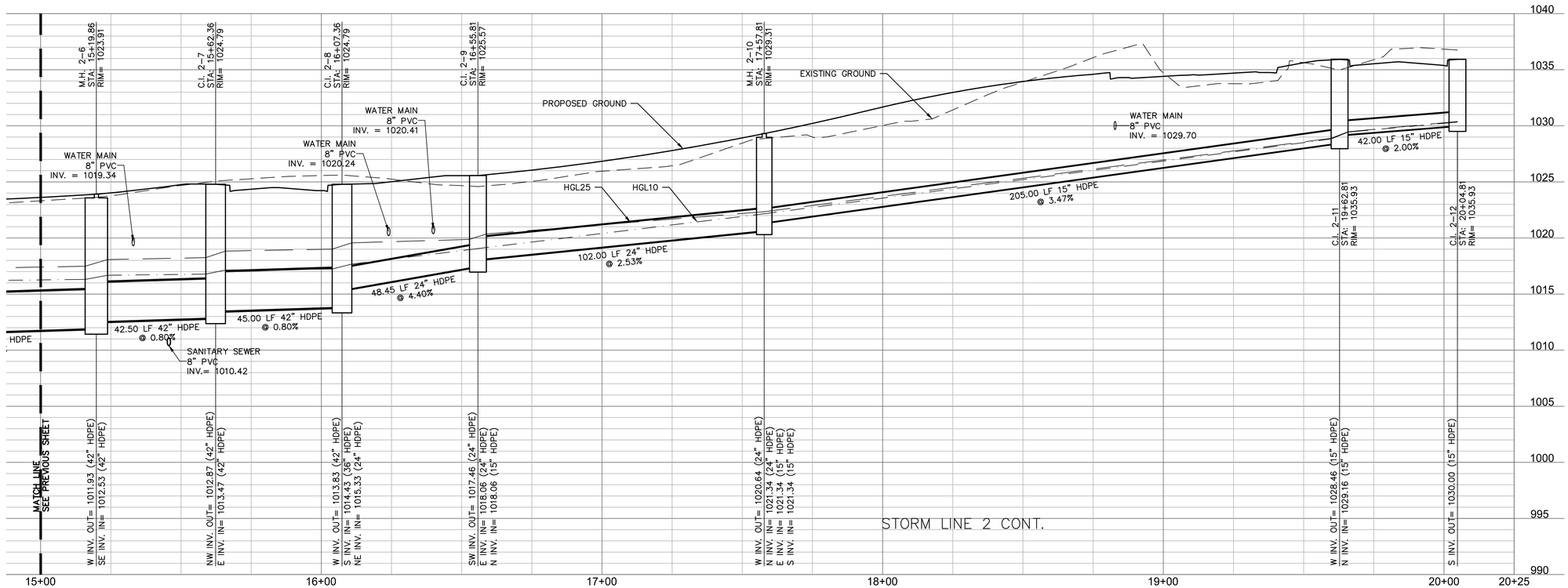

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NO. REV.	DATE	REVISIONS DESCRIPTION	BY
1	08-12-2019	10-YEAR STORM HGL ADDED TO PROFILE VIEW	

REVISIONS

STORM PLAN & PROFILE
STREET & STORM SEWER PLANS

HAWTHORN RIDGE
SECOND PLAT

LEE'S SUMMIT, MISSOURI

2019

drawn by: D.A.H.O
checked by: M.G.D
designed by: B.M.W
QA/QC by: N.D.H
project no.: 019-1605
date: 07-12-2019

SHEET
C126

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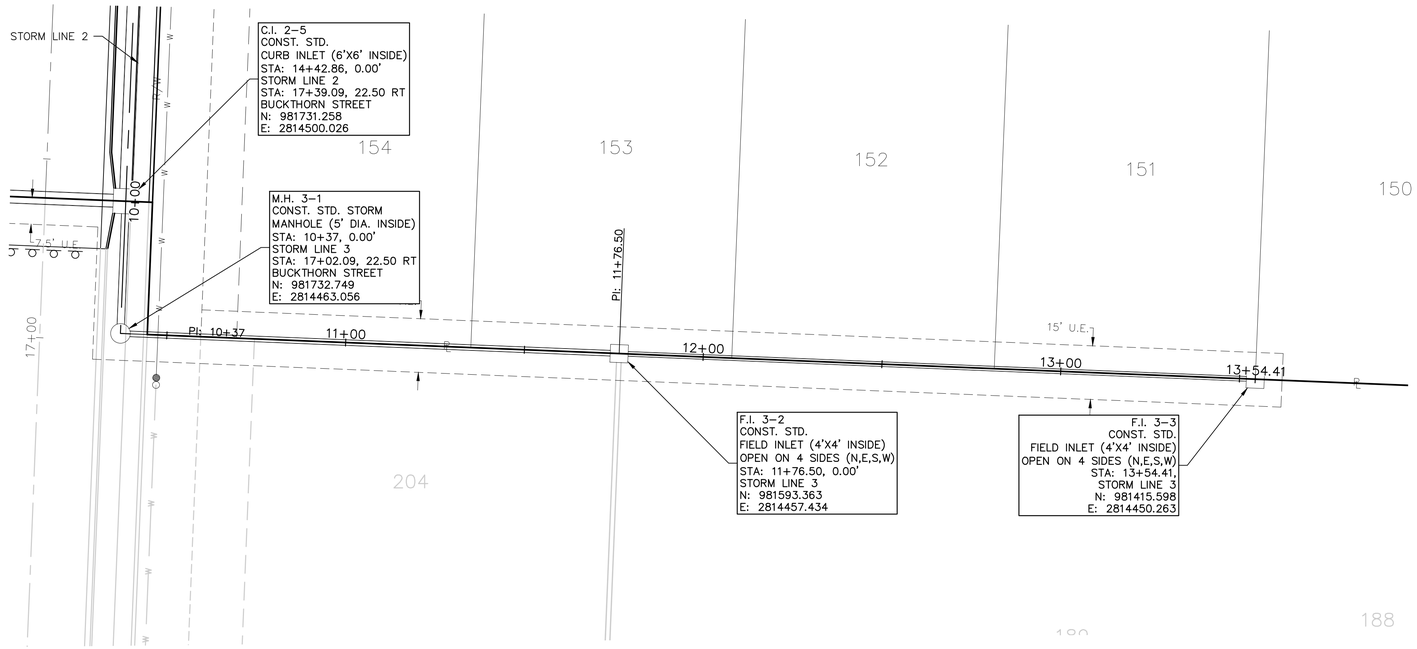

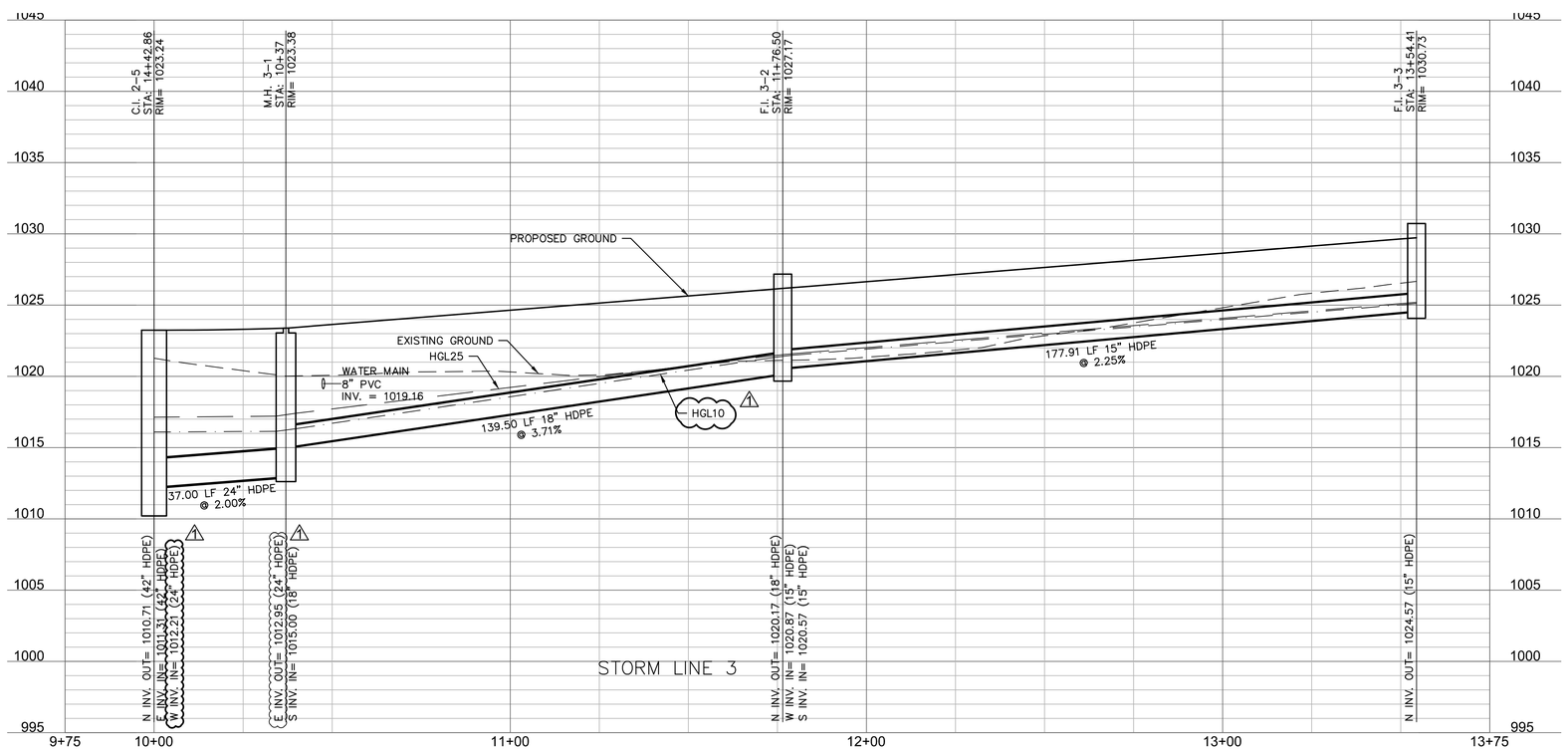

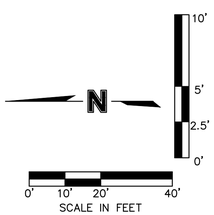

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PROFESSIONAL ENGINEER

JULIE E. SELLERS, P.E.
MO# 2017000367

NO. REV.	DATE	REVISIONS DESCRIPTION	BY
1	08-12-2019	PIPE 3-1 TO 2-5 FLOWLINES ADJUSTED AND 10-YEAR STORM HGL ADDED TO PROFILE VIEW	

REVISIONS

STORM PLAN & PROFILE
STREET & STORM SEWER PLANS

HAWTHORN RIDGE
SECOND PLAT

LEE'S SUMMIT, MISSOURI

2019

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checked by: M.G.D
designed by: B.M.W
QA/QC by: N.D.H
project no.: 019-1605
date: 07-12-2019

SHEET
C127

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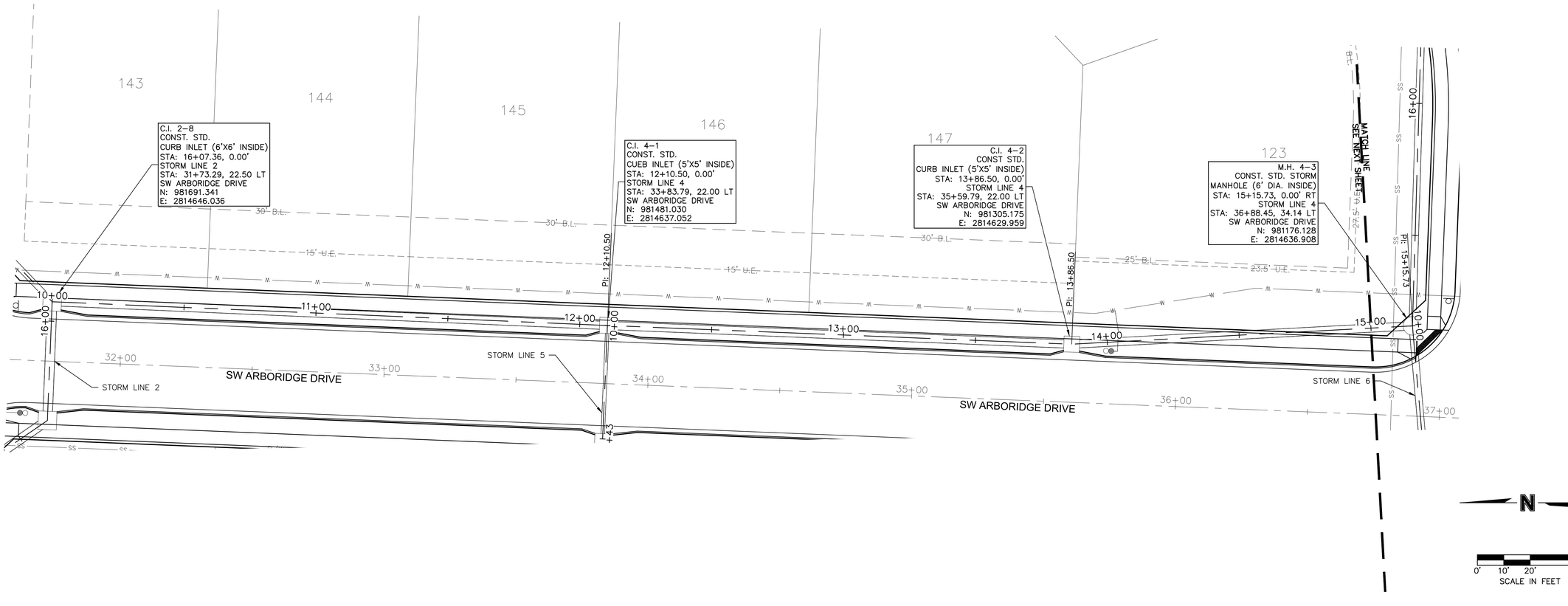

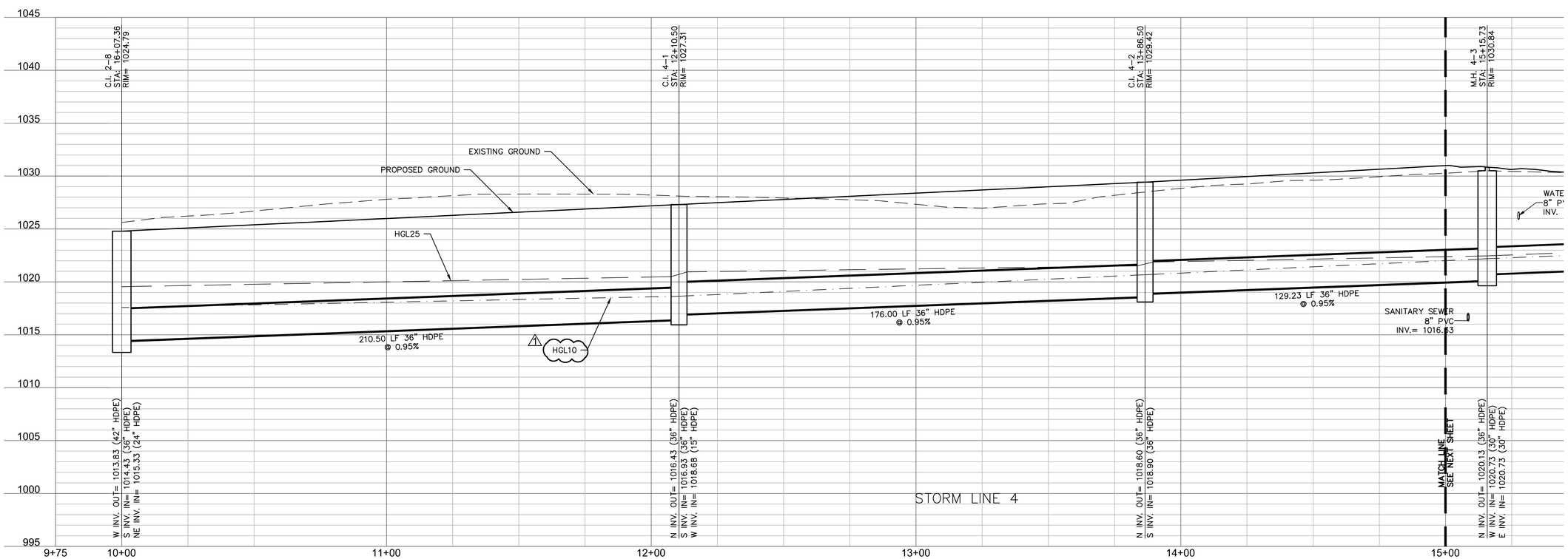

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MO# 2017000367

NO. REV.	DATE	REVISIONS DESCRIPTION	BY
1	08-12-2019	10-YEAR STORM HGL ADDED TO PROFILE VIEW	

REVISIONS

STORM PLAN & PROFILE
STREET & STORM SEWER PLANS

HAWTHORN RIDGE
SECOND PLAT

LEE'S SUMMIT, MISSOURI

2019

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QA/QC by: N.D.H
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date: 07-12-2019

SHEET
C128

DWG: F:\2019\1501-2000\019-1605\40-Design\AutoCAD\Final Plans\Sheets\GNCV\STREET, STORM & SITE DISTURBANCE\C_STM02_0191605.dwg USER: bworthley
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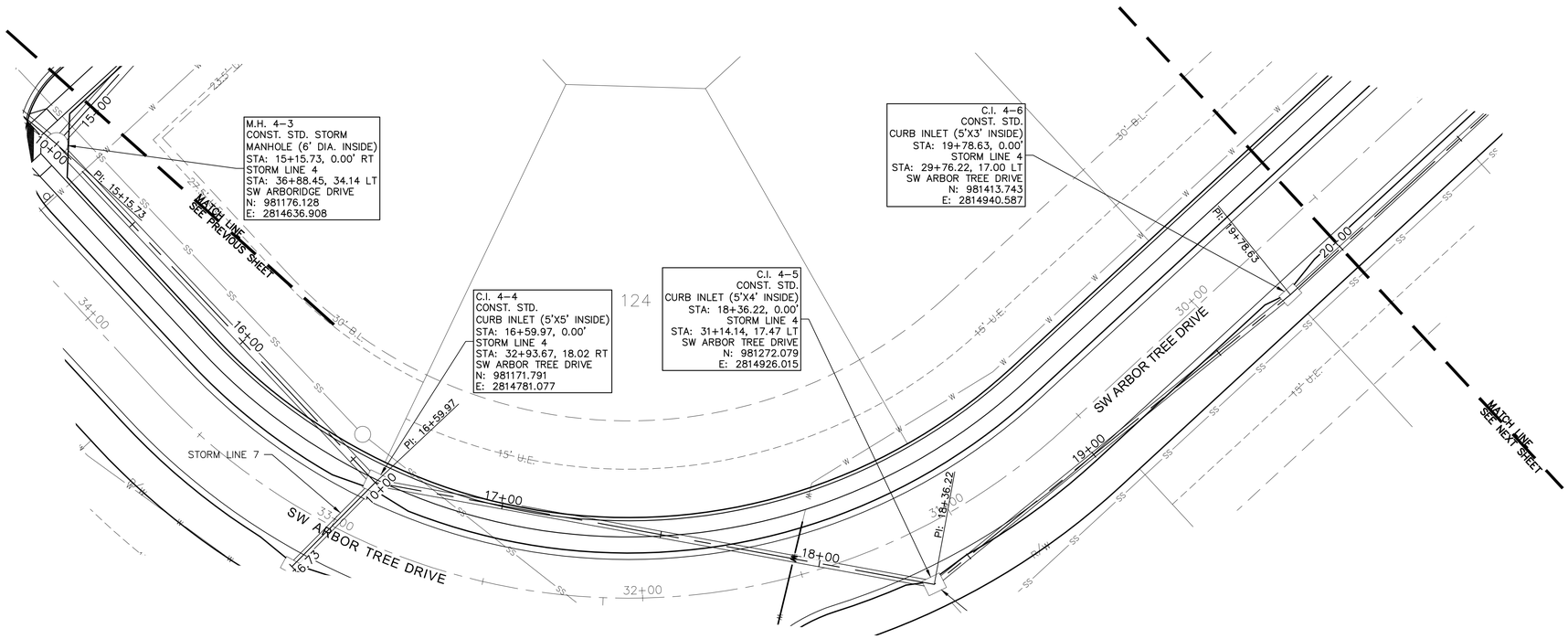

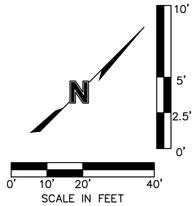

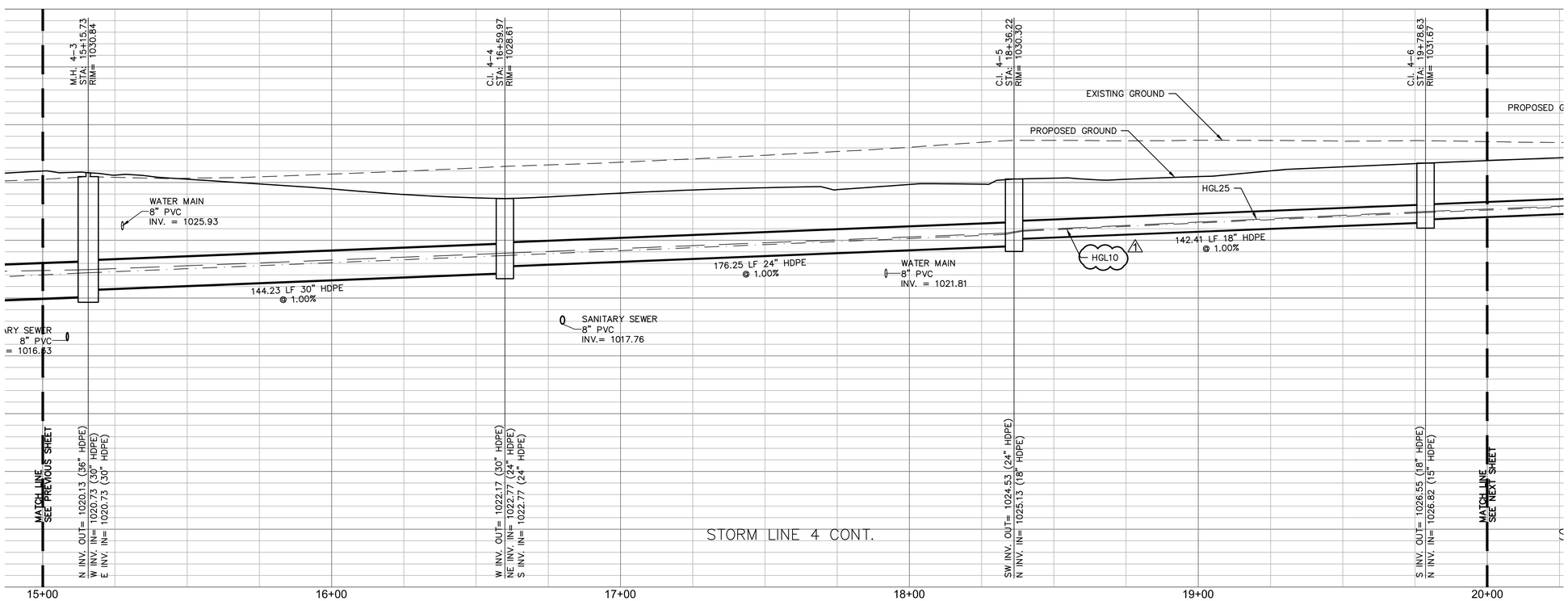

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LEE'S SUMMIT, MISSOURI

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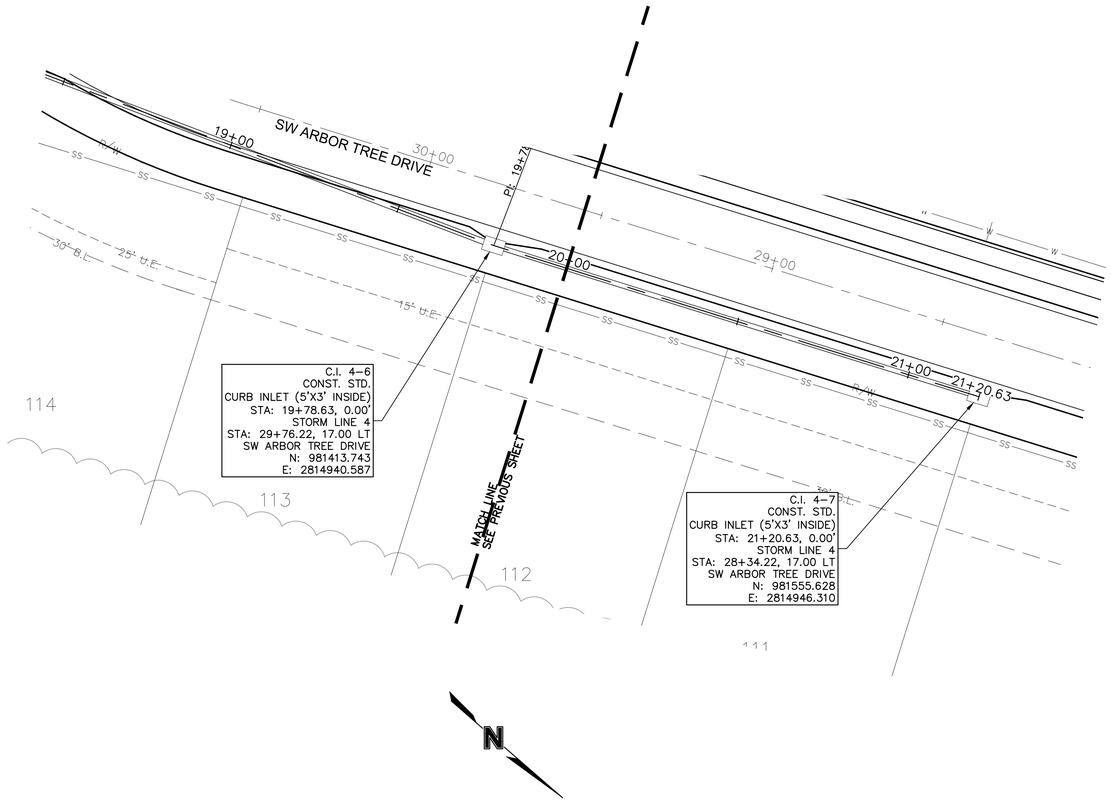

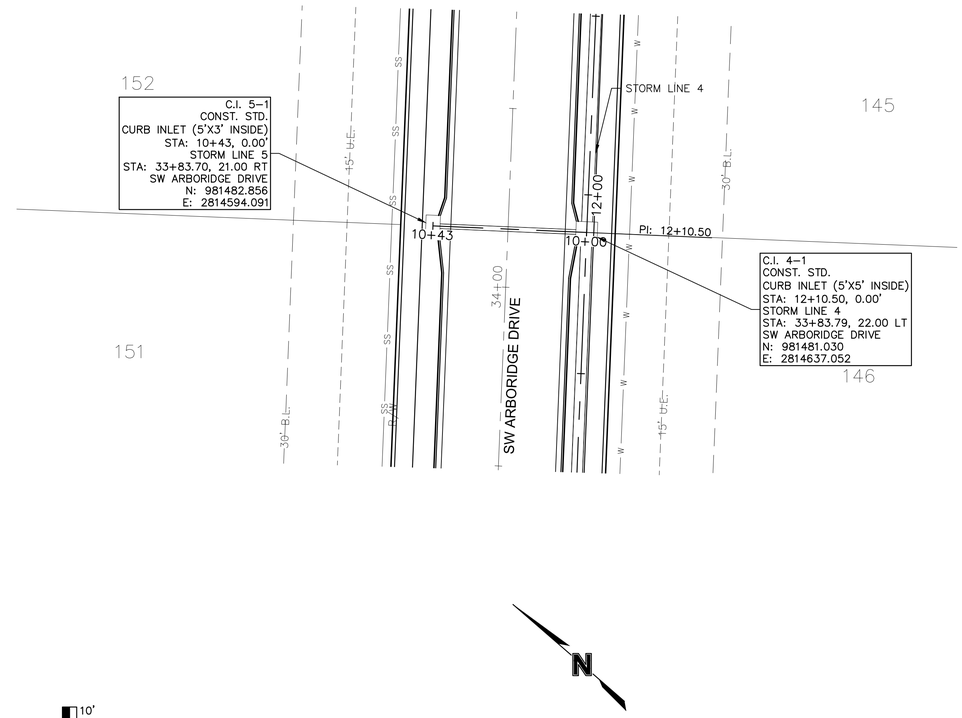

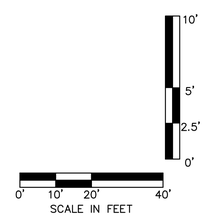

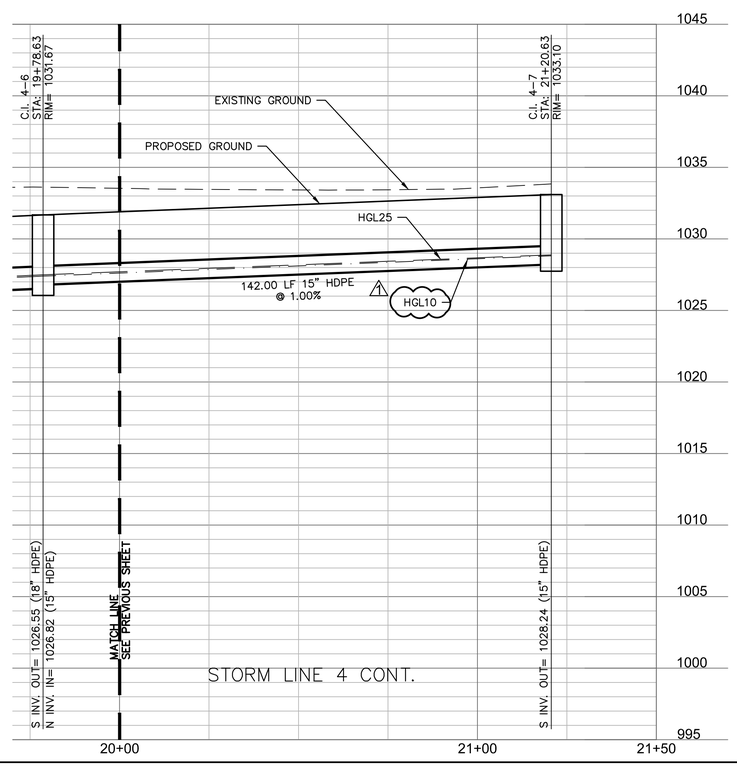

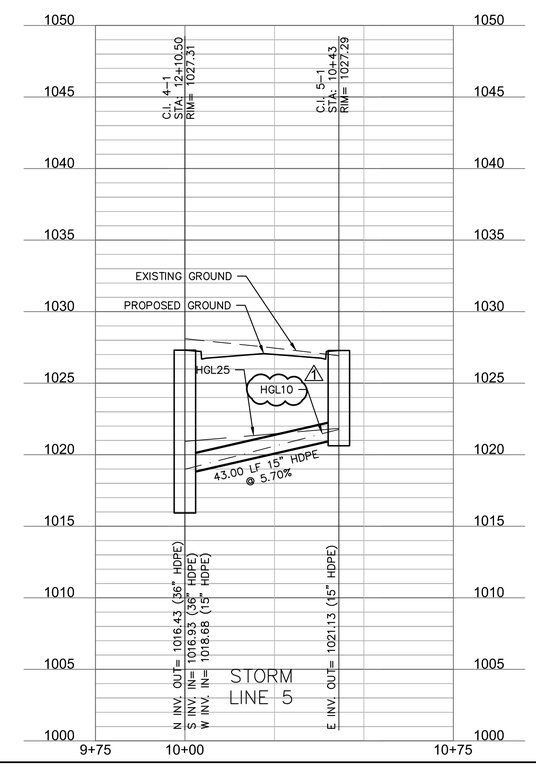

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JULIE E. SELLERS, P.E.
MO# 2017000367

NO. REV.	DATE	REVISIONS DESCRIPTION	BY
1	08-12-2019	10-YEAR STORM HGL ADDED TO PROFILE VIEW	

REVISIONS

STORM PLAN & PROFILE
STREET & STORM SEWER PLANS

HAWTHORN RIDGE
SECOND PLAT

LEE'S SUMMIT, MISSOURI

2019

drawn by: D.A.H.O
checked by: M.G.D
designed by: B.M.W
QA/QC by: N.D.H
project no.: 019-1605
date: 07-12-2019

SHEET
C130

DWG: F:\2019\1501-2000\019-1605\40-Design\AutoCAD\Final Plans\Sheets\GNCV\STREET, STORM & SITE DISTURBANCE\C_STM03_0191605.dwg USER: bworthley
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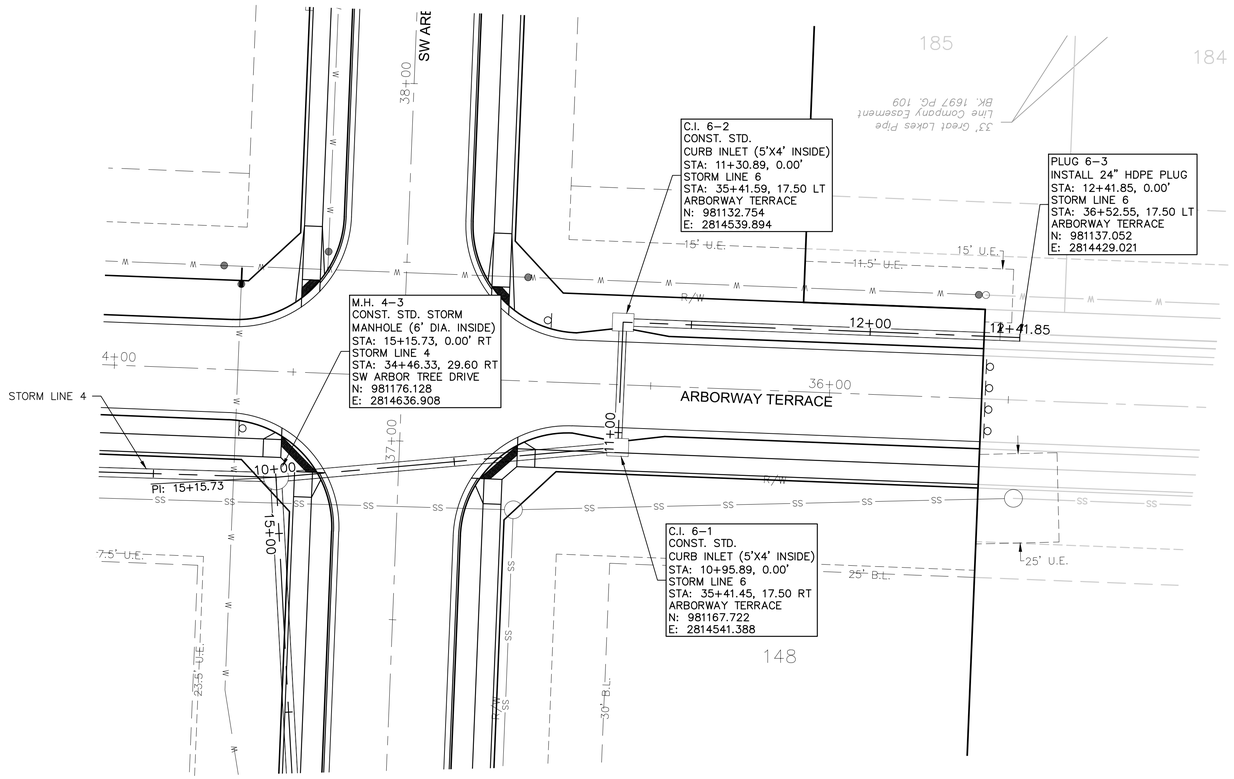

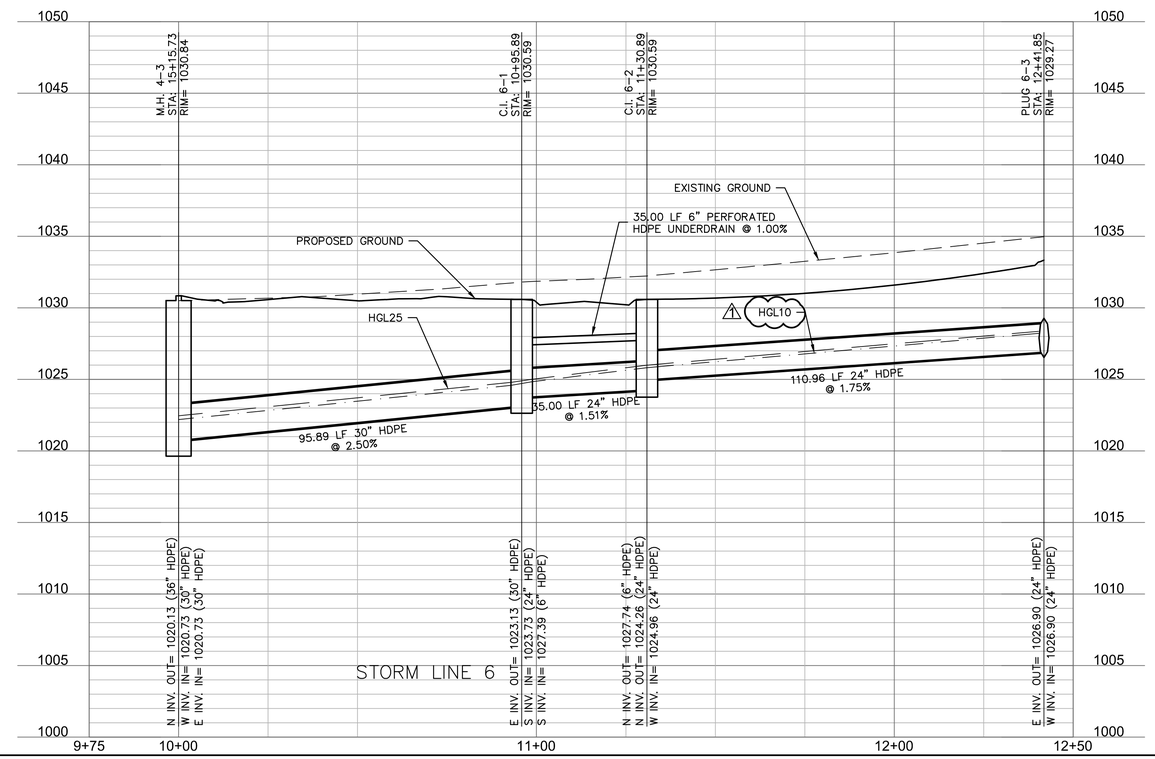

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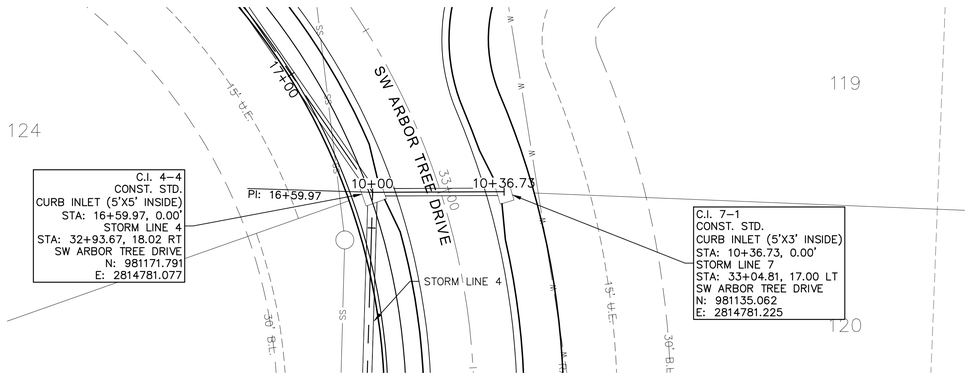

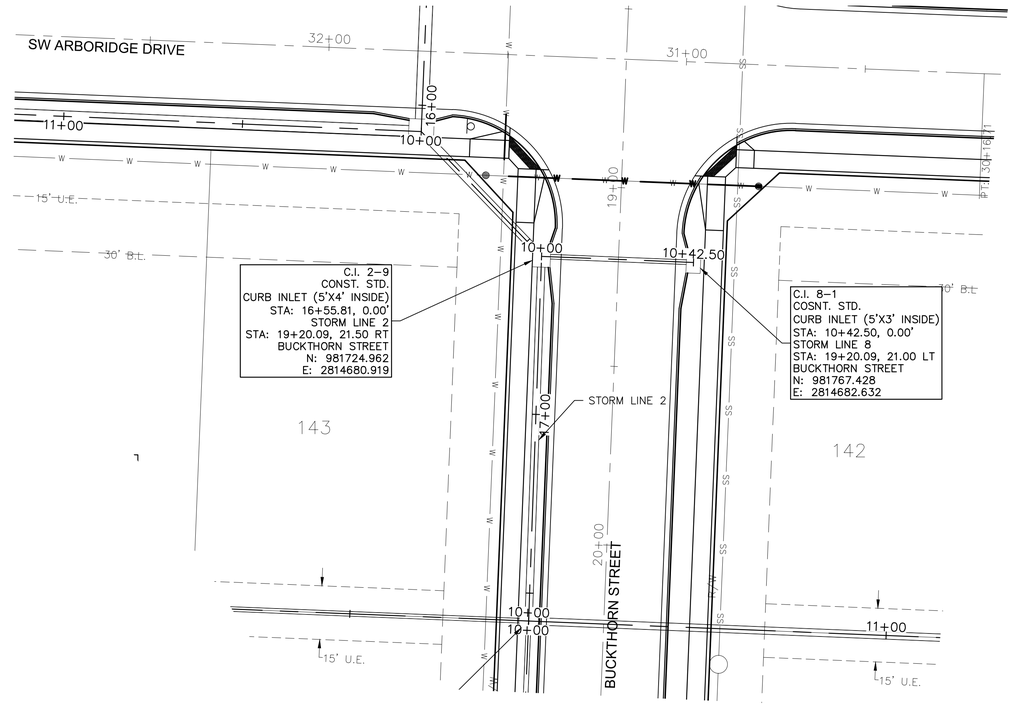

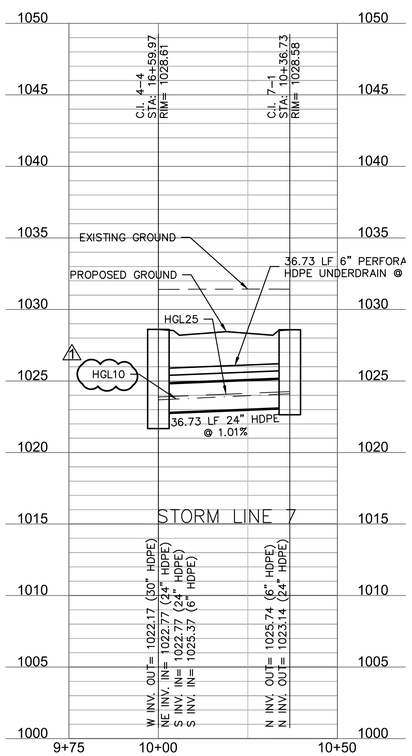

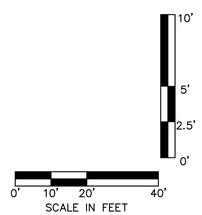

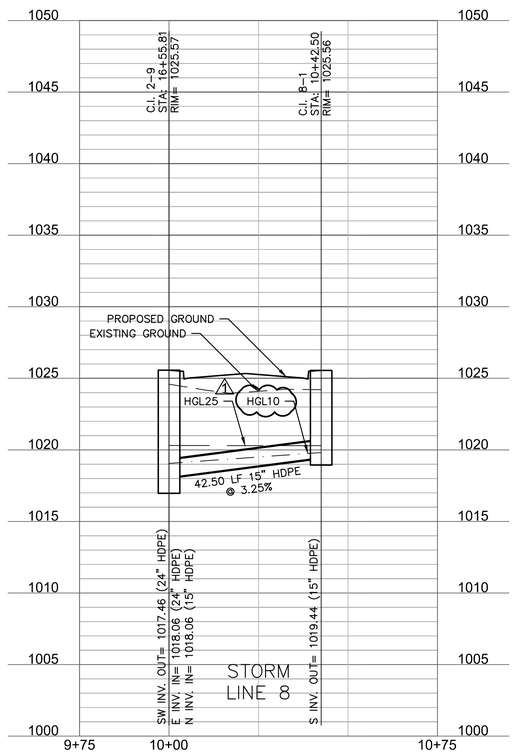

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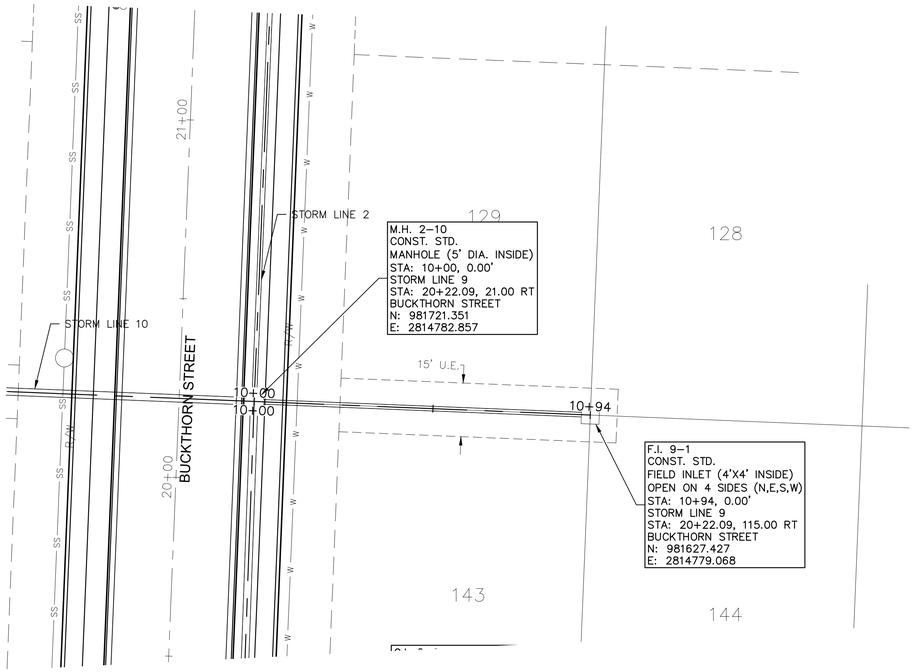

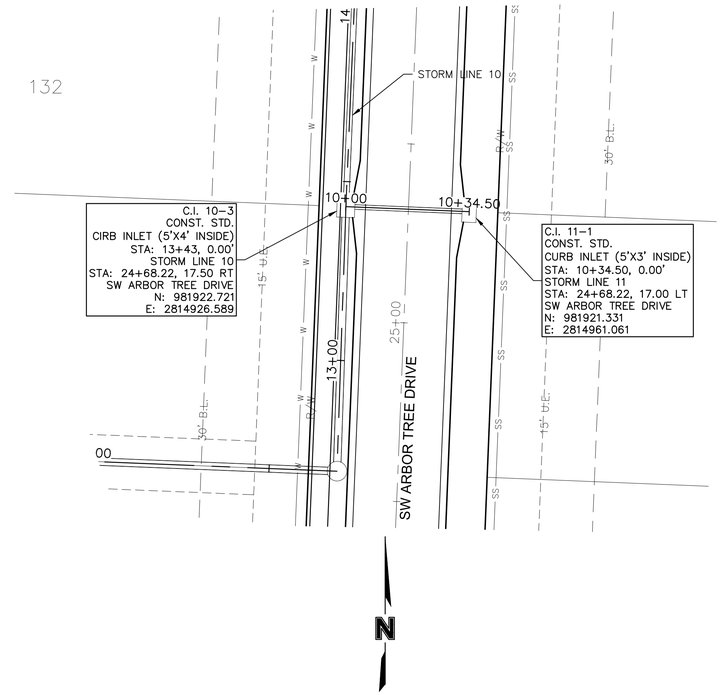

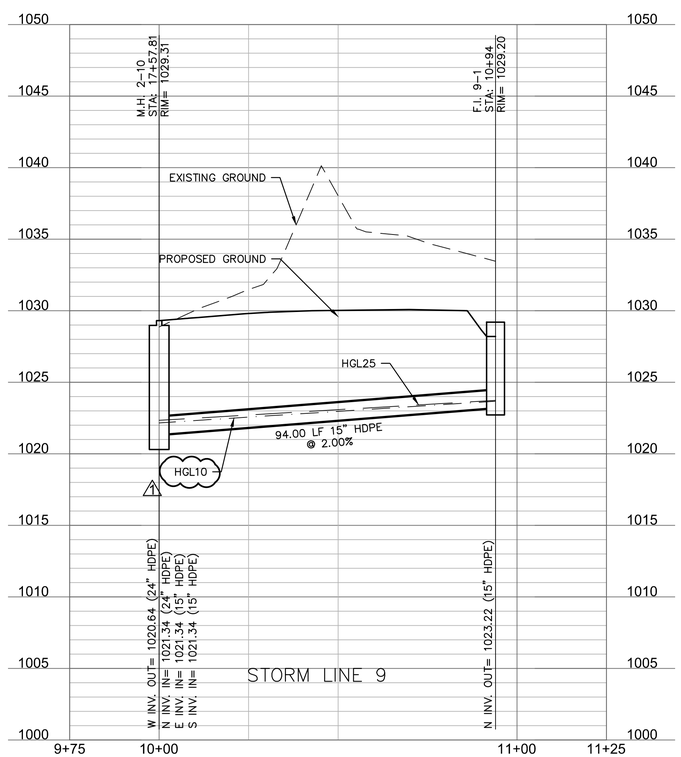

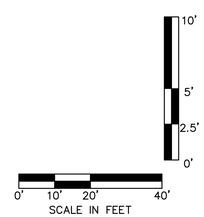

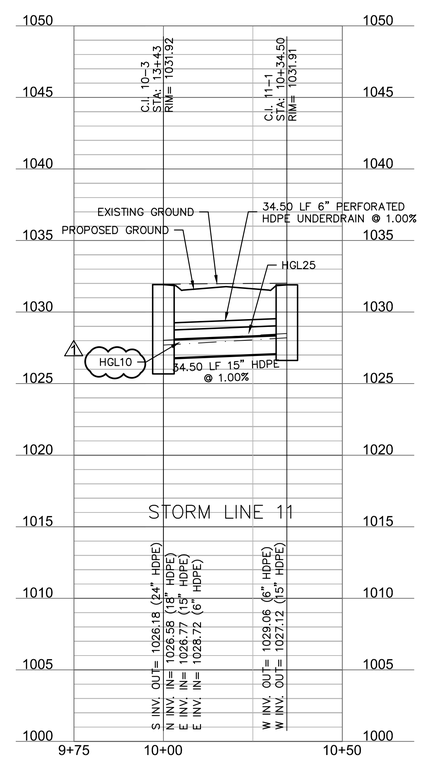

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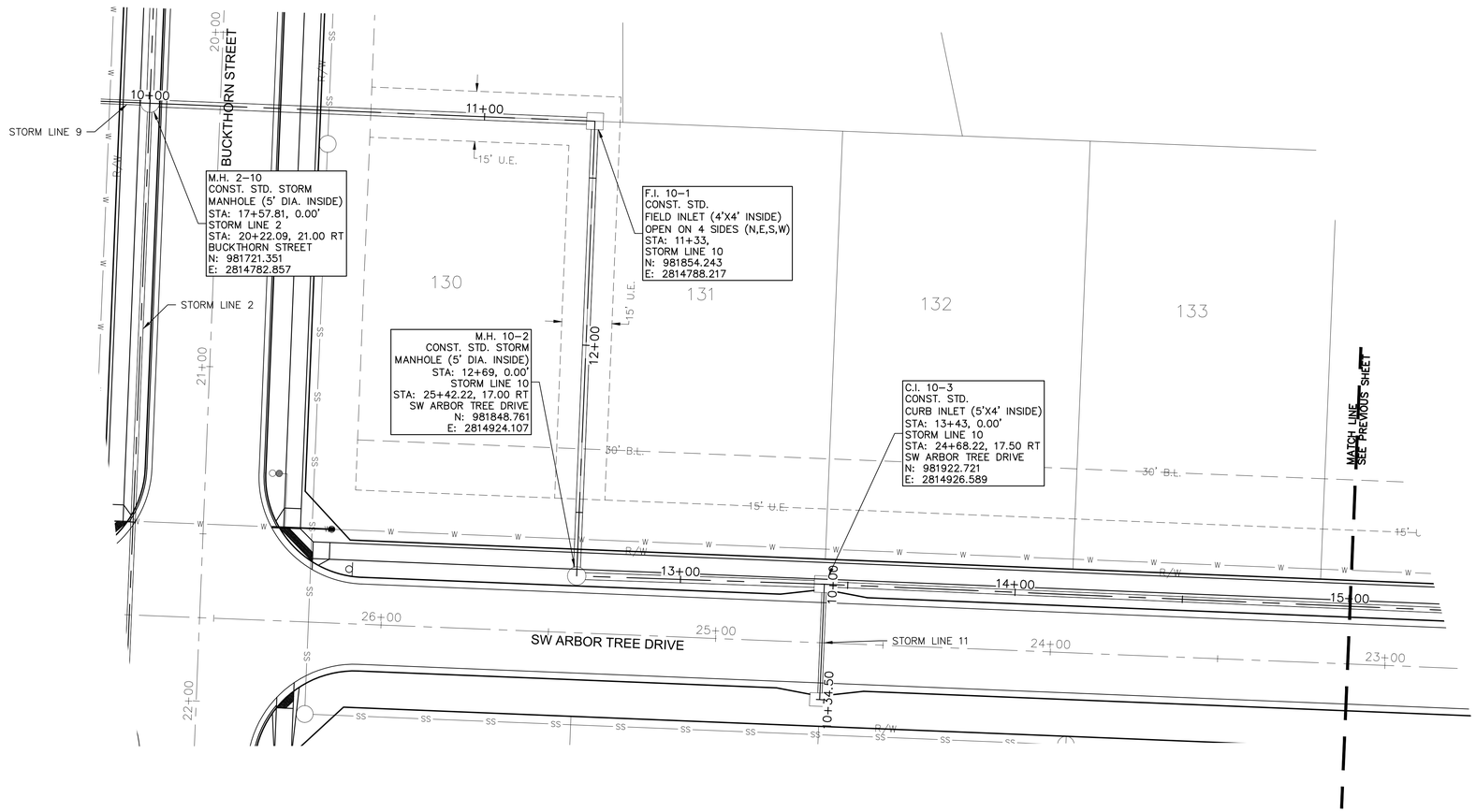

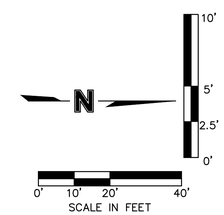

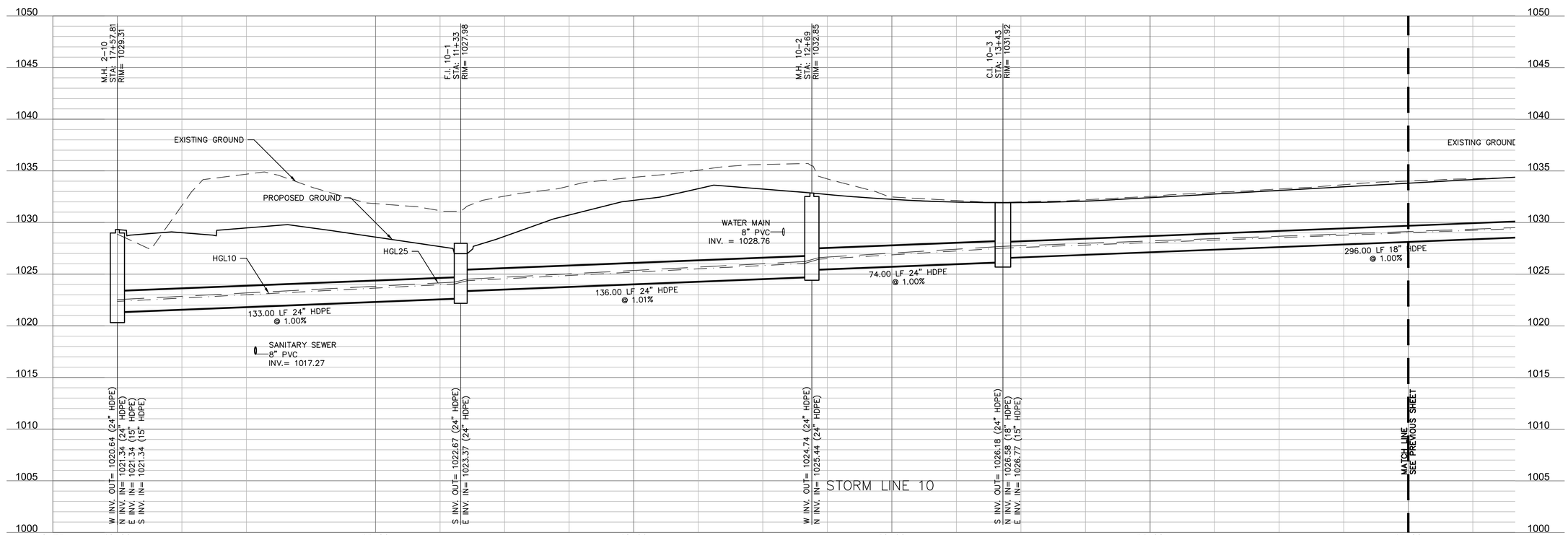

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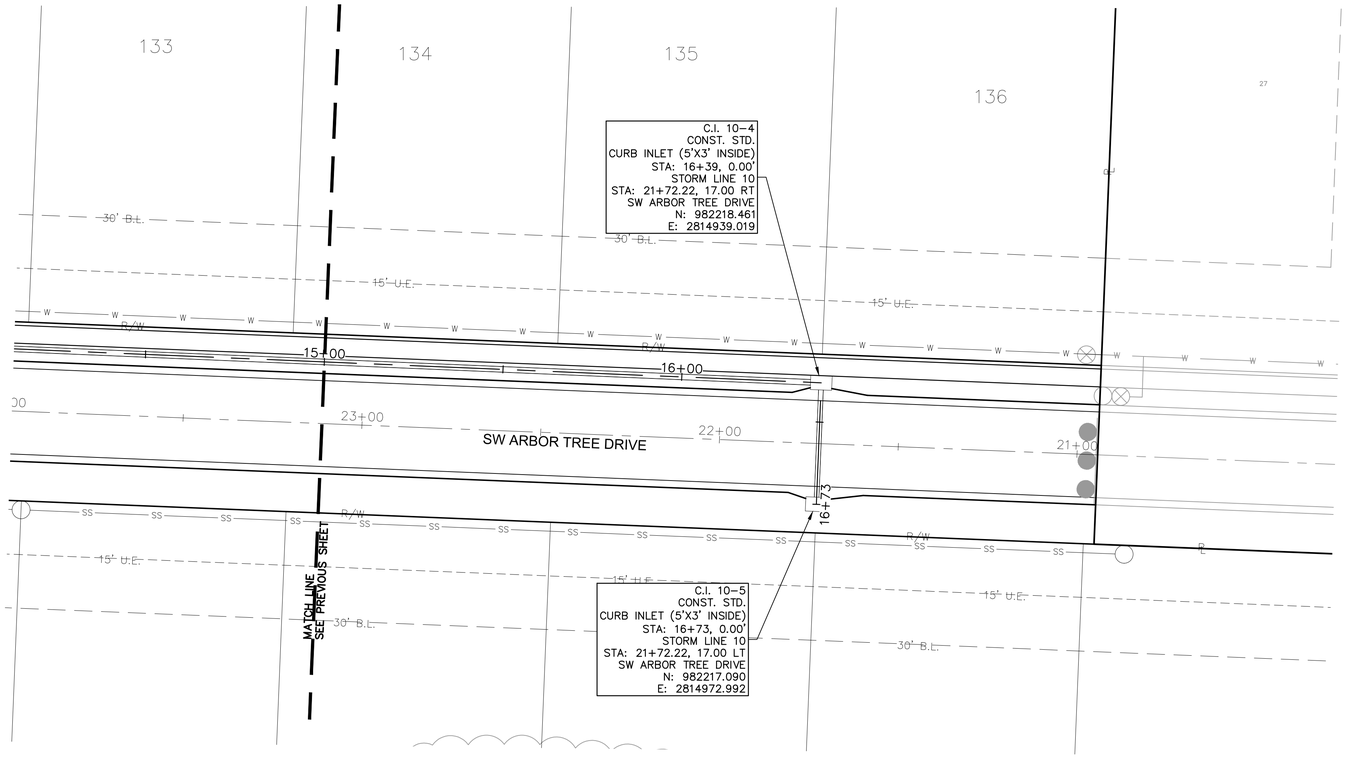

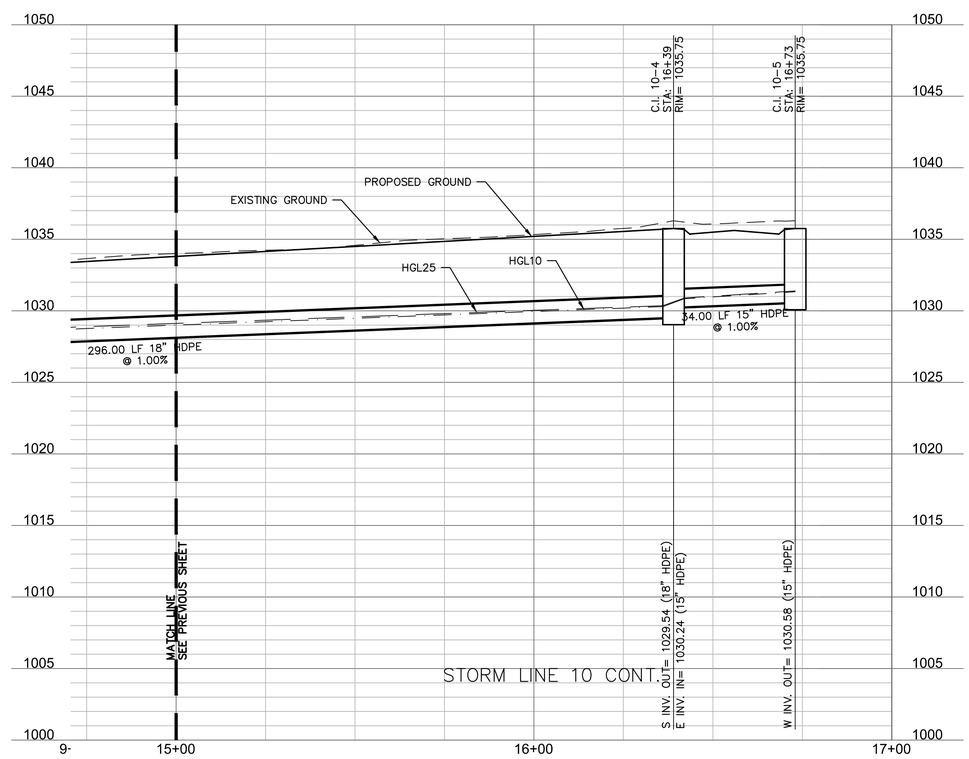

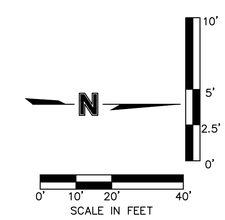

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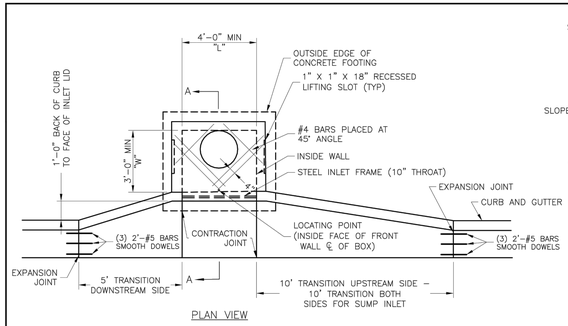
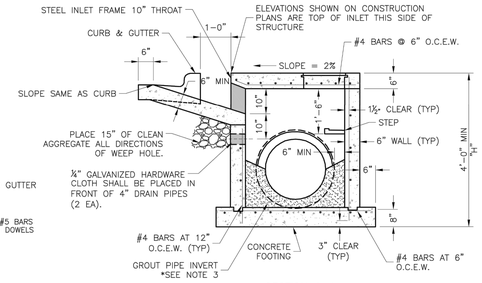
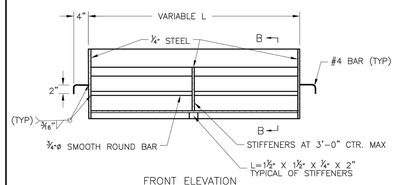


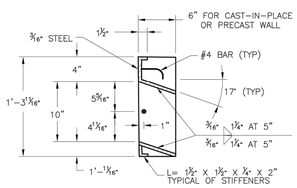
PLAN VIEW



SECTION A–A



FRONT ELEVATION



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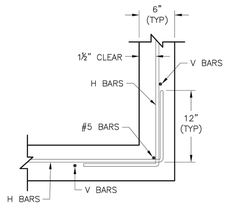
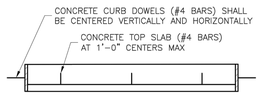


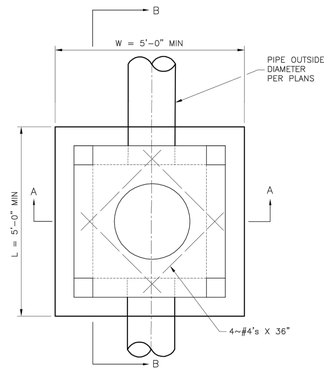
WALL CORNER DETAIL



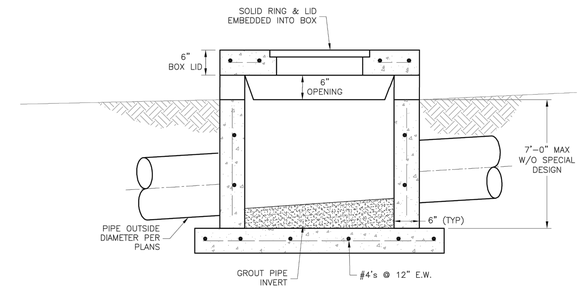
PLAN VIEW

STEEL FRAME NOTES:
1. ALL WELDS SHALL BE PERFORMED IN ACCORDANCE WITH APPROPRIATE AWS SPECIFICATIONS AND PROCEDURES.
2. ALL WELDS ON EXPOSED SURFACES SHALL BE DRESSED SO AS TO PROVIDE A PLEASING FINISHED APPEARANCE.
3. THE ENTIRE FRAME SHALL BE PAINTED A SINGLE COAT OF CHEM–PRIME #37H–78 PRIMER (GRAY) OR EQUAL.

GENERAL NOTES:
1. THE FIRST DIMENSION LISTED IN THE CONSTRUCTION NOTES IS THE "L" DIMENSION. THE SECOND DIMENSION IS THE "W" DIMENSION.
2. FLOW LINES LISTED ON THE PROJECT PLANS ARE LISTED AT THE INSIDE FACE OF THE WALL.
3. FLOOR OF INLET GROUTED AND SHAPED TO MATCH PIPE INVERT TO PROVIDE SMOOTH FLOW.
4. LOCATE MH RING AND COVER ON BLANK WALL IF POSSIBLE.
5. STEPS SHALL BE SPACED AT 1'–4" O.C. VERTICALLY ON BLANK WALL IF POSSIBLE.
6. BEVEL ALL EXPOSED EDGES WITH ¾"CHAMFER OR ½" TOOLED EDGE.
7. ON–GRADE INLETS SHALL CONFORM TO THE STREET GRADE AND SUMP INLETS SHALL BE LEVEL.
8. PRECAST LIDS SHALL BE PINNED, SEALED WITH NON–SHRINKABLE GROUT AND REMOVABLE FOR FUTURE MAINTENANCE.
9. LIFTING RINGS SHALL BE REMOVED AND SEALED WITH NON–SHRINKABLE GROUT
10. FOR RING AND COVER SEE THE STORMWATER APPROVED PRODUCT LIST.



PLAN VIEW



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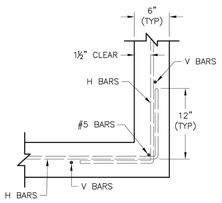
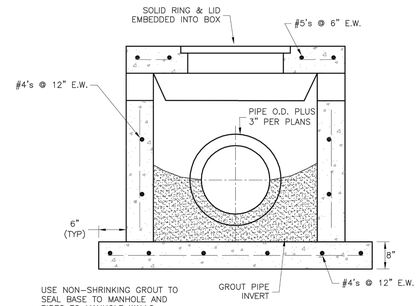
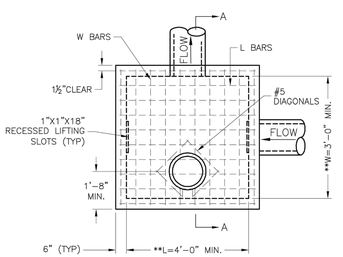


WALL CORNER DETAIL

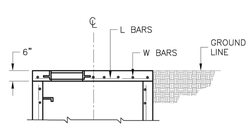


SECTION A–A

GENERAL NOTES:
1. LOCATE RING AND COVER OVER OUTLET ON BLANK WALL.
2. USE ¾" CHAMFER ON ALL EXPOSED CONCRETE CORNERS.
3. FLOOR OF INLET GROUTED AND SHAPED TO MATCH PIPE INVERT TO PROVIDE SMOOTH FLOW.
4. STEPS REQUIRED AT 16" O.C. WHEN DEPTH FROM TOP OF CASTING TO INVERT EXCEEDS 3' ON BLANK WALL IF POSSIBLE.
5. BOXOUTS WILL NOT BE ALLOWED TO PROJECT THROUGH THE CORNERS OF THE STRUCTURE.
6. THE MINIMUM REINFORCING SHALL BE 1 H–BAR OVER A CAST–IN–PLACE PIPE AND 2 H–BARS OVER A PRECAST BOXOUT.
7. SHOW FIELD INLET ORIENTATION ON PLANS PLUS NUMBER AND SIDE OF OPENINGS.
8. PRECAST LIDS SHALL BE PINNED, SEALED WITH NON–SHRINKABLE GROUT AND REMOVABLE FOR FUTURE MAINTENANCE.
9. FOR RING AND COVER SEE THE STORMWATER APPROVED PRODUCT LIST.



PLAN

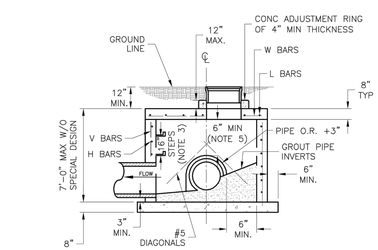


SLAB TOP ALTERNATE FOR JUNCTION BOX (SHALLOW)

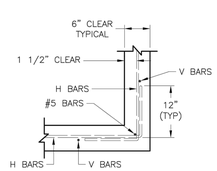
** INCREASE IN MULTIPLES OF 6" (7'–0") MAX WITHOUT SPECIAL DESIGN. (SEE PROJECT PLANS FOR DETAILS)

REINFORCING

BARS	BAR SIZE	SPACING (IN.)
H	4	12
V	4	12
L	5	6
W	5	6

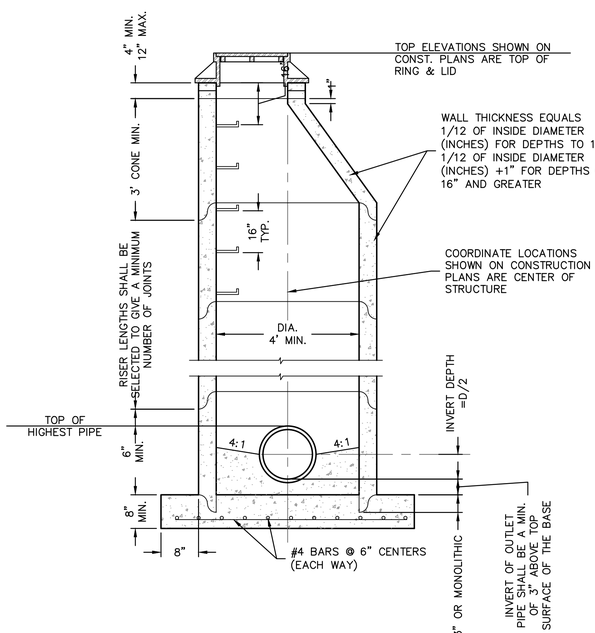


SECTION A–A



WALL CORNER DETAIL

GENERAL NOTES:
1. LOCATE RING AND COVER ON BLANK WALL.
2. USE ¾" CHAMFER STRIP OR ½" R EDGER TOOL ON ALL EXPOSED CONCRETE CORNERS.
3. STEPS REQUIRED AT 16" O.C. WHEN DEPTH FROM TOP OF CASTING TO INVERT EXCEEDS 4' ON BLANK WALL IF POSSIBLE.
4. BOXOUTS WILL NOT BE ALLOWED TO PROJECT THROUGH THE CORNERS OF THE STRUCTURE AND THE MINIMUM DISTANCE BETWEEN BOXOUTS IS 6".
5. THE MINIMUM REINFORCING SHALL BE 1 H–BAR OVER A CAST–IN–PLACE PIPE AND 2 H–BARS OVER A PRECAST BOXOUT.
8. PRECAST LIDS SHALL BE PINNED, SEALED WITH NON–SHRINKABLE GROUT AND REMOVABLE FOR FUTURE MAINTENANCE.
9. REINFORCING OF COVERS IN STREETS REQUIRE SPECIAL DESIGN.
10. FOR RING AND COVER SEE THE STORMWATER APPROVED PRODUCT LIST.



STANDARD PRECAST STORM SEWER MANHOLE
NOT TO SCALE

STORM MANHOLE NOTES

1. ALL MANHOLES ARE TO BE PRECAST CONCRETE AND OF ECCENTRIC CONE TYPE UNLESS OTHERWISE SPECIFIED.
2. MANHOLE TOP ADJUSTMENTS SHALL BE ACCOMPLISHED BY THE USE OF CONCRETE ADJUSTMENT RINGS.
3. TOP OF MANHOLE CASTING SHALL BE SET FLUSH AND ON SAME SLOPE AS FINISHED SURFACE OR AS DIRECTED BY THE ENGINEER.
4. REINFORCEMENT IN ALL SECTIONS SHALL EQUAL OR EXCEED A.S.T.M. C–478 SPECIFICATIONS.
5. THE ENGINEER SHALL DESIGNATE MODIFICATIONS FOR MANHOLES WITH SPECIAL DESIGNS.
6. THE INSIDE DIAMETER OF THE MANHOLE SHALL BE 4'–0" FOR PIPE DIAMETERS FROM 12" THRU 24", 5'–0" FOR PIPE DIAMETERS FROM 27" THRU 36", AND 6'–0" FOR PIPE DIAMETERS 42" THRU 48".
7. CLEARANCE TOLERANCE OF PIPE OPENINGS: THE MAXIMUM ALLOWABLE PIPE OPENING ON A HORIZONTAL AXIS SHALL BE THE OUTSIDE DIAMETER OF THE PIPE PLUS 12". THE MAXIMUM ALLOWABLE PIPE OPENING ON VERTICAL AXIS SHALL BE THE OUTSIDE DIAMETER PLUS 8". THE MAXIMUM CLEARANCE BETWEEN THE OUTSIDE SURFACE OF AN INSTALLED PIPE AND THE CONCRETE OF THE MANHOLE SHALL BE 2".
8. INSTALLATION OF PIPE OPENINGS: ALL REQUIRED PIPE OPENINGS SHALL BE PLANT CAST IN MANHOLE UNITS. FIELD ALTERATIONS OF OPENINGS WILL BE PERMITTED PROVIDED WALLS ARE SCORED WITH A MASONRY SAW TO A DEPTH SUFFICIENT TO SEVER REINFOECING STEEL. A CHIPPING HAMMER MAY THEN BE USED TO REMOVE THE CONCRETE. MINIMUM DISTANCE BETWEEN ANY TWO ADJACENT PIPES SHALL BE 2".
9. NO DIRECT PAYMENT FOR SHAPING FLOOR OR CONNECTING PIPES AS SHOWN ON PLANS.
10. RING AND COVER TO BE NEENAH R–1736, CLAY & BAILEY #2008, DEETER # 1316, OR APPROVED EQUAL. (CASTING MAY VARY BY MUNICIPALITY, REFER TO PLANS & CONTRACT DOCUMENTS.)

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TEL 816.361.1177

STATE OF MISSOURI
JULIE ELAINE SELLERS
NUMBER PE-2017000367
10/1/20
PROFESSIONAL ENGINEER

JULIE E. SELLERS, P.E.
MO# 2017000367

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

STORM SEWER DETAILS
STREET AND STORM SEWER PLANS

HAWTHORN RIDGE
SECOND PLAT

LEE'S SUMMIT, MISSOURI

2019

drawn by: D.A.H.O
checked by: M.G.D
designed by: B.M.W
QA/QC by: N.D.H
project no.: 019-1605
date: 07-12-2019

SHEET
C136

DWG: F:\2019\1501-2000\019-1605\40-Design\AutoCAD\Final Plans\Sheets\GNCV\STREET, STORM & SITE DISTURBANCE\C_DTL01_0191605.dwg
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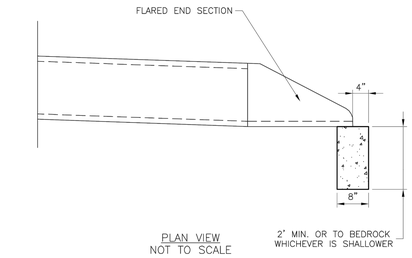
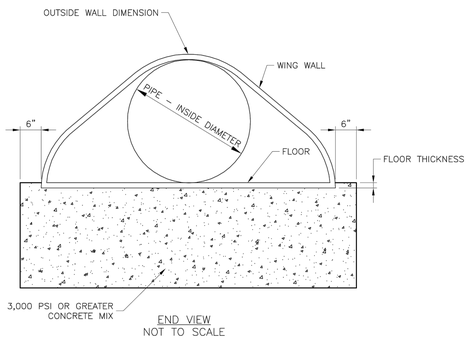
USER: bworthley

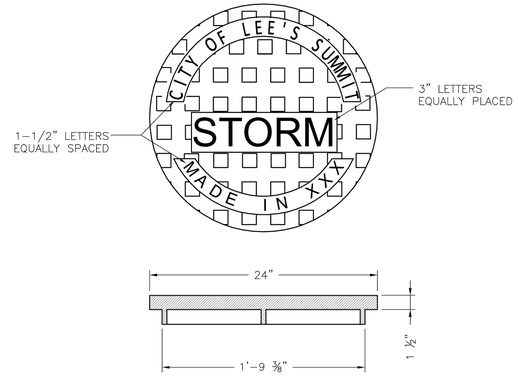




LEE'S SUMMIT
MISSOURI
PUBLIC WORKS ENGINEERING DIVISION | 220 SE GREEN STREET | LEE'S SUMMIT, MO 64063

Date: 04/17
Drawn By: MJF
Checked By: DL

FLARED END SECTION SUPPORT DETAIL — STM-5



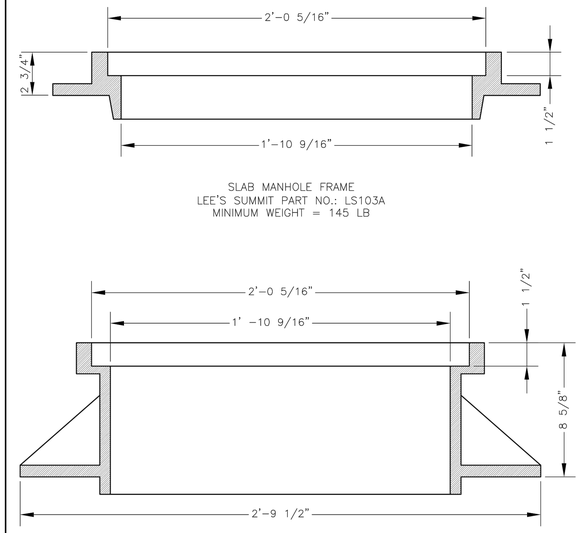
STANDARD 24" MANHOLE COVER
MINIMUM WEIGHT = 160 LB
NOTE: PICK HOLES NOT SHOWN

*COVER AND FRAME MODEL INFORMATION REFER TO THE STORMWATER APPROVED PRODUCT LIST.

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

Date: 04/17
Drawn By: MJF
Checked By: DL

STORM MANHOLE COVER DETAIL — STM-6



SLAB MANHOLE FRAME
LEE'S SUMMIT PART NO.: LS103A
MINIMUM WEIGHT = 145 LB

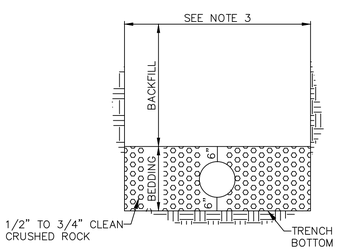
STANDARD 24" MANHOLE FRAME
LEE'S SUMMIT PART NO.: LS101A
MINIMUM WEIGHT = 250 LB

*COVER AND FRAME MODEL INFORMATION REFER TO THE STORMWATER APPROVED PRODUCTS LIST.

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

Date: 04/17
Drawn By: MJF
Checked By: DL

STORM MANHOLE FRAME DETAIL — STM-7



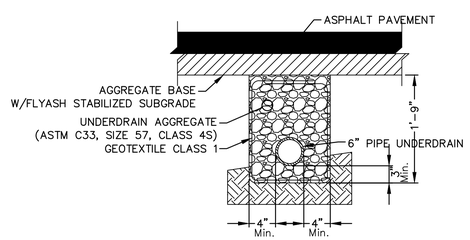
TYPICAL SECTION FOR PLASTIC PIPE
(IN ROCK OR SOIL)

UNDERGROUND PIPE INSTALLATION FOR STORM SEWER LINES
N.T.S.

1. BACKFILL SHALL BE JOB EXECAVATED MATERIAL FREE FROM DEBRIS AND STONES COMPACTED TO 90% OF MAXIMUM DENSITY AT OPTIMUM MOISTURE CONTENT AS DETERMINED BY ASTM D698. BACKFILL UNDER PAVEMENT (EXISTING OR PROPOSED), SHALL BE FLOWABLE FILL.

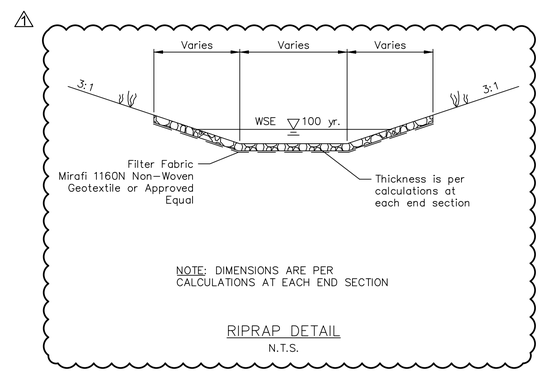
2. TRENCH BANKS MAY BE CUT BACK ON SLOPES IN ACCORDANCE WITH CURRENT OSHA REGULATIONS, BUT ONLY IN AREAS WHERE THE INCREASED TRENCH WIDTH WILL NOT INTERFERE WITH SURFACE FEATURES. SLOPES MUST NOT EXTEND BELOW TOP OF BEDDING.

3. MINIMUM AND MAXIMUM WIDTHS SHALL BE IN ACCORDANCE WITH PIPE MANUFACTURER'S RECOMMENDATION AS APPROVED ON ENGINEERING PLANS.



PIPE UNDERDRAIN LATERAL
N.T.S.

NOTES:
1. Where Pipe Underdrains are used, all Underdrain Outlet Pipes shall be solid wall with watertight joints. All Outlets Pipes shall be tied into the nearest storm sewer inlets at roadway sag locations as indicated in the street profile.
2. All Underdrain Pipes shall be installed at a minimum slope of 1%.
3. Underdrain Pipe shall be installed with the perforations placed down.
4. Blanket Underdrain Aggregate, Pipe Underdrain Aggregate, Pipe Underdrain, Edge Underdrain and Outlet Pipe shall conform to City of Lee's Summit Specifications.
5. Overlap geotextile at top of trench a minimum of 12".



NOTE: DIMENSIONS ARE PER CALCULATIONS AT EACH END SECTION

RIPRAP DETAIL
N.T.S.

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STATE OF MISSOURI
JULIE ELAINE SELLERS
NUMBER PE-2017000367
10/1/20
PROFESSIONAL ENGINEER
JULIE E. SELLERS, P.E.
MO# 2017000367

NO. REV.	DATE	REVISIONS DESCRIPTION	BY
1	08-12-2019	RIPRAP DETAIL ADDED	

REVISIONS

STORM SEWER DETAILS
STREET AND STORM SEWER PLANS

HAWTHORN RIDGE
SECOND PLAT

LEE'S SUMMIT, MISSOURI

2019

drawn by: D.A.H.O
checked by: M.G.D
designed by: B.M.W
QA/QC by: N.D.H
project no.: 019-1605
date: 07-12-2019

SHEET
C137

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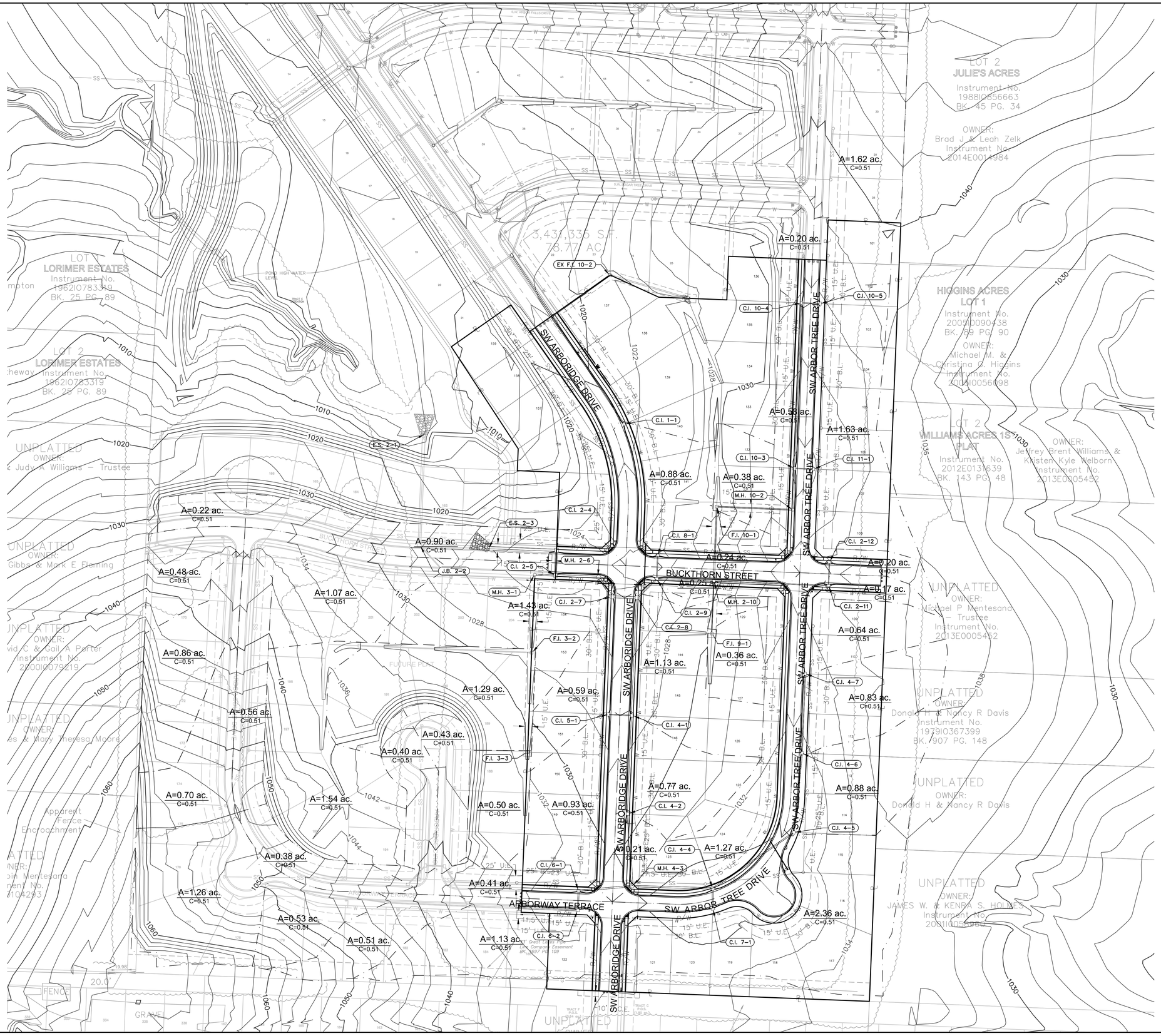

LEGEND	
100	FINISHED INDEX CONTOURS
100	FINISHED INTERMEDIATE CONTOURS
— —	RIDGE LINE
A	DRAINAGE AREA
C	RUNOFF COEFFICIENT
(C.I. 0-0)	STORM STRUCTURE NUMBER

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STATE OF MISSOURI
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NUMBER PE-2017000367
10/1/20
PROFESSIONAL ENGINEER

JULIE E. SELLERS, P.E.
MO# 2017000367

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

DRAINAGE PLAN
STREET & STORM SEWER PLANS

HAWTHORN RIDGE
SECOND PLAT

LEE'S SUMMIT, MISSOURI

2019

drawn by: D.A.H.Q
checked by: M.G.D
designed by: B.M.W
QA/QC by: N.D.H
project no.: 019-1605
date: 07-12-2019

SHEET
C138

DWG: F:\2019\1501-2000\019-1605\40-Design\AutoCAD\Final Plans\Sheets\GNCV\STREET, STORM & SITE DISTURBANCE\C_DRN01_0191605.dwg USER: bworthley
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DATE: Oct 01, 2020 2:48pm XREFS: C_PTBLK_0191605

Drainage Area Design Table
10 Year Return Frequency

Inlet ID	Drainage Area (ac)	C	Tc (min)	i (in/hr)	K	Peak Flow (cfs)
C.I. 1-1	0.88	0.51	5.00	7.35	1.00	3.30
C.I. 2-4(L)	0.68	0.51	5.00	7.35	1.00	2.56
C.I. 2-4(R)	0.05	0.51	5.00	7.35	1.00	0.18
C.I. 2-4(B)	0.17	0.51	7.00	6.78	1.00	0.59
C.I. 2-4	0.90	0.51	7.00	6.78	1.00	3.11
C.I. 2-5(L)	0.20	0.51	5.00	7.35	1.00	0.74
C.I. 2-5(R)	0.65	0.51	5.00	7.35	1.00	2.46
C.I. 2-5(B)	0.58	0.51	7.00	6.78	1.00	2.00
C.I. 2-5	1.43	0.51	7.00	6.78	1.00	4.95
C.I. 2-7	0.59	0.51	5.00	7.35	1.00	2.21
C.I. 2-8	1.13	0.51	10.88	5.90	1.00	3.40
C.I. 2-9	0.25	0.51	5.00	7.35	1.00	0.94
C.I. 2-11	0.17	0.51	5.00	7.35	1.00	0.64
C.I. 2-12	0.20	0.51	5.00	7.35	1.00	0.75
F.I. 3-2	1.24	0.51	5.00	7.35	1.00	4.65
F.I. 3-3	0.50	0.51	5.00	7.35	1.00	1.88
C.I. 4-1	0.77	0.51	5.00	7.35	1.00	2.89
C.I. 4-2	0.21	0.51	5.00	7.35	1.00	0.79
C.I. 4-4(L)	0.14	0.51	5.00	7.35	1.00	0.51
C.I. 4-4(R)	0.82	0.51	5.00	7.35	1.00	3.09
C.I. 4-4(B)	0.31	0.51	7.00	6.78	1.00	1.07
C.I. 4-4	1.27	0.51	7.00	6.78	1.00	4.39
C.I. 4-5	0.88	0.51	5.00	7.35	1.00	3.30
C.I. 4-6	0.83	0.51	5.00	7.35	1.00	3.11
C.I. 4-7	0.64	0.51	5.00	7.35	1.00	2.40
C.I. 5-1	0.93	0.51	11.83	5.71	1.00	2.71
C.I. 6-1(L)	0.29	0.51	5.00	7.35	1.00	1.08
C.I. 6-1(R)	0.00	0.51	5.00	7.35	1.00	0.00
C.I. 6-1(B)	0.12	0.51	5.00	7.35	1.00	0.46
C.I. 6-1	0.41	0.51	5.00	7.35	1.00	1.54
C.I. 6-2(L)	0.00	0.51	5.00	7.35	1.00	0.00
C.I. 6-2(R)	0.47	0.51	5.00	7.35	1.00	1.77
C.I. 6-2(B)	0.66	0.51	7.00	6.78	1.00	2.28
C.I. 6-2	1.13	0.51	7.00	6.78	1.00	3.91
C.I. 7-1(L)	1.59	0.51	13.45	5.43	1.00	4.40
C.I. 7-1(R)	0.21	0.51	5.00	7.35	1.00	0.79
C.I. 7-1(B)	0.56	0.51	5.00	7.35	1.00	2.10
C.I. 7-1	2.36	0.51	13.45	5.43	1.00	6.53
C.I. 8-1	0.24	0.51	5.00	7.35	1.00	0.90
F.I. 9-1	0.36	0.51	5.00	7.35	1.00	1.35
F.I. 10-1	0.38	0.51	5.00	7.35	1.00	1.43
C.I. 10-3(L)	0.11	0.51	5.00	7.35	1.00	0.41
C.I. 10-3(R)	0.30	0.51	5.00	7.35	1.00	1.13
C.I. 10-3(B)	0.17	0.51	5.00	7.35	1.00	0.64
C.I. 10-3	0.58	0.51	5.00	7.35	1.00	2.18
C.I. 10-4	0.20	0.51	5.00	7.35	1.00	0.75
C.I. 10-5	1.62	0.51	8.83	6.33	1.00	5.23
C.I. 11-1(L)	0.73	0.51	5.00	7.35	1.00	2.75
C.I. 11-1(R)	0.20	0.51	5.00	7.35	1.00	0.73
C.I. 11-1(B)	0.70	0.51	7.00	6.78	1.00	2.42
C.I. 11-1	1.63	0.51	7.00	6.78	1.00	5.64

Drainage Area Design Table
25 Year Return Frequency

Inlet ID	Drainage Area (ac)	C	Tc (min)	i (in/hr)	K	Peak Flow (cfs)
C.I. 1-1	0.88	0.51	5.00	8.53	1.10	4.21
C.I. 2-4(L)	0.68	0.51	5.00	8.53	1.10	3.26
C.I. 2-4(R)	0.05	0.51	5.00	8.53	1.10	0.23
C.I. 2-4(B)	0.17	0.51	7.00	7.87	1.10	0.75
C.I. 2-4	0.90	0.51	7.00	7.87	1.10	3.97
C.I. 2-5(L)	0.20	0.51	5.00	8.53	1.10	0.94
C.I. 2-5(R)	0.65	0.51	5.00	8.53	1.10	3.13
C.I. 2-5(B)	0.58	0.51	7.00	7.87	1.10	2.55
C.I. 2-5	1.43	0.51	7.00	7.87	1.10	6.31
C.I. 2-7	0.59	0.51	5.00	8.53	1.10	2.82
C.I. 2-8	1.13	0.51	10.88	6.84	1.10	4.34
C.I. 2-9	0.25	0.51	5.00	8.53	1.10	1.20
C.I. 2-11	0.17	0.51	5.00	8.53	1.10	0.81
C.I. 2-12	0.20	0.51	5.00	8.53	1.10	0.96
F.I. 3-2	1.24	0.51	5.00	8.53	1.10	5.93
F.I. 3-3	0.50	0.51	5.00	8.53	1.10	2.39
C.I. 4-1	0.77	0.51	5.00	8.53	1.10	3.68
C.I. 4-2	0.21	0.51	5.00	8.53	1.10	1.00
C.I. 4-4(L)	0.14	0.51	5.00	8.53	1.10	0.65
C.I. 4-4(R)	0.82	0.51	5.00	8.53	1.10	3.94
C.I. 4-4(B)	0.31	0.51	7.00	7.87	1.10	1.37
C.I. 4-4	1.27	0.51	7.00	7.87	1.10	5.61
C.I. 4-5	0.88	0.51	5.00	8.53	1.10	4.21
C.I. 4-6	0.83	0.51	5.00	8.53	1.10	3.97
C.I. 4-7	0.64	0.51	5.00	8.53	1.10	3.06
C.I. 5-1	0.93	0.51	11.83	6.63	1.10	3.46
C.I. 6-1(L)	0.29	0.51	5.00	8.53	1.10	1.38
C.I. 6-1(R)	0.00	0.51	5.00	8.53	1.10	0.00
C.I. 6-1(B)	0.12	0.51	5.00	8.53	1.10	0.59
C.I. 6-1	0.41	0.51	5.00	8.53	1.10	1.96
C.I. 6-2(L)	0.00	0.51	5.00	8.53	1.10	0.00
C.I. 6-2(R)	0.47	0.51	5.00	8.53	1.10	2.25
C.I. 6-2(B)	0.66	0.51	7.00	7.87	1.10	2.91
C.I. 6-2	1.13	0.51	7.00	7.87	1.10	4.99
C.I. 7-1(L)	1.59	0.51	13.45	6.29	1.10	5.61
C.I. 7-1(R)	0.21	0.51	5.00	8.53	1.10	1.00
C.I. 7-1(B)	0.56	0.51	5.00	8.53	1.10	2.68
C.I. 7-1	2.36	0.51	13.45	6.29	1.10	8.33
C.I. 8-1	0.24	0.51	5.00	8.53	1.10	1.15
F.I. 9-1	0.36	0.51	5.00	8.53	1.10	1.72
F.I. 10-1	0.38	0.51	5.00	8.53	1.10	1.82
C.I. 10-3(L)	0.11	0.51	5.00	8.53	1.10	0.53
C.I. 10-3(R)	0.30	0.51	5.00	8.53	1.10	1.44
C.I. 10-3(B)	0.17	0.51	5.00	8.53	1.10	0.81
C.I. 10-3	0.58	0.51	5.00	8.53	1.10	2.78
C.I. 10-4	0.20	0.51	5.00	8.53	1.10	0.96
C.I. 10-5	1.62	0.51	8.83	7.35	1.10	6.68
C.I. 11-1(L)	0.73	0.51	5.00	8.53	1.10	3.51
C.I. 11-1(R)	0.20	0.51	5.00	8.53	1.10	0.94
C.I. 11-1(B)	0.70	0.51	7.00	7.87	1.10	3.09
C.I. 11-1	1.63	0.51	7.00	7.87	1.10	7.19

Inlet Design Table
10 Year Return Frequency

Inlet ID	Inlet Location	Peak Flow (cfs)	Upstream Bypass (cfs)	Total Flow (cfs)	Clogging Factor	Inlet Capacity (cfs)	Sag Inlet Capacity (Note 1) (cfs)	Captured Flow (cfs)	Bypass Flow (cfs)	Inlet Efficiency (Note 2) (%)	Gutter Depth (ft)	Gutter Spread (ft)	Ponding Depth (ft)
C.I. 1-1	GRADE	3.30	0.00	3.30	1.00	3.04	3.04	3.04	0.26	92.05%	0.21	9.66	...
C.I. 2-4(L)	SAG	2.56	0.00	2.56	...	...	...	...	...	...	0.19	8.70	...
C.I. 2-4(R)	SAG	0.18	0.00	0.18	...	...	...	...	...	...	0.07	3.21	...
C.I. 2-4	SAG	3.11	0.00	3.11	0.80	23.28	18.63	3.11	0.00	100.00%	...	...	...
C.I. 2-5(L)	SAG	0.74	0.39	1.12	...	...	...	...	...	...	0.14	6.35	...
C.I. 2-5(R)	SAG	2.46	0.79	3.25	...	...	...	...	...	...	0.21	9.52	...
C.I. 2-5	SAG	4.95	1.18	6.12	0.80	23.28	18.63	6.12	0.00	100.00%	...	...	...
C.I. 2-7	GRADE	2.21	0.16	2.37	1.00	2.28	2.28	2.28	0.09	96.21%	0.18	8.47	...
C.I. 2-8	GRADE	3.40	0.19	3.58	1.00	3.29	3.29	3.29	0.29	91.86%	0.21	9.89	...
C.I. 2-9	GRADE	0.94	0.00	0.94	1.00	0.93	0.93	0.93	0.01	99.42%	0.11	5.29	...
C.I. 2-11	GRADE	0.64	0.00	0.64	1.00	0.64	0.64	0.64	0.00	99.71%	0.11	4.96	...
C.I. 2-12	GRADE	0.75	0.00	0.75	1.00	0.75	0.75	0.75	0.00	99.97%	0.11	5.28	...
F.I. 3-2	SAG	4.65	...	4.65	0.80	18.67	14.93	4.65	0.00	100.00%	...	...	0.20
F.I. 3-3	SAG	1.88	...	1.88	0.80	18.67	14.93	1.88	0.00	100.00%	...	...	0.11
C.I. 4-1	GRADE	2.89	0.00	2.89	1.00	2.70	2.70	2.70	0.19	93.53%	0.20	9.12	...
C.I. 4-2	GRADE	0.79	0.00	0.79	1.00	0.79	0.79	0.79	0.00	99.90%	0.12	5.60	...
C.I. 4-4(L)	SAG	0.51	0.00	0.51	...	...	...	...	...	...	0.09	4.64	...
C.I. 4-4(R)	SAG	3.09	0.00	3.09	...	...	...	...	...	...	0.20	10.07	...
C.I. 4-4	SAG	4.39	0.00	4.39	0.80	19.40	15.52	4.39	0.00	100.00%	...	...	...
C.I. 4-5	GRADE	3.30	0.65	3.95	1.00	3.10	3.10	3.10	0.85	78.52%	0.22	11.16	...
C.I. 4-6	GRADE	3.11	0.32	3.44	1.00	2.79	2.79	2.79	0.65	81.07%	0.21	10.59	...
C.I. 4-7	GRADE	2.40	0.00	2.40	1.00	2.08	2.08	2.08	0.32	86.54%	0.19	9.26	...
C.I. 5-1	GRADE	2.71	0.00	2.71	1.00	2.55	2.55	2.55	0.16	94.26%	0.19	8.91	...
C.I. 6-1(L)	SAG	1.08	0.65	1.73	...	...	...	...	...	...	0.14	7.10	...
C.I. 6-1(R)	SAG	0.00	0.00	0.00	...	...	...	...	...	...	0.00	0.00	...
C.I. 6-1	SAG	1.54	0.65	2.19	0.80	19.40	15.52	2.19	0.00	100.00%	...	...	...
C.I. 6-2(L)	SAG	0.00	0.00	0.00	...	...	...	...	...	...	0.00	0.00	...
C.I. 6-2(R)	SAG	1.77	1.39	3.15	...	...	...	...	...	...	0.18	8.89	...
C.I. 6-2	SAG	3.91	1.39	5.30	0.80	19.40	15.52	5.30	0.00	100.00%	...	...	...
C.I. 7-1(L)	SAG	4.40	0.85	5.25	...	...	...	...	...	...	0.24	11.91	...
C.I. 7-1(R)	SAG	0.79	0.00	0.79	...	...	...	...	...	...	0.11	5.63	...
C.I. 7-1	SAG	6.53	0.85	7.38	0.80	19.40	15.52	7.38	0.00	100.00%	...	...	...
C.I. 8-1	GRADE	0.90	0.00	0.90	1.00	0.90	0.90	0.90	0.00	99.54%	0.11	5.21	...
F.I. 9-1	SAG	1.35	...	1.35	0.80	18.67	14.93	1.35	0.00	100.00%	...	...	0.09
F.I. 10-1	SAG	1.43	...	1.43	0.80	18.67	14.93	1.43	0.00	100.00%	...	...	0.09
C.I. 10-3(L)	SAG	0.41	0.00	0.41	...	...	...	...	...	...	0.09	4.26	...
C.I. 10-3(R)	SAG	1.13	0.04	1.16	...	...	...	...	...	...	0.13	6.62	...
C.I. 10-3	SAG	2.18	0.04	2.21	0.80	19.40	15.52	2.21	0.00	100.00%	...	...	...
C.I. 10-4	GRADE	0.75	0.00	0.75	1.00	0.71	0.71	0.71	0.04	95.06%	0.11	5.62	...
C.I. 10-5	GRADE	5.23	0.00	5.23	1.00	3.50	3.50	3.50	1.73	66.97%	0.23	11.64	...
C.I. 11-1(L)	SAG	2.75	1.73	4.48	...	...	...	...	...	...	0.22	10.98	...
C.I. 11-1(R)	SAG	0.73	0.00	0.73	...	...	...	...	...	...	0.11	5.29	...
C.I. 11-1	SAG	5.64	1.73	7.37	0.80	19.40	15.52	7.37	0.00	100.00%	...	...	...

Notes:
1. Inlet capacity at sag location has been reduced by a clogging factor of 0.80, reducing theoretical capacity to 80% capacity, as required per APWA Section 5600. Both theoretical capacity and reduced capacity are shown.
2. Inlet efficiency shown in the tables is Captured Flow/Total Flow, denoting the actual percentage of flow captured after the capacity has been reduced to 80% of theoretical capacity.

Inlet Design Table
25 Year Return Frequency

Inlet ID	Inlet Location	Peak Flow (cfs)	Upstream Bypass (cfs)	Total Flow (cfs)	Clogging Factor	Inlet Capacity (cfs)	Sag Inlet Capacity (Note 1) (cfs)	Captured Flow (cfs)	Bypass Flow (cfs)	Inlet Efficiency (Note 2) (%)	Gutter Depth (ft)	Gutter Spread (ft)	Ponding Depth (ft)
C.I. 1-1	GRADE	4.21	0.02	4.23	1.00	3.74	3.74	3.74	0.49	88.37%	0.23	10.59	...
C.I. 2-4(L)	SAG	3.26	0.00	3.26	...	...	...	...	...	...	0.21	9.54	...
C.I. 2-4(R)	SAG	0.23	0.00	0.23	...	...	...	...	...	...	0.08	3.51	...
C.I. 2-4	SAG	3.97	0.00	3.97	0.80	23.28	18.63	3.97	0.00	100.00%	...	...	...
C.I. 2-5(L)	SAG	0.94	0.79	1.73	...	...	...	...	...	...	0.16	7.47	...
C.I. 2-5(R)	SAG	3.13	1.39	4.52	...	...	...	...	...	...	0.23	10.77	...
C.I. 2-5	SAG	6.31	2.18	8.47	0.80	23.28	18.63	8.47	0.00	100.00%	...	...	...
C.I. 2-7	GRADE	2.82	0.30	3.13	1.00	2.92	2.92	2.92	0.20	93.50%	0.20	9.40	...
C.I. 2-8	GRADE	4.34	0.36	4.69	1.00	4.13	4.13	4.13	0.57	87.93%	0.24	10.95	...
C.I. 2-9	GRADE	1.20	0.00	1.20	1.00	1.18	1.18	1.18	0.02	98.32%	0.13	5.80	...
C.I. 2-11	GRADE	0.81	0.00	0.81	1.00	0.81	0.81	0.81	0.00	100.00%	0.12	5.44	...
C.I. 2-12	GRADE	0.96	0.00	0.96	1.00	0.96	0.96	0.96	0.00	99.88%	0.13	5.78	...
F.I. 3-2	SAG	5.93	...	5.93	0.80	18.67	14.93	5.93	0.00	100.00%	...	...	0.23
F.I. 3-3	SAG	2.39	...	2.39	0.80	18.67	14.93	2.39	0.00	100.00%	...	...	0.13
C.I. 4-1	GRADE	3.68	0.00	3.68	1.00	3.33	3.33	3.33	0.36	90.27%	0.22	10.00	...
C.I. 4-2	GRADE	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	99.96%	0.13	6.14	...
C.I. 4-4(L)	SAG	0.65	0.00	0.65	...	...	...	...	...	...	0.10	5.09	...
C.I. 4-4(R)	SAG	3.94	0.00	3.94	...	...	...	...	...	...	0.22	11.03	...
C.I. 4-4	SAG	5.61	0.00	5.61	0.80	19.40	15.52	5.61	0.00	100.00%	...	...	...
C.I. 4-5	GRADE	4.21	1.08	5.29	1.00	3.83	3.83	3.83	1.46	72.40%	0.25	12.45	...
C.I. 4-6	GRADE	3.97	0.52	4.49	1.00	3.41	3.41	3.41	1.08	75.96%	0.23	11.71	...
C.I. 4-7	GRADE	3.06	0.00	3.06	1.00	2.54	2.54	2.54	0.52	82.98%	0.20	10.14	...
C.I. 5-1	GRADE	3.46	0.00	3.46	1.00	3.15	3.15	3.15	0.30	91.19%	0.21	9.76	...
C.I. 6-1(L)	SAG	1.38	1.05	2.42	...	...	...	...	...	...	0.16	8.05	...
C.I. 6-1(R)	SAG	0.00	0.00	0.00	...	...	...	...	...	...	0.00	0.00	...
C.I. 6-1	SAG	1.96	1.05	3.01	0.80	19.40	15.52	3.01	0.00	100.00%	...	...	...
C.I. 6-2(L)	SAG	0.00	0.00	0.00	...	...	...	...	...	...	0.00	0.00	...
C.I. 6-2(R)	SAG	2.25	2.59	4.84	...	...	...	...	...	...	0.21	10.43	...
C.I. 6-2	SAG	4.99	2.59	7.57	0.80	19.40	15.52	7.57	0.00	100.00%	...	...	...
C.I. 7-1(L)	SAG	5.61	1.46	7.07	...	...	...	...	...	...	0.27	13.32	...
C.I. 7-1(R)	SAG	1.00	0.00	1.00	...	...	...	...	...	...	0.12	6.17	...
C.I. 7-1	SAG	8.33	1.46	9.79	0.80	19.40	15.52	9.79	0.00	100.00%	...	...	...
C.I. 8-1	GRADE	1.15	0.00	1.15	1.00	1.13	1.13	1.13	0.02	98.55%	0.12	5.71	...
F.I. 9-1	SAG	1.72	...	1.72	0.80	18.67	14.93	1.72	0.00	100.00%	...	...	0.10
F.I. 10-1	SAG	1.82	...	1.82	0.80	18.67	14.93	1.82	0.00	100.00%	...	...	0.11
C.I. 10-3(L)	SAG	0.53	0.00	0.53	...	...	...	...	...	...	0.09	4.67	...
C.I. 10-3(R)	SAG	1.44	0.06	1.50	...	...	...	...	...	...	0.15	7.28	...
C.I. 10-3	SAG	2.78	0.06	2.84	0.80	19.40	15.52	2.84	0.00	100.00%	...	...	...
C.I. 10-4	GRADE	0.96	0.00	0.96	1.00	0.89	0.89	0.89	0.06	93.44%	0.12	6.16	...
C.I. 10-5	GRADE	6.68	0.00	6.68	1.00	4.03	4.03	4.03	2.64	60.42%	0.26	12.76	...
C.I. 11-1(L)	SAG	3.51	2.64	6.15	...	...	...	...	...	...	0.25	12.37	...
C.I. 11-1(R)	SAG	0.94	0.00	0.94	...	...	...	...	...	...	0.12	5.80	...
C.I. 11-1	SAG	7.19	2.64	9.84	0.80	19.40	15.52	9.84	0.00	100.00%	...	...	...

Notes:
1. Inlet capacity at sag location has been reduced by a clogging factor of 0.80, reducing theoretical capacity to 80% capacity, as required per APWA Section 5600. Both theoretical capacity and reduced capacity are shown.
2. Inlet efficiency shown in the tables is Captured Flow/Total Flow, denoting the actual percentage of flow captured after the capacity has been reduced to 80% of theoretical capacity.

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Storm Sewer Design Calculation Table
10 Year Return Frequency

Upstream Structure	Downstream Structure	Length (ft)	Upstream Invert (ft)	Downstream Invert (ft)	Slope (%)	Diameter (in)	Manning's n	Total Flow (cfs)	Velocity (ft/s)	Capacity (cfs)	Flow Depth (ft)	Upstream Struct. HGL (ft)	Upstream Top Elev. (ft)
C.I. 1-1	EX C.I. 10-1	231.96	1015.54	1010.90	2.00	15	0.010	3.30	2.71	9.89	0.73	1016.27	1021.44
C.I. 2-4	E.S. 2-3	120.00	1009.77	1008.80	0.81	48	0.010	91.38	7.27	167.90	4.00	1015.04	1023.24
C.I. 2-5	C.I. 2-4	45.00	1010.71	1010.37	0.76	42	0.010	88.27	9.18	113.69	3.50	1015.57	1023.24
M.H. 2-6	C.I. 2-5	77.00	1011.93	1011.31	0.81	42	0.010	71.38	7.42	117.36	3.50	1016.33	1023.91
C.I. 2-7	M.H. 2-6	42.50	1012.87	1012.53	0.80	42	0.010	71.38	7.42	116.98	3.50	1016.79	1024.79
C.I. 2-8	C.I. 2-7	45.00	1013.83	1013.47	0.80	42	0.010	69.10	7.21	116.99	3.50	1017.25	1024.79
C.I. 2-9	C.I. 2-8	48.45	1017.46	1015.33	4.40	24	0.010	19.79	6.83	61.65	2.00	1019.06	1025.57
M.H. 2-10	C.I. 2-9	102.00	1020.64	1018.06	2.53	24	0.010	17.96	9.23	46.76	1.00	1022.17	1029.31
C.I. 2-11	M.H. 2-10	205.00	1028.46	1021.34	3.47	15	0.010	1.39	2.48	15.64	0.83	1028.93	1035.93
C.I. 2-12	C.I. 2-11	42.00	1030.00	1029.16	2.00	15	0.010	0.75	4.09	11.87	0.21	1030.34	1035.93
M.H. 3-1	C.I. 2-5	37.00	1012.95	1012.21	2.00	24	0.010	10.77	3.43	41.58	2.00	1016.15	1023.38
F.I. 3-2	M.H. 3-1	139.50	1020.17	1015.00	3.71	18	0.010	10.77	6.91	26.28	1.22	1021.43	1027.17
F.I. 3-3	F.I. 3-2	177.91	1024.57	1020.57	2.25	15	0.010	1.88	2.88	12.59	0.86	1025.12	1030.73
C.I. 4-1	C.I. 2-8	210.50	1016.43	1014.43	0.95	36	0.010	46.02	7.38	84.51	3.00	1018.64	1027.31
C.I. 4-2	C.I. 4-1	176.00	1018.60	1016.93	0.95	36	0.010	40.77	8.81	84.46	1.71	1020.68	1029.42
M.H. 4-3	C.I. 4-2	129.23	1020.13	1018.90	0.95	36	0.010	39.98	8.45	84.58	1.78	1022.19	1030.84
C.I. 4-4	M.H. 4-3	144.24	1022.17	1020.73	1.00	30	0.010	19.74	6.52	53.27	1.46	1023.68	1028.61
C.I. 4-5	C.I. 4-4	176.25	1024.53	1022.77	1.00	24	0.010	7.97	5.40	29.38	0.91	1025.53	1030.30
C.I. 4-6	C.I. 4-5	142.41	1026.55	1025.13	1.00	18	0.010	4.87	5.90	13.63	0.62	1027.40	1031.67
C.I. 4-7	C.I. 4-6	142.00	1028.24	1026.82	1.00	15	0.010	2.08	3.76	8.39	0.58	1028.82	1033.10
C.I. 5-1	C.I. 4-1	43.00	1021.13	1018.68	5.70	15	0.010	2.55	7.61	20.04	0.30	1021.77	1027.29
C.I. 6-1	M.H. 4-3	95.89	1023.13	1020.73	2.50	30	0.010	20.24	6.63	84.35	1.46	1024.66	1030.59
C.I. 6-2	C.I. 6-1	35.00	1024.26	1023.73	1.51	24	0.010	18.70	9.37	36.18	1.02	1025.82	1030.59
C.I. 7-1	C.I. 4-4	36.73	1023.14	1022.77	1.01	24	0.010	7.38	5.13	29.51	0.91	1024.10	1028.58
C.I. 8-1	C.I. 2-9	42.50	1019.44	1018.06	3.25	15	0.010	0.90	1.90	15.13	1.00	1019.81	1025.56
F.I. 9-1	M.H. 2-10	94.00	1023.22	1021.34	2.00	15	0.010	1.35	2.44	11.87	0.83	1023.68	1029.20
F.I. 10-1	M.H. 2-10	133.00	1022.67	1021.34	1.00	24	0.010	15.22	7.94	29.40	1.02	1024.08	1027.98
M.H. 10-2	F.I. 10-1	136.00	1024.74	1023.37	1.01	24	0.010	13.79	7.71	29.51	0.96	1026.08	1032.85
C.I. 10-3	M.H. 10-2	74.00	1026.18	1025.44	1.00	24	0.010	13.79	7.69	29.41	0.96	1027.52	1031.92
C.I. 10-4	C.I. 10-3	296.00	1029.54	1026.58	1.00	18	0.010	4.21	4.06	13.65	0.94	1030.33	1035.75
C.I. 10-5	C.I. 10-4	34.00	1030.58	1030.24	1.00	15	0.010	3.50	5.52	8.39	0.56	1031.33	1035.75
C.I. 11-1	C.I. 10-3	34.50	1027.12	1026.78	0.99	15	0.010	7.37	7.10	8.33	0.91	1028.20	1031.91

NOTE:
SW ARBORTREE DRIVE AND ARBORWAY TERRACE ARE RESIDENTIAL LOCAL ROADS REQUIRING INLET AND GUTTER CAPACITY FOR THE 10-YEAR STORM EVENT. THEREFORE, INLET DESIGN, PIPE DESIGN, AND DRAINAGE AREA DESIGN TABLES HAVE BEEN INCLUDED FOR THE 10-YEAR STORM EVENT. ALL STORM SEWER PIPES HAVE BEEN DESIGNED TO CONVEY THE 25-YEAR STORM EVENT, PER RESIDENTIAL COLLECTOR STANDARDS FOR BUCKTHORN STREET AND SW ARBORIDGE DRIVE.

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Storm Sewer Design Calculation Table
25 Year Return Frequency

Upstream Structure	Downstream Structure	Length (ft)	Upstream Invert (ft)	Downstream Invert (ft)	Slope (%)	Diameter (in)	Manning's n	Total Flow (cfs)	Velocity (ft/s)	Capacity (cfs)	Flow Depth (ft)	Upstream Struct. HGL (ft)	Upstream Top Elev. (ft)
C.I. 1-1	EX C.I. 10-1	231.96	1015.54	1010.90	2.00	15	0.010	4.23	3.45	9.89	0.83	1016.37	1021.44
C.I. 2-4	E.S. 2-3	120.00	1009.77	1008.80	0.81	48	0.010	116.68	9.29	167.90	4.00	1015.41	1023.24
C.I. 2-5	C.I. 2-4	45.00	1010.71	1010.37	0.76	42	0.010	112.71	11.72	113.69	3.50	1016.28	1023.24
M.H. 2-6	C.I. 2-5	77.00	1011.93	1011.31	0.81	42	0.010	90.84	9.44	117.36	3.50	1017.51	1023.91
C.I. 2-7	M.H. 2-6	42.50	1012.87	1012.53	0.80	42	0.010	90.84	9.44	116.98	3.50	1018.27	1024.79
C.I. 2-8	C.I. 2-7	45.00	1013.83	1013.47	0.80	42	0.010	87.92	9.14	116.99	3.50	1019.02	1024.79
C.I. 2-9	C.I. 2-8	48.45	1017.46	1015.33	4.40	24	0.010	25.22	8.03	61.65	2.00	1019.90	1025.57
M.H. 2-10	C.I. 2-9	102.00	1020.64	1018.06	2.53	24	0.010	22.91	7.67	46.76	2.00	1022.34	1029.31
C.I. 2-11	M.H. 2-10	205.00	1028.46	1021.34	3.47	15	0.010	1.77	2.64	15.64	1.00	1028.99	1035.93
C.I. 2-12	C.I. 2-11	42.00	1030.00	1029.16	2.00	15	0.010	0.96	4.40	11.87	0.24	1030.39	1035.93
M.H. 3-1	C.I. 2-5	37.00	1012.95	1012.21	2.00	24	0.010	13.40	4.27	41.58	2.00	1017.21	1023.38
F.I. 3-2	M.H. 3-1	139.50	1020.17	1015.00	3.71	18	0.010	13.40	7.76	26.28	1.50	1021.53	1027.17
F.I. 3-3	F.I. 3-2	177.91	1024.57	1020.57	2.25	15	0.010	2.49	3.23	12.59	0.96	1025.20	1030.73
C.I. 4-1	C.I. 2-8	210.50	1016.43	1014.43	0.95	36	0.010	58.57	8.29	84.51	3.00	1020.51	1027.31
C.I. 4-2	C.I. 4-1	176.00	1018.60	1016.93	0.95	36	0.010	52.09	7.40	84.46	3.00	1021.52	1029.42
M.H. 4-3	C.I. 4-2	129.23	1020.13	1018.90	0.95	36	0.010	51.09	7.97	84.58	2.96	1022.45	1030.84
C.I. 4-4	M.H. 4-3	144.24	1022.17	1020.73	1.00	30	0.010	25.18	7.01	53.27	1.72	1023.88	1028.61
C.I. 4-5	C.I. 4-4	176.25	1024.53	1022.77	1.00	24	0.010	9.78	5.44	29.38	1.11	1025.65	1030.30
C.I. 4-6	C.I. 4-5	142.41	1026.55	1025.13	1.00	18	0.010	5.95	6.27	13.63	0.69	1027.49	1031.67
C.I. 4-7	C.I. 4-6	142.00	1028.24	1026.82	1.00	15	0.010	2.54	3.91	8.39	0.67	1028.88	1033.10
C.I. 5-1	C.I. 4-1	43.00	1021.13	1018.68	5.70	15	0.010	3.15	3.46	20.04	1.25	1021.84	1027.29
C.I. 6-1	M.H. 4-3	95.89	1023.13	1020.73	2.50	30	0.010	25.91	7.16	84.35	1.72	1024.86	1030.59
C.I. 6-2	C.I. 6-1	35.00	1024.26	1023.73	1.51	24	0.010	23.95	10.30	36.18	1.19	1025.99	1030.59
C.I. 7-1	C.I. 4-4	36.73	1023.14	1022.77	1.01	24	0.010	9.79	5.45	29.51	1.11	1024.26	1028.58
C.I. 8-1	C.I. 2-9	42.50	1019.44	1018.06	3.25	15	0.010	1.13	1.09	15.13	1.25	1020.30	1025.56
F.I. 9-1	M.H. 2-10	94.00	1023.22	1021.34	2.00	15	0.010	1.72	2.59	11.87	1.00	1023.74	1029.20
F.I. 10-1	M.H. 2-10	133.00	1022.67	1021.34	1.00	24	0.010	19.42	8.64	29.40	1.19	1024.25	1027.98
M.H. 10-2	F.I. 10-1	136.00	1024.74	1023.37	1.01	24	0.010	17.60	8.36	29.51	1.11	1026.25	1032.85
C.I. 10-3	M.H. 10-2	74.00	1026.18	1025.44	1.00	24	0.010	17.60	8.35	29.41	1.11	1027.69	1031.92
C.I. 10-4	C.I. 10-3	296.00	1029.54	1026.58	1.00	18	0.010	4.92	4.13	13.65	1.11	1030.39	1035.75
C.I. 10-5	C.I. 10-4	34.00	1030.58	1030.24	1.00	15	0.010	4.03	5.77	8.39	0.61	1031.39	1035.75
C.I. 11-1	C.I. 10-3	34.50	1027.12	1026.78	1.00	15	0.010	9.84	8.02	8.39	1.25	1028.50	1031.91

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JULIE ELAINE SELLERS
NUMBER PE-2017000367
10/1/20

JULIE E. SELLERS, P.E.
MO# 2017000367

REVISIONS

NO. REV.	DATE	REVISIONS DESCRIPTION	BY
1	08-12-2019	STORM SEWER CALCULATIONS REVISED BASED ON NEW DRAINAGE AREAS TO C.I. 2-8 AND F.I. 9-1	
2	10-02-2020	STORM SEWER CALCULATIONS REVISED BASED ON NEW STORM LINE 2 ALIGNMENT	

2019

DRAINAGE TABLES
STREET & STORM SEWER PLANS

HAWTHORN RIDGE
SECOND PLAT

LEE'S SUMMIT, MISSOURI

drawn by: D.A.H.O
checked by: M.G.D
designed by: B.M.W
QA/QC by: N.D.H
project no.: 019-1605
date: 07-12-2019

SHEET
C139

Drainage Area Design Table

100 Year Return Frequency

Inlet ID	Drainage Area	C	Tc	i	K	Peak Flow
	(ac)		(min)	(in/hr)		(cfs)
C.I. 1-1	0.88	0.51	5.00	10.32	1.25	5.79
C.I. 2-4(L)	0.68	0.51	5.00	10.32	1.25	4.49
C.I. 2-4(R)	0.05	0.51	5.00	10.32	1.25	0.32
C.I. 2-4(B)	0.17	0.51	7.00	9.55	1.25	1.03
C.I. 2-4	0.90	0.51	7.00	9.55	1.25	5.48
C.I. 2-5(L)	0.20	0.51	5.00	10.32	1.25	1.29
C.I. 2-5(R)	0.65	0.51	5.00	10.32	1.25	4.31
C.I. 2-5(B)	0.58	0.51	7.00	9.55	1.25	3.52
C.I. 2-5	1.43	0.51	7.00	9.55	1.25	8.71
C.I. 2-7	0.59	0.51	5.00	10.32	1.25	3.88
C.I. 2-8	1.13	0.51	10.88	8.34	1.25	6.01
C.I. 2-9	0.25	0.51	5.00	10.32	1.25	1.65
C.I. 2-11	0.17	0.51	5.00	10.32	1.25	1.12
C.I. 2-12	0.20	0.51	5.00	10.32	1.25	1.32
F.I. 3-2	1.24	0.51	5.00	10.32	1.25	8.16
F.I. 3-3	0.50	0.51	5.00	10.32	1.25	3.29
C.I. 4-1	0.77	0.51	5.00	10.32	1.25	5.07
C.I. 4-2	0.21	0.51	5.00	10.32	1.25	1.38
C.I. 4-4(L)	0.14	0.51	5.00	10.32	1.25	0.89
C.I. 4-4(R)	0.82	0.51	5.00	10.32	1.25	5.42
C.I. 4-4(B)	0.31	0.51	7.00	9.55	1.25	1.89
C.I. 4-4	1.27	0.51	7.00	9.55	1.25	7.73
C.I. 4-5	0.88	0.51	5.00	10.32	1.25	5.79
C.I. 4-6	0.83	0.51	5.00	10.32	1.25	5.46
C.I. 4-7	0.64	0.51	5.00	10.32	1.25	4.21
C.I. 5-1	0.93	0.51	11.83	8.09	1.25	4.80
C.I. 6-1(L)	0.29	0.51	5.00	10.32	1.25	1.89
C.I. 6-1(R)	0.00	0.51	5.00	10.32	1.25	0.00
C.I. 6-1(B)	0.12	0.51	5.00	10.32	1.25	0.81
C.I. 6-1	0.41	0.51	5.00	10.32	1.25	2.70
C.I. 6-2(L)	0.00	0.51	5.00	10.32	1.25	0.00
C.I. 6-2(R)	0.47	0.51	5.00	10.32	1.25	3.10
C.I. 6-2(B)	0.66	0.51	7.00	9.55	1.25	4.01
C.I. 6-2	1.13	0.51	7.00	9.55	1.25	6.88
C.I. 7-1(L)	1.59	0.51	13.45	7.70	1.25	7.80
C.I. 7-1(R)	0.21	0.51	5.00	10.32	1.25	1.38
C.I. 7-1(B)	0.56	0.51	5.00	10.32	1.25	3.69
C.I. 7-1	2.36	0.51	13.45	7.70	1.25	11.58
C.I. 8-1	0.24	0.51	5.00	10.32	1.25	1.58
F.I. 9-1	0.36	0.51	5.00	10.32	1.25	2.37
F.I. 10-1	0.38	0.51	5.00	10.32	1.25	2.50
C.I. 10-3(L)	0.11	0.51	5.00	10.32	1.25	0.72
C.I. 10-3(R)	0.30	0.51	5.00	10.32	1.25	1.97
C.I. 10-3(B)	0.17	0.51	5.00	10.32	1.25	1.12
C.I. 10-3	0.58	0.51	5.00	10.32	1.25	3.82
C.I. 10-4	0.20	0.51	5.00	10.32	1.25	1.32
C.I. 10-5	1.62	0.51	8.83	8.94	1.25	9.23
C.I. 11-1(L)	0.73	0.51	5.00	10.32	1.25	4.83
C.I. 11-1(R)	0.20	0.51	5.00	10.32	1.25	1.29
C.I. 11-1(B)	0.70	0.51	7.00	9.55	1.25	4.27
C.I. 11-1	1.63	0.51	7.00	9.55	1.25	9.92

Inlet Design Table

100 Year Return Frequency

Inlet ID	Inlet Location	Peak Flow	Upstream Bypass	Total Flow	Clogging Factor	Inlet Capacity	Sag Inlet Capacity (Note 1)	Captured Flow	Bypass Flow	Inlet Efficiency (Note 2)	Gutter Depth	Gutter Spread	Ponding Depth
		(cfs)	(cfs)	(cfs)		(cfs)	(cfs)	(cfs)	(cfs)	(%)	(ft)	(ft)	(ft)
C.I. 1-1	GRADE	5.79	0.06	5.85	1.00	4.81	4.81	4.81	1.04	82.22%	0.26	11.96	...
C.I. 2-4(L)	SAG	4.49	0.00	4.49	...	...	...	...	...	...	0.23	10.75	...
C.I. 2-4(R)	SAG	0.32	0.00	0.32	...	...	...	...	...	...	0.09	3.96	...
C.I. 2-4	SAG	5.48	0.00	5.48	0.80	23.28	18.63	5.48	0.00	100.00%	...	...	...
C.I. 2-5(L)	SAG	1.29	1.89	3.18	...	...	...	...	...	...	0.20	9.38	...
C.I. 2-5(R)	SAG	4.31	2.76	7.07	...	...	...	...	...	...	0.28	12.74	...
C.I. 2-5	SAG	8.71	4.64	13.28	0.80	23.28	18.63	13.28	0.00	100.00%	...	...	...
C.I. 2-7	GRADE	3.88	0.68	4.56	1.00	4.03	4.03	4.03	0.53	88.39%	0.23	10.83	...
C.I. 2-8	GRADE	6.01	0.77	6.78	1.00	5.49	5.49	5.49	1.29	80.98%	0.27	12.57	...
C.I. 2-9	GRADE	1.65	0.00	1.65	1.00	1.58	1.58	1.58	0.07	95.98%	0.14	6.53	...
C.I. 2-11	GRADE	1.12	0.00	1.12	1.00	1.11	1.11	1.11	0.01	99.54%	0.13	6.13	...
C.I. 2-12	GRADE	1.32	0.00	1.32	1.00	1.30	1.30	1.30	0.01	98.93%	0.14	6.52	...
F.I. 3-2	SAG	8.16	...	8.16	0.80	18.67	14.93	8.16	0.00	100.00%	...	...	0.29
F.I. 3-3	SAG	3.29	...	3.29	0.80	18.67	14.93	3.29	0.00	100.00%	...	...	0.16
C.I. 4-1	GRADE	5.07	0.01	5.08	1.00	4.30	4.30	4.30	0.77	84.75%	0.24	11.27	...
C.I. 4-2	GRADE	1.38	0.00	1.38	1.00	1.37	1.37	1.37	0.01	99.20%	0.15	6.92	...
C.I. 4-4(L)	SAG	0.89	0.00	0.89	...	...	...	...	...	...	0.11	5.73	...
C.I. 4-4(R)	SAG	5.42	0.00	5.42	...	...	...	...	...	...	0.25	12.43	...
C.I. 4-4	SAG	7.73	0.00	7.73	0.80	19.40	15.52	7.73	0.00	100.00%	...	...	...
C.I. 4-5	GRADE	5.79	2.07	7.86	1.00	4.91	4.91	4.91	2.95	62.43%	0.29	14.45	...
C.I. 4-6	GRADE	5.46	0.96	6.42	1.00	4.35	4.35	4.35	2.07	67.76%	0.27	13.39	...
C.I. 4-7	GRADE	4.21	0.00	4.21	1.00	3.25	3.25	3.25	0.96	77.27%	0.23	11.43	...
C.I. 5-1	GRADE	4.80	0.00	4.80	1.00	4.12	4.12	4.12	0.68	85.83%	0.24	11.04	...
C.I. 6-1(L)	SAG	1.89	1.91	3.80	...	...	...	...	...	...	0.19	9.53	...
C.I. 6-1(R)	SAG	0.00	0.00	0.00	...	...	...	...	...	...	0.00	0.00	...
C.I. 6-1	SAG	2.70	1.91	4.61	0.80	19.40	15.52	4.61	0.00	100.00%	...	...	...
C.I. 6-2(L)	SAG	0.00	0.00	0.00	...	...	...	...	...	...	0.00	0.00	...
C.I. 6-2(R)	SAG	3.10	5.45	8.54	...	...	...	...	...	...	0.26	12.91	...
C.I. 6-2	SAG	6.88	5.45	12.33	0.80	19.40	15.52	12.33	0.00	100.00%	...	...	...
C.I. 7-1(L)	SAG	7.80	2.95	10.76	...	...	...	...	...	...	0.31	15.58	...
C.I. 7-1(R)	SAG	1.38	0.00	1.38	...	...	...	...	...	...	0.14	6.95	...
C.I. 7-1	SAG	11.58	2.95	14.54	0.80	19.40	15.52	14.54	0.00	100.00%	...	...	...
C.I. 8-1	GRADE	1.58	0.00	1.58	1.00	1.52	1.52	1.52	0.06	96.34%	0.14	6.43	...
F.I. 9-1	SAG	2.37	...	2.37	0.80	18.67	14.93	2.37	0.00	100.00%	...	...	0.13
F.I. 10-1	SAG	2.50	...	2.50	0.80	18.67	14.93	2.50	0.00	100.00%	...	...	0.13
C.I. 10-3(L)	SAG	0.72	0.00	0.72	...	...	...	...	...	...	0.11	5.26	...
C.I. 10-3(R)	SAG	1.97	0.12	2.10	...	...	...	...	...	...	0.17	8.26	...
C.I. 10-3	SAG	3.82	0.12	3.94	0.80	19.40	15.52	3.94	0.00	100.00%	...	...	...
C.I. 10-4	GRADE	1.32	0.00	1.32	1.00	1.19	1.19	1.19	0.12	90.72%	0.14	6.94	...
C.I. 10-5	GRADE	9.23	0.00	9.23	1.00	4.70	4.70	4.70	4.53	50.95%	0.29	14.41	...
C.I. 11-1(L)	SAG	4.83	4.53	9.36	...	...	...	...	...	...	0.29	14.48	...
C.I. 11-1(R)	SAG	1.29	0.01	1.30	...	...	...	...	...	...	0.13	6.56	...
C.I. 11-1	SAG	9.92	4.54	14.47	0.80	19.40	15.52	14.47	0.00	100.00%	...	...	...

Notes:

1. Inlet capacity at sag location has been reduced by a clogging factor of 0.80, reducing theoretical capacity to 80% capacity, as required per APWA Section 5600.
   Both theoretical capacity and reduced capacity are shown.
2. Inlet efficiency shown in the tables is Captured Flow/Total Flow, denoting the actual percentage of flow captured after the capacity has been reduced to 80% of theoretical capacity.

Storm Sewer Design Calculation Table

100 Year Return Frequency

Upstream Structure	Downstream Structure	Length	Upstream Invert	Downstream Invert	Slope	Diameter	Manning's n	Total Flow	Velocity	Capacity	Flow Depth	Upstream Struct. HGL	Upstream Top Elev.
		(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(ft/s)	(cfs)	(ft)	(ft)	(ft)
C.I. 1-1	EX C.I. 10-1	231.96	1015.54	1010.90	2.00	15	0.010	5.85	4.77	9.89	1.25	1031.28	1021.44
C.I. 2-4	E.S. 2-3	120.00	1009.77	1008.80	0.81	48	0.010	162.27	12.91	167.90	4.00	1015.97	1023.24
C.I. 2-5	C.I. 2-4	45.00	1010.71	1010.37	0.76	42	0.010	156.79	16.30	113.69	3.50	1017.65	1023.24
M.H. 2-6	C.I. 2-5	77.00	1011.93	1011.31	0.81	42	0.010	124.62	12.95	117.36	3.50	1020.00	1023.91
C.I. 2-7	M.H. 2-6	42.50	1012.87	1012.53	0.80	42	0.010	124.62	12.95	116.98	3.50	1021.44	1024.79
C.I. 2-8	C.I. 2-7	45.00	1013.83	1013.47	0.80	42	0.010	120.59	12.54	116.99	3.50	1022.86	1024.79
C.I. 2-9	C.I. 2-8	48.45	1017.46	1015.33	4.40	24	0.010	34.68	11.04	61.65	2.00	1024.51	1025.57
M.H. 2-10	C.I. 2-9	102.00	1020.64	1018.06	2.53	24	0.010	31.58	10.05	46.76	2.00	1026.45	1029.31
C.I. 2-11	M.H. 2-10	205.00	1028.46	1021.34	3.47	15	0.010	2.41	2.96	15.64	1.25	1029.08	1035.93
C.I. 2-12	C.I. 2-11	42.00	1030.00	1029.16	2.00	15	0.010	1.30	4.81	11.87	0.28	1030.45	1035.93
M.H. 3-1	C.I. 2-5	37.00	1012.95	1012.21	2.00	24	0.010	18.89	6.01	41.58	2.00	1019.46	1023.38
F.I. 3-2	M.H. 3-1	139.50	1020.17	1015.00	3.71	18	0.010	18.89	10.69	26.28	1.50	1022.35	1027.17
F.I. 3-3	F.I. 3-2	177.91	1024.57	1020.57	2.25	15	0.010	3.29	3.55	12.59	1.25	1025.30	1030.73
C.I. 4-1	C.I. 2-8	210.50	1016.43	1014.43	0.95	36	0.010	80.42	11.38	84.51	3.00	1025.65	1027.31
C.I. 4-2	C.I. 4-1	176.00	1018.60	1016.93	0.95	36	0.010	72.00	10.19	84.46	3.00	1027.67	1029.42
M.H. 4-3	C.I. 4-2	129.23	1020.13	1018.90	0.95	36	0.010	70.63	9.99	84.58	3.00	1029.17	1030.84
C.I. 4-4	M.H. 4-3	144.24	1022.17	1020.73	1.00	30	0.010	34.78	7.09	53.27	2.50	1030.41	1028.61
C.I. 4-5	C.I. 4-4	176.25	1024.53	1022.77	1.00	24	0.010	12.51	3.98	29.38	2.00	1031.04	1030.30
C.I. 4-6	C.I. 4-5	142.41	1026.55	1025.13	1.00	18	0.010	7.60	4.30	13.63	1.50	1031.58	1031.67
C.I. 4-7	C.I. 4-6	142.00	1028.24	1026.82	1.00	15	0.010	3.25	2.65	8.39	1.25	1031.88	1033.10
C.I. 5-1	C.I. 4-1	43.00	1021.13	1018.68	5.70	15	0.010	4.12	3.36	20.04	1.25	1026.56	1027.29
C.I. 6-1	M.H. 4-3	95.89	1023.13	1020.73	2.50	30	0.010	35.85	7.30	84.35	2.50	1030.23	1030.59
C.I. 6-2	C.I. 6-1	35.00	1024.26	1023.73	1.51	24	0.010	33.15	10.55	36.18	2.00	1031.01	1030.59
C.I. 7-1	C.I. 4-4	36.73	1023.14	1022.77	1.01	24	0.010	14.54	4.63	29.51	2.00	1030.81	1028.58
C.I. 8-1	C.I. 2-9	42.50	1019.44	1018.06	3.25	15	0.010	1.52	1.24	15.13	1.25	1025.29	1025.56
F.I. 9-1	M.H. 2-10	94.00	1023.22	1021.34	2.00	15	0.010	2.37	1.93	11.87	1.25	1027.15	1029.20
F.I. 10-1	M.H. 2-10	133.00	1022.67	1021.34	1.00	24	0.010	26.80	8.53	29.40	2.00	1028.18	1027.98
M.H. 10-2	F.I. 10-1	136.00	1024.74	1023.37	1.01	24	0.010	24.30	7.74	29.51	2.00	1029.57	1032.85
C.I. 10-3	M.H. 10-2	74.00	1026.18	1025.44	1.00	24	0.010	24.30	7.74	29.41	2.00	1030.44	1031.92
C.I. 10-4	C.I. 10-3	296.00	1029.54	1026.58	1.00	18	0.010	5.89	3.33	13.65	1.50	1031.37	1035.75
C.I. 10-5	C.I. 10-4	34.00	1030.58	1030.24	1.00	15	0.010	4.70	4.50	8.39	1.20	1031.46	1035.75
C.I. 11-1	C.I. 10-3	34.50	1027.12	1026.78	0.99	15	0.010	14.47	11.79	8.33	1.25	1031.84	1031.91

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JULIE ELAINE SELLERS
NUMBER PE-2017000367
10/1/20
PROFESSIONAL ENGINEER

JULIE E. SELLERS, P.E.
MO# 2017000367

NO. REV.	DATE	REVISIONS DESCRIPTION	BY
1	08-12-2019	STORM SEWER CALCULATIONS REVISED BASED ON NEW DRAINAGE AREAS TO C.I. 2-8 AND F.I. 9-1.	
2	10-02-2020	STORM SEWER CALCULATIONS REVISED BASED ON NEW STORM LINE 2 ALIGNMENT	

REVISIONS

DRAINAGE TABLES
STREET & STORM SEWER PLANS

HAWTHORN RIDGE
SECOND PLAT

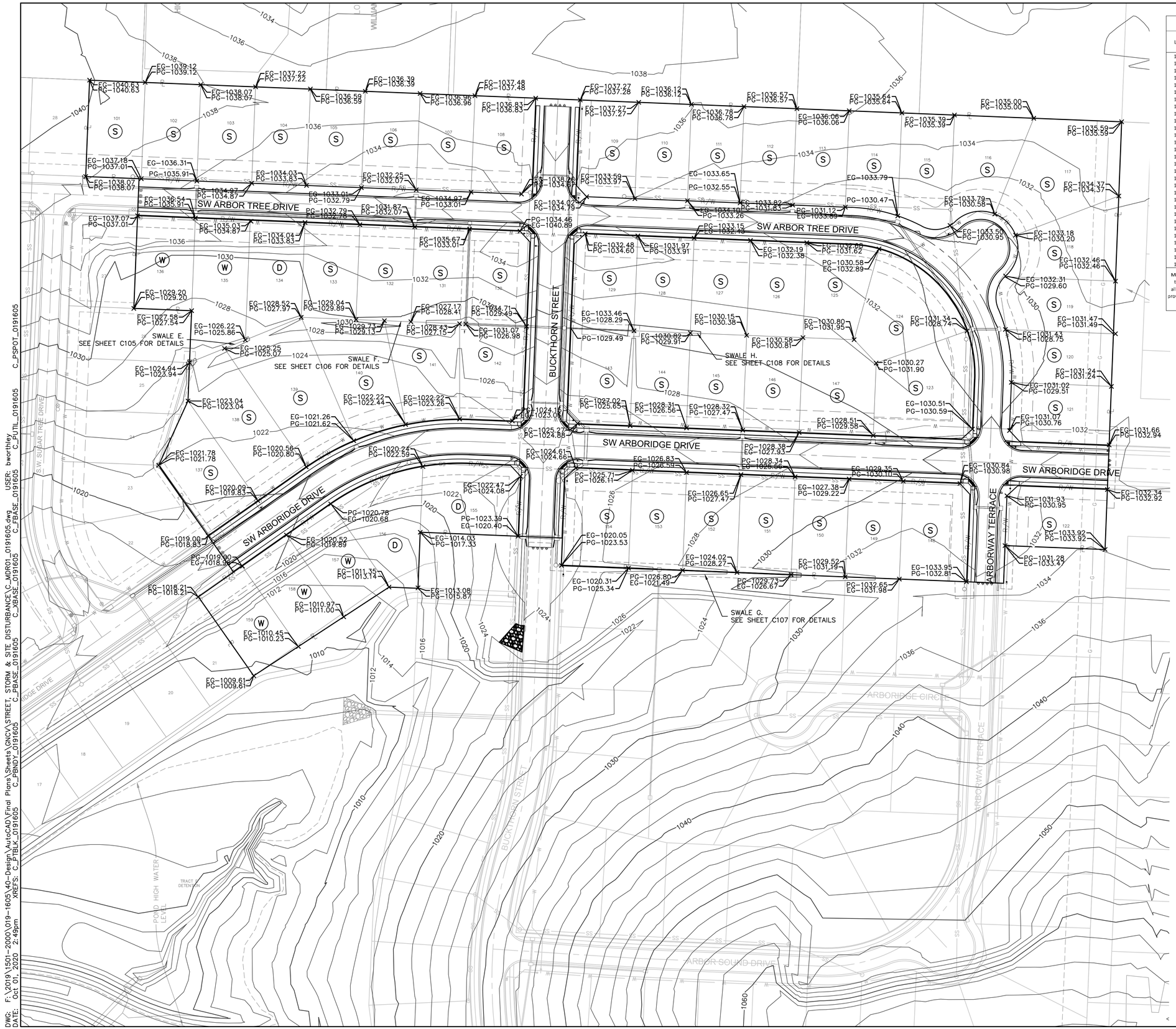
LEE'S SUMMIT, MISSOURI

2019

drawn by: D.A.H.O
checked by: M.G.D
designed by: B.M.W
QA/QC by: N.D.H
project no.: 019-1605
date: 07-12-2019

SHEET
C140

DWG: F:\2019\1501-2000\019-1605\40-Design\AutoCAD\Final Plans\Sheets\GNCV\STREET, STORM & SITE DISTURBANCE\C_TAB01_0191605.dwg USER: bworthley
DATE: Oct 01, 2020 2:46pm XREFS: C_PTBLK_0191605



Hawthorn Ridge 2nd Plat Minimum Building Opening Elevation				
Lot	Rear Left MBOE	Rear Right MBOE	Front Left MBOE	Front Right MBOE
101	1040.63	1039.68	1038.51	1037.56
102	1039.68	1038.63	1037.56	1036.51
103	1038.63	1037.59	1036.51	1035.47
104	1037.59	1036.55	1035.47	1034.43
105	1036.55	1035.51	1034.43	1033.39
106	1035.51	1034.79	1033.39	1032.67
107	1034.79	1035.73	1032.67	1033.61
108	1035.73	1037.14	1033.61	1035.02
109	1037.30	1036.69	1035.18	1034.57
110	1036.69	1035.98	1034.57	1033.86
111	1035.98	1035.27	1033.86	1033.15
112	1035.27	1034.55	1033.15	1032.43
113	1034.55	1033.84	1032.43	1031.72
114	1033.84	1033.16	1031.72	1031.04
115	1033.16	1033.54	1031.04	1031.42
116	1033.54	1033.30	1031.42	1031.18
117	1033.30	1032.92	1031.18	1030.80
118	1032.92	1032.17	1030.80	1030.05
119	1032.17	1031.46	1030.05	1029.34
120	1031.46	1032.23	1029.34	1030.11
121	1032.23	1033.24	1030.11	1031.12
122	1033.60	1034.12	1031.36	1031.88
123	1033.24	1031.46	1031.12	1029.34
124	1031.46	1033.30	1029.34	1031.18
125	1033.30	1034.34	1031.18	1032.22
126	1032.06	1031.78	-	-
127	1031.78	1031.40	-	-
128	1031.40	1030.27	-	-
129	1030.27	1031.95	-	-
130	1031.95	1030.33	-	-

MBOE's have been provided per lot lines, facing the lot from the street. Interpolation will be allowed between the right and left side MBOE's provided, depending on the location of the lowest opening on the proposed structure.

Hawthorn Ridge 2nd Plat Minimum Building Opening Elevation				
Lot	Rear Left MBOE	Rear Right MBOE	Front Left MBOE	Front Right MBOE
131	1029.38	1030.81	-	-
132	1030.81	1032.29	-	-
133	1032.29	1030.37	-	-
134	1030.37	1028.26	-	-
135	1028.26	1026.34	-	-
136	1028.97	1030.15	-	-
137	1021.53	1022.65	1019.31	1020.43
138	1022.65	1023.62	1020.43	1021.40
139	1023.62	1024.44	1021.40	1022.22
140	1024.44	1025.26	1022.22	1023.04
141	1025.26	1026.08	1023.04	1023.86
142	1026.08	1026.89	1023.86	1024.67
143	1027.66	1028.47	1025.44	1026.25
144	1028.35	1029.26	1026.25	1027.16
145	1029.26	1030.17	1027.16	1028.07
146	1030.17	1031.08	1028.07	1028.98
147	1031.08	1032.28	1028.98	1030.18
148	1033.03	1033.90	-	-
149	1035.05	1033.59	-	-
150	1033.59	1032.13	-	-
151	1032.13	1030.67	-	-
152	1030.67	1029.20	-	-
153	1029.20	1027.74	-	-
154	1027.74	1026.53	-	-
155	1018.54	1024.20	-	-
156	1016.29	1013.29	-	-
157	1013.29	1012.18	-	-
158	1012.18	1011.61	-	-
159	1011.61	1011.06	-	-

MBOE's have been provided per lot lines, facing the lot from the street. Interpolation will be allowed between the right and left side MBOE's provided, depending on the location of the lowest opening on the proposed structure.

NOTES:

MBOE – MINIMUM BUILDING OPENING ELEVATION

NOTES:

1. INDIVIDUAL LOT OWNERS SHALL NOT CHANGE OR OBSTRUCT THE DRAINAGE FLOW LINES OR PATHS ON THE LOTS, AS SHOWN ON THE MATER DRAINAGE PLAN, UNLESS SPECIFIC APPLICATION IS MADE AND APPROVED BY THE CITY ENGINEER.

2. PLAT IS LOCATION IN ZONE X, "AREAS OUTSIDE THE 1–PERCENT ANNUAL CHANCE FLOODPLAINS, AREAS OF 1–PERCENT ANNUAL CHANCE SHEET FLOW FLOODING WHERE THE AVERAGE DEPTHS ARE LESS THAN 1 FOOT, AREAS OF 1–PERCENT ANNUAL CHANCE STREAM FLOODING WHERE THE CONTRIBUTING DRAINAGE AREA IS LESS THAN 1 SQUARE MILE, OR AREAS PROTECTED FROM THE 1–PERCENT ANNUAL CHANCE FLOOD BY LEVEES. NO BASE FLOOD ELEVATIONS OR DEPTHS ARE SHOWN WITHIN THIS ZONE"

3. PLAT IS LOCATED OUTSIDE OF ANY REQUIRED BUFFER ZONES FOR NATURAL STREAMS.

4. MBOE ELEVATIONS HAVE BEEN PROVIDED AT EACH LOT CORNER. INTERPOLATION WILL BE ALLOWED BETWEEN THE RIGHT AND LEFT SIDE MBOE'S SHOWN ON THE MASTER DRAINAGE PLAN, DEPENDING ON THE LOCATION OF THE LOWEST OPENING ON THE PROPOSED STRUCTURE.

5. REFER TO SHEET C105–C108 FOR SWALE GRADING DETAILS.

6. DRAINAGE PATHS TO BE CONSTRUCTED BETWEEN EACH OF THE LOTS LABELED AS STANDARD LOTS TO DRAIN WEST.

7. NO BUILDING PERMITS WILL BE ISSUED UNTIL AN AS–GRADED MASTER DRAINAGE PLAN HAS BEEN SUBMITTED TO THE CITY AND APPROVED BY THE CITY.

BASEMENT TYPES

- (D) DAYLIGHT
- (W) WALKOUT
- (S) STANDARD

N

0' 30' 60' 120'
SCALE IN FEET

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STATE OF MISSOURI
JULIE ELAINE SELLERS
NUMBER PE-2017000367
10/1/20
PROFESSIONAL ENGINEER
JULIE E. SELLERS, P.E.
MO# 2017000367

NO. REV.	DATE	REVISIONS DESCRIPTION	BY
1	08-12-2019	MLO ABBREVIATION CHANGED TO MBOE. EXISTING GRADE ELEVATIONS ADDED TO LOT CORNERS	

REVISIONS

MASTER DRAINAGE PLAN
STREET & STORM SEWER PLANS

HAWTHORN RIDGE
SECOND PLAT

LEE'S SUMMIT, MISSOURI

2019

drawn by: D.A.H.O
checked by: M.G.D
designed by: B.M.W
QA/QC by: N.D.H
project no.: 019-1605
date: 07-12-2019

SHEET
C141

DWG: F:\2019\1501-2000\019-1605\40-Design\AutoCAD\Final Plans\Sheets\GNCV\STREET, STORM & SITE DISTURBANCE\C_MDR01_0191605.dwg USER: bworthley
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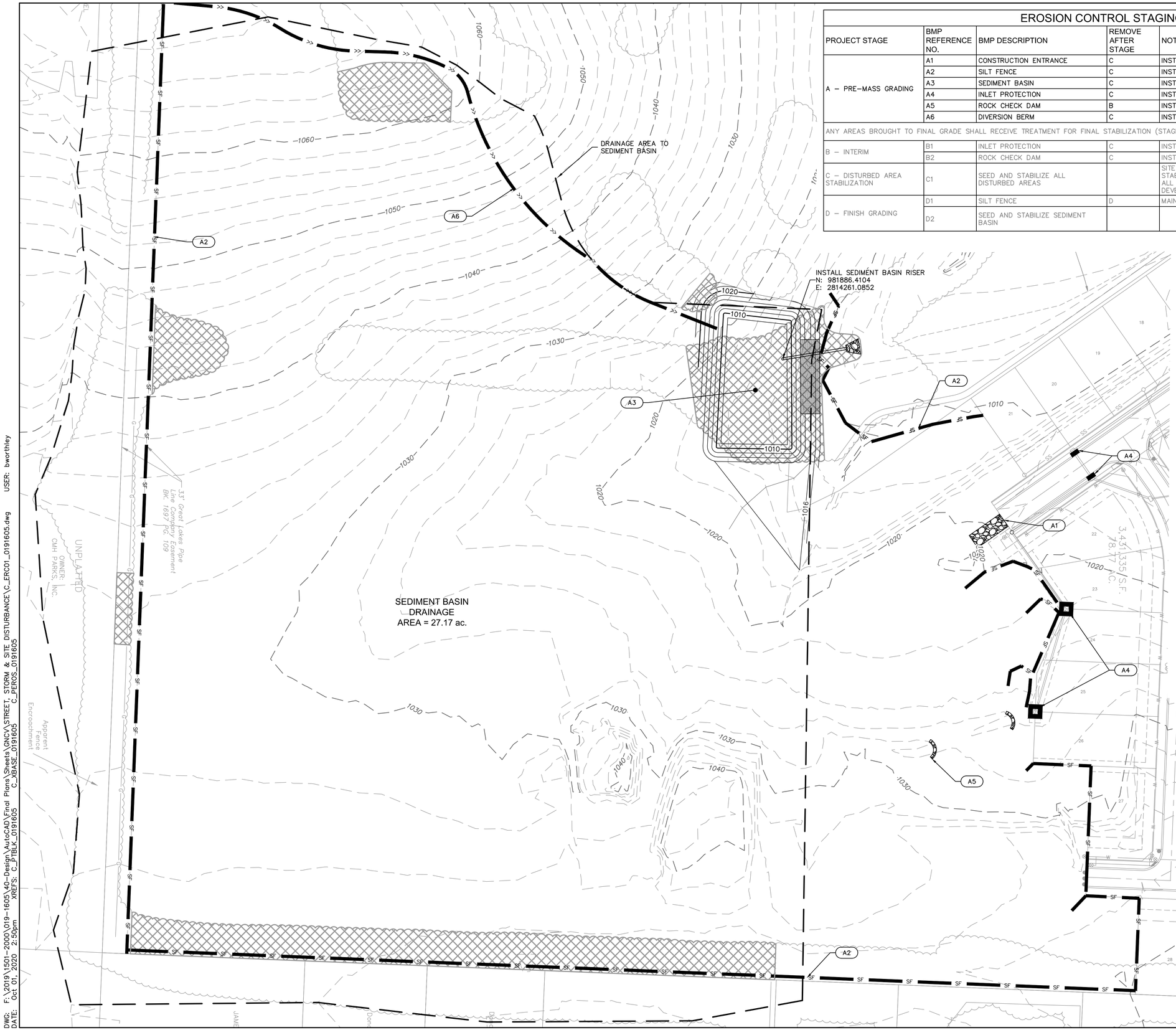

EROSION CONTROL STAGING CHART

PROJECT STAGE	BMP REFERENCE NO.	BMP DESCRIPTION	REMOVE AFTER STAGE	NOTES:
A – PRE–MASS GRADING	A1	CONSTRUCTION ENTRANCE	C	INSTALL PER APWA DETAIL ESC–01
	A2	SILT FENCE	C	INSTALL PER APWA DETAIL ESC–03
	A3	SEDIMENT BASIN	C	INSTALL PER APWA DETAIL ESC–11 AND DETAIL ON SHEET C146
	A4	INLET PROTECTION	C	INSTALL PER APWA DETAIL ESC–06 AND ESC–07
	A5	ROCK CHECK DAM	B	INSTALL PER APWA DETAIL ESC–10
	A6	DIVERSION BERM	C	INSTALL PER APWA DETAIL ESC–05
ANY AREAS BROUGHT TO FINAL GRADE SHALL RECEIVE TREATMENT FOR FINAL STABILIZATION (STAGE C BELOW). ALL OTHER AREAS SHALL BE TEMPORARILY STABILIZED.				
B – INTERIM	B1	INLET PROTECTION	C	INSTALL PER APWA DETAIL ESC–06 AND ESC–07
	B2	ROCK CHECK DAM	C	INSTALL PER APWA DETAIL ESC–10
C – DISTURBED AREA STABILIZATION	C1	SEED AND STABILIZE ALL DISTURBED AREAS		SITE STABILIZATION PER LOCAL CODES AND ORDINANCES. AT A MINIMUM STABILIZATION SHALL CONFORM WITH APWA SECTION 2406. COORDINATE ALL STABILIZATION WITH EROSION CONTROL MEASURES INDICATED IN SITE DEVELOPMENT PLANS.
D – FINISH GRADING	D1	SILT FENCE	D	MAINTAIN UNTIL DISTURBED AREAS ARE STABILIZED
	D2	SEED AND STABILIZE SEDIMENT BASIN		

LEGEND

PHASE 1	
SF	SILT FENCE
	STORM DRAIN INLET PROTECTION
<<	TEMPORARY DIVERSION BERM
	ROCK CHECK DAMS
	TEMPORARY STONE CONSTRUCTION ENTRANCE
	SOIL STABILIZATION BLANKETS & MATTING
	TREE CLEARING

WHERE SILT FENCE IS SPECIFIED, IT MAY BE REPLACED BY MULCH BERM OR WATTLES FILLED WITH MULCH AT THE CONTRACTOR'S DISCRETION. MULCH BERMS MAY NOT BE REPLACED BY SILT FENCE.

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STATE OF MISSOURI
JULIE ELAINE SELLERS
NUMBER PE-2017000367
10/1/20
PROFESSIONAL ENGINEER

JULIE E. SELLERS, P.E.
MO# 2017000367

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

SITE DISTURBANCE PHASE 1
STREET & STORM SEWER PLANS

HAWTHORN RIDGE
SECOND PLAT

LEE'S SUMMIT, MISSOURI

2019

drawn by: D.A.H.O
checked by: M.G.D
designed by: B.M.W
QA/QC by: N.D.H
project no.: 019-1605
date: 07-12-2019

SHEET
C142

DWG: F:\2019\1501-2000\019-1605\40-Design\AutoCAD\Final Plans\Sheets\GNCV\STREET, STORM & SITE DISTURBANCE\C_ERC01_0191605.dwg USER: bworthley
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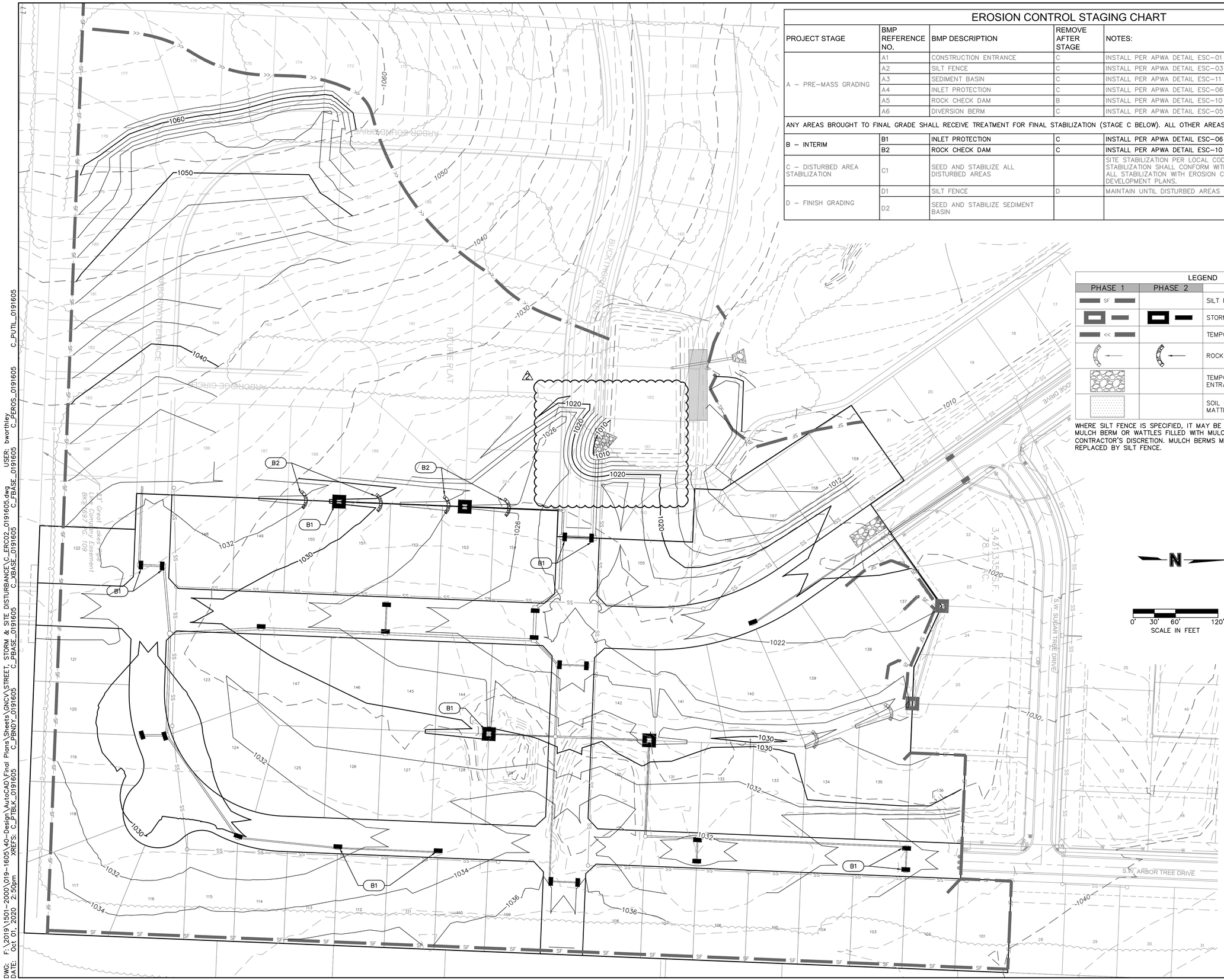

EROSION CONTROL STAGING CHART

PROJECT STAGE	BMP REFERENCE NO.	BMP DESCRIPTION	REMOVE AFTER STAGE	NOTES:
A – PRE–MASS GRADING	A1	CONSTRUCTION ENTRANCE	C	INSTALL PER APWA DETAIL ESC–01
	A2	SILT FENCE	C	INSTALL PER APWA DETAIL ESC–03
	A3	SEDIMENT BASIN	C	INSTALL PER APWA DETAIL ESC–11 AND DETAIL ON SHEET C146
	A4	INLET PROTECTION	C	INSTALL PER APWA DETAIL ESC–06 AND ESC–07
	A5	ROCK CHECK DAM	B	INSTALL PER APWA DETAIL ESC–10
	A6	DIVERSION BERM	C	INSTALL PER APWA DETAIL ESC–05
ANY AREAS BROUGHT TO FINAL GRADE SHALL RECEIVE TREATMENT FOR FINAL STABILIZATION (STAGE C BELOW). ALL OTHER AREAS SHALL BE TEMPORARILY STABILIZED.				
B – INTERIM	B1	INLET PROTECTION	C	INSTALL PER APWA DETAIL ESC–06 AND ESC–07
	B2	ROCK CHECK DAM	C	INSTALL PER APWA DETAIL ESC–10
C – DISTURBED AREA STABILIZATION	C1	SEED AND STABILIZE ALL DISTURBED AREAS		SITE STABILIZATION PER LOCAL CODES AND ORDINANCES. AT A MINIMUM STABILIZATION SHALL CONFORM WITH APWA SECTION 2406. COORDINATE ALL STABILIZATION WITH EROSION CONTROL MEASURES INDICATED IN SITE DEVELOPMENT PLANS.
D – FINISH GRADING	D1	SILT FENCE	D	MAINTAIN UNTIL DISTURBED AREAS ARE STABILIZED
	D2	SEED AND STABILIZE SEDIMENT BASIN		

LEGEND

PHASE 1	PHASE 2	
SF		SILT FENCE
		STORM DRAIN INLET PROTECTION
<<		TEMPORARY DIVERSION BERM
		ROCK CHECK DAMS
		TEMPORARY STONE CONSTRUCTION ENTRANCE
		SOIL STABILIZATION BLANKETS & MATTING

WHERE SILT FENCE IS SPECIFIED, IT MAY BE REPLACED BY MULCH BERM OR WATTLES FILLED WITH MULCH AT THE CONTRACTOR'S DISCRETION. MULCH BERMS MAY NOT BE REPLACED BY SILT FENCE.

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JULIE ELAINE SELLERS
NUMBER PE-2017000367
10/1/20
PROFESSIONAL ENGINEER

JULIE E. SELLERS, P.E.
MO# 2017000367

NO. REV.	DATE	REVISIONS DESCRIPTION	BY
2	10-02-2020	SEDIMENT BASIN GRADING CHANGED TO ALLOW STORM LINE 2 TO DRAIN INTO IT	

REVISIONS

SITE DISTURBANCE PHASE 2
STREET & STORM SEWER PLANS

HAWTHORN RIDGE
SECOND PLAT

LEE'S SUMMIT, MISSOURI

2019

drawn by: D.A.H.O
checked by: M.G.D
designed by: B.M.W
QA/QC by: N.D.H
project no.: 019-1605
date: 07-12-2019

SHEET
C143

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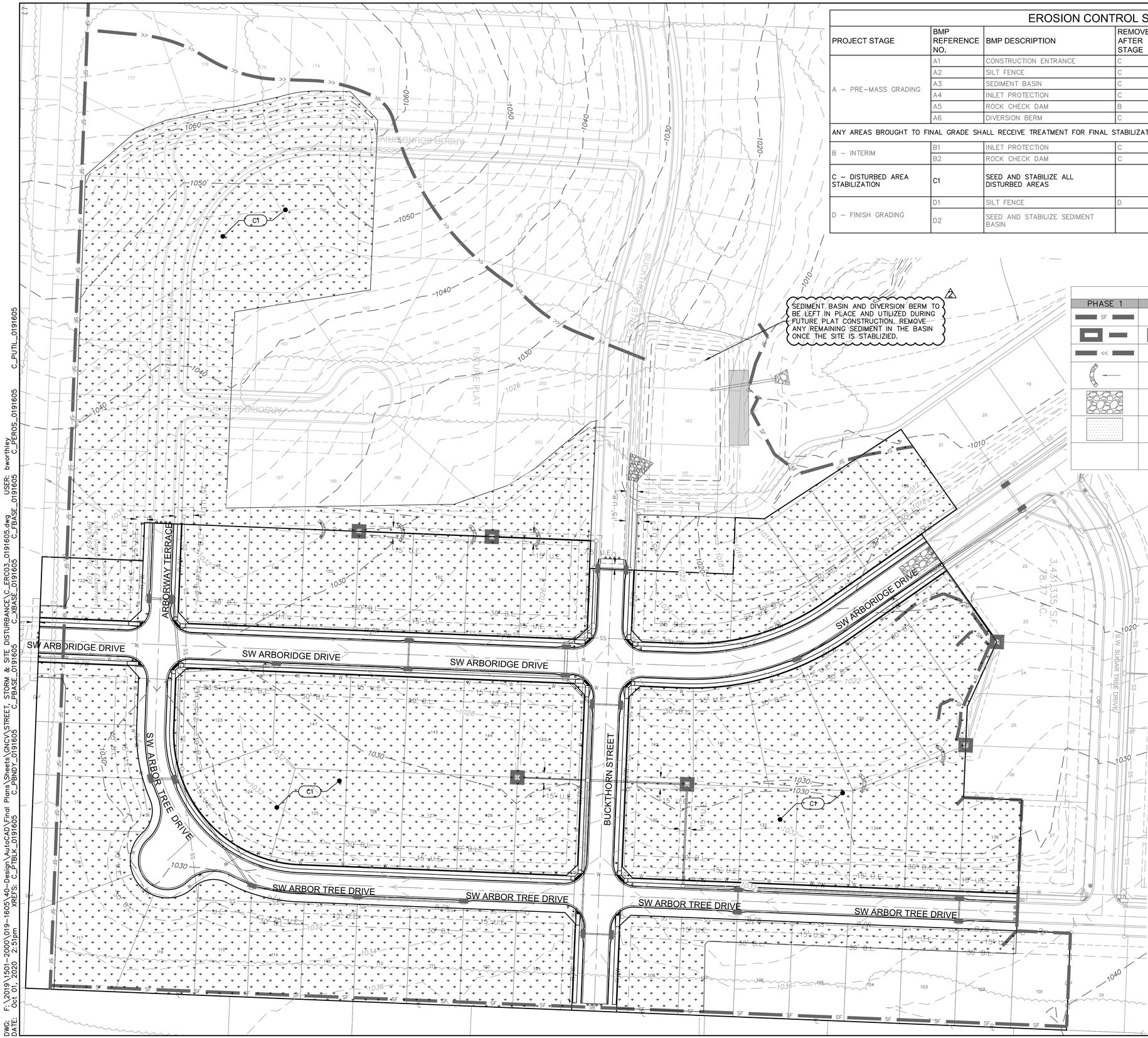

EROSION CONTROL STAGING CHART

PROJECT STAGE	BMP REFERENCE NO.	BMP DESCRIPTION	REMOVE AFTER STAGE	NOTES:
A – PRE–MASS GRADING	A1	CONSTRUCTION ENTRANCE	C	INSTALL PER APWA DETAIL ESC–01
	A2	SILT FENCE	C	INSTALL PER APWA DETAIL ESC–03
	A3	SEDIMENT BASIN	C	INSTALL PER APWA DETAIL ESC–11 AND DETAIL ON SHEET C146
	A4	INLET PROTECTION	C	INSTALL PER APWA DETAIL ESC–06 AND ESC–07
	A5	ROCK CHECK DAM	B	INSTALL PER APWA DETAIL ESC–10
	A6	DIVERSION BERM	C	INSTALL PER APWA DETAIL ESC–05
ANY AREAS BROUGHT TO FINAL GRADE SHALL RECEIVE TREATMENT FOR FINAL STABILIZATION (STAGE C BELOW). ALL OTHER AREAS SHALL BE TEMPORARILY STABILIZED.				
B – INTERIM	B1	INLET PROTECTION	C	INSTALL PER APWA DETAIL ESC–06 AND ESC–07
	B2	ROCK CHECK DAM	C	INSTALL PER APWA DETAIL ESC–10
C – DISTURBED AREA STABILIZATION	C1	SEED AND STABILIZE ALL DISTURBED AREAS		SITE STABILIZATION PER LOCAL CODES AND ORDINANCES. AT A MINIMUM STABILIZATION SHALL CONFORM WITH APWA SECTION 2406. COORDINATE ALL STABILIZATION WITH EROSION CONTROL MEASURES INDICATED IN SITE DEVELOPMENT PLANS.
D – FINISH GRADING	D1	SILT FENCE	D	MAINTAIN UNTIL DISTURBED AREAS ARE STABILIZED
	D2	SEED AND STABILIZE SEDIMENT BASIN		

LEGEND

PHASE 1	PHASE 2	PHASE 3	
SF			SILT FENCE
			STORM DRAIN INLET PROTECTION
<<			TEMPORARY DIVERSION BERM
			ROCK CHECK DAMS
			TEMPORARY STONE CONSTRUCTION ENTRANCE
			SOIL STABILIZATION BLANKETS & MATTING
			TURF GRASS SEEDING

GENERAL NOTES:

CONTRACTOR TO PLACE AT LEAST 12" OF TOP SOIL CAPABLE OF SUPPORTING VEGETATION.

SEED & MULCH NOTES:
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 SEED SHALL NOT EXCEED ONE PERCENT BY WEIGHT OF MIX.

SEED & FERTILIZER RATE:
MIX I – RYE GRASS / BLUE GRASS -----100 LBS. PER. ACRE
MIX II – TALL FESCUE / BLUE GRASS ----195 LBS. PER ACRE
FERTILIZER ----------800 TO 1200 LBS. PER ACRE
(25 LBS. PER 1000 SQ. FT.)

DURING THE DATES DECEMBER 15TH THROUGH MAY 31 ALL 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, FERTILIZER, SEED, AND MULCH SHALL BE APPLIED AT THE FOLLOWING RATES:
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.

THE SITE DISTURBANCE PLANS INDICATES THE FINAL PLACEMENT OF EROSION CONTROL DEVICES. THE CONTRACTOR(S) MAY PROCEED WITH THE 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.

ALL DISTURBED AREAS SHALL BE PREPPED FOR SEEDING/SODDING PER KCMO/APWA 2406, APPLICATION OF SEED/SOD SHALL BE DONE IN ACCORDANCE WITH KCMO/APWA 2406.4. THE SITE DISTURBANCE PERMIT SHALL BE MAINTAINED IN AN "OPEN" STATUS UNTIL FINAL ACCEPTANCE PER KCMO/APWA 2407.

NATIVE SEED MIXES AND SLOPES OVER 5:1 TO BE INSTALLED WITH AN EROSION CONTROL BLANKET (NORTH AMERICAN GREEN SC10B OR APPROVED EQUAL) AND INSTALLED PER MANUFACTURER'S SPECIFICATIONS.

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STATE OF MISSOURI
JULIE ELAINE SELLERS
NUMBER PE-2017000367
10/1/20
PROFESSIONAL ENGINEER

JULIE E. SELLERS, P.E.
MO# 2017000367

NO. REV.	DATE	REVISIONS DESCRIPTION	BY
2	10-02-2020	NOTE ADDED SAVING SEDIMENT BASIN TO REMAIN IN PLACE	

REVISIONS

SITE DISTURBANCE PHASE 3
STREET & STORM SEWER PLANS

HAWTHORN RIDGE
SECOND PLAT

LEE'S SUMMIT, MISSOURI

2019

drawn by: D.A.H.O
checked by: M.G.D
designed by: B.M.W
QA/QC by: N.D.H
project no.: 019-1605
date: 07-12-2019

SHEET
C144

DWG: F:\2019\1501-2000\019-1605\40-Design\AutoCAD\Final Plans\Sheets\GNCV\STREET, STORM & SITE DISTURBANCE\C_ERC03_0191605.dwg USER: bworthley
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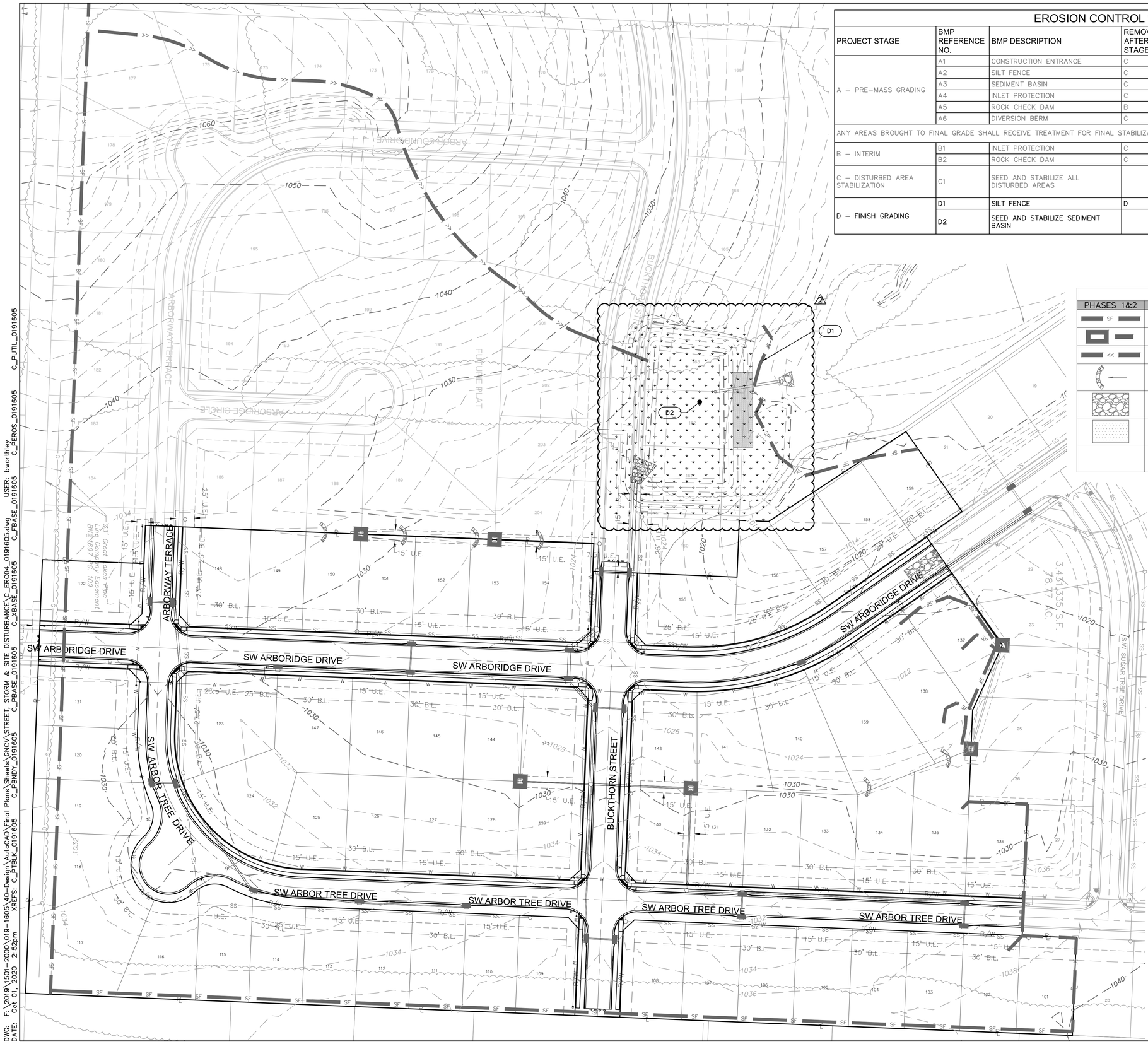

EROSION CONTROL STAGING CHART

PROJECT STAGE	BMP REFERENCE NO.	BMP DESCRIPTION	REMOVE AFTER STAGE	NOTES:
A – PRE–MASS GRADING	A1	CONSTRUCTION ENTRANCE	C	INSTALL PER APWA DETAIL ESC–01
	A2	SILT FENCE	C	INSTALL PER APWA DETAIL ESC–03
	A3	SEDIMENT BASIN	C	INSTALL PER APWA DETAIL ESC–11 AND DETAIL ON SHEET C146
	A4	INLET PROTECTION	C	INSTALL PER APWA DETAIL ESC–06 AND ESC–07
	A5	ROCK CHECK DAM	B	INSTALL PER APWA DETAIL ESC–10
	A6	DIVERSION BERM	C	INSTALL PER APWA DETAIL ESC–05
ANY AREAS BROUGHT TO FINAL GRADE SHALL RECEIVE TREATMENT FOR FINAL STABILIZATION (STAGE C BELOW). ALL OTHER AREAS SHALL BE TEMPORARILY STABILIZED.				
B – INTERIM	B1	INLET PROTECTION	C	INSTALL PER APWA DETAIL ESC–06 AND ESC–07
	B2	ROCK CHECK DAM	C	INSTALL PER APWA DETAIL ESC–10
C – DISTURBED AREA STABILIZATION	C1	SEED AND STABILIZE ALL DISTURBED AREAS		SITE STABILIZATION PER LOCAL CODES AND ORDINANCES. AT A MINIMUM STABILIZATION SHALL CONFORM WITH APWA SECTION 2406. COORDINATE ALL STABILIZATION WITH EROSION CONTROL MEASURES INDICATED IN SITE DEVELOPMENT PLANS.
D – FINISH GRADING	D1	SILT FENCE	D	MAINTAIN UNTIL DISTURBED AREAS ARE STABILIZED
	D2	SEED AND STABILIZE SEDIMENT BASIN		

LEGEND

PHASES 1&2	PHASE 3	PHASE 4	
SF			SILT FENCE
			STORM DRAIN INLET PROTECTION
<<			TEMPORARY DIVERSION BERM
			ROCK CHECK DAMS
			TEMPORARY STONE CONSTRUCTION ENTRANCE
			SOIL STABILIZATION BLANKETS & MATTING
			TURF GRASS SEEDING

GENERAL NOTES:

CONTRACTOR TO PLACE AT LEAST 12" OF TOP SOIL CAPABLE OF SUPPORTING VEGETATION.

SEED & MULCH NOTES:
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 SEED SHALL NOT EXCEED ONE PERCENT BY WEIGHT OF MIX.

SEED & FERTILIZER RATE:
MIX I – RYE GRASS / BLUE GRASS -----100 LBS. PER. ACRE
MIX II – TALL FESCUE / BLUE GRASS ----195 LBS. PER ACRE
FERTILIZER ----------800 TO 1200 LBS. PER ACRE
(25 LBS. PER 1000 SQ. FT.)

DURING THE DATES DECEMBER 15TH THROUGH MAY 31 ALL 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, FERTILIZER, SEED, AND MULCH SHALL BE APPLIED AT THE FOLLOWING RATES:
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.

THE SITE DISTURBANCE PLANS INDICATES THE FINAL PLACEMENT OF EROSION CONTROL DEVICES. THE CONTRACTOR(S) MAY PROCEED WITH THE 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.

ALL DISTURBED AREAS SHALL BE PREPPED FOR SEEDING/SODDING PER KCMO/APWA 2406, APPLICATION OF SEED/SOD SHALL BE DONE IN ACCORDANCE WITH KCMO/APWA 2406.4. THE SITE DISTURBANCE PERMIT SHALL BE MAINTAINED IN AN "OPEN" STATUS UNTIL FINAL ACCEPTANCE PER KCMO/APWA 2407.

NATIVE SEED MIXES AND SLOPES OVER 5:1 TO BE INSTALLED WITH AN EROSION CONTROL BLANKET (NORTH AMERICAN GREEN SC10B OR APPROVED EQUAL) AND INSTALLED PER MANUFACTURER'S SPECIFICATIONS.

N

0' 30' 60' 120'
SCALE IN FEET

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STATE OF MISSOURI
JULIE ELAINE SELLERS
NUMBER PE-2017000367
10/1/20
PROFESSIONAL ENGINEER

JULIE E. SELLERS, P.E.
MO# 2017000367

NO. REV.	DATE	REVISIONS DESCRIPTION	BY
2	10-02-2020	SEDIMENT BASIN TO REMAIN IN PLACE	

REVISIONS

SITE DISTURBANCE PHASE 4
STREET & STORM SEWER PLANS

HAWTHORN RIDGE
SECOND PLAT

LEE'S SUMMIT, MISSOURI

2019

drawn by: D.A.H.O
checked by: M.G.D
designed by: B.M.W
QA/QC by: N.D.H
project no.: 019-1605
date: 07-12-2019

SHEET
C145

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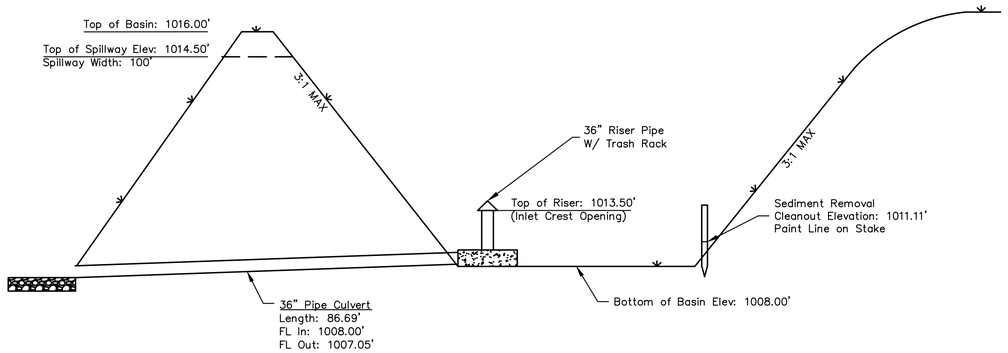
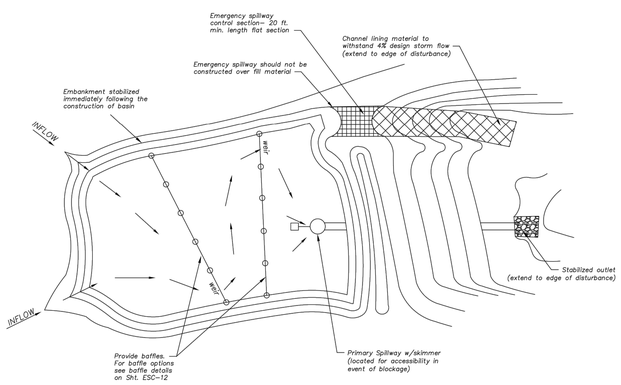


N.T.S.

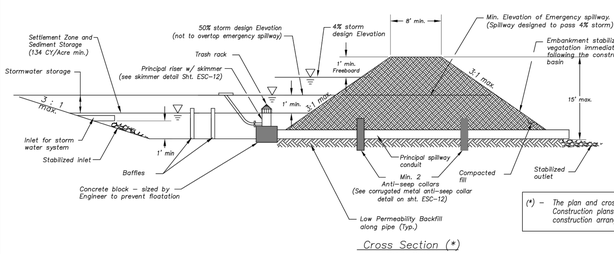
1 TEMPORARY SEDIMENT BASIN 1

Sediment Basin #1 Design Summary

Design Item	Quantity	Units
Site Data		
Tributary Drainage Area To Pond	27.17	Acres
50% (2 YR) Design Flow	72.16	cfs
4% (25 YR) Design Flow	139.96	cfs
1% (100 YR) Design Flow	177.96	cfs
Pond Data		
Minimum Sediment Storage Volume	3641	cu yd
Provided Sediment Storage Volume	4216	cu yd
Bottom Elevation	1008.00	ft
Sediment Cleanout Elevation	1011.11	ft
Sediment Cleanout Volume	2711.63	cu yd
Top of Riser Elevation	1013.50	ft
Top of Dam Elevation	1016.00	ft
Basin Shape Data		
A = Area at Top of Riser	22954	sq ft
L = Length of Flow Path	180	ft
WE = Effective Width = A/L	128	ft
Principal Spillway Data		
Riser Pipe DIA	36	in
Barrel Pipe DIA.	36	in
Barrel Invert In	1008.00	ft
Barrel Invert Out	1007.05	ft
Riser Perforations		
Number of Rows	4	
Perforation DIA.	1	in
Perforations per Row	36	
Lowest Row Elevation	1011.50	ft
Distance Between Rows	0.5	ft
Emergency Spillway Data		
Spillway Width	100.00	ft
Emergency Spillway Elevation	1014.50	ft
Water Surface Data		
2 year WSE	1014.40	ft
25 year WSE	1014.94	ft
100 year WSE	1015.06	ft
Discharge Data		
2 year	29.88	cfs
25 year	138.96	cfs
100 year	178.71	cfs



Plan View (*)
Not to Scale



Cross Section (*)
Not to Scale

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

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

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.

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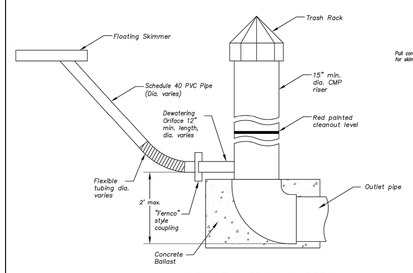
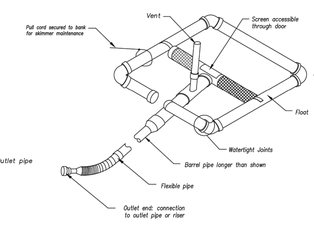
Kansas City Metro Chapter
KANSAS CITY METRO CHAPTER
SEDIMENT BASIN
STANDARD DRAWING NUMBER ESC–11
ADOPTED: 10/24/2016

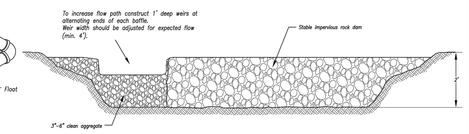


PRINCIPAL SPILLWAY DETAIL

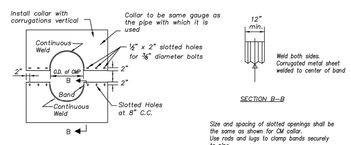


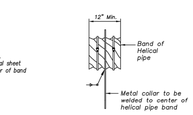
SKIMMER DETAIL (Typ.) *

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

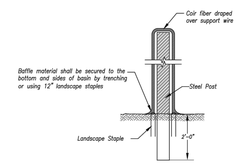


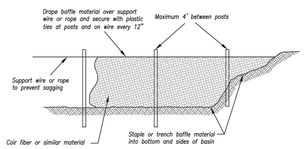
Option A – Rock with Weir





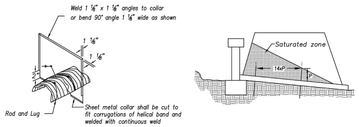
PARTIAL ELEVATION





Option B – Coir Fiber Material

BAFFLE DETAILS
Not to Scale



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. 14xP = 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) ⅝" 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
KANSAS CITY METRO CHAPTER
SEDIMENT BASIN – DETAILS
STANDARD DRAWING NUMBER ESC–12
ADOPTED: 10/24/2016

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JULIE ELAINE SELLERS
NUMBER PE-2017000367
10/1/20
PROFESSIONAL ENGINEER
JULIE E. SELLERS, P.E.
MO# 2017000367

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

SEDIMENT BASIN DETAIL
STREET & STORM SEWER PLANS
HAWTHORN RIDGE
SECOND PLAT
LEE'S SUMMIT, MISSOURI
2019

drawn by: D.A.H.O
checked by: M.G.D
designed by: B.M.W
QA/QC by: N.D.H
project no.: 019-1605
date: 07-12-2019

SHEET
C146

DWG: F:\2019\1501-2000\019-1605\40-Design\AutoCAD\Final Plans\Sheets\GNCV\STREET, STORM & SITE DISTURBANCE\C_ERC01_0191605.dwg USER: bworthley
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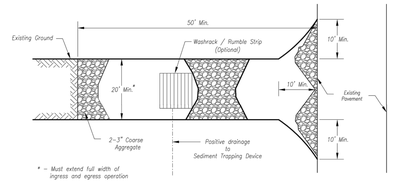
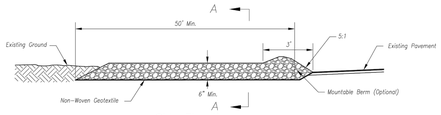
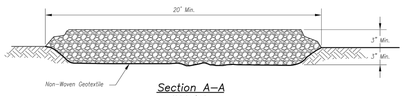


Plan View
Not to Scale



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.*

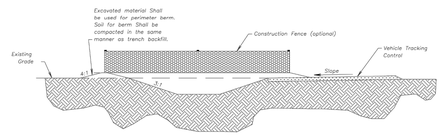
CONSTRUCTION ENTRANCE

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:

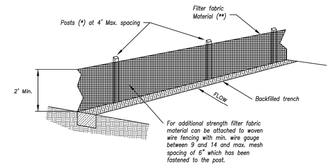
1. *Concrete washout materials shall be removed once the materials have filled the washout to approximately 75% full.*
2. *Concrete washout areas shall be enlarged as necessary to maintain capacity for wasted concrete.*
3. *Concrete washout water, wasted pieces of concrete and all other debris in the 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

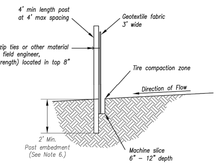
Construction Entrance modified from 2015 Overland Park Standard Details for Erosion and Sediment Control; Concrete Washout modified from 2009 City of Great Bend Standard Drawings.

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



(*) POSTS
– MIN. LENGTH 4'
– HARDWOOD 1 3/4" x 1 3/4"
– NO.2 SOUTHERN PINE 2 3/4" x 2 3/4"
– STEEL 1.33 LB/FT

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



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.*

SILT FENCE DETAILS
Not to Scale

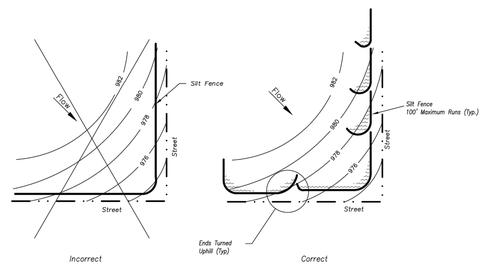
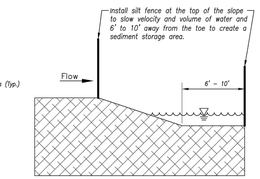
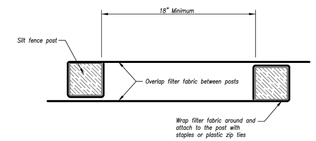


Figure A

SILT FENCE LAYOUT
Not to Scale

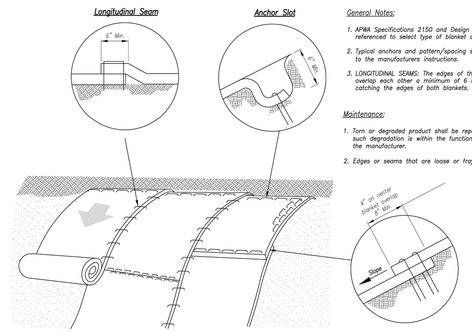




JOINING FENCE SECTIONS
Not to Scale

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

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

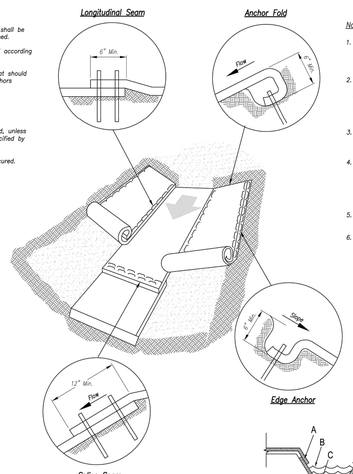


General Notes:

1. *APWA Specifications 2150 and Design Guidance 5100 shall be referenced to select type of blanket or mat to be used.*
2. *Typical anchors and pattern/spacing shall be installed according to the manufacturers instructions.*
3. *LONGITUDINAL SEAMS: The edges of the blanket or mat should overlap each other a minimum of 6 inches, with anchors catching the edges of both blankets.*

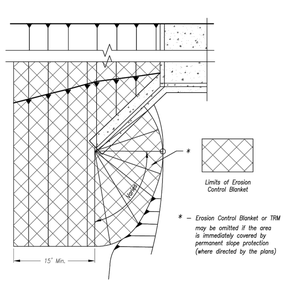
Maintenance:

1. *Torn or degraded product shall be repaired or replaced, unless such degradation is within the functional longevity specified by the manufacturer.*
2. *Edges or seams that are loose or frayed shall be secured.*



Notes for Installation in Channels:

1. *Erosion Control Blankets and TRMs shall be laid in the direction of the flow, with the first course at the centerline of channel, where applicable. In order for the mat to be in contact with the soil, lay the mat loosely, avoiding stretching.*
2. *ANCHOR FOLD: The top of the mat should be folded under, buried and secured with wood or other approved anchors placed 6 inches apart. The top edge of the mat should be buried in a slot 6 inches wide x 6 inches deep, anchored in the bottom of the slot, backfilled, and the mat folded over the top as shown in detail.*
3. *SPLICE SEAM: When splices are necessary, overlap end a minimum of 12 inches in direction of water flow. Stagger splice seams.*
4. *CHECK SLOTS: Establish check slots transverse to slope every 30 feet. The slots should be 6 inches wide x 6 inches deep. The mat shall be cut to a length 12 inches beyond the slot. The top of the downstream mat shall be slotted in, secured and buried similar to the edge anchor fold. The upstream mat shall then cover the slot and be anchored as shown.*
5. *EDGE ANCHORS: Lay outside edge of mat into trench at top of the slope and anchor.*
6. *TERMINUS: The bottom edge of the mat shall be anchored.*



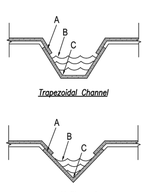
* – Erosion Control Blanket or TRM may be omitted if the area is immediately covered by permanent slope protection (where directed by the plans)

Partial Box Culvert Plan
Not to Scale

Installation Around Culvert Slope

Notes for Installation on Slopes:

1. *Erosion Control Blankets and TRMs shall be laid in the direction of the slope. In order for blanket to be in contact with the soil, lay blanket loosely, avoiding stretching.*
2. *ANCHOR SLOTS: The top of the blanket should be "slotted in" at the top of the slope and anchored in place with anchors 6 inches apart. The slots should be 6 inches wide x 6 inches deep with the blanket anchored in the bottom of the slot, then backfilled, tamped and seeded.*
3. *SPLICE SEAM: When splices are necessary, overlap and a minimum of 8 inches in direction of water flow. Stagger splice seams.*
4. *TERMINAL FOLD: The bottom edge of the blanket shall be turned under a minimum of 4 inches, then anchored in place with anchors 9 inches apart.*



Installation in Channels

Critical Points:

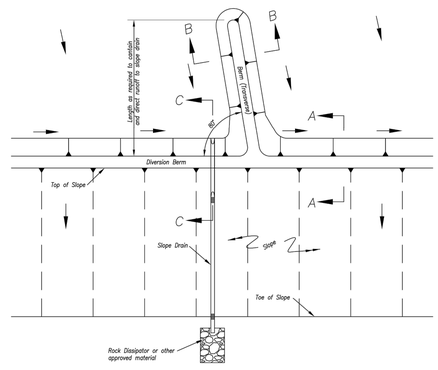
A – Overlaps and seams;

B – Projected water line;

C – Channel bottom / side slope vertices;

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

AMERICAN PUBLIC WORKS ASSOCIATION
Kansas City Metro Chapter
KANSAS CITY METRO CHAPTER
EROSION CONTROL BLANKETS AND TURF REINFORMENT MATS
STANDARD DRAWING NUMBER ESC-02
ADOPTED: 10/24/2016



TYPICAL PLAN VIEW OF DIVERSION BERM AND SLOPE DRAIN

Notes for Diversion Berm:

1. *Slope drains are optional, but may be required by the engineer if the berm is at the top of a steep slope.*
2. *Diversion berms must be installed as a first step in the land-disturbing activity and must be functional prior to upslope land disturbance.*
3. *The berm should be adequately compacted to prevent failure.*
4. *Temporary or permanent seeding and mulch shall be applied to the berm immediately following its construction.*
5. *Place the berm so to minimize damages by construction operations and traffic.*
6. *The berm must discharge to a temporary sediment trap or stabilized area.*
7. *All trees, brush, stumps, obstructions and other objectionable material shall be removed and disposed of so as not to interfere with the proper functioning of diversion.*
8. *The diversion shall be excavated or shaped to line, grade and cross-section as required to meet the criteria specified herein, free of irregularities which will impede flow.*
9. *Fills shall be compacted as needed to prevent unequal settlement that would cause damage in the completed diversion. Fill shall be composed of soil which is free from excessive organic debris, rocks or other objectionable materials.*

Maintenance:

1. *Berm shall be reshaped, compacted, and stabilized as necessary to maintain its function.*
2. *Breaches in the berm shall be repaired immediately.*

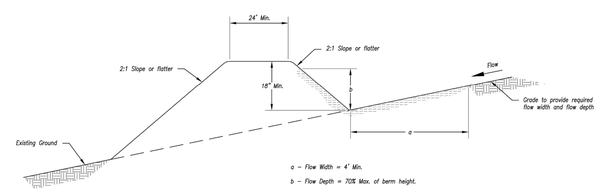
Notes for Slope Drain:

1. *Slope Drain and Diversion Berm may be used on either project foreslopes or project backslopes.*
2. *Discharge of Slope Drains shall be into stabilized ditch or area, or into Sediment Basin.*
3. *Pipe shall be secured in place as approved by Engineer.*

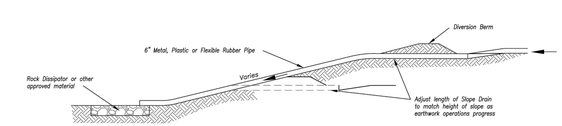
Maintenance:

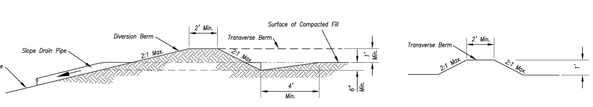
1. *Accumulation of any visible sediment at the inlet and outlet shall be removed promptly.*
2. *Outlet conditions shall be repaired if scour is observed. Leaking or damaged section of pipe shall be repaired immediately.*
3. *Barriers directing water to the inlet shall be monitored for continuity and effectiveness.*

TYPICAL PROFILE OF DIVERSION BEAM
Not to Scale



TYPICAL PROFILE OF DIVERSION BERM





Section C–C

Section B–B

TYPICAL PROFILE OF DIVERSION BERM WITH SLOPE DRAIN

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

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Kansas City Metro Chapter
KANSAS CITY METRO CHAPTER
DIVERSION BERMS AND SLOPE DRAINS
STANDARD DRAWING NUMBER ESC-05
ADOPTED: 10/24/2016

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STATE OF MISSOURI
JULIE ELAINE SELLERS
NUMBER PE-2017000367
10/1/20
PROFESSIONAL ENGINEER

JULIE E. SELLERS, P.E.
MO# 2017000367

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

SITE DISTURBANCE DETAILS
STREET AND STORM SEWER PLANS

HAWTHORN RIDGE
SECOND PLAT

LEE'S SUMMIT, MISSOURI

2019

drawn by: D.A.H.O
checked by: M.G.D
designed by: B.M.W
QA/QC by: N.D.H
project no.: 019-1605
date: 07-12-2019

SHEET
C147

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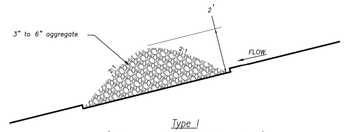
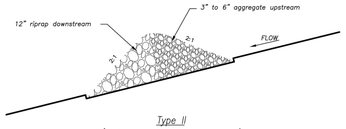
USER: bwarthley



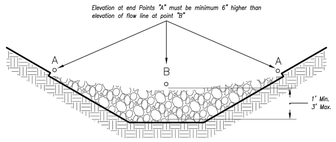
Type I
(2 Acres or less of Drainage Area)
Not to Scale



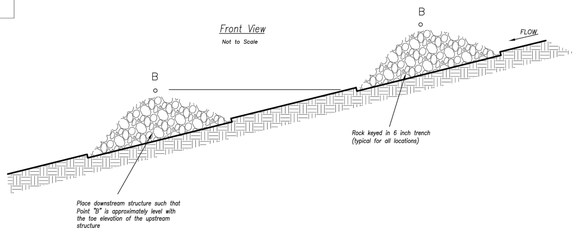
Type II
(2–10 Acres of Drainage Area)
Not to Scale

ROCK DITCH CHECK

Temporary Rock Ditch Check Spacing	
Ditch Centerline Slope (%)	Spacing Interval (Feet)
5.0	60
6.0	50
7.0	43
8.0	36
9.0	33
10.0	29
Note: Use this spacing only for Rock Ditch Checks.	



Front View
Not to Scale



Spacing Between Check Dams (all types)
Not to Scale

Notes:

1. Rock check dams shall be used only for drainage areas less that 10 acres unless approved by the City Engineer.
2. Use rock checks only in situations where the ditch slope exceeds 6%.

Maintenance:

1. Remove and dispose of sediment deposits when the deposit approaches ½ the height of the ditch check.
2. Replace and reshape as necessary to maintain function and integrity of installation.

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

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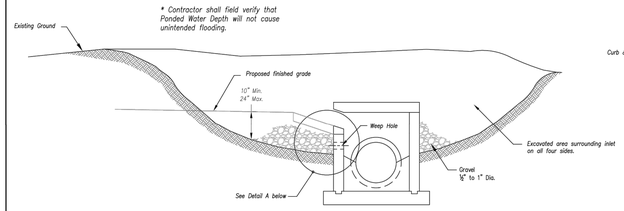
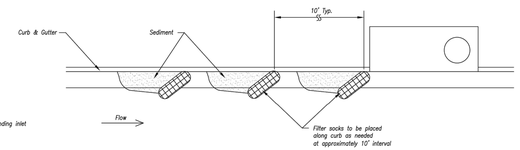
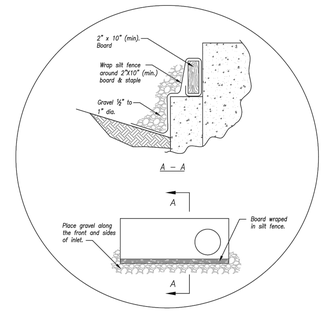
KANSAS CITY METRO CHAPTER
ROCK DITCH CHECKS
STANDARD DRAWING NUMBER ESC-10
ADOPTED: 10/24/2016





On Grade Curb Inlet Protection



Detail A

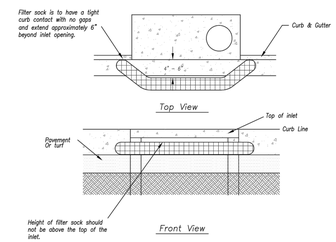
EARLY STAGE CURB INLET
(Open Box and Prior to Pouring Curb and Inlet Throat)

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.

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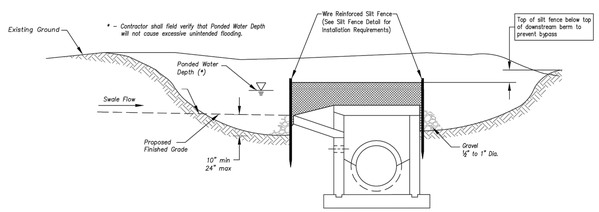
KANSAS CITY METRO CHAPTER
CURB INLET PROTECTION
STANDARD DRAWING NUMBER ESC-06
ADOPTED: 10/24/2016



Section A–A
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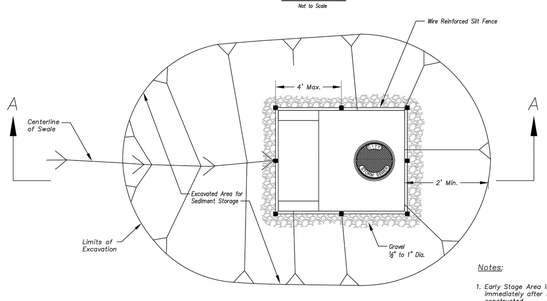
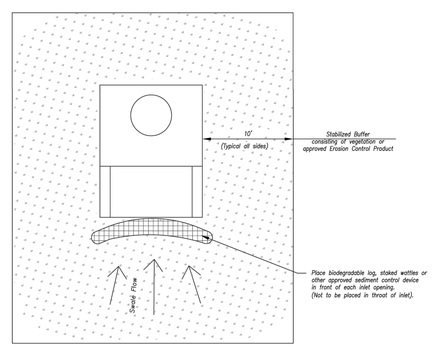
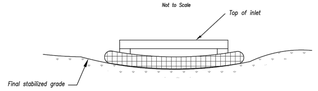


Plan
Not to Scale

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



Plan
Not to Scale



Front View

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

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.

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.

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

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