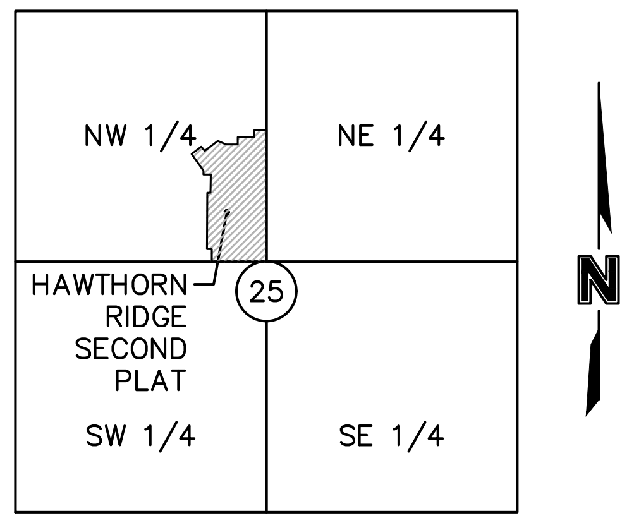
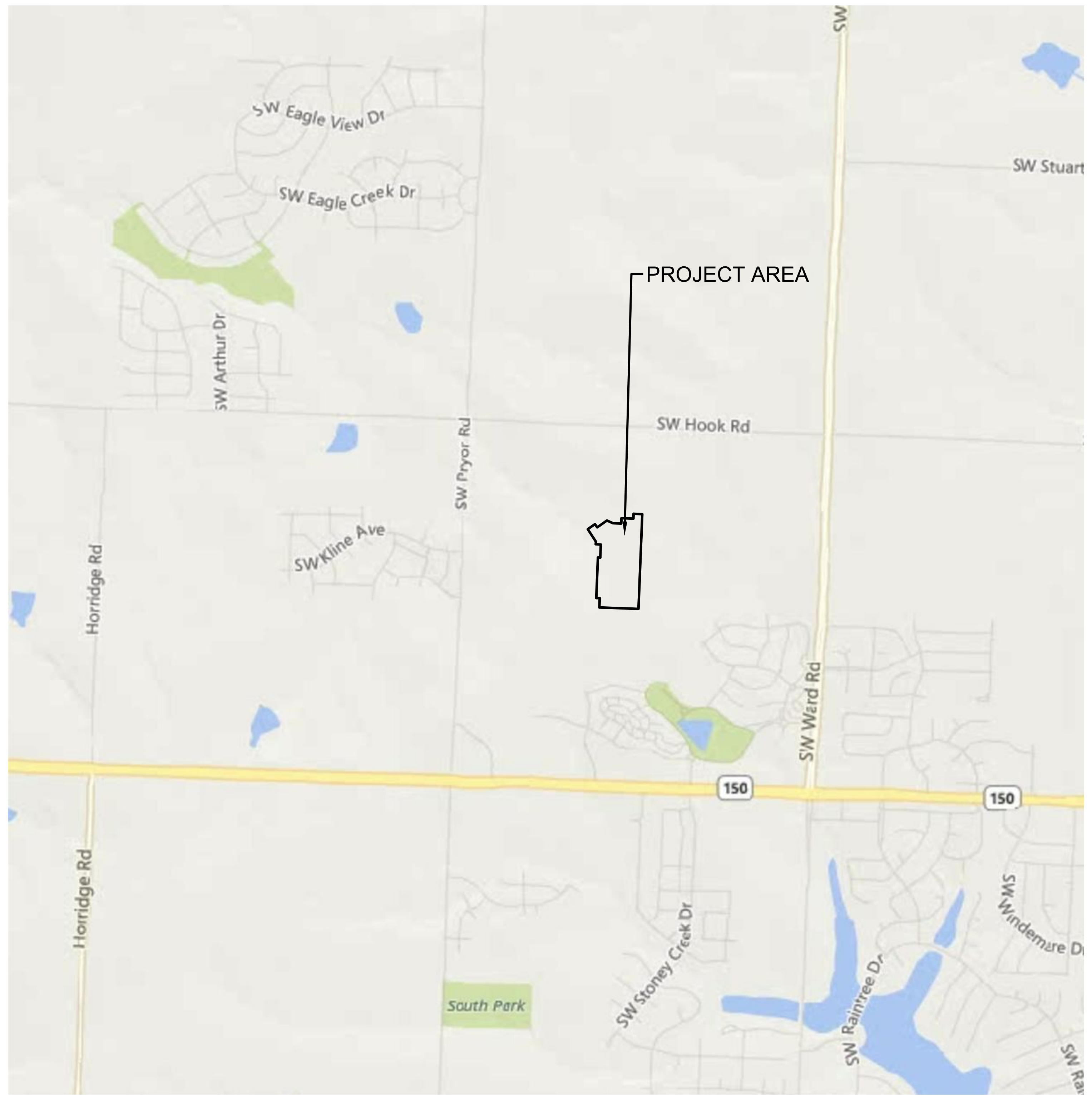
HAWTHORN RIDGE
SECOND PLAT
STREET & STORM SEWER PLANS

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.)



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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 ENGINEER OLSSON 1301 BURLINGTON ST. SUITE 100 NORTH KANSAS CITY, MO 64116 CONTACT: JULIE E. SELLERS PHONE: 816.361.1177 EMAIL: JSELLERS@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	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

☐ NOT FOR CONSTRUCTION

☒ REVIEWED FOR CONSTRUCTION

Accepted
Record Drawings

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

Sue Pyles
Sue Pyles
I have reviewed
this document
2021.11.18
08:02:35-06'00'

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 Sellers 3/18/21

JULIE E. SELLERS
CIVIL ENGINEER
MO#2017000367

DATE

AS-BUILT
3/17/2021

olsson
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JULIE ELAINE SELLERS
NUMBER PE-2017000367
3/18/21

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

REVISIONS

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

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\As-Built\Sheets\GNCV\STREET, STORM & SITE DISTURBANCE\C_TTL01_0191605.dwg USER: bworthley
DATE: Feb 15, 2021 3:39pm 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.	~~7977~~	7977
2	EMBANKMENT	C.Y.	~~2205~~	2205
3	SUBGRADE STABILIZATION (6" FLYASH TREATMENT)	S.Y.	~~5724~~	5724
4	SUBGRADE STABILIZATION (9" FLYASH TREATMENT)	S.Y.	~~7659~~	7659
5	6" ASPHALT PAVEMENT	S.Y.	~~4776~~	4776
6	7.5" ASPHALT PAVEMENT	S.Y.	~~6501~~	6501
7	CONCRETE CURB & GUTTER (CG–1)	L.F.	~~3213~~	3213
8	CONCRETE CURB & GUTTER (CG–2)	L.F.	~~2959~~	2959
9	MILL & OVERLAY	S.Y.	~~31~~	31
10	ADA RAMP	EA.	~~20~~	20
11	STOP SIGNS	EA.	~~6~~	6
12	STREET NAME SIGNS	EA.	~~12~~	12
13	END OF ROAD TREATMENT	EA.	~~16~~	16
	STORM			
14	STD. CURB INLET (5'x3' INSIDE)	EA.	~~11~~	11
15	STD. CURB INLET (5'x4' INSIDE)	EA.	~~5~~	5
16	STD. CURB INLET (5'x5' INSIDE)	EA.	~~3~~	3
17	STD. CURB INLET (6'x6' INSIDE)	EA.	~~4~~	4
18	STD. FIELD INLET (4'x4' INSIDE)	EA.	~~4~~	4
19	STD. MANHOLE (5' DIA. INSIDE)	EA.	~~3~~	3
20	STD. MANHOLE (6' DIA. INSIDE)	EA.	~~1~~	1
21	STD. MANHOLE (7' DIA. INSIDE)	EA.	~~1~~	1
22	STD. JUNCTION BOX (6'x6' INSIDE)	EA.	~~0~~	0
23	15" HDPE	L.F.	~~1046.87~~	1044.22
24	18" HDPE	L.F.	~~577.91~~	579.81
25	24" HDPE	L.F.	~~778.43~~	893.98
26	30" HDPE	L.F.	~~240.12~~	240.57
27	36" HDPE	L.F.	~~515.73~~	517.55
28	42" HDPE	L.F.	~~209.50~~	211.97
29	48" HDPE	L.F.	~~120.00~~	120.77
30	54" HDPE	L.F.	~~0~~	0
31	54" CMP END SECTION	EA.	~~0~~	0
32	24" HDPE PLUG	EA.	~~1~~	1
33	RIPRAP	S.Y.	~~80.60~~	80.60
34	CONNECTION TO EXISTING STRUCTURE	EA.	~~1~~	1
	PRIVATE GRADING			
35	EXCAVATION	C.Y.	~~41742~~	41742
36	EMBANKMENT	C.Y.	~~24259~~	24259
	EROSION CONTROL			
37	VEHICLE TRACKING DEVICE	EA.	~~1~~	1
38	SEDIMENT BASIN	EA.	~~1~~	1
39	SILT FENCE	LF.	~~3971~~	3971
40	DIVERSION BERM	LF.	~~910~~	910
41	ROCK CHECK DAM	EA.	~~6~~	6
42	CURB INLET PROTECTION	EA.	~~25~~	25
43	AREA INLET PROTECTION	EA.	~~6~~	6
44	PERMANENT SEEDING	AC.	~~19~~	19

AS-BUILT
3/17/2021

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JULIE ELAINE SELLERS
NUMBER PE-2017000367
3/18/21

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

REVISIONS

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

GENERAL NOTES
STREET & STORM SEWER PLANS

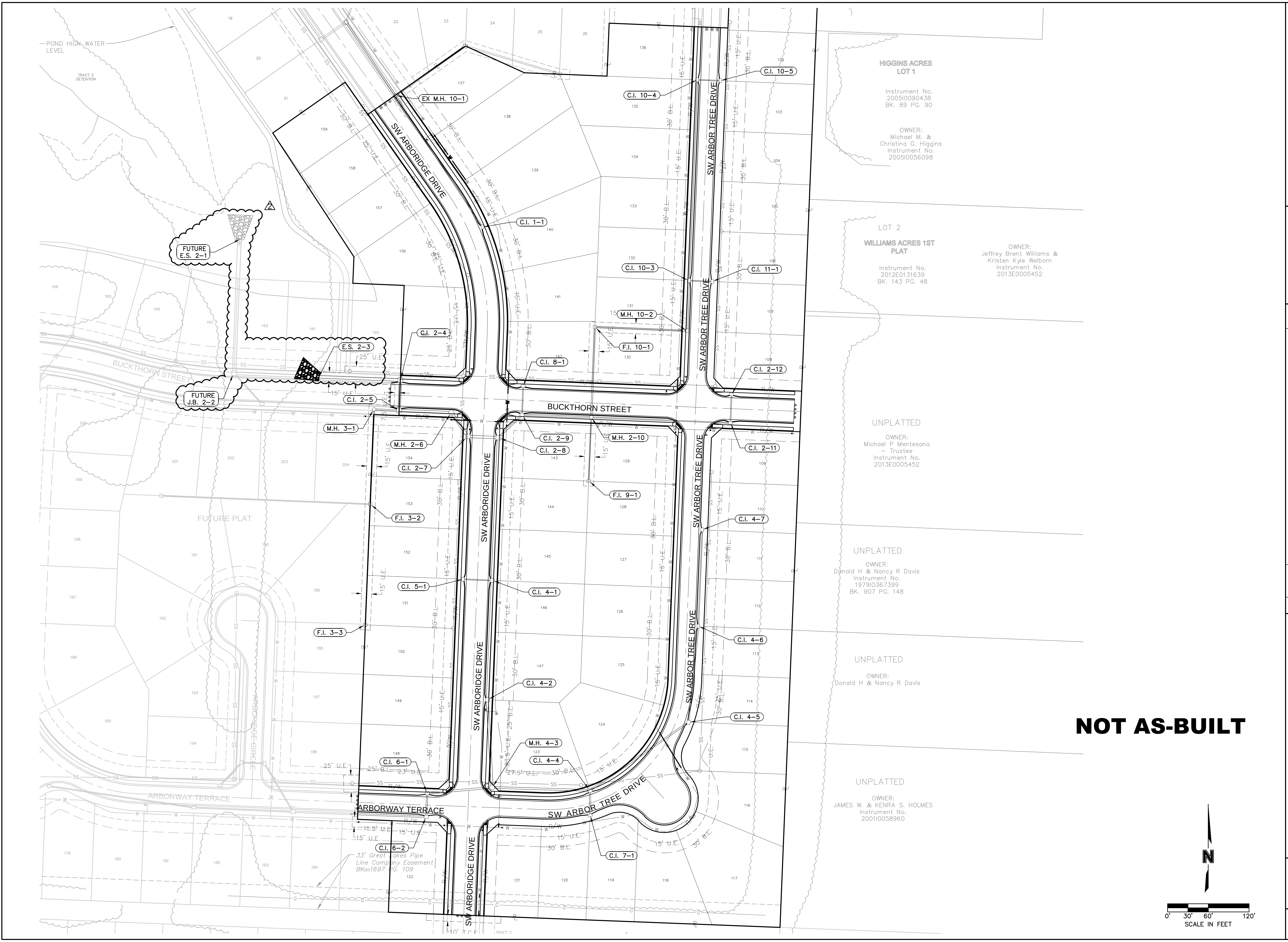
HAWTHORN RIDGE
SECOND PLAT

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


POND HIGH WATER LEVEL
TRACT E DETENTION
FUTURE E.S. 2-1
FUTURE J.B. 2-2
E.S. 2-3
EX M.H. 10-1
C.I. 10-4
C.I. 10-5
C.I. 1-1
C.I. 10-3
C.I. 11-1
M.H. 10-2
F.I. 10-1
C.I. 2-4
C.I. 8-1
C.I. 2-12
C.I. 2-5
M.H. 3-1
M.H. 2-6
C.I. 2-7
C.I. 2-9
C.I. 2-8
M.H. 2-10
C.I. 2-11
F.I. 9-1
F.I. 3-2
C.I. 4-7
C.I. 5-1
C.I. 4-1
F.I. 3-3
C.I. 4-6
C.I. 4-2
C.I. 4-5
M.H. 4-3
C.I. 4-4
C.I. 6-1
C.I. 6-2
C.I. 7-1
SW ARBORIDGE DRIVE
SW ARBOR TREE DRIVE
BUCKTHORN STREET
ARBORWAY TERRACE
ARBORIDGE CIRCLE
FUTURE PLAT
25' U.E.
15' U.E.
30' B.L.
25' B.L.
23' U.E.
27.5' U.E.
11.5' U.E.
33' Great Lakes Pipe Line Company Easement BK. 1697 PG. 109
HIGGINS ACRES LOT 1
Instrument No. 2005I0090438 BK. 89 PG. 90
OWNER: Michael M. & Christina G. Higgins Instrument No. 2005I0056098
LOT 2 WILLIAMS ACRES 1ST PLAT
Instrument No. 2012E0131639 BK. 143 PG. 48
OWNER: Jeffrey Brent Williams & Kristen Kyle Welborn Instrument No. 2013E0005452
UNPLATTED
OWNER: Michael P Mentesana – Trustee Instrument No. 2013E0005452
UNPLATTED
OWNER: Donald H & Nancy R Davis Instrument No. 1979I0367399 BK. 907 PG. 148
UNPLATTED
OWNER: Donald H & Nancy R Davis
UNPLATTED
OWNER: JAMES W. & KENRA S. HOLMES Instrument No. 2001I0058960
N
0' 30' 60' 120'
SCALE IN FEET

NOT AS-BUILT

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REVISIONS

NO. REV.	DATE	REVISIONS DESCRIPTION	BY
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GENERAL LAYOUT
STREET & STORM SEWER PLANS

HAWTHORN RIDGE
SECOND PLAT

LEE'S SUMMIT, MISSOURI

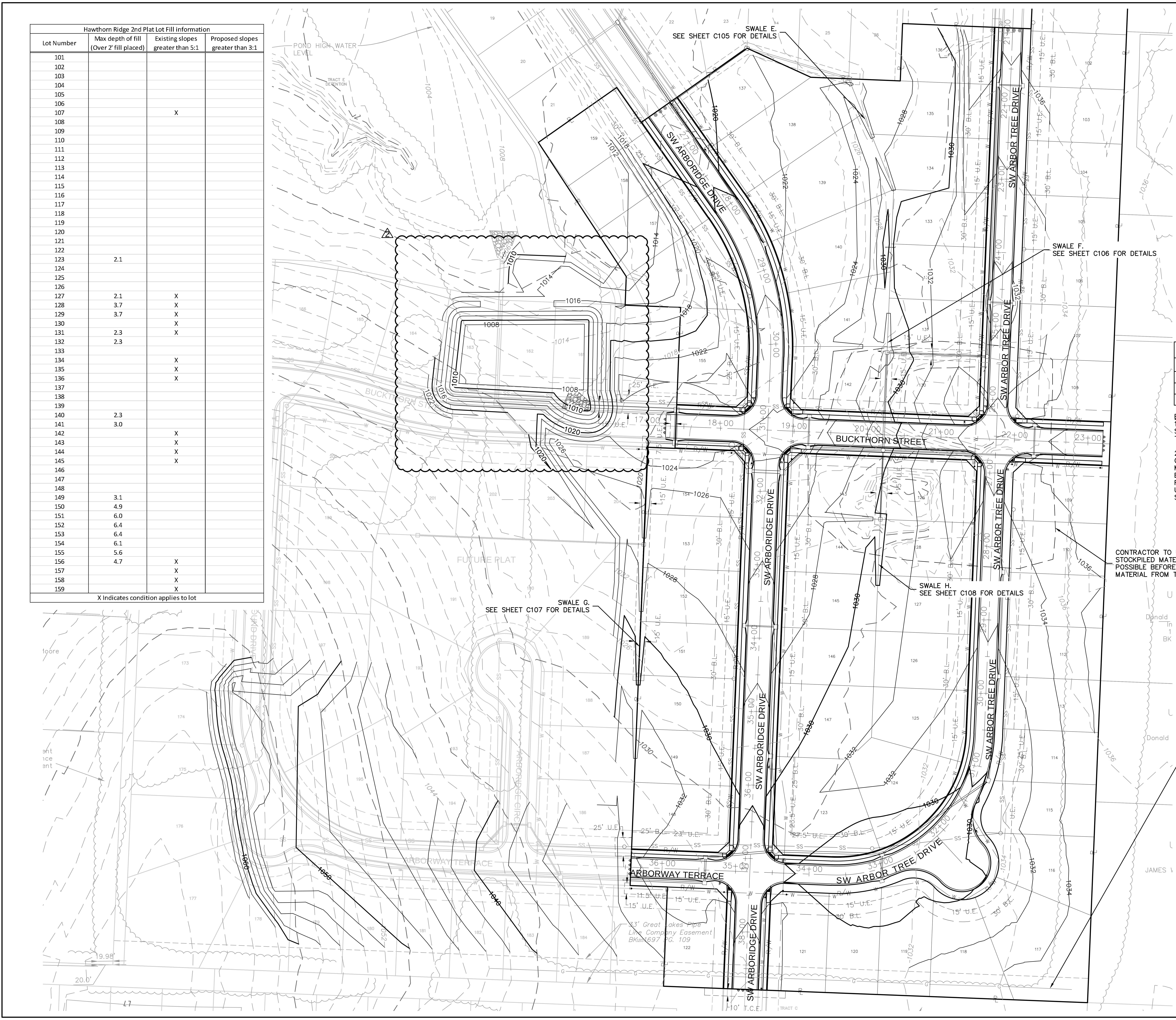
2019

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

DWG: F:\2019\1501-2000\019-1605\40-Design\AutoCAD\As-Built\Sheets\GNCV\STREET, STORM & SITE DISTURBANCE\C_GEN01_0191605.dwg USER: bworthley
DATE: Feb 15, 2021 11:57am XREFS: C_PTBLK_0191605 C_PBNDY_0191605 C_PBASE_0191605 C_XBASE_0191605 C_FBASE_0191605 C_PUTIL_0191605 C_PSTRM_0191605

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			



SWALE E.
SEE SHEET C105 FOR DETAILS
SWALE F.
SEE SHEET C106 FOR DETAILS
SWALE G.
SEE SHEET C107 FOR DETAILS
SWALE H.
SEE SHEET C108 FOR DETAILS
SW ARBORIDGE DRIVE
SW ARBOR TREE DRIVE
BUCKTHORN STREET
ARBORWAY TERRACE
FUTURE PLAT
POND HIGH WATER LEVEL
TRACT E DETENTION
CONTRACTOR TO USE THIS STOCKPILED MATERIAL WHEREVER POSSIBLE BEFORE MOVING MATERIAL FROM THE THIRD PLAT
23' Great Lakes Pipe Line Company Easement BK. 1697 PG. 109
N
0' 30' 60' 120'
SCALE IN FEET

NOT AS-BUILT

REFER TO MASTER DRAINAGE PLAN FOR UPDATED GRADING

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.

LEGEND

–100–	EXISTING INDEX CONTOURS
–100–	EXISTING INTERMEDIATE CONTOURS
—100—	PROPOSED INDEX CONTOURS
—100—	PROPOSED INTERMEDIATE CONTOURS

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	41,742	24,259
TOTAL	49,719	26,464

2

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.

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NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
www.olsson.com

JULIE ELAINE SELLERS
NUMBER PE-2017000367
3/18/21

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

REVISIONS

NO. REV.	DATE	REVISIONS DESCRIPTION	BY
1	08-12-2019	SWALE H ADDED AND GRADING QUANTITIES UPDATED	
2	10-02-2020	TEMPIRARY SEDIMENT BASIN ADDED TO THE SURFACE	

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\As–Built\Sheets\GNGV\STREET, STORM & SITE DISTURBANCE\C_GRD01_0191605.dwg USER: bworthley
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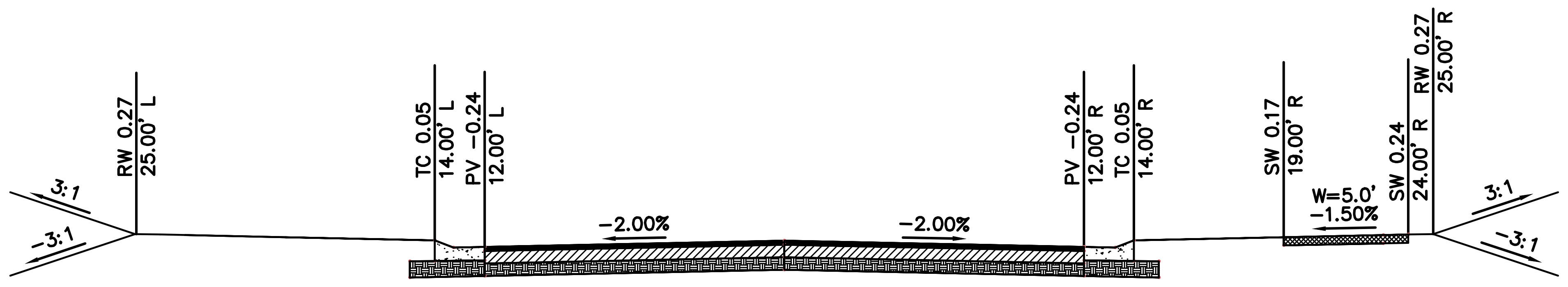
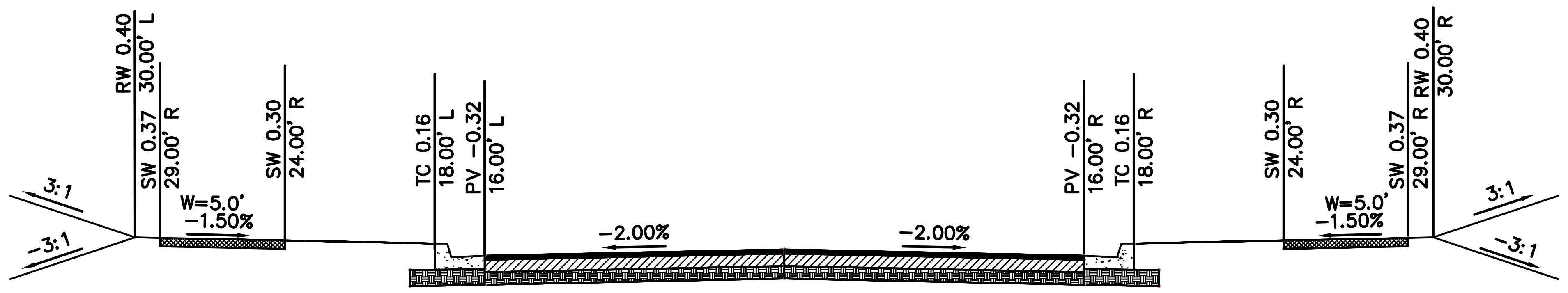

RW 0.27
25.00' L
3:1
-3:1
TC 0.05
14.00' L
PV -0.24
12.00' L
-2.00%
-2.00%
PV -0.24
12.00' R
TC 0.05
14.00' R
SW 0.17
19.00' R
W=5.0'
-1.50%
SW 0.24
24.00' R
RW 0.27
25.00' R
3:1
-3:1

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


RW 0.40
30.00' L
SW 0.37
29.00' R
3:1
-3:1
W=5.0'
-1.50%
SW 0.30
24.00' R
TC 0.16
18.00' L
PV -0.32
16.00' L
-2.00%
-2.00%
PV -0.32
16.00' R
TC 0.16
18.00' R
SW 0.30
24.00' R
W=5.0'
-1.50%
SW 0.37
29.00' R
RW 0.40
30.00' R
3:1
-3:1

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

NOT AS-BUILT

DWG: F:\2019\1501-2000\019-1605\40-Design\AutoCAD\As-Built\Sheets\GNCV\STREET, STORM & SITE DISTURBANCE\C_TYP01_0191605.dwg USER: bworthley
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JULIE ELAINE SELLERS
NUMBER PE-2017000367
3/18/21

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

REVISIONS

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

TYPICAL SECTIONS
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
C104

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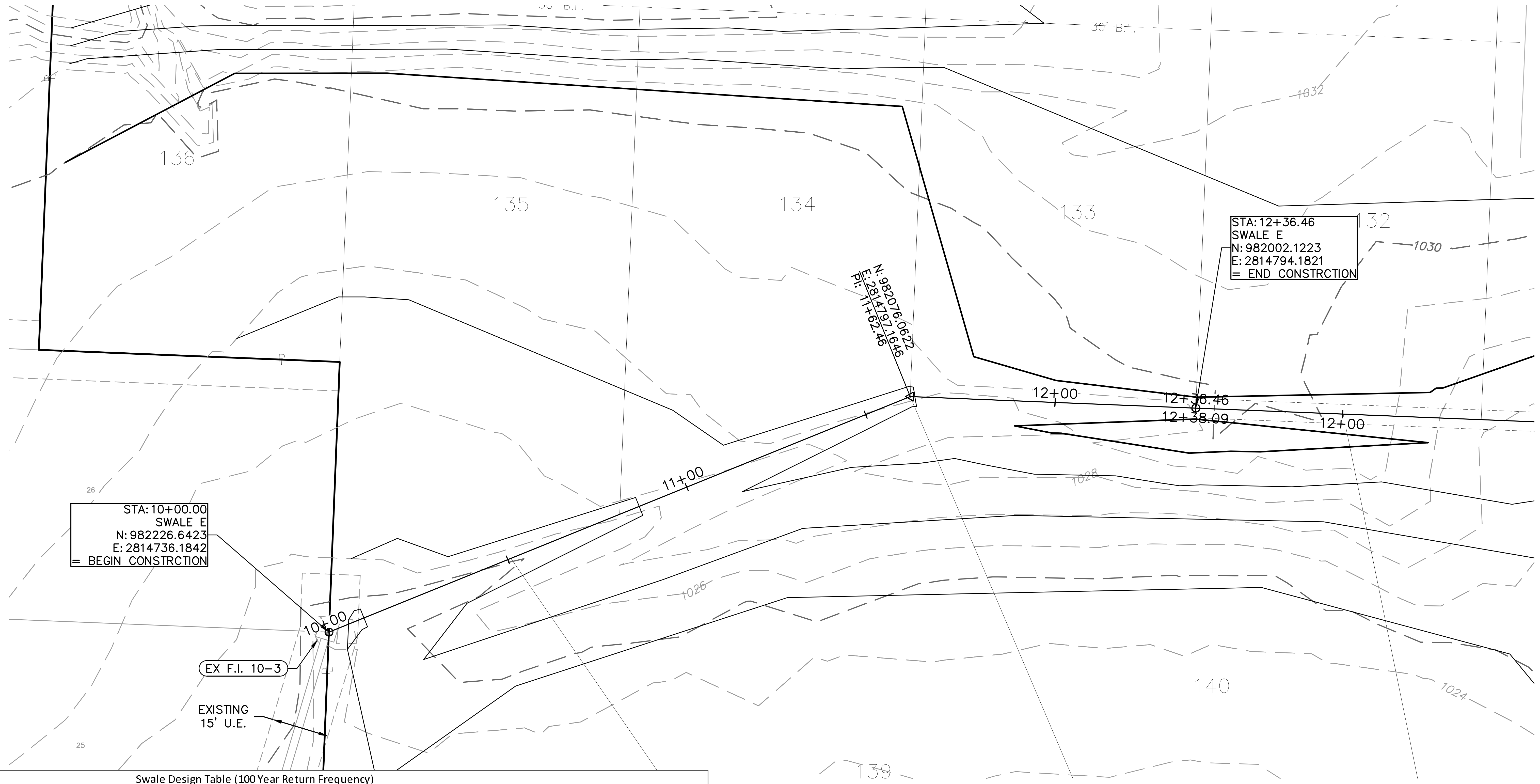

30' B.L.
136
135
134
133
132
1032
1030
1028
1026
1024
140
139
26
25
N: 982076.0622
E: 2814787.1646
PI: 11+62.46
STA: 12+36.46
SWALE E
N: 982002.1223
E: 2814794.1821
= END CONSTRCTION
12+00
12+36.46
12+38.09
11+00
10+00
STA: 10+00.00
SWALE E
N: 982226.6423
E: 2814736.1842
= BEGIN CONSTRCTION
EX F.I. 10-3
EXISTING
15' U.E.

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.

NOTE:
AS-BUILT PLOT PLAN REQUIRED ON LOTS BORDERING THIS SWALE. FINAL GRADING OF SWALE TO BE SHOWN ON THE FINAL PLOT PLAN PER ELEVATIONS AND SECTIONS SHOWN ON THIS SHEET.

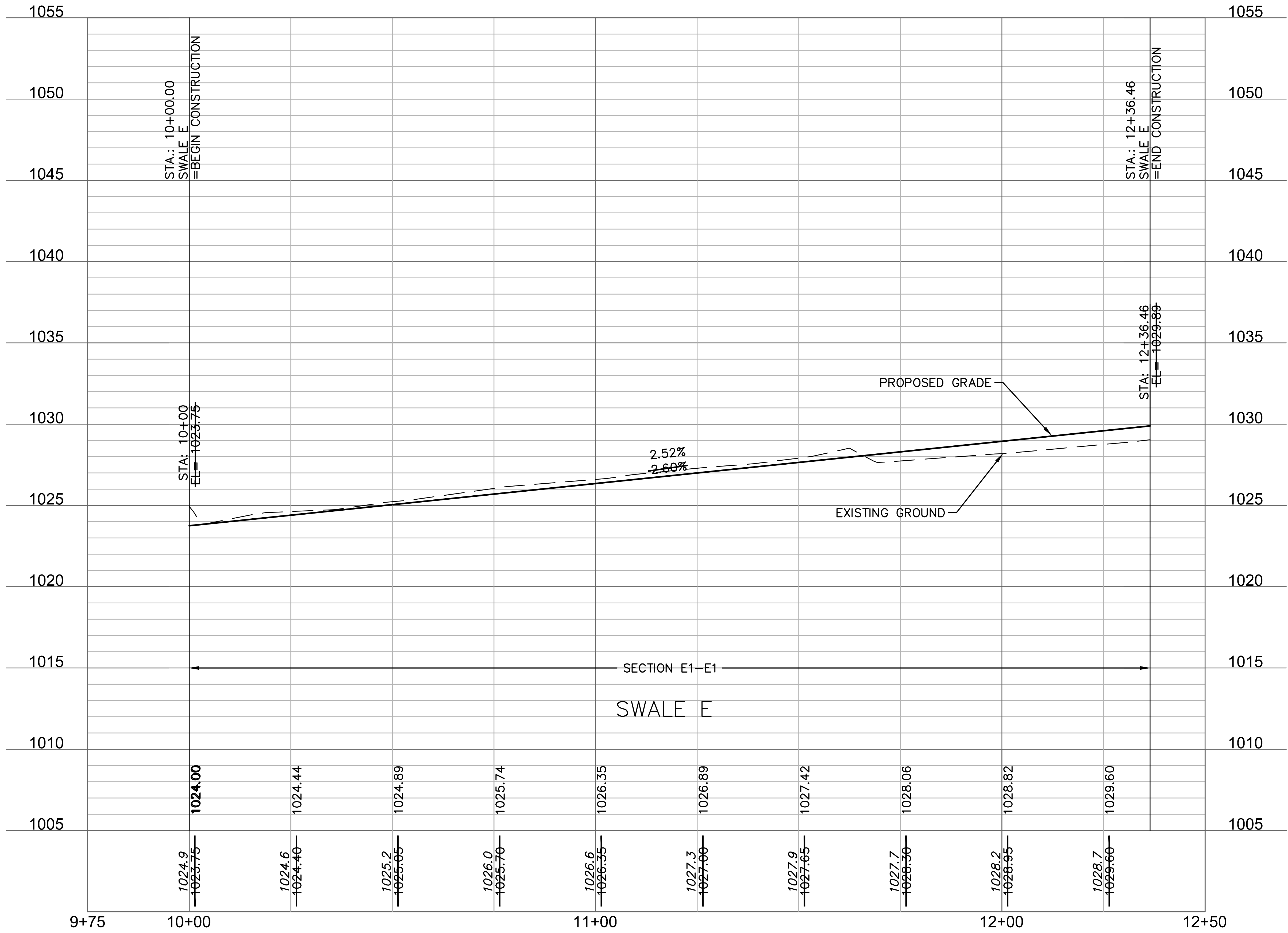
AS-BUILT
3/17/2021

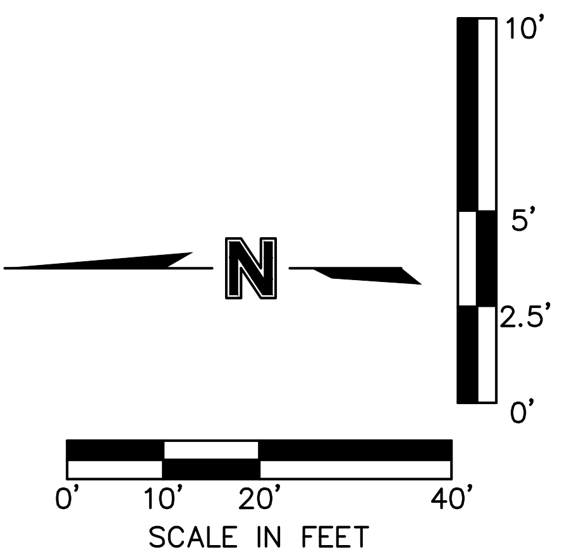
Swale Design Table (100 Year Return Frequency)

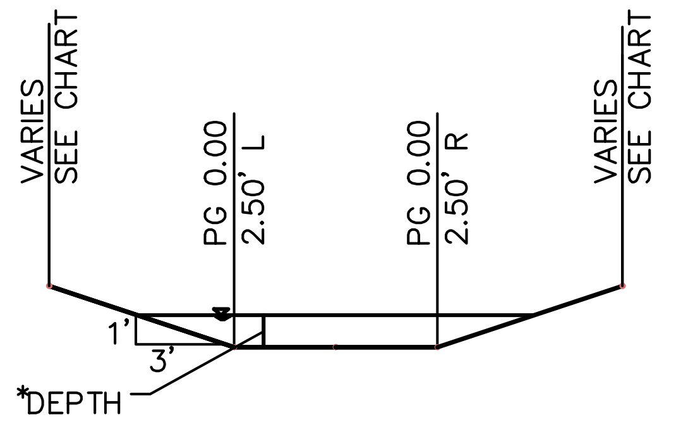
Section Data							Flow Data							
SECTION	Mannings Coefficient	Channel Slope (%)	Min. Swale Depth (ft)	Left Side Slope (H:V)	Right Side Slope (H:V)	Bottom Width (ft)	Discharge (cfs)	Water Depth (ft)	Flow Area (ft^2)	Velocity (ft/sec)	Wetted Perimeter (ft)	Top Width (ft)	Specific Energy (ft)	Shear Stress (lbs/ft^3)
E1-E1	0.03	2.52%	1.25	3:1	3:1	5.00	3.92	0.25	1.44	2.73	6.58	6.50	0.37	0.34

Swale Drainage Area Table (100 year Return Frequency)

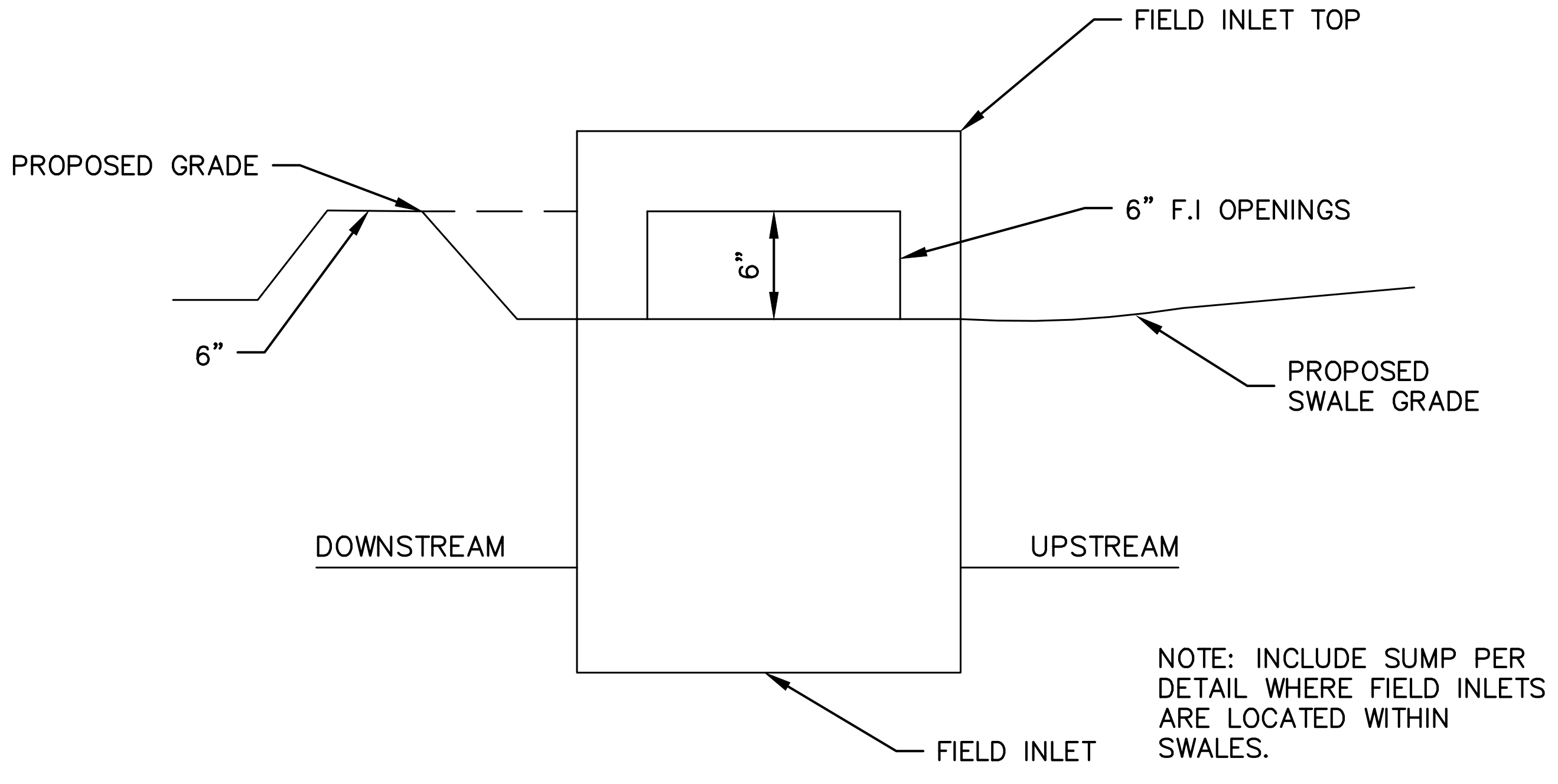
Section	Drainage Area (ac.)	C	Tc (min)	i (in/hr)	K	Peak Flow (cfs)
E1-E1	0.60	0.51	5	10.32	1.25	3.92




N
10'
5'
2.5'
0'
0'
10'
20'
40'
SCALE IN FEET


VARIES
SEE CHART
PG 0.00
2.50' L
PG 0.00
2.50' R
VARIES
SEE CHART
1'
3'
*DEPTH

SWALE TYPICAL SECTION
* SEE TABLE FOR SWALE DEPTH
NTS


FIELD INLET TOP
PROPOSED GRADE
6" F.I OPENINGS
6"
6"
PROPOSED
SWALE GRADE
DOWNSTREAM
UPSTREAM
FIELD INLET

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

FIELD INLET SUMP DETAIL
N.T.S.

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NUMBER PE-2017000367
3/18/21
Julie Sellers
JULIE E. SELLERS, P.E.
MO# 2017000367

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

SWALE PLAN & PROFILE
STREET & STORM SEWER PLANS

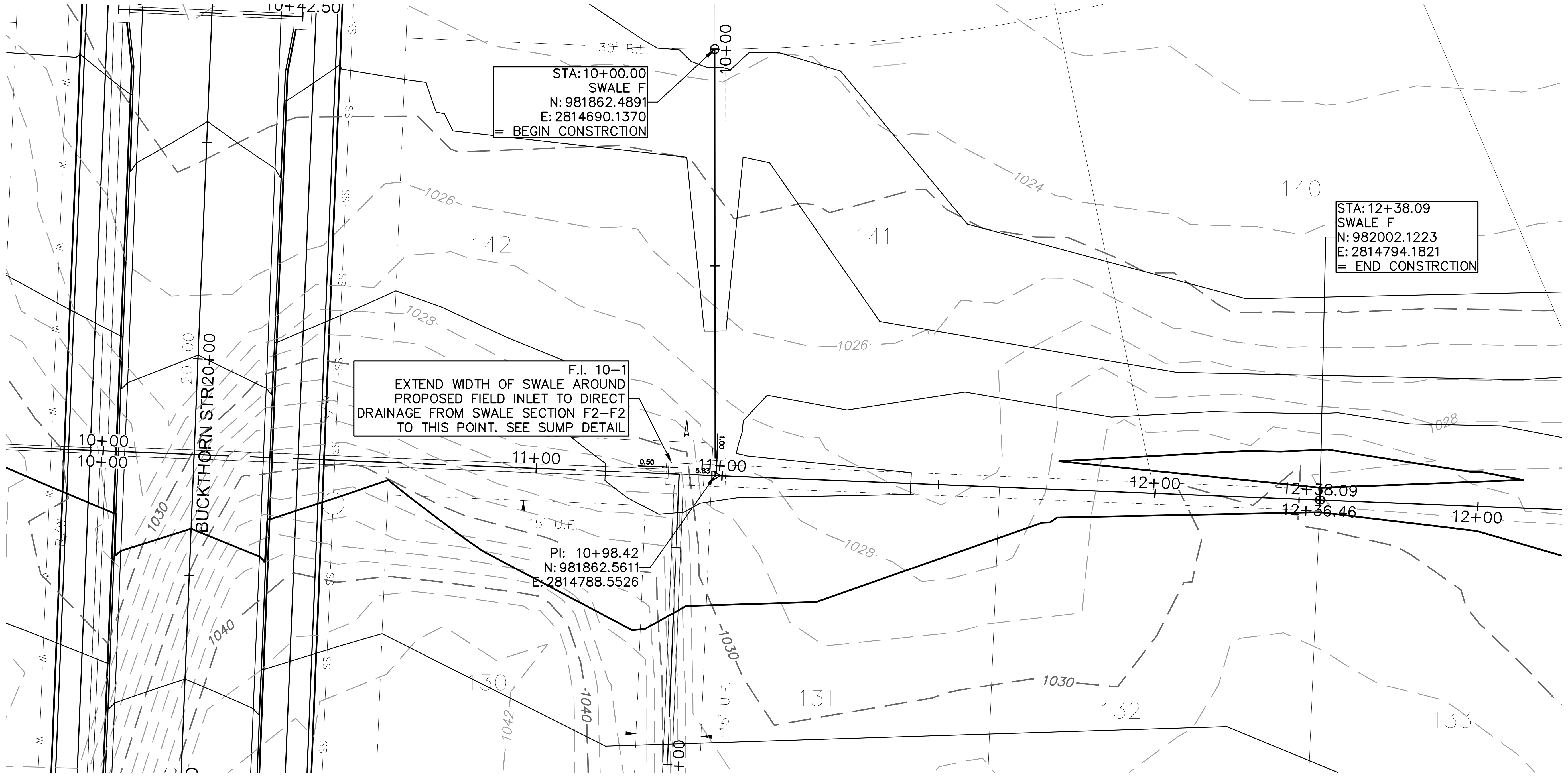
HAWTHORN RIDGE
SECOND PLAT

2019

LEE'S SUMMIT, MISSOURI

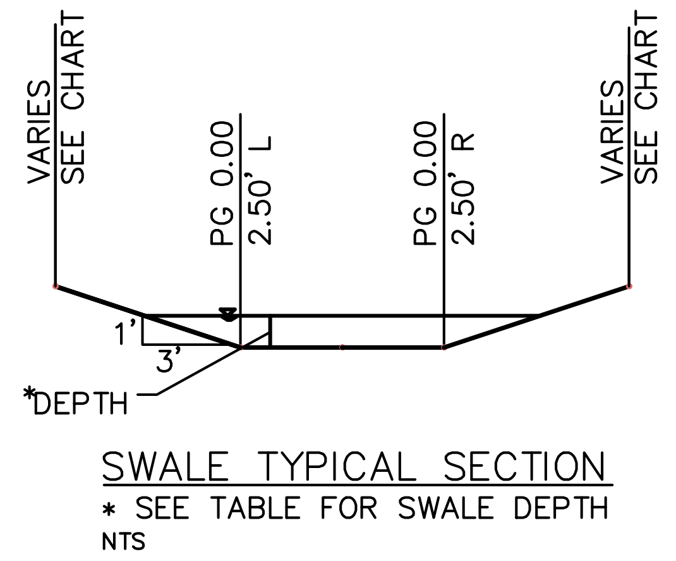
drawn by: D.A.H.O
checked by: M.G.D
designed by: B.M.W
QA/QC by: N.D.H
project no.: 019-1605
date: 07-12-2019

SHEET
C105


STA:10+00.00
SWALE F
N: 981862.4891
E: 2814690.1370
= BEGIN CONSTRCTION
STA:12+38.09
SWALE F
N: 982002.1223
E: 2814794.1821
= END CONSTRCTION
F.I. 10-1
EXTEND WIDTH OF SWALE AROUND
PROPOSED FIELD INLET TO DIRECT
DRAINAGE FROM SWALE SECTION F2-F2
TO THIS POINT. SEE SUMP DETAIL
PI: 10+98.42
N: 981862.5611
E: 2814788.5526
BUCKTHORN STR20+00
10+00
11+00
12+00
12+38.09
12+36.46
30' B.L.
15' U.E.
140
141
142
130
131
132
133
1024
1026
1028
1030
1040
1042

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.


VARIES
SEE CHART
PG 0.00
2.50' L
PG 0.00
2.50' R
VARIES
SEE CHART
1'
3'
*DEPTH

SWALE TYPICAL SECTION

* SEE TABLE FOR SWALE DEPTH

NTS

NOTE:

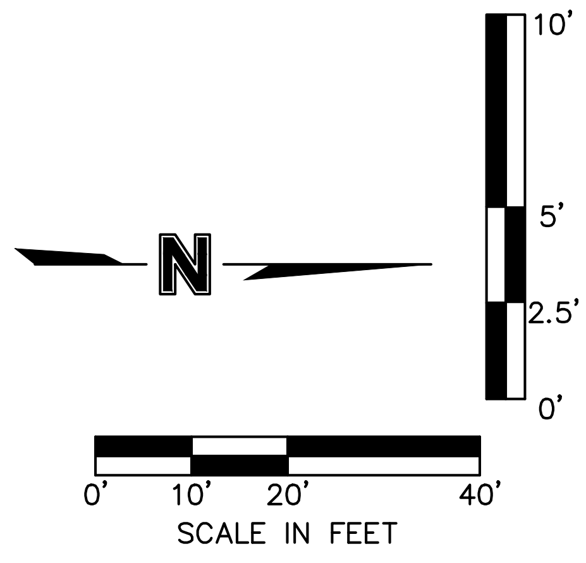
AS-BUILT PLOT PLAN REQUIRED ON LOTS BORDERING THIS SWALE. FINAL GRADING OF SWALE TO BE SHOWN ON THE FINAL PLOT PLAN PER ELEVATIONS AND SECTIONS SHOWN ON THIS SHEET.

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	3.57%	1.17	3:1	3:1	5.00	2.50	0.17	0.94	2.67	6.08	6.02	0.28	0.34
F2-F2	0.03	2.05%	1.12	3:1	3:1	5.00	0.92	0.12	0.64	1.43	5.76	5.72	0.15	0.14

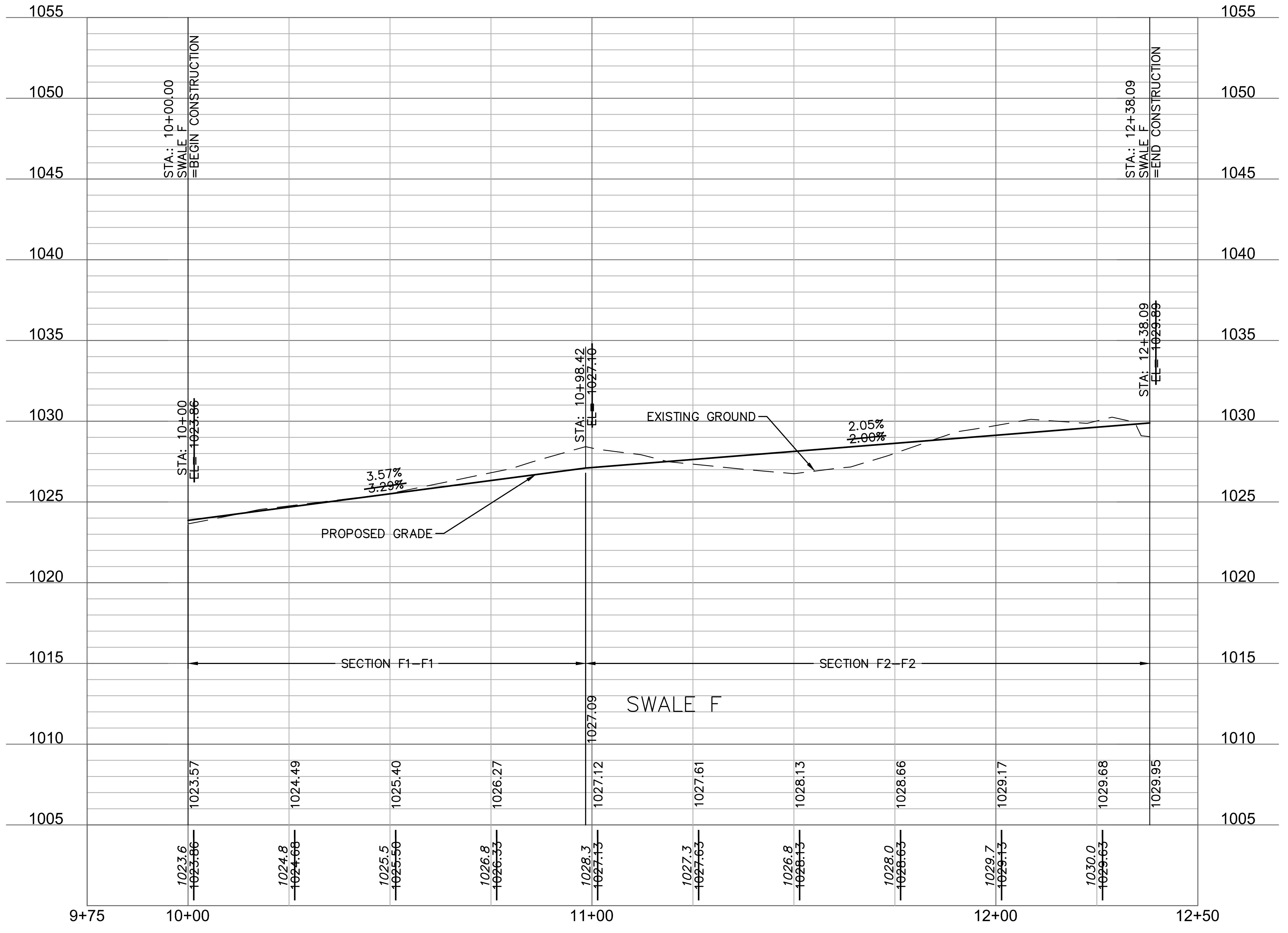
Swale Drainage Area Table (100 year Return Frequency)

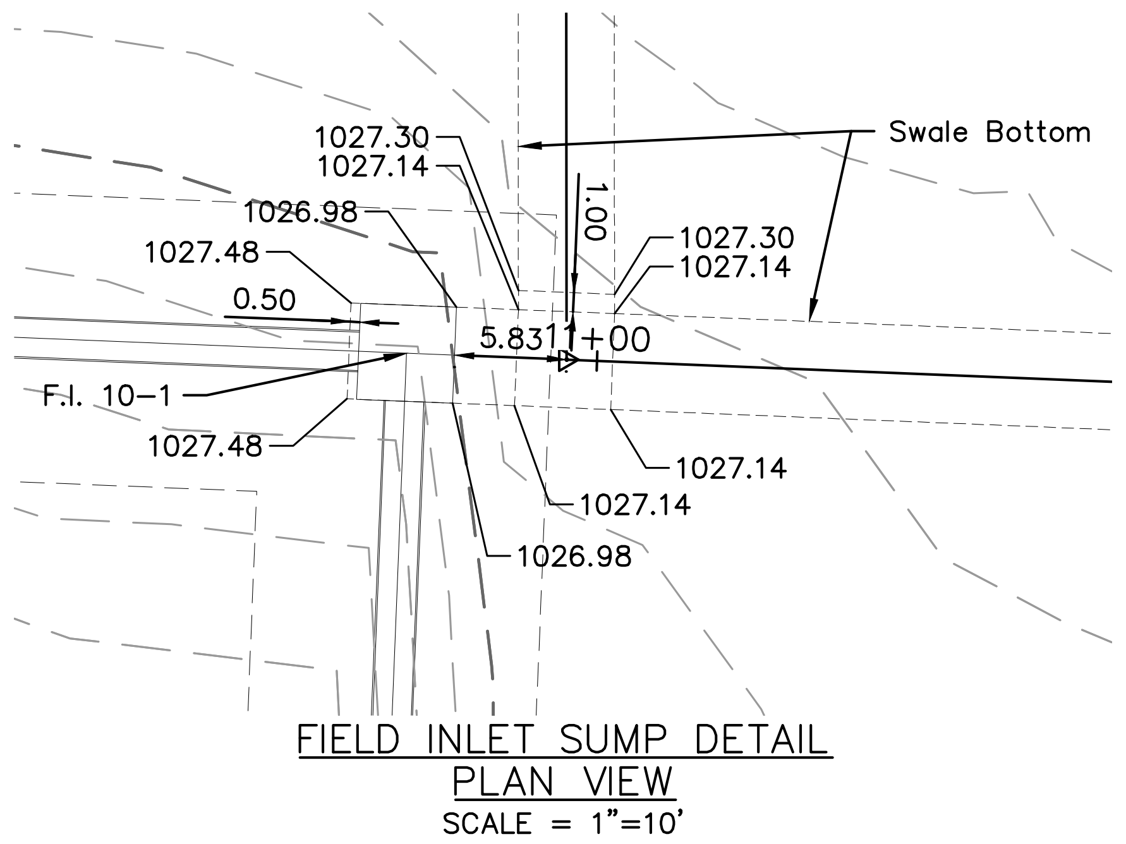
Section	Drainage Area	C	Tc	i	K	Peak Flow
	(ac.)		(min)	(in/hr)		(cfs)
F1-F1	0.38	0.51	5	10.32	1.25	2.50
F2-F2	0.14	0.51	5	10.32	1.25	0.92


N
10'
5'
2.5'
0'
0'
10'
20'
40'
SCALE IN FEET

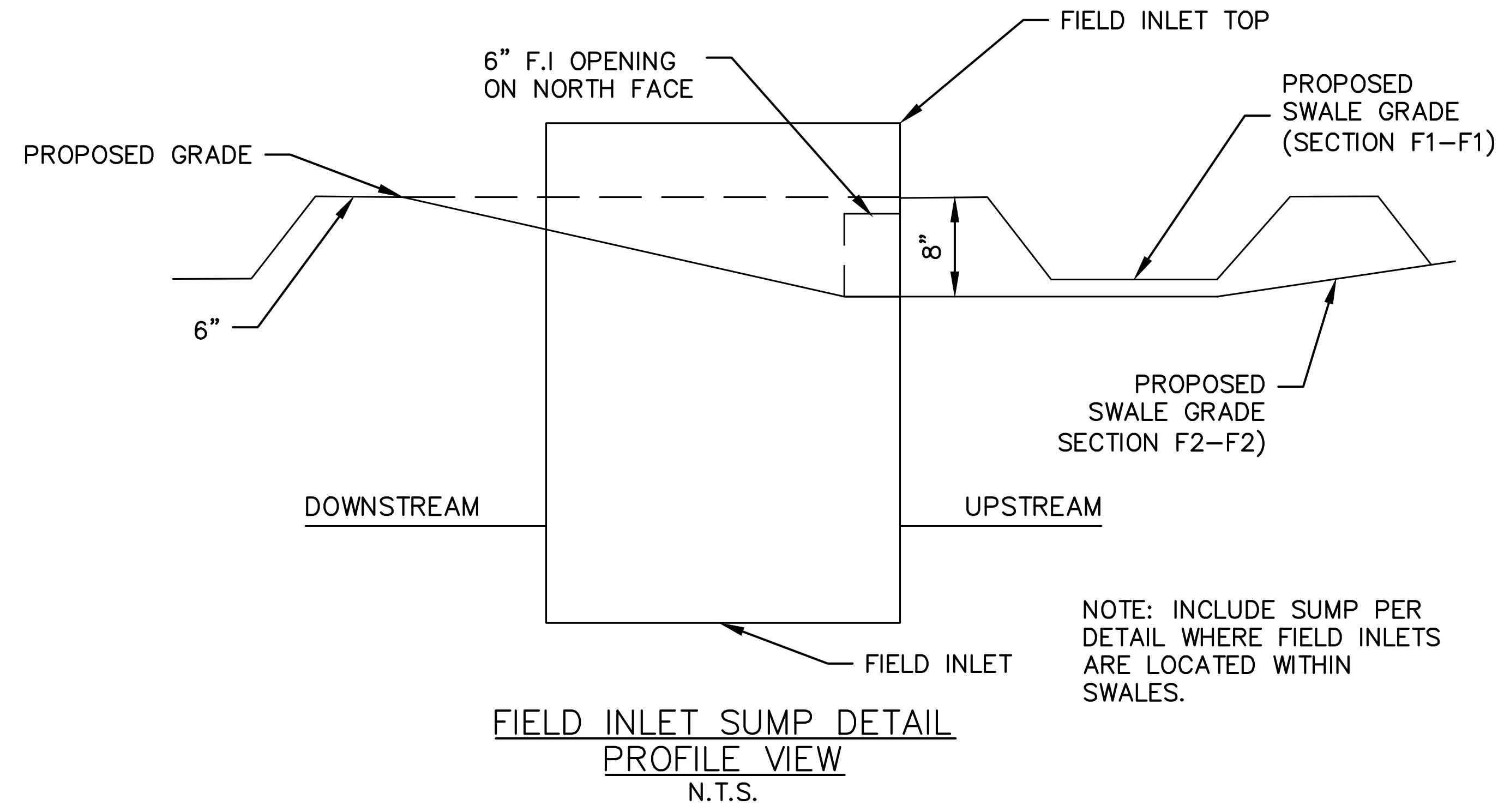
AS-BUILT

3/17/2021




Swale Bottom
1027.30
1027.14
1026.98
1027.48
0.50
F.I. 10-1
1027.48
1.00
1027.30
1027.14
5.83
11+00
1027.14
1027.14
1026.98

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


FIELD INLET TOP
6" F.I OPENING
ON NORTH FACE
PROPOSED
SWALE GRADE
(SECTION F1-F1)
PROPOSED GRADE
8"
6"
PROPOSED
SWALE GRADE
SECTION F2-F2)
DOWNSTREAM
UPSTREAM
FIELD INLET

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
3/18/21
PROFESSIONAL ENGINEER

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

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

SWALE PLAN & PROFILE
STREET & STORM SEWER PLANS

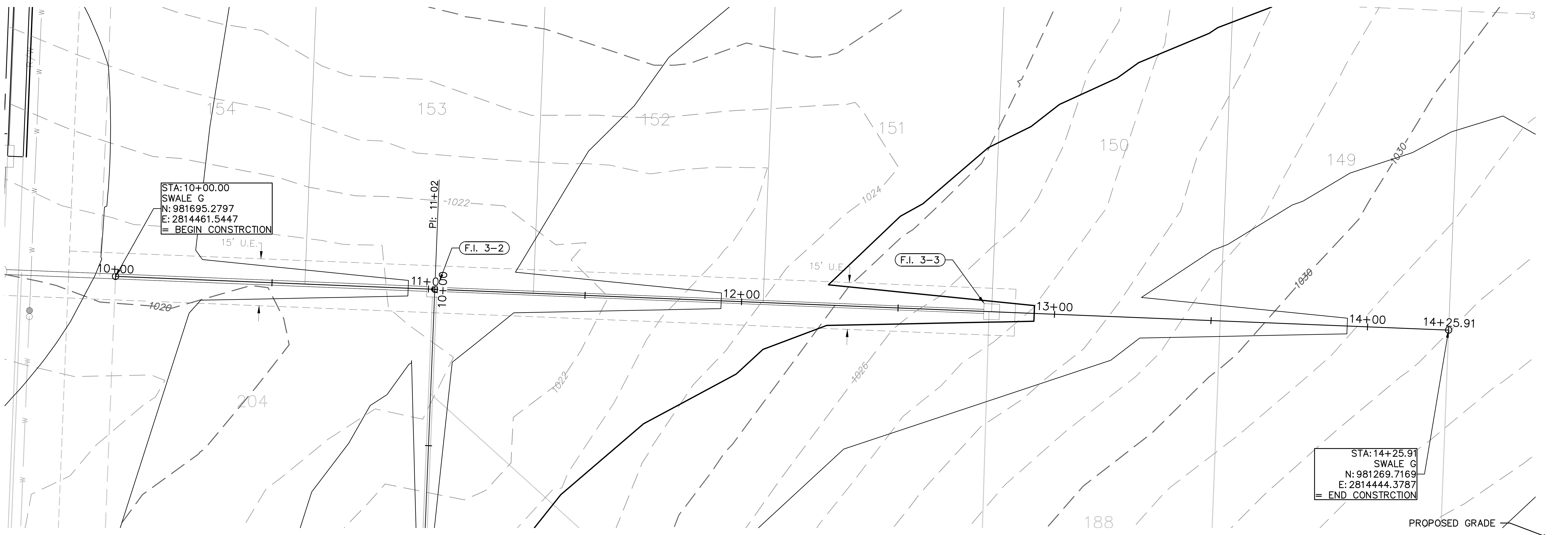
HAWTHORN RIDGE
SECOND PLAT

2019

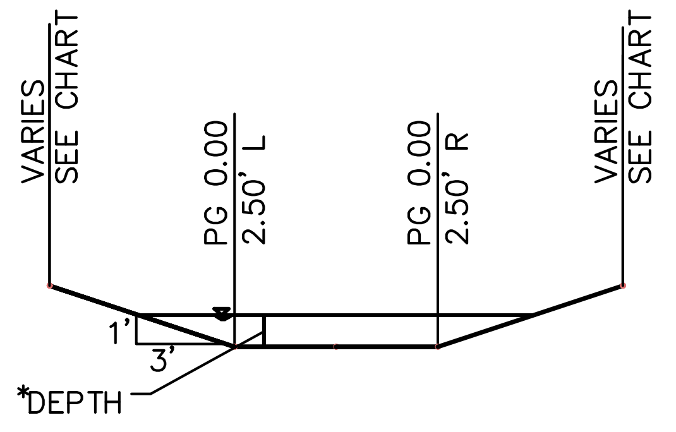
LEE'S SUMMIT, MISSOURI

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
C106


154
153
152
151
150
149
204
188
1020
1022
1024
1026
1030
15' U.E.
STA: 10+00.00
SWALE G
N: 981695.2797
E: 2814461.5447
= BEGIN CONSTRCTION
PI: 11+02
F.I. 3-2
F.I. 3-3
10+00
11+00
12+00
13+00
14+00
14+25.91
STA: 14+25.91
SWALE G
N: 981269.7169
E: 2814444.3787
= END CONSTRCTION

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.


VARIES SEE CHART
PG 0.00 2.50' L
PG 0.00 2.50' R
VARIES SEE CHART
1'
3'
*DEPTH

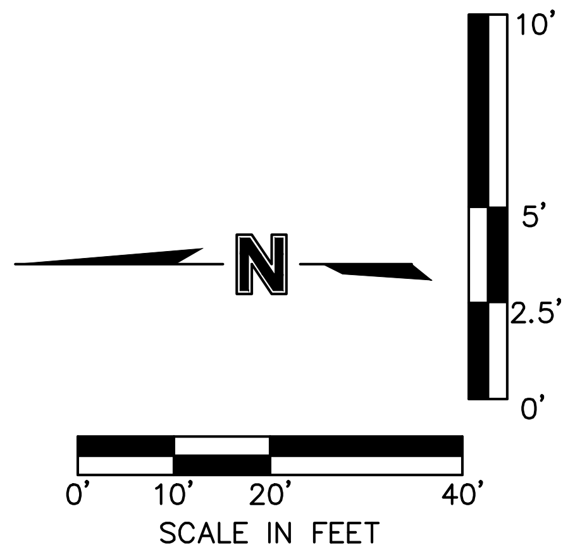
SWALE TYPICAL SECTION
* SEE TABLE FOR SWALE DEPTH
NTS

Swale Design Table (100 Year Return Frequency)

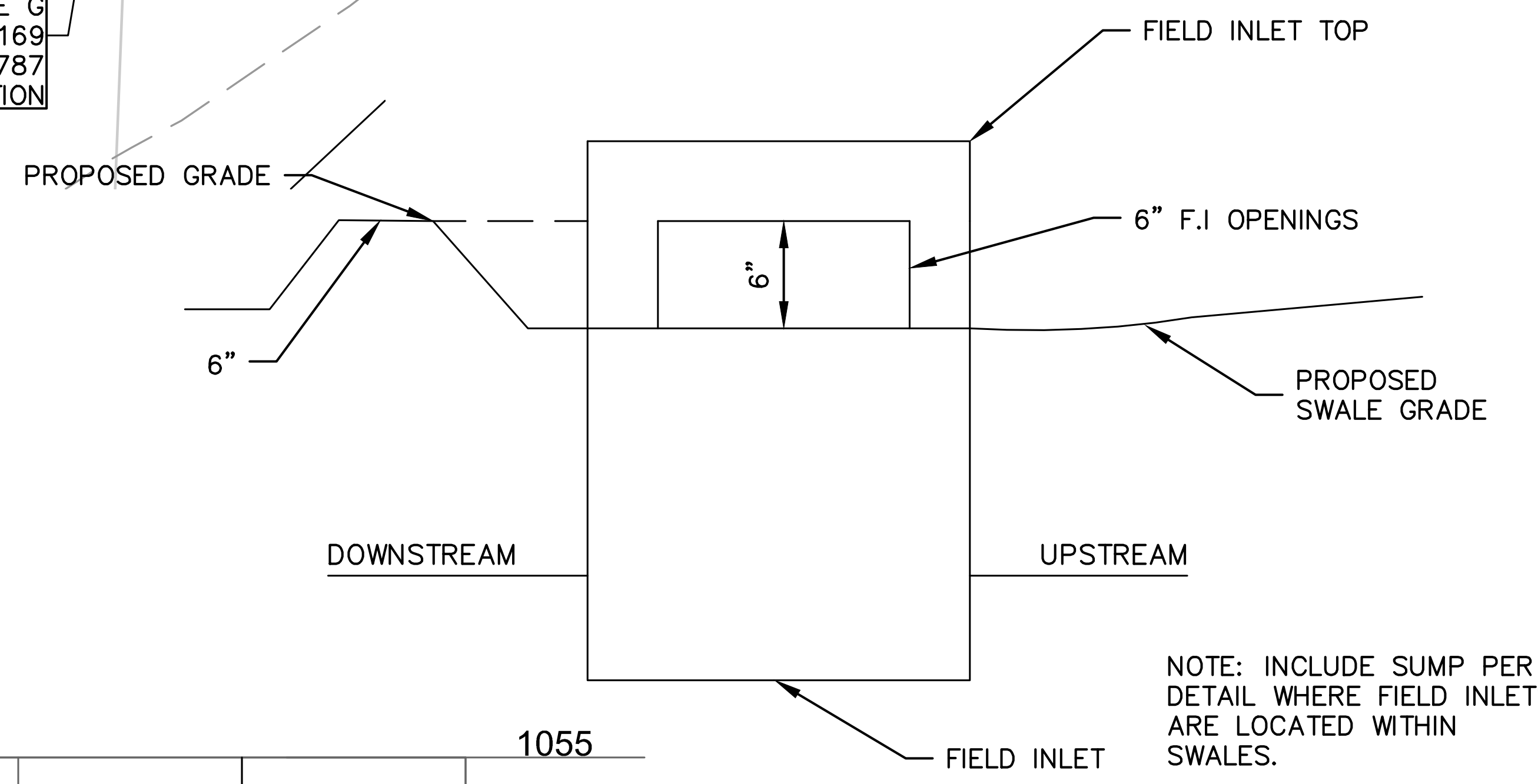
Section Data							Flow Data							
SECTION	Mannings Coefficient	Channel Slope (%)	Min. Swale Depth (ft)	Left Side Slope (H:V)	Right Side Slope (H:V)	Bottom Width (ft)	Discharge (cfs)	Water Depth (ft)	Flow Area (ft^2)	Velocity (ft/sec)	Wetted Perimeter (ft)	Top Width (ft)	Specific Energy (ft)	Shear Stress (lbs/ft^3)
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	2.03%	1.20	3:1	3:1	5.00	2.40	0.20	1.12	2.14	6.26	6.20	0.27	0.23
G3-G3	0.03	2.05%	1.24	3:1	3:1	5.00	3.28	0.24	1.37	2.39	6.52	6.44	0.33	0.27

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

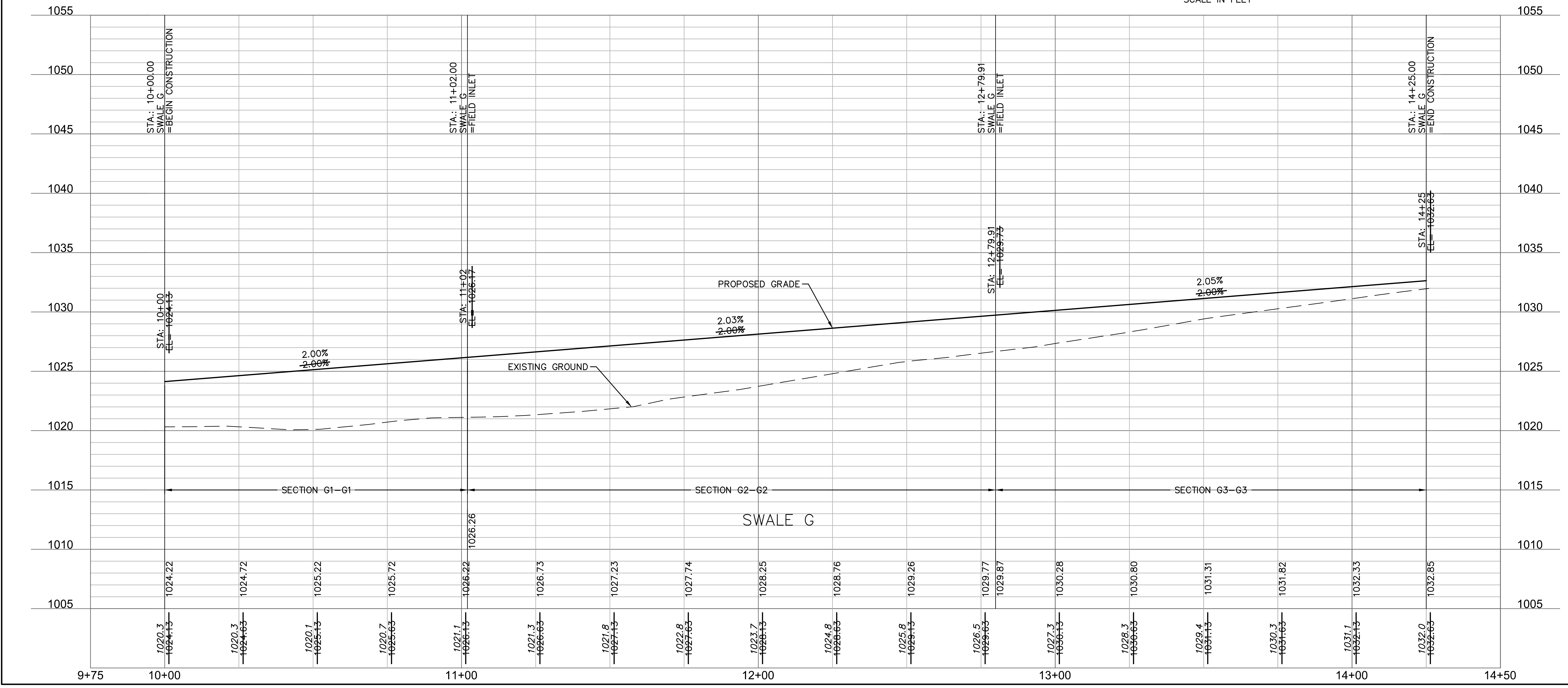

N
10'
5'
2.5'
0'
0'
10'
20'
40'

SCALE IN FEET


FIELD INLET TOP
PROPOSED GRADE
6" F.I OPENINGS
6"
6"
PROPOSED SWALE GRADE
DOWNSTREAM
UPSTREAM
FIELD INLET

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

FIELD INLET SUMP DETAIL
N.T.S.



NOTE:
AS-BUILT PLOT PLAN REQUIRED ON LOTS BORDERING THIS SWALE. FINAL GRADING OF SWALE TO BE SHOWN ON THE FINAL PLOT PLAN PER ELEVATIONS AND SECTIONS SHOWN ON THIS SHEET.

AS-BUILT
3/17/2021

DWG: F:\2019\1501-2000\019-1605\40-Design\AutoCAD\As-Built\Sheets\GNCV\STREET, STORM & SITE DISTURBANCE\C_SWP01_0191605.dwg USER: bworthley
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1301 BURLINGTON, SUITE 100
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TEL 816.361.1177
www.olsson.com

JULIE ELAINE SELLERS
NUMBER PE-2017000367
3/18/21

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

REVISIONS

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

SWALE PLAN & PROFILE
STREET & STORM SEWER PLANS

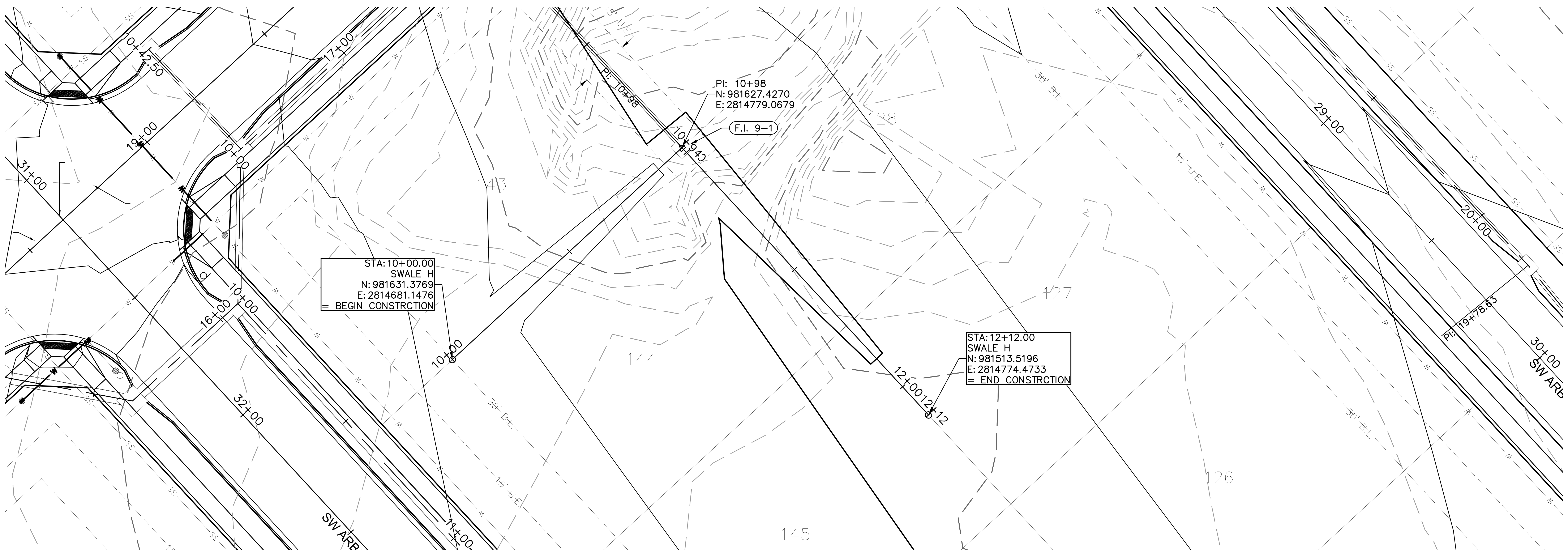
HAWTHORN RIDGE
SECOND PLAT

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

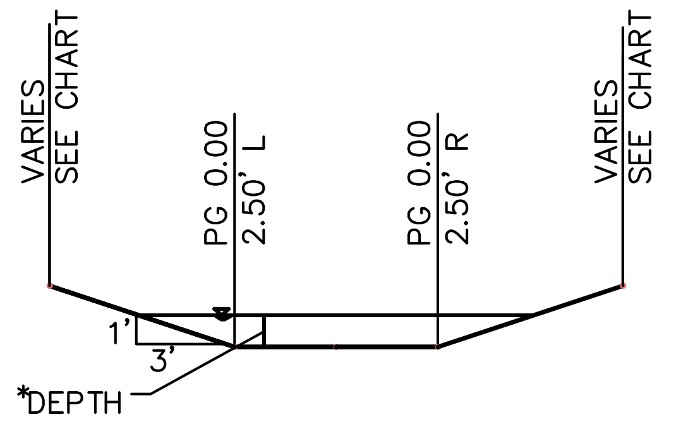
SHEET
C107



STA: 10+00.00
SWALE H
N: 981631.3769
E: 2814681.1476
= BEGIN CONSTRCTION
PI: 10+98
N: 981627.4270
E: 2814779.0679
F.I. 9-1
STA: 12+12.00
SWALE H
N: 981513.5196
E: 2814774.4733
= END CONSTRCTION
10+00
12+00
12+12
10+98
143
144
145
126
127
128
SW ARB
PI: 19+78.63
29+00
20+00
30+00
31+00
32+00
16+00
17+00
19+00
10+42.50
11+00
30' B.L.
15' U.E.

SWALE GRADING NOTES: △1

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.



VARIES SEE CHART
PG 0.00 2.50' L
PG 0.00 2.50' R
VARIES SEE CHART
1'
3'
DEPTH

SWALE TYPICAL SECTION

* SEE TABLE FOR SWALE DEPTH

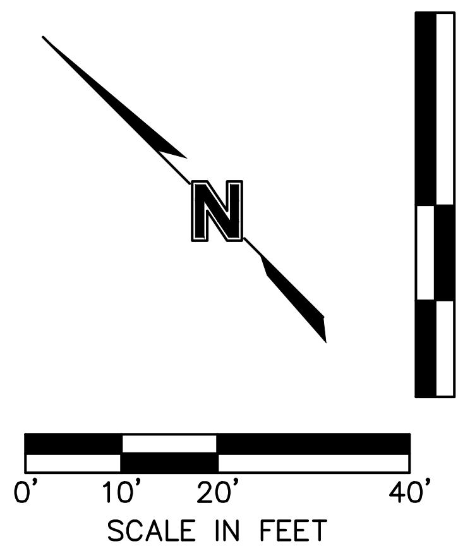
NTS

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	2.34%	1.07	3:1	3:1	5.00	0.39	0.07	0.37	1.07	5.44	5.42	0.09	0.10
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



N
10'
5'
2.5'
0'
0'
10'
20'
40'

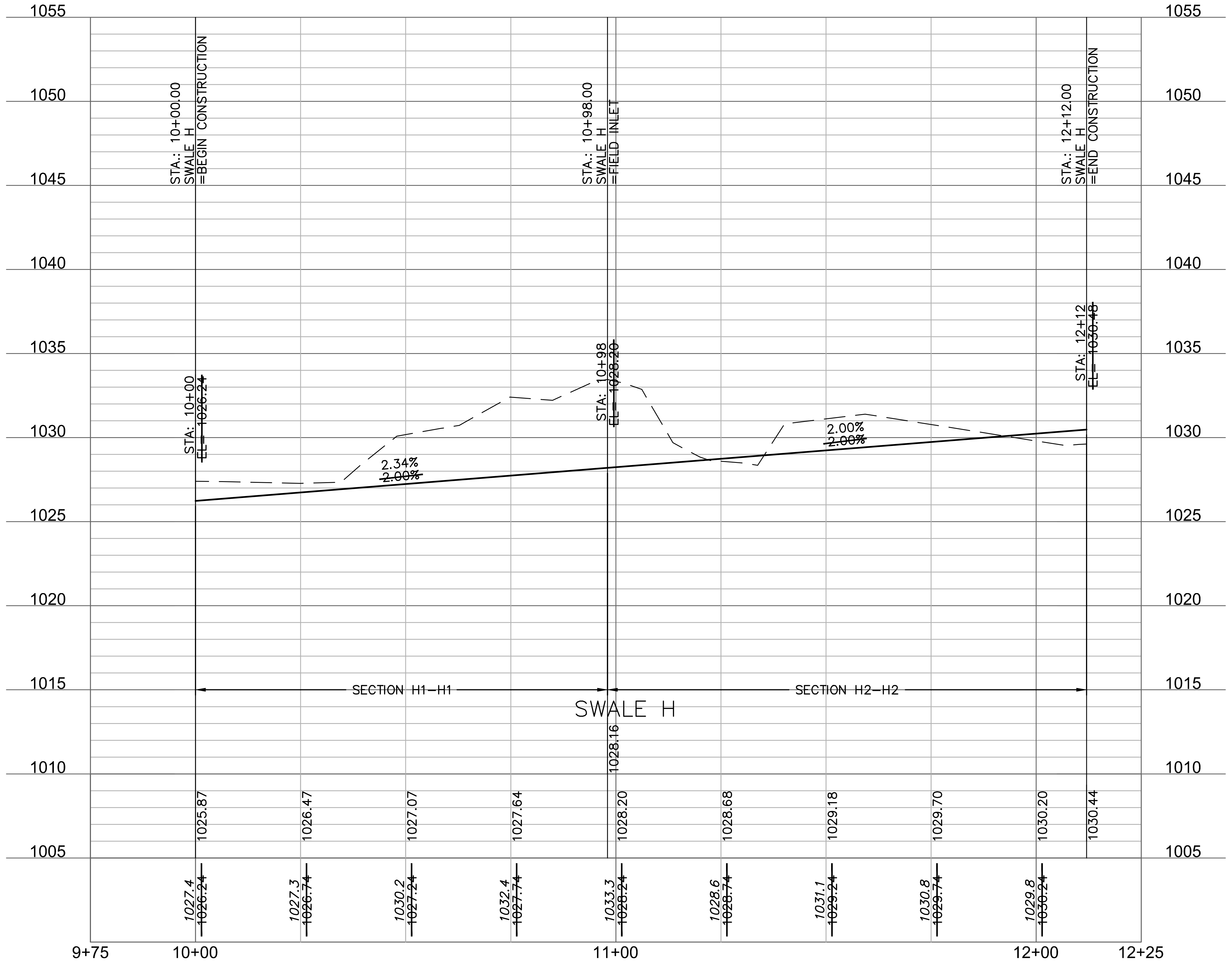
SCALE IN FEET

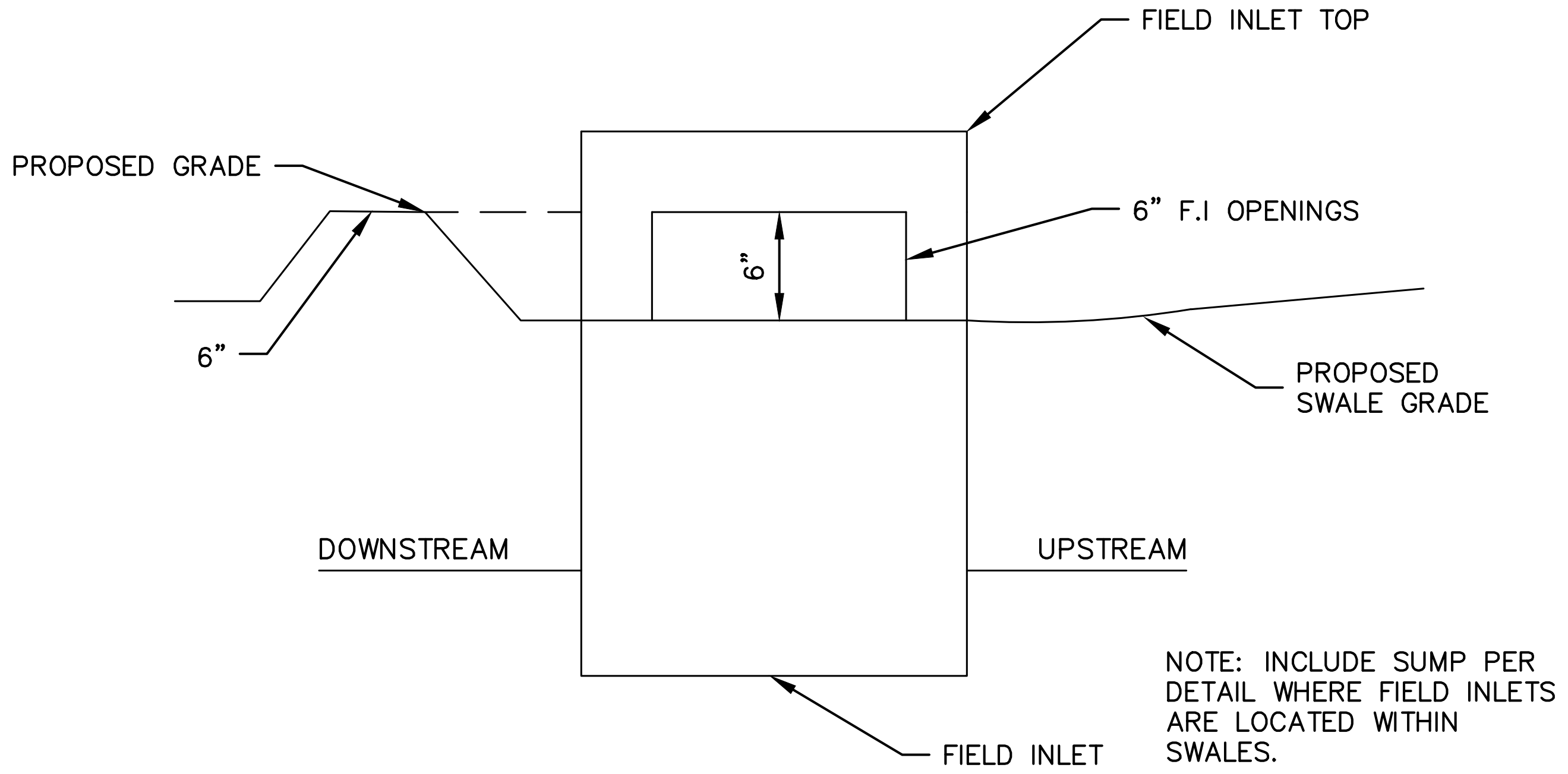
NOTE:

AS-BUILT PLOT PLAN REQUIRED ON LOTS BORDERING THIS SWALE. FINAL GRADING OF SWALE TO BE SHOWN ON THE FINAL PLOT PLAN PER ELEVATIONS AND SECTIONS SHOWN ON THIS SHEET.

AS-BUILT

3/17/2021





FIELD INLET TOP
PROPOSED GRADE
6" F.I OPENINGS
6"
6"
PROPOSED SWALE GRADE
DOWNSTREAM
UPSTREAM
FIELD INLET

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

FIELD INLET SUMP DETAIL

N.T.S.

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

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JULIE ELAINE SELLERS
NUMBER
PE-2017000367
3/18/21
Julie Sellers

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

SHEET
C108

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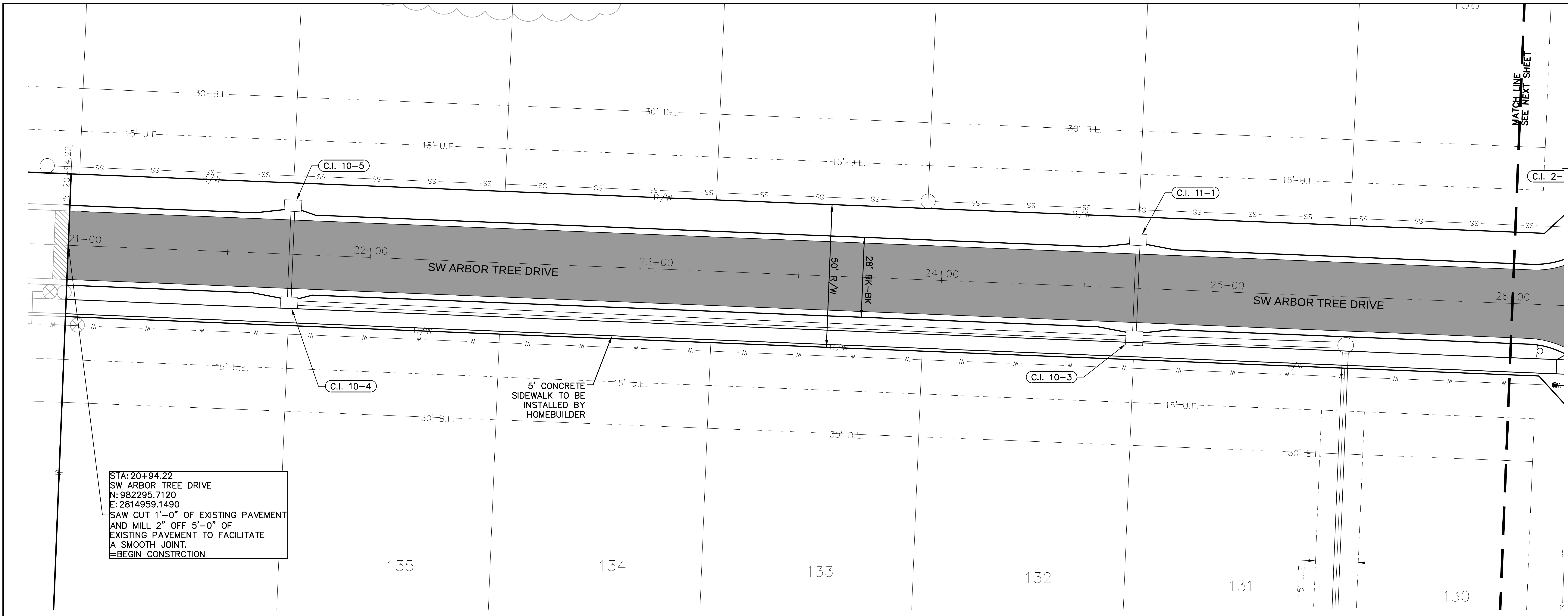
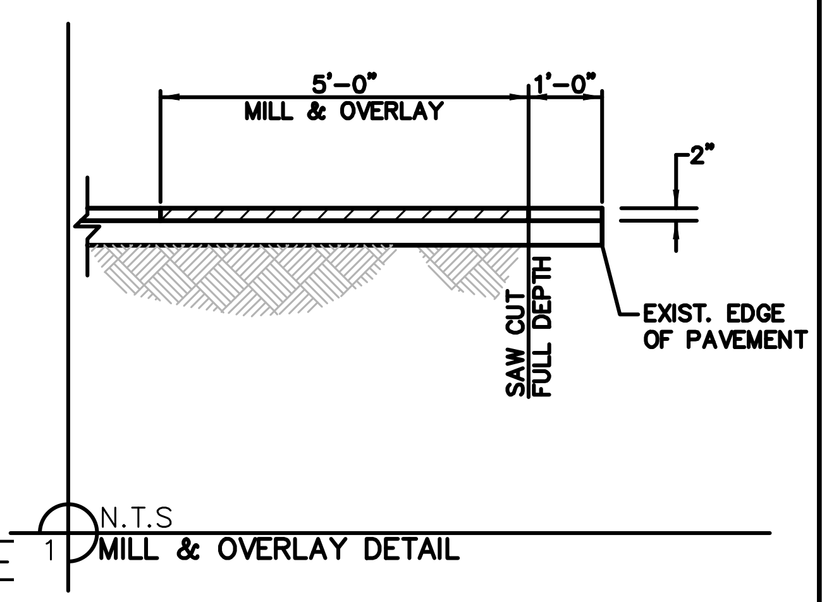
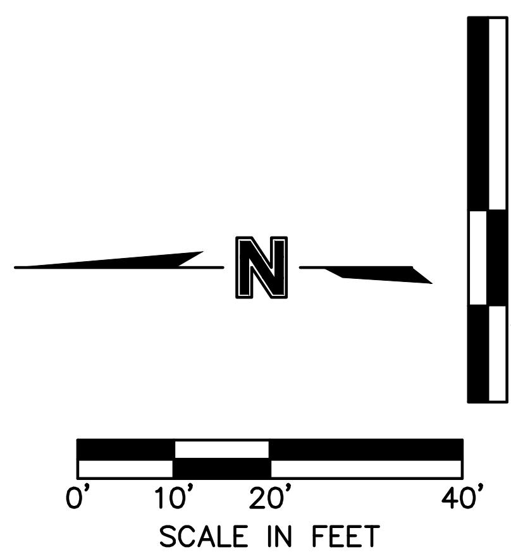

30' B.L.
15' U.E.
SS
R/W
C.I. 10-5
C.I. 11-1
C.I. 10-4
C.I. 10-3
21+00
22+00
23+00
24+00
25+00
26+00
SW ARBOR TREE DRIVE
SW ARBOR TREE DRIVE
50' R/W
28' BK-BK
M
5' CONCRETE SIDEWALK TO BE INSTALLED BY HOMEBUILDER
135
134
133
132
131
130
MATCH LINE SEE NEXT SHEET

STA: 20+94.22
SW ARBOR TREE DRIVE
N: 982295.7120
E: 2814959.1490
SAW CUT 1'-0" OF EXISTING PAVEMENT AND MILL 2" OFF 5'-0" OF EXISTING PAVEMENT TO FACILITATE A SMOOTH JOINT.
=BEGIN CONSTRCTION

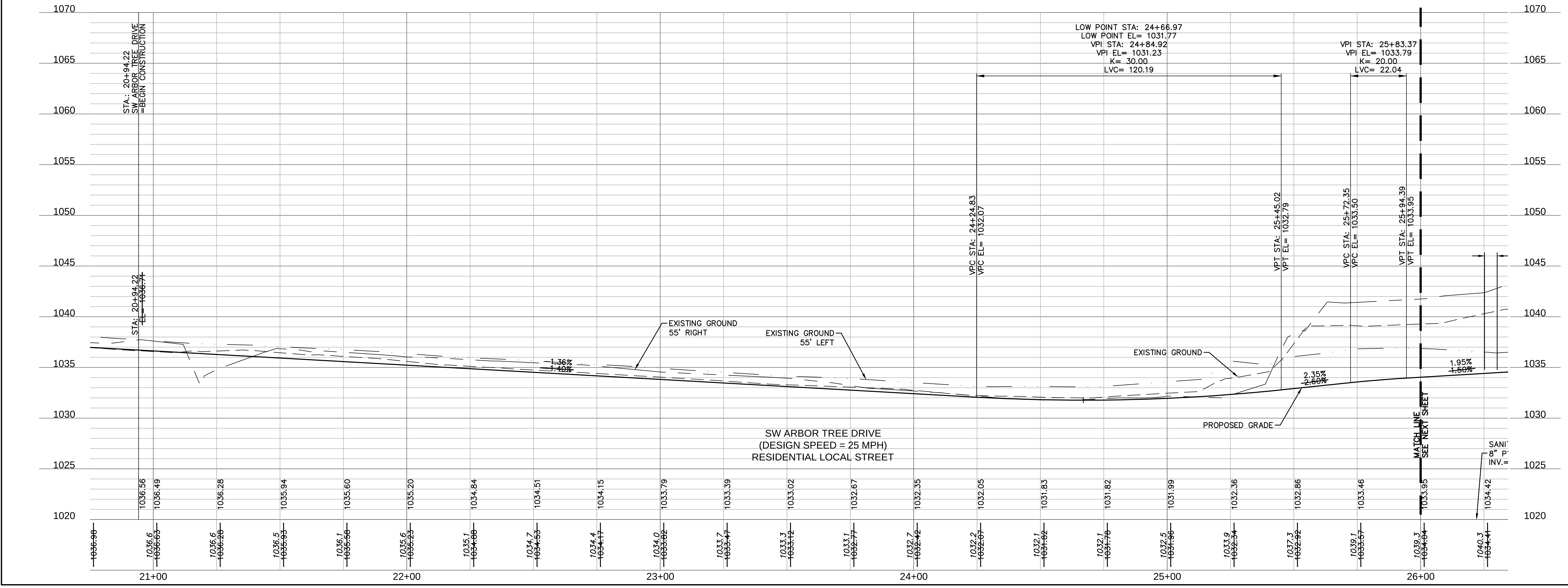

5'-0"
MILL & OVERLAY
1'-0"
2"
EXIST. EDGE OF PAVEMENT
SAW CUT FULL DEPTH
C.I. 2-

1 MILL & OVERLAY DETAIL
N.T.S

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


N
10'
5'
2.5'
0'
0'
10'
20'
40'
SCALE IN FEET

AS-BUILT
3/17/2021



SW ARBOR TREE DRIVE
(DESIGN SPEED = 25 MPH)
RESIDENTIAL LOCAL STREET

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NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
www.olsson.com

JULIE ELAINE SELLERS
NUMBER PE-2017000367
3/18/21
Julie Sellers
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\As-Built\Sheets\GNCV\STREET, STORM & SITE DISTURBANCE\C_RPP01_0191605.dwg USER: bworthley
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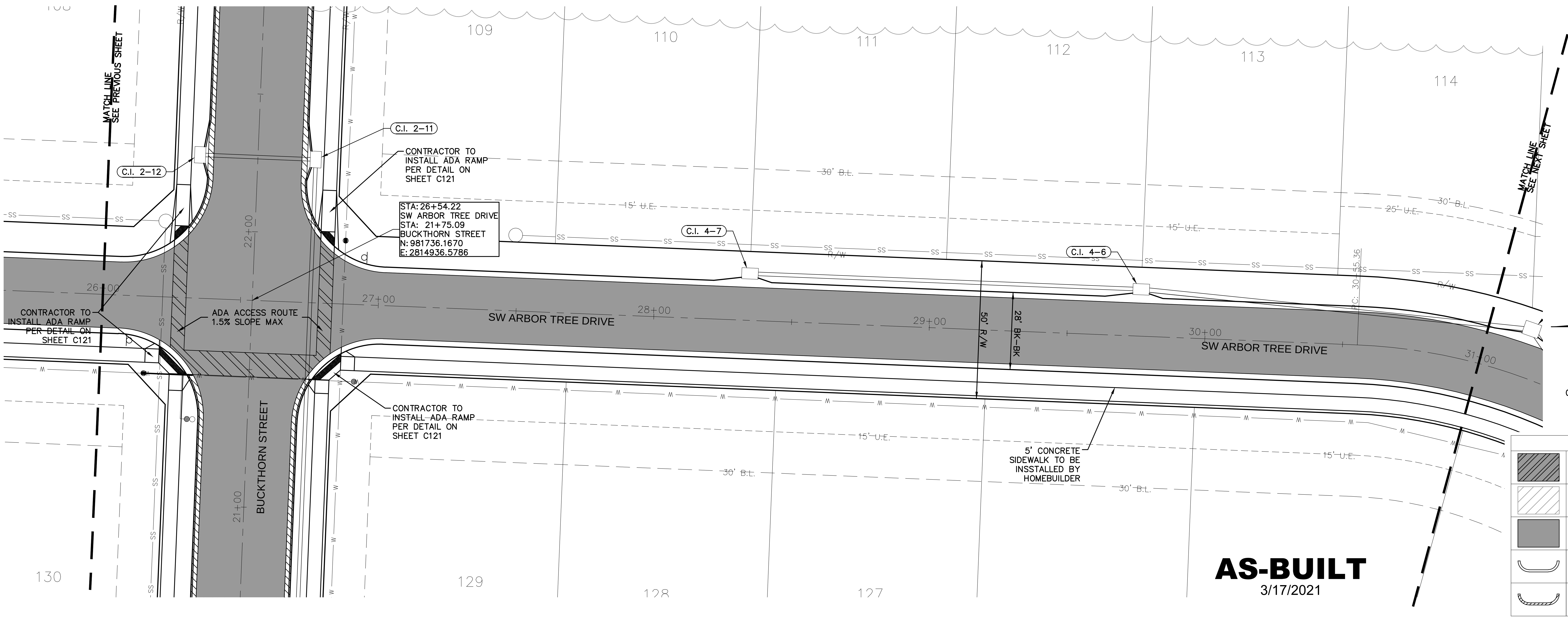
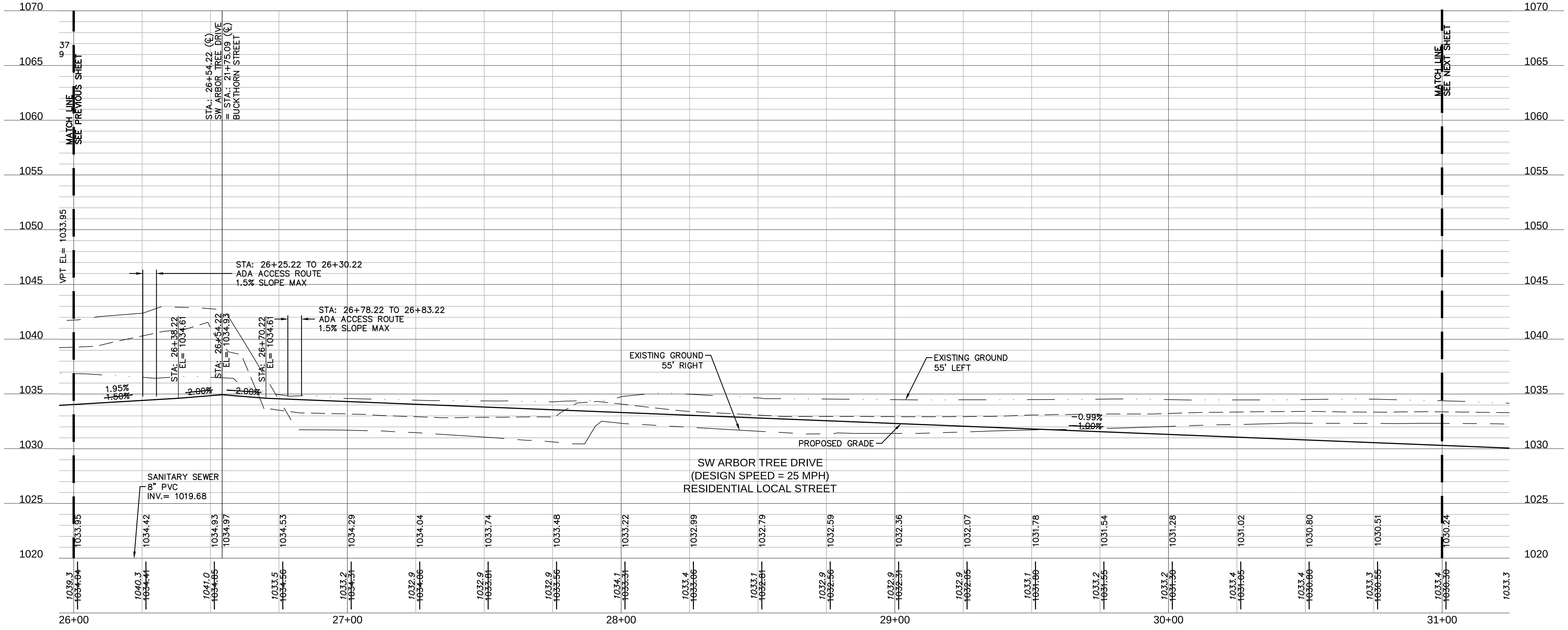


108
109
110
111
112
113
114
130
129
128
127
MATCH LINE SEE PREVIOUS SHEET
MATCH LINE SEE NEXT SHEET
C.I. 2-11
C.I. 2-12
C.I. 4-7
C.I. 4-6
CONTRACTOR TO INSTALL ADA RAMP PER DETAIL ON SHEET C121
STA: 26+54.22
SW ARBOR TREE DRIVE
STA: 21+75.09
BUCKTHORN STREET
N: 981736.1670
E: 2814936.5786
CONTRACTOR TO INSTALL ADA RAMP PER DETAIL ON SHEET C121
ADA ACCESS ROUTE 1.5% SLOPE MAX
CONTRACTOR TO INSTALL ADA RAMP PER DETAIL ON SHEET C121
SW ARBOR TREE DRIVE
SW ARBOR TREE DRIVE
BUCKTHORN STREET
22+00
21+00
26+00
27+00
28+00
29+00
30+00
31+00
50' R/W
28' BK-BK
30' B.L.
15' U.E.
25' U.E.
30' B.L.
15' U.E.
15' U.E.
30' B.L.
15' U.E.
30' B.L.
5' CONCRETE SIDEWALK TO BE INSSTALLED BY HOMEBUILDER
PC: 30+45.36
SS
W
M
R/W
N
10'
5'
2.5'
0'
0' 10' 20' 40'
SCALE IN FEET

AS-BUILT
3/17/2021

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



1070
1065
1060
1055
1050
1045
1040
1035
1030
1025
1020
MATCH LINE SEE PREVIOUS SHEET
MATCH LINE SEE NEXT SHEET
37
9
VPT EL= 1033.95
STA: 26+54.22 (℄) SW ARBOR TREE DRIVE = STA: 21+75.09 (℄) BUCKTHORN STREET
STA: 26+25.22 TO 26+30.22 ADA ACCESS ROUTE 1.5% SLOPE MAX
STA: 26+78.22 TO 26+83.22 ADA ACCESS ROUTE 1.5% SLOPE MAX
STA: 26+38.22 EL= 1034.61
STA: 26+54.22 EL= 1034.93
STA: 26+70.22 EL= 1034.61
1.95%
1.50%
2.00%
2.00%
EXISTING GROUND 55' RIGHT
EXISTING GROUND 55' LEFT
PROPOSED GRADE
-0.99%
-1.00%
SW ARBOR TREE DRIVE
(DESIGN SPEED = 25 MPH)
RESIDENTIAL LOCAL STREET
SANITARY SEWER
8" PVC
INV.= 1019.68
1033.95
1034.42
1034.93
1034.97
1034.53
1034.29
1034.04
1033.74
1033.48
1033.22
1032.99
1032.79
1032.59
1032.36
1032.07
1031.78
1031.54
1031.28
1031.02
1030.80
1030.51
1030.24
1039.3
~~1034.04~~
1040.3
~~1034.41~~
1041.0
~~1034.85~~
1033.5
~~1034.56~~
1033.2
~~1034.31~~
1032.9
~~1034.06~~
1032.9
~~1033.81~~
1032.9
~~1033.56~~
1034.1
~~1033.31~~
1033.4
~~1033.06~~
1033.1
~~1032.81~~
1032.9
~~1032.56~~
1032.9
~~1032.31~~
1032.9
~~1032.05~~
1033.1
~~1031.80~~
1033.2
~~1031.55~~
1033.2
~~1031.30~~
1033.4
~~1031.05~~
1033.4
~~1030.80~~
1033.3
~~1030.55~~
1033.4
~~1030.30~~
1033.3
26+00
27+00
28+00
29+00
30+00
31+00

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NUMBER PE-2017000367
3/18/21

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NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

ROAD PLAN & PROFILE
STREET & STORM SEWER PLANS

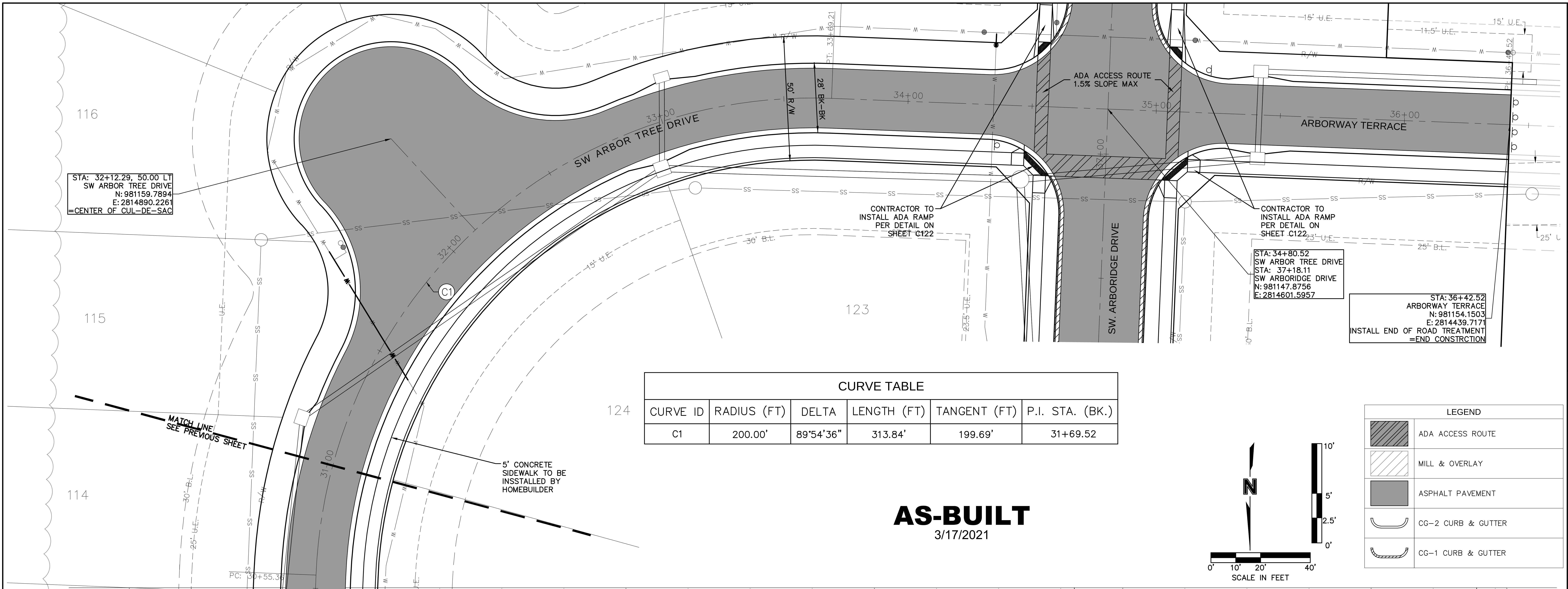
HAWTHORN RIDGE
SECOND PLAT

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

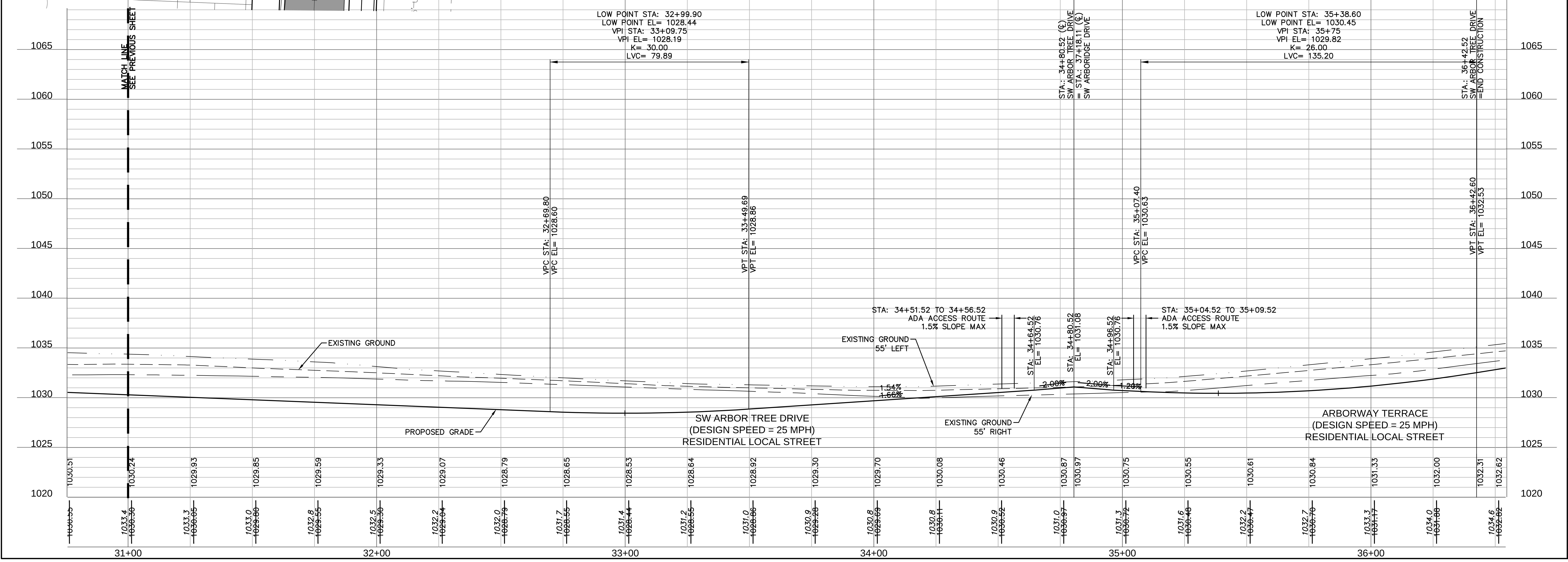
SHEET
C110


116
115
114
123
124
STA: 32+12.29, 50.00 LT
SW ARBOR TREE DRIVE
N: 981159.7894
E: 2814890.2261
=CENTER OF CUL-DE-SAC
SW ARBOR TREE DRIVE
33+00
34+00
35+00
36+00
32+00
31+00
50' R/W
28' BK-BK
PT: 33+69.21
C1
ADA ACCESS ROUTE
1.5% SLOPE MAX
ARBORWAY TERRACE
SW. ARBORIDGE DRIVE
CONTRACTOR TO
INSTALL ADA RAMP
PER DETAIL ON
SHEET C122
CONTRACTOR TO
INSTALL ADA RAMP
PER DETAIL ON
SHEET C122
STA: 34+80.52
SW ARBOR TREE DRIVE
STA: 37+18.11
SW ARBORIDGE DRIVE
N: 981147.8756
E: 2814601.5957
STA: 36+42.52
ARBORWAY TERRACE
N: 981154.1503
E: 2814439.7171
INSTALL END OF ROAD TREATMENT
=END CONSTRCTION
15' U.E.
11.5' U.E.
15' U.E.
25' B.L.
30' B.L.
25' U.E.
23.5' U.E.
MATCH LINE
SEE PREVIOUS SHEET
5' CONCRETE
SIDEWALK TO BE
INSSTALLED BY
HOMEBUILDER
PC: 30+55.30
N
10'
5'
2.5'
0'
0' 10' 20' 40'
SCALE IN FEET

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

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

AS-BUILT
3/17/2021


MATCH LINE
SEE PREVIOUS SHEET
LOW POINT STA: 32+99.90
LOW POINT EL= 1028.44
VPI STA: 33+09.75
VPI EL= 1028.19
K= 30.00
LVC= 79.89
VPC STA: 32+69.80
VPC EL= 1028.60
VPT STA: 33+49.69
VPT EL= 1028.86
STA: 34+80.52 (℄)
SW ARBOR TREE DRIVE
= STA: 37+18.11 (℄)
SW ARBORIDGE DRIVE
LOW POINT STA: 35+38.60
LOW POINT EL= 1030.45
VPI STA: 35+75
VPI EL= 1029.82
K= 26.00
LVC= 135.20
VPC STA: 35+07.40
VPC EL= 1030.63
VPT STA: 36+42.60
VPT EL= 1032.53
STA: 36+42.52
SW ARBOR TREE DRIVE
=END CONSTRUCTION
STA: 34+51.52 TO 34+56.52
ADA ACCESS ROUTE
1.5% SLOPE MAX
STA: 34+64.52
EL= 1030.76
STA: 34+80.52
EL= 1031.08
STA: 34+96.52
EL= 1030.76
STA: 35+04.52 TO 35+09.52
ADA ACCESS ROUTE
1.5% SLOPE MAX
EXISTING GROUND
EXISTING GROUND
55' LEFT
EXISTING GROUND
55' RIGHT
PROPOSED GRADE
1.54%
1.66%
-2.00%
2.00%
-1.20%
SW ARBOR TREE DRIVE
(DESIGN SPEED = 25 MPH)
RESIDENTIAL LOCAL STREET
ARBORWAY TERRACE
(DESIGN SPEED = 25 MPH)
RESIDENTIAL LOCAL STREET
1065
1060
1055
1050
1045
1040
1035
1030
1025
1020
1030.51
1030.24
1029.93
1029.85
1029.59
1029.33
1029.07
1028.79
1028.65
1028.53
1028.64
1028.92
1029.30
1029.70
1030.08
1030.46
1030.87
1030.97
1030.75
1030.55
1030.61
1030.84
1031.33
1032.00
1032.31
1032.62
1030.55
1033.4
1030.30
1033.3
1030.05
1033.0
1029.80
1032.8
1029.55
1032.5
1029.30
1032.2
1029.04
1032.0
1028.79
1031.7
1028.55
1031.4
1028.44
1031.2
1028.55
1031.0
1028.86
1030.9
1029.28
1030.8
1029.69
1030.8
1030.11
1030.9
1030.52
1031.0
1030.97
1031.3
1030.72
1031.6
1030.48
1032.2
1030.47
1032.7
1030.70
1033.3
1031.17
1034.0
1031.88
1034.6
1032.82
31+00
32+00
33+00
34+00
35+00
36+00

DWG: F:\2019\1501-2000\019-1605\40-Design\AutoCAD\As-Built\Streets\GNCV\STREET, STORM & SITE DISTURBANCE\C_RPP01_0191605.dwg USER: bworthley
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NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
www.olsson.com

JULIE ELAINE
SELLERS
NUMBER
PE-2017000367
3/18/21

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

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

ROAD PLAN & PROFILE
STREET & STORM SEWER PLANS

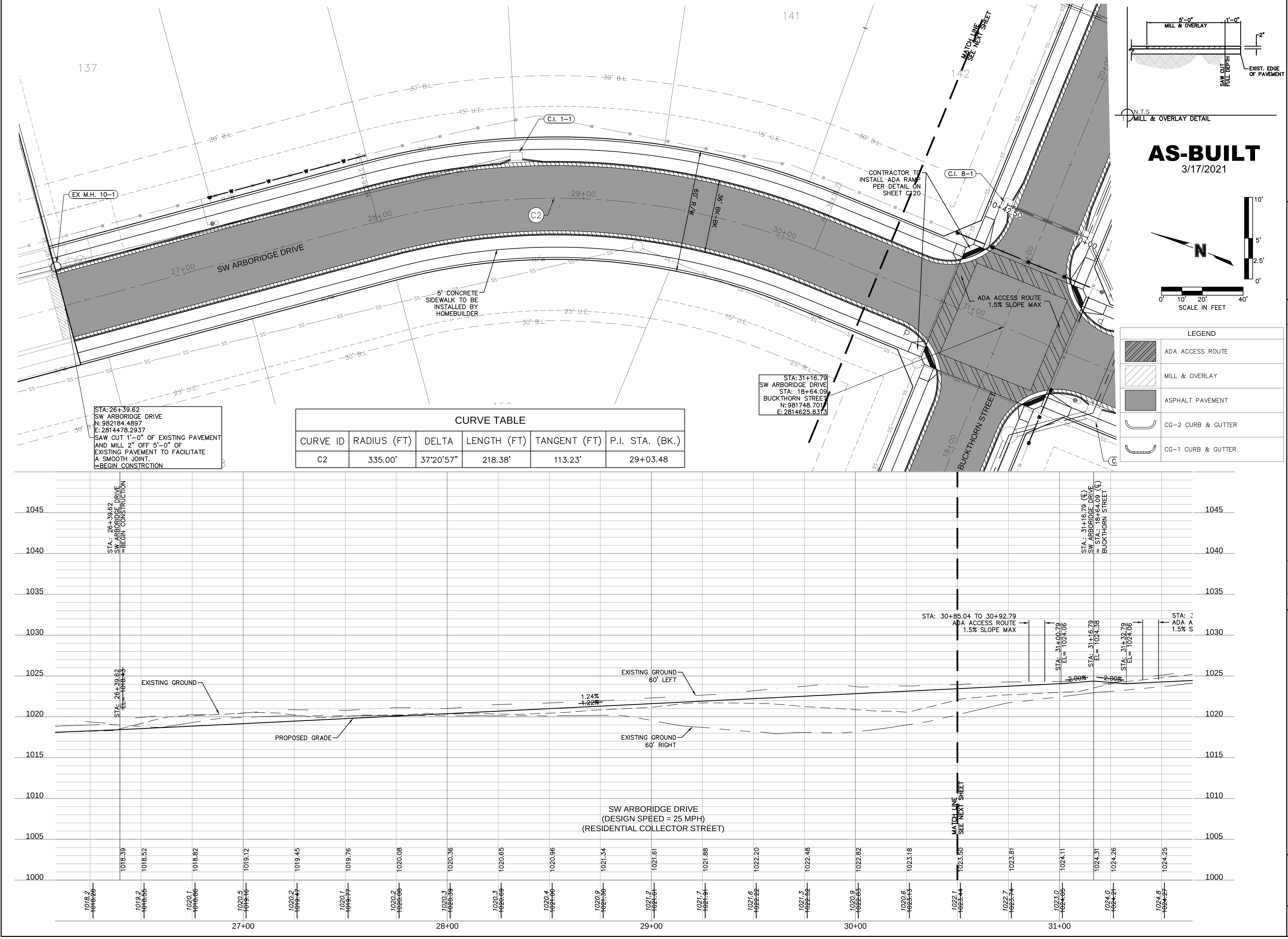
HAWTHORN RIDGE
SECOND PLAT

2019

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
C111


137
141
142
30' B.L.
15' U.E.
25' U.E.
C.I. 1-1
C.I. 8-1
EX M.H. 10-1
C2
27+00
28+00
29+00
30+00
31+00
SW ARBORIDGE DRIVE
BUCKTHORN STREET
60' R/W
36' BK-BK
MATCH LINE SEE NEXT SHEET
CONTRACTOR TO INSTALL ADA RAMP PER DETAIL ON SHEET C120
5' CONCRETE SIDEWALK TO BE INSTALLED BY HOMEBUILDER
ADA ACCESS ROUTE 1.5% SLOPE MAX
STA: 31+16.79
SW ARBORIDGE DRIVE
STA: 18+64.09
BUCKTHORN STREET
N: 981748.7011
E: 2814625.8373
5'-0" MILL & OVERLAY
1'-0"
2"
SAW CUT FULL DEPTH
EXIST. EDGE OF PAVEMENT
1 N.T.S. MILL & OVERLAY DETAIL
N
10'
5'
2.5'
0'
0' 10' 20' 40'
SCALE IN FEET
1045
1040
1035
1030
1025
1020
1015
1010
1005
1000
STA: 26+39.62 SW ARBORIDGE DRIVE =BEGIN CONSTRUCTION
STA: 26+39.62 EL= 1018.43
EXISTING GROUND
PROPOSED GRADE
EXISTING GROUND 60' LEFT
EXISTING GROUND 60' RIGHT
1.24%
1.22%
STA: 30+85.04 TO 30+92.79 ADA ACCESS ROUTE 1.5% SLOPE MAX
STA: 31+00.79 EL= 1024.06
STA: 31+16.79 EL= 1024.38
STA: 31+32.79 EL= 1024.06
STA: 31+16.79 (℄) SW ARBORIDGE DRIVE = STA: 18+64.09 (℄) BUCKTHORN STREET
2.00%
2.00%
SW ARBORIDGE DRIVE
(DESIGN SPEED = 25 MPH)
(RESIDENTIAL COLLECTOR STREET)
1018.39
1018.52
1018.82
1019.12
1019.45
1019.76
1020.08
1020.36
1020.65
1020.96
1021.34
1021.61
1021.88
1022.20
1022.48
1022.82
1023.18
1023.50
1023.81
1024.11
1024.31
1024.26
1024.25
1018.2
1019.2
1020.1
1020.5
1020.2
1020.1
1020.2
1020.3
1020.3
1020.4
1020.9
1021.2
1021.7
1021.6
1021.3
1020.9
1020.6
1022.1
1022.7
1023.0
1024.0
1024.8

AS-BUILT
3/17/2021

STA: 26+39.62
SW ARBORIDGE DRIVE
N: 982184.4897
E: 2814478.2937
SAW CUT 1'-0" OF EXISTING PAVEMENT AND MILL 2" OFF 5'-0" OF EXISTING PAVEMENT TO FACILITATE A SMOOTH JOINT.
=BEGIN CONSTRCTION

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

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

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TEL 816.361.1177
www.olsson.com

JULIE ELAINE SELLERS
NUMBER PE-2017000367
3/18/21
Julie Sellers
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
C112

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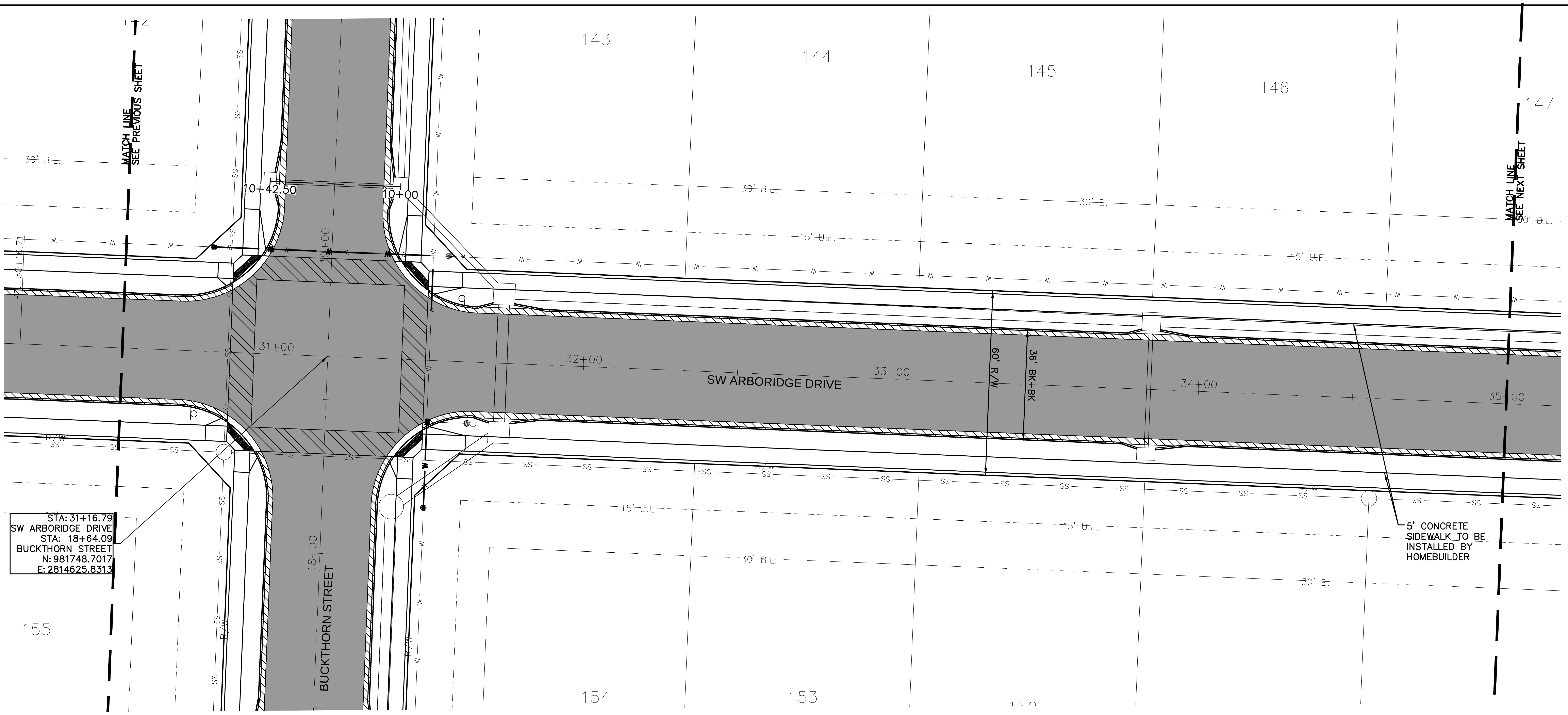
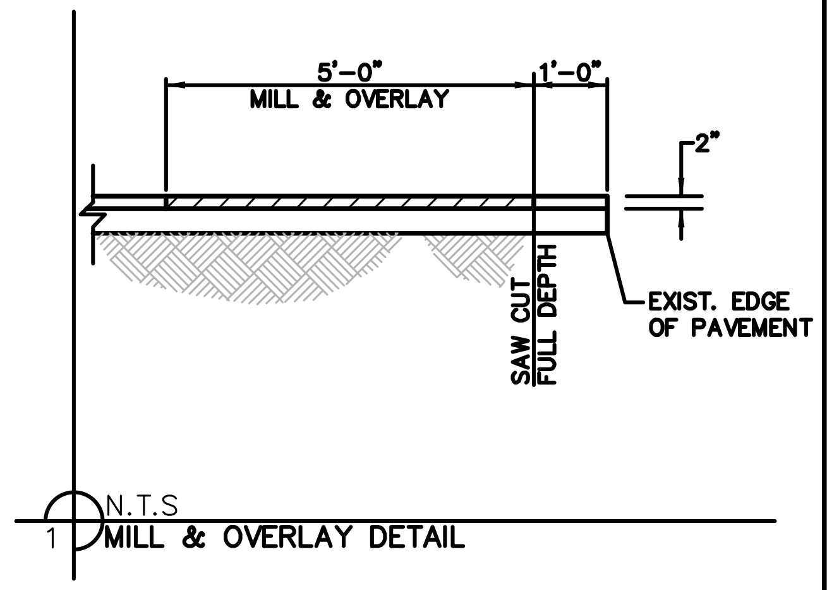
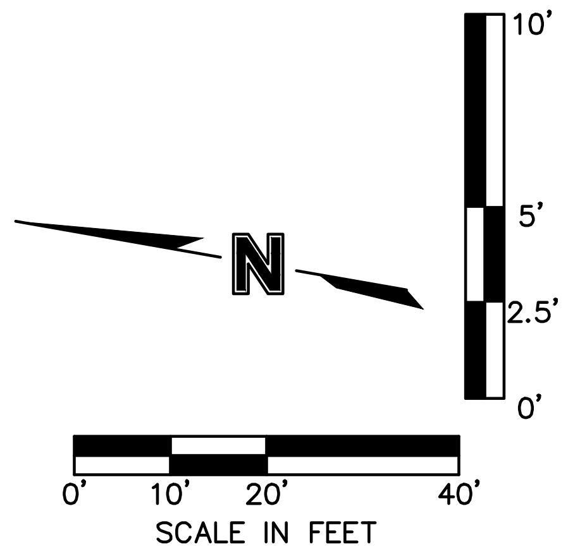

143
144
145
146
147
MATCH LINE SEE PREVIOUS SHEET
MATCH LINE SEE NEXT SHEET
30' B.L.
15' U.E.
10+42.50
10+00
31+00
32+00
33+00
34+00
35+00
SW ARBORIDGE DRIVE
60' R/W
36' BK-BK
18+00
BUCKTHORN STREET
STA: 31+16.79
SW ARBORIDGE DRIVE
STA: 18+64.09
BUCKTHORN STREET
N: 981748.7017
E: 2814625.8313
5' CONCRETE SIDEWALK TO BE INSTALLED BY HOMEBUILDER
155
154
153
R/W
SS
W
M


5'-0"
MILL & OVERLAY
1'-0"
2"
EXIST. EDGE OF PAVEMENT
SAW CUT FULL DEPTH

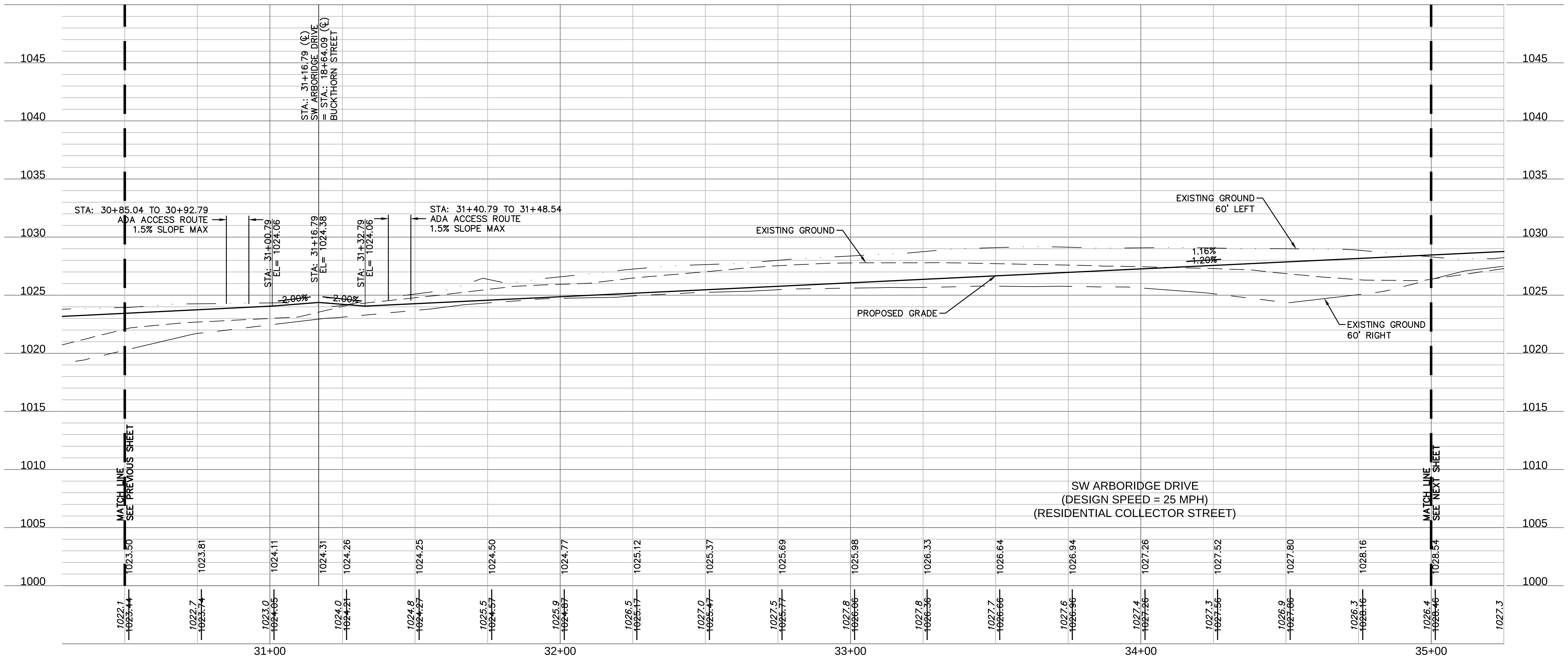
1 N.T.S
MILL & OVERLAY DETAIL


N
10'
5'
2.5'
0'
0'
10'
20'
40'

SCALE IN FEET

LEGEND	
▨	ADA ACCESS ROUTE
▨	MILL & OVERLAY
■	ASPHALT PAVEMENT
◡	CG–2 CURB & GUTTER
◡	CG–1 CURB & GUTTER

AS-BUILT
3/17/2021



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STATE OF MISSOURI
JULIE ELAINE SELLERS
NUMBER PE-2017000367
3/18/21
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\As-Built\Sheets\GNCV\STREET, STORM & SITE DISTURBANCE\C_RPP02_0191605.dwg USER: bworthley
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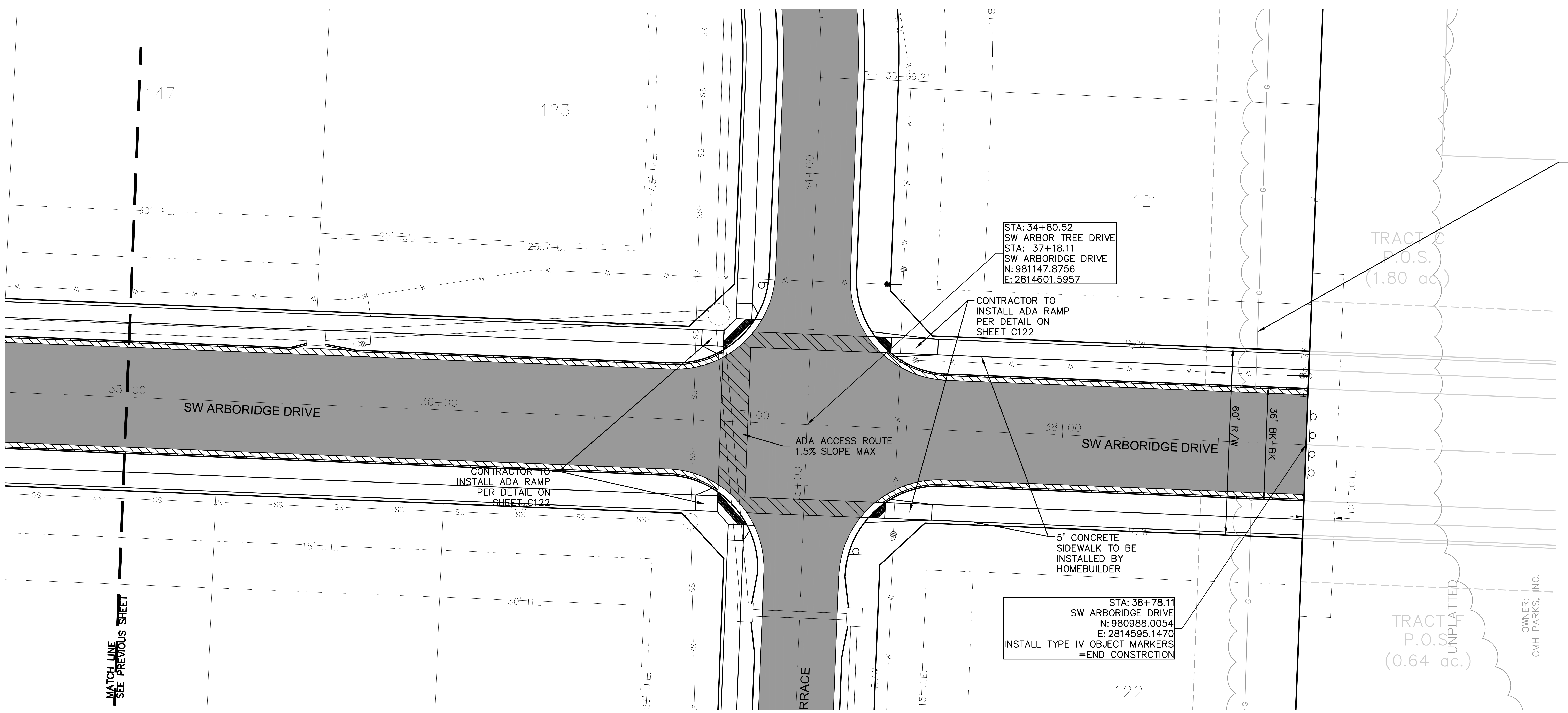
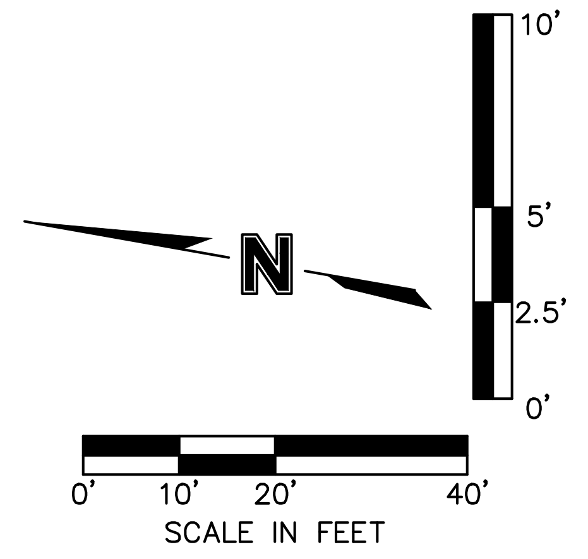
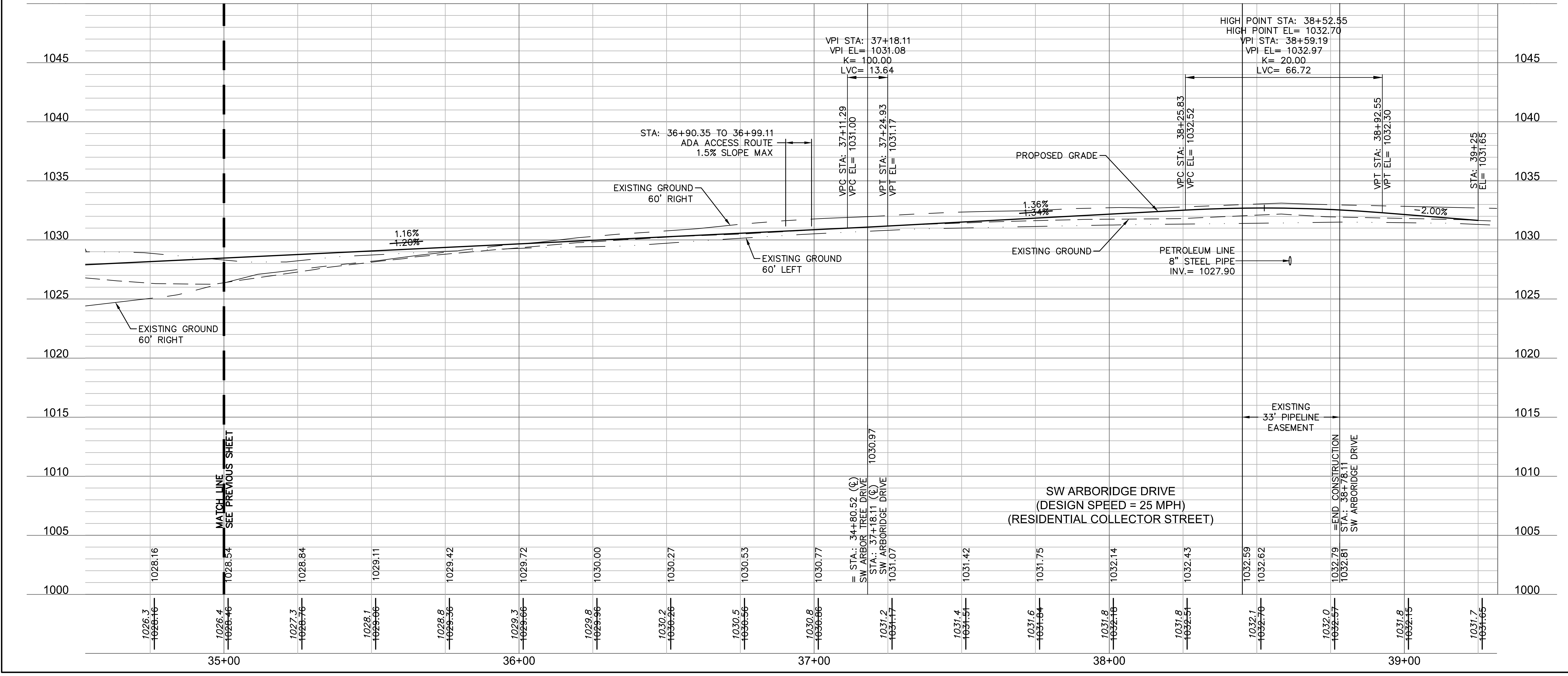

147
123
121
122
PT: 33+69.21
34+00
35+00
36+00
38+00
30' B.L.
25' B.L.
23.5' U.E.
27.5' U.E.
15' U.E.
30' B.L.
23' U.E.
15' U.E.
10' T.C.E.
SW ARBORIDGE DRIVE
SW ARBORIDGE DRIVE
TERRACE
TRACT C
P.O.S.
(1.80 ac.)
TRACT
P.O.S.
(0.64 ac.)
UNPLATTED
OWNER:
CMH PARKS, INC.
60' R/W
36' BK–BK
STA: 34+80.52
SW ARBOR TREE DRIVE
STA: 37+18.11
SW ARBORIDGE DRIVE
N: 981147.8756
E: 2814601.5957
CONTRACTOR TO
INSTALL ADA RAMP
PER DETAIL ON
SHEET C122
CONTRACTOR TO
INSTALL ADA RAMP
PER DETAIL ON
SHEET C122
ADA ACCESS ROUTE
1.5% SLOPE MAX
5' CONCRETE
SIDEWALK TO BE
INSTALLED BY
HOMEBUILDER
STA: 38+78.11
SW ARBORIDGE DRIVE
N: 980988.0054
E: 2814595.1470
INSTALL TYPE IV OBJECT MARKERS
=END CONSTRCTION
MATCH LINE
SEE PREVIOUS SHEET

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.


10'
5'
2.5'
0'
N
0'
10'
20'
40'
SCALE IN FEET

LEGEND	
▨	ADA ACCESS ROUTE
▨	MILL & OVERLAY
■	ASPHALT PAVEMENT
◡	CG–2 CURB & GUTTER
◡	CG–1 CURB & GUTTER

AS-BUILT
3/17/2021



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TEL 816.361.1177
www.olsson.com

JULIE ELAINE SELLERS
NUMBER PE-2017000367
3/18/21

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

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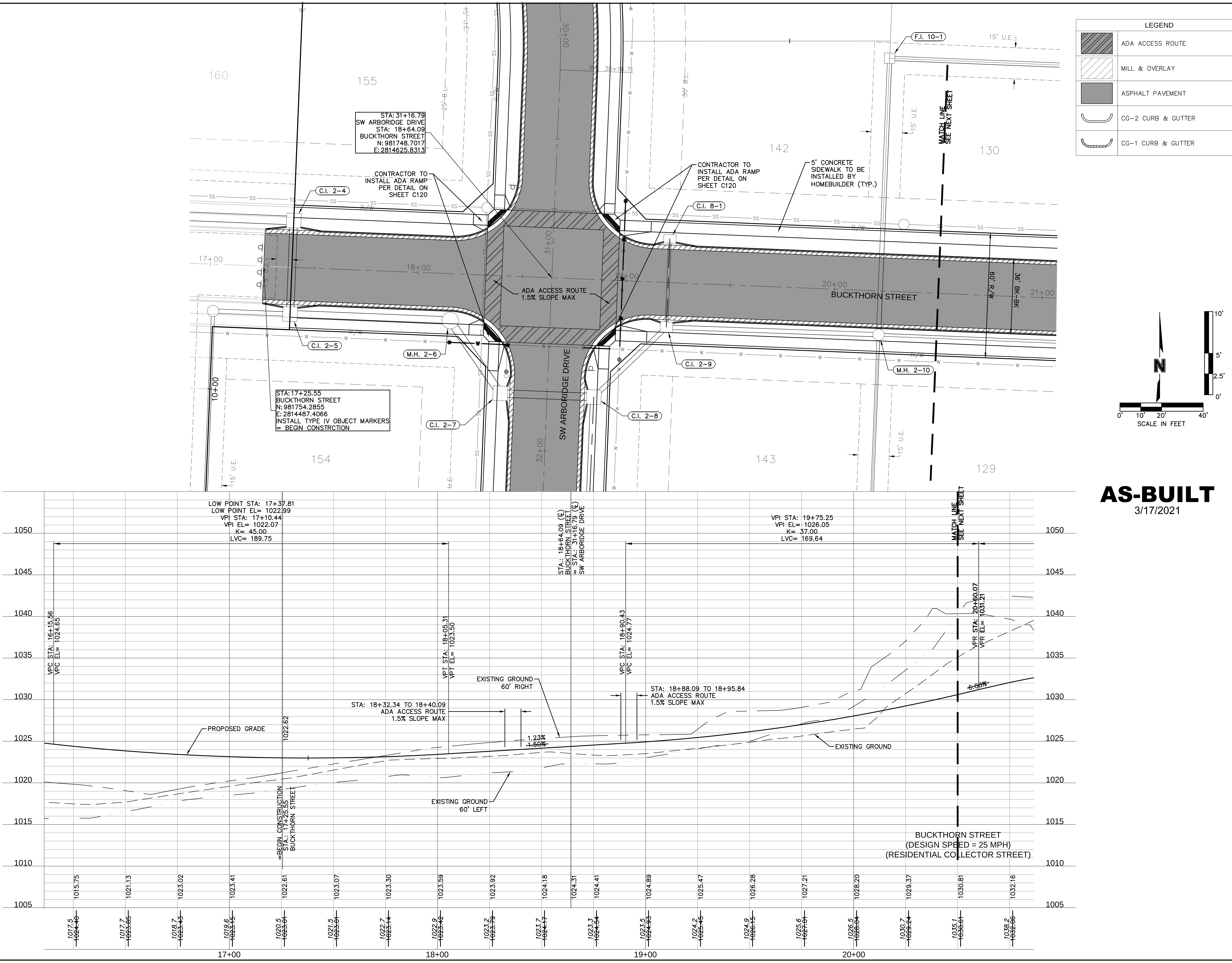

160
155
142
130
154
143
129
30+00
31+00
32+00
17+00
18+00
19+00
20+00
21+00
10+00
PI 30+16.71
30' B.L.
25' B.L.
15' U.E.
R/W
SS
W
F.I. 10-1
MATCH LINE SEE NEXT SHEET
STA: 31+16.79
SW ARBORIDGE DRIVE
STA: 18+64.09
BUCKTHORN STREET
N: 981748.7017
E: 2814625.8313
CONTRACTOR TO INSTALL ADA RAMP PER DETAIL ON SHEET C120
CONTRACTOR TO INSTALL ADA RAMP PER DETAIL ON SHEET C120
5' CONCRETE SIDEWALK TO BE INSTALLED BY HOMEBUILDER (TYP.)
C.I. 2-4
C.I. 8-1
C.I. 2-5
C.I. 2-6
C.I. 2-7
C.I. 2-8
C.I. 2-9
M.H. 2-6
M.H. 2-10
ADA ACCESS ROUTE 1.5% SLOPE MAX
BUCKTHORN STREET
SW ARBORIDGE DRIVE
60' R/W
36' BK-BK
STA:17+25.55
BUCKTHORN STREET
N: 981754.2855
E: 2814487.4066
INSTALL TYPE IV OBJECT MARKERS
= BEGIN CONSTRCTION
N
0' 10' 20' 40'
SCALE IN FEET
10' 5' 2.5' 0'
LOW POINT STA: 17+37.81
LOW POINT EL= 1022.99
VPI STA: 17+10.44
VPI EL= 1022.07
K= 45.00
LVC= 189.75
VPI STA: 19+75.25
VPI EL= 1026.05
K= 37.00
LVC= 169.64
STA.: 18+64.09 (℄) BUCKTHORN STREET = STA.: 31+16.79 (℄) SW ARBORIDGE DRIVE
MATCH LINE SEE NEXT SHEET
VPC STA: 16+15.56
VPC EL= 1024.65
VPT STA: 18+05.31
VPT EL= 1023.50
VPC STA: 18+90.43
VPC EL= 1024.77
VPR STA: 20+60.07
VPR EL= 1031.21
EXISTING GROUND 60' RIGHT
STA: 18+32.34 TO 18+40.09
ADA ACCESS ROUTE
1.5% SLOPE MAX
STA: 18+88.09 TO 18+95.84
ADA ACCESS ROUTE
1.5% SLOPE MAX
1.23%
~~1.50%~~
6.00%
PROPOSED GRADE
EXISTING GROUND
EXISTING GROUND 60' LEFT
1022.62
=BEGIN CONSTRUCTION
STA.: 17+25.55
BUCKTHORN STREET
1050
1045
1040
1035
1030
1025
1020
1015
1010
1005
BUCKTHORN STREET
(DESIGN SPEED = 25 MPH)
(RESIDENTIAL COLLECTOR STREET)
1015.75
1021.13
1023.02
1023.41
1022.61
1023.07
1023.30
1023.59
1023.92
1024.18
1024.31
1024.41
1024.89
1025.47
1026.28
1027.21
1028.20
1029.37
1030.81
1032.16
1017.5 ~~1024.40~~
1017.7 ~~1023.85~~
1018.7 ~~1023.43~~
1019.6 ~~1023.15~~
1020.5 ~~1023.01~~
1021.5 ~~1023.01~~
1022.7 ~~1023.14~~
1022.9 ~~1023.42~~
1023.2 ~~1023.79~~
1023.7 ~~1024.17~~
1023.3 ~~1024.54~~
1023.5 ~~1024.93~~
1024.2 ~~1025.45~~
1024.9 ~~1026.15~~
1025.6 ~~1027.01~~
1026.5 ~~1028.04~~
1030.7 ~~1029.24~~
1035.1 ~~1030.61~~
1038.2 ~~1032.06~~
17+00
18+00
19+00
20+00

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

AS-BUILT
3/17/2021

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1301 BURLINGTON, SUITE 100
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
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JULIE ELAINE SELLERS
NUMBER PE-2017000367
3/18/21
Julie Sellers

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

REVISIONS

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

2019

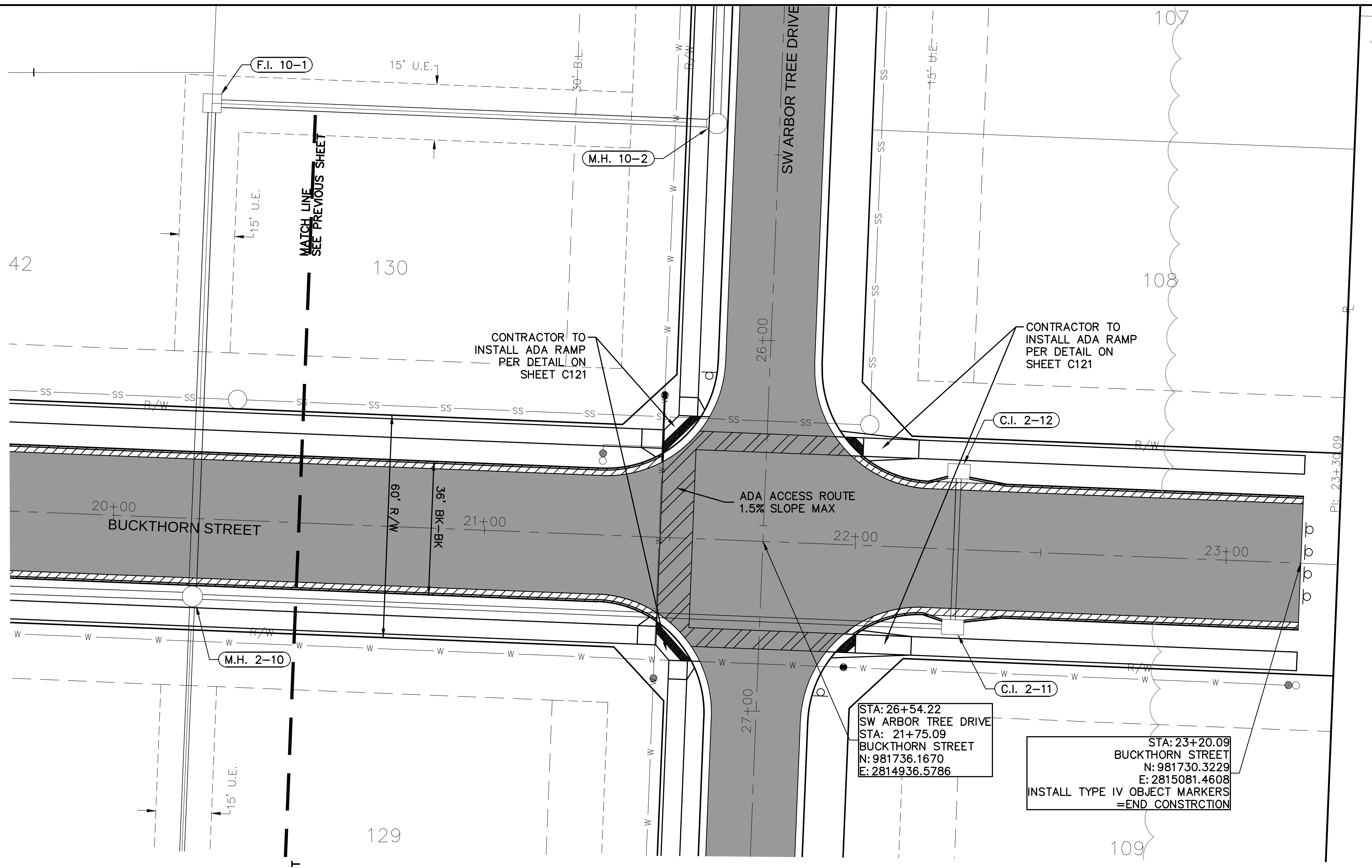
ROAD PLAN & PROFILE
STREET & STORM SEWER PLANS

HAWTHORN RIDGE
SECOND PLAT

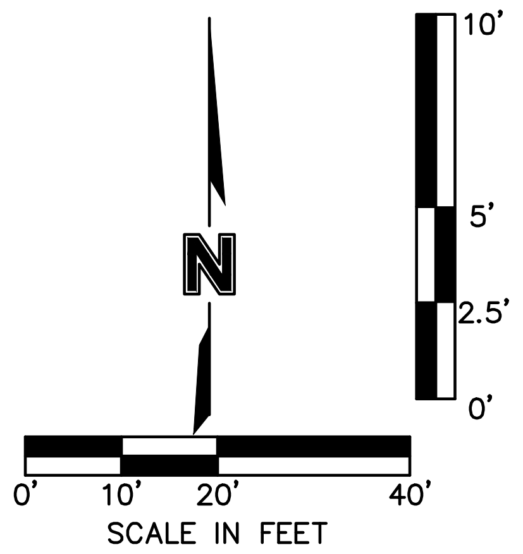
LEE'S SUMMIT, MISSOURI

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

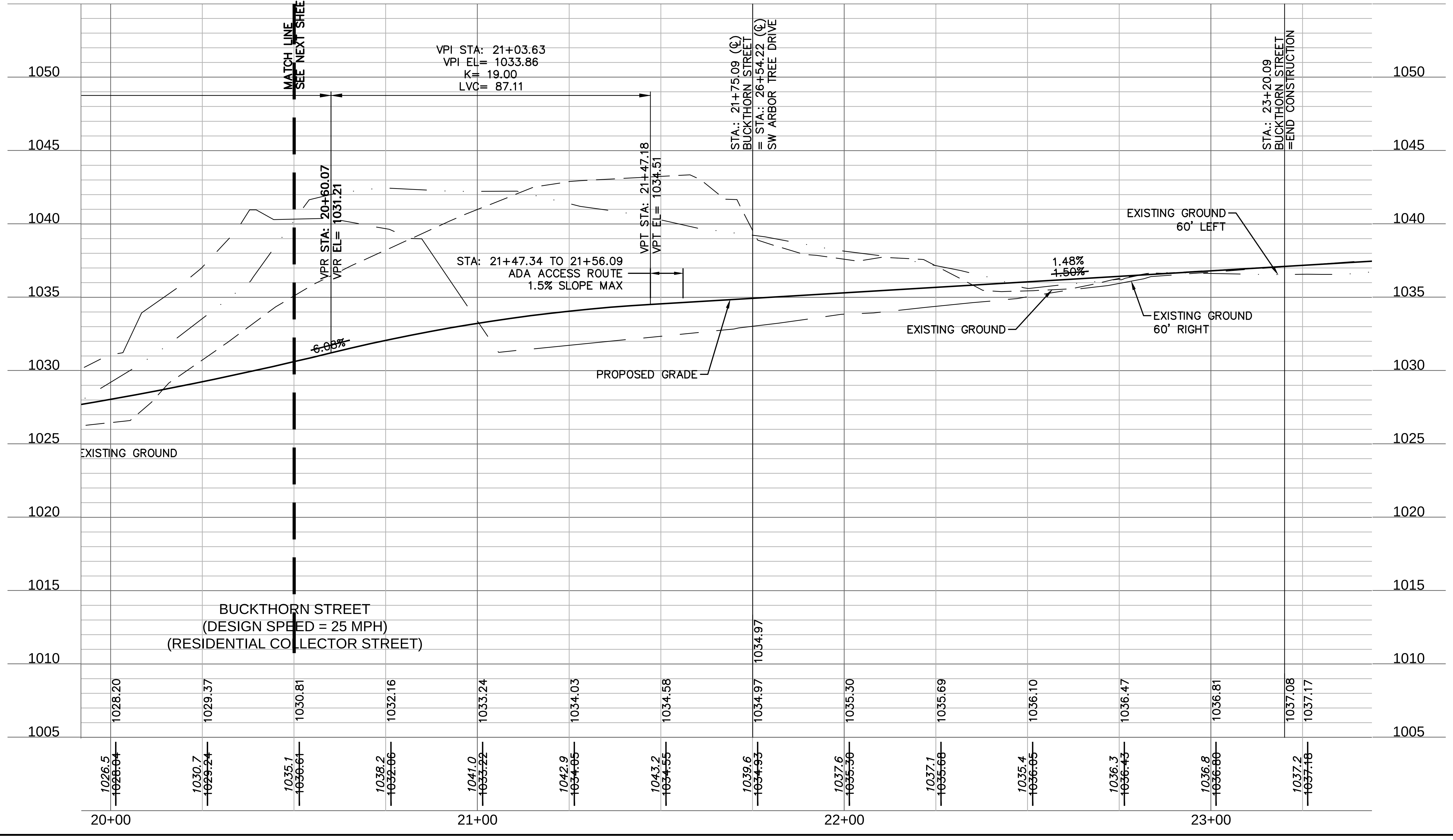
SHEET
C115


F.I. 10-1
15' U.E.
30' B.L.
R/W
SW ARBOR TREE DRIVE
107
M.H. 10-2
MATCH LINE SEE PREVIOUS SHEET
15' U.E.
42
130
108
CONTRACTOR TO INSTALL ADA RAMP PER DETAIL ON SHEET C121
CONTRACTOR TO INSTALL ADA RAMP PER DETAIL ON SHEET C121
26+00
C.I. 2-12
PI: 23+30.09
20+00
BUCKTHORN STREET
60' R/W
36' BK-BK
21+00
ADA ACCESS ROUTE 1.5% SLOPE MAX
22+00
23+00
M.H. 2-10
C.I. 2-11
27+00
STA: 26+54.22 SW ARBOR TREE DRIVE STA: 21+75.09 BUCKTHORN STREET N: 981736.1670 E: 2814936.5786
STA: 23+20.09 BUCKTHORN STREET N: 981730.3229 E: 2815081.4608 INSTALL TYPE IV OBJECT MARKERS =END CONSTRCTION
15' U.E.
129
109

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


N
10'
5'
2.5'
0'
0'
10'
20'
40'
SCALE IN FEET

AS-BUILT
3/17/2021



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DATE: Mar 16, 2021 8:43pm 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

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1301 BURLINGTON, SUITE 100
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
www.olsson.com

JULIE ELAINE SELLERS
NUMBER PE-2017000367
3/18/21

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

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

ROAD PLAN & PROFILE
STREET & STORM SEWER PLANS

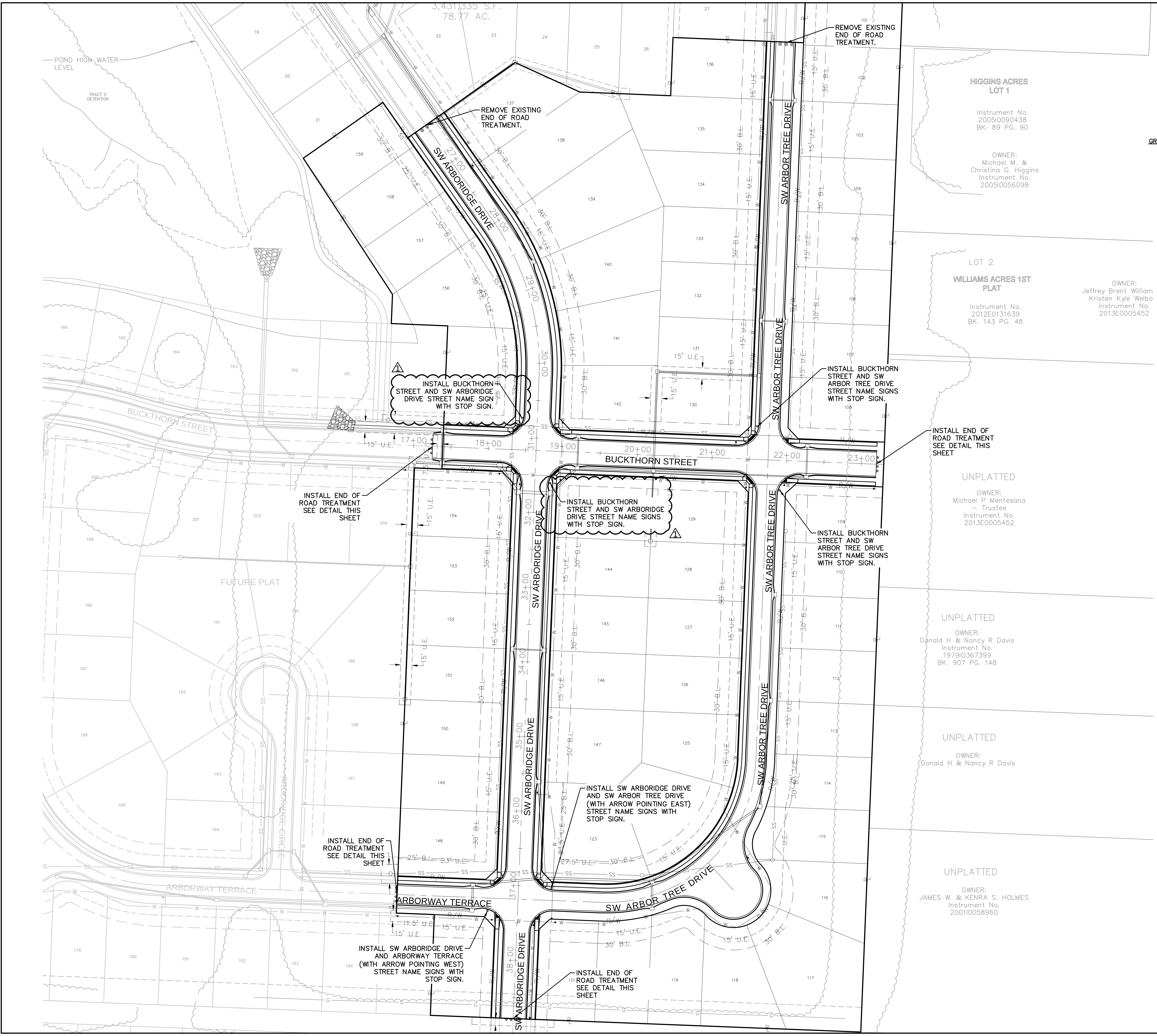
HAWTHORN RIDGE
SECOND PLAT

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


SW ARBORIDGE DRIVE
SW ARBOR TREE DRIVE
BUCKTHORN STREET
ARBORWAY TERRACE
ARBORIDGE CIRCLE
17+00
18+00
19+00
20+00
21+00
22+00
23+00
27+00
28+00
29+00
30+00
31+00
32+00
33+00
34+00
35+00
36+00
37+00
38+00
POND HIGH WATER LEVEL
TRACT E DETENTION
3,431,335 S.F.
78.77 AC.
FUTURE PLAT
HIGGINS ACRES LOT 1
Instrument No. 2005I0090438 BK. 89 PG. 90
OWNER: Michael M. & Christina G. Higgins Instrument No. 2005I0056098
LOT 2
WILLIAMS ACRES 1ST PLAT
Instrument No. 2012E0131639 BK. 143 PG. 48
OWNER: Jeffrey Brent William Kristen Kyle Welbo Instrument No. 2013E0005452
UNPLATTED
OWNER: Michael P Mentesana – Trustee Instrument No. 2013E0005452
UNPLATTED
OWNER: Donald H & Nancy R Davis Instrument No. 1979I0367399 BK. 907 PG. 148
UNPLATTED
OWNER: Donald H & Nancy R Davis
UNPLATTED
OWNER: JAMES W. & KENRA S. HOLMES Instrument No. 2001I0058960
30' B.L.
15' U.E.
25' B.L.
27.5' U.E.
11.5' U.E.
R/W
SS
W

REMOVE EXISTING END OF ROAD TREATMENT.

REMOVE EXISTING END OF ROAD TREATMENT.

INSTALL BUCKTHORN STREET AND SW ARBORIDGE DRIVE STREET NAME SIGN WITH STOP SIGN. ⚠

INSTALL BUCKTHORN STREET AND SW ARBOR TREE DRIVE STREET NAME SIGNS WITH STOP SIGN.

INSTALL END OF ROAD TREATMENT SEE DETAIL THIS SHEET

INSTALL END OF ROAD TREATMENT SEE DETAIL THIS SHEET

INSTALL BUCKTHORN STREET AND SW ARBORIDGE DRIVE STREET NAME SIGNS WITH STOP SIGN. ⚠

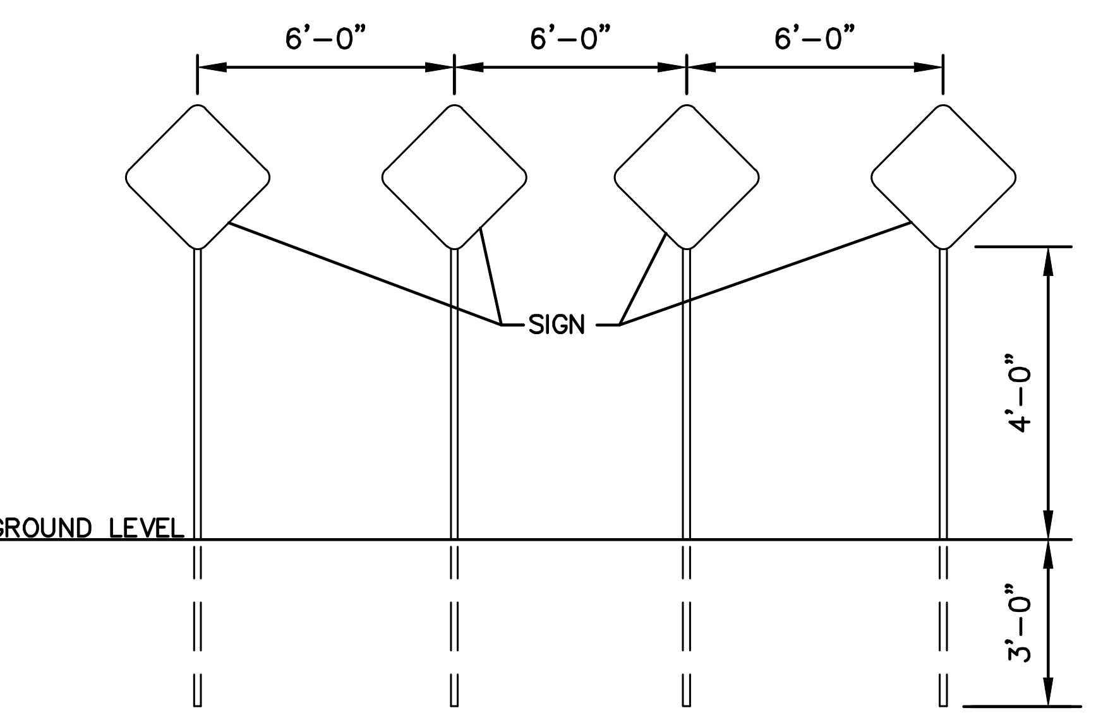
INSTALL BUCKTHORN STREET AND SW ARBOR TREE DRIVE STREET NAME SIGNS WITH STOP SIGN.

INSTALL SW ARBORIDGE DRIVE AND SW ARBOR TREE DRIVE (WITH ARROW POINTING EAST) STREET NAME SIGNS WITH STOP SIGN.

INSTALL END OF ROAD TREATMENT SEE DETAIL THIS SHEET

INSTALL SW ARBORIDGE DRIVE AND ARBORWAY TERRACE (WITH ARROW POINTING WEST) STREET NAME SIGNS WITH STOP SIGN.

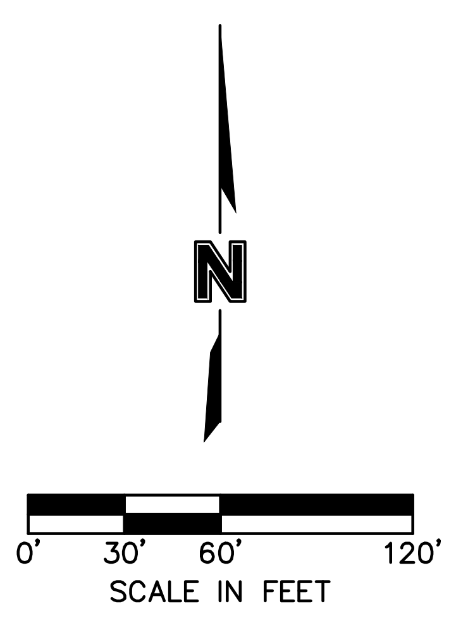
INSTALL END OF ROAD TREATMENT SEE DETAIL THIS SHEET


6'–0"
6'–0"
6'–0"
SIGN
GROUND LEVEL
4'–0"
3'–0"

END OF ROAD TREATMENT
N.T.S.

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

NOT AS-BUILT


N
0'
30'
60'
120'
SCALE IN FEET

DWG: F:\2019\1501–2000\019–1605\40–Design\AutoCAD\As–Built\Sheets\GNCV\STREET, STORM & SITE DISTURBANCE\C_TRC01_0191605.dwg USER: bworthley
DATE: Feb 15, 2021 12:09pm XREFS: C_PTBLK_0191605 C_PBNDY_0191605 C_PBASE_0191605 C_XBASE_0191605 C_FBASE_0191605 C_PUTIL_0191605

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JULIE ELAINE SELLERS
NUMBER PE-2017000367
3/18/21

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

REVISIONS

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

TRAFFIC CONTROL
STREET & STORM SEWER PLANS

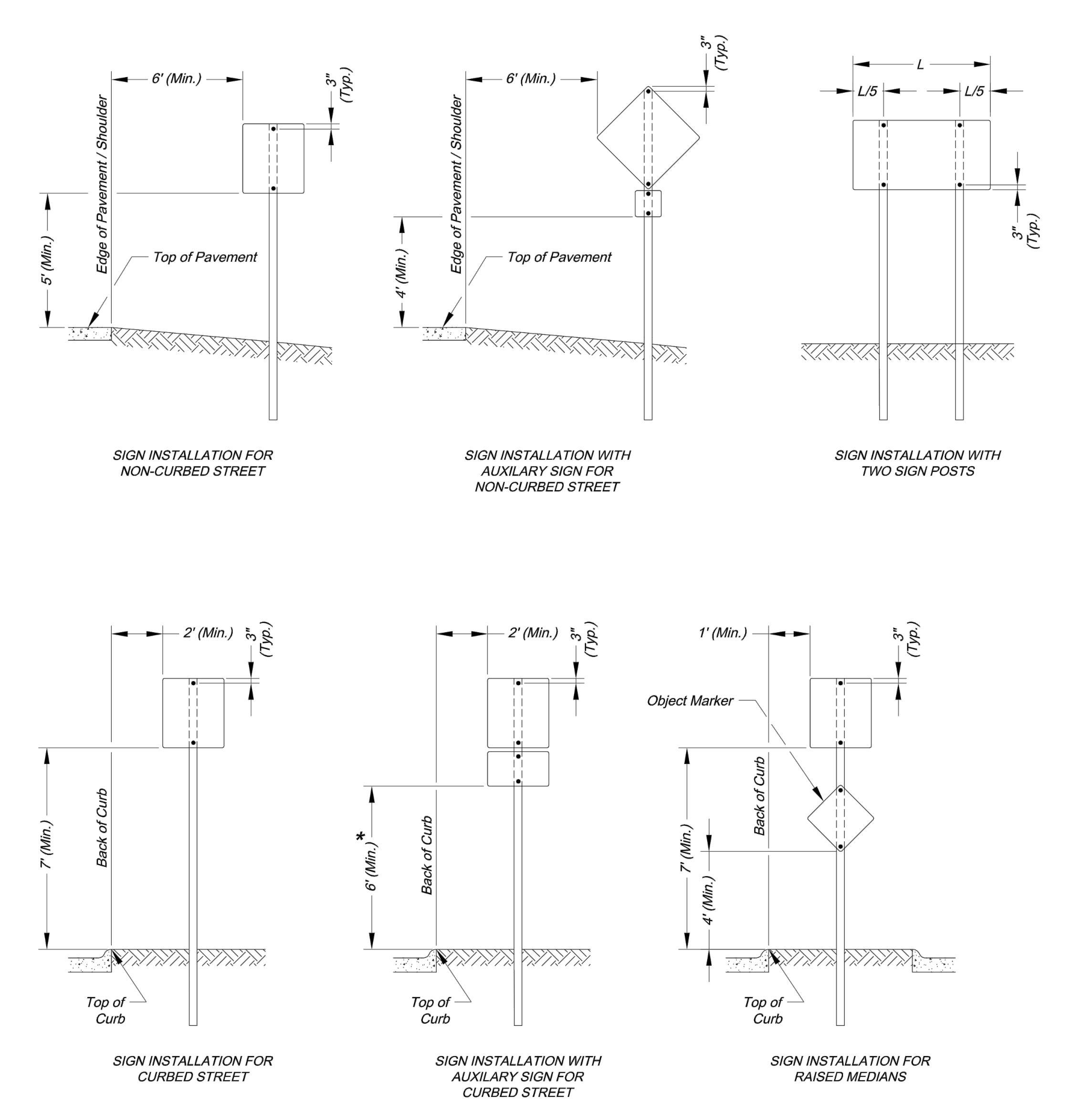
HAWTHORN RIDGE
SECOND PLAT

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
C117


6' (Min.)
3" (Typ.)
Edge of Pavement / Shoulder
5' (Min.)
4' (Min.)
Top of Pavement
L
L/5
2' (Min.)
1' (Min.)
Object Marker
Back of Curb
7' (Min.)
6' (Min.)
4' (Min.)
Top of Curb

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

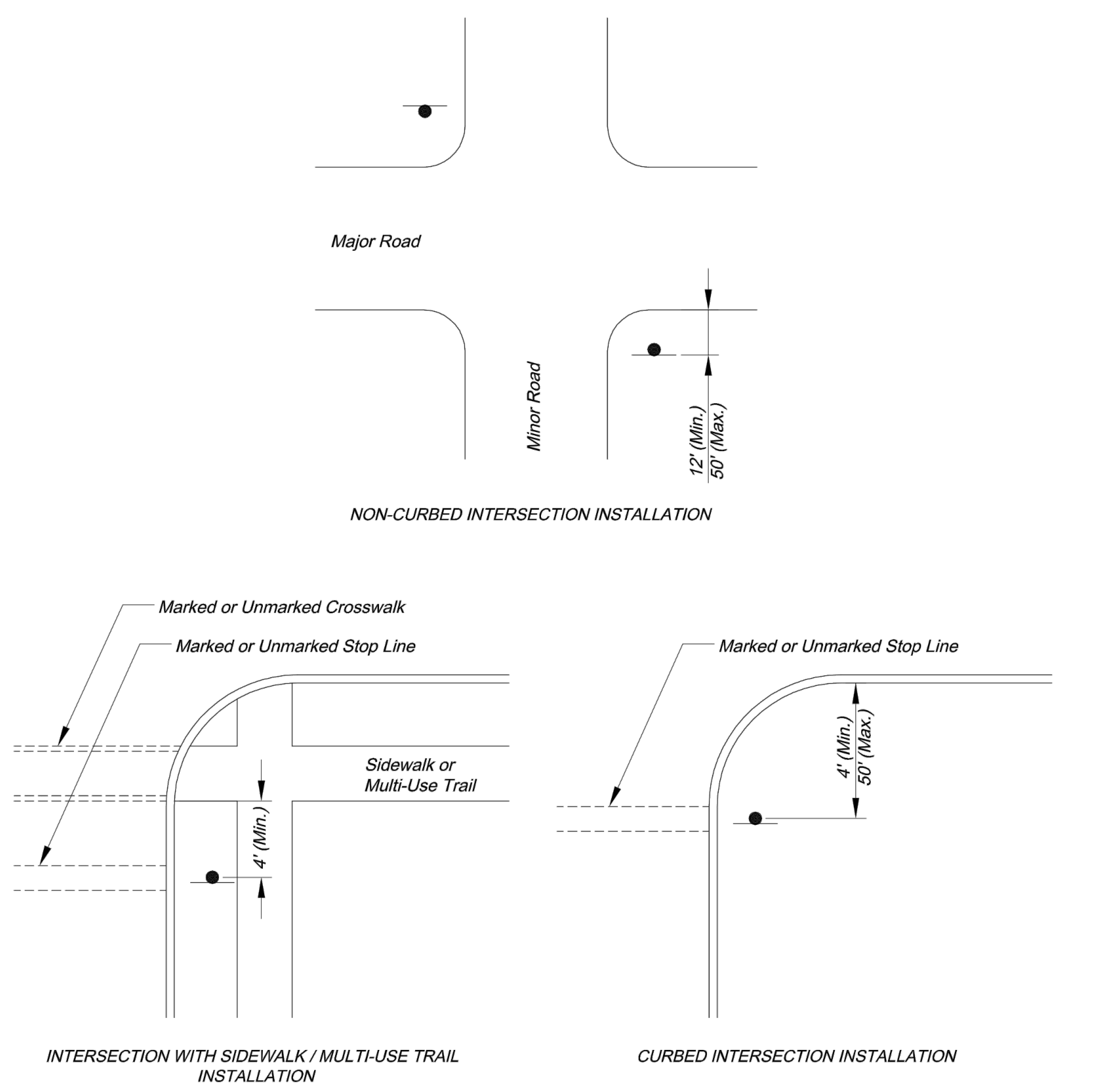
SIGN INSTALLATION WITH AUXILARY SIGN FOR CURBED STREET

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.

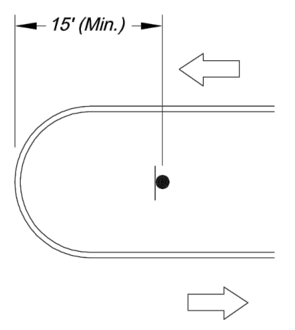

Major Road
Minor Road
12' (Min.)
50' (Max.)
Marked or Unmarked Crosswalk
Marked or Unmarked Stop Line
Sidewalk or Multi-Use Trail
4' (Min.)
4' (Min.)
50' (Max.)

NON-CURBED INTERSECTION INSTALLATION

INTERSECTION WITH SIDEWALK / MULTI-USE TRAIL INSTALLATION

CURBED INTERSECTION INSTALLATION

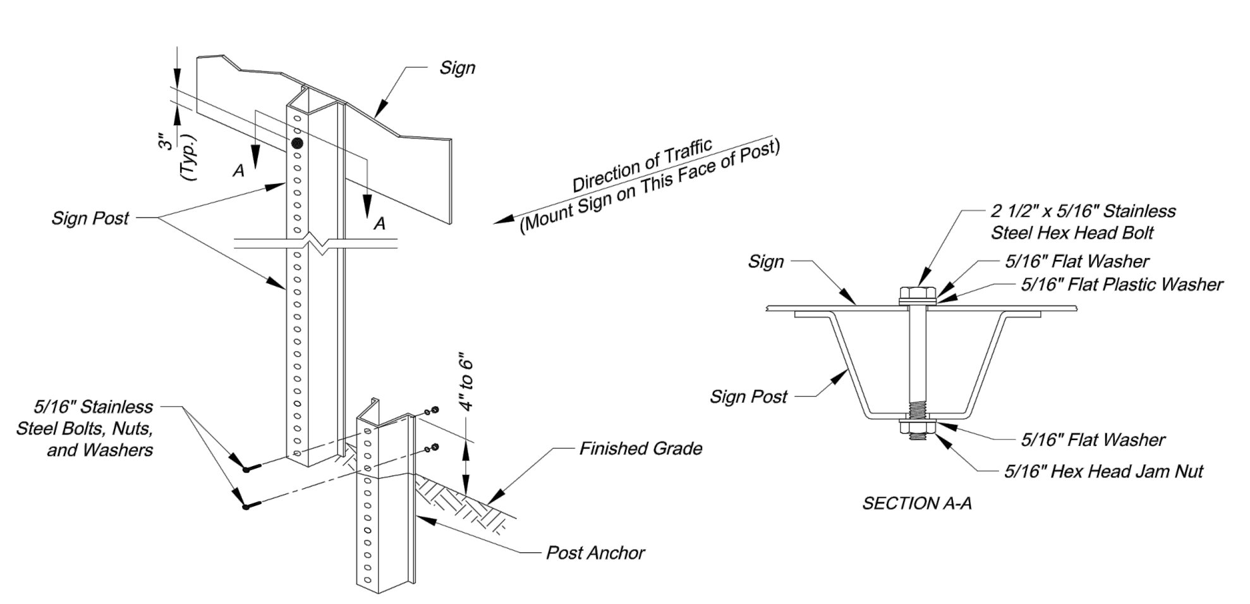
CONTROL SIGN LOCATION



TYPICAL MEDIAN SIGN LOCATION

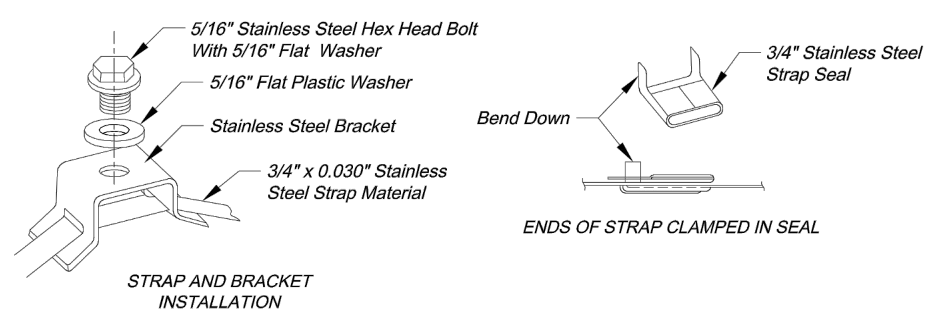
MEDIAN SIGN LOCATION

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.


Sign
Direction of Traffic (Mount Sign on This Face of Post)
3" (Typ.)
Sign Post
A
5/16" Stainless Steel Bolts, Nuts, and Washers
4" to 6"
Finished Grade
Post Anchor
2 1/2" x 5/16" Stainless Steel Hex Head Bolt
5/16" Flat Washer
5/16" Flat Plastic Washer
5/16" Flat Washer
5/16" Hex Head Jam Nut
SECTION A-A

U-STEEL POST DETAILS

U-STEEL POST NOTES:
1. Splice shall be positioned entirely between finished grade line and 18" 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.


5/16" Stainless Steel Hex Head Bolt With 5/16" Flat Washer
5/16" Flat Plastic Washer
Stainless Steel Bracket
3/4" x 0.030" Stainless Steel Strap Material
Bend Down
3/4" Stainless Steel Strap Seal

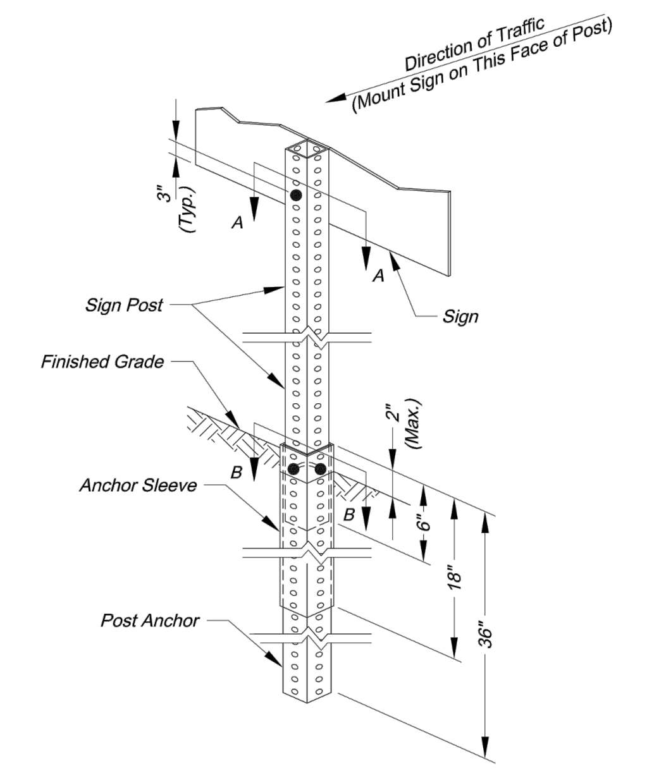
STRAP AND BRACKET INSTALLATION

ENDS OF STRAP CLAMPED IN SEAL

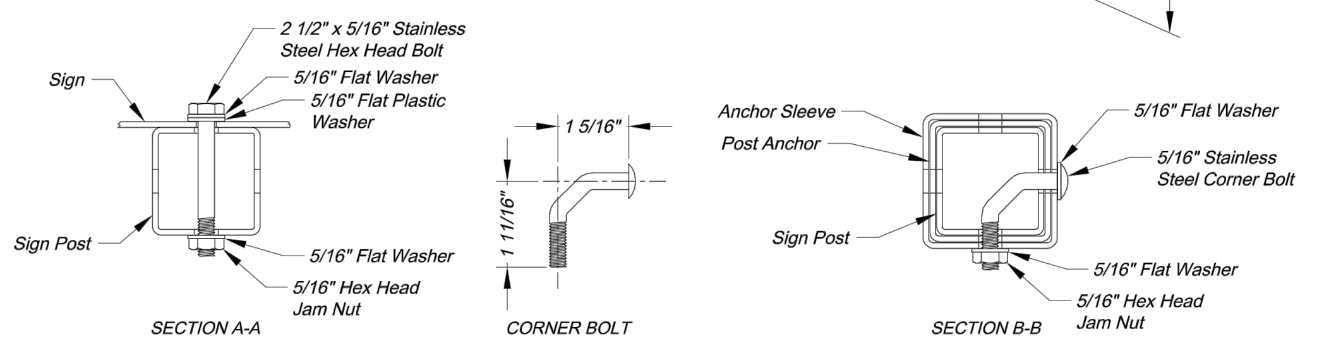
STRAP TYPE SIGN SUPPORT DETAILS

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.

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.


Direction of Traffic (Mount Sign on This Face of Post)
3" (Typ.)
A
Sign Post
Sign
Finished Grade
2" (Max.)
B
Anchor Sleeve
6"
18"
36"
Post Anchor

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.


2 1/2" x 5/16" Stainless Steel Hex Head Bolt
Sign
5/16" Flat Washer
5/16" Flat Plastic Washer
Sign Post
5/16" Flat Washer
5/16" Hex Head Jam Nut
1 5/16"
1 11/16"
Anchor Sleeve
Post Anchor
Sign Post
5/16" Flat Washer
5/16" Stainless Steel Corner Bolt
5/16" Flat Washer
5/16" Hex Head Jam Nut

SECTION A-A

CORNER BOLT

SECTION B-B

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 1/4" x 2 1/4" 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.

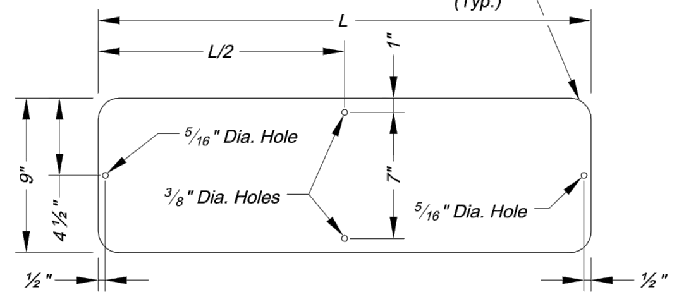
STANDARD ABBREVIATION LISTS

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

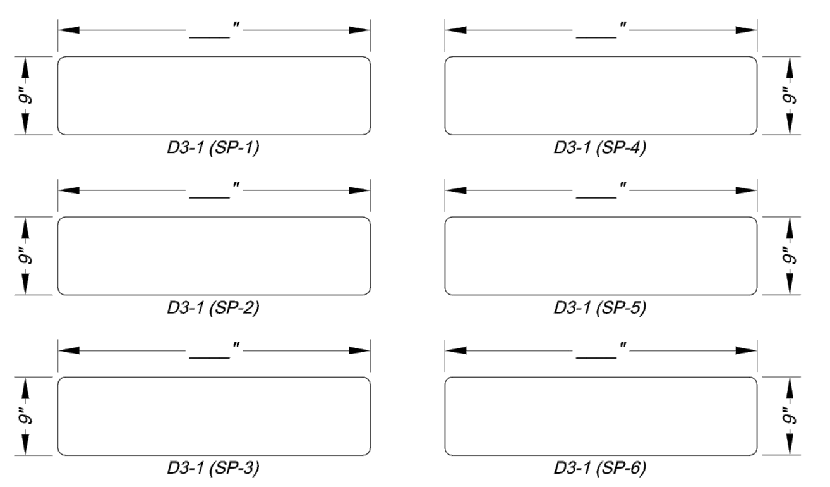
STREET NAME SIGN QUANTITIES

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			

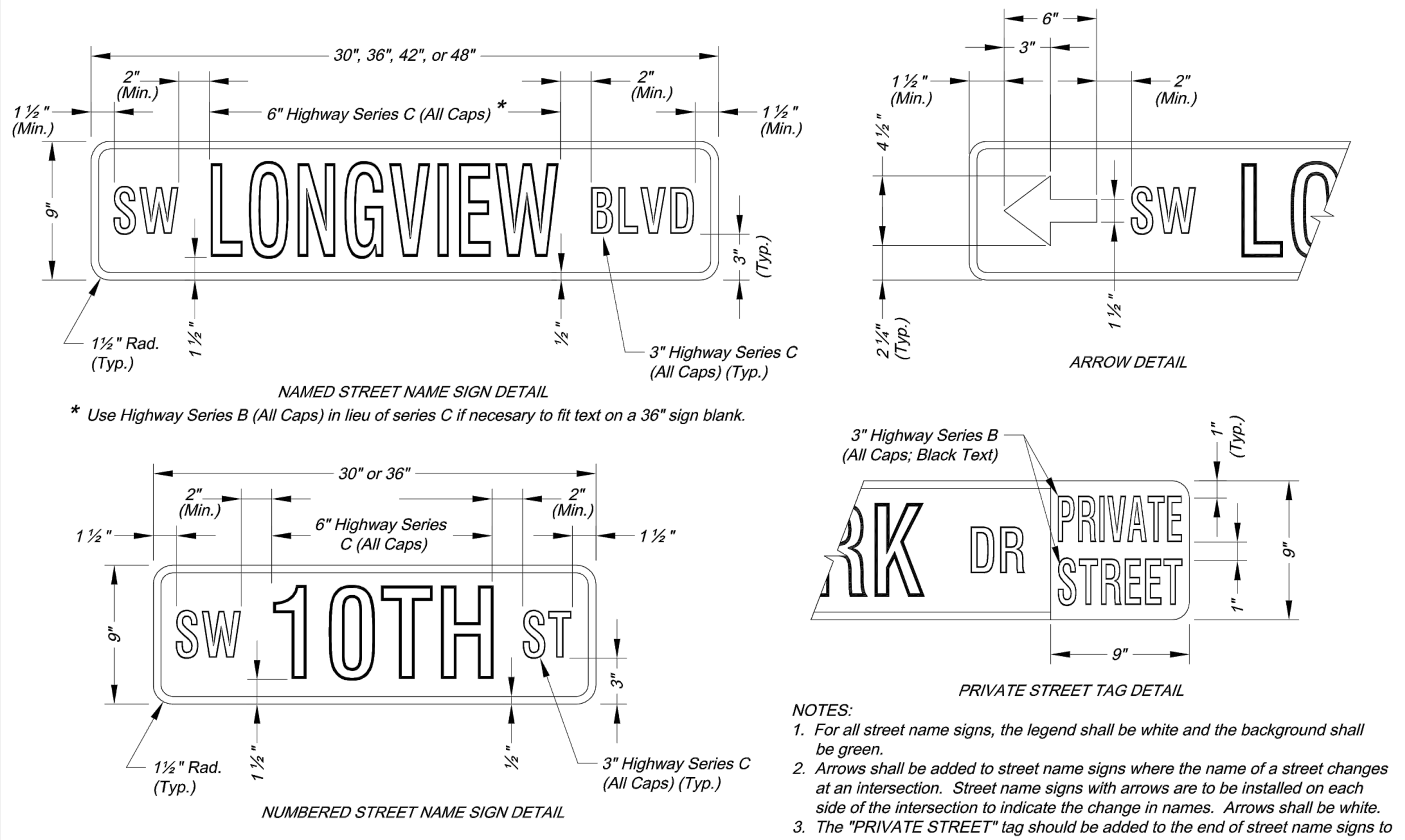

1½" Rad. (Typ.)
L
L/2
1"
5/16" Dia. Hole
3/8" Dia. Holes
7"
5/16" Dia. Hole
9"
4½"
½"
½"

STREET NAME SIGN BLANK DETAILS

For Mounting on Square Steel Posts


___"
9"
D3-1 (SP-1)
D3-1 (SP-2)
D3-1 (SP-3)
D3-1 (SP-4)
D3-1 (SP-5)
D3-1 (SP-6)

PROJECT SIGN DETAILS


30", 36", 42", or 48"
2" (Min.)
1½" (Min.)
6" Highway Series C (All Caps)
SW LONGVIEW BLVD
8"
3" (Typ.)
1½" Rad. (Typ.)
1½"
3" Highway Series C (All Caps) (Typ.)
6"
3"
SW LO
2" (Min.)
2¼" (Typ.)
1½"
30" or 36"
6" Highway Series C (All Caps)
SW 10TH ST
9"
3" Highway Series B (All Caps; Black Text)
RK DR PRIVATE STREET
1" (Typ.)
1"
9"

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.

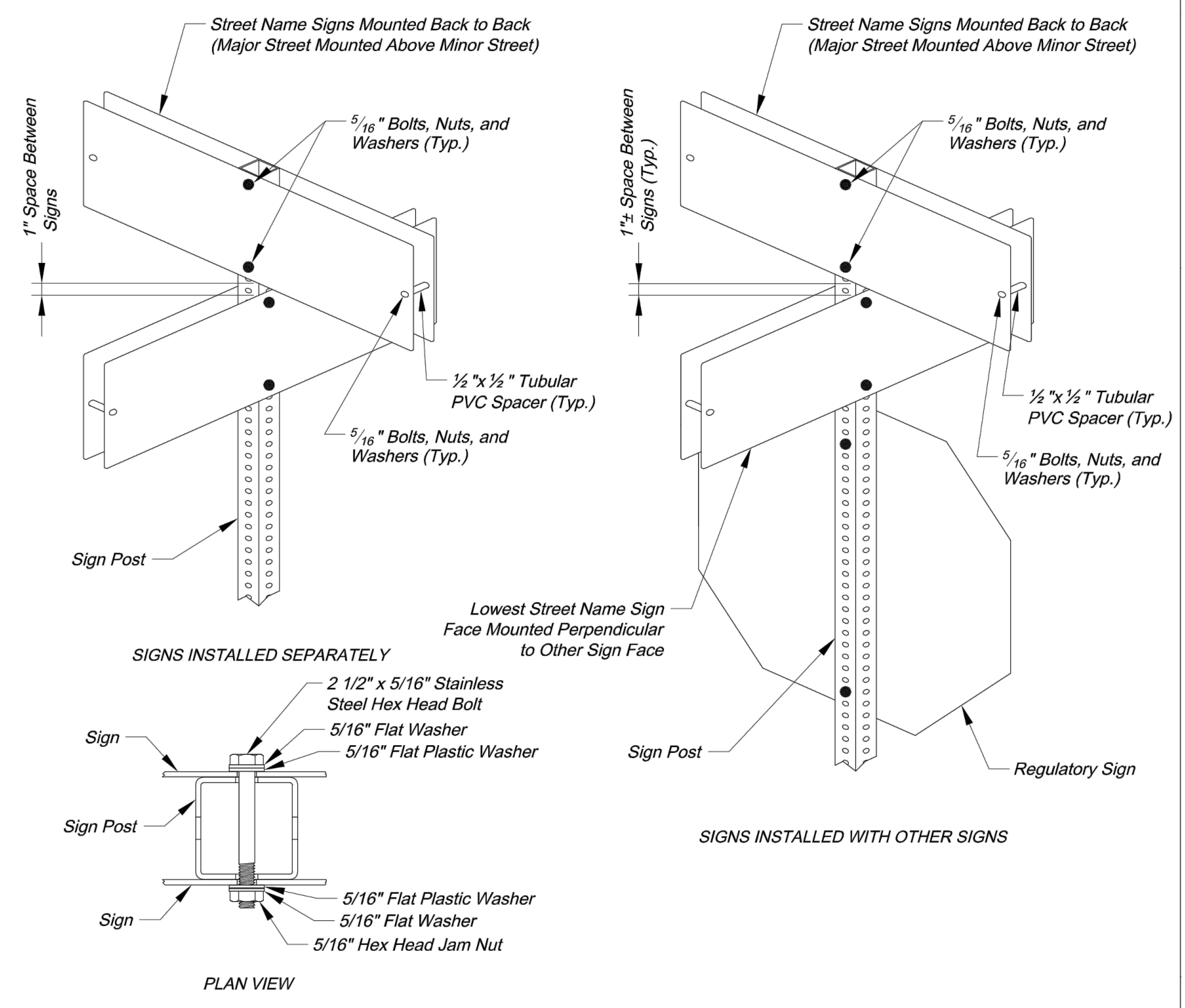
ARROW DETAIL

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

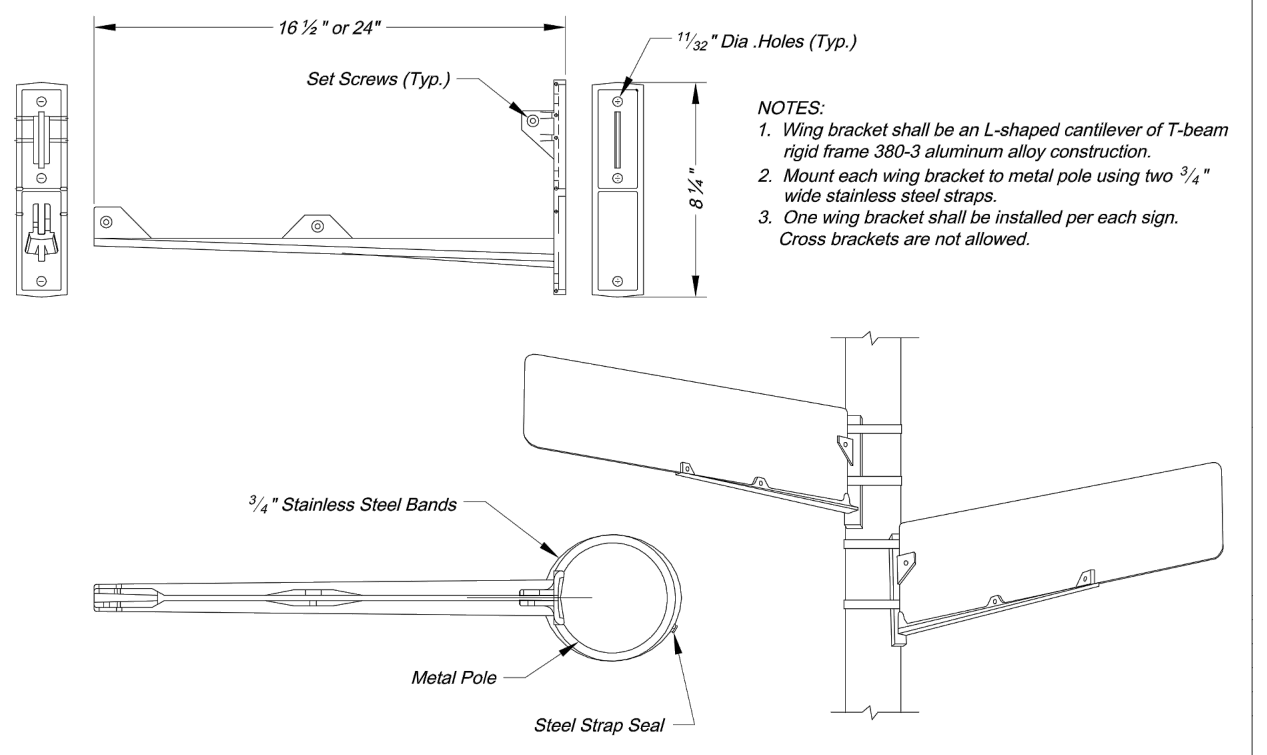

Street Name Signs Mounted Back to Back (Major Street Mounted Above Minor Street)
1" Space Between Signs
5/16" Bolts, Nuts, and Washers (Typ.)
½"x½" Tubular PVC Spacer (Typ.)
5/16" Bolts, Nuts, and Washers (Typ.)
Sign Post
1" Space Between Signs (Typ.)
Lowest Street Name Sign Face Mounted Perpendicular to Other Sign Face
Regulatory Sign
Sign
2 1/2" x 5/16" Stainless Steel Hex Head Bolt
5/16" Flat Washer
5/16" Flat Plastic Washer
5/16" Flat Plastic Washer
5/16" Flat Washer
5/16" Hex Head Jam Nut

SIGNS INSTALLED SEPARATELY

SIGNS INSTALLED WITH OTHER SIGNS

PLAN VIEW

SQUARE STEEL POST MOUNTING DETAILS


16½" or 24"
Set Screws (Typ.)
11/32" Dia .Holes (Typ.)
8¼"
3/4" Stainless Steel Bands
Metal Pole
Steel Strap Seal

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 3/4" wide stainless steel straps.
3. One wing bracket shall be installed per each sign. Cross brackets are not allowed.

WING BRACKET MOUNTING DETAILS

NOT AS-BUILT

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MO CERTIFICATE OF AUTHORITY #:001592
1301 BURLINGTON, SUITE 100
NORTH KANSAS CITY, MO 64116
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NUMBER PE-2017000367
3/18/21

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MO# 2017000367

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

SIGN DETAILS
STREET AND STORM SEWER PLANS

HAWTHORN RIDGE
SECOND PLAT

LEE'S SUMMIT, MISSOURI

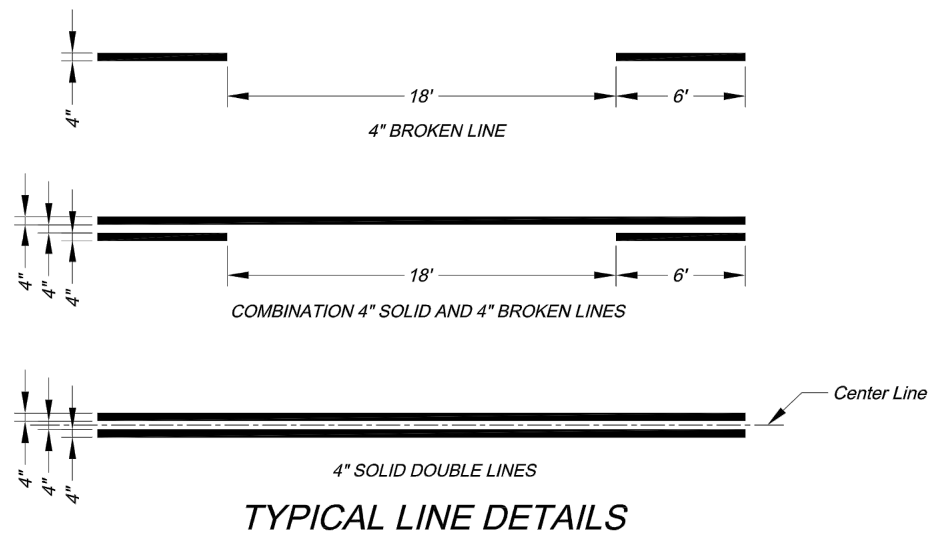
2019

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

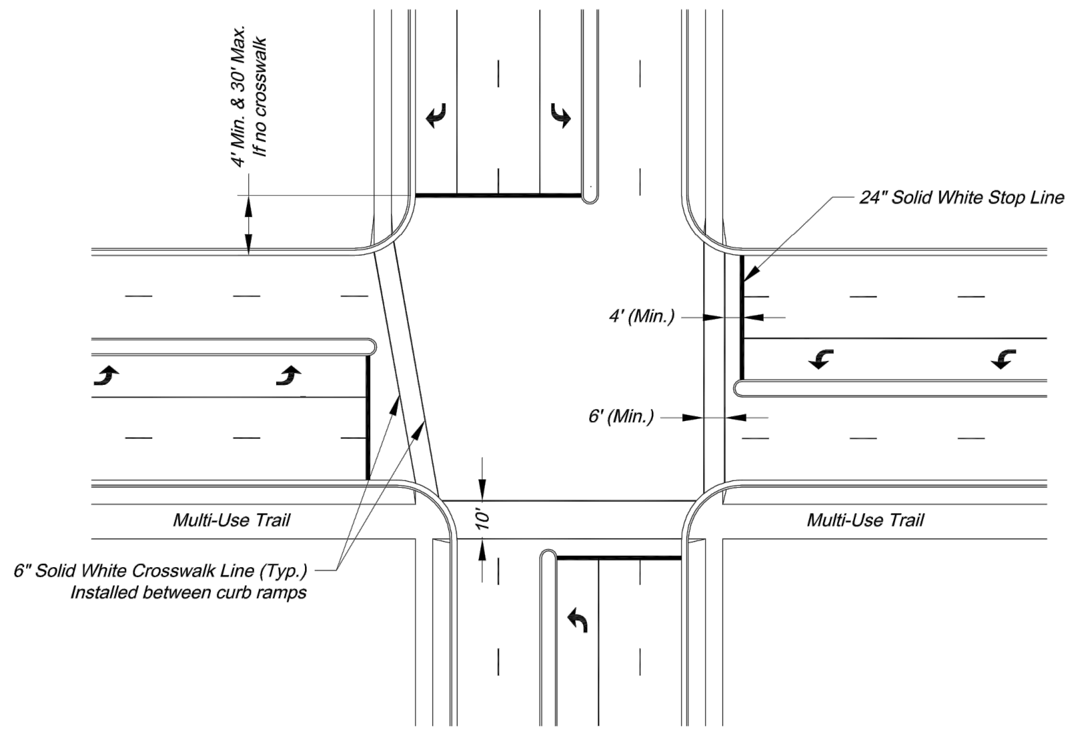
DWG: F:\2019\1501-2000\019-1605\40-Design\AutoCAD\As-Built\Sheets\GNCV\STREET, STORM & SITE DISTURBANCE\C_DTL01_0191605.dwg USER: bworthley
DATE: Feb 15, 2021 12:10pm XREFS: C_PTBLK_0191605

DWG: F:\2019\1501-2000\019-1605\40-Design\AutoCAD\As-Built\Sheets\GNCV\STREET, STORM & SITE DISTURBANCE\C_DTL01_0191605.dwg USER: bworthley
DATE: Feb 15, 2021 12:10pm XREFS: C_PTBLK_0191605


4"
18'
6'
4" BROKEN LINE
4"
4"
4"
18'
6'
COMBINATION 4" SOLID AND 4" BROKEN LINES
Center Line
4"
4"
4"
4" SOLID DOUBLE LINES

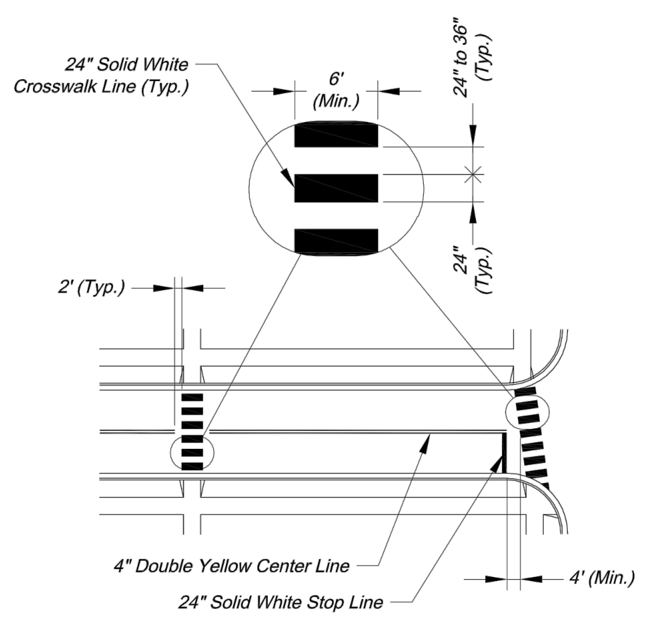
TYPICAL LINE DETAILS

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.

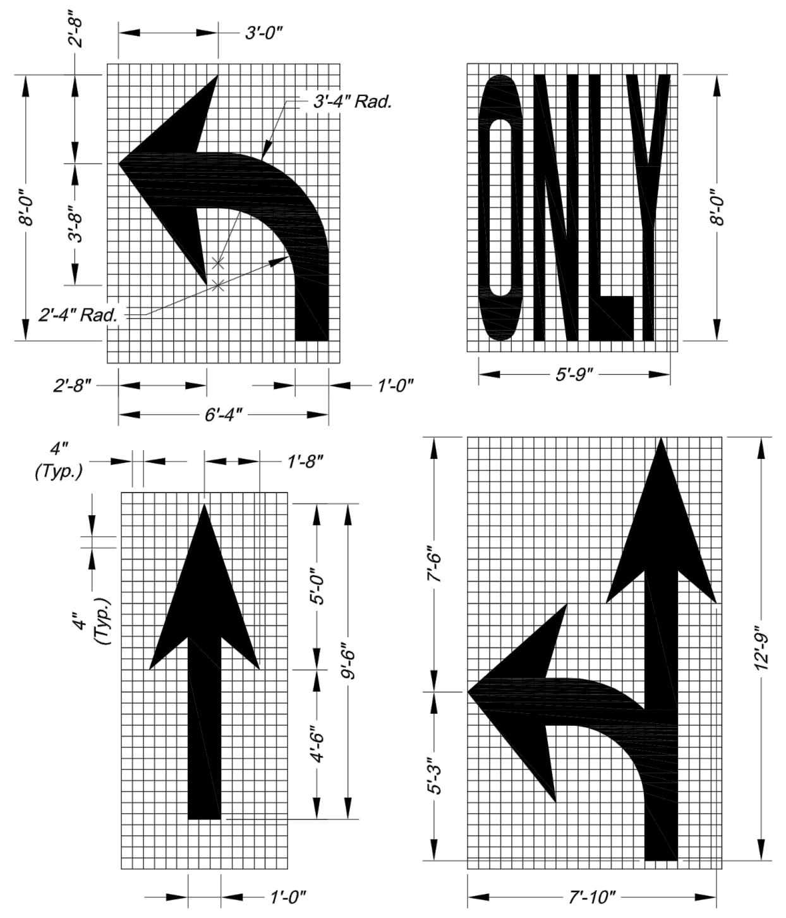

4' Min. & 30' Max.
If no crosswalk
24" Solid White Stop Line (Typ.)
4' (Min.)
6' (Min.)
Multi-Use Trail
10'
Multi-Use Trail
6" Solid White Crosswalk Line (Typ.)
Installed between curb ramps

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.

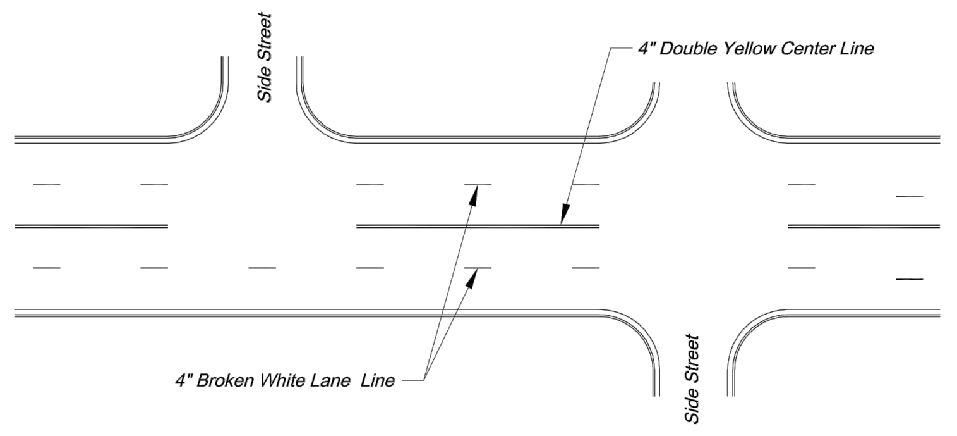

24" Solid White
Crosswalk Line (Typ.)
6'
(Min.)
24" to 36"
(Typ.)
24"
(Typ.)
2' (Typ.)
4" Double Yellow Center Line
24" Solid White Stop Line
4' (Min.)

TYPICAL MIDBLOCK OR SCHOOL CROSS WALK

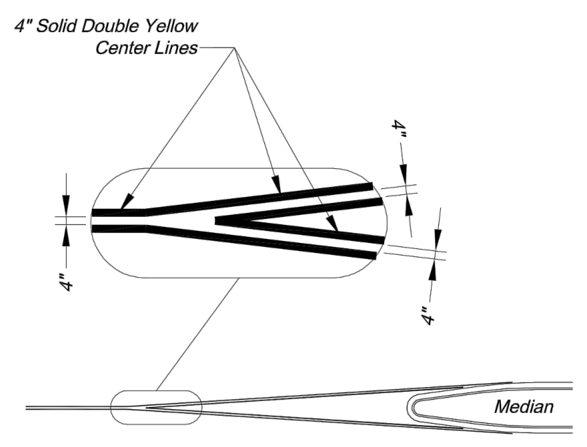

2'-8"
3'-0"
3'-4" Rad.
8'-0"
3'-8"
2'-4" Rad.
2'-8"
1'-0"
6'-4"
ONLY
8'-0"
5'-9"
4"
(Typ.)
1'-8"
4"
(Typ.)
5'-0"
9'-6"
4'-6"
1'-0"
7'-6"
5'-3"
12'-9"
7'-10"

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.


Side Street
4" Double Yellow Center Line
4" Broken White Lane Line
Side Street

TYPICAL MARKINGS FOR FOUR-LANE UNDIVIDED ROADWAY


4" Solid Double Yellow
Center Lines
4"
4"
4"
Median

TYPICAL MEDIAN NOSE CENTER LINE DETAIL

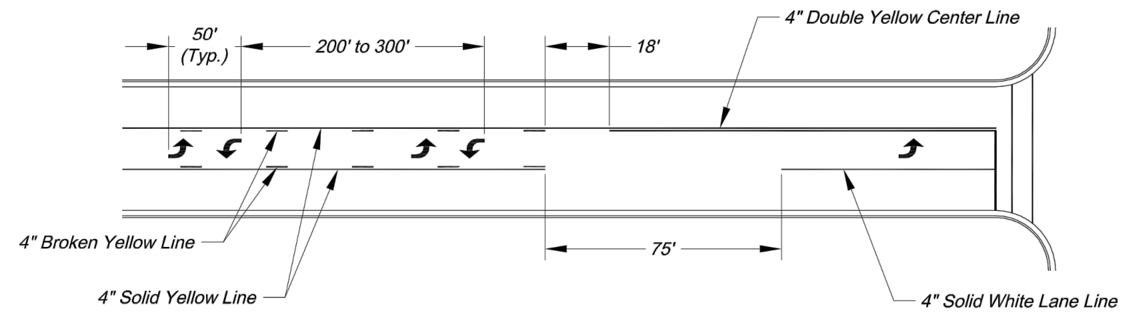
PAVEMENT MARKING GENERAL NOTES:
1. All pavement markings shall be in accordance with the latest edition of the Manual on Uniform Traffic Control Devices (MUTCD).
2. All words and symbols shall conform to the latest edition of Standard Alphabets for Highway Signs and Pavement Markings printed by the U.S. 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

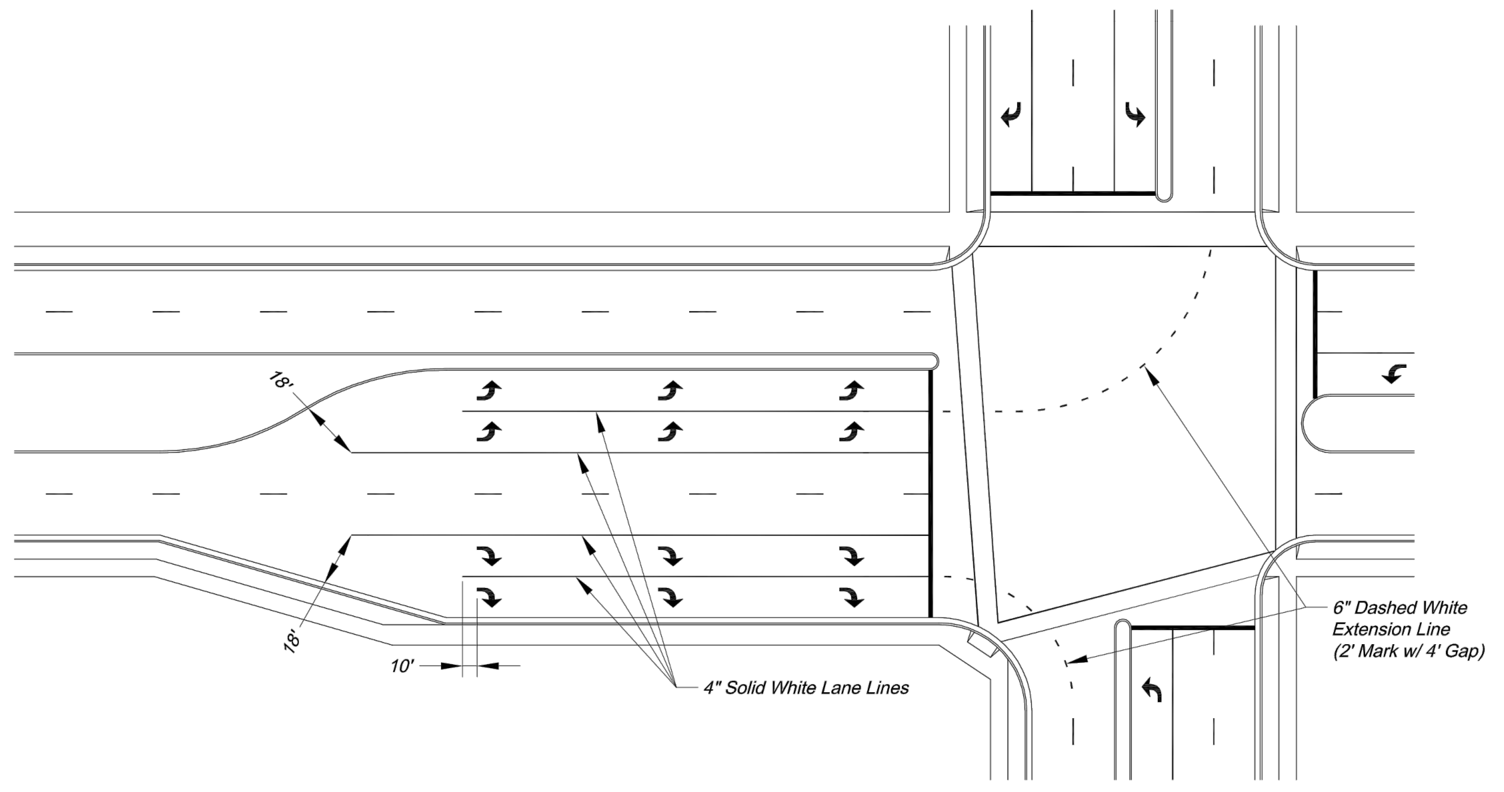
Project:
ROADWAY MARKING DETAILS
Sheet Name: STANDARD DRAWING PM-1

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

1 OF 2
1

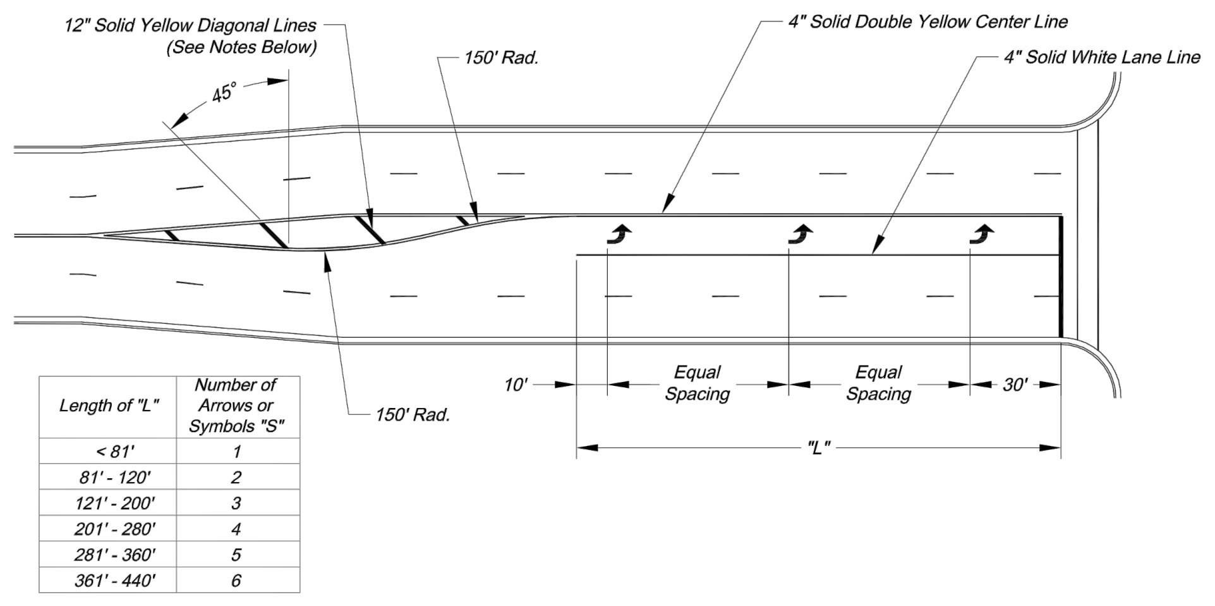

50'
(Typ.)
200' to 300'
18'
4" Double Yellow Center Line
4" Broken Yellow Line
4" Solid Yellow Line
75'
4" Solid White Lane Line

TYPICAL MARKINGS FOR TWO-WAY LEFT-TURN LANE


18'
18'
10'
4" Solid White Lane Lines
6" Dashed White
Extension Line
(2' Mark w/ 4' Gap)

TYPICAL DUAL TURN LANE MARKINGS

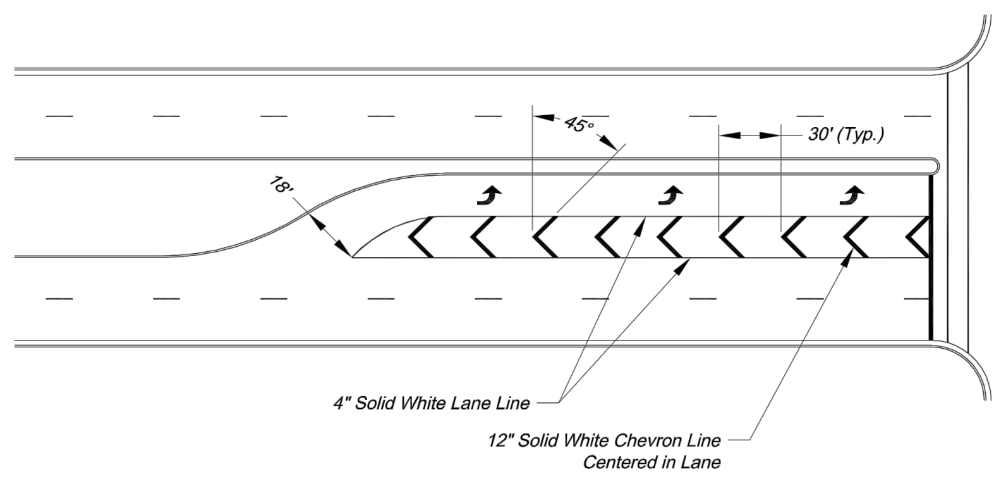
NOTE:
1. Dashed extension lines shall not extend through crosswalks.


12" Solid Yellow Diagonal Lines
(See Notes Below)
45°
150' Rad.
4" Solid Double Yellow Center Line
4" Solid White Lane Line
150' Rad.
10'
Equal
Spacing
Equal
Spacing
30'
"L"

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.


45°
30' (Typ.)
18'
4" Solid White Lane Line
12" Solid White Chevron Line
Centered in Lane

TYPICAL STRIPED OUT TURN LANE MARKINGS

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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

NOT AS-BUILT

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MO CERTIFICATE OF AUTHORITY #:001592
1301 BURLINGTON, SUITE 100
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177

JULIE ELAINE
SELLERS
NUMBER
PE-2017000367
3/18/21
Julie Sellers

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

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

ROADWAY MARKING DETAILS
STREET AND STORM SEWER PLANS

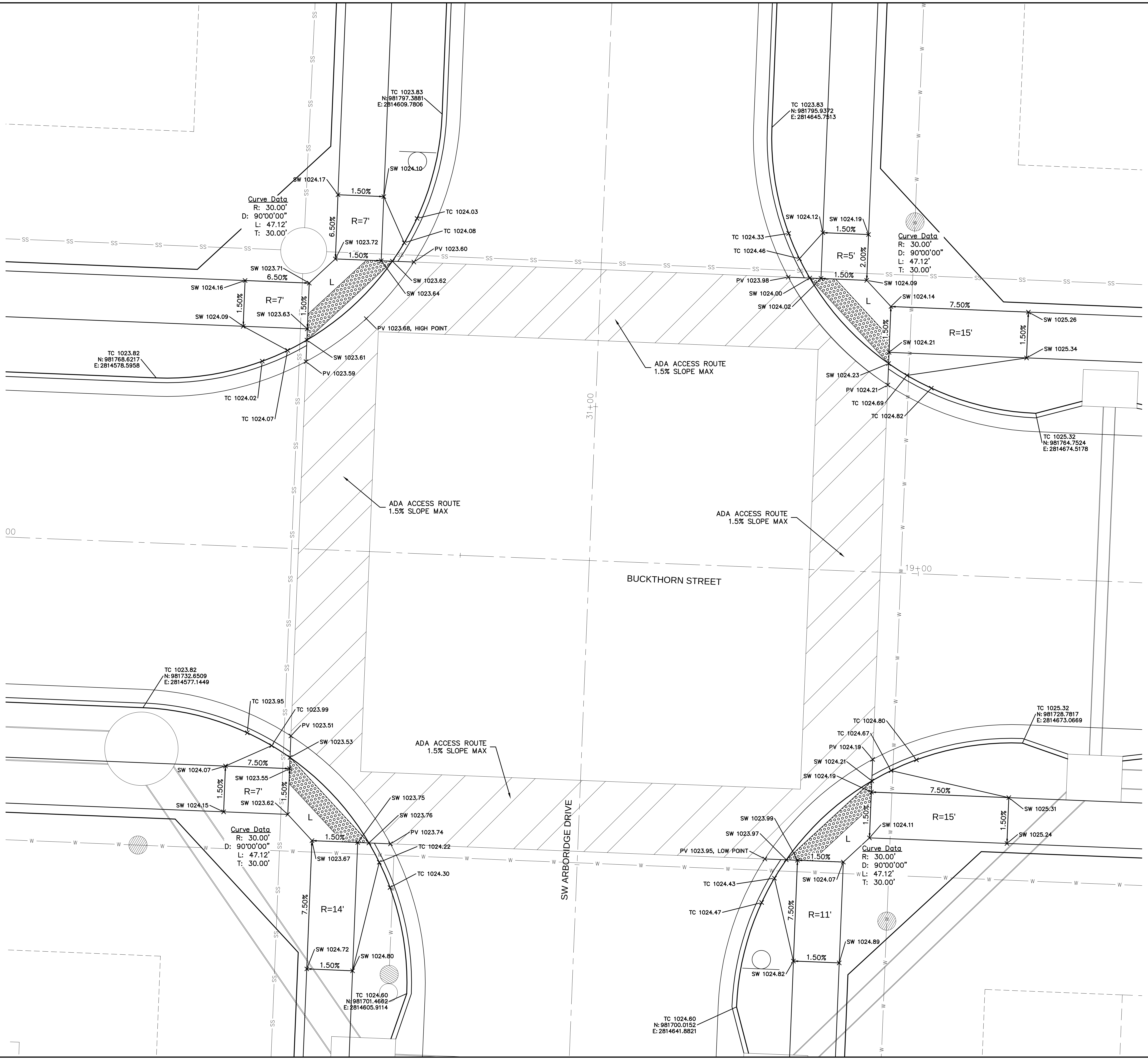
HAWTHORN RIDGE
SECOND PLAT

2019

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
C119

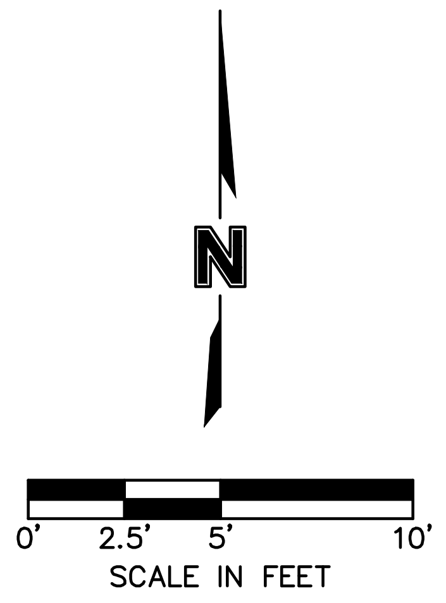

TC 1023.83
N: 981797.3881
E: 2814609.7806
SW 1024.10
SW 1024.17
1.50%
Curve Data
R: 30.00'
D: 90°00'00"
L: 47.12'
T: 30.00'
6.50%
R=7'
TC 1024.03
TC 1024.08
SW 1023.72
PV 1023.60
1.50%
SW 1023.71
6.50%
SW 1024.16
L
SW 1023.62
SW 1023.64
1.50%
R=7'
1.50%
SW 1024.09
SW 1023.63
PV 1023.68, HIGH POINT
TC 1023.82
N: 981768.6217
E: 2814578.5958
SW 1023.61
PV 1023.59
TC 1024.02
TC 1024.07
TC 1023.83
N: 981795.9372
E: 2814645.7513
SW 1024.12
SW 1024.19
TC 1024.33
1.50%
TC 1024.46
R=5'
2.00%
Curve Data
R: 30.00'
D: 90°00'00"
L: 47.12'
T: 30.00'
1.50%
PV 1023.98
SW 1024.09
SW 1024.00
L
SW 1024.02
SW 1024.14
7.50%
SW 1025.26
R=15'
1.50%
1.50%
SW 1024.21
SW 1025.34
SW 1024.23
PV 1024.21
TC 1024.69
TC 1024.82
TC 1025.32
N: 981764.7524
E: 2814674.5178
ADA ACCESS ROUTE
1.5% SLOPE MAX
31+00
ADA ACCESS ROUTE
1.5% SLOPE MAX
ADA ACCESS ROUTE
1.5% SLOPE MAX
00
19+00
BUCKTHORN STREET
TC 1023.82
N: 981732.6509
E: 2814577.1449
TC 1023.95
TC 1023.99
PV 1023.51
SW 1023.53
7.50%
SW 1024.07
SW 1023.55
1.50%
R=7'
1.50%
SW 1023.62
SW 1024.15
L
Curve Data
R: 30.00'
D: 90°00'00"
L: 47.12'
T: 30.00'
1.50%
SW 1023.67
ADA ACCESS ROUTE
1.5% SLOPE MAX
SW 1023.75
SW 1023.76
PV 1023.74
TC 1024.22
TC 1024.30
7.50%
R=14'
SW 1024.72
SW 1024.80
1.50%
TC 1024.60
N: 981701.4682
E: 2814605.9114
SW ARBORIDGE DRIVE
TC 1025.32
N: 981728.7817
E: 2814673.0669
TC 1024.80
TC 1024.67
PV 1024.19
SW 1024.21
SW 1024.19
7.50%
SW 1025.31
1.50%
R=15'
1.50%
SW 1024.11
SW 1025.24
SW 1023.99
L
SW 1023.97
PV 1023.95, LOW POINT
1.50%
SW 1024.07
Curve Data
R: 30.00'
D: 90°00'00"
L: 47.12'
T: 30.00'
TC 1024.43
7.50%
TC 1024.47
R=11'
SW 1024.89
1.50%
SW 1024.82
TC 1024.60
N: 981700.0152
E: 2814641.8821
SS
W

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

NOT AS-BUILT


N
0'
2.5'
5'
10'
SCALE IN FEET

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

JULIE ELAINE SELLERS
NUMBER PE-2017000367
3/18/21

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

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

SPOT ELEVATIONS
STREET & STORM SEWER PLANS

HAWTHORN RIDGE
SECOND PLAT

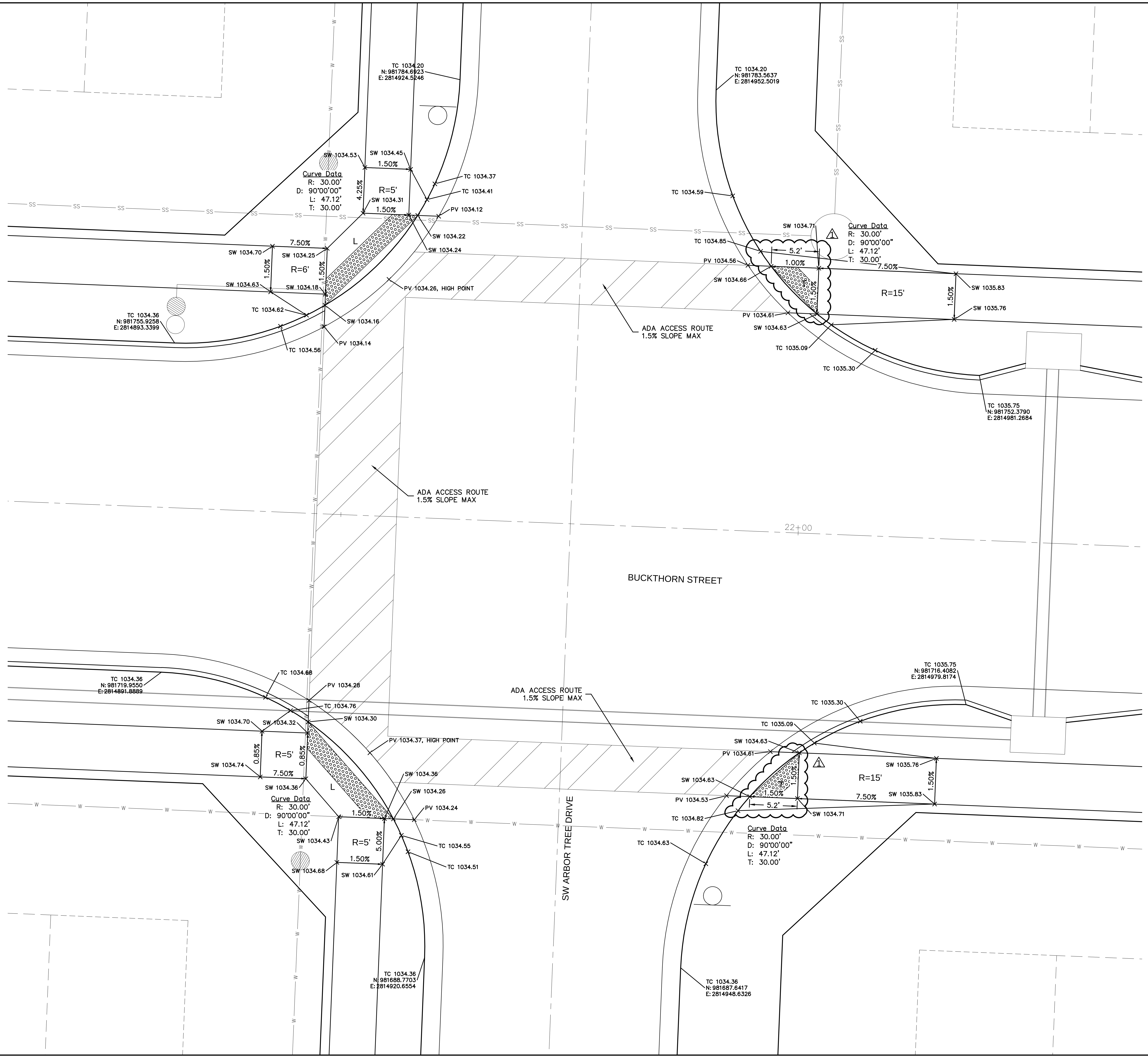
LEE'S SUMMIT, MISSOURI

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\As-Built\Sheets\GNCV\STREET, STORM & SITE DISTURBANCE\C_SPT01_0191605.dwg USER: bworthley
DATE: Feb 15, 2021 12:11pm XREFS: C_PTBLK_0191605 C_PBNDY_0191605 C_PBASE_0191605 C_XBASE_0191605 C_FBASE_0191605 C_PUTIL_0191605 C_PSPOT_0191605


TC 1034.20
N: 981784.6923
E: 2814924.5246
SW 1034.53
SW 1034.45
1.50%
Curve Data
R: 30.00'
D: 90°00'00"
L: 47.12'
T: 30.00'
4.25%
R=5'
SW 1034.31
1.50%
TC 1034.37
TC 1034.41
PV 1034.12
SW 1034.22
SW 1034.24
7.50%
SW 1034.70
SW 1034.25
L
R=6'
1.50%
1.50%
SW 1034.63
SW 1034.18
TC 1034.62
PV 1034.26, HIGH POINT
SW 1034.16
TC 1034.36
N: 981755.9258
E: 2814893.3399
TC 1034.56
PV 1034.14
TC 1034.20
N: 981783.5637
E: 2814952.5019
TC 1034.59
SW 1034.71
Curve Data
R: 30.00'
D: 90°00'00"
L: 47.12'
T: 30.00'
1
TC 1034.85
5.2'
1.00%
7.50%
PV 1034.56
SW 1034.66
T
1.50%
R=15'
1.50%
SW 1035.83
SW 1035.76
PV 1034.61
SW 1034.63
TC 1035.09
TC 1035.30
TC 1035.75
N: 981752.3790
E: 2814981.2684
ADA ACCESS ROUTE
1.5% SLOPE MAX
ADA ACCESS ROUTE
1.5% SLOPE MAX
22+00
BUCKTHORN STREET
TC 1035.75
N: 981716.4082
E: 2814979.8174
TC 1034.36
N: 981719.9550
E: 2814891.8889
TC 1034.68
PV 1034.28
TC 1034.76
SW 1034.30
ADA ACCESS ROUTE
1.5% SLOPE MAX
TC 1035.30
TC 1035.09
SW 1034.70
SW 1034.32
0.85%
0.85%
R=5'
PV 1034.37, HIGH POINT
SW 1034.74
7.50%
SW 1034.36
L
Curve Data
R: 30.00'
D: 90°00'00"
L: 47.12'
T: 30.00'
SW 1034.36
SW 1034.26
1.50%
PV 1034.24
SW 1034.43
R=5'
5.00%
1.50%
TC 1034.55
TC 1034.51
SW 1034.68
SW 1034.61
SW 1034.63
PV 1034.61
1
SW 1034.63
1.50%
R=15'
SW 1035.76
1.50%
PV 1034.53
1.50%
7.50%
SW 1035.83
5.2'
TC 1034.82
SW 1034.71
Curve Data
R: 30.00'
D: 90°00'00"
L: 47.12'
T: 30.00'
TC 1034.63
SW ARBOR TREE DRIVE
TC 1034.36
N: 981688.7703
E: 2814920.6554
TC 1034.36
N: 981687.6417
E: 2814948.6326
SS
W

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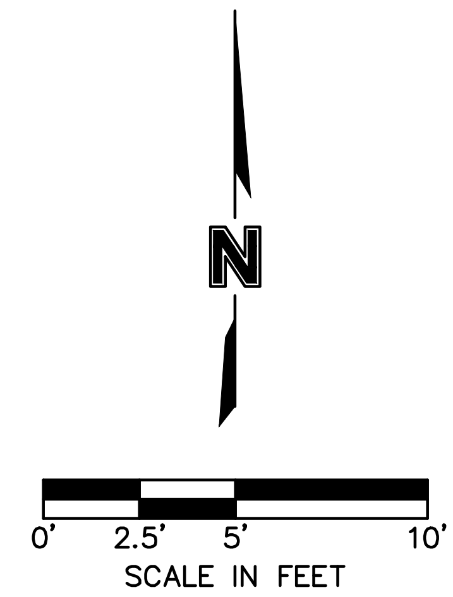
LEGEND	
TC–	TOP OF CURB
PV–	TOP OF PAVEMENT
SW–	SIDEWALK
L	LANDING AREA
R	RAMP AREA
T	TRANSITION AREA

NOT AS-BUILT


N
0'
2.5'
5'
10'
SCALE IN FEET

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MO CERTIFICATE OF AUTHORITY #:001592
1301 BURLINGTON, SUITE 100
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177

STATE OF MISSOURI
JULIE ELAINE SELLERS
NUMBER PE-2017000367
3/18/21
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\As-Built\Sheets\GNCV\STREET, STORM & SITE DISTURBANCE\C_SPT01_0191605.dwg USER: bworthley
DATE: Feb 15, 2021 12:11pm 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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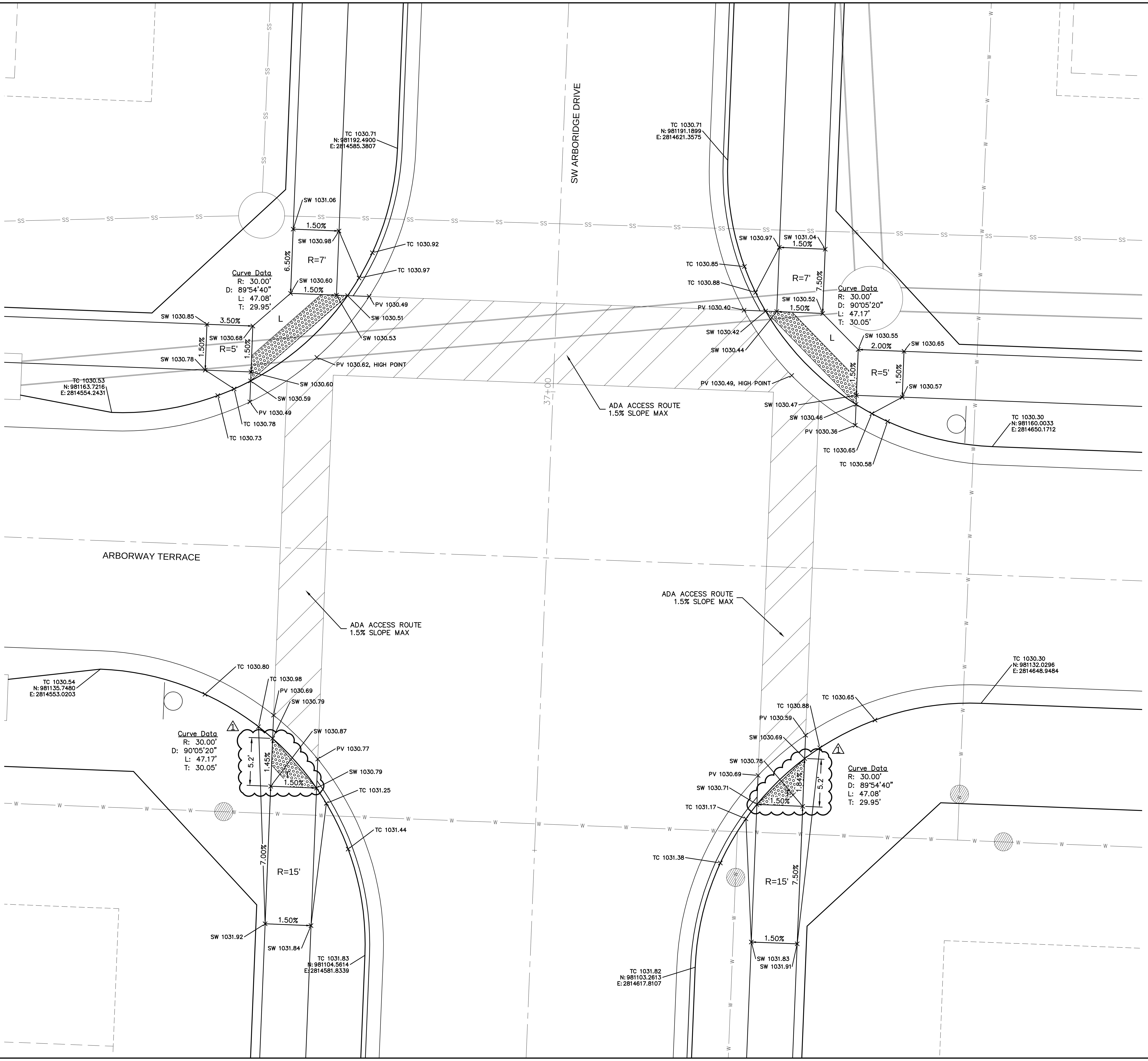
DATE: Feb 15, 2021 12:11pm XREFS: C_PTBLK_0191605 C_PBNDY_0191605 C_PBASE_0191605 C_XBASE_0191605 C_FBASE_0191605 C_PUTIL_0191605 C_PSPOT_0191605

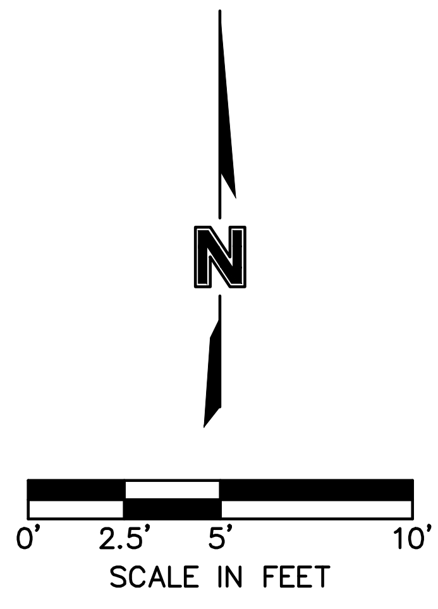

SW ARBORIDGE DRIVE
ARBORWAY TERRACE
37+00
TC 1030.71
N: 981192.4900
E: 2814585.3807
SW 1031.06
1.50%
SW 1030.98
6.50%
R=7'
SW 1030.60
1.50%
TC 1030.92
TC 1030.97
PV 1030.49
SW 1030.51
SW 1030.53
Curve Data
R: 30.00'
D: 89°54'40"
L: 47.08'
T: 29.95'
SW 1030.85
3.50%
L
SW 1030.68
1.50%
R=5'
1.50%
SW 1030.78
PV 1030.62, HIGH POINT
SW 1030.60
SW 1030.59
PV 1030.49
TC 1030.78
TC 1030.73
TC 1030.53
N: 981163.7216
E: 2814554.2431
ADA ACCESS ROUTE
1.5% SLOPE MAX
TC 1030.71
N: 981191.1899
E: 2814621.3575
SW 1030.97
SW 1031.04
1.50%
TC 1030.85
TC 1030.88
R=7'
7.50%
Curve Data
R: 30.00'
D: 90°05'20"
L: 47.17'
T: 30.05'
SW 1030.52
1.50%
PV 1030.40
SW 1030.42
SW 1030.44
L
SW 1030.55
2.00%
SW 1030.65
R=5'
1.50%
1.50%
SW 1030.57
PV 1030.49, HIGH POINT
SW 1030.47
SW 1030.46
PV 1030.36
TC 1030.65
TC 1030.58
TC 1030.30
N: 981160.0033
E: 2814650.1712
ADA ACCESS ROUTE
1.5% SLOPE MAX
ADA ACCESS ROUTE
1.5% SLOPE MAX
TC 1030.54
N: 981135.7480
E: 2814553.0203
TC 1030.80
TC 1030.98
PV 1030.69
SW 1030.79
SW 1030.87
PV 1030.77
SW 1030.79
TC 1031.25
TC 1031.44
Curve Data
R: 30.00'
D: 90°05'20"
L: 47.17'
T: 30.05'
5.2'
1.45%
1.50%
1
7.00%
R=15'
1.50%
SW 1031.92
SW 1031.84
TC 1031.83
N: 981104.5614
E: 2814581.8339
TC 1030.30
N: 981132.0296
E: 2814648.9484
TC 1030.65
TC 1030.88
PV 1030.59
SW 1030.69
SW 1030.78
PV 1030.69
SW 1030.71
TC 1031.17
1
Curve Data
R: 30.00'
D: 89°54'40"
L: 47.08'
T: 29.95'
1.84%
5.2'
1.50%
TC 1031.38
R=15'
7.50%
1.50%
SW 1031.83
SW 1031.91
TC 1031.82
N: 981103.2613
E: 2814617.8107
SS
W

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

NOT AS-BUILT


N
0'
2.5'
5'
10'
SCALE IN FEET

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MO CERTIFICATE OF AUTHORITY #:001592
1301 BURLINGTON, SUITE 100
NORTH KANSAS CITY, MO 64116
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JULIE ELAINE SELLERS
NUMBER PE-2017000367
3/18/21

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

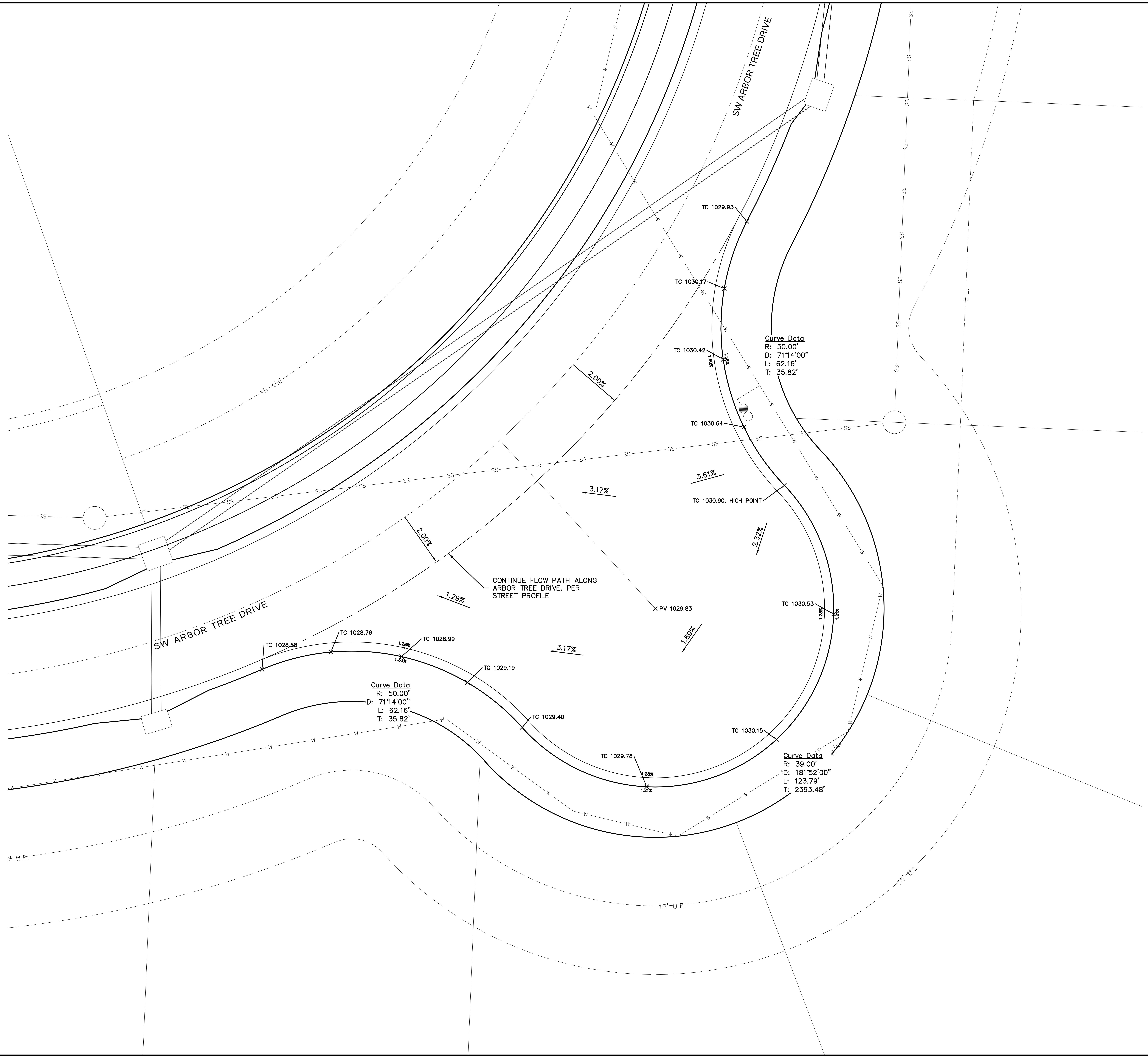
SPOT ELEVATIONS
STREET & STORM SEWER PLANS

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


SW ARBOR TREE DRIVE
SW ARBOR TREE DRIVE
TC 1029.93
TC 1030.17
TC 1030.42
1.50%
1.56%
TC 1030.64
Curve Data
R: 50.00'
D: 71°14'00"
L: 62.16'
T: 35.82'
2.00%
2.00%
3.61%
3.17%
TC 1030.90, HIGH POINT
2.32%
CONTINUE FLOW PATH ALONG ARBOR TREE DRIVE, PER STREET PROFILE
1.29%
PV 1029.83
1.89%
TC 1030.53
1.28%
1.21%
TC 1028.58
TC 1028.76
1.28%
1.33%
TC 1028.99
3.17%
TC 1029.19
TC 1029.40
Curve Data
R: 50.00'
D: 71°14'00"
L: 62.16'
T: 35.82'
TC 1030.15
TC 1029.78
1.28%
1.21%
Curve Data
R: 39.00'
D: 181°52'00"
L: 123.79'
T: 2393.48'
15' U.E.
15' U.E.
15' U.E.
U.E.
30' B.L.
SS
W

INTERSECTION AND ADA DETAIL NOTES:

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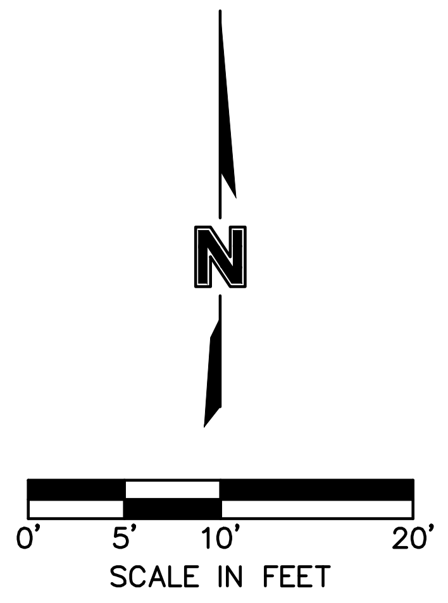
9. CURVE DATA IS FOR BACK OF CURB.

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

NOT AS-BUILT


N
0'
5'
10'
20'
SCALE IN FEET

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JULIE ELAINE SELLERS
NUMBER PE-2017000367
3/18/21
Julie Sellers

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

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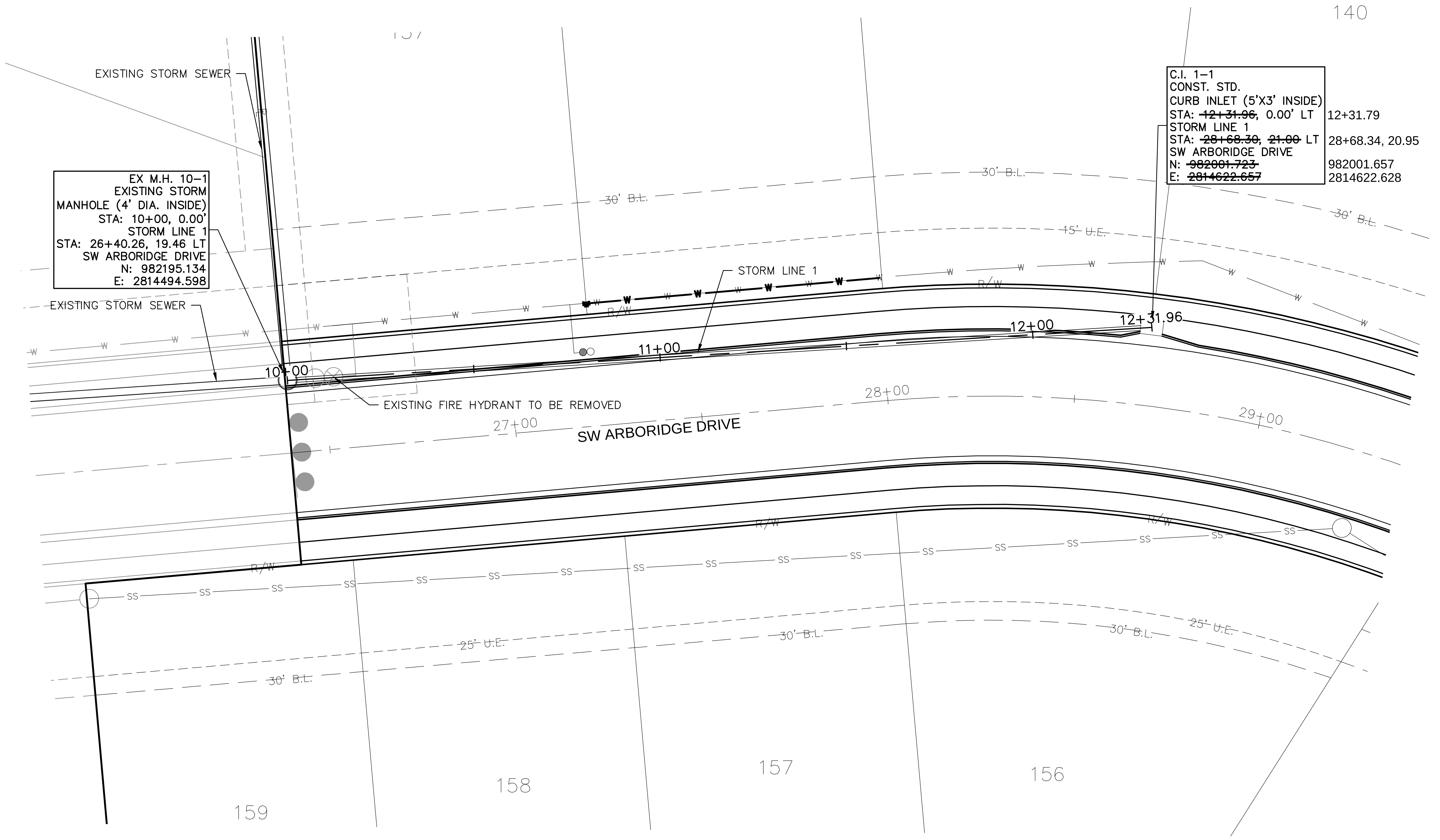
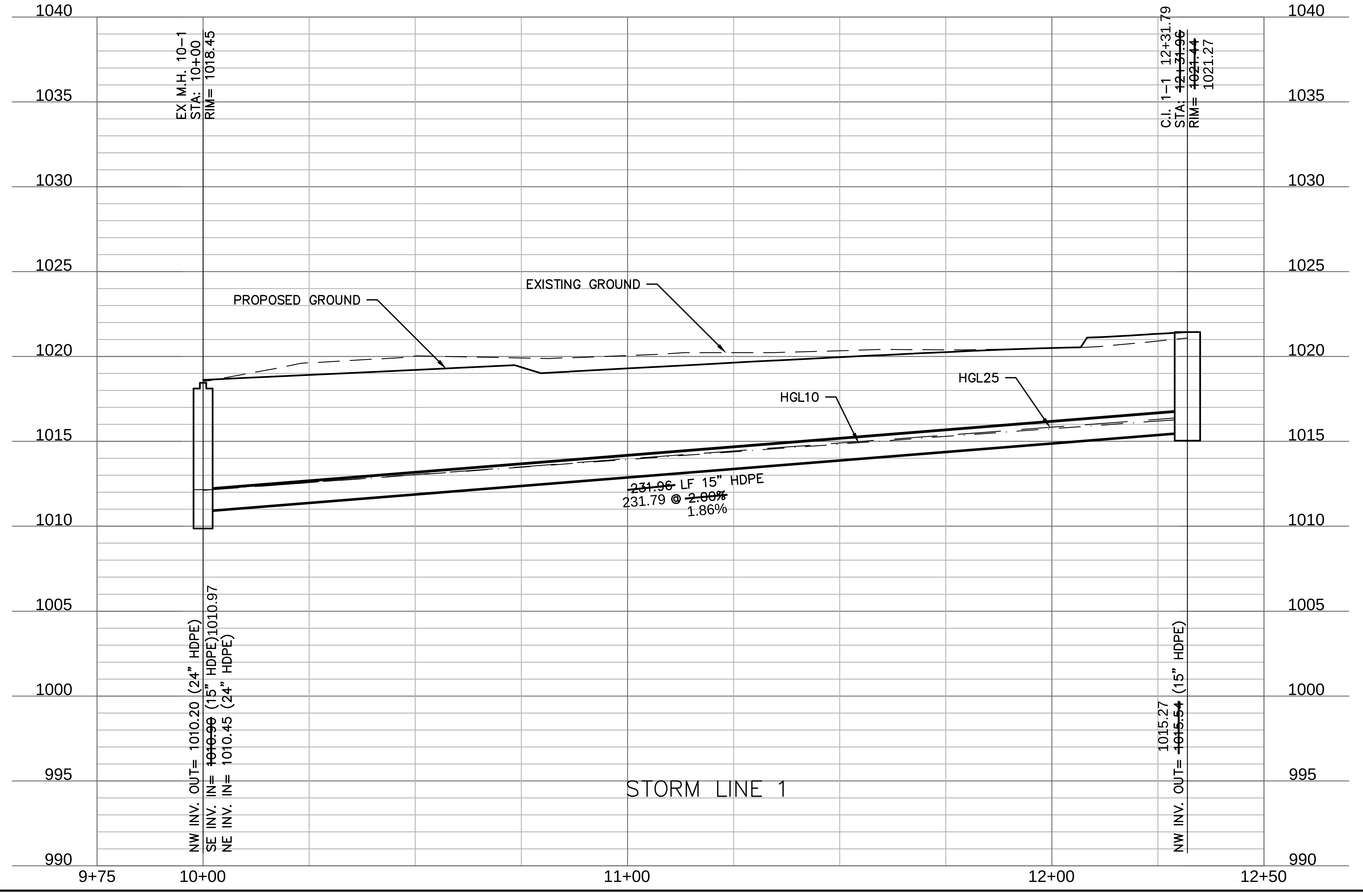
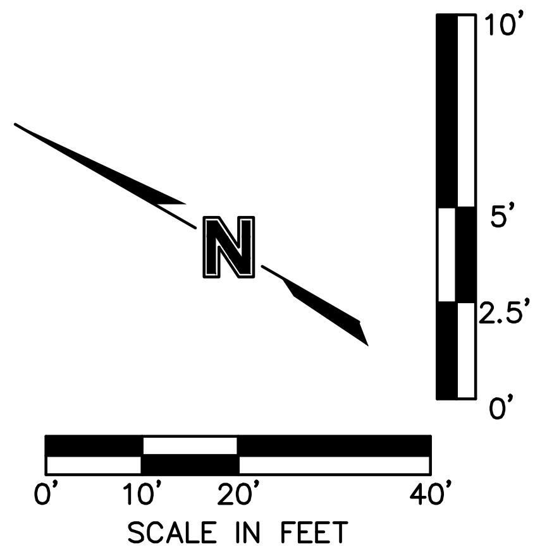


140
EXISTING STORM SEWER
EX M.H. 10-1
EXISTING STORM
MANHOLE (4' DIA. INSIDE)
STA: 10+00, 0.00'
STORM LINE 1
STA: 26+40.26, 19.46 LT
SW ARBORIDGE DRIVE
N: 982195.134
E: 2814494.598
EXISTING STORM SEWER
C.I. 1-1
CONST. STD.
CURB INLET (5'X3' INSIDE)
STA: ~~12+31.96~~, 0.00' LT 12+31.79
STORM LINE 1
STA: ~~28+68.30~~, ~~21.00~~ LT 28+68.34, 20.95
SW ARBORIDGE DRIVE
N: ~~982001.723~~ 982001.657
E: ~~2814622.657~~ 2814622.628
30' B.L.
30' B.L.
30' B.L.
15' U.E.
STORM LINE 1
R/W
10+00
11+00
12+00
12+31.96
EXISTING FIRE HYDRANT TO BE REMOVED
27+00
28+00
29+00
SW ARBORIDGE DRIVE
W
SS
25' U.E.
30' B.L.
30' B.L.
30' B.L.
25' U.E.
159
158
157
156



1040
1035
1030
1025
1020
1015
1010
1005
1000
995
990
EX M.H. 10-1
STA: 10+00
RIM= 1018.45
C.I. 1-1 12+31.79
STA: ~~12+31.96~~
RIM= ~~1021.44~~ 1021.27
PROPOSED GROUND
EXISTING GROUND
HGL10
HGL25
~~231.96~~ LF 15" HDPE
231.79 @ ~~2.00%~~
1.86%
NW INV. OUT= 1010.20 (24" HDPE)
SE INV. IN= ~~1010.90~~ (15" HDPE)1010.97
NE INV. IN= 1010.45 (24" HDPE)
1015.27
NW INV. OUT= ~~1015.54~~ (15" HDPE)
STORM LINE 1
9+75
10+00
11+00
12+00
12+50

AS-BUILT
3/17/2021



N
10'
5'
2.5'
0'
0'
10'
20'
40'
SCALE IN FEET

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NUMBER PE-2017000367
3/18/21

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

REVISIONS

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

STORM PLAN & PROFILE
STREET & STORM SEWER PLANS

HAWTHORN RIDGE
SECOND PLAT

LEE'S SUMMIT, MISSOURI

2019

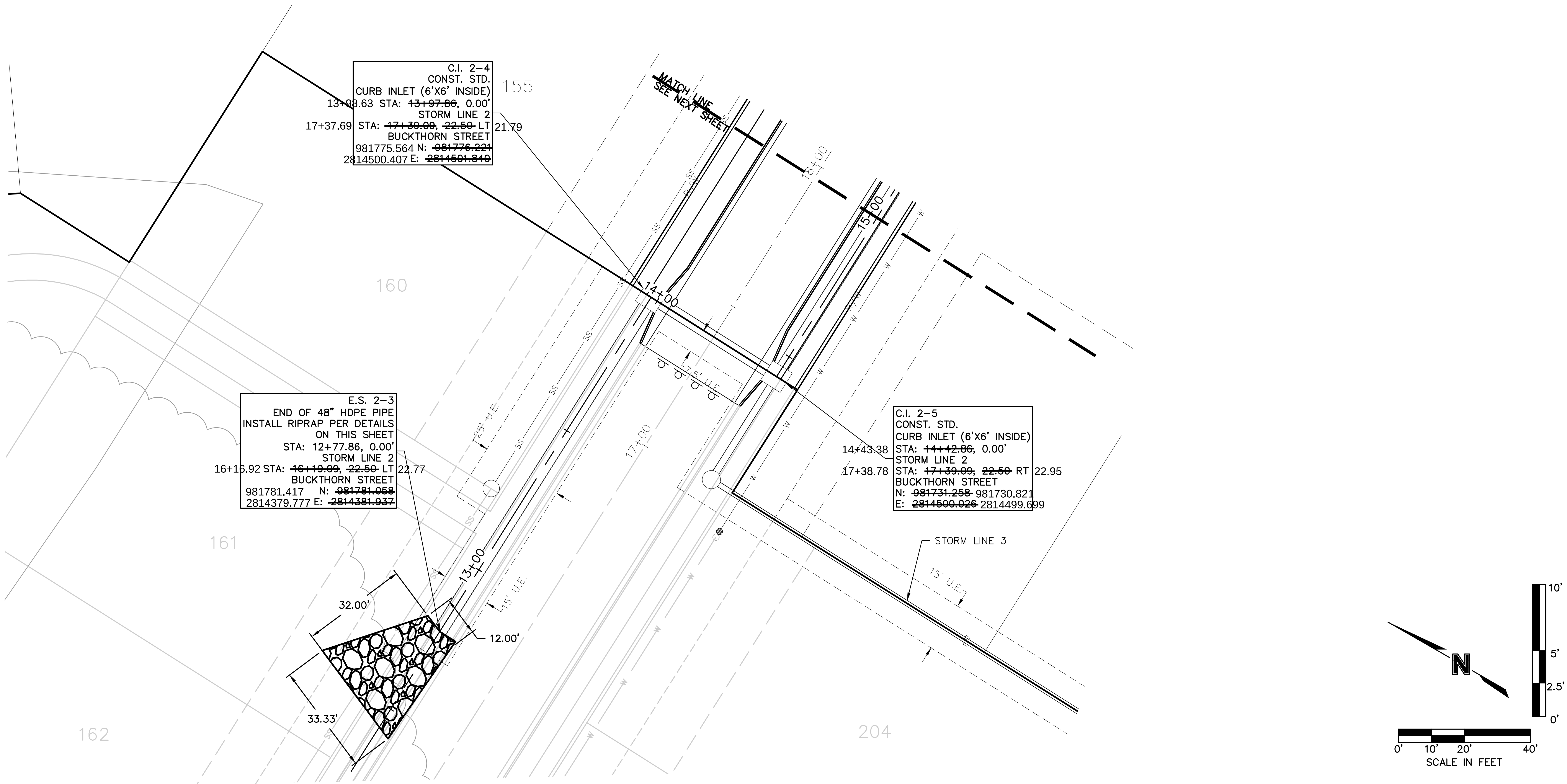
drawn by: D.A.H.O
checked by: M.G.D
designed by: B.M.W
QA/QC by: N.D.H
project no.: 019-1605
date: 07-12-2019

SHEET
C124

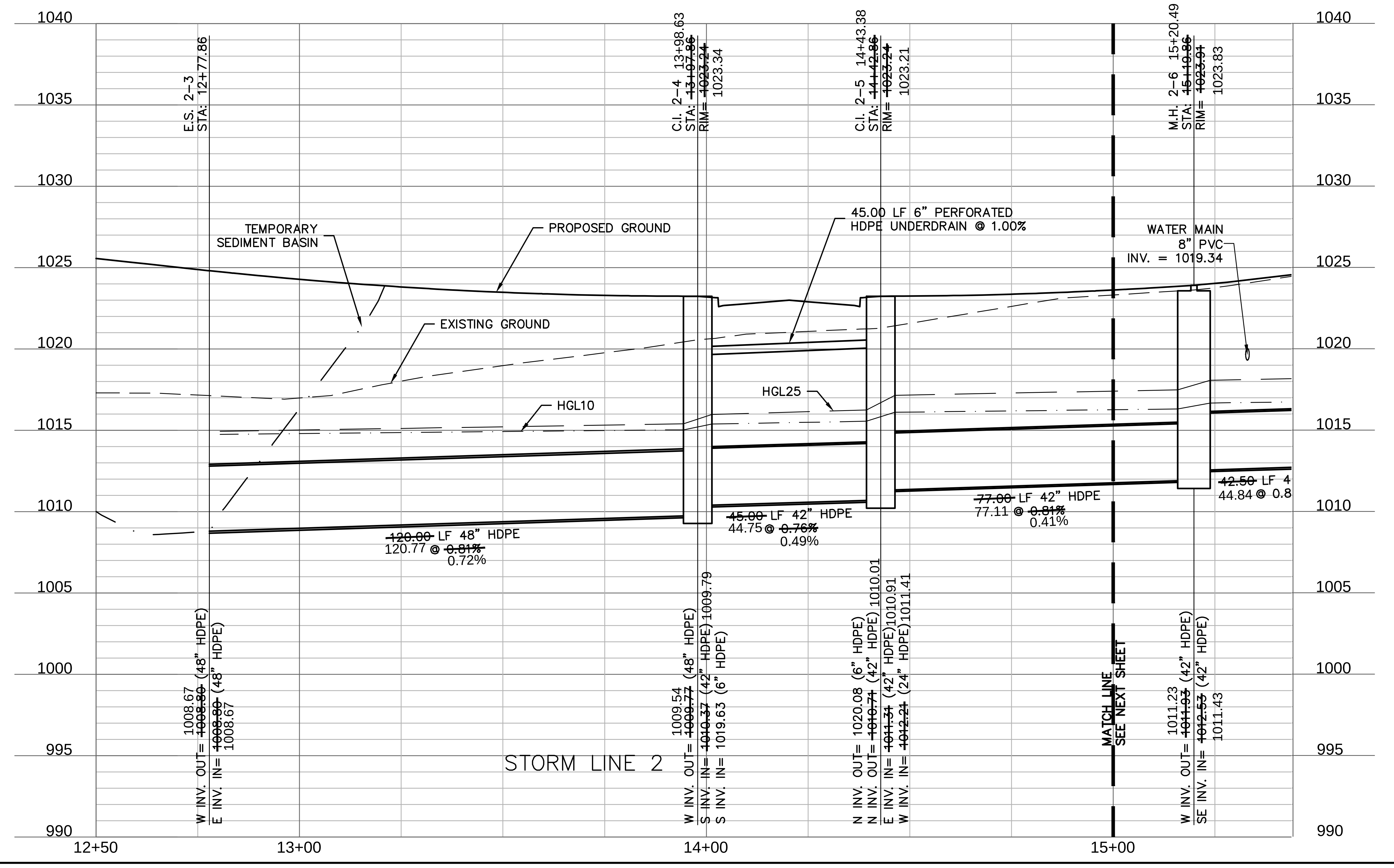
Riprap Calculations							
End Section	Q_{100}	Pipe Diameter	Class*	D50*	Apron Length	Apron Depth	Area
	(cfs)	(ft)		(in)	(ft)	(ft)	(SY)
E.S. 2-3	164.18	4	6	22	32	3.67	80.6

*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.


C.I. 2–4
CONST. STD.
CURB INLET (6'X6' INSIDE)
13+98.63 STA: ~~13+97.86~~, 0.00'
STORM LINE 2
17+37.69 STA: ~~17+39.09~~, ~~22.50~~ LT 21.79
BUCKTHORN STREET
981775.564 N: ~~981776.221~~
2814500.407 E: ~~2814501.840~~
155
MATCH LINE
SEE NEXT SHEET
160
E.S. 2–3
END OF 48" HDPE PIPE
INSTALL RIPRAP PER DETAILS
ON THIS SHEET
STA: 12+77.86, 0.00'
STORM LINE 2
16+16.92 STA: ~~16+19.09~~, ~~22.50~~ LT 22.77
BUCKTHORN STREET
981781.417 N: ~~981781.058~~
2814379.777 E: ~~2814381.937~~
C.I. 2–5
CONST. STD.
CURB INLET (6'X6' INSIDE)
14+43.38 STA: ~~14+42.86~~, 0.00'
STORM LINE 2
17+38.78 STA: ~~17+39.09~~, ~~22.50~~ RT 22.95
BUCKTHORN STREET
N: ~~981731.258~~ 981730.821
E: ~~2814500.026~~ 2814499.699
STORM LINE 3
25' U.E.
15' U.E.
161
162
204
13+00
14+00
15+00
16+00
17+00
18+00
SS
W
32.00'
12.00'
33.33'
N
10'
5'
2.5'
0'
0' 10' 20' 40'
SCALE IN FEET

NOTE:
DUE TO AS-BUILT PIPE SLOPES BEING MUCH LOWER THAN DESIGNED PIPE SLOPES, THE STORM SEWER HAS BEEN REMODELED USING THE AS-BUILT STORM SEWER INFORMATION. SEE SHEETS C139 & C140 FOR AS-BUILT STORM SEWER DESIGN INFORMATION.


1040
1035
1030
1025
1020
1015
1010
1005
1000
995
990
E.S. 2–3
STA: 12+77.86
C.I. 2–4 13+98.63
STA: ~~13+97.86~~
RIM= ~~1023.24~~ 1023.34
C.I. 2–5 14+43.38
STA: ~~14+42.86~~
RIM= ~~1023.24~~ 1023.21
M.H. 2–6 15+20.49
STA: ~~15+19.86~~
RIM= ~~1023.91~~ 1023.83
TEMPORARY
SEDIMENT BASIN
PROPOSED GROUND
45.00 LF 6" PERFORATED
HDPE UNDERDRAIN @ 1.00%
WATER MAIN
8" PVC
INV. = 1019.34
EXISTING GROUND
HGL25
HGL10
~~120.00~~ LF 48" HDPE
120.77 @ ~~0.81%~~ 0.72%
~~45.00~~ LF 42" HDPE
44.75 @ ~~0.76%~~ 0.49%
~~77.00~~ LF 42" HDPE
77.11 @ ~~0.81%~~ 0.41%
~~42.50~~ LF 4
44.84 @ 0.8
W INV. OUT= 1008.67 ~~1008.80~~ (48" HDPE)
E INV. IN= ~~1008.80~~ 1008.67 (48" HDPE)
W INV. OUT= 1009.54 ~~1009.77~~ (48" HDPE)
S INV. IN= ~~1010.37~~ (42" HDPE) 1009.79
S INV. IN= 1019.63 (6" HDPE)
N INV. OUT= 1020.08 (6" HDPE)
N INV. OUT= ~~1010.71~~ (42" HDPE) 1010.01
E INV. IN= ~~1011.31~~ (42" HDPE) 1010.91
W INV. IN= ~~1012.21~~ (24" HDPE) 1011.41
MATCH LINE
SEE NEXT SHEET
W INV. OUT= 1011.23 ~~1011.03~~ (42" HDPE)
SE INV. IN= ~~1012.53~~ 1011.43 (42" HDPE)
STORM LINE 2
12+50
13+00
14+00
15+00

AS-BUILT
3/17/2021

DWG: F:\2019\1501-2000\019-1605\40-Design\AutoCAD\As-Built\Sheets\GNCV\STREET, STORM & SITE DISTURBANCE\C_STM01_0191605.dwg USER: bworthley
DATE: Feb 15, 2021 12:12pm XREFS: C_PTBLK_0191605 C_PBNDY_0191605 C_PBASE_0191605 C_XBASE_0191605 C_FBASE_0191605 C_PUTIL_0191605 C_PSTRM_0191605

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NUMBER PE-2017000367
3/18/21

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

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	

REVISIONS

STORM PLAN & PROFILE
STREET & STORM SEWER PLANS

HAWTHORN RIDGE
SECOND PLAT

LEE'S SUMMIT, MISSOURI

2019

drawn by: D.A.H.O
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designed by: B.M.W
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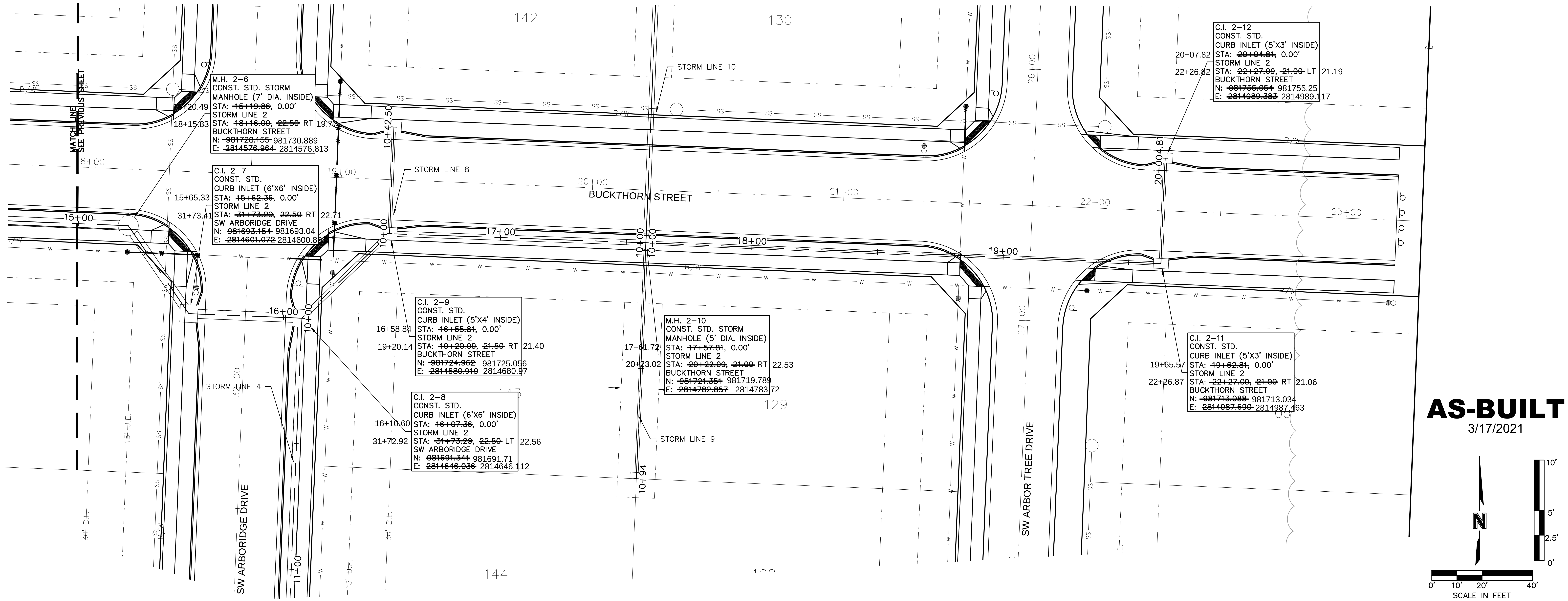
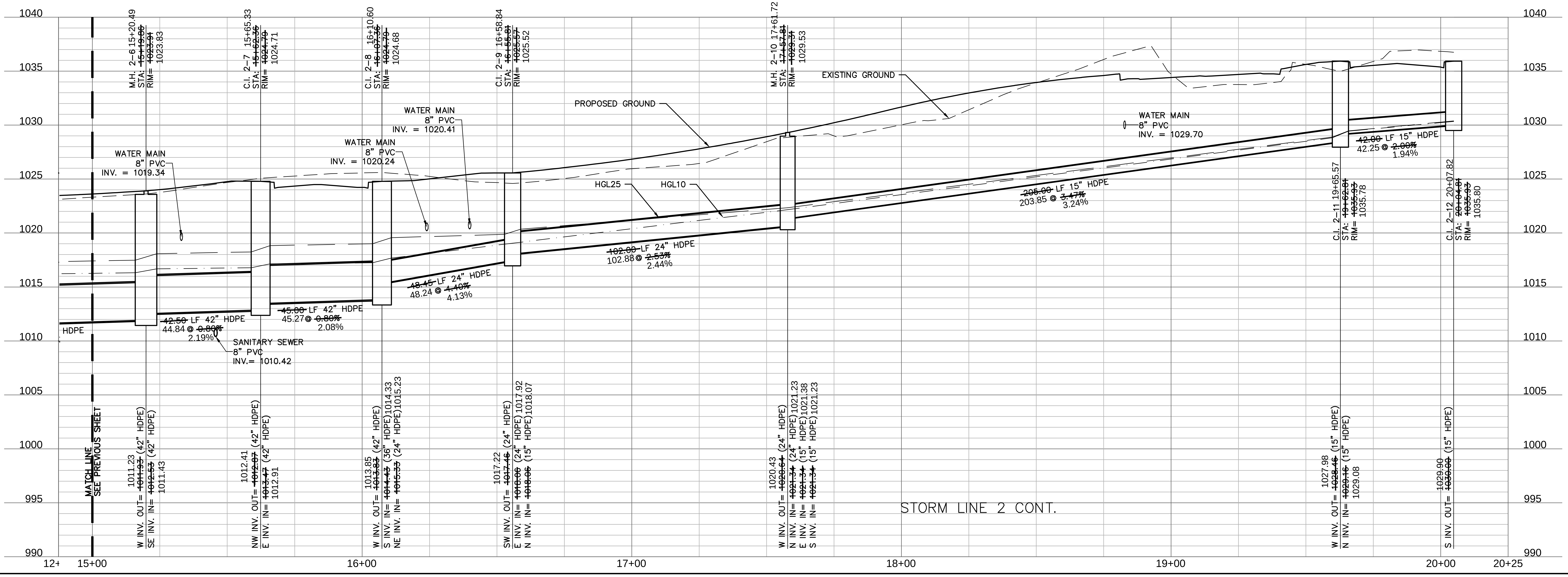


142
130
MATCH LINE SEE PREVIOUS SHEET
STORM LINE 10
STORM LINE 8
STORM LINE 4
STORM LINE 9
BUCKTHORN STREET
SW ARBORIDGE DRIVE
SW ARBOR TREE DRIVE
15+00
16+00
17+00
18+00
19+00
20+00
21+00
22+00
23+00
10+00
10+42.50
11+00
10+94
20+004.81
26+00
27+00
34+00
129
144
147
109
SS
W
R/W
30' B.L.
15' U.E.
M.H. 2–6
CONST. STD. STORM
MANHOLE (7' DIA. INSIDE)
15+20.49 STA: ~~15+19.86,~~ 0.00'
STORM LINE 2
18+15.83 STA: ~~18+16.09,~~ ~~22.50~~ RT 19.77
BUCKTHORN STREET
N: ~~981728.155~~ 981730.889
E: ~~2814576.964~~ 2814576.813
C.I. 2–7
CONST. STD.
CURB INLET (6'X6' INSIDE)
15+65.33 STA: ~~15+62.36,~~ 0.00'
STORM LINE 2
31+73.41 STA: ~~31+73.29,~~ ~~22.50~~ RT 22.71
SW ARBORIDGE DRIVE
N: ~~981693.154~~ 981693.04
E: ~~2814601.072~~ 2814600.86
C.I. 2–9
CONST. STD.
CURB INLET (5'X4' INSIDE)
16+58.84 STA: ~~16+55.81,~~ 0.00'
STORM LINE 2
19+20.14 STA: ~~19+20.09,~~ ~~21.50~~ RT 21.40
BUCKTHORN STREET
N: ~~981724.962~~ 981725.056
E: ~~2814680.919~~ 2814680.97
C.I. 2–8
CONST. STD.
CURB INLET (6'X6' INSIDE)
16+10.60 STA: ~~16+07.36,~~ 0.00'
STORM LINE 2
31+72.92 STA: ~~31+73.29,~~ ~~22.50~~ LT 22.56
SW ARBORIDGE DRIVE
N: ~~981691.341~~ 981691.71
E: ~~2814646.036~~ 2814646.112
M.H. 2–10
CONST. STD. STORM
MANHOLE (5' DIA. INSIDE)
17+61.72 STA: ~~17+57.81,~~ 0.00'
STORM LINE 2
20+23.02 STA: ~~20+22.09,~~ ~~21.00~~ RT 22.53
BUCKTHORN STREET
N: ~~981721.351~~ 981719.789
E: ~~2814782.857~~ 2814783.72
C.I. 2–12
CONST. STD.
CURB INLET (5'X3' INSIDE)
20+07.82 STA: ~~20+04.81,~~ 0.00'
STORM LINE 2
22+26.82 STA: ~~22+27.09,~~ ~~21.00~~ LT 21.19
BUCKTHORN STREET
N: ~~981755.054~~ 981755.25
E: ~~2814989.383~~ 2814989.117
C.I. 2–11
CONST. STD.
CURB INLET (5'X3' INSIDE)
19+65.57 STA: ~~19+62.81,~~ 0.00'
STORM LINE 2
22+26.87 STA: ~~22+27.09,~~ ~~21.00~~ RT 21.06
BUCKTHORN STREET
N: ~~981713.088~~ 981713.034
E: ~~2814987.690~~ 2814987.463
N
10'
5'
2.5'
0'
0' 10' 20' 40'
SCALE IN FEET

AS-BUILT

3/17/2021



1040
1035
1030
1025
1020
1015
1010
1005
1000
995
990
MATCH LINE SEE PREVIOUS SHEET
M.H. 2–6 15+20.49 STA= ~~15+19.86~~ RIM= ~~1023.93~~ 1023.83
C.I. 2–7 15+65.33 STA= ~~15+62.36~~ RIM= ~~1024.79~~ 1024.71
C.I. 2–8 16+10.60 STA= ~~16+07.36~~ RIM= ~~1024.79~~ 1024.68
C.I. 2–9 16+58.84 STA= ~~16+55.81~~ RIM= ~~1025.57~~ 1025.52
M.H. 2–10 17+61.72 STA= ~~17+57.81~~ RIM= ~~1029.31~~ 1029.53
C.I. 2–11 19+65.57 STA= ~~19+62.81~~ RIM= ~~1035.63~~ 1035.78
C.I. 2–12 20+07.82 STA= ~~20+04.81~~ RIM= ~~1035.63~~ 1035.80
EXISTING GROUND
PROPOSED GROUND
WATER MAIN 8" PVC INV. = 1019.34
WATER MAIN 8" PVC INV. = 1020.24
WATER MAIN 8" PVC INV. = 1020.41
WATER MAIN 8" PVC INV. = 1029.70
HGL25
HGL10
~~42.50~~ LF 42" HDPE 44.84 @ ~~0.80%~~ 2.19%
~~45.00~~ LF 42" HDPE 45.27 @ ~~0.80%~~ 2.08%
~~48.45~~ LF 24" HDPE 48.24 @ ~~4.40%~~ 4.13%
~~102.00~~ LF 24" HDPE 102.88 @ ~~2.53%~~ 2.44%
~~205.00~~ LF 15" HDPE 203.85 @ ~~3.47%~~ 3.24%
~~42.00~~ LF 15" HDPE 42.25 @ ~~2.00%~~ 1.94%
HDPE
SANITARY SEWER 8" PVC INV.= 1010.42
W INV. OUT= ~~1011.93~~ (42" HDPE) 1011.23
SE INV. IN= ~~1012.53~~ (42" HDPE) 1011.43
NW INV. OUT= ~~1012.87~~ (42" HDPE) 1012.41
E INV. IN= ~~1013.47~~ (42" HDPE) 1012.91
W INV. OUT= ~~1013.83~~ (42" HDPE) 1013.85
S INV. IN= ~~1014.43~~ (36" HDPE) 1014.33
NE INV. IN= ~~1015.33~~ (24" HDPE) 1015.23
SW INV. OUT= ~~1017.46~~ (24" HDPE) 1017.22
E INV. IN= ~~1018.06~~ (24" HDPE) 1017.92
N INV. IN= ~~1018.06~~ (15" HDPE) 1018.07
W INV. OUT= ~~1020.64~~ (24" HDPE) 1020.43
N INV. IN= ~~1021.34~~ (24" HDPE) 1021.23
E INV. IN= ~~1021.34~~ (15" HDPE) 1021.38
S INV. IN= ~~1021.34~~ (15" HDPE) 1021.23
W INV. OUT= ~~1028.46~~ (15" HDPE) 1027.98
N INV. IN= ~~1029.16~~ (15" HDPE) 1029.08
S INV. OUT= ~~1030.00~~ (15" HDPE) 1029.90
STORM LINE 2 CONT.
12+ 15+00
16+00
17+00
18+00
19+00
20+00 20+25

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STATE OF MISSOURI
JULIE ELAINE SELLERS
NUMBER PE-2017000367
PROFESSIONAL ENGINEER
3/18/21

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

REVISIONS

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

2019

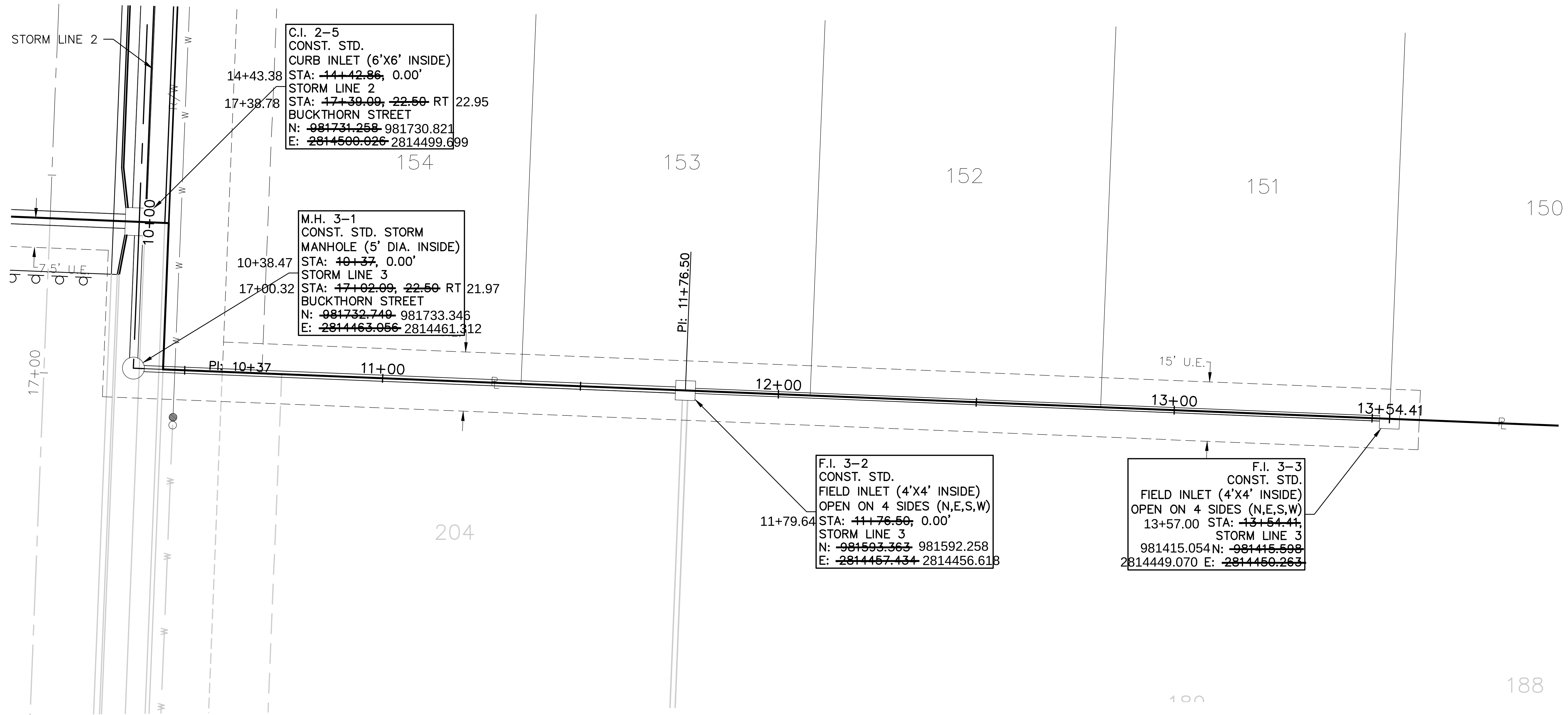
STORM PLAN & PROFILE
STREET & STORM SEWER PLANS

HAWTHORN RIDGE
SECOND PLAT

LEE'S SUMMIT, MISSOURI

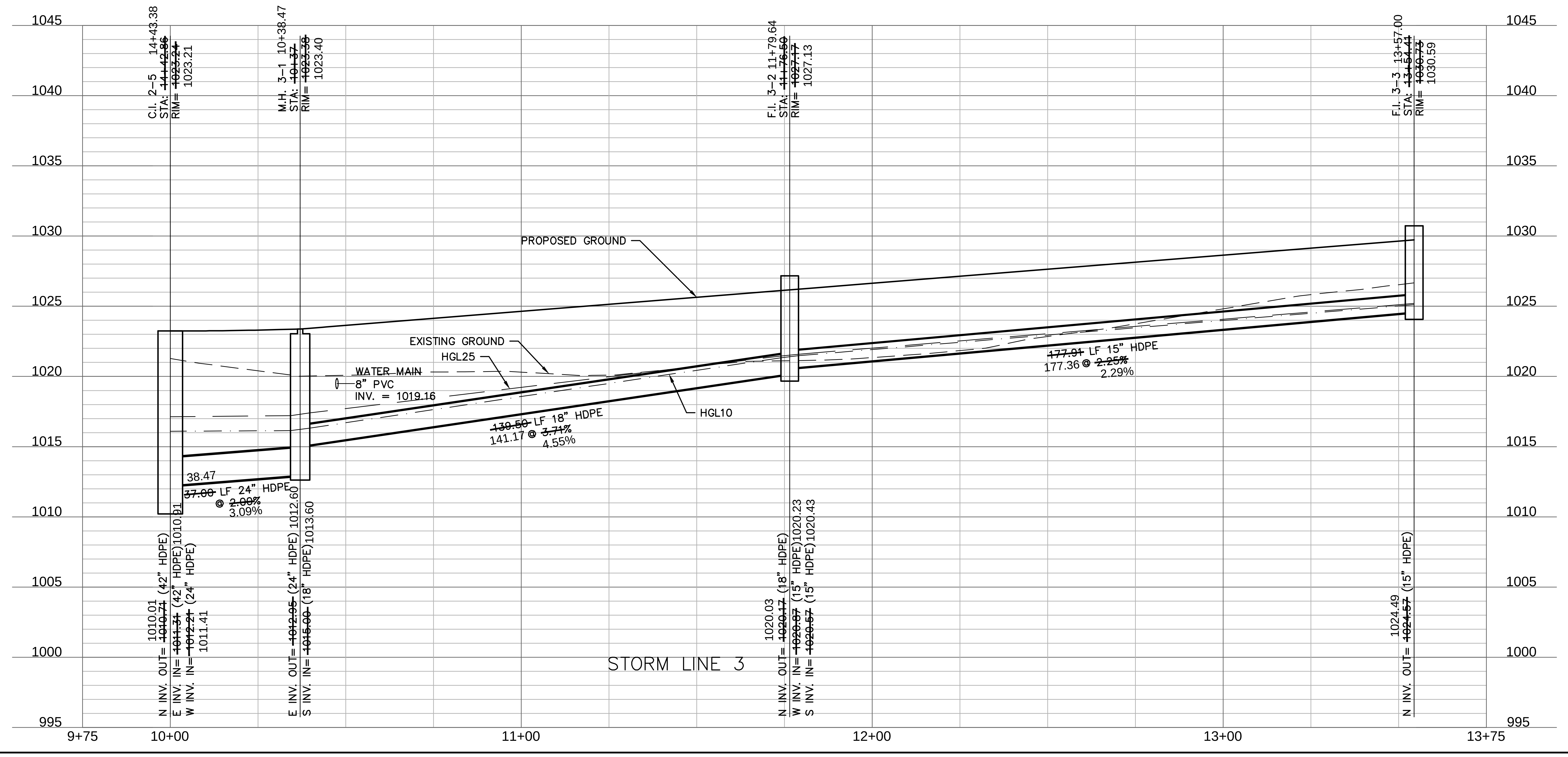
drawn by: D.A.H.O
checked by: M.G.D
designed by: B.M.W
QA/QC by: N.D.H
project no.: 019-1605
date: 07-12-2019

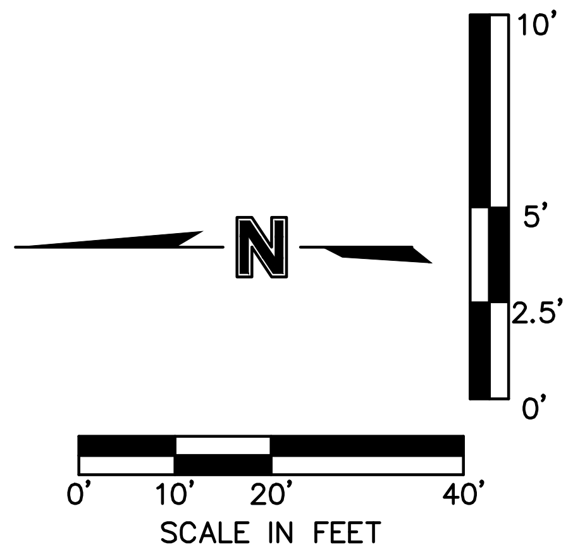
SHEET
C126


STORM LINE 2
C.I. 2–5
CONST. STD.
CURB INLET (6'X6' INSIDE)
14+43.38 STA: ~~14+42.86,~~ 0.00'
STORM LINE 2
17+38.78 STA: ~~17+39.09,~~ ~~22.50~~ RT 22.95
BUCKTHORN STREET
N: ~~981731.258~~ 981730.821
E: ~~2814500.026~~ 2814499.699
M.H. 3–1
CONST. STD. STORM
MANHOLE (5' DIA. INSIDE)
10+38.47 STA: ~~10+37,~~ 0.00'
STORM LINE 3
17+00.32 STA: ~~17+02.09,~~ ~~22.50~~ RT 21.97
BUCKTHORN STREET
N: ~~981732.749~~ 981733.346
E: ~~2814463.056~~ 2814461.312
7.5' U.E.
10+00
17+00
PI: 10+37
11+00
PI: 11+76.50
12+00
13+00
13+54.41
15' U.E.
154
153
152
151
150
204
188
F.I. 3–2
CONST. STD.
FIELD INLET (4'X4' INSIDE)
OPEN ON 4 SIDES (N,E,S,W)
11+79.64 STA: ~~11+76.50,~~ 0.00'
STORM LINE 3
N: ~~981593.363~~ 981592.258
E: ~~2814457.434~~ 2814456.618
F.I. 3–3
CONST. STD.
FIELD INLET (4'X4' INSIDE)
OPEN ON 4 SIDES (N,E,S,W)
13+57.00 STA: ~~13+54.41,~~
STORM LINE 3
981415.054 N: ~~981415.598~~
2814449.070 E: ~~2814450.263~~

AS-BUILT

3/17/2021


1045
1040
1035
1030
1025
1020
1015
1010
1005
1000
995
C.I. 2–5 14+43.38
STA: ~~14+42.86~~
RIM= ~~1023.24~~ 1023.21
M.H. 3–1 10+38.47
STA: ~~10+37~~
RIM= ~~1023.38~~ 1023.40
F.I. 3–2 11+79.64
STA: ~~11+76.50~~
RIM= ~~1027.17~~ 1027.13
F.I. 3–3 13+57.00
STA: ~~13+54.41~~
RIM= ~~1030.73~~ 1030.59
PROPOSED GROUND
EXISTING GROUND
HGL25
HGL10
WATER MAIN
8" PVC
INV. = 1019.16
38.47
~~37.00~~ LF 24" HDPE
@ ~~2.00%~~
3.09%
~~139.50~~ LF 18" HDPE
141.17 @ ~~3.71%~~
4.55%
~~177.91~~ LF 15" HDPE
177.36 @ ~~2.25%~~
2.29%
N INV. OUT= ~~1010.71~~ (42" HDPE) 1010.01
E INV. IN= ~~1011.31~~ (42" HDPE)1010.91
W INV. IN= ~~1012.21~~ (24" HDPE) 1011.41
E INV. OUT= ~~1012.95~~ (24" HDPE) 1012.60
S INV. IN= ~~1015.00~~ (18" HDPE)1013.60
N INV. OUT= ~~1020.17~~ (18" HDPE) 1020.03
W INV. IN= ~~1020.87~~ (15" HDPE)1020.23
S INV. IN= ~~1020.57~~ (15" HDPE)1020.43
N INV. OUT= ~~1024.57~~ (15" HDPE) 1024.49
STORM LINE 3
9+75
10+00
11+00
12+00
13+00
13+75


N
10'
5'
2.5'
0'
0'
10'
20'
40'
SCALE IN FEET

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JULIE ELAINE SELLERS
NUMBER
PE-2017000367
3/18/21

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

2019

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
C127

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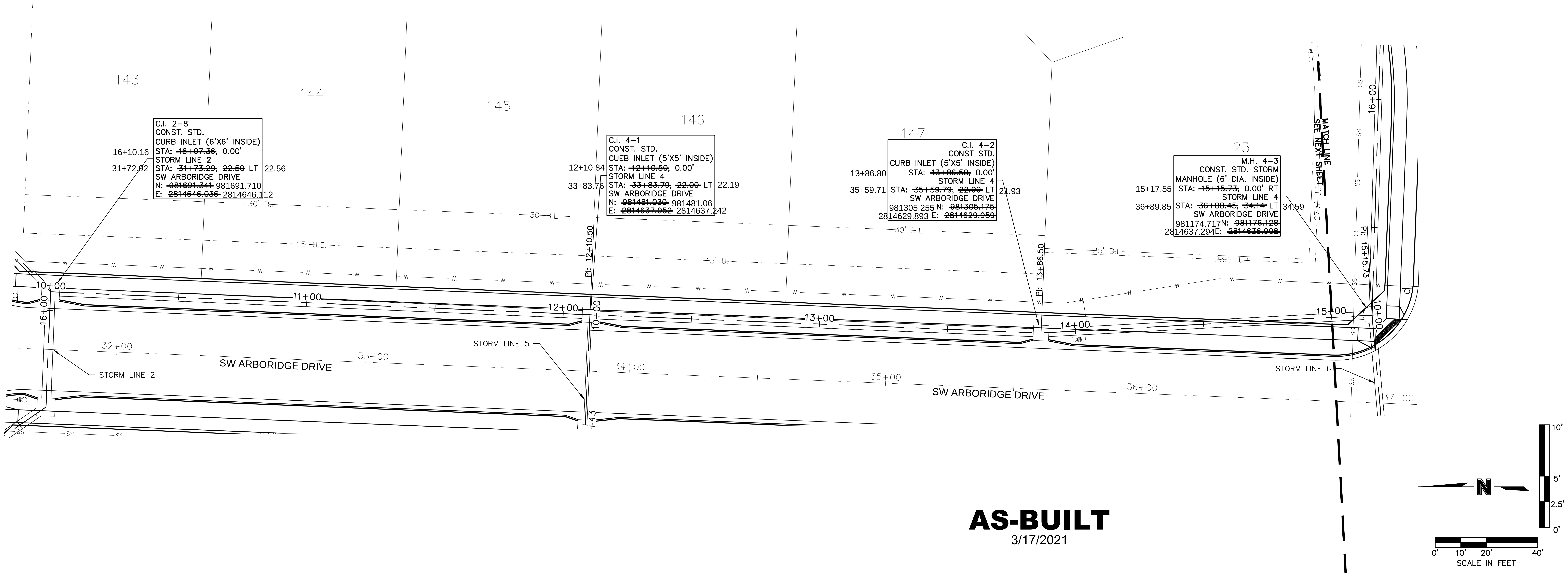
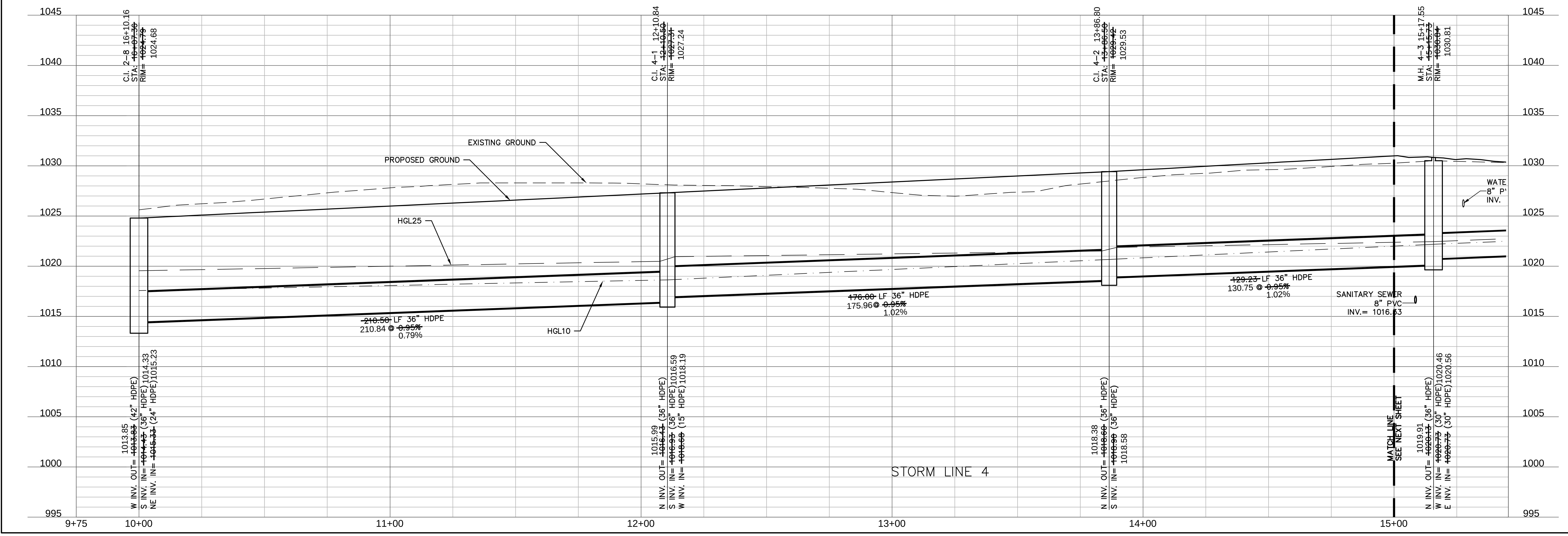

143
144
145
146
147
123
C.I. 2–8
CONST. STD.
CURB INLET (6'X6' INSIDE)
16+10.16 STA: ~~16+07.36,~~ 0.00'
STORM LINE 2
31+72.92 STA: ~~31+73.29,~~ ~~22.50~~ LT 22.56
SW ARBORIDGE DRIVE
N: ~~981691.341~~ 981691.710
E: ~~2814646.036~~ 2814646.112
C.I. 4–1
CONST. STD.
CUEB INLET (5'X5' INSIDE)
12+10.84 STA: ~~12+10.50,~~ 0.00'
STORM LINE 4
33+83.76 STA: ~~33+83.79,~~ ~~22.00~~ LT 22.19
SW ARBORIDGE DRIVE
N: ~~981481.030~~ 981481.06
E: ~~2814637.052~~ 2814637.242
C.I. 4–2
CONST STD.
CURB INLET (5'X5' INSIDE)
13+86.80 STA: ~~13+86.50,~~ 0.00'
STORM LINE 4
35+59.71 STA: ~~35+59.79,~~ ~~22.00~~ LT 21.93
SW ARBORIDGE DRIVE
981305.255 N: ~~981305.175~~
2814629.893 E: ~~2814629.959~~
M.H. 4–3
CONST. STD. STORM
MANHOLE (6' DIA. INSIDE)
15+17.55 STA: ~~15+15.73,~~ 0.00' RT
STORM LINE 4
36+89.85 STA: ~~36+88.45,~~ ~~34.14~~ LT 34.59
SW ARBORIDGE DRIVE
981174.717N: ~~981176.128~~
2814637.294E: ~~2814636.908~~
30' B.L.
30' B.L.
30' B.L.
25' B.L.
15' U.E.
15' U.E.
23.5' U.E.
27.5' U.E.
PI: 12+10.50
PI: 13+86.50
PI: 15+15.73
10+00
11+00
12+00
13+00
14+00
15+00
16+00
10+00
16+00
10+00
+43
32+00
33+00
34+00
35+00
36+00
37+00
SW ARBORIDGE DRIVE
SW ARBORIDGE DRIVE
STORM LINE 2
STORM LINE 5
STORM LINE 6
MATCH LINE
SEE NEXT SHEET
N
10'
5'
2.5'
0'
0' 10' 20' 40'
SCALE IN FEET

AS-BUILT
3/17/2021


1045
1040
1035
1030
1025
1020
1015
1010
1005
1000
995
C.I. 2–8 16+10.16
STA: ~~16+07.36~~
RIM= ~~1024.79~~ 1024.68
C.I. 4–1 12+10.84
STA: ~~12+10.50~~
RIM= ~~1027.31~~ 1027.24
C.I. 4–2 13+86.80
STA: ~~13+86.50~~
RIM= ~~1029.42~~ 1029.53
M.H. 4–3 15+17.55
STA: ~~15+15.73~~
RIM= ~~1030.84~~ 1030.81
EXISTING GROUND
PROPOSED GROUND
HGL25
HGL10
WATE
8" P
INV.
~~210.56~~ LF 36" HDPE
210.84 @ ~~0.95%~~
0.79%
~~176.00~~ LF 36" HDPE
175.96@ ~~0.95%~~
1.02%
~~129.23~~ LF 36" HDPE
130.75 @ ~~0.95%~~
1.02%
SANITARY SEWER
8" PVC
INV.= 1016.33
W INV. OUT= ~~1013.83~~ 1013.85 (42" HDPE)
S INV. IN= ~~1014.43~~ (36" HDPE) 1014.33
NE INV. IN= ~~1015.33~~ (24" HDPE) 1015.23
N INV. OUT= ~~1016.43~~ 1015.99 (36" HDPE)
S INV. IN= ~~1016.93~~ (36" HDPE) 1016.59
W INV. IN= ~~1018.68~~ (15" HDPE) 1018.19
N INV. OUT= ~~1018.60~~ 1018.38 (36" HDPE)
S INV. IN= ~~1018.90~~ 1018.58 (36" HDPE)
N INV. OUT= ~~1020.13~~ 1019.91 (36" HDPE)
W INV. IN= ~~1020.73~~ (30" HDPE) 1020.46
E INV. IN= ~~1020.73~~ (30" HDPE) 1020.56
MATCH LINE
SEE NEXT SHEET
STORM LINE 4
9+75
10+00
11+00
12+00
13+00
14+00
15+00

DWG: F:\2019\1501-2000\019-1605\40-Design\AutoCAD\As-Built\Sheets\GNC\STREET, STORM & SITE DISTURBANCE\C_STM02_0191605.dwg USER: bworthley
DATE: Feb 15, 2021 12:13pm XREFS: C_PTBLK_0191605 C_PBNDY_0191605 C_PBASE_0191605 C_XBASE_0191605 C_FBASE_0191605 C_PUTIL_0191605 C_PSTRM_0191605

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JULIE ELAINE SELLERS
NUMBER PE-2017000367
3/18/21

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

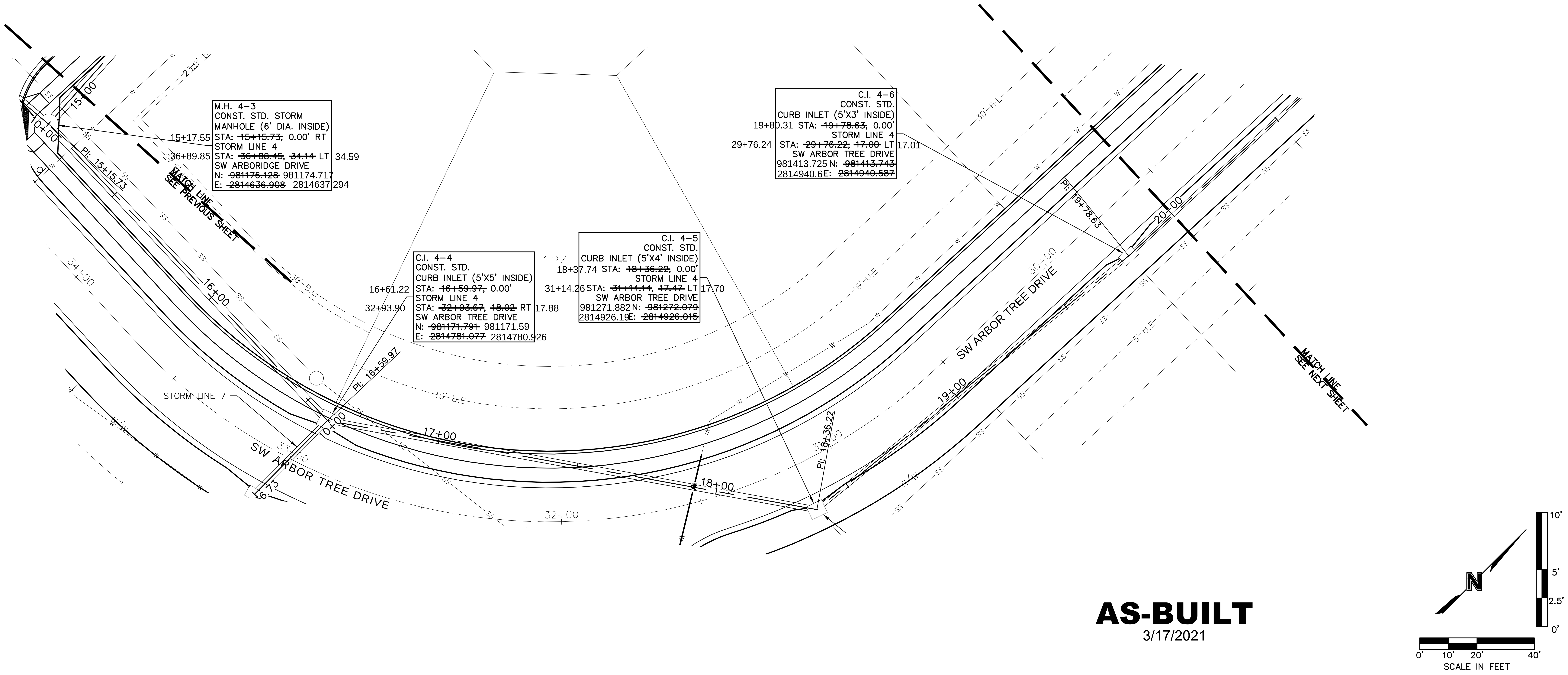
HAWTHORN RIDGE
SECOND PLAT

2019

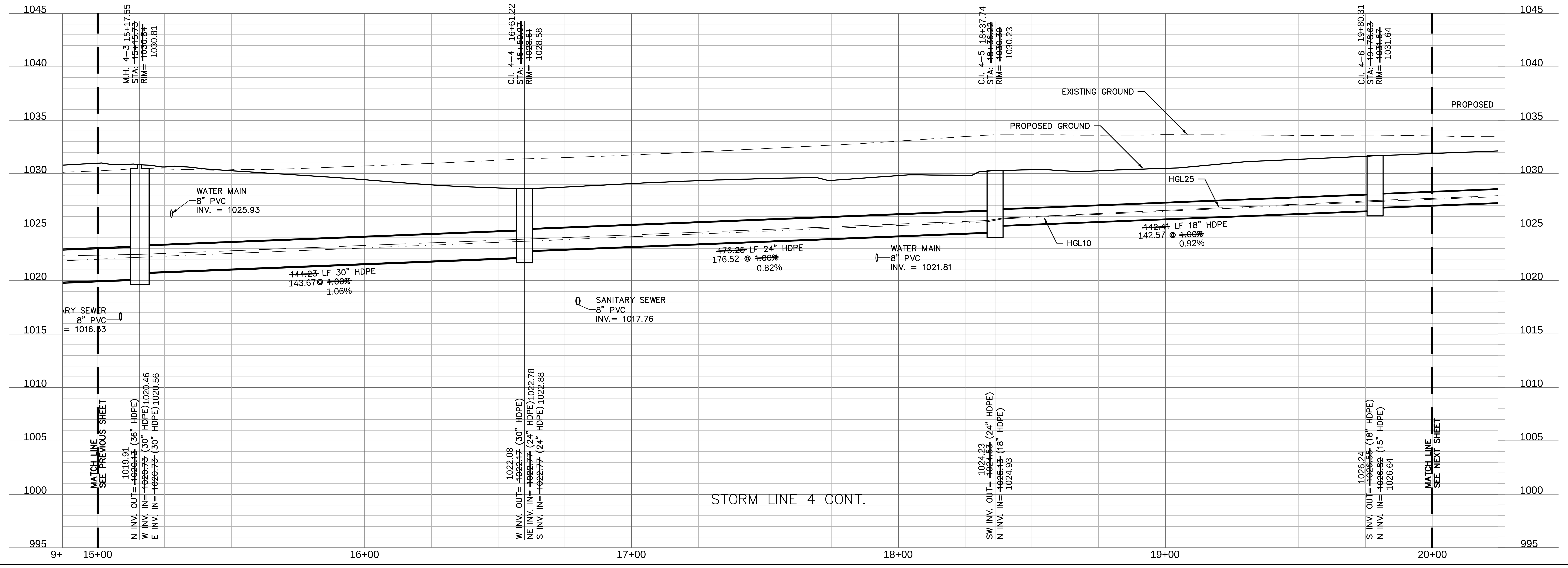
LEE'S SUMMIT, MISSOURI

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
C128


M.H. 4–3
CONST. STD. STORM
MANHOLE (6' DIA. INSIDE)
15+17.55 STA: ~~15+15.73,~~ 0.00' RT
STORM LINE 4
36+89.85 STA: ~~36+88.45,~~ ~~34.14~~ LT 34.59
SW ARBORIDGE DRIVE
N: ~~981176.128~~ 981174.717
E: ~~2814636.908~~ 2814637.294
C.I. 4–4
CONST. STD.
CURB INLET (5'X5' INSIDE)
16+61.22 STA: ~~16+59.97,~~ 0.00'
STORM LINE 4
32+93.90 STA: ~~32+93.67,~~ ~~18.02~~ RT 17.88
SW ARBOR TREE DRIVE
N: ~~981171.791~~ 981171.59
E: ~~2814781.077~~ 2814780.926
C.I. 4–5
CONST. STD.
CURB INLET (5'X4' INSIDE)
18+37.74 STA: ~~18+36.22,~~ 0.00'
STORM LINE 4
31+14.26 STA: ~~31+14.14,~~ ~~17.47~~ LT 17.70
SW ARBOR TREE DRIVE
981271.882 N: ~~981272.079~~
2814926.19 E: ~~2814926.015~~
C.I. 4–6
CONST. STD.
CURB INLET (5'X3' INSIDE)
19+80.31 STA: ~~19+78.63,~~ 0.00'
STORM LINE 4
29+76.24 STA: ~~29+76.22,~~ ~~17.00~~ LT 17.01
SW ARBOR TREE DRIVE
981413.725 N: ~~981413.743~~
2814940.6 E: ~~2814940.587~~
124
MATCH LINE SEE PREVIOUS SHEET
MATCH LINE SEE NEXT SHEET
PI: 15+15.73
PI: 16+59.97
PI: 18+36.22
PI: 19+78.63
15+00
16+00
17+00
18+00
19+00
20+00
0+00
10+00
15+73
33+00
32+00
31+00
30+00
34+00
23.5'
30' B.L.
15' U.E.
STORM LINE 7
SW ARBOR TREE DRIVE
SS
W
N
10' 5' 2.5' 0'
0' 10' 20' 40'
SCALE IN FEET

AS-BUILT
3/17/2021


1045
1040
1035
1030
1025
1020
1015
1010
1005
1000
995
M.H. 4–3 15+17.55
STA: ~~15+15.73~~
RIM= ~~1030.64~~ 1030.81
C.I. 4–4 16+61.22
STA: ~~16+59.97~~
RIM= ~~1028.61~~ 1028.58
C.I. 4–5 18+37.74
STA: ~~18+36.22~~
RIM= ~~1030.19~~ 1030.23
C.I. 4–6 19+80.31
STA: ~~19+78.63~~
RIM= ~~1031.67~~ 1031.64
EXISTING GROUND
PROPOSED GROUND
PROPOSED
HGL25
HGL10
WATER MAIN
8" PVC
INV. = 1025.93
WATER MAIN
8" PVC
INV. = 1021.81
SANITARY SEWER
8" PVC
INV.= 1017.76
ARY SEWER
8" PVC
= 1016.63
~~144.23~~ LF 30" HDPE
143.67 @ ~~1.00%~~
1.06%
~~176.25~~ LF 24" HDPE
176.52 @ ~~1.00%~~
0.82%
~~142.41~~ LF 18" HDPE
142.57 @ ~~1.00%~~
0.92%
MATCH LINE SEE PREVIOUS SHEET
MATCH LINE SEE NEXT SHEET
N INV. OUT= ~~1020.13~~ (36" HDPE) 1019.91
W INV. IN= ~~1020.73~~ (30" HDPE) 1020.46
E INV. IN= ~~1020.73~~ (30" HDPE) 1020.56
W INV. OUT= ~~1021.17~~ (30" HDPE) 1022.08
NE INV. IN= ~~1022.77~~ (24" HDPE) 1022.78
S INV. IN= ~~1022.77~~ (24" HDPE) 1022.88
SW INV. OUT= ~~1024.53~~ (24" HDPE) 1024.23
N INV. IN= ~~1025.13~~ (18" HDPE) 1024.93
S INV. OUT= ~~1026.55~~ (18" HDPE) 1026.24
N INV. IN= ~~1026.82~~ (15" HDPE) 1026.64
STORM LINE 4 CONT.
9+
15+00
16+00
17+00
18+00
19+00
20+00

DWG: F:\2019\1501–2000\019–1605\40–Design\AutoCAD\As–Built\Sheets\GNCV\STREET, STORM & SITE DISTURBANCE\C_STM02_0191605.dwg USER: bworthley
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STATE OF MISSOURI
JULIE ELAINE SELLERS
NUMBER PE-2017000367
3/18/21
PROFESSIONAL ENGINEER

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

REVISIONS

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

STORM PLAN & PROFILE
STREET & STORM SEWER PLANS

HAWTHORN RIDGE
SECOND PLAT

2019

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
C129

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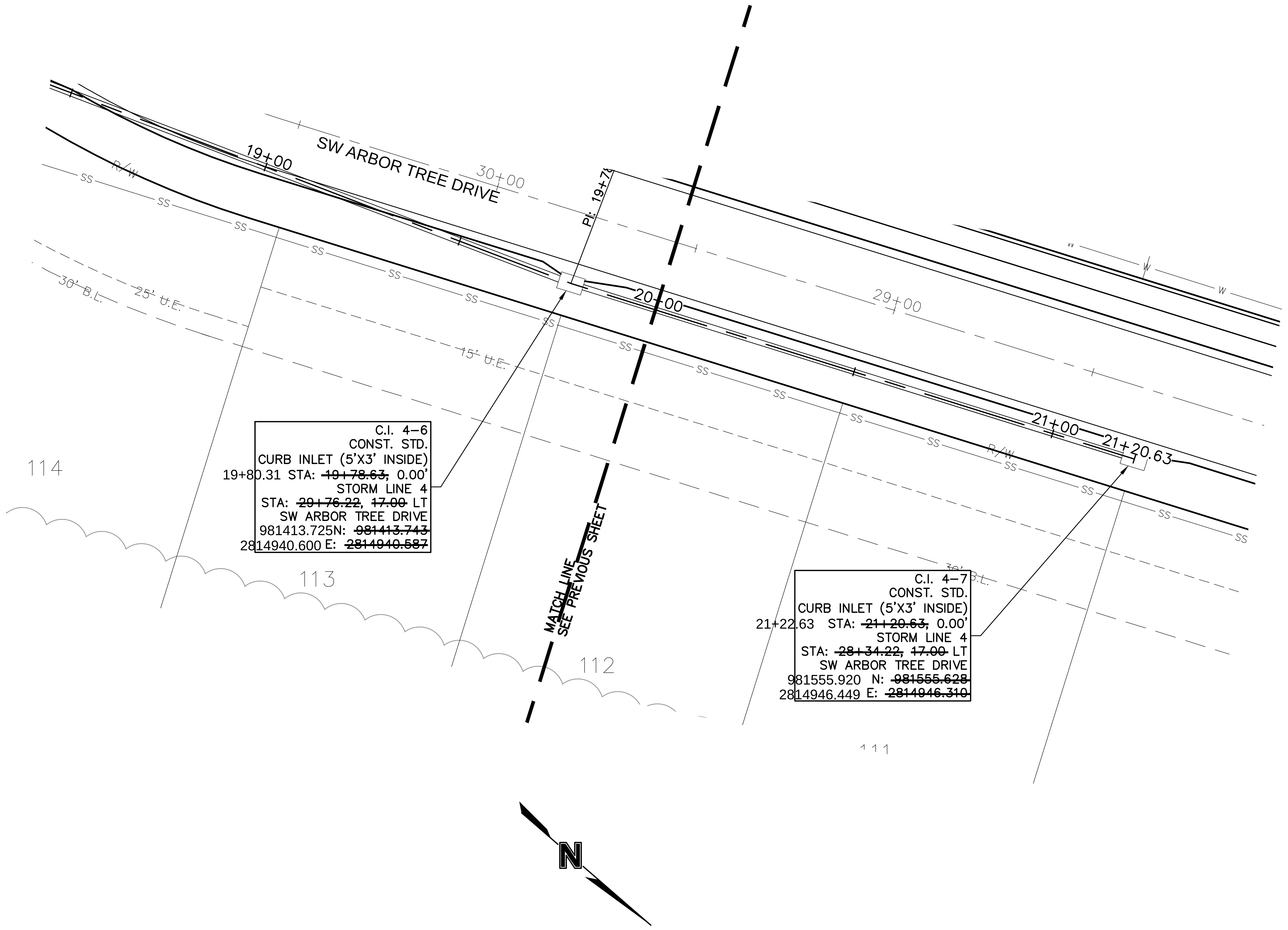
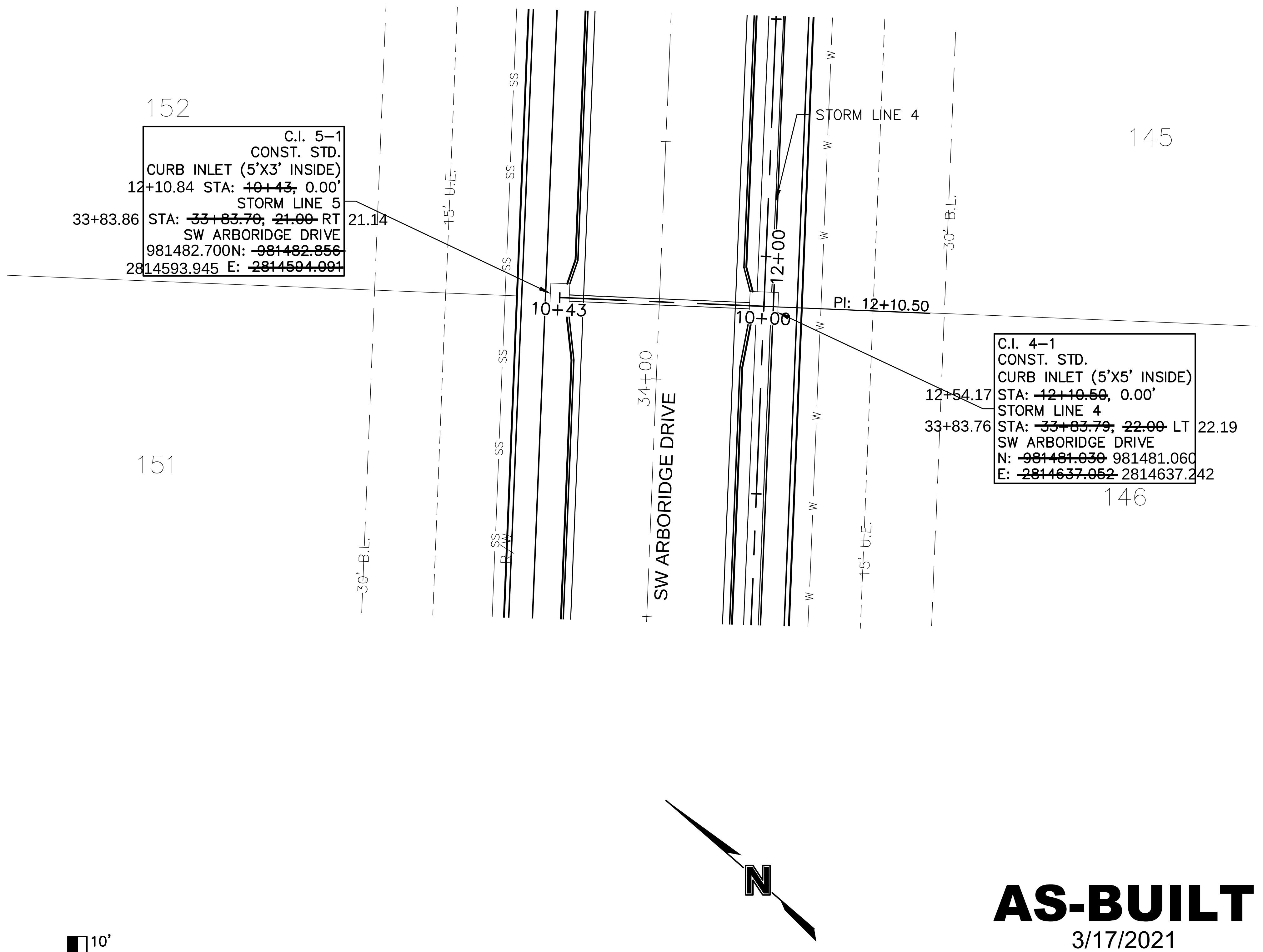
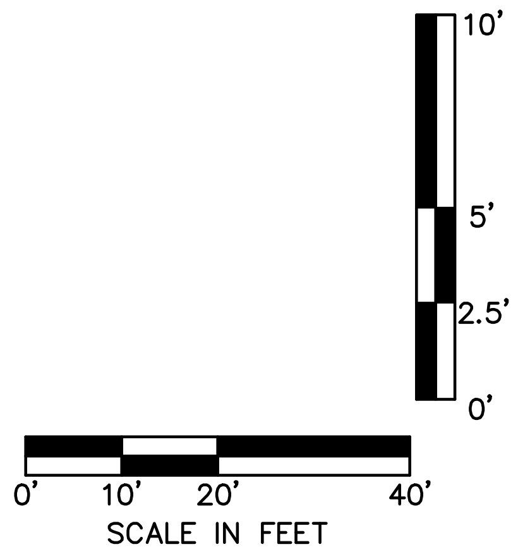


SW ARBOR TREE DRIVE
19+00
20+00
21+00
21+20.63
30+00
29+00
PI: 19+7
R/W
SS
W
30' B.L.
25' U.E.
15' U.E.
114
113
112
111
MATCH LINE
SEE PREVIOUS SHEET
C.I. 4–6
CONST. STD.
CURB INLET (5'X3' INSIDE)
19+80.31 STA: ~~19+78.63,~~ 0.00'
STORM LINE 4
STA: ~~29+76.22,~~ ~~17.00~~ LT
SW ARBOR TREE DRIVE
981413.725N: ~~981413.743~~
2814940.600 E: ~~2814940.587~~
C.I. 4–7
CONST. STD.
CURB INLET (5'X3' INSIDE)
21+22.63 STA: ~~21+20.63,~~ 0.00'
STORM LINE 4
STA: ~~28+34.22,~~ ~~17.00~~ LT
SW ARBOR TREE DRIVE
981555.920 N: ~~981555.628~~
2814946.449 E: ~~2814946.310~~
N

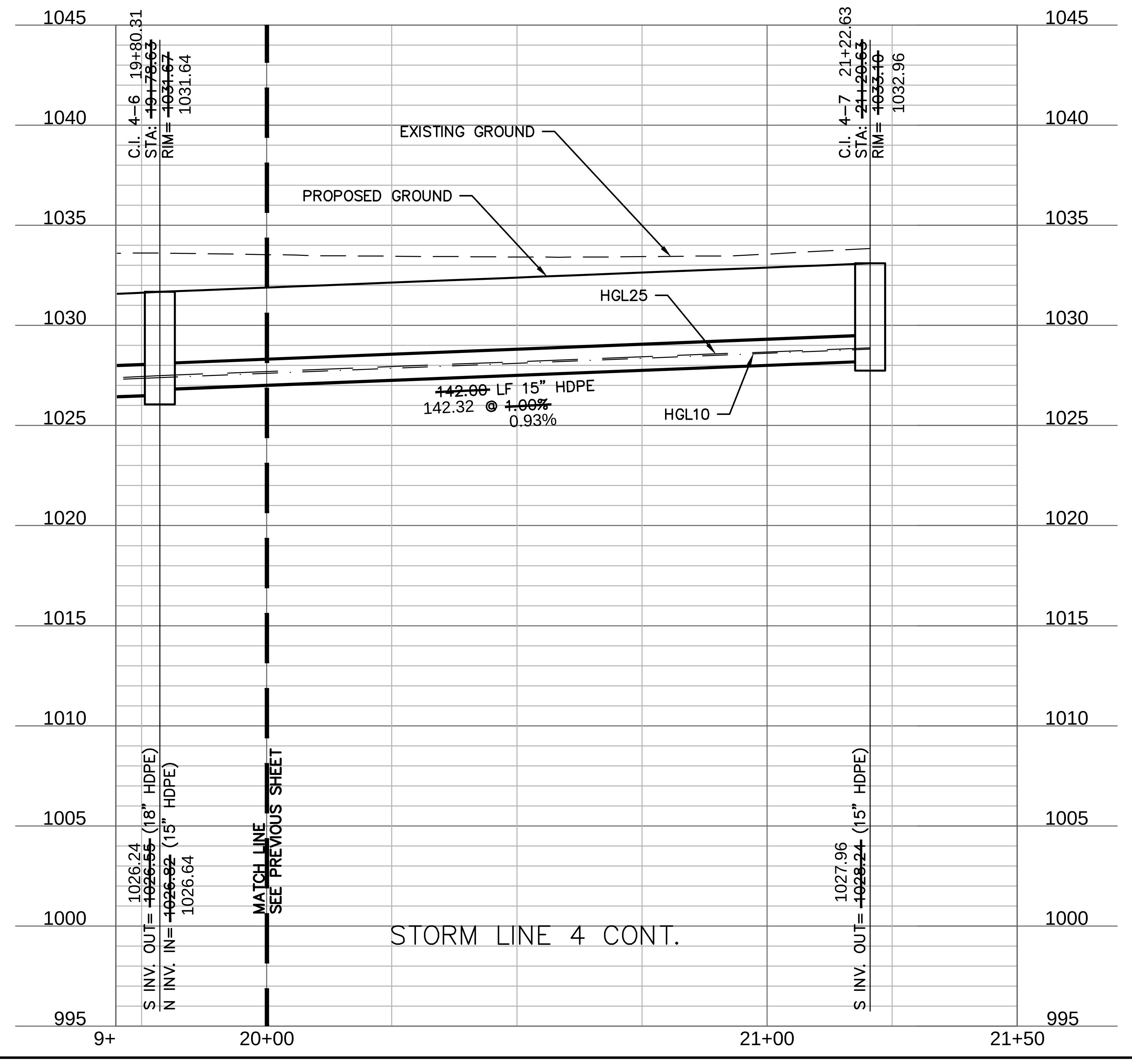


152
151
145
146
C.I. 5–1
CONST. STD.
CURB INLET (5'X3' INSIDE)
12+10.84 STA: ~~10+43,~~ 0.00'
STORM LINE 5
33+83.86 STA: ~~33+83.70,~~ ~~21.00~~ RT 21.14
SW ARBORIDGE DRIVE
981482.700N: ~~981482.856~~
2814593.945 E: ~~2814594.091~~
STORM LINE 4
12+00
10+43
10+00
PI: 12+10.50
34+00
SW ARBORIDGE DRIVE
C.I. 4–1
CONST. STD.
CURB INLET (5'X5' INSIDE)
12+54.17 STA: ~~12+10.50,~~ 0.00'
STORM LINE 4
33+83.76 STA: ~~33+83.79,~~ ~~22.00~~ LT 22.19
SW ARBORIDGE DRIVE
N: ~~981481.030~~ 981481.060
E: ~~2814637.052~~ 2814637.242
30' B.L.
15' U.E.
R/W
SS
W
N

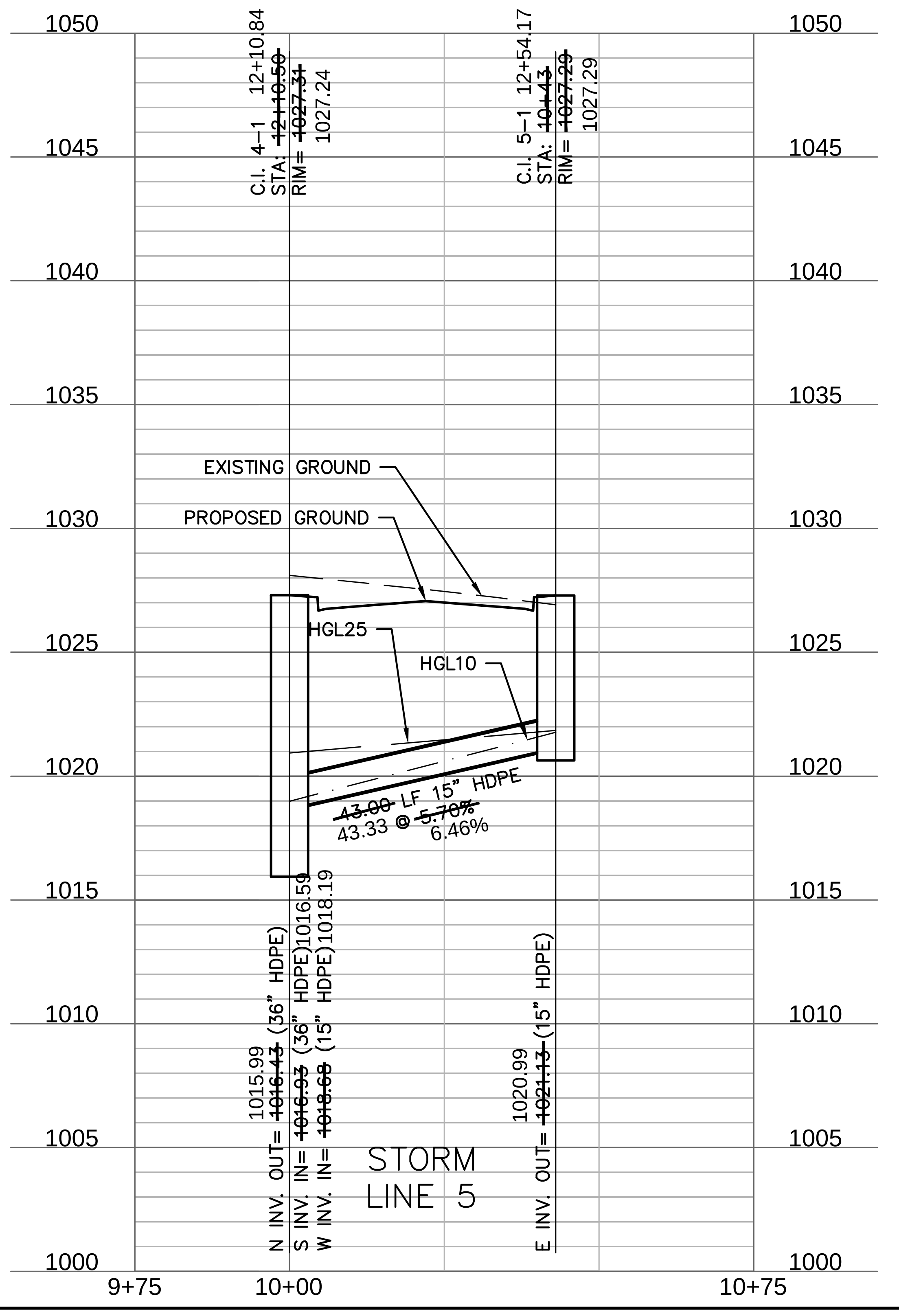
AS-BUILT
3/17/2021



10'
5'
2.5'
0'
0'
10'
20'
40'
SCALE IN FEET



1045
1040
1035
1030
1025
1020
1015
1010
1005
1000
995
C.I. 4–6 19+80.31
STA: ~~19+78.63~~
RIM= ~~1031.67~~ 1031.64
C.I. 4–7 21+22.63
STA: ~~21+20.63~~
RIM= ~~1033.10~~ 1032.96
EXISTING GROUND
PROPOSED GROUND
HGL25
HGL10
~~142.00~~ LF 15" HDPE
142.32 @ ~~1.00%~~
0.93%
1026.24
S INV. OUT= ~~1026.55~~ (18" HDPE)
N INV. IN= ~~1026.92~~ (15" HDPE)
1026.64
MATCH LINE
SEE PREVIOUS SHEET
1027.96
S INV. OUT= ~~1028.24~~ (15" HDPE)
STORM LINE 4 CONT.
9+
20+00
21+00
21+50



1050
1045
1040
1035
1030
1025
1020
1015
1010
1005
1000
C.I. 4–1 12+10.84
STA: ~~12+10.50~~
RIM= ~~1027.31~~ 1027.24
C.I. 5–1 12+54.17
STA: ~~10+43~~
RIM= ~~1027.29~~ 1027.29
EXISTING GROUND
PROPOSED GROUND
HGL25
HGL10
~~43.00~~ LF 15" HDPE
43.33 @ ~~5.70%~~
6.46%
1015.99
N INV. OUT= ~~1016.43~~ (36" HDPE)
S INV. IN= ~~1016.93~~ (36" HDPE)1016.59
W INV. IN= ~~1018.68~~ (15" HDPE)1018.19
1020.99
E INV. OUT= ~~1021.13~~ (15" HDPE)
STORM LINE 5
9+75
10+00
10+75

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1301 BURLINGTON, SUITE 100
NORTH KANSAS CITY, MO 64116
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www.olsson.com

STATE OF MISSOURI
JULIE ELAINE SELLERS
NUMBER PE-2017000367
3/18/21
PROFESSIONAL ENGINEER

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

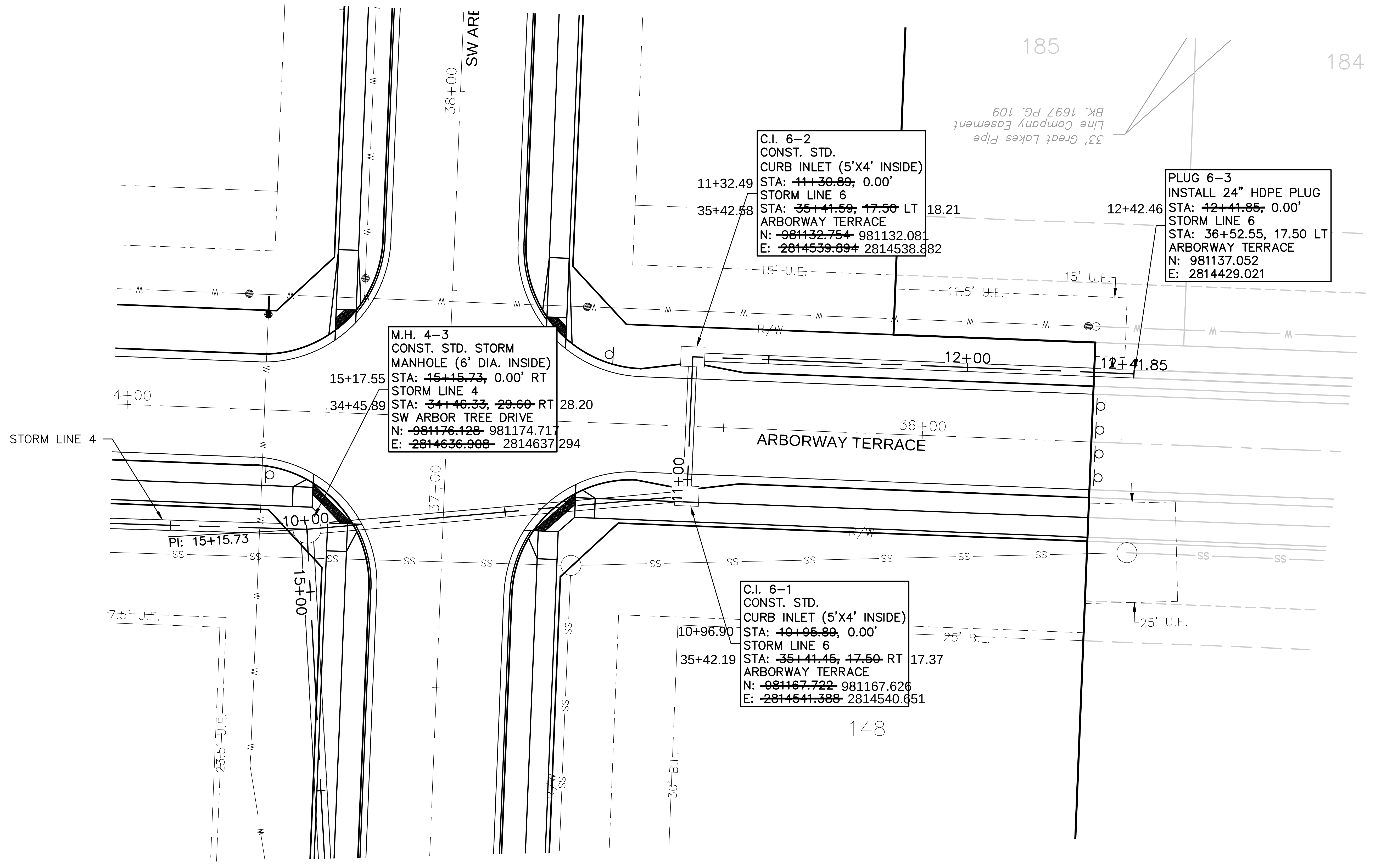
LEE'S SUMMIT, MISSOURI

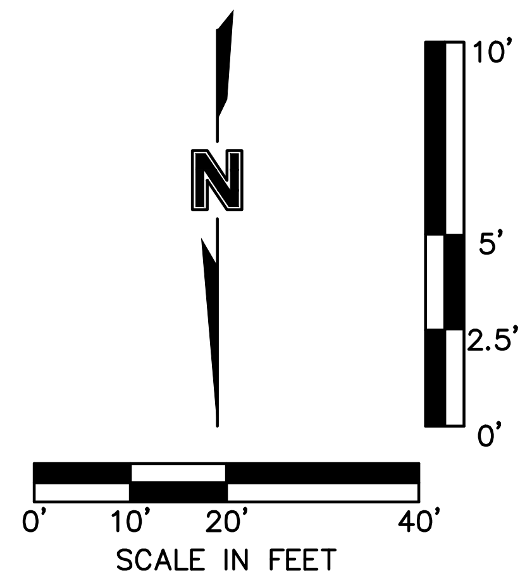
2019

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

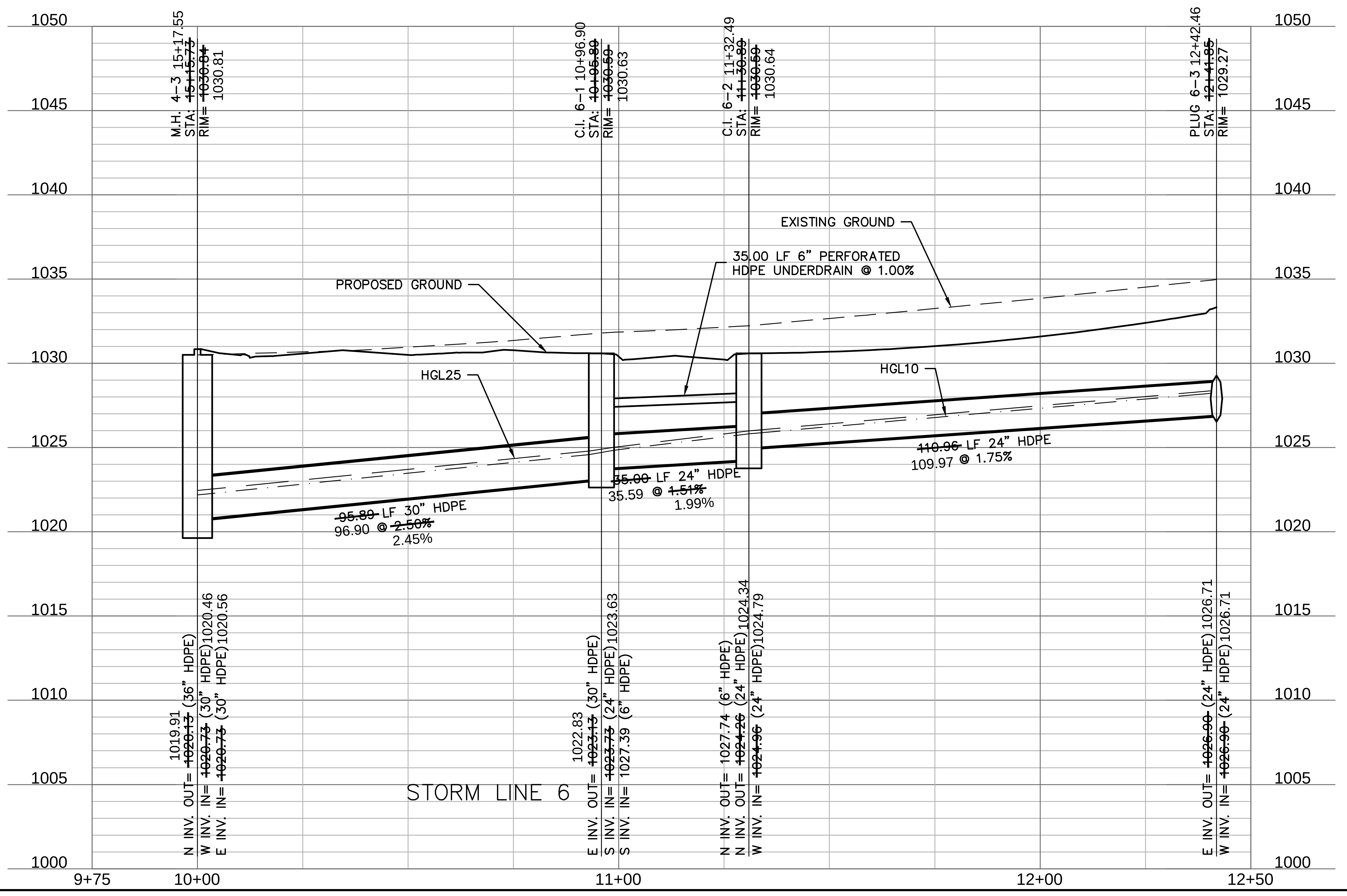
SHEET
C130

DWG: F:\2019\1501-2000\019-1605\40-Design\AutoCAD\As-Built\Sheets\GNCV\STREET, STORM & SITE DISTURBANCE\C_STM03_0191605.dwg USER: bworthley
DATE: Feb 15, 2021 12:15pm XREFS: C_PTBLK_0191605 C_PBNDY_0191605 C_PBASE_0191605 C_XBASE_0191605 C_FBASE_0191605 C_PUTIL_0191605 C_PSTRM_0191605


SW ARE
38+00
185
184
33' Great Lakes Pipe
Line Company Easement
BK. 1697 PG. 109
C.I. 6-2
CONST. STD.
CURB INLET (5'X4' INSIDE)
11+32.49 STA: ~~11+30.89,~~ 0.00'
STORM LINE 6
35+42.58 STA: ~~35+41.59,~~ ~~17.50~~ LT 18.21
ARBORWAY TERRACE
N: ~~981132.754~~ 981132.081
E: ~~2814539.894~~ 2814538.882
PLUG 6-3
INSTALL 24" HDPE PLUG
12+42.46 STA: ~~12+41.85,~~ 0.00'
STORM LINE 6
STA: 36+52.55, 17.50 LT
ARBORWAY TERRACE
N: 981137.052
E: 2814429.021
15' U.E.
11.5' U.E.
15' U.E.
R/W
12+00
12+41.85
M.H. 4-3
CONST. STD. STORM
MANHOLE (6' DIA. INSIDE)
15+17.55 STA: ~~15+15.73,~~ 0.00' RT
STORM LINE 4
34+45.89 STA: ~~34+46.33,~~ ~~29.60~~ RT 28.20
SW ARBOR TREE DRIVE
N: ~~981176.128~~ 981174.717
E: ~~2814636.908~~ 2814637.294
4+00
36+00
ARBORWAY TERRACE
STORM LINE 4
37+00
11+00
10+00
PI: 15+15.73
15+00
R/W
7.5' U.E.
23.5' U.E.
C.I. 6-1
CONST. STD.
CURB INLET (5'X4' INSIDE)
10+96.90 STA: ~~10+95.89,~~ 0.00'
STORM LINE 6
35+42.19 STA: ~~35+41.45,~~ ~~17.50~~ RT 17.37
ARBORWAY TERRACE
N: ~~981167.722~~ 981167.626
E: ~~2814541.388~~ 2814540.651
25' B.L.
25' U.E.
148
30' B.L.


N
10'
5'
2.5'
0'
0'
10'
20'
40'
SCALE IN FEET

AS-BUILT
3/17/2021


1050
1045
1040
1035
1030
1025
1020
1015
1010
1005
1000
M.H. 4-3 15+17.55
STA: ~~15+15.73~~
RIM= ~~1030.84~~ 1030.81
C.I. 6-1 10+96.90
STA: ~~10+95.89~~
RIM= ~~1030.59~~ 1030.63
C.I. 6-2 11+32.49
STA: ~~11+30.89~~
RIM= ~~1030.59~~ 1030.64
PLUG 6-3 12+42.46
STA: ~~12+41.85~~
RIM= 1029.27
EXISTING GROUND
35.00 LF 6" PERFORATED
HDPE UNDERDRAIN @ 1.00%
PROPOSED GROUND
HGL25
HGL10
~~110.96~~ LF 24" HDPE
109.97 @ 1.75%
~~35.00~~ LF 24" HDPE
35.59 @ ~~1.51%~~
1.99%
~~95.89~~ LF 30" HDPE
96.90 @ ~~2.50%~~
2.45%
1019.91
N INV. OUT= ~~1020.13~~ (36" HDPE)
W INV. IN= ~~1020.73~~ (30" HDPE)1020.46
E INV. IN= ~~1020.73~~ (30" HDPE)1020.56
STORM LINE 6
1022.83
E INV. OUT= ~~1023.13~~ (30" HDPE)
S INV. IN= ~~1023.73~~ (24" HDPE)1023.63
S INV. IN= 1027.39 (6" HDPE)
N INV. OUT= 1027.74 (6" HDPE)
N INV. OUT= ~~1024.26~~ (24" HDPE)1024.34
W INV. IN= ~~1024.96~~ (24" HDPE)1024.79
E INV. OUT= ~~1026.90~~ (24" HDPE) 1026.71
W INV. IN= ~~1026.90~~ (24" HDPE) 1026.71
9+75
10+00
11+00
12+00
12+50

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www.olsson.com

JULIE ELAINE SELLERS
NUMBER PE-2017000367
3/18/21

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

REVISIONS

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

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
C131

DWG: F:\2019\1501-2000\019-1605\40-Design\AutoCAD\As-Built\Sheets\GNCV\STREET, STORM & SITE DISTURBANCE\C_STM04_0191605.dwg USER: bworthley
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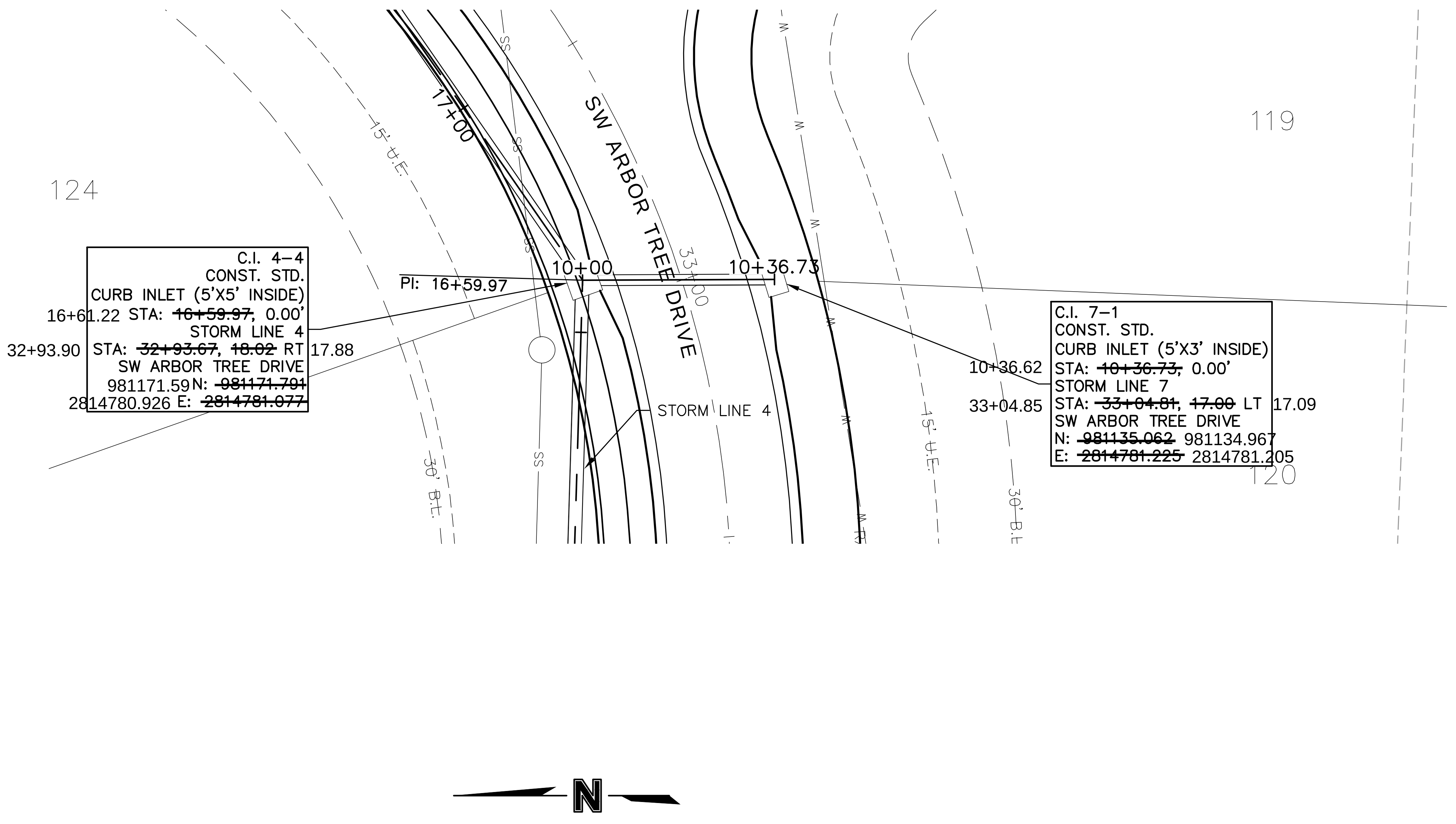
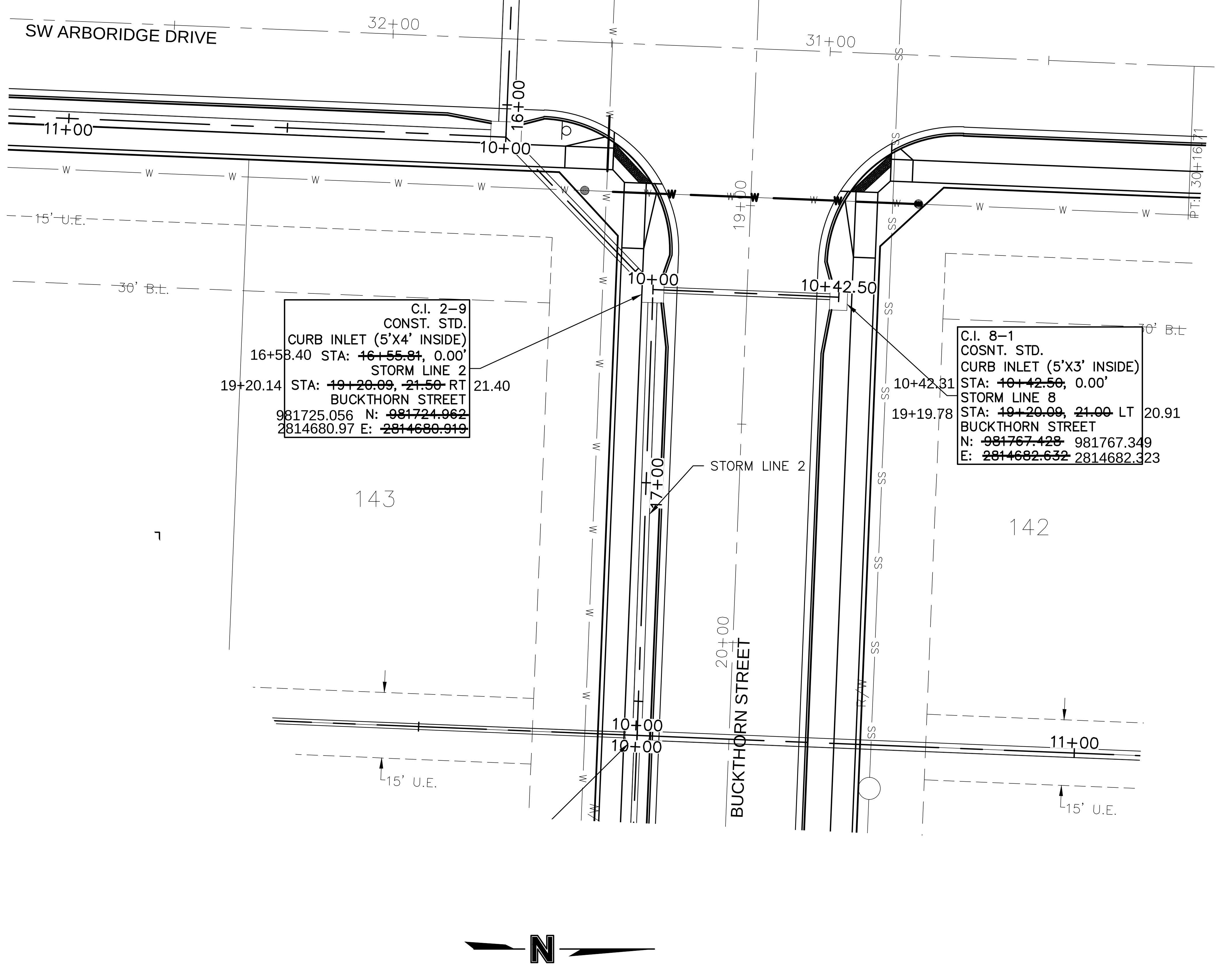
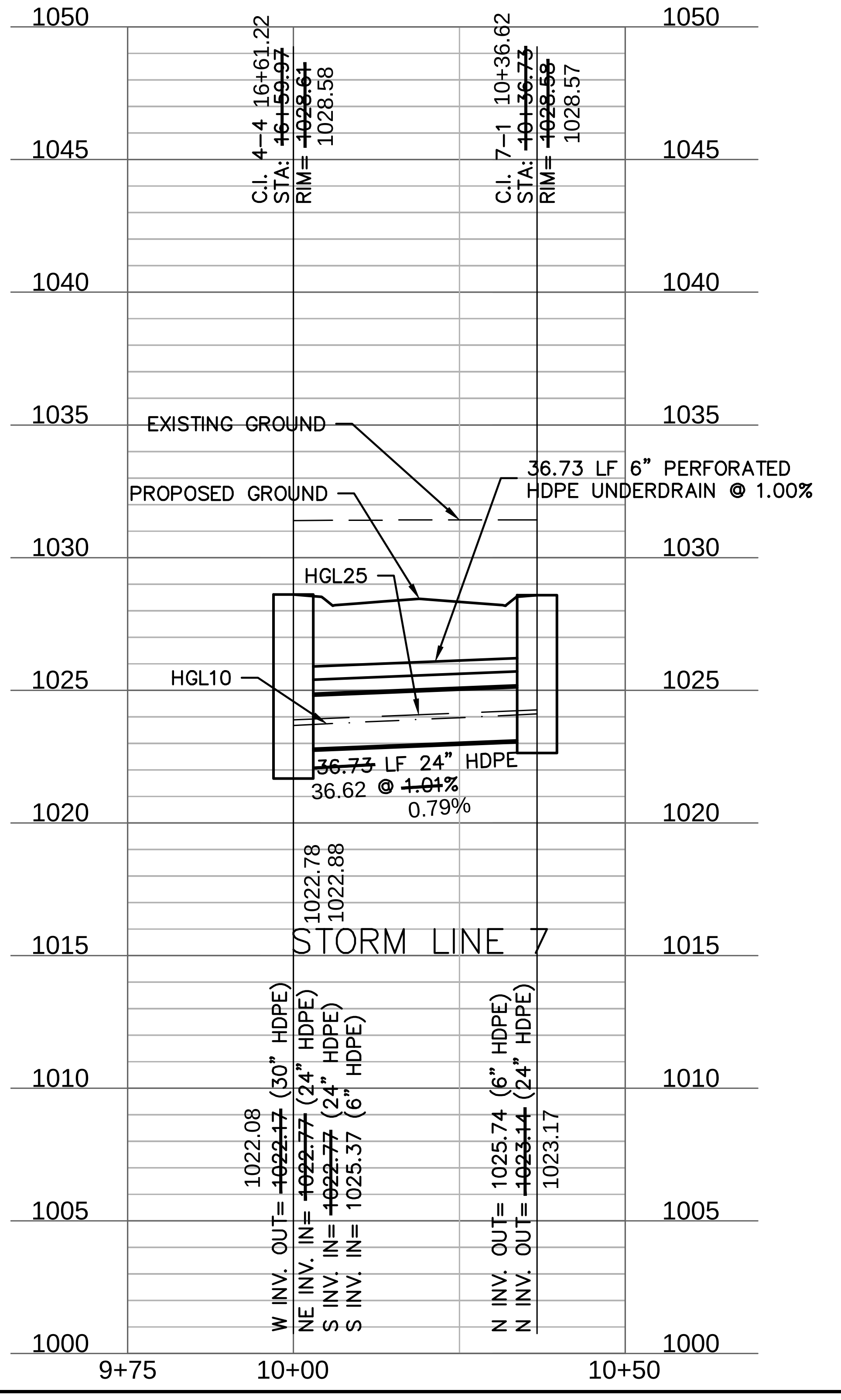
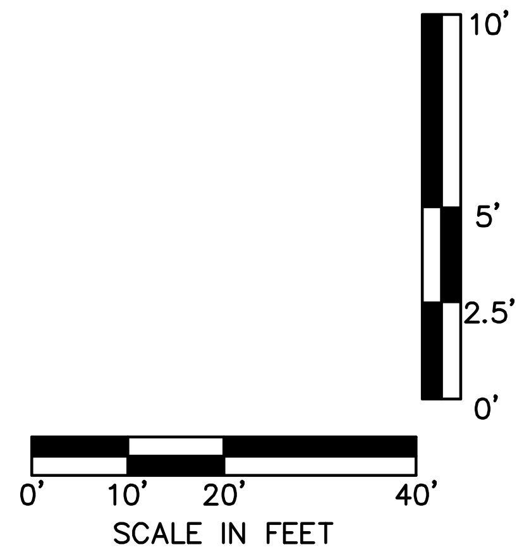
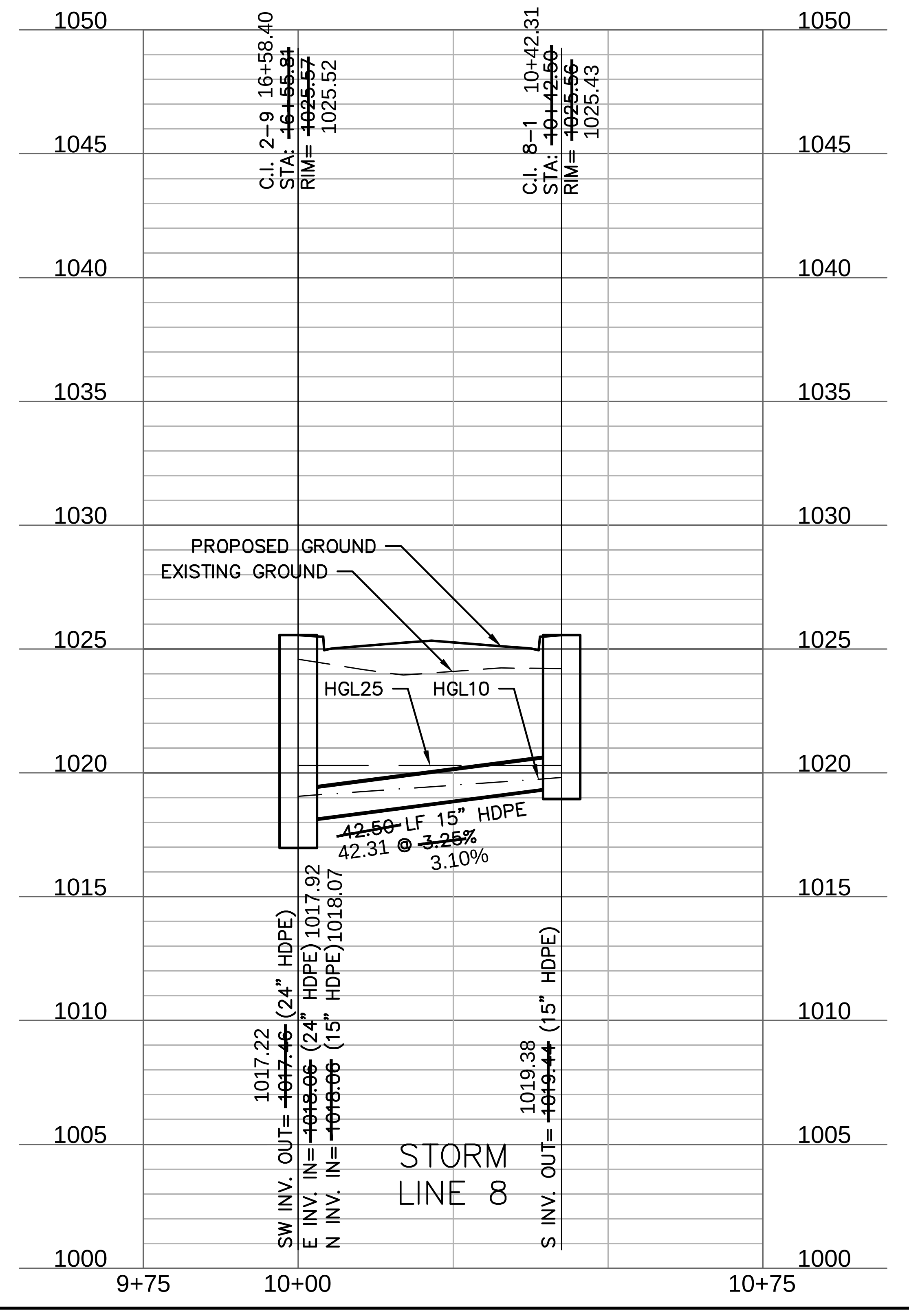

124
119
120
SW ARBOR TREE DRIVE
17+00
33+00
15' U.E.
30' B.L.
SS
W
PI: 16+59.97
10+00
10+36.73
C.I. 4–4
CONST. STD.
CURB INLET (5'X5' INSIDE)
16+61.22 STA: ~~16+59.97~~, 0.00'
STORM LINE 4
32+93.90 STA: ~~32+93.67~~, ~~18.02~~ RT 17.88
SW ARBOR TREE DRIVE
981171.59 N: ~~981171.791~~
2814780.926 E: ~~2814781.077~~
C.I. 7–1
CONST. STD.
CURB INLET (5'X3' INSIDE)
10+36.62 STA: ~~10+36.73~~, 0.00'
STORM LINE 7
33+04.85 STA: ~~33+04.81~~, ~~17.00~~ LT 17.09
SW ARBOR TREE DRIVE
N: ~~981135.062~~ 981134.967
E: ~~2814781.225~~ 2814781.205
STORM LINE 4
N


SW ARBORIDGE DRIVE
32+00
31+00
11+00
16+00
10+00
15' U.E.
30' B.L.
19+00
10+00
10+42.50
PT: 30+16.71
C.I. 2–9
CONST. STD.
CURB INLET (5'X4' INSIDE)
16+58.40 STA: ~~16+55.81~~, 0.00'
STORM LINE 2
19+20.14 STA: ~~19+20.09~~, ~~21.50~~ RT 21.40
BUCKTHORN STREET
981725.056 N: ~~981724.962~~
2814680.97 E: ~~2814680.919~~
C.I. 8–1
COSNT. STD.
CURB INLET (5'X3' INSIDE)
10+42.31 STA: ~~10+42.50~~, 0.00'
STORM LINE 8
19+19.78 STA: ~~19+20.09~~, ~~21.00~~ LT 20.91
BUCKTHORN STREET
N: ~~981767.428~~ 981767.349
E: ~~2814682.632~~ 2814682.323
30' B.L.
143
142
17+00
STORM LINE 2
20+00
BUCKTHORN STREET
10+00
10+00
11+00
15' U.E.
15' U.E.
W
SS
N


1050
1045
1040
1035
1030
1025
1020
1015
1010
1005
1000
C.I. 4–4 16+61.22
STA: ~~16+59.97~~
RIM= ~~1028.61~~ 1028.58
C.I. 7–1 10+36.62
STA: ~~10+36.73~~
RIM= ~~1028.58~~ 1028.57
EXISTING GROUND
PROPOSED GROUND
36.73 LF 6" PERFORATED
HDPE UNDERDRAIN @ 1.00%
HGL25
HGL10
~~36.73~~ LF 24" HDPE
36.62 @ ~~1.01%~~
0.79%
1022.78
1022.88
STORM LINE 7
W INV. OUT= ~~1022.17~~ 1022.08 (30" HDPE)
NE INV. IN= ~~1022.77~~ (24" HDPE)
S INV. IN= ~~1022.77~~ (24" HDPE)
S INV. IN= 1025.37 (6" HDPE)
N INV. OUT= 1025.74 (6" HDPE)
N INV. OUT= ~~1023.14~~ 1023.17 (24" HDPE)
9+75
10+00
10+50


10'
5'
2.5'
0'
0'
10'
20'
40'
SCALE IN FEET


1050
1045
1040
1035
1030
1025
1020
1015
1010
1005
1000
C.I. 2–9 16+58.40
STA: ~~16+55.81~~
RIM= ~~1025.57~~ 1025.52
C.I. 8–1 10+42.31
STA: ~~10+42.50~~
RIM= ~~1025.56~~ 1025.43
PROPOSED GROUND
EXISTING GROUND
HGL25
HGL10
~~42.50~~ LF 15" HDPE
42.31 @ ~~3.25%~~
3.10%
SW INV. OUT= ~~1017.46~~ 1017.22 (24" HDPE)
E INV. IN= ~~1018.06~~ (24" HDPE) 1017.92
N INV. IN= ~~1018.06~~ (15" HDPE) 1018.07
STORM LINE 8
S INV. OUT= ~~1019.44~~ 1019.38 (15" HDPE)
9+75
10+00
10+75

AS-BUILT
3/17/2021

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TEL 816.361.1177
www.olsson.com

JULIE ELAINE
SELLERS
NUMBER
PE-2017000367
3/18/21

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

2019

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
C132

DWG: F:\2019\1501-2000\019-1605\40-Design\AutoCAD\As-Built\Sheets\GNCV\STREET, STORM & SITE DISTURBANCE\C_STM04_0191605.dwg USER: bworthley
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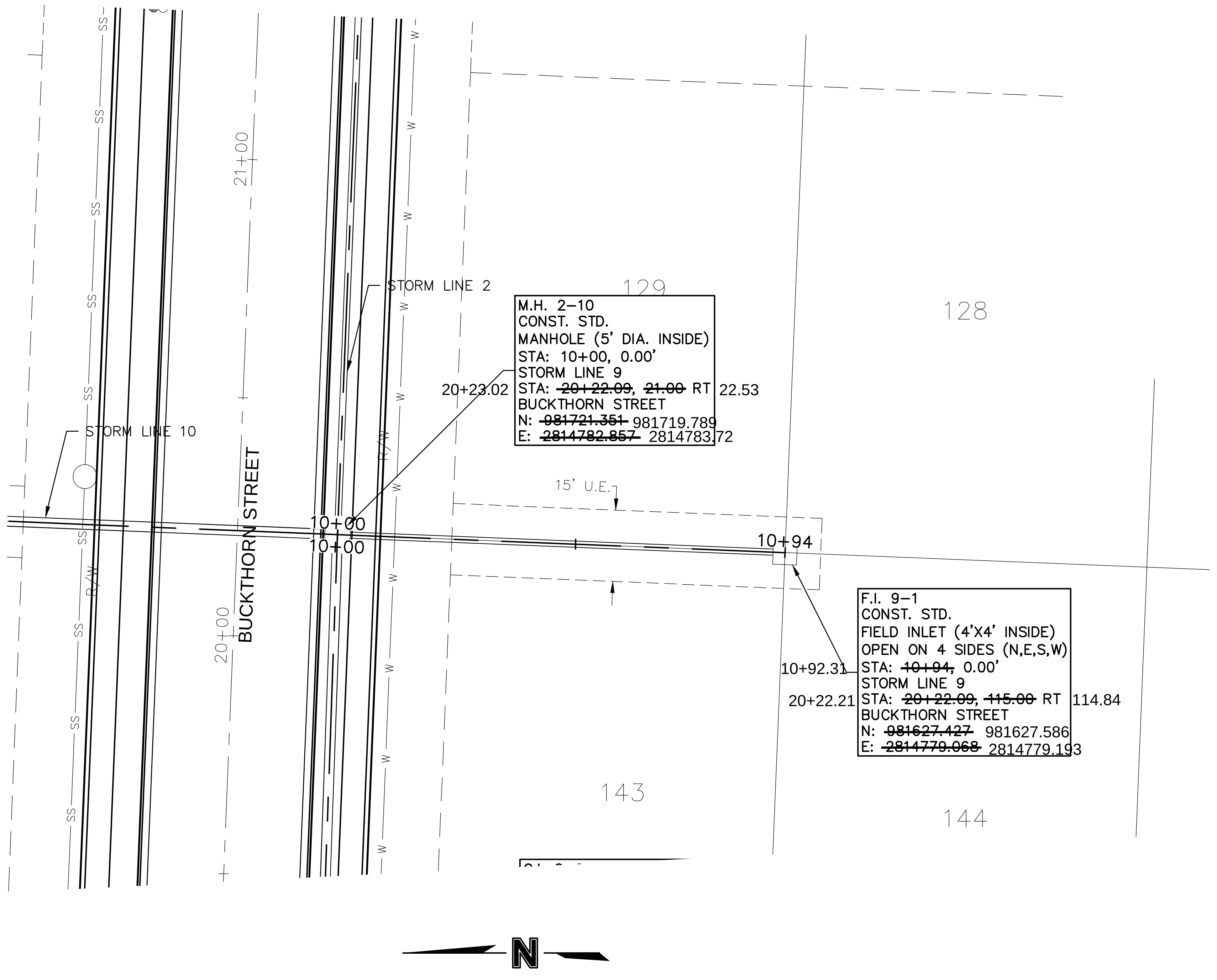
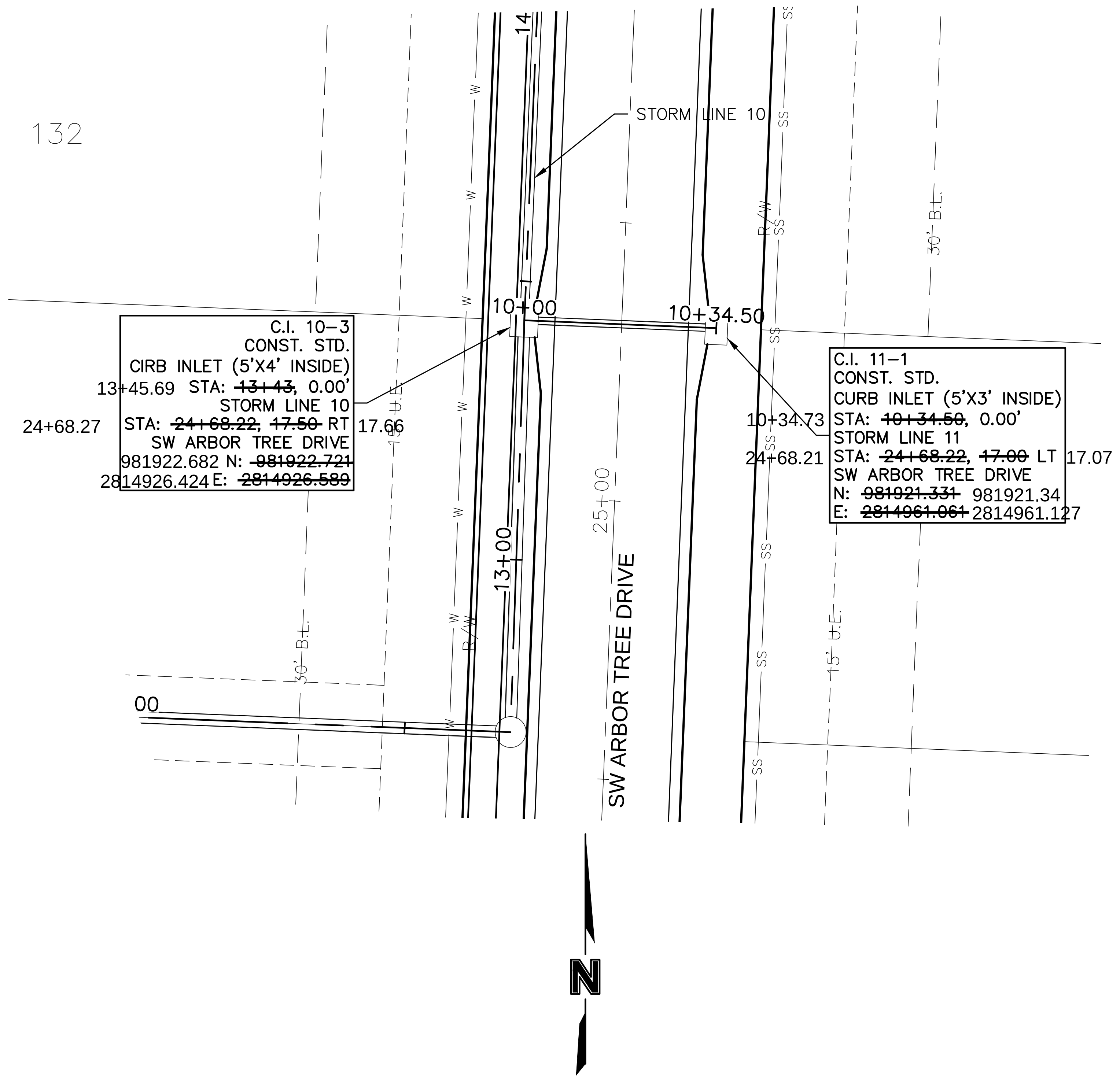
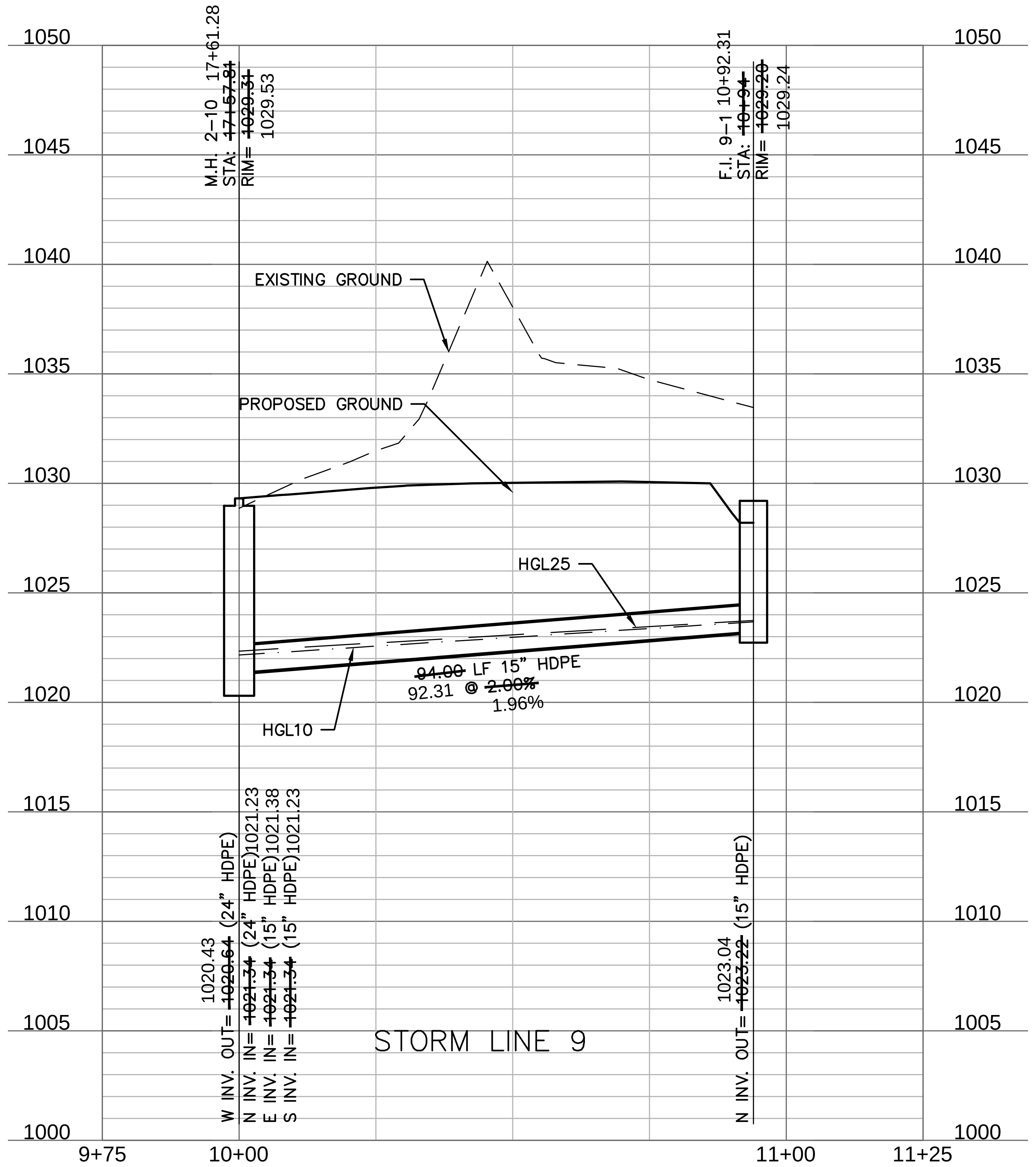


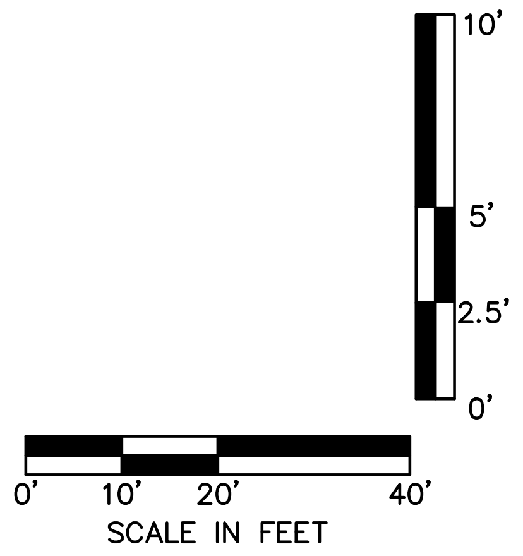
STORM LINE 2
STORM LINE 10
BUCKTHORN STREET
21+00
20+00
10+00
10+00
10+94
15' U.E.
129
128
143
144
M.H. 2–10
CONST. STD.
MANHOLE (5' DIA. INSIDE)
STA: 10+00, 0.00'
STORM LINE 9
20+23.02 STA: ~~20+22.09,~~ ~~21.00~~ RT 22.53
BUCKTHORN STREET
N: ~~981721.351~~ 981719.789
E: ~~2814782.857~~ 2814783.72
F.I. 9–1
CONST. STD.
FIELD INLET (4'X4' INSIDE)
OPEN ON 4 SIDES (N,E,S,W)
10+92.31 STA: ~~10+94,~~ 0.00'
STORM LINE 9
20+22.21 STA: ~~20+22.09,~~ ~~115.00~~ RT 114.84
BUCKTHORN STREET
N: ~~981627.427~~ 981627.586
E: ~~2814779.068~~ 2814779.193
N



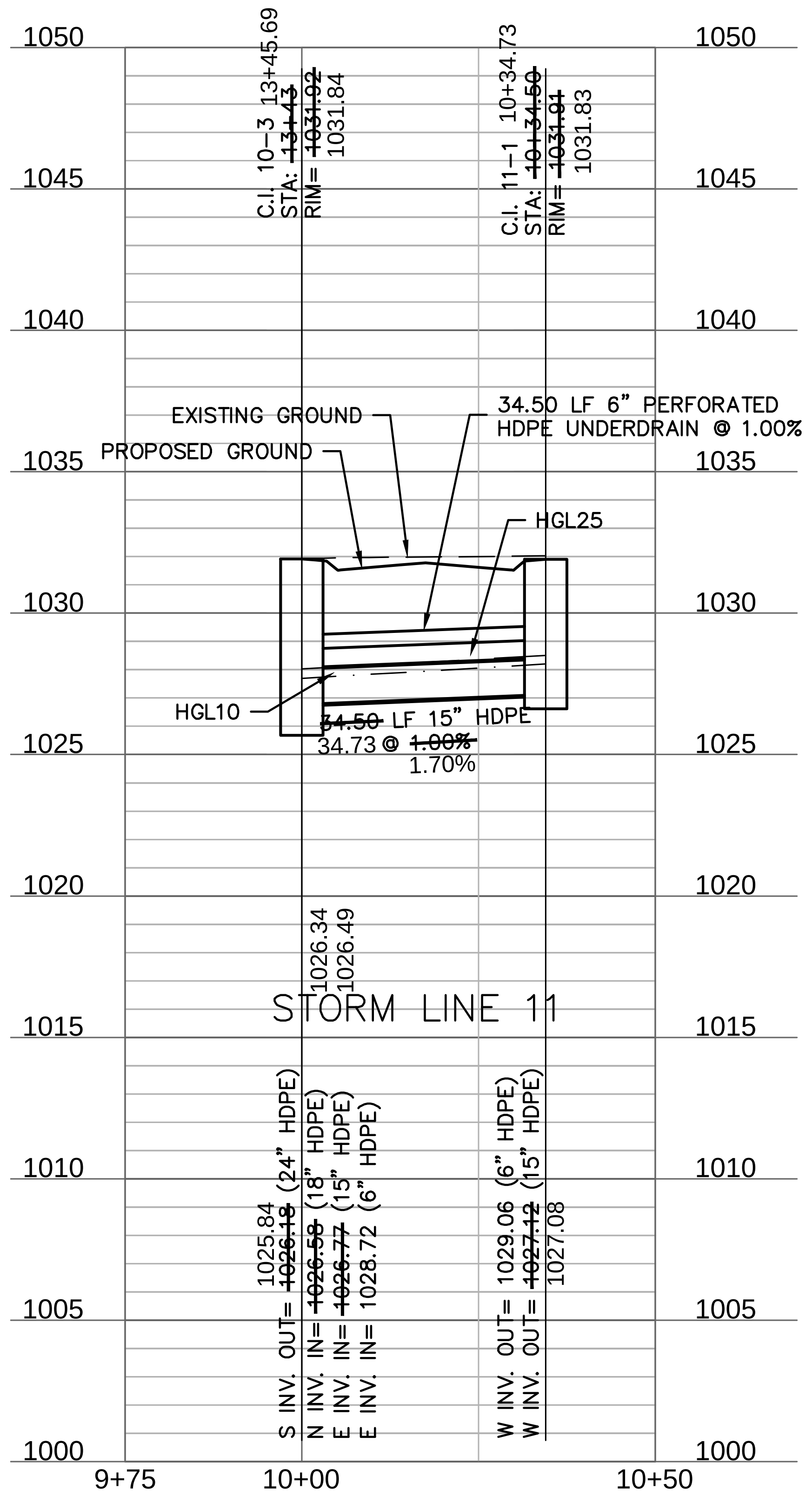
132
STORM LINE 10
10+00
10+34.50
13+00
25+00
14
30' B.L.
15' U.E.
SW ARBOR TREE DRIVE
00
C.I. 10–3
CONST. STD.
CIRB INLET (5'X4' INSIDE)
13+45.69 STA: ~~13+43,~~ 0.00'
STORM LINE 10
24+68.27 STA: ~~24+68.22,~~ ~~17.50~~ RT 17.66
SW ARBOR TREE DRIVE
981922.682 N: ~~981922.721~~
2814926.424 E: ~~2814926.589~~
C.I. 11–1
CONST. STD.
CURB INLET (5'X3' INSIDE)
10+34.73 STA: ~~10+34.50,~~ 0.00'
STORM LINE 11
24+68.21 STA: ~~24+68.22,~~ ~~17.00~~ LT 17.07
SW ARBOR TREE DRIVE
N: ~~981921.331~~ 981921.34
E: ~~2814961.061~~ 2814961.127
N



1050
1045
1040
1035
1030
1025
1020
1015
1010
1005
1000
M.H. 2–10 17+61.28
STA: ~~17+57.81~~
RIM= ~~1029.31~~ 1029.53
F.I. 9–1 10+92.31
STA: ~~10+94~~
RIM= ~~1029.20~~ 1029.24
EXISTING GROUND
PROPOSED GROUND
HGL25
HGL10
~~94.00~~ LF 15" HDPE
92.31 @ ~~2.00%~~
1.96%
W INV. OUT= ~~1020.64~~ 1020.43 (24" HDPE)
N INV. IN= ~~1021.34~~ (24" HDPE)1021.23
E INV. IN= ~~1021.34~~ (15" HDPE)1021.38
S INV. IN= ~~1021.34~~ (15" HDPE)1021.23
N INV. OUT= ~~1023.22~~ 1023.04 (15" HDPE)
STORM LINE 9
9+75
10+00
11+00
11+25



10'
5'
2.5'
0'
0'
10'
20'
40'
SCALE IN FEET



1050
1045
1040
1035
1030
1025
1020
1015
1010
1005
1000
C.I. 10–3 13+45.69
STA: ~~13+43~~
RIM= ~~1031.92~~ 1031.84
C.I. 11–1 10+34.73
STA: ~~10+34.50~~
RIM= ~~1031.91~~ 1031.83
EXISTING GROUND
PROPOSED GROUND
34.50 LF 6" PERFORATED HDPE UNDERDRAIN @ 1.00%
HGL25
HGL10
~~34.50~~ LF 15" HDPE
34.73 @ ~~1.00%~~
1.70%
1026.34
1026.49
STORM LINE 11
S INV. OUT= ~~1026.18~~ 1025.84 (24" HDPE)
N INV. IN= ~~1026.58~~ (18" HDPE)
E INV. IN= ~~1026.77~~ (15" HDPE)
E INV. IN= 1028.72 (6" HDPE)
W INV. OUT= 1029.06 (6" HDPE)
W INV. OUT= ~~1027.12~~ 1027.08 (15" HDPE)
9+75
10+00
10+50

AS-BUILT
3/17/2021

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NORTH KANSAS CITY, MO 64116
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JULIE ELAINE SELLERS
NUMBER PE-2017000367
3/18/21

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

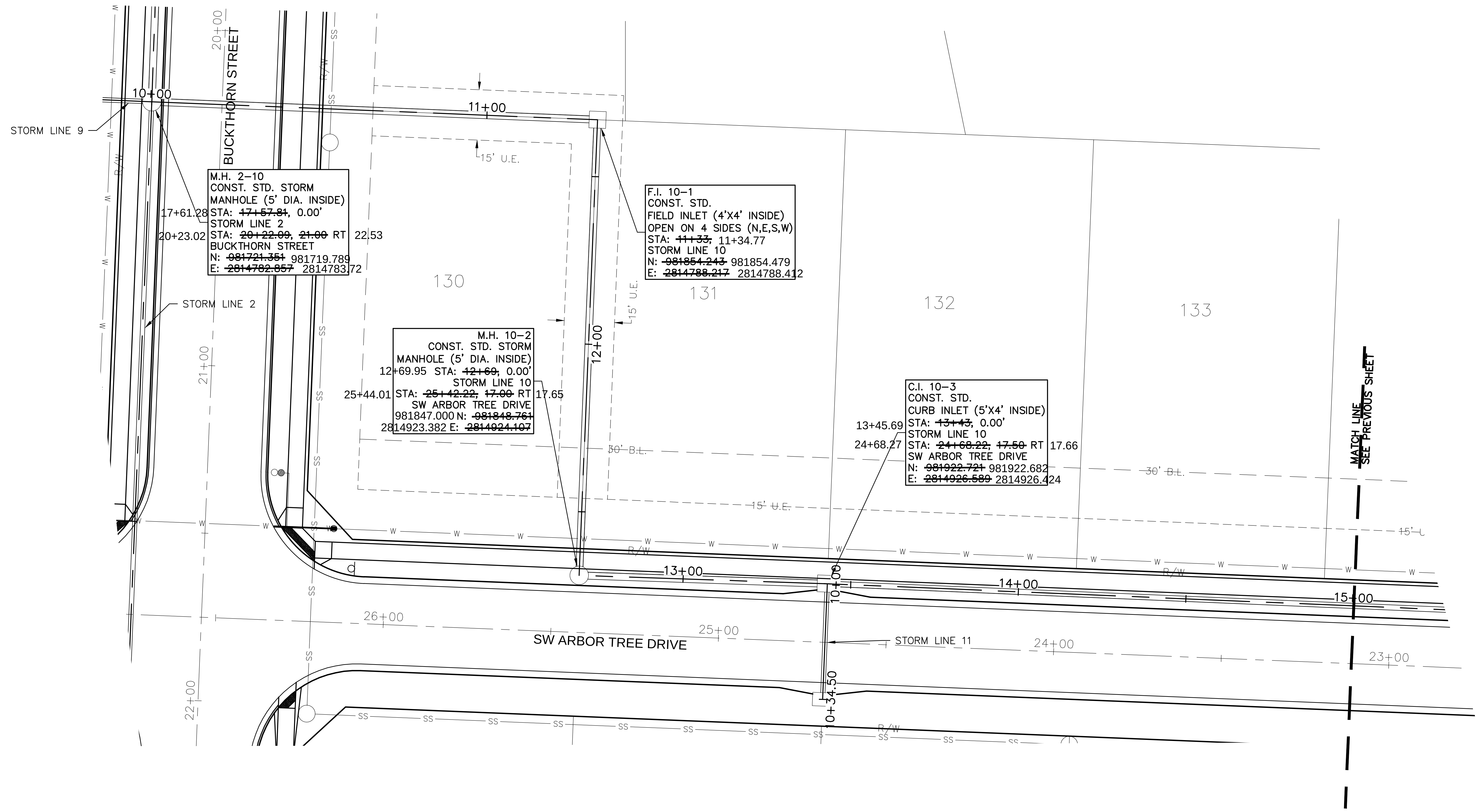
LEE'S SUMMIT, MISSOURI

2019

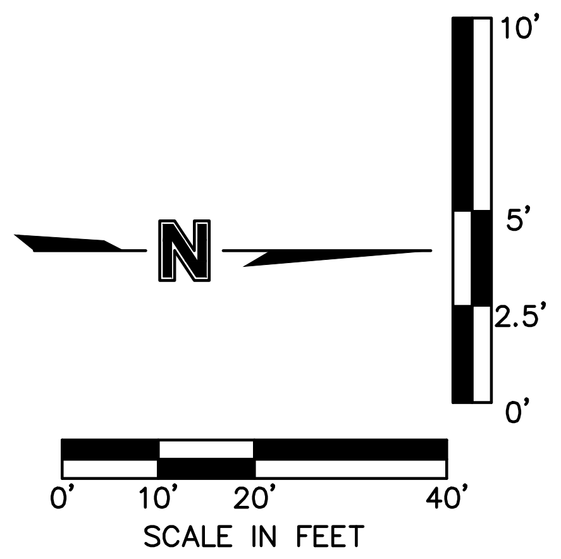
drawn by: D.A.H.O
checked by: M.G.D
designed by: B.M.W
QA/QC by: N.D.H
project no.: 019-1605
date: 07-12-2019

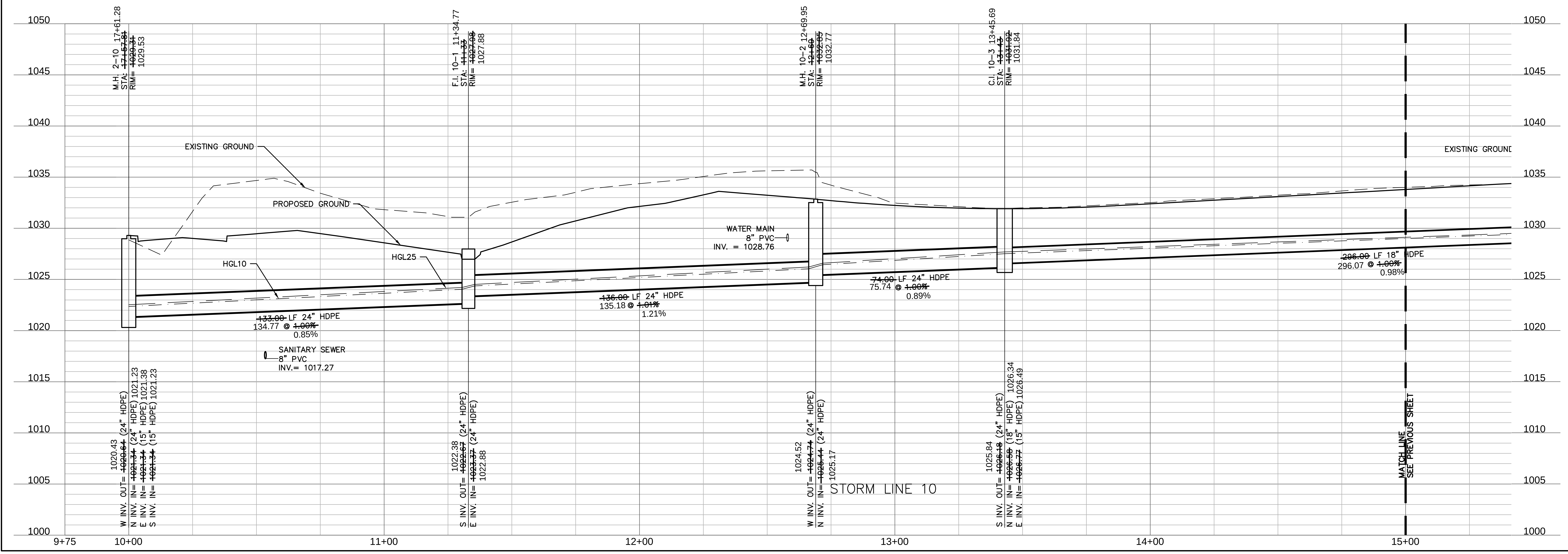
SHEET
C133

DWG: F:\2019\1501-2000\019-1605\40-Design\AutoCAD\As-Built\Sheets\GNCV\STREET, STORM & SITE DISTURBANCE\C_STM05_0191605.dwg USER: bworthley
DATE: Feb 15, 2021 12:18pm XREFS: C_PTBLK_0191605 C_PBNDY_0191605 C_PBASE_0191605 C_XBASE_0191605 C_FBASE_0191605 C_PUTIL_0191605 C_PSTRM_0191605


10+00
11+00
12+00
13+00
14+00
15+00
20+00
21+00
22+00
23+00
24+00
25+00
26+00
10+00
0+34.50
STORM LINE 9
STORM LINE 2
STORM LINE 11
BUCKTHORN STREET
SW ARBOR TREE DRIVE
130
131
132
133
15' U.E.
30' B.L.
R/W
W
SS
MATCH LINE SEE PREVIOUS SHEET
M.H. 2–10
CONST. STD. STORM
MANHOLE (5' DIA. INSIDE)
17+61.28 STA: ~~17+57.81~~, 0.00'
STORM LINE 2
20+23.02 STA: ~~20+22.09~~, ~~21.00~~ RT 22.53
BUCKTHORN STREET
N: ~~981721.351~~ 981719.789
E: ~~2814782.857~~ 2814783.72
F.I. 10–1
CONST. STD.
FIELD INLET (4'X4' INSIDE)
OPEN ON 4 SIDES (N,E,S,W)
STA: ~~11+33~~, 11+34.77
STORM LINE 10
N: ~~981854.243~~ 981854.479
E: ~~2814788.217~~ 2814788.412
M.H. 10–2
CONST. STD. STORM
MANHOLE (5' DIA. INSIDE)
12+69.95 STA: ~~12+69~~, 0.00'
STORM LINE 10
25+44.01 STA: ~~25+42.22~~, ~~17.00~~ RT 17.65
SW ARBOR TREE DRIVE
981847.000 N: ~~981848.761~~
2814923.382 E: ~~2814924.107~~
C.I. 10–3
CONST. STD.
CURB INLET (5'X4' INSIDE)
13+45.69 STA: ~~13+43~~, 0.00'
STORM LINE 10
24+68.27 STA: ~~24+68.22~~, ~~17.50~~ RT 17.66
SW ARBOR TREE DRIVE
N: ~~981922.721~~ 981922.682
E: ~~2814926.589~~ 2814926.424

AS-BUILT
3/17/2021


N
10'
5'
2.5'
0'
0'
10'
20'
40'
SCALE IN FEET


1050
1045
1040
1035
1030
1025
1020
1015
1010
1005
1000
9+75
10+00
11+00
12+00
13+00
14+00
15+00
M.H. 2–10 17+61.28
STA: ~~17+57.81~~
RIM= ~~1029.31~~ 1029.53
F.I. 10–1 11+34.77
STA: ~~11+33~~
RIM= ~~1027.98~~ 1027.88
M.H. 10–2 12+69.95
STA: ~~12+69~~
RIM= ~~1032.85~~ 1032.77
C.I. 10–3 13+45.69
STA: ~~13+43~~
RIM= ~~1031.92~~ 1031.84
EXISTING GROUND
EXISTING GROUND
PROPOSED GROUND
HGL10
HGL25
WATER MAIN
8" PVC
INV. = 1028.76
~~133.00~~ LF 24" HDPE
134.77 @ ~~1.00%~~
0.85%
~~136.00~~ LF 24" HDPE
135.18 @ ~~1.01%~~
1.21%
~~74.00~~ LF 24" HDPE
75.74 @ ~~1.00%~~
0.89%
~~296.00~~ LF 18" HDPE
296.07 @ ~~1.00%~~
0.98%
SANITARY SEWER
8" PVC
INV.= 1017.27
W INV. OUT= ~~1020.64~~ (24" HDPE) 1020.43
N INV. IN= ~~1021.34~~ (24" HDPE) 1021.23
E INV. IN= ~~1021.34~~ (15" HDPE) 1021.38
S INV. IN= ~~1021.34~~ (15" HDPE) 1021.23
S INV. OUT= ~~1022.67~~ (24" HDPE) 1022.38
E INV. IN= ~~1023.37~~ (24" HDPE) 1022.88
W INV. OUT= ~~1024.74~~ (24" HDPE) 1024.52
N INV. IN= ~~1025.44~~ (24" HDPE) 1025.17
S INV. OUT= ~~1026.18~~ (24" HDPE) 1025.84
N INV. IN= ~~1026.58~~ (18" HDPE) 1026.34
E INV. IN= ~~1026.77~~ (15" HDPE) 1026.49
STORM LINE 10
MATCH LINE SEE PREVIOUS SHEET

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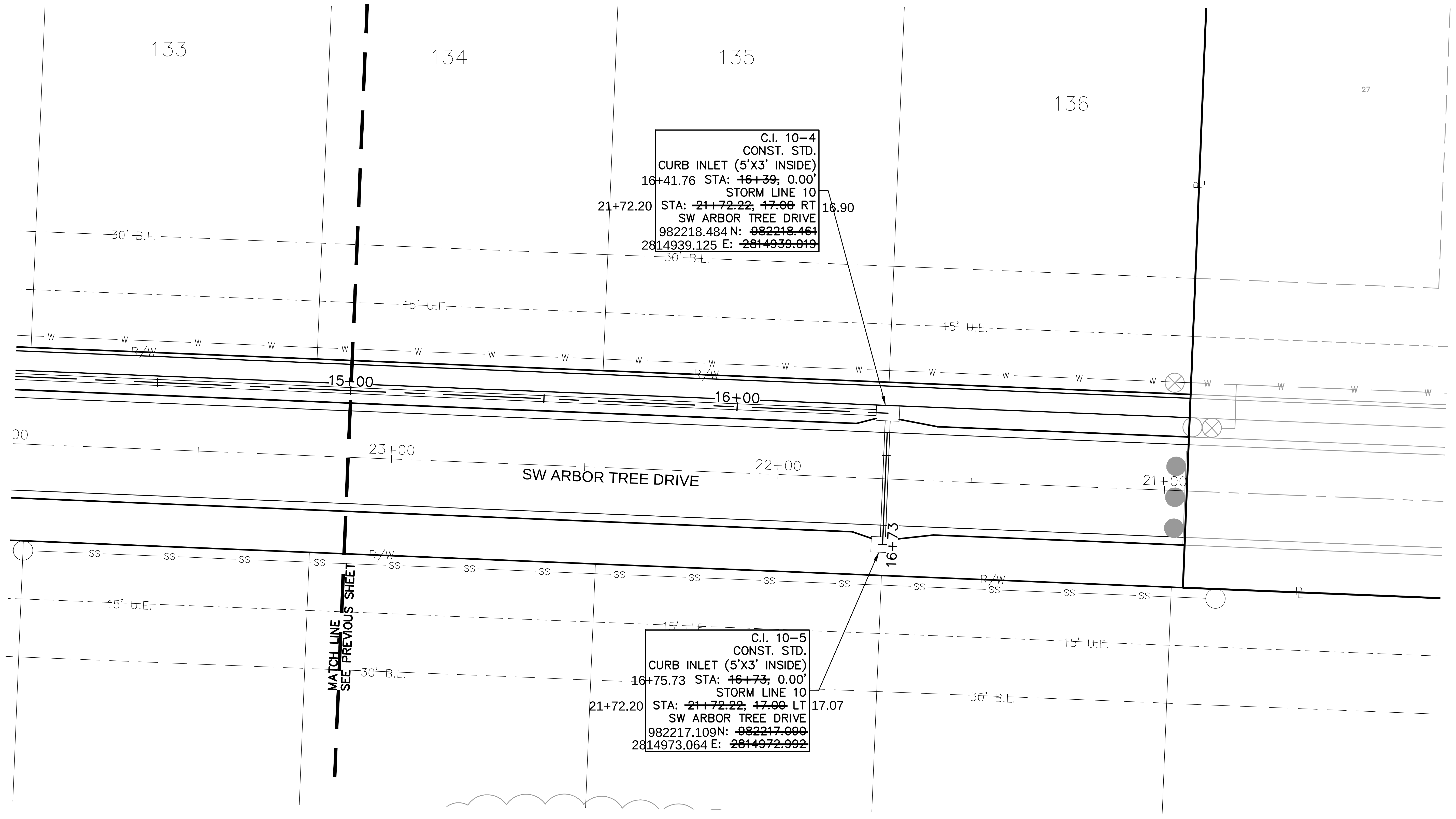
HAWTHORN RIDGE
SECOND PLAT

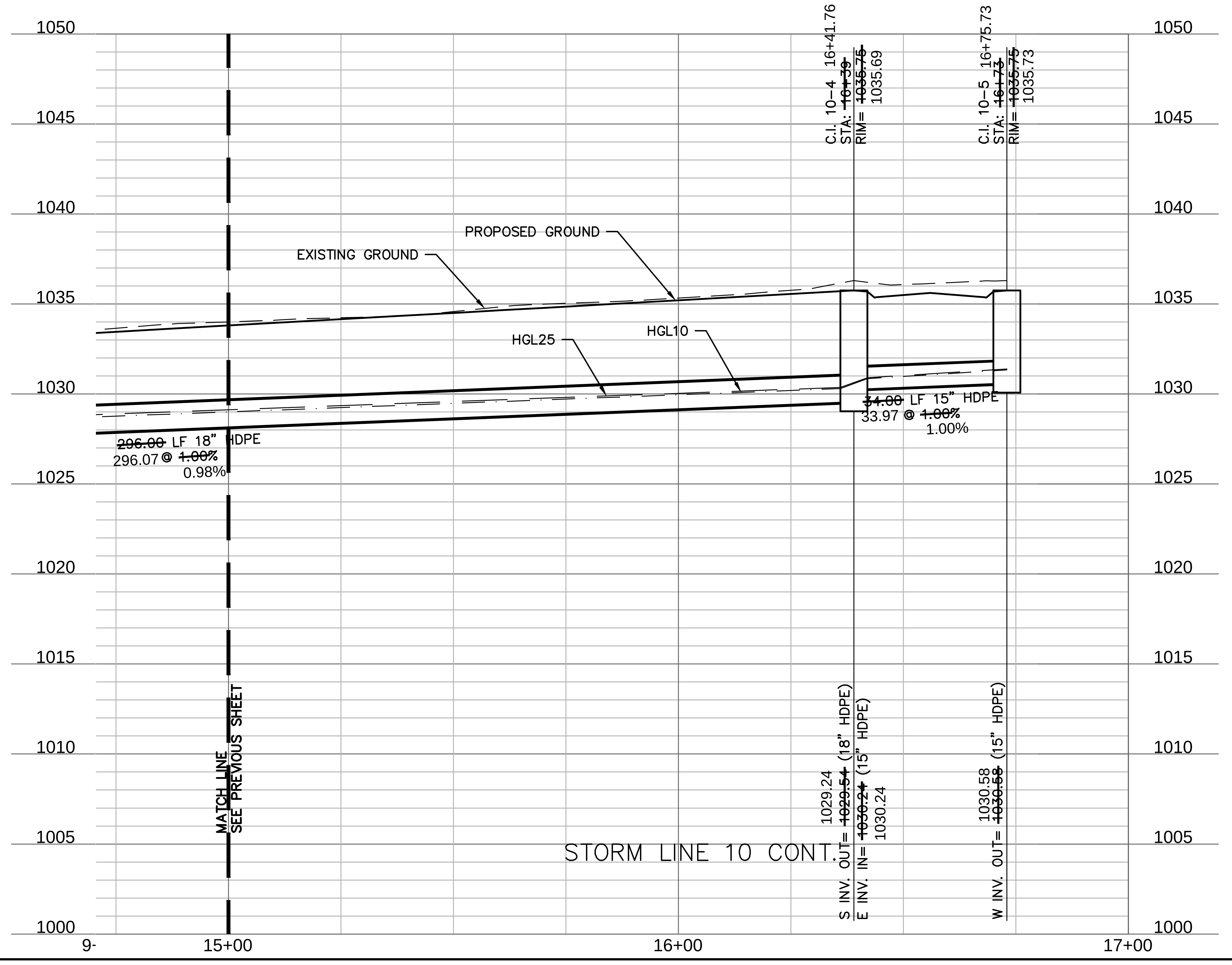
2019

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

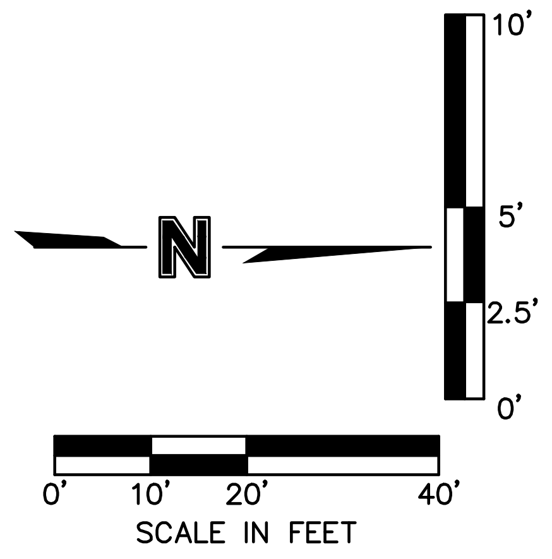
SHEET
C134


133
134
135
136
27
30' B.L.
15' U.E.
R/W
15+00
16+00
23+00
22+00
21+00
SW ARBOR TREE DRIVE
16+73
MATCH LINE
SEE PREVIOUS SHEET
C.I. 10–4
CONST. STD.
CURB INLET (5'X3' INSIDE)
16+41.76 STA: ~~16+39,~~ 0.00'
STORM LINE 10
21+72.20 STA: ~~21+72.22,~~ ~~17.00~~ RT 16.90
SW ARBOR TREE DRIVE
982218.484 N: ~~982218.461~~
2814939.125 E: ~~2814939.019~~
C.I. 10–5
CONST. STD.
CURB INLET (5'X3' INSIDE)
16+75.73 STA: ~~16+73,~~ 0.00'
STORM LINE 10
21+72.20 STA: ~~21+72.22,~~ ~~17.00~~ LT 17.07
SW ARBOR TREE DRIVE
982217.109 N: ~~982217.090~~
2814973.064 E: ~~2814972.992~~


1050
1045
1040
1035
1030
1025
1020
1015
1010
1005
1000
15+00
16+00
17+00
C.I. 10–4 16+41.76
STA: ~~16+39~~
RIM= ~~1035.75~~ 1035.69
C.I. 10–5 16+75.73
STA: ~~16+73~~
RIM= ~~1035.75~~ 1035.73
PROPOSED GROUND
EXISTING GROUND
HGL25
HGL10
~~34.00~~ LF 15" HDPE
33.97 @ ~~1.00%~~
1.00%
~~296.00~~ LF 18" HDPE
296.07 @ ~~1.00%~~
0.98%
MATCH LINE
SEE PREVIOUS SHEET
STORM LINE 10 CONT.
S INV. OUT= ~~1029.54~~ 1029.24 (18" HDPE)
E INV. IN= ~~1030.24~~ 1030.24 (15" HDPE)
W INV. OUT= ~~1030.58~~ 1030.58 (15" HDPE)

AS-BUILT

3/17/2021


N
10'
5'
2.5'
0'
0'
10'
20'
40'
SCALE IN FEET

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NUMBER PE-2017000367
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Julie Sellers

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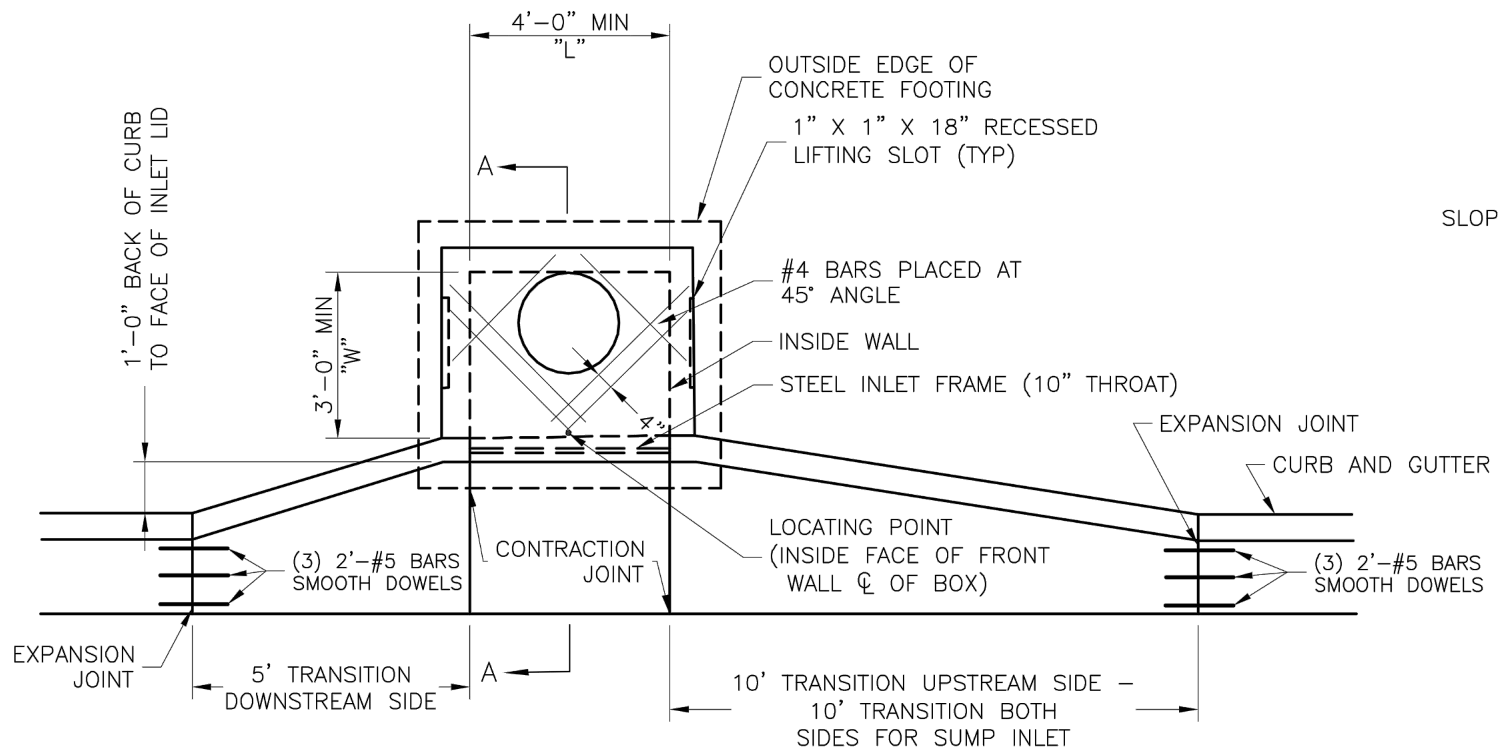
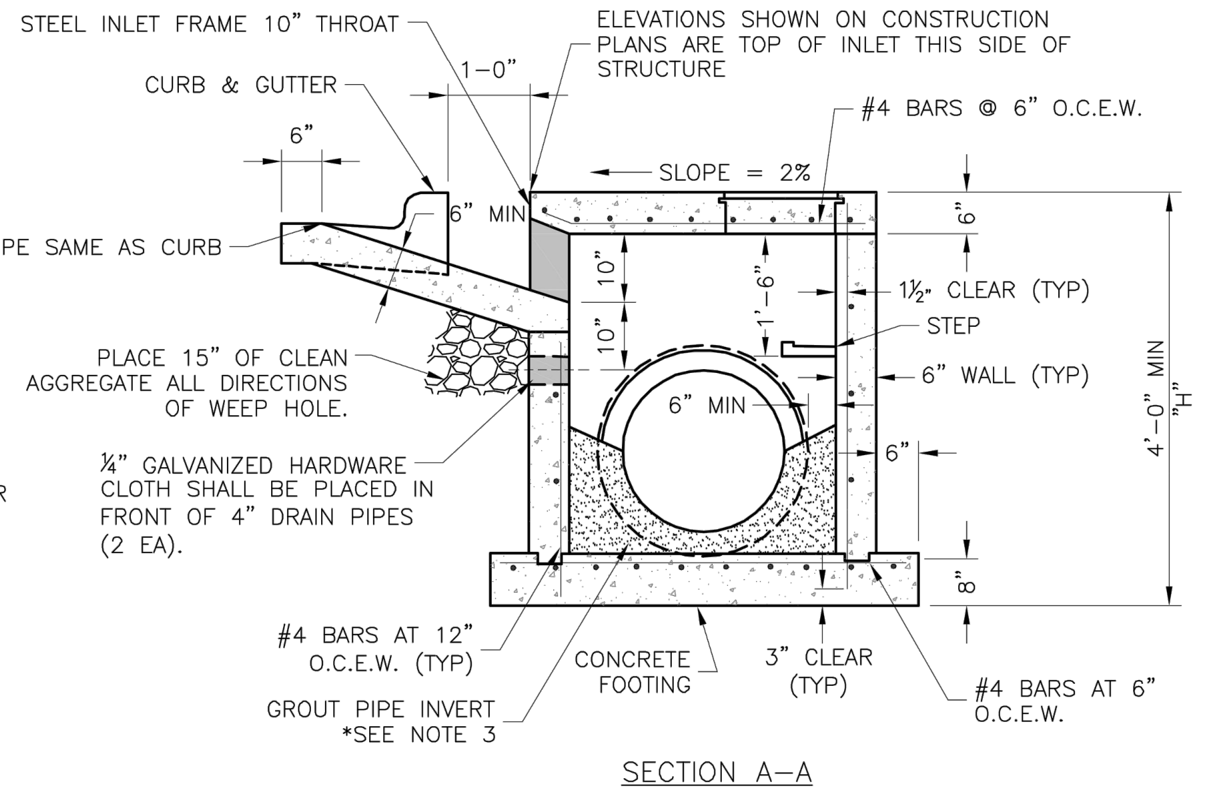
designed by: B.M.W
QA/QC by: N.D.H
project no.: 019-1605
date: 07-12-2019

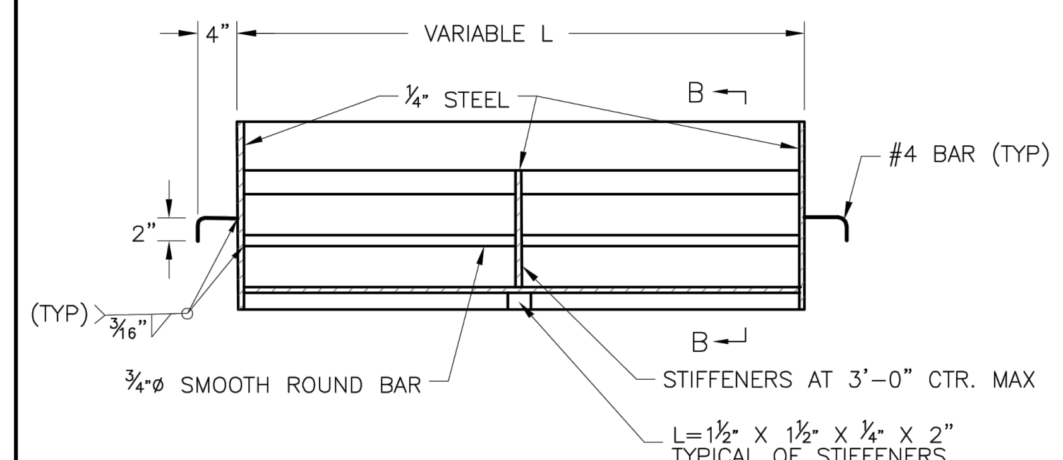
SHEET
C135


4'-0" MIN
"L"
OUTSIDE EDGE OF CONCRETE FOOTING
1" X 1" X 18" RECESSED LIFTING SLOT (TYP)
1'-0" BACK OF CURB TO FACE OF INLET LID
3'-0" MIN "W"
#4 BARS PLACED AT 45° ANGLE
INSIDE WALL
STEEL INLET FRAME (10" THROAT)
EXPANSION JOINT
CURB AND GUTTER
4"
A
(3) 2'-#5 BARS SMOOTH DOWELS
CONTRACTION JOINT
LOCATING POINT (INSIDE FACE OF FRONT WALL ℄ OF BOX)
(3) 2'-#5 BARS SMOOTH DOWELS
EXPANSION JOINT
5' TRANSITION DOWNSTREAM SIDE
A
10' TRANSITION UPSTREAM SIDE – 10' TRANSITION BOTH SIDES FOR SUMP INLET

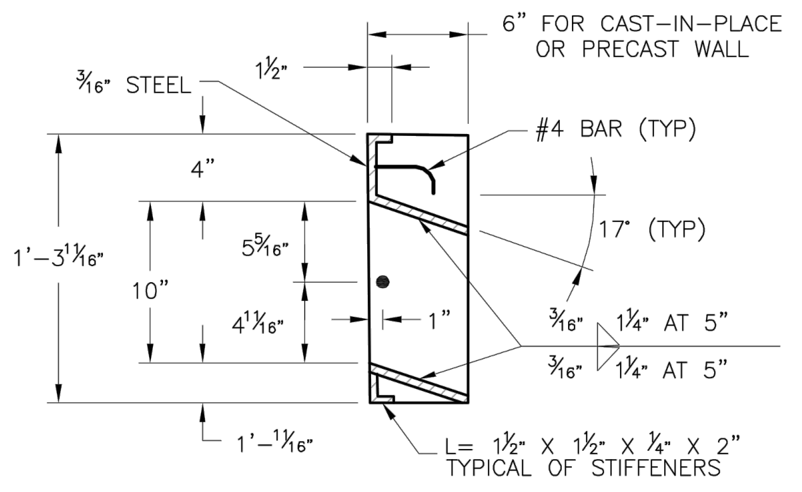
PLAN VIEW


STEEL INLET FRAME 10" THROAT
CURB & GUTTER
1-0"
ELEVATIONS SHOWN ON CONSTRUCTION PLANS ARE TOP OF INLET THIS SIDE OF STRUCTURE
#4 BARS @ 6" O.C.E.W.
6"
SLOPE = 2%
6" MIN
SLOPE SAME AS CURB
10"
10"
1'-6"
6"
1½" CLEAR (TYP)
STEP
PLACE 15" OF CLEAN AGGREGATE ALL DIRECTIONS OF WEEP HOLE.
6" WALL (TYP)
6" MIN
4'-0" MIN "H"
¼" GALVANIZED HARDWARE CLOTH SHALL BE PLACED IN FRONT OF 4" DRAIN PIPES (2 EA).
6"
8"
#4 BARS AT 12" O.C.E.W. (TYP)
CONCRETE FOOTING
3" CLEAR (TYP)
#4 BARS AT 6" O.C.E.W.
GROUT PIPE INVERT *SEE NOTE 3

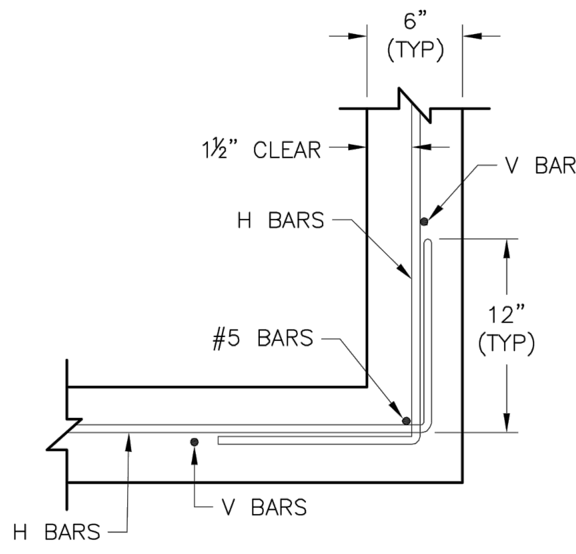
SECTION A–A


4"
VARIABLE L
¼" STEEL
B
#4 BAR (TYP)
2"
(TYP)
3⁄16"
B
¾"ø SMOOTH ROUND BAR
STIFFENERS AT 3'-0" CTR. MAX
L=1½" X 1½" X ¼" X 2" TYPICAL OF STIFFENERS

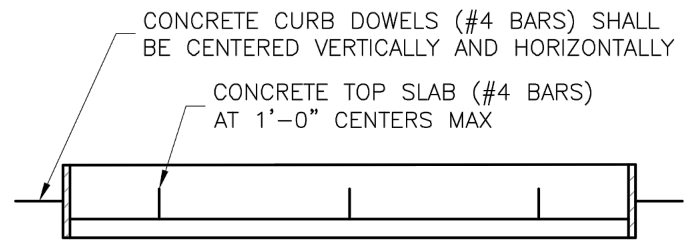
FRONT ELEVATION


6" FOR CAST-IN-PLACE OR PRECAST WALL
3⁄16" STEEL
1½"
#4 BAR (TYP)
4"
17° (TYP)
1'-3 11⁄16"
5 5⁄16"
10"
4 11⁄16"
1"
3⁄16" 1¼" AT 5"
3⁄16" 1¼" AT 5"
1'-1⁄16"
L= 1½" X 1½" X ¼" X 2" TYPICAL OF STIFFENERS

SECTION B–B


6" (TYP)
1½" CLEAR
V BARS
H BARS
12" (TYP)
#5 BARS
H BARS
V BARS

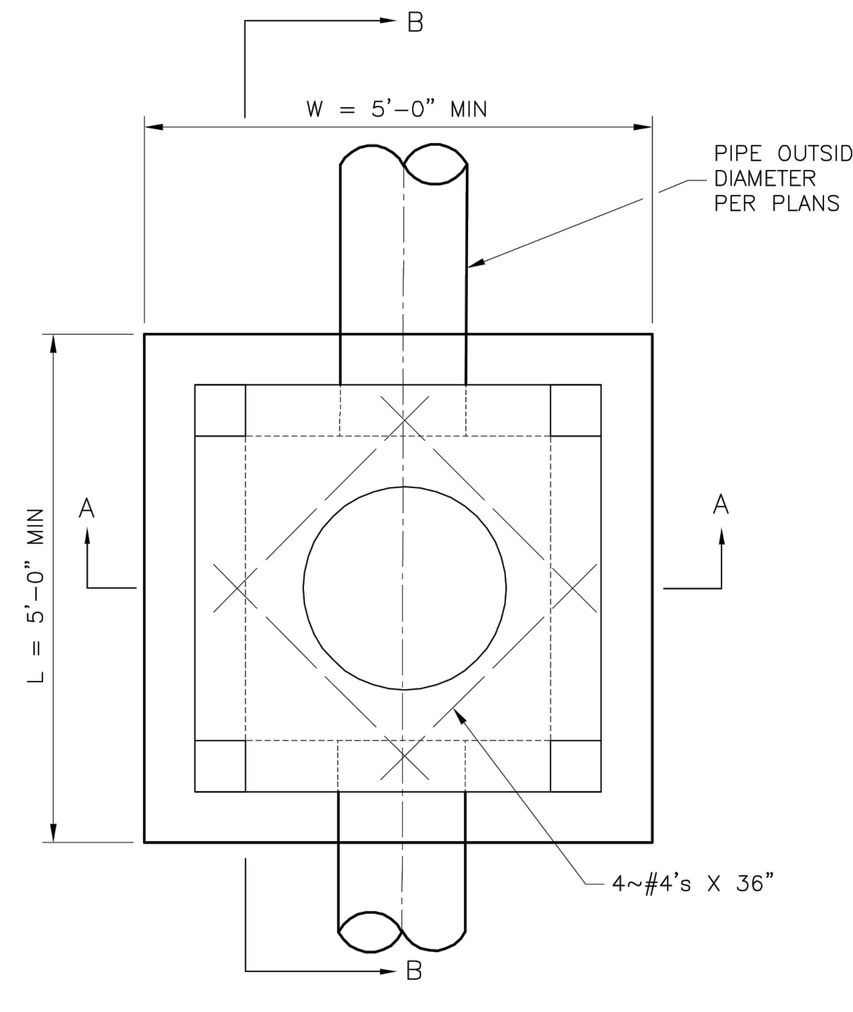
WALL CORNER DETAIL


CONCRETE CURB DOWELS (#4 BARS) SHALL BE CENTERED VERTICALLY AND HORIZONTALLY
CONCRETE TOP SLAB (#4 BARS) AT 1'-0" CENTERS MAX

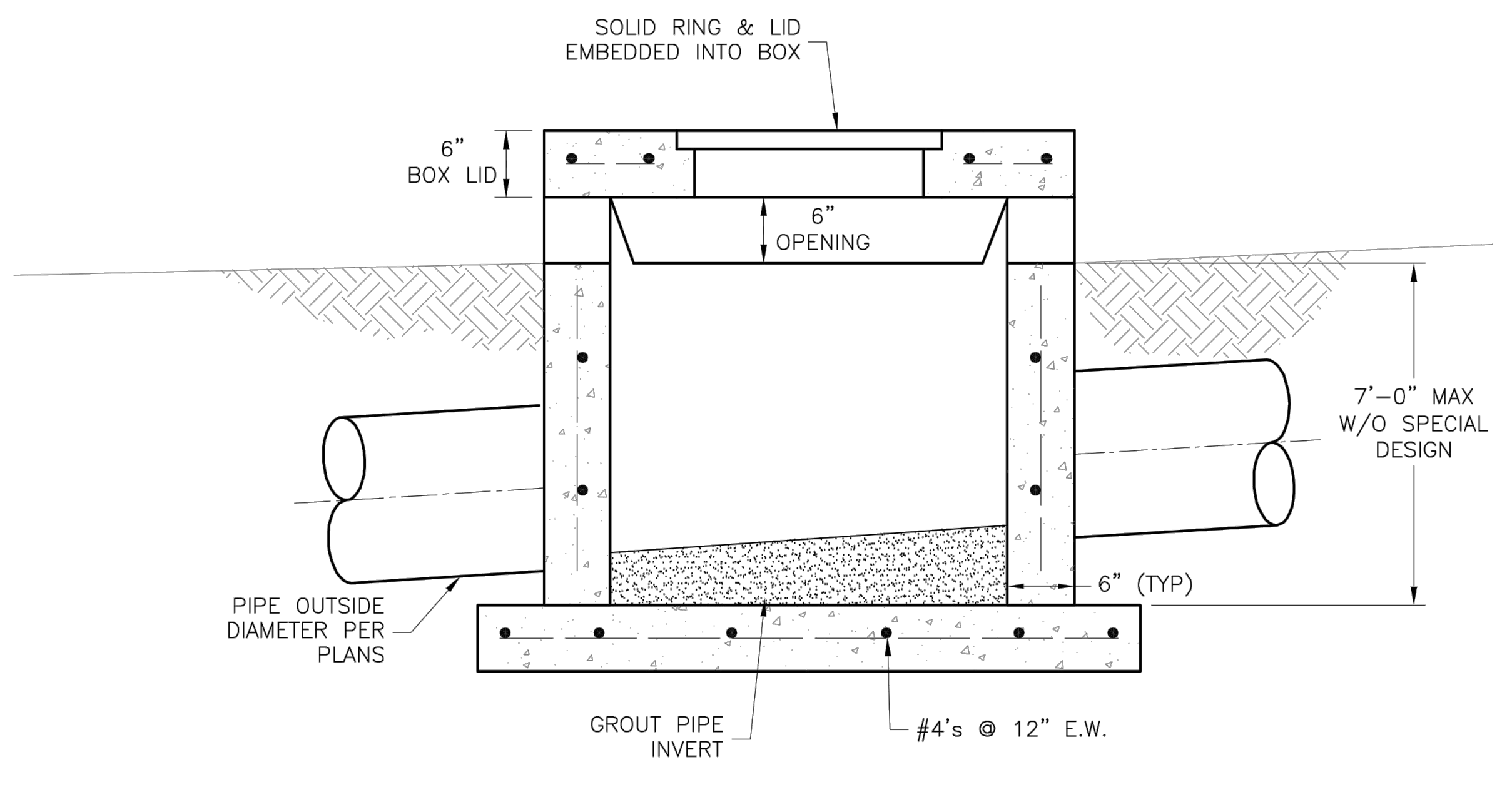
PLAN VIEW

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.

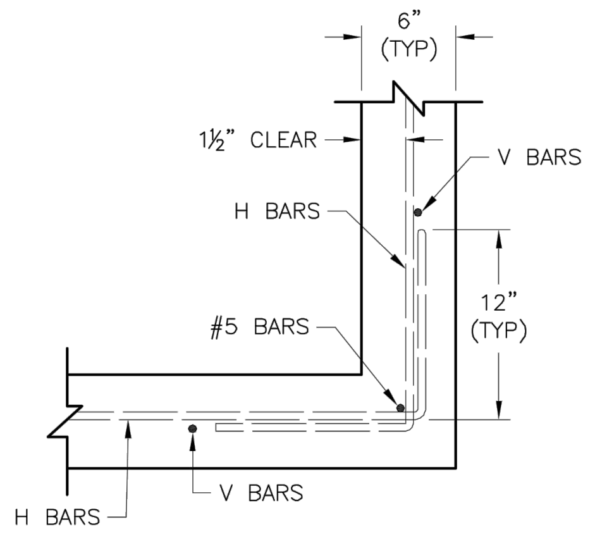
GENERAL NOTES:
1. THE FIRST DIMENSION LISTED IN THE CONSTRUCTION NOTES IS THE "L" DIMENSION. THE SECOND DIMENSION IS THE "W" DIMENSION.
2. FLOW LINES LISTED ON THE PROJECT PLANS ARE LISTED AT THE INSIDE FACE OF THE WALL.
3. FLOOR OF INLET GROUTED AND SHAPED TO MATCH PIPE INVERT TO PROVIDE SMOOTH FLOW.
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.


B
W = 5'-0" MIN
PIPE OUTSIDE DIAMETER PER PLANS
A
A
L = 5'-0" MIN
4~#4's X 36"
B

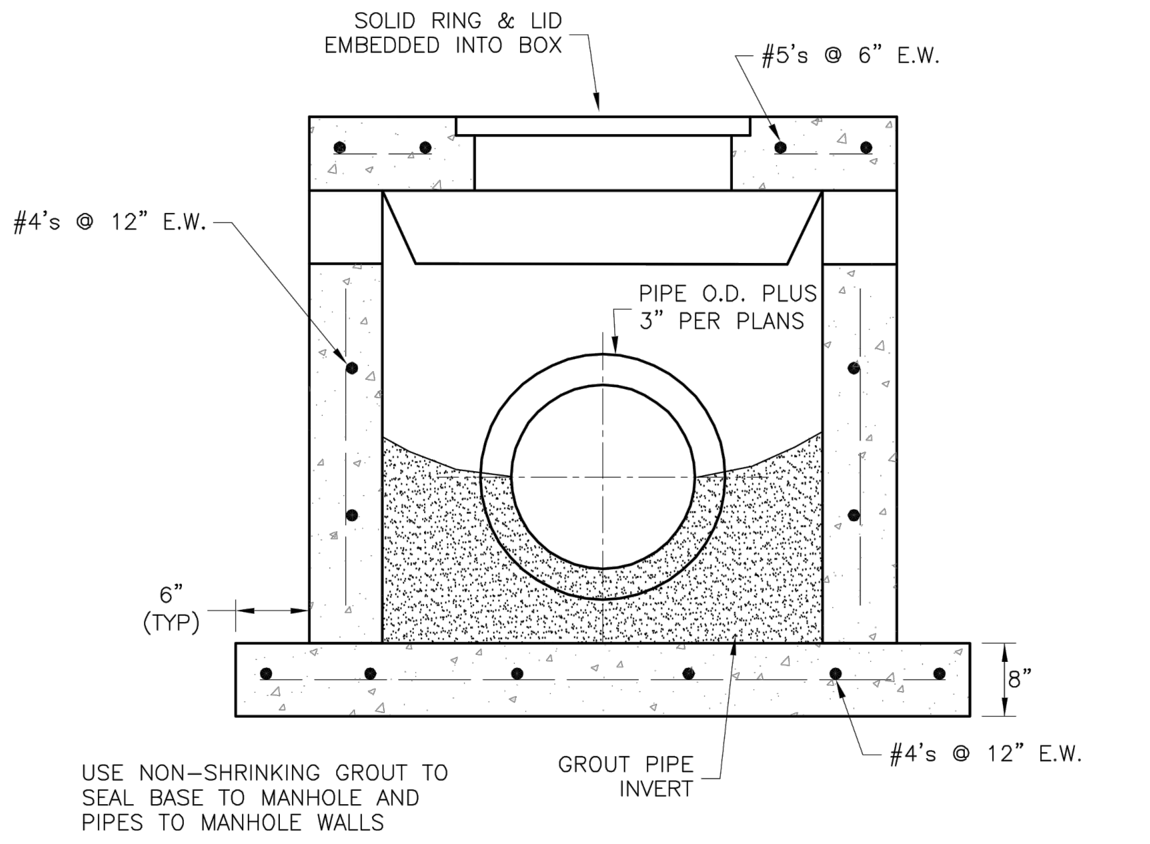
PLAN VIEW


SOLID RING & LID EMBEDDED INTO BOX
6" BOX LID
6" OPENING
7'-0" MAX W/O SPECIAL DESIGN
PIPE OUTSIDE DIAMETER PER PLANS
6" (TYP)
GROUT PIPE INVERT
#4's @ 12" E.W.

SECTION B–B


6" (TYP)
1½" CLEAR
V BARS
H BARS
12" (TYP)
#5 BARS
H BARS
V BARS

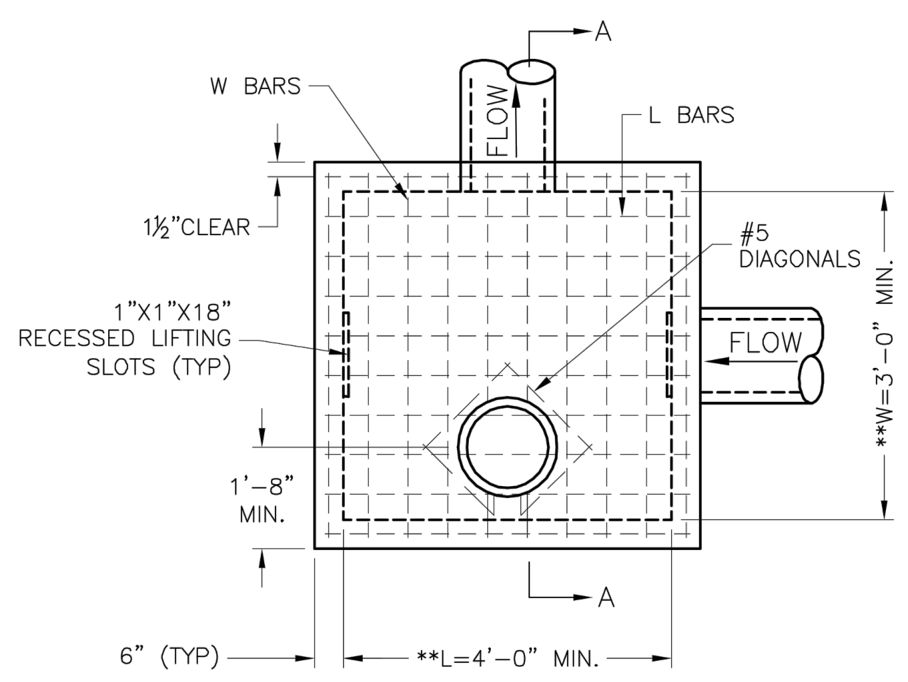
WALL CORNER DETAIL


SOLID RING & LID EMBEDDED INTO BOX
#5's @ 6" E.W.
#4's @ 12" E.W.
PIPE O.D. PLUS 3" PER PLANS
6" (TYP)
8"
USE NON-SHRINKING GROUT TO SEAL BASE TO MANHOLE AND PIPES TO MANHOLE WALLS
GROUT PIPE INVERT
#4's @ 12" E.W.

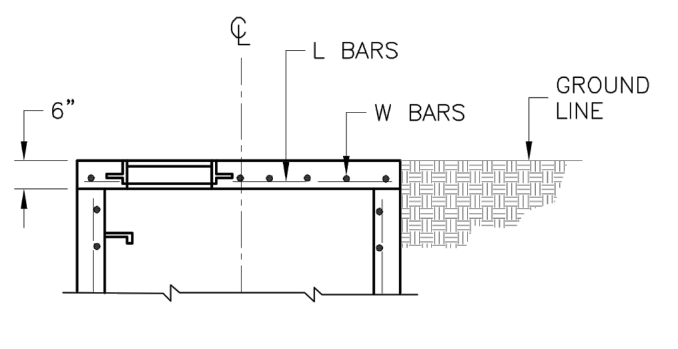
SECTION A–A

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.


A
W BARS
FLOW
L BARS
1½"CLEAR
#5 DIAGONALS
1"X1"X18" RECESSED LIFTING SLOTS (TYP)
FLOW
**W=3'-0" MIN.
1'-8" MIN.
A
6" (TYP)
**L=4'-0" MIN.

PLAN

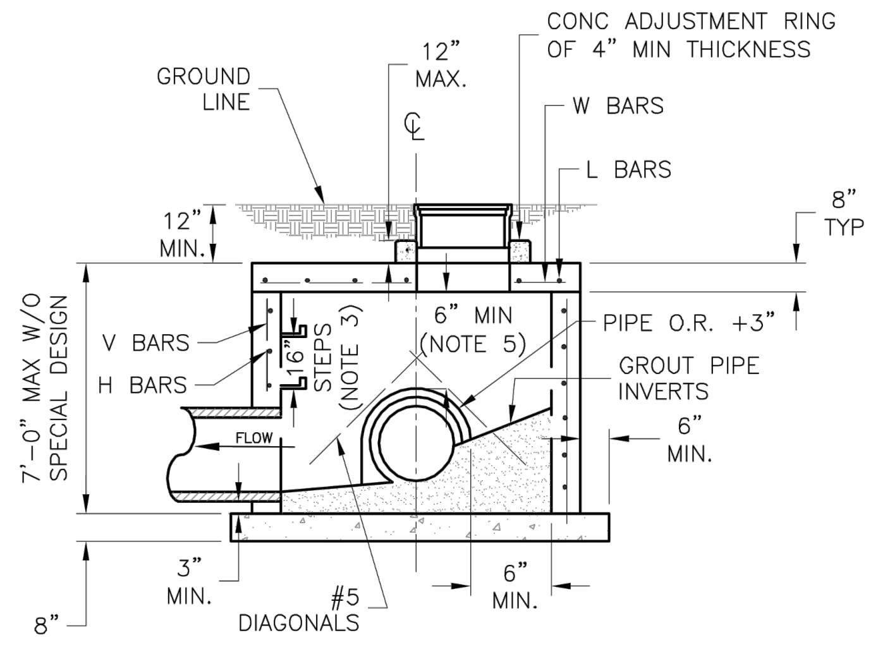

℄
L BARS
6"
W BARS
GROUND LINE

SLAB TOP ALTERNATE FOR JUNCTION BOX (SHALLOW)

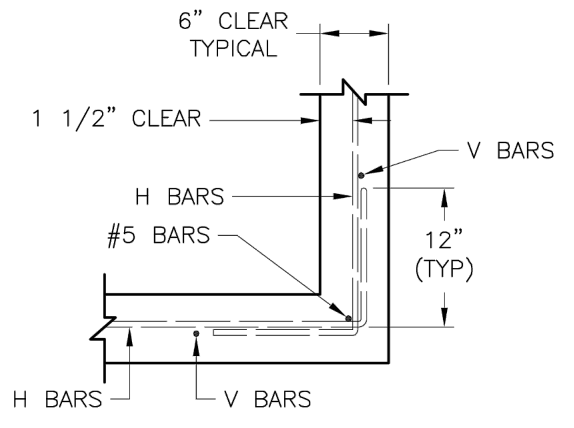
** INCREASE IN MULTIPLES OF 6" (7'-0") MAX WITHOUT SPECIAL DESIGN. (SEE PROJECT PLANS FOR DETAILS)

REINFORCING

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

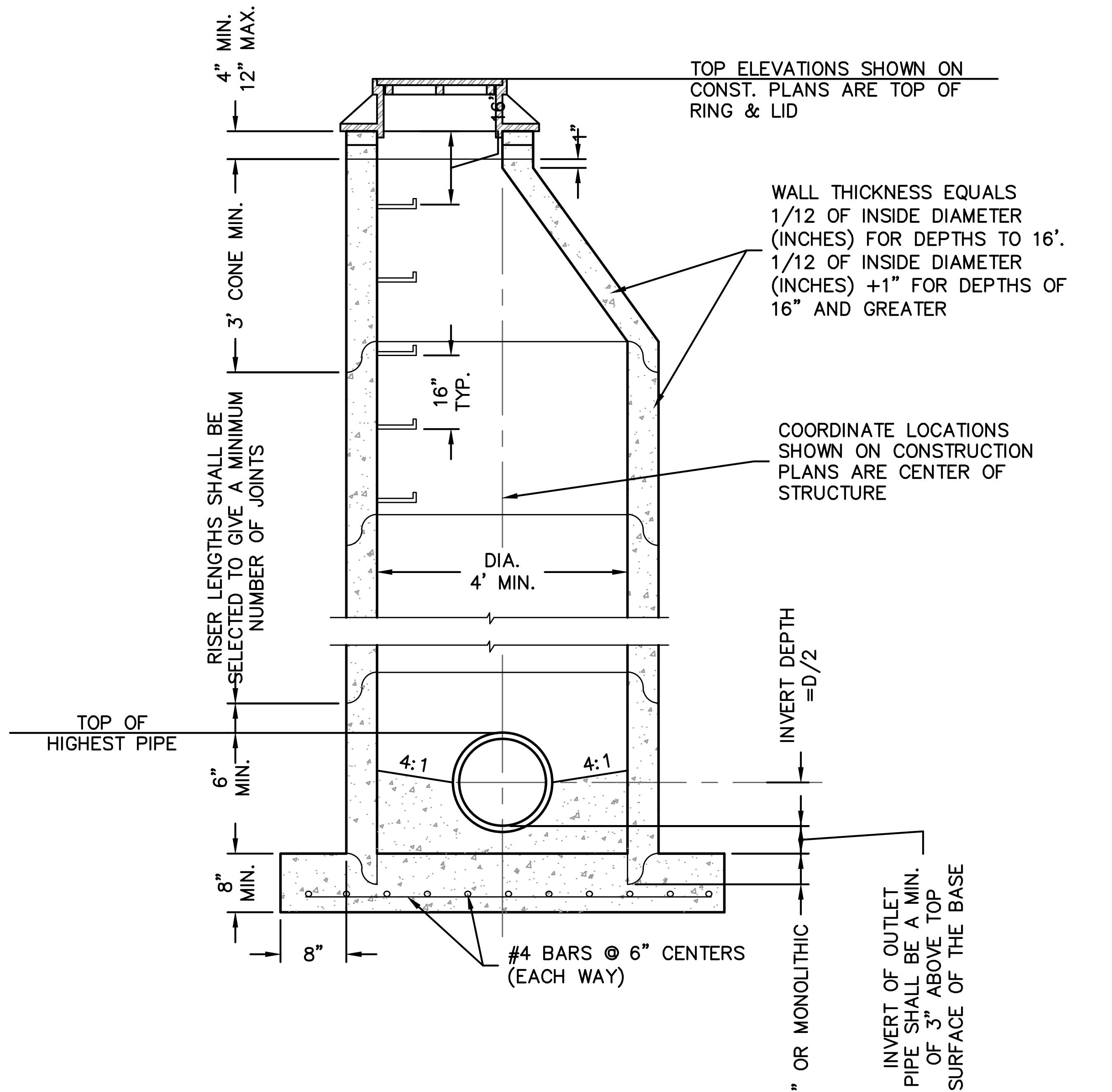

CONC ADJUSTMENT RING OF 4" MIN THICKNESS
GROUND LINE
12" MAX.
℄
W BARS
L BARS
12" MIN.
8" TYP
7'-0" MAX W/O SPECIAL DESIGN
V BARS
H BARS
16" STEPS (NOTE 3)
6" MIN (NOTE 5)
PIPE O.R. +3"
GROUT PIPE INVERTS
FLOW
6" MIN.
3" MIN.
#5 DIAGONALS
6" MIN.
8"

SECTION A–A


6" CLEAR TYPICAL
1 1/2" CLEAR
V BARS
H BARS
#5 BARS
12" (TYP)
H BARS
V BARS

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.


4" MIN. 12" MAX.
TOP ELEVATIONS SHOWN ON CONST. PLANS ARE TOP OF RING & LID
16"
4"
3' CONE MIN.
WALL THICKNESS EQUALS 1/12 OF INSIDE DIAMETER (INCHES) FOR DEPTHS TO 16'. 1/12 OF INSIDE DIAMETER (INCHES) +1" FOR DEPTHS OF 16" AND GREATER
16" TYP.
RISER LENGTHS SHALL BE SELECTED TO GIVE A MINIMUM NUMBER OF JOINTS
COORDINATE LOCATIONS SHOWN ON CONSTRUCTION PLANS ARE CENTER OF STRUCTURE
DIA. 4' MIN.
INVERT DEPTH =D/2
TOP OF HIGHEST PIPE
6" MIN.
4:1
4:1
8" MIN.
8"
#4 BARS @ 6" CENTERS (EACH WAY)
3" OR MONOLITHIC
INVERT OF OUTLET PIPE SHALL BE A MIN. OF 3" ABOVE TOP SURFACE OF THE BASE

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 REINFOCEING 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.)

NOT AS-BUILT

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TEL 816.361.1177
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JULIE ELAINE SELLERS
NUMBER PE-2017000367
3/18/21

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

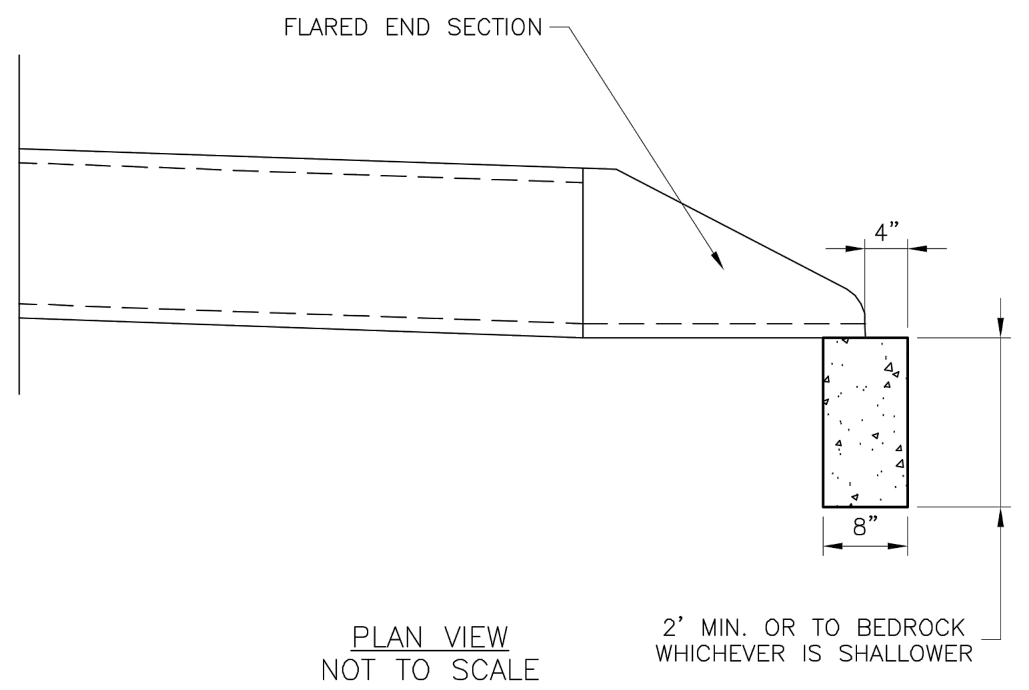
2019

LEE'S SUMMIT, MISSOURI

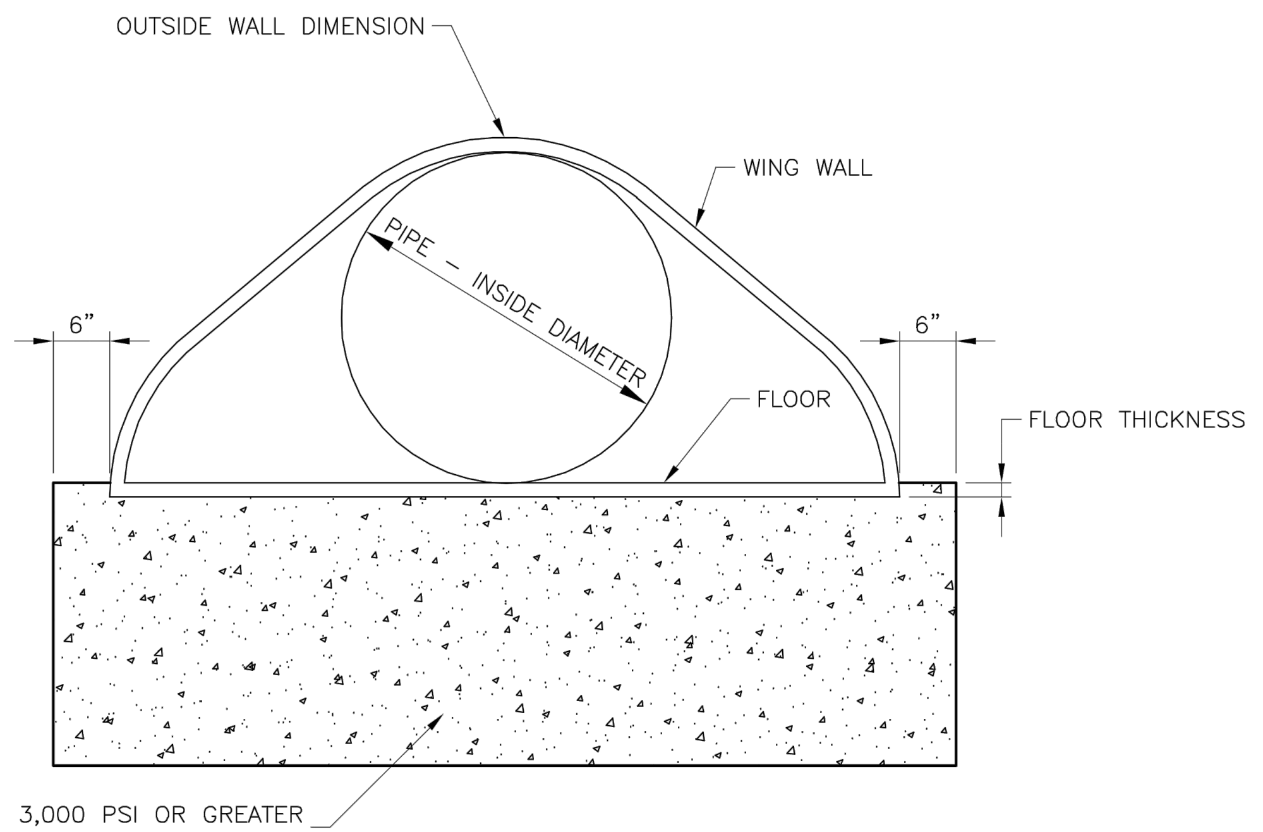
drawn by: D.A.H.O
checked by: M.G.D
designed by: B.M.W
QA/QC by: N.D.H
project no.: 019-1605
date: 07-12-2019

SHEET
C136

DWG: F:\2019\1501-2000\019-1605\40-Design\AutoCAD\As-Built\Sheets\GNCV\STREET, STORM & SITE DISTURBANCE\C_DTL01_0191605.dwg USER: bworthley
DATE: Feb 15, 2021 12:19pm XREFS: C_PTBLK_0191605


FLARED END SECTION
4"
8"
2' MIN. OR TO BEDROCK
WHICHEVER IS SHALLOWER

PLAN VIEW
NOT TO SCALE


OUTSIDE WALL DIMENSION
WING WALL
PIPE – INSIDE DIAMETER
6"
6"
FLOOR
FLOOR THICKNESS

3,000 PSI OR GREATER
CONCRETE MIX

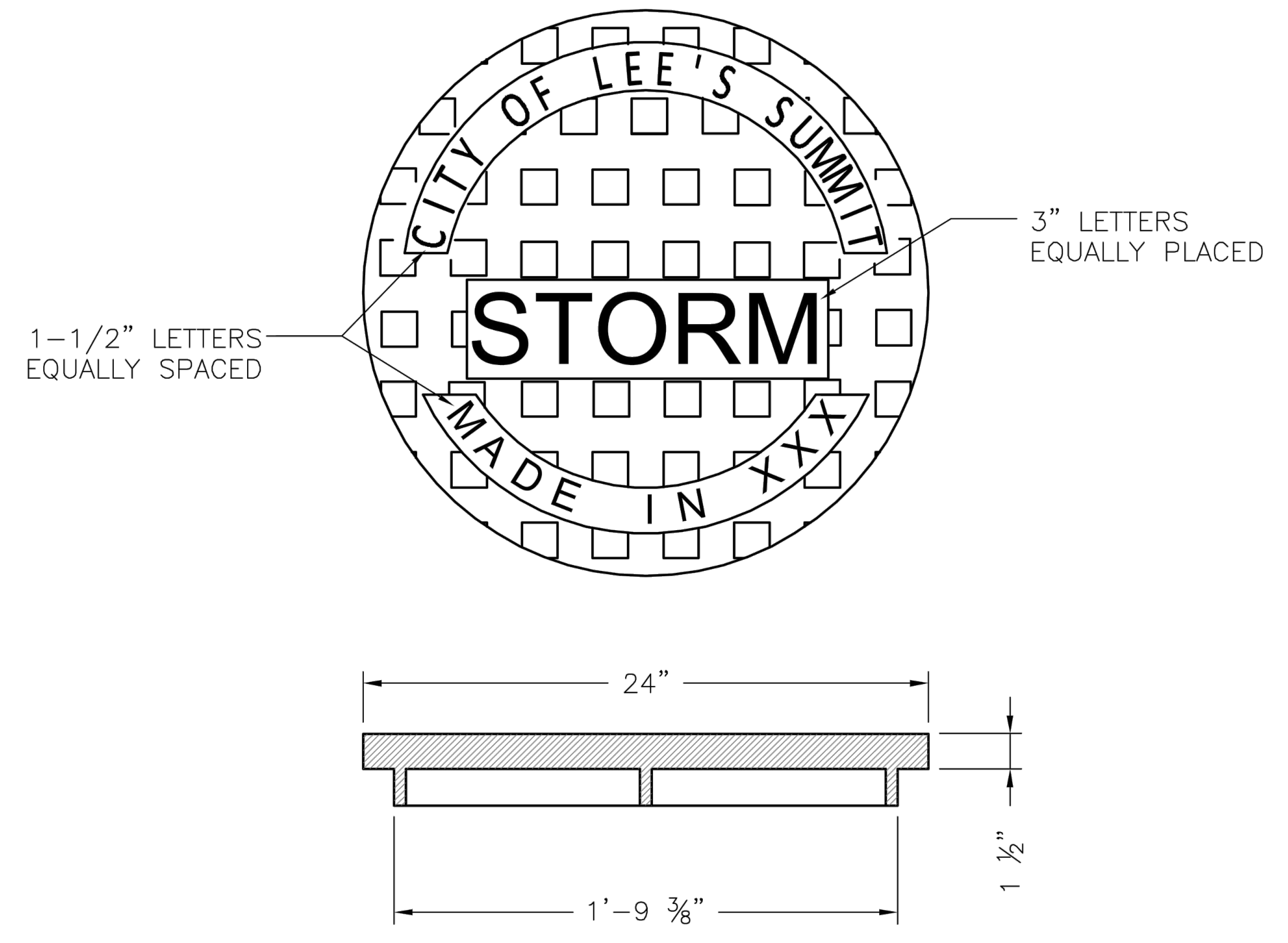
END VIEW
NOT TO SCALE

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

FLARED END SECTION SUPPORT DETAIL

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

STM-5


CITY OF LEE'S SUMMIT
STORM
MADE IN XXX
1-1/2" LETTERS
EQUALLY SPACED
3" LETTERS
EQUALLY PLACED
24"
1'-9 3/8"
1 1/2"

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

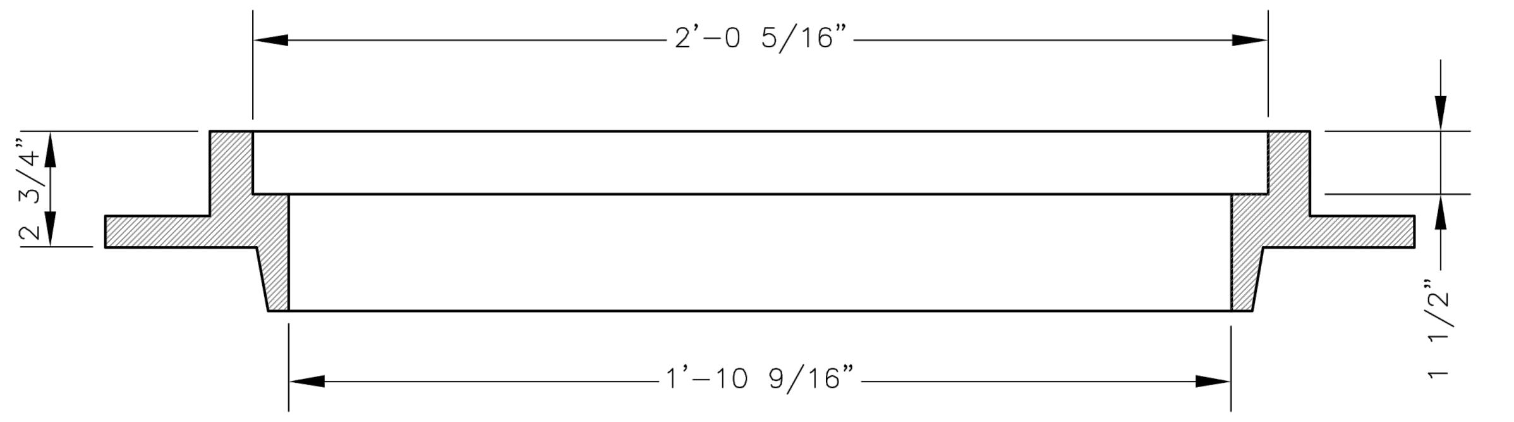
*COVER AND FRAME MODEL INFORMATION REFER TO
THE STORMWATER APPROVED PRODUCT LIST.

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

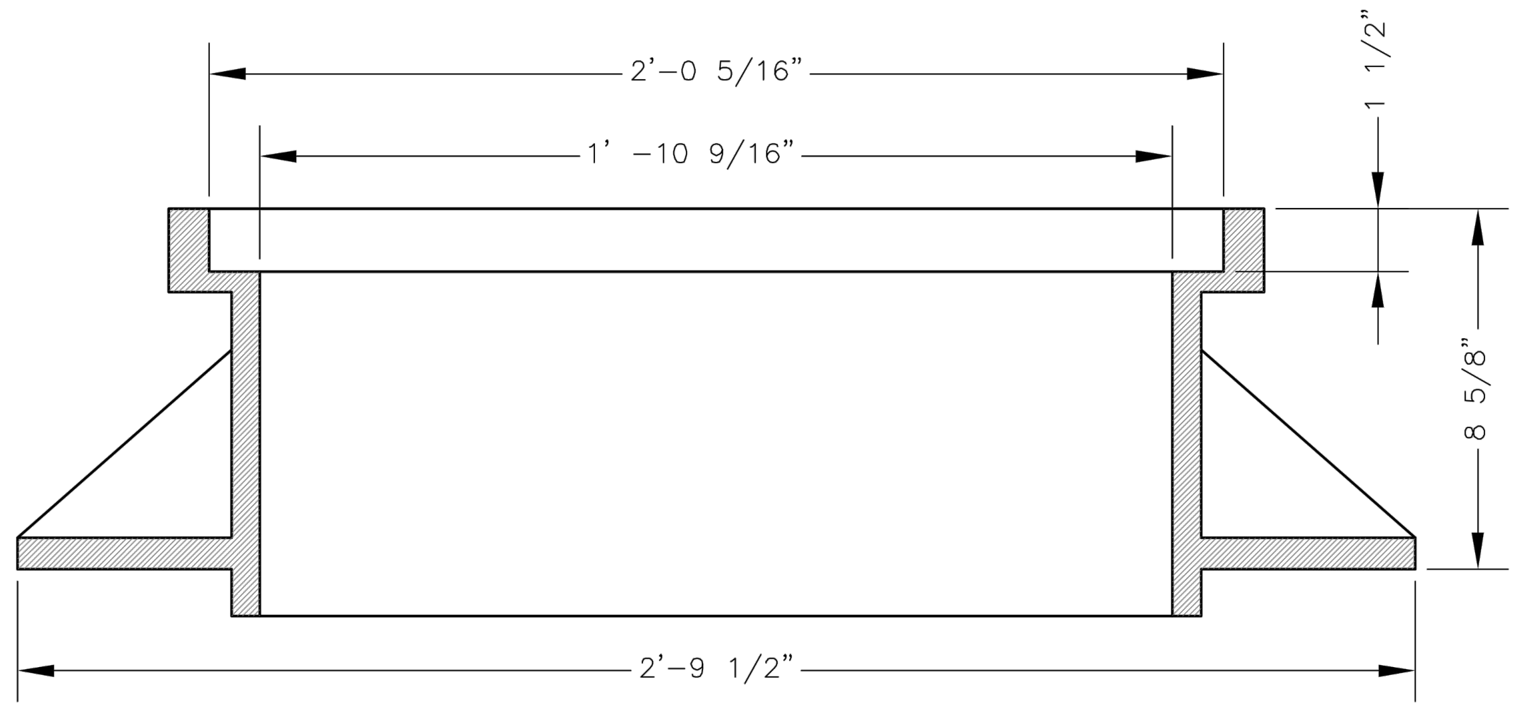
STORM MANHOLE COVER DETAIL

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

STM-6


2'-0 5/16"
2 3/4"
1'-10 9/16"
1 1/2"

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


2'-0 5/16"
1' -10 9/16"
1 1/2"
8 5/8"
2'-9 1/2"

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

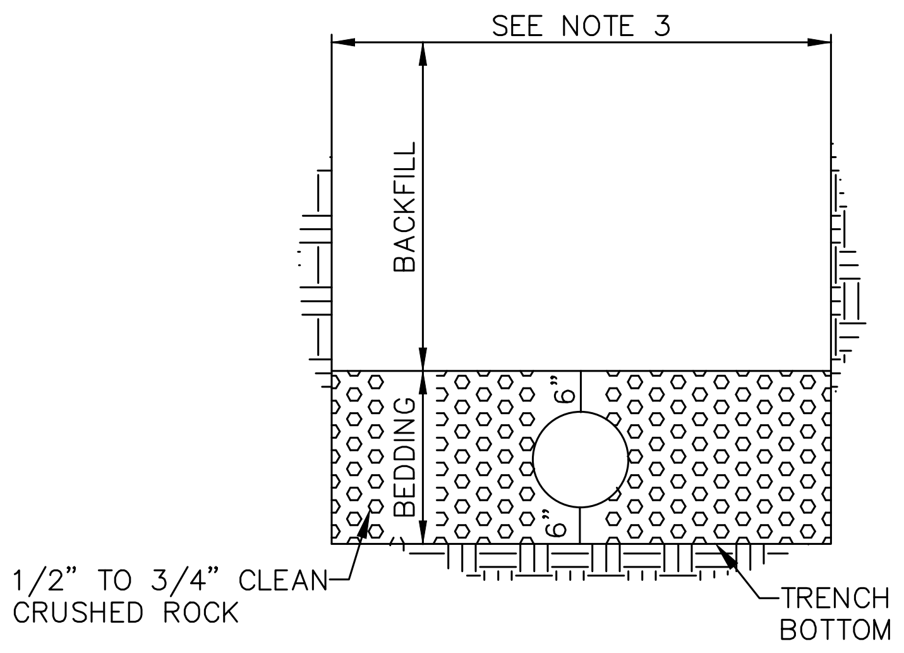
*COVER AND FRAME MODEL INFORMATION REFER TO
THE STORMWATER APPROVED PRODUCTS LIST.

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

STORM MANHOLE FRAME DETAIL

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

STM-7


SEE NOTE 3
BACKFILL
BEDDING
6"
6"
1/2" TO 3/4" CLEAN
CRUSHED ROCK
TRENCH
BOTTOM

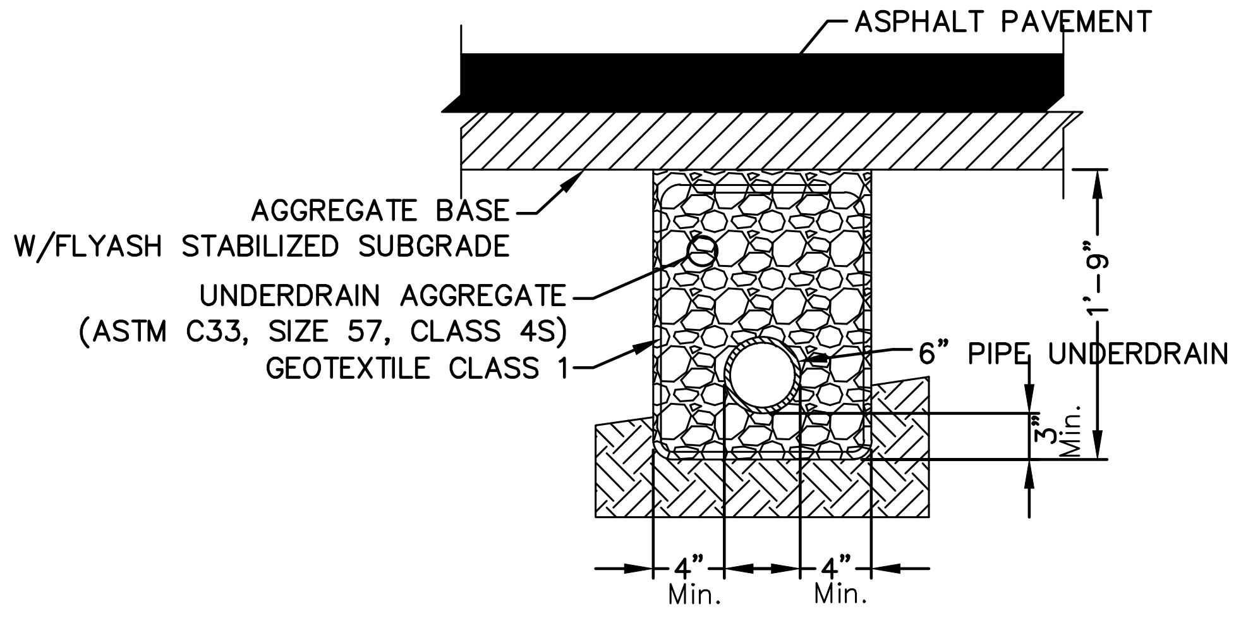
TYPICAL SECTION FOR PLASTIC PIPE
(IN ROCK OR SOIL)

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.

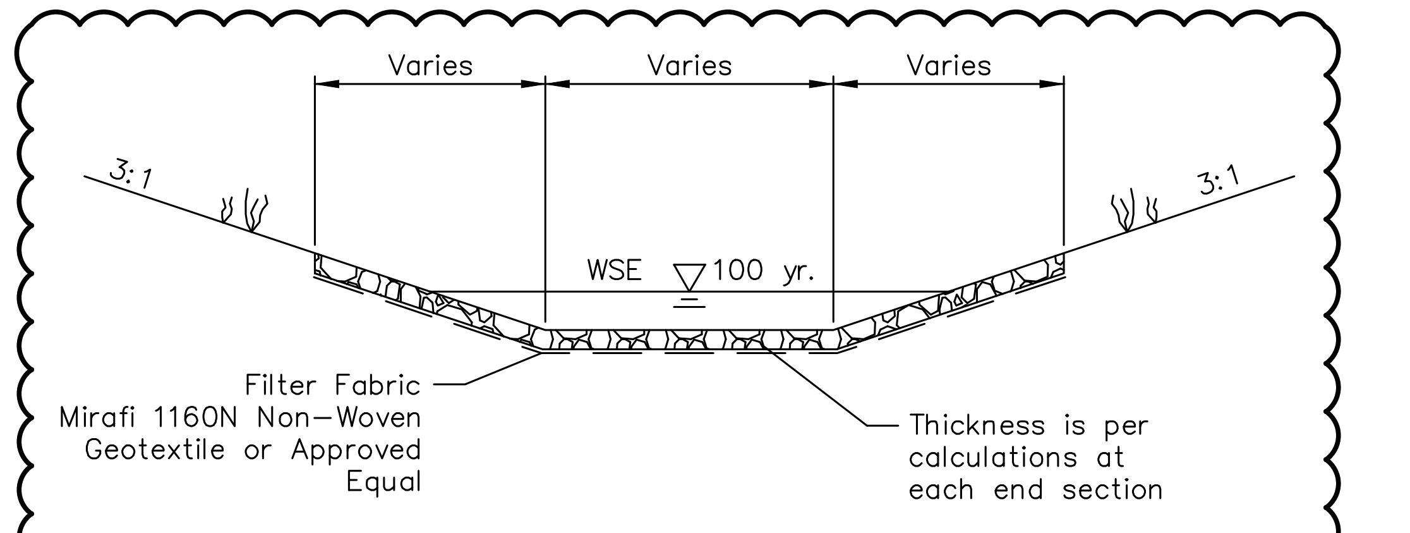
3. MINIMUM AND MAXIMUM WIDTHS SHALL BE IN ACCORDANCE WITH PIPE MANUFACTURER'S RECOMMENDATION AS APPROVED ON ENGINEERING PLANS.


ASPHALT PAVEMENT
AGGREGATE BASE
W/FLYASH STABILIZED SUBGRADE
UNDERDRAIN AGGREGATE
(ASTM C33, SIZE 57, CLASS 4S)
GEOTEXTILE CLASS 1
6" PIPE UNDERDRAIN
1'-9"
3" Min.
4" Min.
4" Min.

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".

△1


Varies
Varies
Varies
3:1
3:1
WSE
100 yr.
Filter Fabric
Mirafi 1160N Non–Woven
Geotextile or Approved
Equal
Thickness is per
calculations at
each end section

NOTE: DIMENSIONS ARE PER CALCULATIONS AT EACH END SECTION

RIPRAP DETAIL
N.T.S.

NOT AS-BUILT

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JULIE ELAINE SELLERS
NUMBER PE-2017000367
3/18/21

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

2019

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
C137

DWG: F:\2019\1501-2000\019-1605\40-Design\AutoCAD\As-Built\Sheets\GNCV\STREET, STORM & SITE DISTURBANCE\C_DTL01_0191605.dwg USER: bworthley
DATE: Feb 15, 2021 12:19pm XREFS: C_PTBLK_0191605

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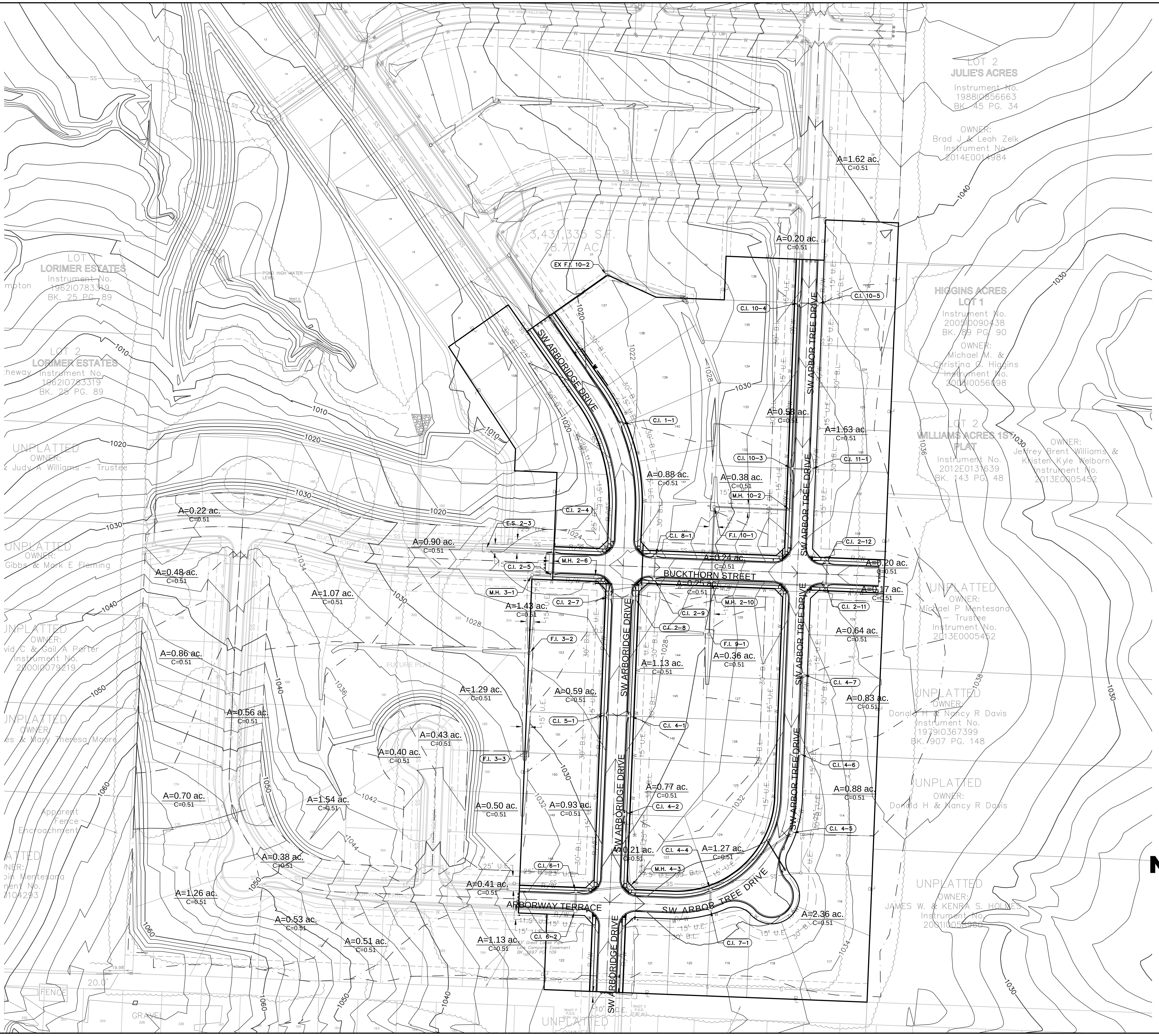
DATE: Feb 15, 2021 12:20pm XREFS: C_PTBLK_0191605 C_PBNDY_0191605 C_PBASE_0191605 C_XBASE_0191605 C_FBASE_0191605 C_PUTIL_0191605 C_PSTRM_0191605



SW ARBORIDGE DRIVE
SW ARBOR TREE DRIVE
BUCKTHORN STREET
ARBORWAY TERRACE
A=1.62 ac. C=0.51
A=0.20 ac. C=0.51
A=0.58 ac. C=0.51
A=1.63 ac. C=0.51
A=0.88 ac. C=0.51
A=0.38 ac. C=0.51
A=0.22 ac. C=0.51
A=0.90 ac. C=0.51
A=0.24 ac. C=0.51
A=0.48 ac. C=0.51
A=1.07 ac. C=0.51
A=1.43 ac. C=0.51
A=0.25 ac. C=0.51
A=0.20 ac. C=0.51
A=0.17 ac. C=0.51
A=0.64 ac. C=0.51
A=0.86 ac. C=0.51
A=1.13 ac. C=0.51
A=0.36 ac. C=0.51
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A=0.83 ac. C=0.51
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A=0.43 ac. C=0.51
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A=0.88 ac. C=0.51
A=0.70 ac. C=0.51
A=1.54 ac. C=0.51
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A=0.93 ac. C=0.51
A=0.21 ac. C=0.51
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A=0.38 ac. C=0.51
A=0.41 ac. C=0.51
A=1.26 ac. C=0.51
A=2.36 ac. C=0.51
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A=0.51 ac. C=0.51
A=1.13 ac. C=0.51
EX F.I. 10-2
C.I. 10-4
C.I. 10-5
C.I. 1-1
C.I. 10-3
C.I. 11-1
M.H. 10-2
C.I. 2-4
E.S. 2-3
C.I. 8-1
F.I. 10-1
C.I. 2-12
C.I. 2-5
M.H. 2-6
M.H. 3-1
C.I. 2-7
M.H. 2-10
C.I. 2-11
C.I. 2-9
C.I. 2-8
F.I. 3-2
F.I. 9-1
C.I. 4-7
C.I. 5-1
C.I. 4-1
F.I. 3-3
C.I. 4-6
C.I. 4-2
C.I. 4-5
C.I. 4-4
C.I. 6-1
M.H. 4-3
C.I. 6-2
C.I. 7-1
LOT 2 JULIE'S ACRES Instrument No. 1988I0856663 BK. 45 PG. 34
OWNER: Brad J & Leah Zelk Instrument No. 2014E0014984
LOT LORIMER ESTATES Instrument No. 1962I0783319 BK. 25 PG. 89
LOT 2 LORIMER ESTATES Instrument No. 1962I0783319 BK. 25 PG. 89
HIGGINS ACRES LOT 1 Instrument No. 2005I0090438 BK. 89 PG. 90
OWNER: Michael M. & Christina G. Higgins Instrument No. 2004I0056098
LOT 2 WILLIAMS ACRES 1ST PLAT Instrument No. 2012E0131639 BK. 143 PG. 48
OWNER: Jeffrey Brent Williams & Kristen Kyle Welborn Instrument No. 2013E0005452
UNPLATTED OWNER: Michael P Mentesana - Trustee Instrument No. 2013E0005452
UNPLATTED OWNER: Donald H & Nancy R Davis Instrument No. 1979I0367399 BK. 907 PG. 148
UNPLATTED OWNER: Donald H & Nancy R Davis
UNPLATTED OWNER: JAMES W. & KENRA S. HOLMES Instrument No. 2001I0056960
3,431,335 S.F. 78.77 AC.
FUTURE PLAT
Apparent Fence Encroachment
FENCE
GRAVEL
1010
1020
1030
1040
1050
1060

NOT AS-BUILT

N

0' 40' 80' 160'
SCALE IN FEET

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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JULIE ELAINE SELLERS
NUMBER PE-2017000367
3/18/21

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

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

DRAINAGE PLAN
STREET & STORM SEWER PLANS

HAWTHORN RIDGE
SECOND PLAT

2019

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
C138

Drainage Area Design Table

Inlet ID	Drainage Area	C	Tc	i	K	Peak Flow
10	Year Return Frequency					
	(ac)		(min)	(in/hr)		(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

Inlet ID	Drainage Area	C	Tc	i	K	Peak Flow
25	Year Return Frequency					
	(ac)		(min)	(in/hr)		(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

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
10	Year Return Frequency												
		(cfs)	(cfs)	(cfs)		(cfs)	(cfs)	(cfs)	(cfs)	(%)	(ft)	(ft)	(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

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
25	Year Return Frequency												
		(cfs)	(cfs)	(cfs)		(cfs)	(cfs)	(cfs)	(cfs)	(%)	(ft)	(ft)	(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.

Storm Sewer Design Calculation Table

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.
10	Year Return Frequency												
		(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(ft/s)	(cfs)	(ft)	(ft)	(ft)
C.I. 1-1	EX C.I. 10-1	231.79	1015.27	1010.97	1.86	15	0.010	3.04	3.43	11.43	1.15	1015.97	1021.27
C.I. 2-4	E.S. 2-3	120.77	1009.54	1008.67	0.72	48	0.010	90.51	11.18	158.49	2.17	1012.42	1023.28
C.I. 2-5	C.I. 2-4	44.75	1010.01	1009.79	0.49	42	0.010	87.40	10.54	91.71	2.73	1012.92	1023.20
M.H. 2-6	C.I. 2-5	77.11	1011.23	1010.91	0.41	42	0.010	69.22	9.39	84.25	2.42	1013.84	1023.83
C.I. 2-7	M.H. 2-6	44.84	1012.41	1011.43	2.19	42	0.010	69.22	9.42	193.35	2.41	1015.02	1024.71
C.I. 2-8	C.I. 2-7	45.27	1013.85	1012.91	2.08	42	0.010	66.94	9.97	188.47	2.11	1016.41	1024.68
C.I. 2-9	C.I. 2-8	48.24	1017.22	1015.23	4.13	24	0.010	19.79	8.80	59.72	1.18	1018.82	1025.52
M.H. 2-10	C.I. 2-9	102.89	1020.43	1017.92	2.44	24	0.010	17.96	10.07	45.93	0.90	1021.96	1029.53
C.I. 2-11	M.H. 2-10	203.86	1027.98	1021.38	3.24	15	0.010	1.39	2.93	15.10	0.58	1028.45	1035.78
C.I. 2-12	C.I. 2-11	42.25	1029.90	1029.08	1.94	15	0.010	0.75	4.07	11.70	0.21	1030.24	1035.80
M.H. 3-1	C.I. 2-5	38.47	1012.60	1011.41	3.09	24	0.010	12.06	5.31	51.71	1.50	1013.85	1023.37
F.I. 3-2	M.H. 3-1	141.17	1020.03	1013.60	4.55	18	0.010	12.06	11.52	29.14	0.67	1021.35	1027.12
F.I. 3-3	F.I. 3-2	177.37	1024.49	1020.43	2.29	15	0.010	1.88	2.80	12.70	0.92	1025.04	1030.56
C.I. 4-1	C.I. 2-8	210.84	1015.99	1014.33	0.79	36	0.010	43.86	8.22	76.93	2.08	1018.15	1027.24
C.I. 4-2	C.I. 4-1	175.96	1018.38	1016.59	1.02	36	0.010	38.61	9.03	87.45	1.56	1020.40	1029.53
M.H. 4-3	C.I. 4-2	130.75	1019.91	1018.58	1.02	36	0.010	37.82	7.99	87.44	1.82	1021.91	1030.81
C.I. 4-4	M.H. 4-3	143.67	1022.08	1020.56	1.06	30	0.010	19.74	6.85	54.84	1.35	1023.59	1028.58
C.I. 4-5	C.I. 4-4	176.52	1024.23	1022.78	0.82	24	0.010	7.97	5.88	26.65	0.81	1025.23	1030.23
C.I. 4-6	C.I. 4-5	142.57	1026.24	1024.93	0.92	18	0.010	4.87	5.79	13.09	0.63	1027.09	1031.64
C.I. 4-7	C.I. 4-6	142.32	1027.96	1026.64	0.93	15	0.010	2.08	4.52	8.08	0.45	1028.54	1032.96
C.I. 5-1	C.I. 4-1	43.33	1020.99	1018.19	6.46	15	0.010	2.55	7.87	21.34	0.29	1021.63	1027.29
C.I. 6-1	M.H. 4-3	96.90	1022.83	1020.46	2.45	30	0.010	18.08	6.16	83.38	1.45	1024.27	1030.57
C.I. 6-2	C.I. 6-1	35.59	1024.34	1023.63	1.99	24	0.010	15.89	9.46	41.53	0.86	1025.78	1030.61
C.I. 7-1	C.I. 4-4	36.62	1023.17	1022.88	0.79	24	0.010	7.38	6.04	26.16	0.73	1024.13	1028.57
C.I. 8-1	C.I. 2-9	42.32	1019.38	1018.07	3.10	15	0.010	0.90	2.06	14.77	0.75	1019.75	1025.43
F.I. 9-1	M.H. 2-10	92.31	1023.04	1021.23	1.96	15	0.010	1.35	2.57	11.75	0.73	1023.50	1029.24
F.I. 10-1	M.H. 2-10	134.77	1022.38	1021.23	0.85	24	0.010	15.22	7.67	27.16	1.07	1023.79	1027.88
M.H. 10-2	F.I. 10-1	135.18	1024.52	1022.88	1.21	24	0.010	13.79	8.04	32.39	0.91	1025.86	1032.77
C.I. 10-3	M.H. 10-2	75.74	1025.84	1025.17	0.88	24	0.010	13.79	7.49	27.65	1.00	1027.18	1031.84
C.I. 10-4	C.I. 10-3	296.08	1029.24	1026.34	0.98	18	0.010	4.21	4.33	13.51	0.84	1030.03	1035.69
C.I. 10-5	C.I. 10-4	33.97	1030.58	1030.24	1.00	15	0.010	3.50	5.53	8.40	0.56	1031.33	1035.73
C.I. 11-1	C.I. 10-3	34.73	1027.08	1026.49	1.70	15	0.010	7.37	8.05	10.94	0.75	1028.16	1031.83

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.

NOTE:

DRAINAGE AREA AND INLET DESIGN TABLES ARE NOT AS-BUILT. ONLY STORM SEWER DESIGN CALCULATION TABLES HAVE BEEN AS-BUILT.

Storm Sewer Design Calculation Table

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.
25	Year Return Frequency												
		(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(ft/s)	(cfs)	(ft)	(ft)	(ft)
C.I. 1-1	EX C.I. 10-1	231.79	1015.27	1010.97	1.86	15	0.010	3.74	3.88	11.43	1.18	1016.05	1021.27
C.I. 2-4	E.S. 2-3	120.77	1009.54	1008.67	0.72	48	0.010	116.47	12.21	158.49	2.55	1012.79	1023.28
C.I. 2-5	C.I. 2-4	44.75	1010.01	1009.79	0.49	42	0.010	112.50	11.69	91.71	3.50	1013.62	1023.20
M.H. 2-6	C.I. 2-5	77.11	1011.23	1010.91	0.41	42	0.010	88.65	9.21	84.25	3.50	1014.83	1023.83
C.I. 2-7	M.H. 2-6	44.84	1012.41	1011.43	2.19	42	0.010	88.65	9.77	193.35	3.50	1015.33	1024.71
C.I. 2-8	C.I. 2-7	45.27	1013.85	1012.91	2.08	42	0.010	85.73	11.09	188.47	2.42	1016.73	1024.68
C.I. 2-9	C.I. 2-8	48.24	1017.22	1015.23	4.13	24	0.010	25.87	9.49	59.72	1.50	1019.00	1025.52
M.H. 2-10	C.I. 2-9	102.89	1020.43	1017.92	2.44	24	0.010	23.56	10.89	45.93	1.08	1022.15	1029.53
C.I. 2-11	M.H. 2-10	203.86	1027.98	1021.38	3.24	15	0.010	1.77	2.91	15.10	0.77	1028.51	1035.78
C.I. 2-12	C.I. 2-11	42.25	1029.90	1029.08	1.94	15	0.010	0.96	4.37	11.70	0.24	1030.29	1035.80
M.H. 3-1	C.I. 2-5	38.47	1012.60	1011.41	3.09	24	0.010	15.38	4.90	51.71	2.00	1014.57	1023.37
F.I. 3-2	M.H. 3-1	141.17	1020.03	1013.60	4.55	18	0.010	15.38	9.89	29.14	1.12	1021.44	1027.12
F.I. 3-3	F.I. 3-2	177.37	1024.49	1020.43	2.29	15	0.010	2.39	3.10	12.70	1.01	1025.11	1030.56
C.I. 4-1	C.I. 2-8	210.84	1015.99	1014.33	0.79	36	0.010	55.73	9.16	76.93	2.40	1018.41	1027.24
C.I. 4-2	C.I. 4-1	175.96	1018.38	1016.59	1.02	36	0.010	49.25	9.76	87.45	1.82	1020.66	1029.53
M.H. 4-3	C.I. 4-2	130.75	1019.91	1018.58	1.02	36	0.010	48.25	8.83	87.44	2.08	1022.17	1030.81
C.I. 4-4	M.H. 4-3	143.67	1022.08	1020.56	1.06	30	0.010	25.18	7.29	54.84	1.61	1023.79	1028.58
C.I. 4-5	C.I. 4-4	176.52	1024.23	1022.78	0.82	24	0.010	9.78	5.79	26.65	1.01	1025.35	1030.23
C.I. 4-6	C.I. 4-5	142.57	1026.24	1024.93	0.92	18	0.010	5.95	6.16	13.09	0.71	1027.18	1031.64
C.I. 4-7	C.I. 4-6	142.32	1027.96	1026.64	0.93	15	0.010	2.54	4.51	8.08	0.54	1028.60	1032.96
C.I. 5-1	C.I. 4-1	43.33	1020.99	1018.19	6.46	15	0.010	3.15	8.40	21.34	0.32	1021.70	1027.29
C.I. 6-1	M.H. 4-3	96.90	1022.83	1020.46	2.45	30	0.010	23.07	6.62	83.38	1.71	1024.46	1030.57
C.I. 6-2	C.I. 6-1	35.59	1024.34	1023.63	1.99	24	0.010	20.06	10.26	41.53	0.98	1025.95	1030.61
C.I. 7-1	C.I. 4-4	36.62	1023.17	1022.88	0.79	24	0.010	9.79	6.24	26.16	0.91	1024.29	1028.57
C.I. 8-1	C.I. 2-9	42.32	1019.38	1018.07	3.10	15	0.010	1.13	2.14	14.77	0.93	1019.80	1025.43
F.I. 9-1	M.H. 2-10	92.31	1023.04	1021.23	1.96	15	0.010	2.37	3.19	11.75	0.92	1023.66	1029.24
F.I. 10-1	M.H. 2-10	134.77	1022.38	1021.23	0.85	24	0.010	19.42	8.34	27.16	1.25	1023.96	1027.88
M.H. 10-2	F.I. 10-1	135.18	1024.52	1022.88	1.21	24	0.010	17.60	8.52	32.39	1.08	1026.03	1032.77
C.I. 10-3	M.H. 10-2	75.74	1025.84	1025.17	0.88	24	0.010	17.60	8.12	27.65	1.16	1027.35	1031.84
C.I. 10-4	C.I. 10-3	296.08	1029.24	1026.34	0.98	18	0.010	4.92	4.32	13.51	1.01	1030.09	1035.69
C.I. 10-5	C.I. 10-4	33.97	1030.58	1030.24	1.00	15	0.010	4.03	5.77	8.40	0.61	1031.39	1035.73
C.I. 11-1	C.I. 10-3	34.73	1027.08	1026.49	1.70	15	0.010	9.84	9.14	10.94	0.93	1028.26	1031.83

AS-BUILT

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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
C139

DWG: F:\2019\1501-2000\019-1605\40-Design\AutoCAD\As-Built\Sheets\GNCV\STREET, STORM & SITE DISTURBANCE\C_TAB01_0191605.dwg USER: bworthley
DATE: Feb 15, 2021 12:21pm XREFS: C_PTBLK_0191605

Drainage Area Design Table
100 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	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 (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	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 (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	231.79	1015.27	1010.97	1.86	15	0.010	4.81	3.92	11.43	1.25	1030.42	1021.27
C.I. 2-4	E.S. 2-3	120.77	1009.54	1008.67	0.72	48	0.010	159.86	13.81	158.49	3.31	1013.20	1023.28
C.I. 2-5	C.I. 2-4	44.75	1010.01	1009.79	0.49	42	0.010	155.05	16.12	91.71	3.50	1013.92	1023.20
M.H. 2-6	C.I. 2-5	77.11	1011.23	1010.91	0.41	42	0.010	120.58	12.53	84.25	3.50	1016.19	1023.83
C.I. 2-7	M.H. 2-6	44.84	1012.41	1011.43	2.19	42	0.010	120.58	12.53	193.35	3.50	1017.55	1024.71
C.I. 2-8	C.I. 2-7	45.27	1013.85	1012.91	2.08	42	0.010	116.55	12.12	188.47	3.50	1018.89	1024.68
C.I. 2-9	C.I. 2-8	48.24	1017.22	1015.23	4.13	24	0.010	34.68	11.04	59.72	2.00	1020.47	1025.52
M.H. 2-10	C.I. 2-9	102.89	1020.43	1017.92	2.44	24	0.010	31.58	10.05	45.93	2.00	1022.43	1029.53
C.I. 2-11	M.H. 2-10	203.86	1027.98	1021.38	3.24	15	0.010	2.41	2.96	15.10	1.25	1028.60	1035.78
C.I. 2-12	C.I. 2-11	42.25	1029.90	1029.08	1.94	15	0.010	1.30	4.77	11.70	0.28	1030.35	1035.80
M.H. 3-1	C.I. 2-5	38.47	1012.60	1011.41	3.09	24	0.010	21.19	6.75	51.71	2.00	1015.74	1023.37
F.I. 3-2	M.H. 3-1	141.17	1020.03	1013.60	4.55	18	0.010	21.19	12.02	29.14	1.50	1021.50	1027.12
F.I. 3-3	F.I. 3-2	177.37	1024.49	1020.43	2.29	15	0.010	3.29	3.68	12.70	1.07	1025.22	1030.56
C.I. 4-1	C.I. 2-8	210.84	1015.99	1014.33	0.79	36	0.010	76.38	10.81	76.93	3.00	1021.44	1027.24
C.I. 4-2	C.I. 4-1	175.96	1018.38	1016.59	1.02	36	0.010	67.96	9.62	87.45	3.00	1023.25	1029.53
M.H. 4-3	C.I. 4-2	130.75	1019.91	1018.58	1.02	36	0.010	66.59	9.42	87.44	3.00	1024.59	1030.81
C.I. 4-4	M.H. 4-3	143.67	1022.08	1020.56	1.06	30	0.010	34.78	7.09	54.84	2.50	1025.76	1028.58
C.I. 4-5	C.I. 4-4	176.52	1024.23	1022.78	0.82	24	0.010	12.51	3.98	26.65	2.00	1026.39	1030.23
C.I. 4-6	C.I. 4-5	142.57	1026.24	1024.93	0.92	18	0.010	7.60	4.98	13.09	1.50	1027.31	1031.64
C.I. 4-7	C.I. 4-6	142.32	1027.96	1026.64	0.93	15	0.010	3.25	4.64	8.08	0.67	1028.69	1032.96
C.I. 5-1	C.I. 4-1	43.33	1020.99	1018.19	6.46	15	0.010	4.12	3.36	21.34	1.25	1022.24	1027.29
C.I. 6-1	M.H. 4-3	96.90	1022.83	1020.46	2.45	30	0.010	31.81	6.48	83.38	2.50	1025.49	1030.57
C.I. 6-2	C.I. 6-1	35.59	1024.34	1023.63	1.99	24	0.010	27.20	8.88	41.53	2.00	1026.15	1030.61
C.I. 7-1	C.I. 4-4	36.62	1023.17	1022.88	0.79	24	0.010	14.54	4.63	26.16	2.00	1026.16	1028.57
C.I. 8-1	C.I. 2-9	42.32	1019.38	1018.07	3.10	15	0.010	1.52	1.24	14.77	1.25	1021.25	1025.43
F.I. 9-1	M.H. 2-10	92.31	1023.04	1021.23	1.96	15	0.010	2.37	2.94	11.75	1.25	1023.66	1029.24
F.I. 10-1	M.H. 2-10	134.77	1022.38	1021.23	0.85	24	0.010	26.80	8.94	27.16	1.83	1024.18	1027.88
M.H. 10-2	F.I. 10-1	135.18	1024.52	1022.88	1.21	24	0.010	24.30	9.79	32.39	1.30	1026.26	1032.77
C.I. 10-3	M.H. 10-2	75.74	1025.84	1025.17	0.88	24	0.010	24.30	9.15	27.65	1.45	1027.58	1031.84
C.I. 10-4	C.I. 10-3	296.08	1029.24	1026.34	0.98	18	0.010	5.89	4.42	13.51	1.24	1030.18	1035.69
C.I. 10-5	C.I. 10-4	33.97	1030.58	1030.24	1.00	15	0.010	4.70	6.07	8.40	0.67	1031.46	1035.73
C.I. 11-1	C.I. 10-3	34.73	1027.08	1026.49	1.70	15	0.010	14.47	11.79	10.94	1.25	1028.77	1031.83

NOTE:
DRAINAGE AREA AND INLET DESIGN TABLES ARE NOT AS-BUILT. ONLY STORM SEWER DESIGN CALCULATION TABLE HAS BEEN AS-BUILT.

AS-BUILT

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NUMBER PE-2017000367
3/18/21

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	

DRAINAGE TABLES
STREET & STORM SEWER PLANS

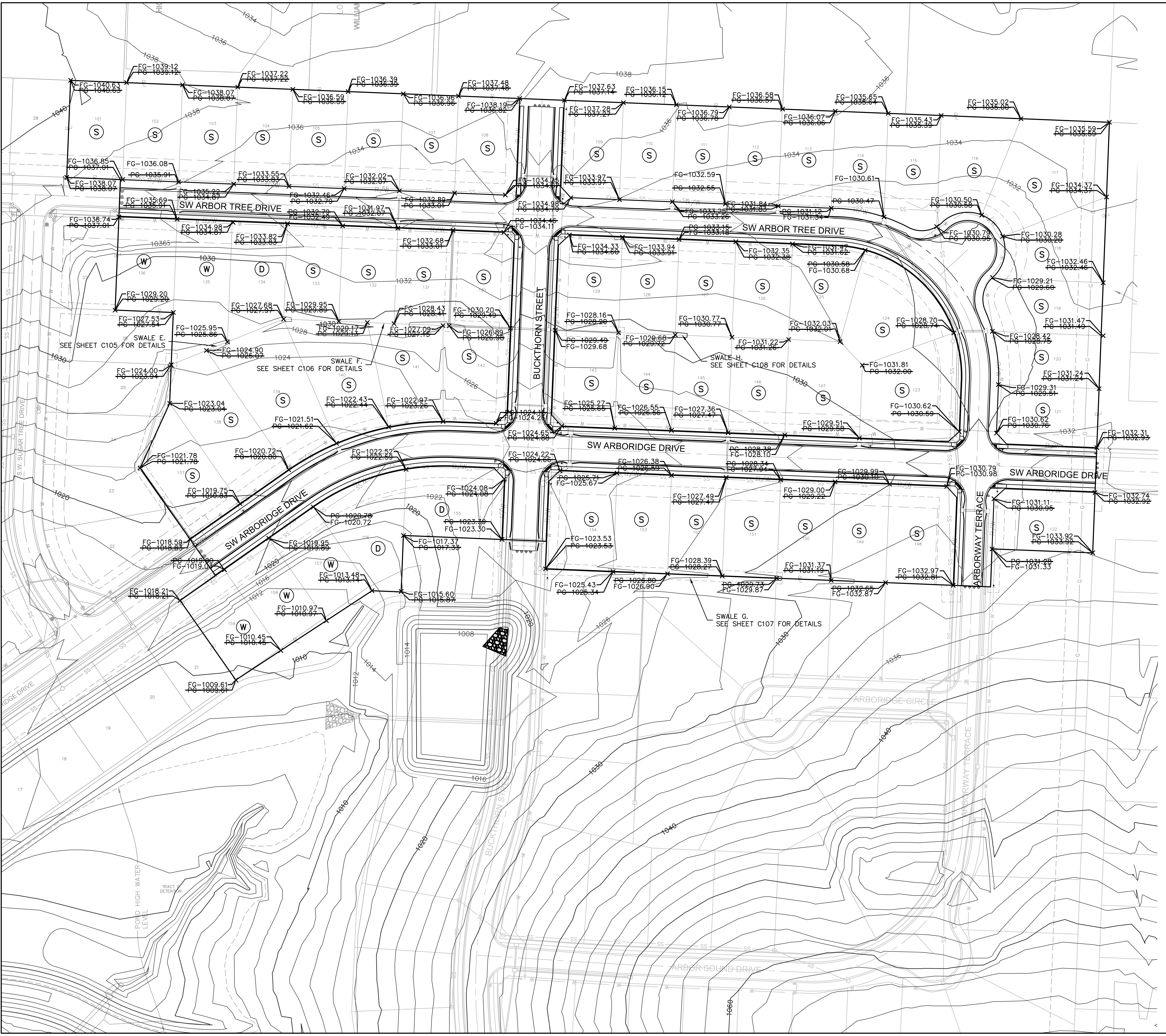
HAWTHORN RIDGE
SECOND PLAT

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


SW ARBOR TREE DRIVE
SW ARBOR TREE DRIVE
BUCKTHORN STREET
SW ARBORIDGE DRIVE
SW ARBORIDGE DRIVE
SW ARBORIDGE DRIVE
ARBORWAY TERRACE
ARBORIDGE CIRCLE
ARBOR SOUND DRIVE
SW SUGAR TREE DRIVE
SWALE E.
SEE SHEET C105 FOR DETAILS
SWALE F.
SEE SHEET C106 FOR DETAILS
SWALE H.
SEE SHEET C108 FOR DETAILS
SWALE G.
SEE SHEET C107 FOR DETAILS
POND HIGH WATER LEVEL
TRACT C DETENTION
FG–1040.63
FG–1039.12
FG–1038.07
FG–1037.22
FG–1036.59
FG–1036.39
FG–1036.96
FG–1037.48
FG–1038.19
FG–1037.63
FG–1037.28
FG–1036.15
FG–1036.79
FG–1036.58
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FG–1035.65
FG–1035.43
FG–1035.02
FG–1035.59
FG–1036.85
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FG–1038.07
FG–1035.69
FG–1033.55
FG–1035.23
FG–1032.46
FG–1032.02
FG–1032.89
FG–1031.97
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FG–1034.98
FG–1033.97
FG–1032.59
FG–1032.55
FG–1030.61
FG–1031.84
FG–1031.12
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FG–1030.50
FG–1034.37
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FG–1028.34
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FG–1030.79
FG–1030.98
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FG–1019.75
FG–1024.08
FG–1027.49
FG–1029.00
FG–1032.74
FG–1031.11
FG–1020.76
FG–1020.72
FG–1023.39
FG–1023.30
FG–1023.53
FG–1033.92
FG–1018.59
FG–1019.95
FG–1017.37
FG–1019.20
FG–1019.07
FG–1028.39
FG–1031.37
FG–1031.29
FG–1031.33
FG–1013.48
FG–1025.43
FG–1026.80
FG–1029.77
FG–1029.87
FG–1032.65
FG–1032.87
FG–1032.97
FG–1018.21
FG–1015.60
FG–1010.97
FG–1010.45
FG–1009.61
D
W
S
1008
1010
1012
1014
1016
1020
1024
1026
1028
1030
1032
1034
1036
1038
1040
1050

Hawthorn Ridge 2nd Plat Minimum Building Opening Elevation					
Lot	Rear Left MBOE	Rear Right MBOE	Front Left MBOE	Front Right MBOE	As-Built Grading Plan Required
127	1031.67	1030.75			X
128	1030.75	1029.26			X
129	1029.26	1030.88			X
130	1031.40	1027.91			X
131	1027.91	1029.67			X
132	1029.67	1030.85			X
133	1030.85	1028.83			X
134	1028.83	1027.10			X
135	1027.10	1025.15			X
138					X
139					X
140					X
141					X
142					X
143					X
144					X
145					X
149					X
150					X
151					X
152					X
153					X
154					X
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.

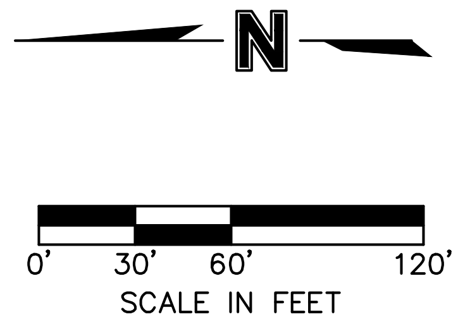
6. DRAINAGE PATHS TO BE CONSTRUCTED BETWEEN EACH OF THE LOTS LABELED AS STANDARD LOTS TO DRAIN WEST.

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

Ⓓ	DAYLIGHT
Ⓦ	WALKOUT
Ⓢ	STANDARD

AS-BUILT
3/17/2021


N
0'
30'
60'
120'
SCALE IN FEET

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Julie Sellers
3/18/21

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

2019

LEE'S SUMMIT, MISSOURI

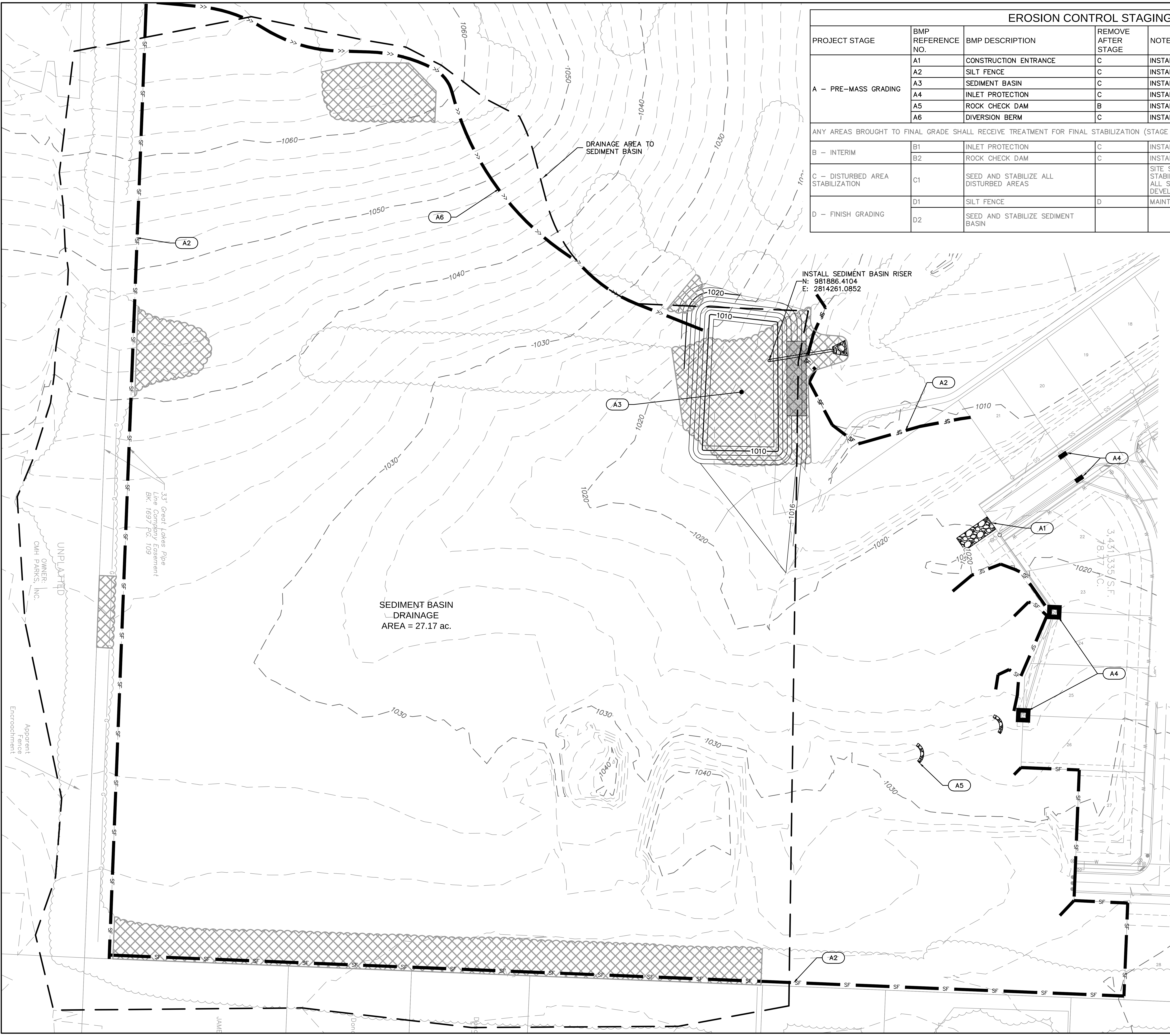
drawn by: D.A.H.O
checked by: M.G.D
designed by: B.M.W
QA/QC by: N.D.H
project no.: 019-1605
date: 07-12-2019

SHEET
C141

DWG: F:\2019\1501–2000\019–1605\40–Design\AutoCAD\As–Built\Streets\GNCV\STREET, STORM & SITE DISTURBANCE\C_MDR01_0191605.dwg USER: bworthley
DATE: Mar 18, 2021 4:03pm XREFS: C_PTBLK_0191605 C_PBNDY_0191605 C_PBASE_0191605 C_XBASE_0191605 C_FBASE_0191605 C_PUTIL_0191605 C_PSPOT_0191605

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		


DRAINAGE AREA TO SEDIMENT BASIN
INSTALL SEDIMENT BASIN RISER
N: 981886.4104
E: 2814261.0852
SEDIMENT BASIN DRAINAGE AREA = 27.17 ac.
A1
A2
A3
A4
A5
A6
SF
1060
1050
1040
1030
1020
1016
1010
33' Great Lakes Pipe Line Company Easement BK. 1697 PG. 109
UNPLATTED
OWNER: CMH PARKS, INC.
Apparent Fence Encroachment
3,431,335 S.F.
78.77 AC.
SS
W
18
19
20
21
22
23
24
25
26
27
28
29
32
33
34

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.

NOT AS-BUILT

N

0' 30' 60' 120'
SCALE IN FEET

DWG: F:\2019\1501–2000\019–1605\40–Design\AutoCAD\As–Built\Sheets\GNCV\STREET, STORM & SITE DISTURBANCE\C_ERC01_0191605.dwg USER: bworthley
DATE: Feb 15, 2021 12:22pm XREFS: C_PTBLK_0191605 C_XBASE_0191605 C_PEROS_0191605

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JULIE ELAINE SELLERS
NUMBER PE-2017000367
3/18/21

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

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

SITE DISTURBANCE PHASE 1
STREET & STORM SEWER PLANS

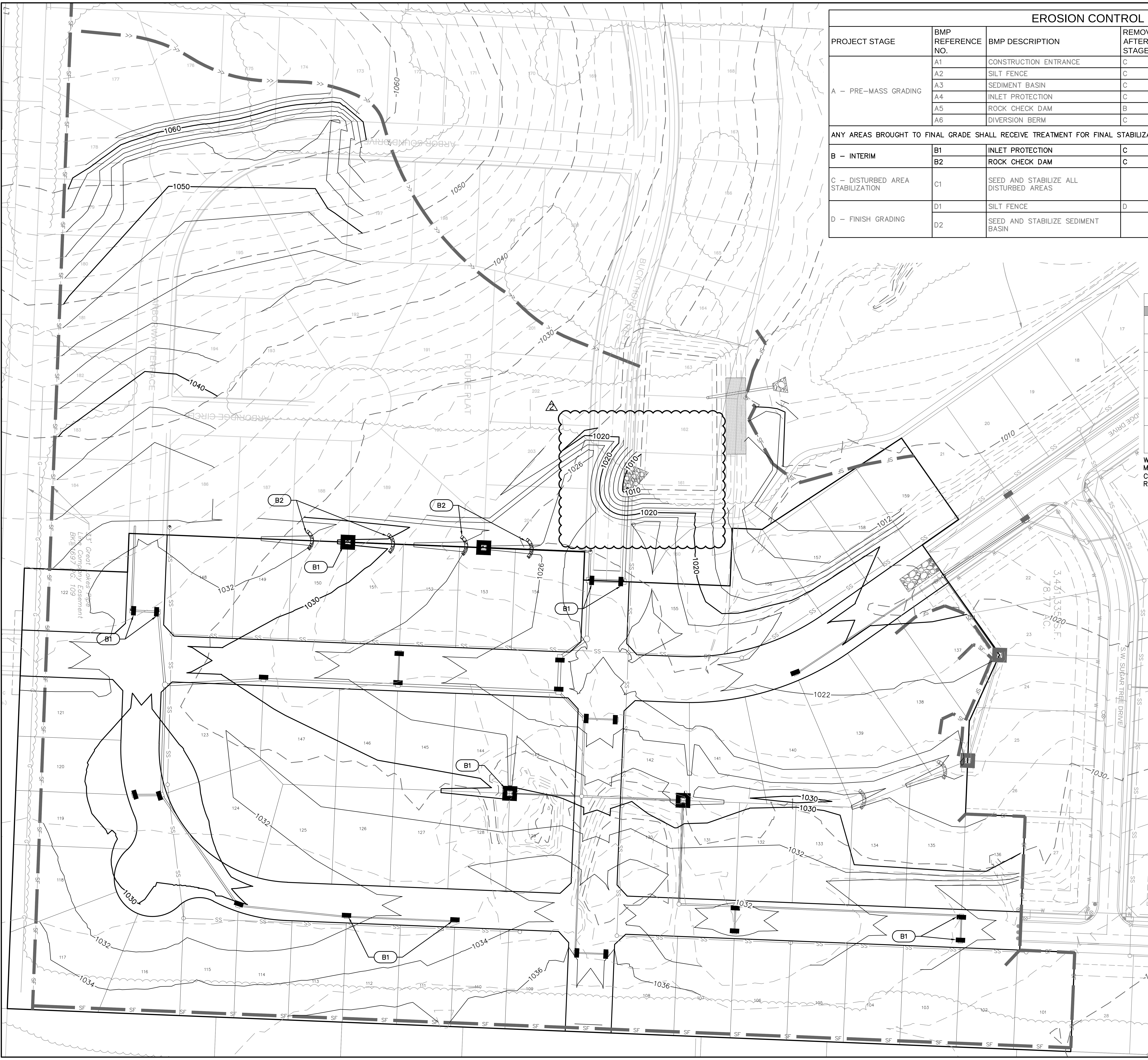
HAWTHORN RIDGE
SECOND PLAT

2019

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
C142



NOT AS-BUILT

N

0' 30' 60' 120'
SCALE IN FEET

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
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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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3/18/21

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

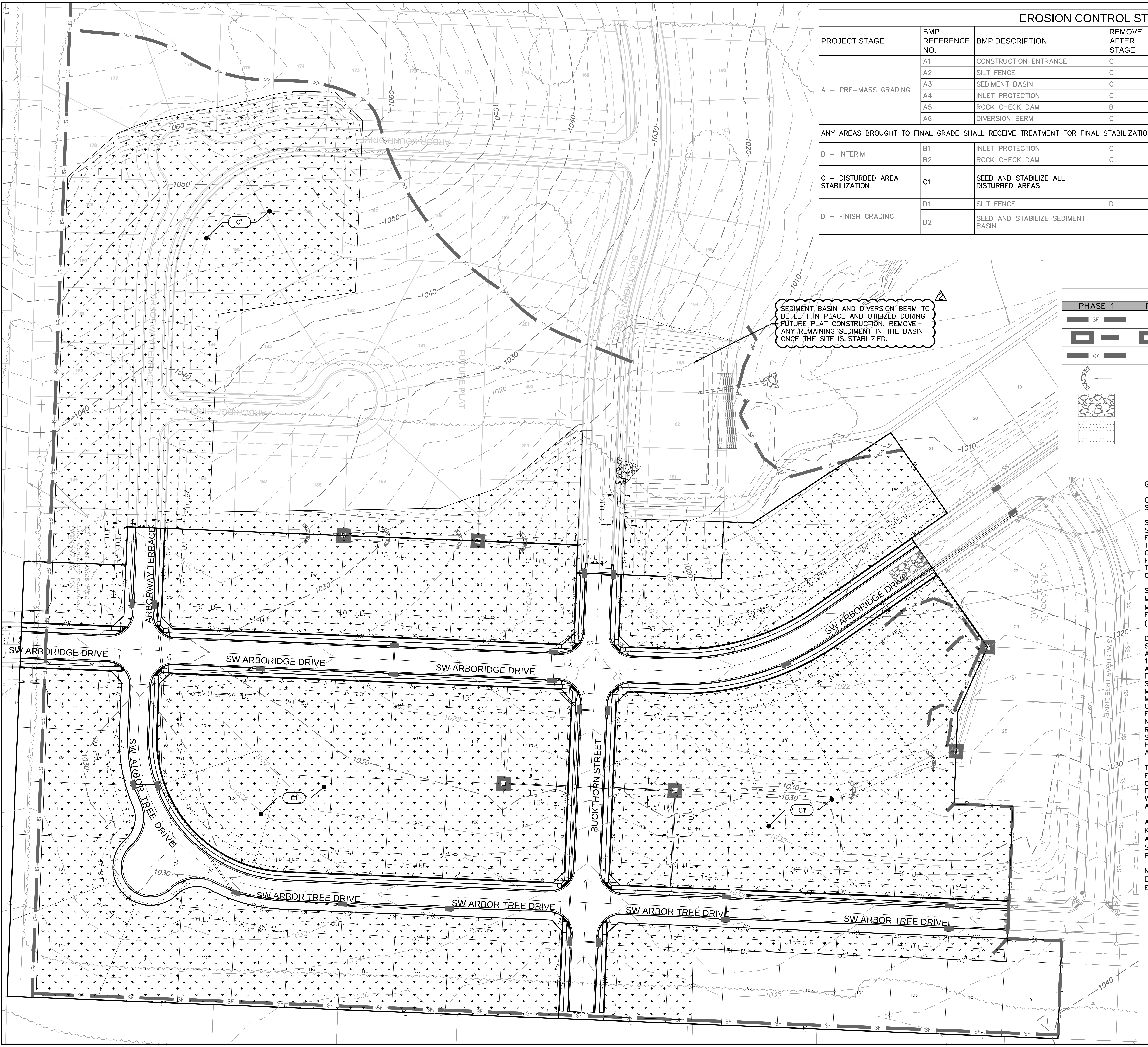
LEE'S SUMMIT, MISSOURI

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

DWG: F:\2019\1501-2000\019-1605\40-Design\AutoCAD\As-Built\Sheets\GNCV\STREET, STORM & SITE DISTURBANCE\C_ERC02_0191605.dwg USER: bworthley
DATE: Feb 15, 2021 12:23pm XREFS: C_PTBLK_0191605 C_PBNDY_0191605 C_PBASE_0191605 C_XBASE_0191605 C_FBASE_0191605 C_PEROS_0191605 C_PUTIL_0191605



SEDIMENT BASIN AND DIVERSION BERM TO BE LEFT IN PLACE AND UTILIZED DURING FUTURE PLAT CONSTRUCTION. REMOVE ANY REMAINING SEDIMENT IN THE BASIN ONCE THE SITE IS STABLIZIED. ⚠2

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.

NOT AS-BUILT

N

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TEL 816.361.1177
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JULIE ELAINE SELLERS
NUMBER PE-2017000367
3/18/21

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

REVISIONS

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

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\As-Built\Sheets\GNCV\STREET, STORM & SITE DISTURBANCE\C_ERC03_0191605.dwg USER: bworthley
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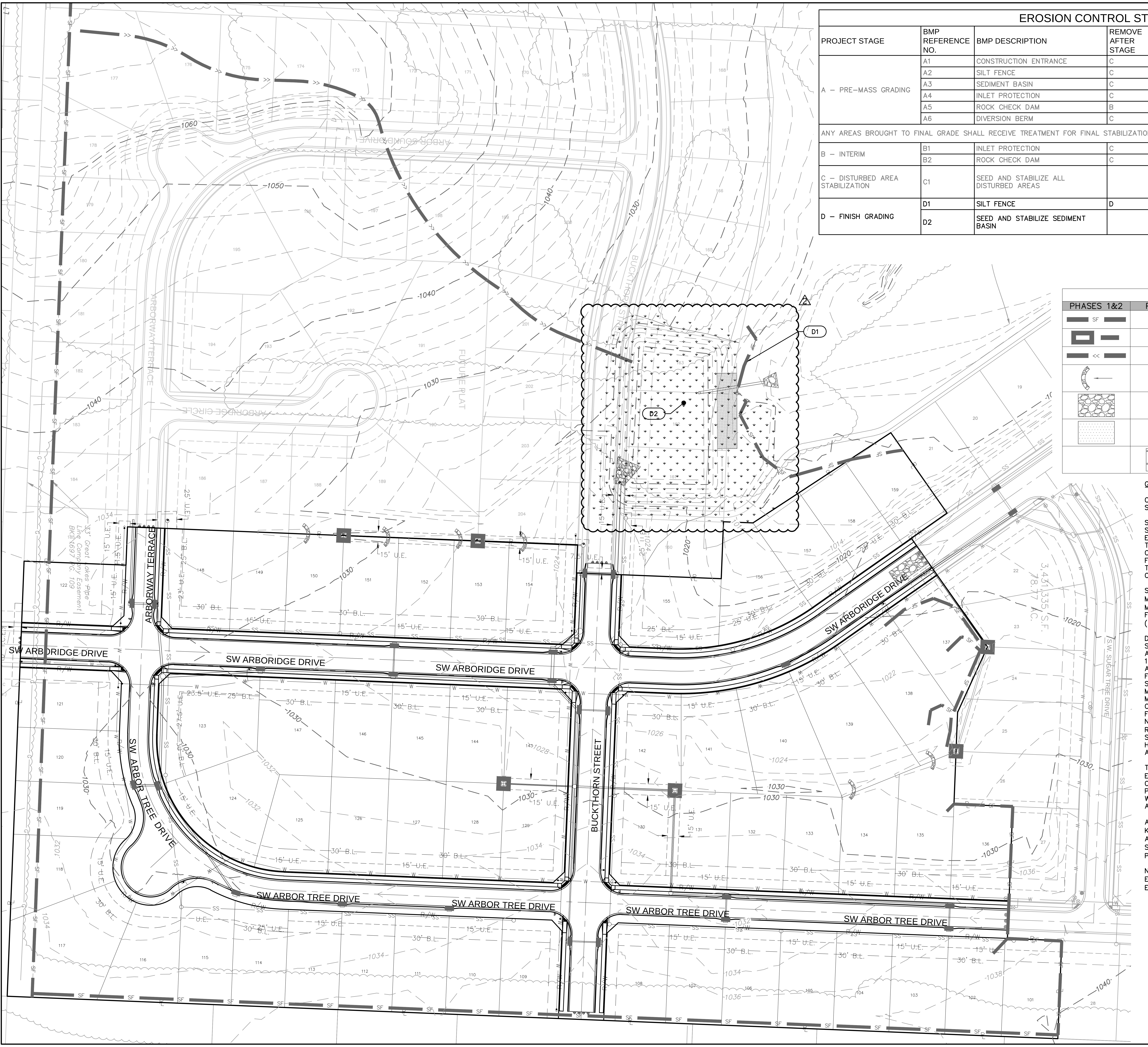
DATE: Feb 15, 2021 12:25pm XREFS: C_PTBLK_0191605 C_PBNDY_0191605 C_PBASE_0191605 C_XBASE_0191605 C_FBASE_0191605 C_PEROS_0191605 C_PUTIL_0191605



EROSION CONTROL STAGING CHART

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LEGEND

PHASES 1&2	PHASE 3	PHASE 4	
▬ SF ▬			SILT FENCE
▭ ▬			STORM DRAIN INLET PROTECTION
▬ << ▬			TEMPORARY DIVERSION BERM
◠ ←			ROCK CHECK DAMS
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3/18/21
Julie Sellers

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

REVISIONS

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

SITE DISTURBANCE PHASE 4
STREET & STORM SEWER PLANS

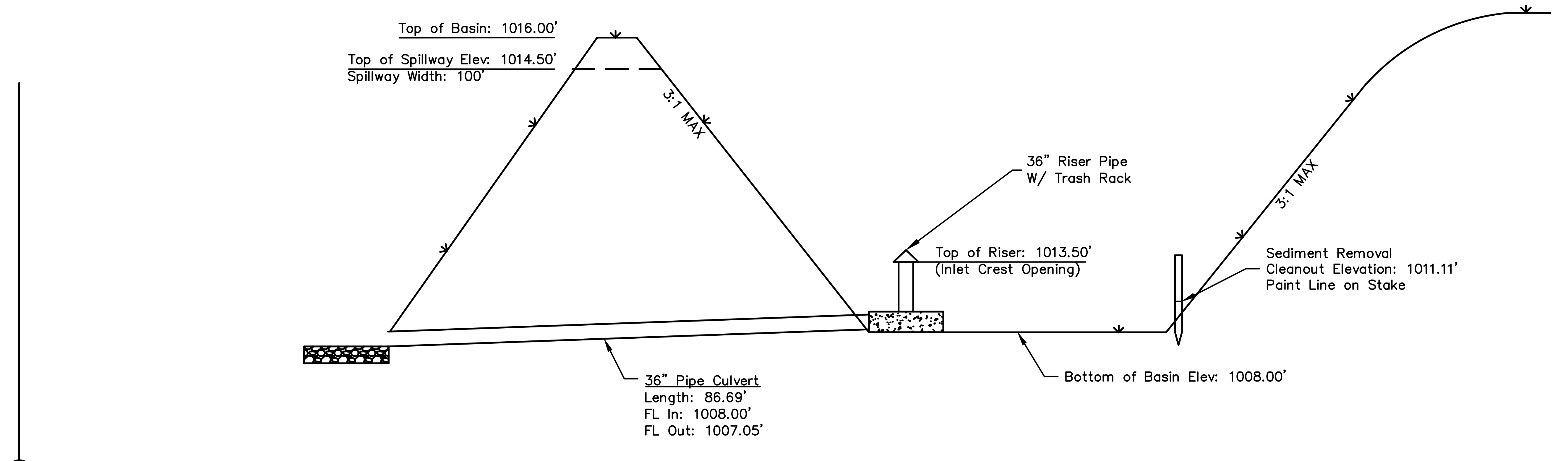
HAWTHORN RIDGE
SECOND PLAT

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

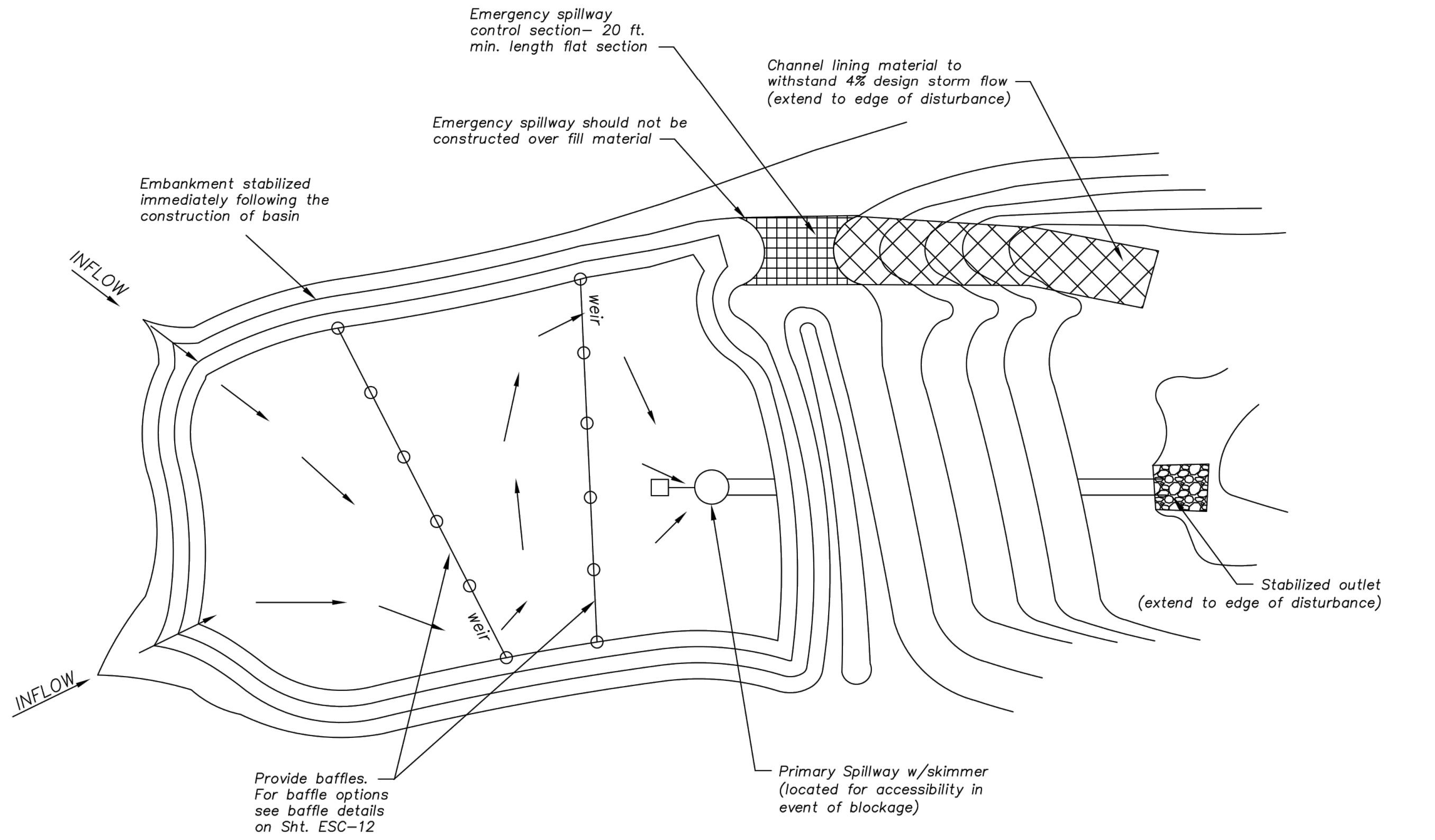
SHEET
C145


Top of Basin: 1016.00'
Top of Spillway Elev: 1014.50'
Spillway Width: 100'
3:1 MAX
36" Riser Pipe
W/ Trash Rack
Top of Riser: 1013.50'
(Inlet Crest Opening)
3:1 MAX
Sediment Removal
Cleanout Elevation: 1011.11'
Paint Line on Stake
36" Pipe Culvert
Length: 86.69'
FL In: 1008.00'
FL Out: 1007.05'
Bottom of Basin Elev: 1008.00'

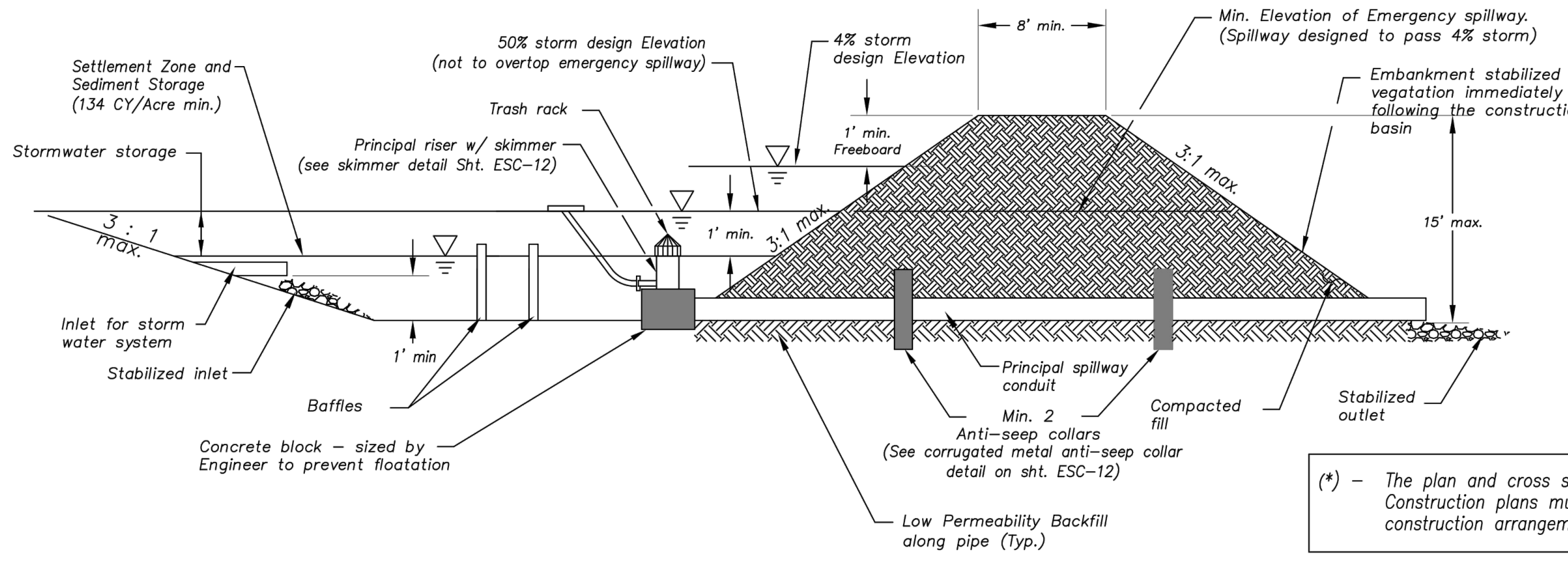
1 N.T.S.
TEMPORARY SEDIMENT BASIN 1

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

NOT AS-BUILT


Emergency spillway
control section– 20 ft.
min. length flat section
Channel lining material to
withstand 4% design storm flow
(extend to edge of disturbance)
Emergency spillway should not be
constructed over fill material
Embankment stabilized
immediately following the
construction of basin
INFLOW
weir
weir
INFLOW
Stabilized outlet
(extend to edge of disturbance)
Provide baffles.
For baffle options
see baffle details
on Sht. ESC–12
Primary Spillway w/skimmer
(located for accessibility in
event of blockage)

Plan View (*)
Not to Scale


Settlement Zone and
Sediment Storage
(134 CY/Acre min.)
50% storm design Elevation
(not to overtop emergency spillway)
4% storm
design Elevation
8' min.
Min. Elevation of Emergency spillway.
(Spillway designed to pass 4% storm)
Embankment stabilized with
vegatation immediately
following the construction of
basin
Stormwater storage
Trash rack
Principal riser w/ skimmer
(see skimmer detail Sht. ESC–12)
1' min.
Freeboard
3:1 max.
3 : 1
max.
1' min.
3:1 max.
15' max.
Inlet for storm
water system
Stabilized inlet
1' min
Baffles
Concrete block – sized by
Engineer to prevent floatation
Principal spillway
conduit
Min. 2
Anti–seep collars
(See corrugated metal anti–seep collar
detail on sht. ESC–12)
Compacted
fill
Stabilized
outlet
Low Permeability Backfill
along pipe (Typ.)

Cross Section (*)
Not to Scale

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".

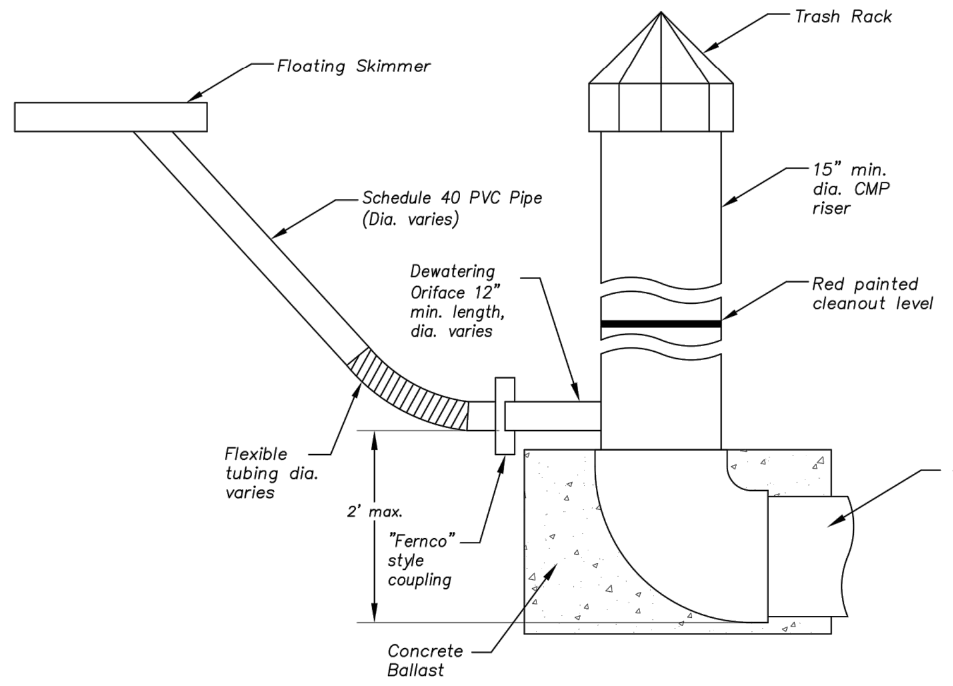
Maintenance:

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.

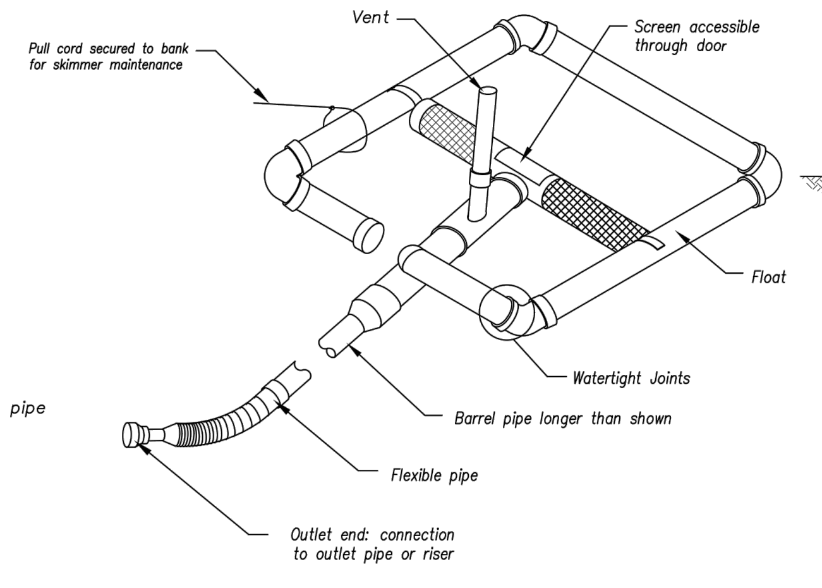
(*) – The plan and cross section are schematic in nature. Construction plans must provide specific site construction arrangements.

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

AMERICAN PUBLIC WORKS ASSOCIATION
KANSAS CITY
METRO CHAPTER
SEDIMENT BASIN
STANDARD DRAWING
NUMBER ESC-II
ADOPTED:
10/24/2016

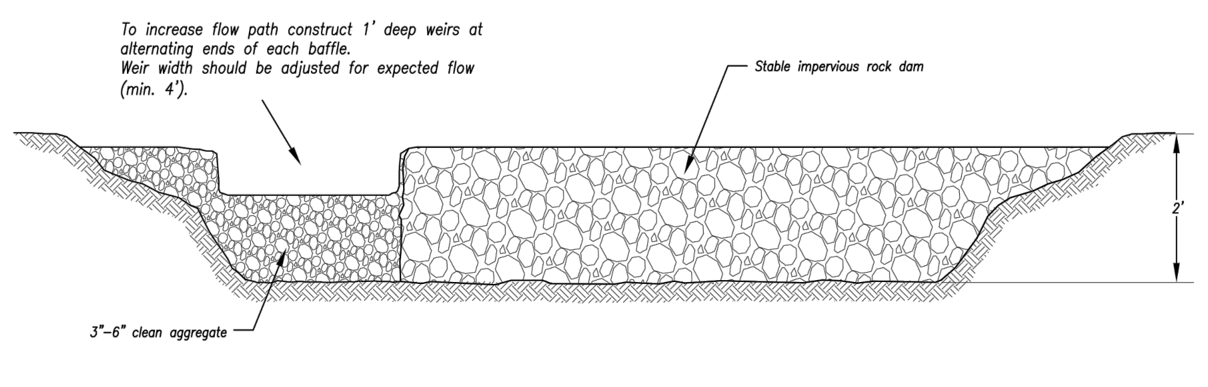

Trash Rack
Floating Skimmer
Schedule 40 PVC Pipe
(Dia. varies)
15" min.
dia. CMP
riser
Dewatering
Oriface 12"
min. length,
dia. varies
Red painted
cleanout level
Flexible
tubing dia.
varies
2' max.
"Fernco"
style
coupling
Outlet pipe
Concrete
Ballast

PRINCIPAL SPILLWAY DETAIL

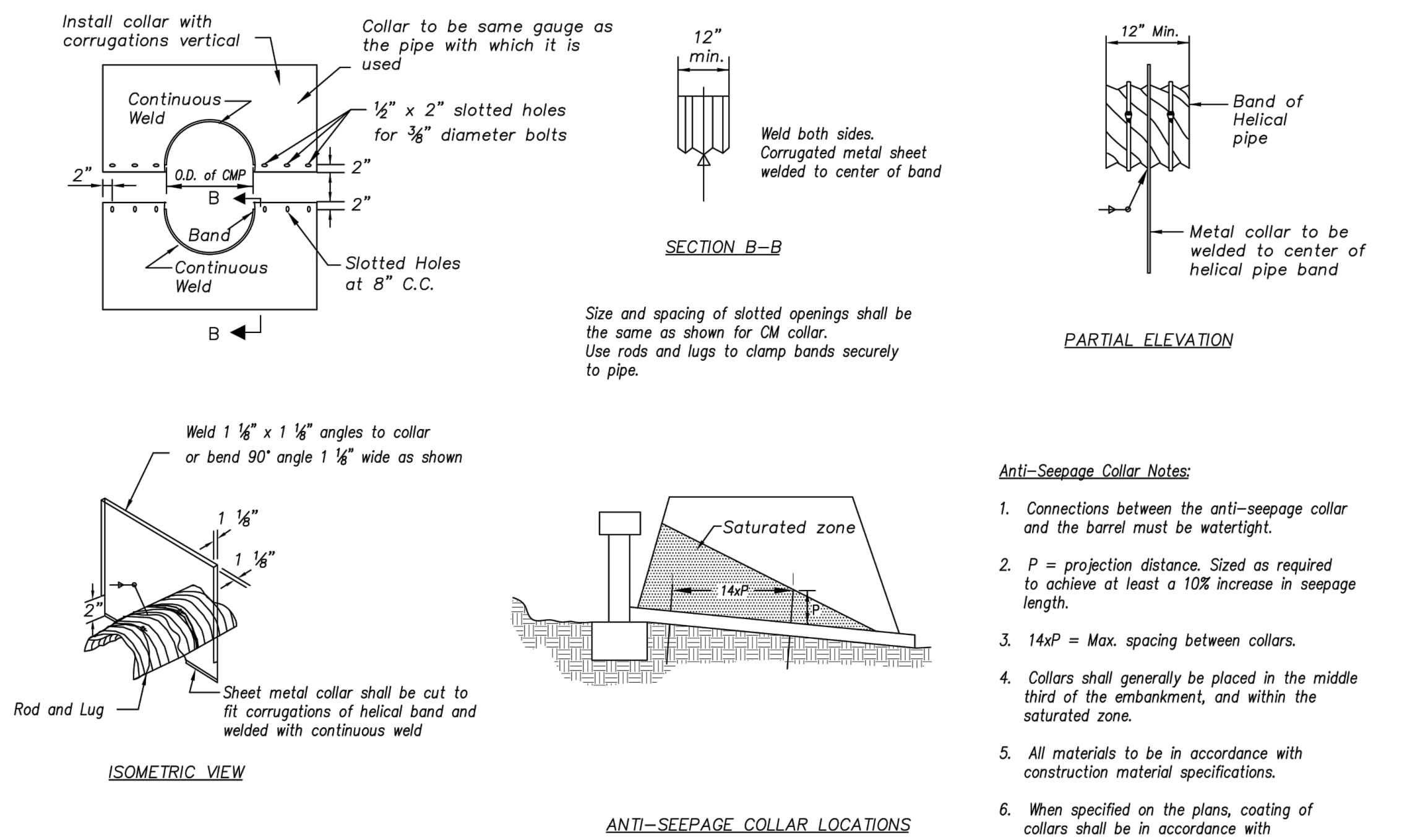

Vent
Pull cord secured to bank
for skimmer maintenance
Screen accessible
through door
Float
Watertight Joints
Barrel pipe longer than shown
Flexible pipe
Outlet end: connection
to outlet pipe or riser

SKIMMER DETAIL (Typ.) *

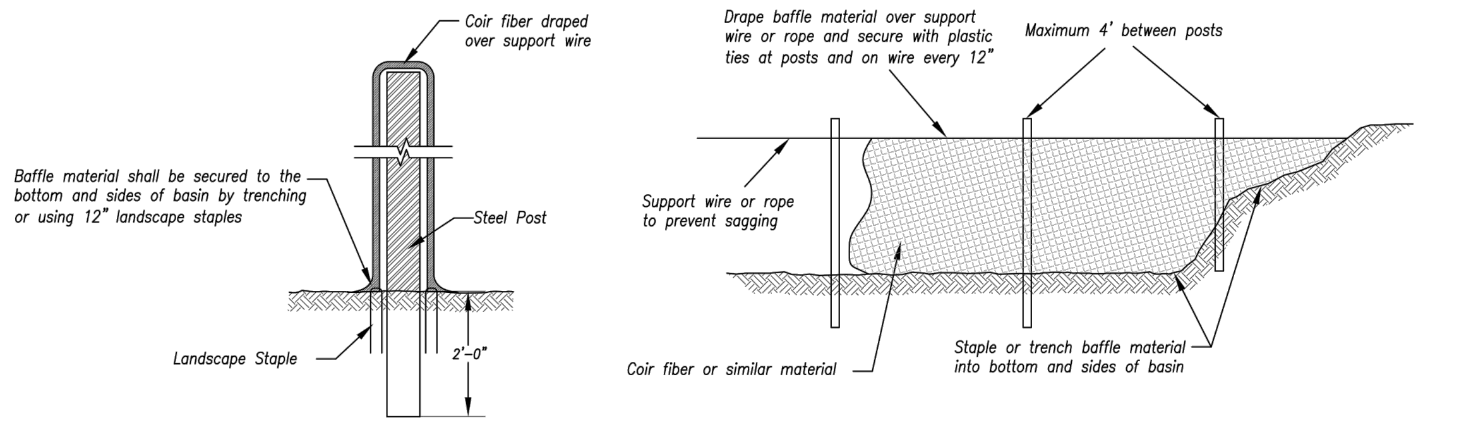
* Designer to provide specific details per application (e.g. pipe sizes, screen sizes, perforation, etc.) as required.


To increase flow path construct 1' deep weirs at
alternating ends of each baffle.
Weir width should be adjusted for expected flow
(min. 4').
Stable impervious rock dam
2'
3"–6" clean aggregate

Option A – Rock with Weir


Install collar with
corrugations vertical
Collar to be same gauge as
the pipe with which it is
used
Continuous
Weld
½" x 2" slotted holes
for ⅜" diameter bolts
2"
O.D. of CMP
2"
2"
B
Band
Continuous
Weld
Slotted Holes
at 8" C.C.
B
12"
min.
Weld both sides.
Corrugated metal sheet
welded to center of band
SECTION B–B
Size and spacing of slotted openings shall be
the same as shown for CM collar.
Use rods and lugs to clamp bands securely
to pipe.
12" Min.
Band of
Helical
pipe
Metal collar to be
welded to center of
helical pipe band
PARTIAL ELEVATION
Weld 1 ⅛" x 1 ⅛" angles to collar
or bend 90° angle 1 ⅛" wide as shown
1 ⅛"
1 ⅛"
2"
Rod and Lug
Sheet metal collar shall be cut to
fit corrugations of helical band and
welded with continuous weld
ISOMETRIC VIEW
Saturated zone
14xP
P
ANTI–SEEPAGE COLLAR LOCATIONS

CORRUGATED METAL
ANTI–SEEPAGE COLLAR DETAIL
Not to Scale


Coir fiber draped
over support wire
Baffle material shall be secured to the
bottom and sides of basin by trenching
or using 12" landscape staples
Steel Post
Landscape Staple
2'–0"
Drape baffle material over support
wire or rope and secure with plastic
ties at posts and on wire every 12"
Maximum 4' between posts
Support wire or rope
to prevent sagging
Coir fiber or similar material
Staple or trench baffle material
into bottom and sides of basin

Option B – Coir Fiber Material

BAFFLE DETAILS
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) ½" 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
SEDIMENT BASIN – DETAILS
STANDARD DRAWING
NUMBER ESC-I2
ADOPTED:
10/24/2016

olsson
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NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
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JULIE ELAINE SELLERS
NUMBER PE-2017000367
3/18/21
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

2019

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
C146

DWG: F:\2019\1501-2000\019-1605\40-Design\AutoCAD\As-Built\Sheets\GNCV\STREET, STORM & SITE DISTURBANCE\C_ERC01_0191605.dwg USER: bworthley
DATE: Feb 15, 2021 12:25pm XREFS: C_PTBLK_0191605 C_XBASE_0191605 C_PEROS_0191605

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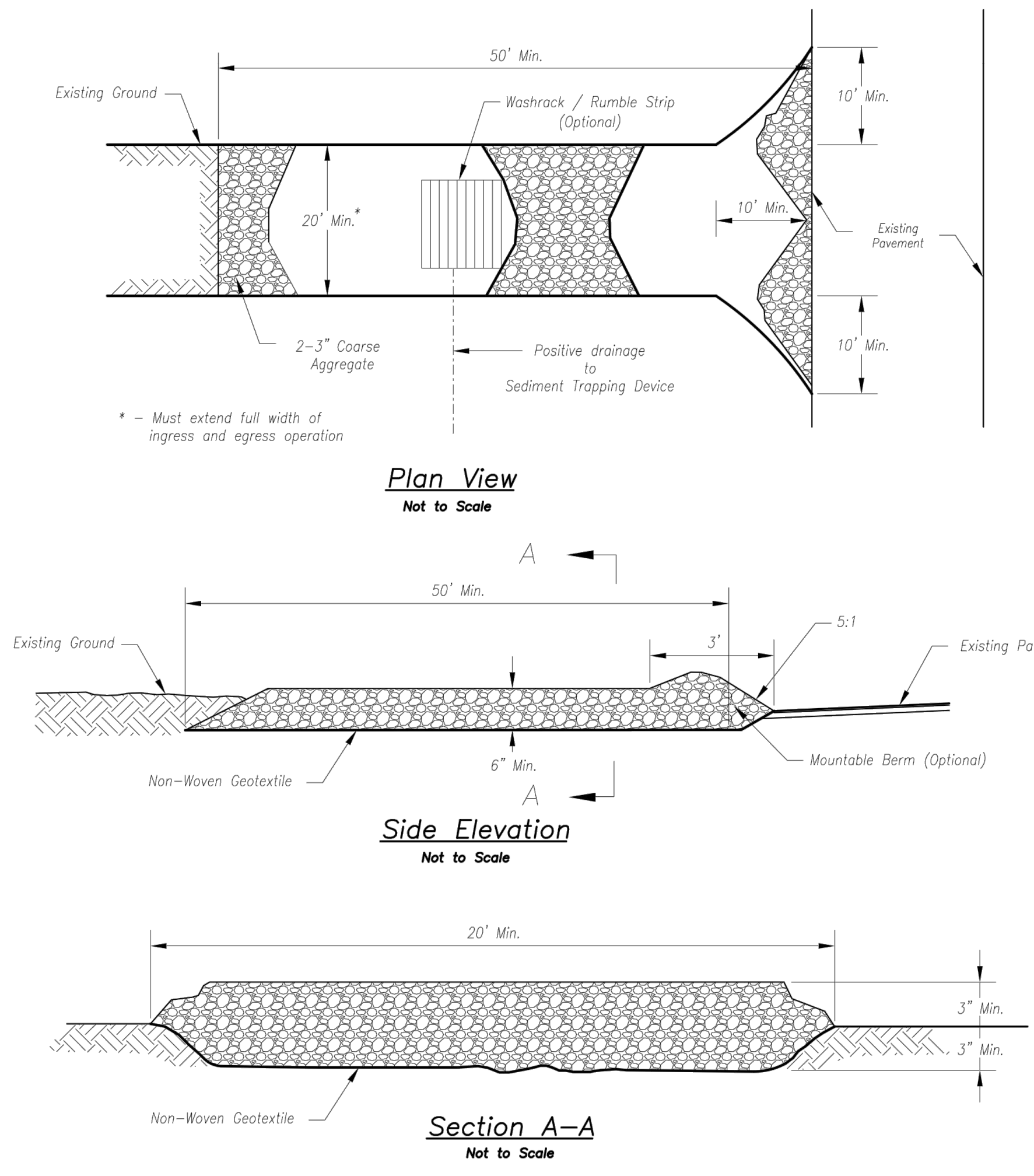

Existing Ground
50' Min.
Washrack / Rumble Strip (Optional)
10' Min.
20' Min.*
2-3" Coarse Aggregate
Positive drainage to Sediment Trapping Device
Existing Pavement
* - Must extend full width of ingress and egress operation
A
5:1
3'
Existing Pavement
Non-Woven Geotextile
6" Min.
Mountable Berm (Optional)
20' Min.
3" Min.

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.

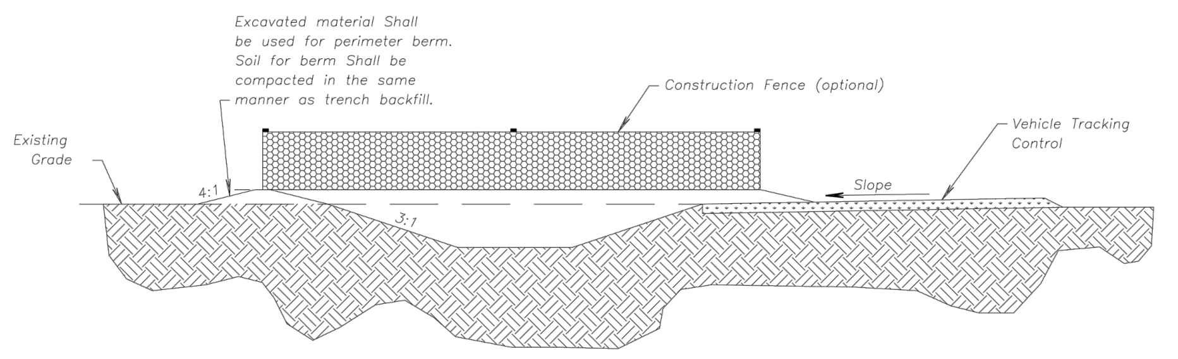
CONSTRUCTION ENTRANCE

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.


Excavated material Shall be used for perimeter berm. Soil for berm Shall be compacted in the same manner as trench backfill.
Construction Fence (optional)
Vehicle Tracking Control
Existing Grade
Slope
3:1

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.

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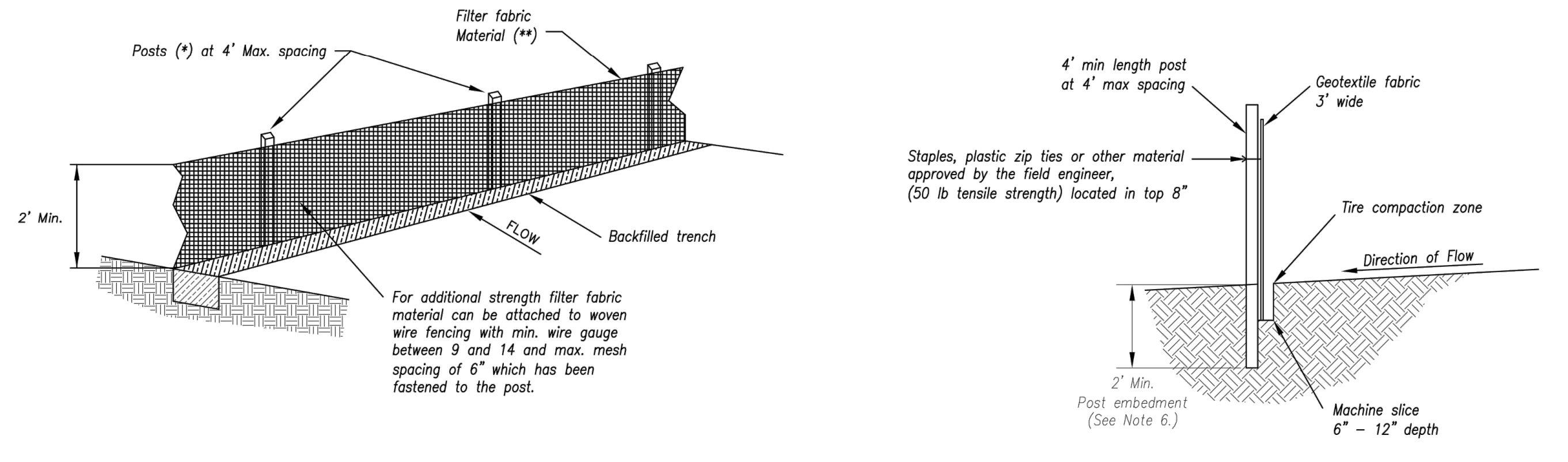
Kansas City Metro Chapter APWA AMERICAN PUBLIC WORKS ASSOCIATION
KANSAS CITY
METRO CHAPTER
CONSTRUCTION ENTRANCE
AND CONCRETE WASHOUT
STANDARD DRAWING
NUMBER ESC-01
ADOPTED:
10/24/2016


Filter fabric Material (**)
Posts (*) at 4' Max. spacing
2' Min.
FLOW
Backfilled trench
For additional strength filter fabric material can be attached to woven wire fencing with min. wire gauge between 9 and 14 and max. mesh spacing of 6" which has been fastened to the post.
4' min length post at 4' max spacing
Geotextile fabric 3' wide
Staples, plastic zip ties or other material approved by the field engineer, (50 lb tensile strength) located in top 8"
Tire compaction zone
Direction of Flow
2' Min. Post embedment (See Note 6.)
Machine slice 6" - 12" depth

(*) POSTS
- MIN, LENGTH 4'
- HARDWOOD 1 3/16" x 1 3/16"
- NO.2 SOUTHERN PINE 2 5/8" x 2 5/8"
- STEEL 1.33 LB/FT

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

SILT FENCE DETAILS
Not to Scale

Notes:

1. In order to contain water, the ends of the silt fence must be turned uphill (Figure A).
2. Long perimeter runs of silt fence must be limited to 100'. Runs should be broken up into several smaller segments to minimize water concentrations (Figure A).
3. Long slopes should be broken up with intermediate rows of silt fence to slow runoff velocities.
4. Attach fabric to upstream side of post.
5. Install posts a minimum of 2' into the ground.
6. Trenching will only be allowed for small or difficult installation, where slicing machine cannot be reasonably used.

Maintenance:

1. Remove and dispose of sediment deposits when the deposit approaches ⅓ the height of silt fence.
2. Repair as necessary to maintain function and structure.

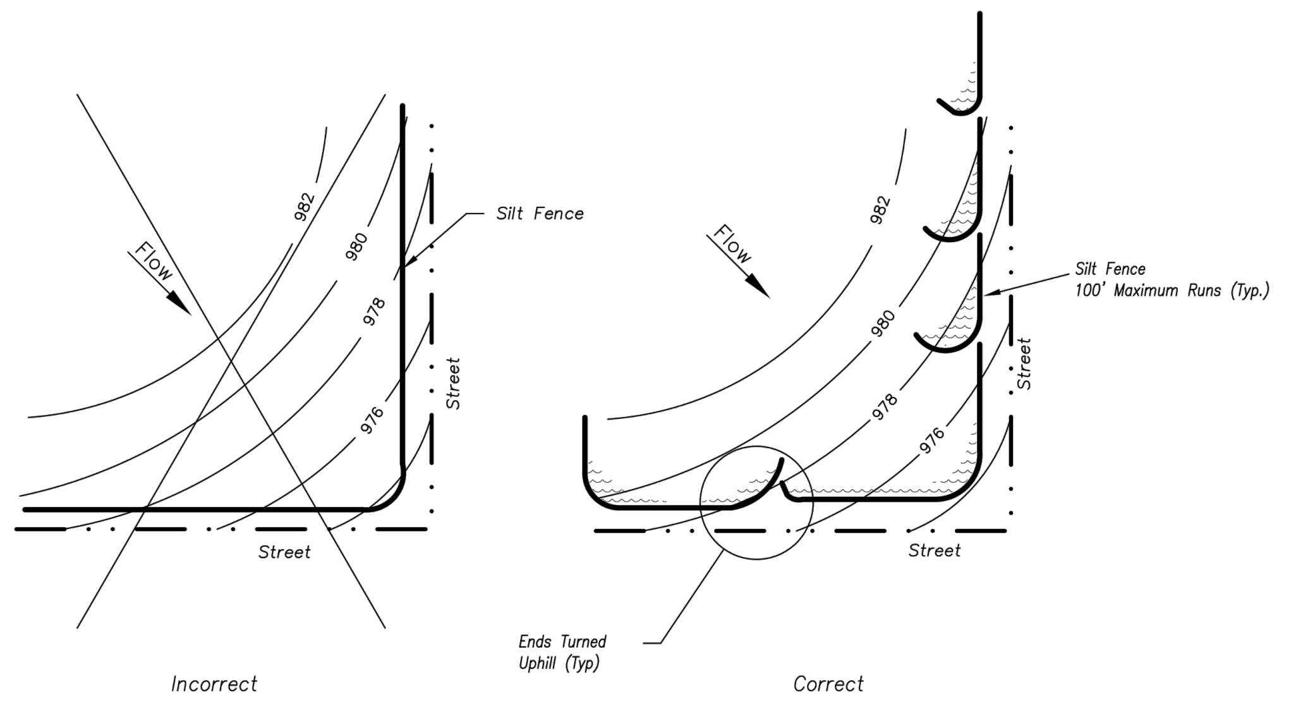
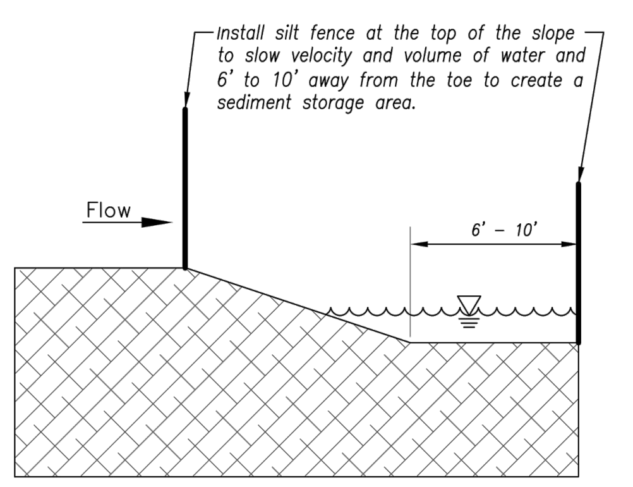
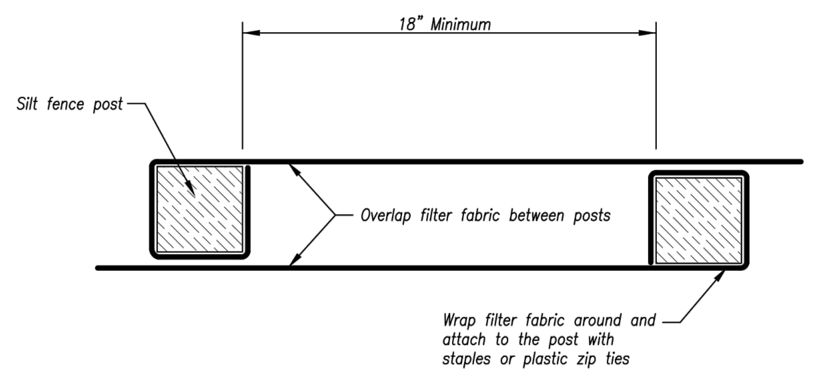

Flow
982
980
978
976
Silt Fence
Street
Incorrect
Flow
982
980
978
976
Silt Fence
100' Maximum Runs (Typ.)
Street
Ends Turned Uphill (Typ)
Correct

Figure A


Install silt fence at the top of the slope to slow velocity and volume of water and 6' to 10' away from the toe to create a sediment storage area.
Flow
6' - 10'

SILT FENCE LAYOUT
Not to Scale


18" Minimum
Silt fence post
Overlap filter fabric between posts
Wrap filter fabric around and attach to the post with staples or plastic zip ties

JOINING FENCE SECTIONS
Not to Scale

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

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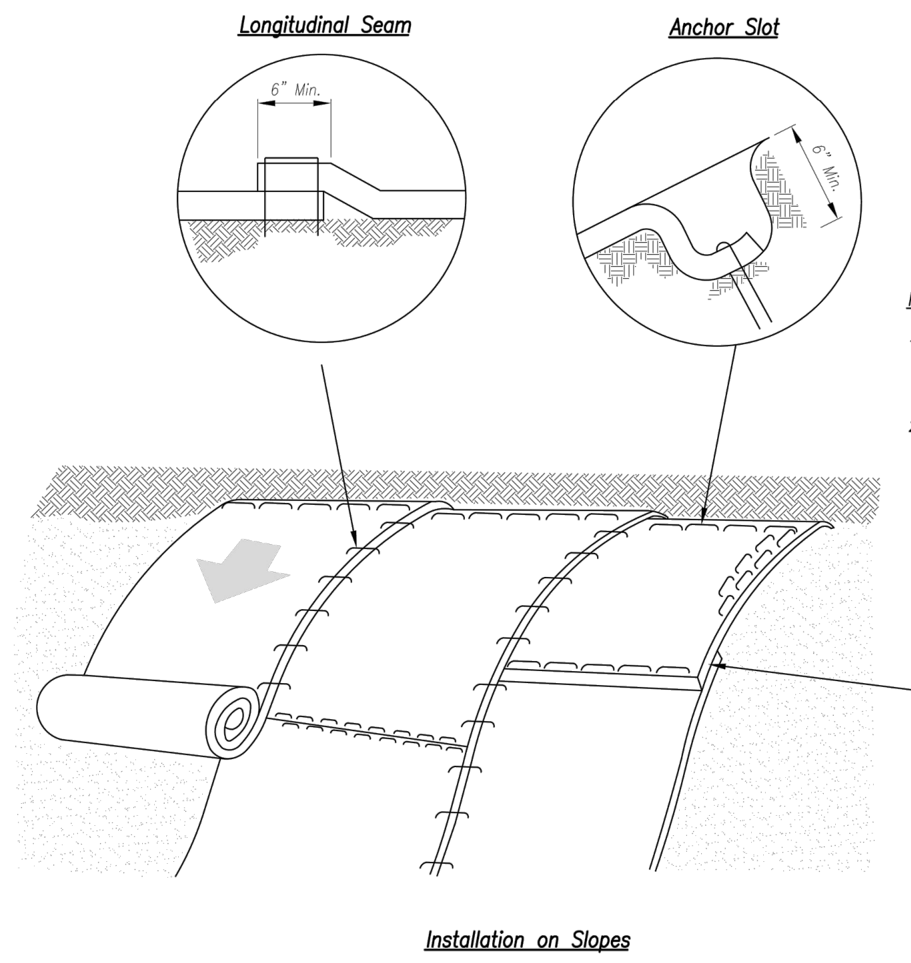
Kansas City Metro Chapter APWA AMERICAN PUBLIC WORKS ASSOCIATION
KANSAS CITY
METRO CHAPTER
SILT FENCE
STANDARD DRAWING
NUMBER ESC-03
ADOPTED:
10/24/2016

NOT AS-BUILT


Longitudinal Seam
6" Min.
Anchor Slot
6" Min.

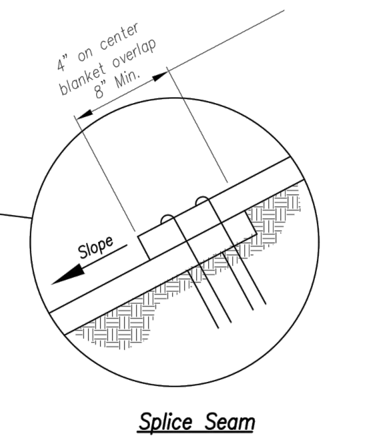
Installation on Slopes

General Notes:

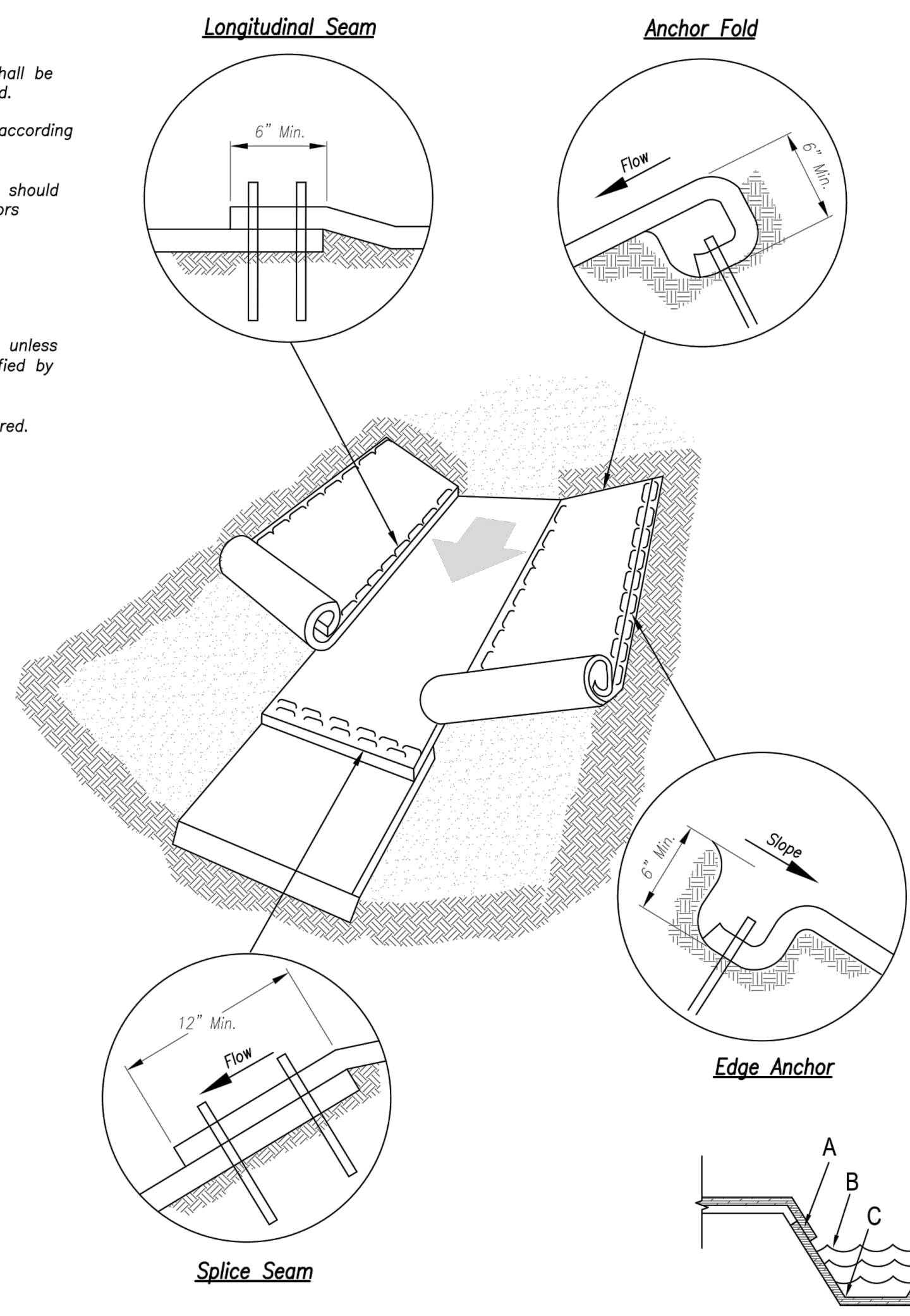
1. APWA Specifications 2150 and Design Guidance 5100 shall be referenced to select type of blanket or mat to be used.
2. Typical anchors and pattern/spacing shall be installed according to the manufacturers instructions.
3. LONGITUDINAL SEAMS: The edges of the blanket or mat should overlap each other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


4" on center blanket overlap 8" Min.
Slope

Splice Seam

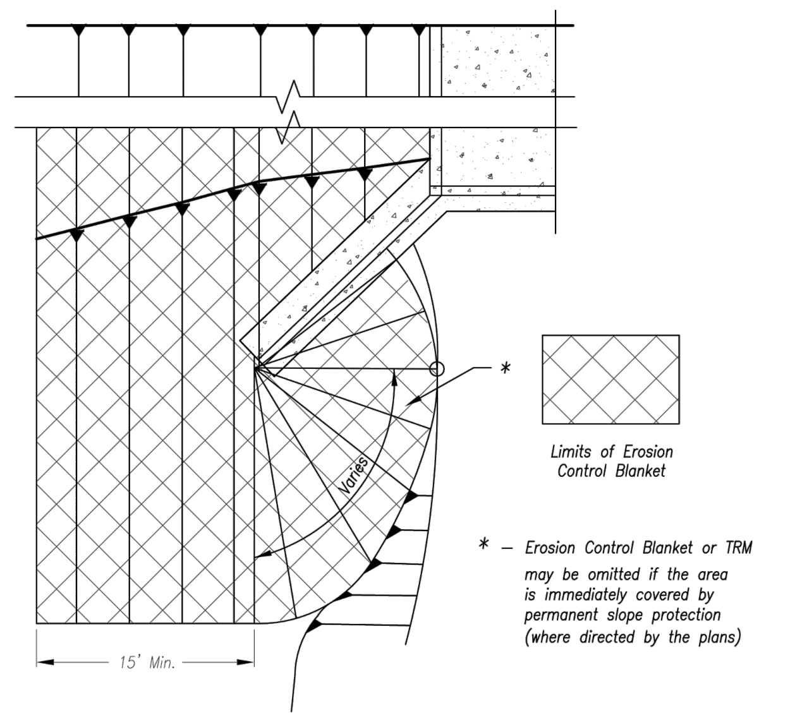

Longitudinal Seam
6" Min.
Anchor Fold
Flow
6" Min.
Slope
12" Min.
Flow

Edge Anchor

Splice Seam

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.


Slope
15' Min.

Limits of Erosion Control Blanket

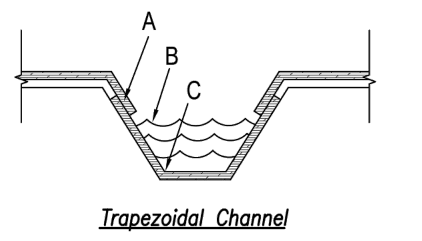
* - Erosion Control Blanket or TRM may be omitted if the area is immediately covered by permanent slope protection (where directed by the plans)

Partial Box Culvert Plan
Not to Scale

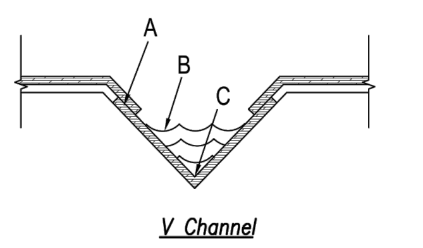
Installation Around Culvert Slope

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 end 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.



Trapezoidal Channel



V Channel

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.

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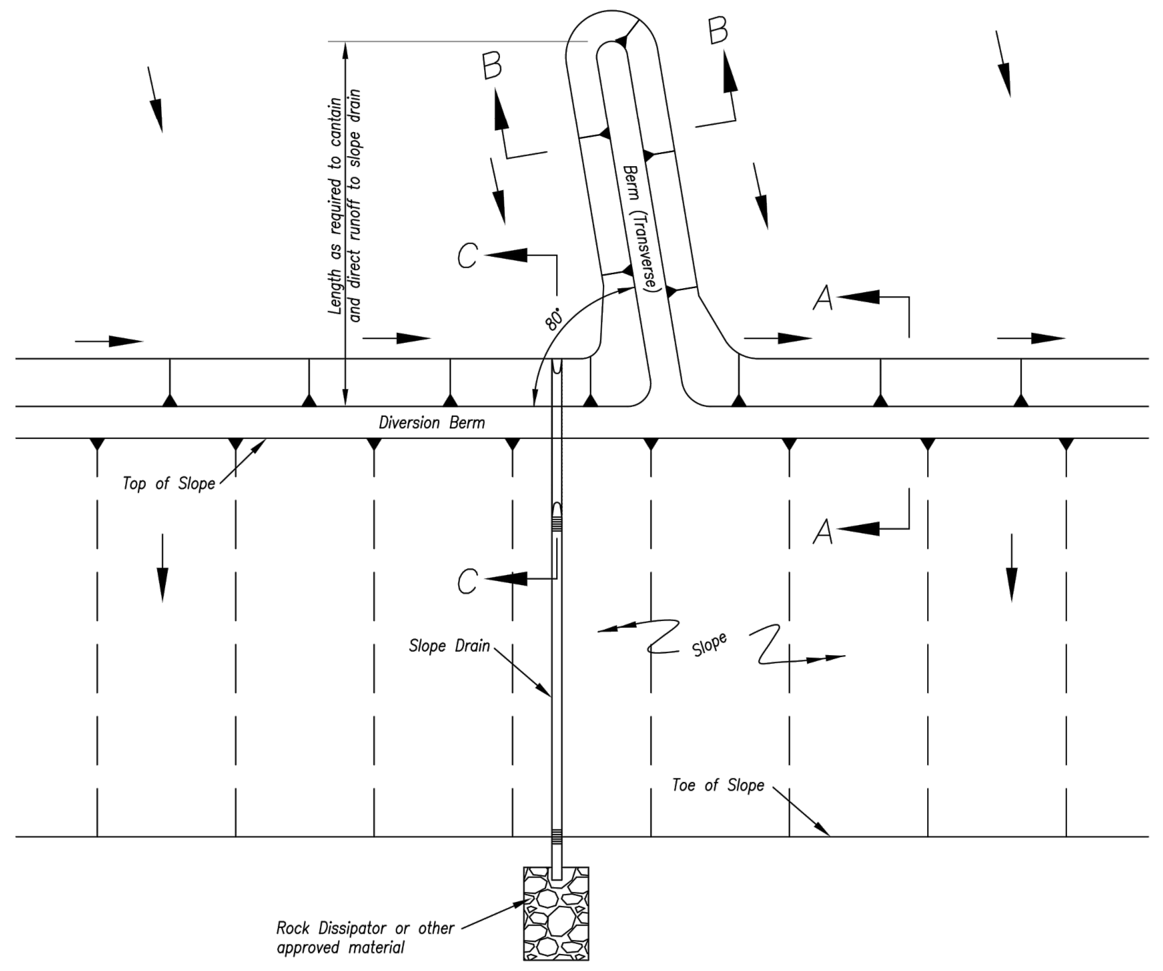
Kansas City Metro Chapter APWA AMERICAN PUBLIC WORKS ASSOCIATION
KANSAS CITY
METRO CHAPTER
EROSION CONTROL BLANKETS
AND TURF REINFORCEMENT MATS
STANDARD DRAWING
NUMBER ESC-02
ADOPTED:
10/24/2016


B
B
Length as required to contain and direct runoff to slope drain
Berm (Transverse)
C
A
Diversion Berm
Top of Slope
A
C
Slope Drain
Slope
Toe of Slope
Rock Dissipator or other approved material

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.

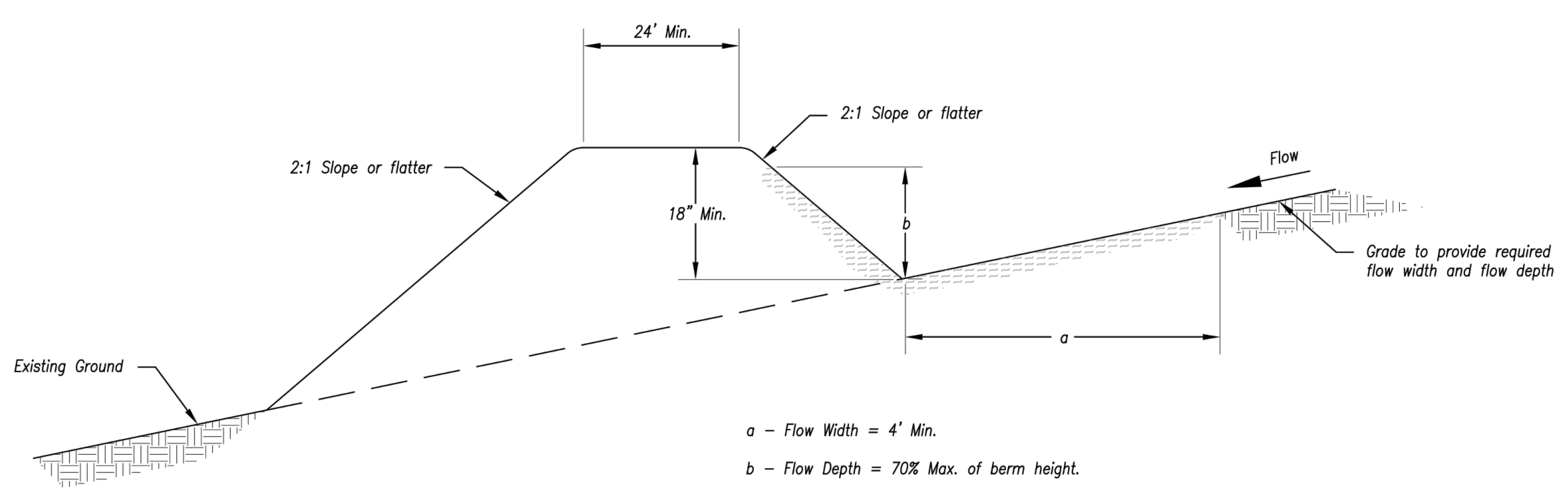
Notes for Slope Drain:

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:

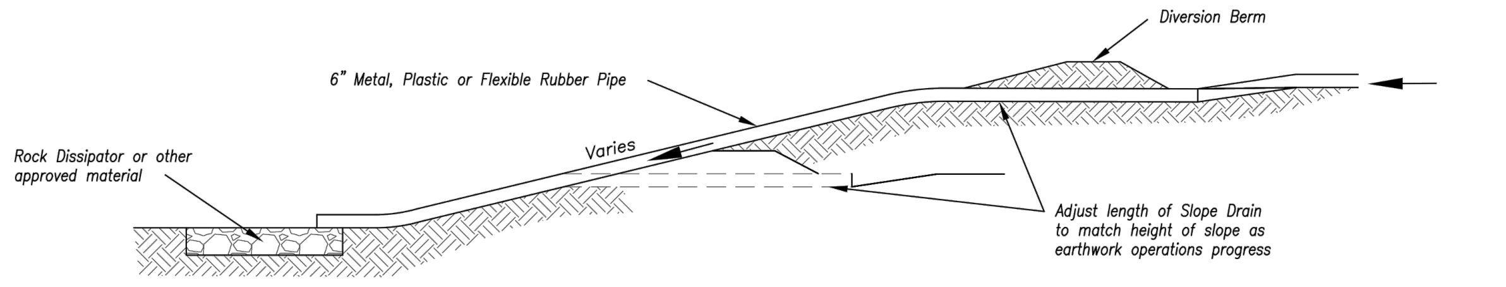
1. Accumulation of any visible sediment at the inlet and outlet shall be removed promptly.
2. Outlet conditions shall be repaired if scour is observed. Leaking or damaged section of pipe shall be repaired immediately.
3. Barriers directing water to the inlet shall be monitored for continuity and effectiveness.

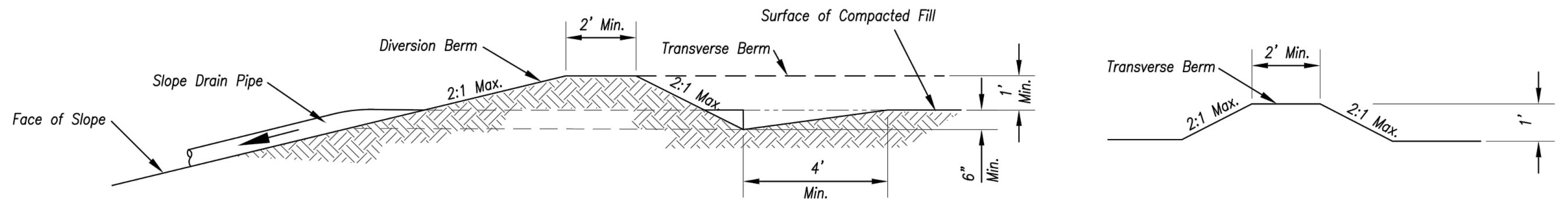
TYPICAL PROFILE OF DIVERSION BEAM
Not to Scale


24" Min.
2:1 Slope or flatter
2:1 Slope or flatter
Flow
18" Min.
b
a
Grade to provide required flow width and flow depth
Existing Ground

a - Flow Width = 4' Min.
b - Flow Depth = 70% Max. of berm height.

TYPICAL PROFILE OF DIVERSION BERM


Diversion Berm
6" Metal, Plastic or Flexible Rubber Pipe
Rock Dissipator or other approved material
Varies
Adjust length of Slope Drain to match height of slope as earthwork operations progress


Diversion Berm
2' Min.
Surface of Compacted Fill
Transverse Berm
Slope Drain Pipe
Face of Slope
2:1 Max.
2:1 Min.
1'
4' Min.
6" Min.
Transverse Berm
2' Min.
2:1 Max.
2:1 Min.
1'

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
DIVERSION BERMS AND
SLOPE DRAINS
STANDARD DRAWING
NUMBER ESC-05
ADOPTED:
10/24/2016

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NORTH KANSAS CITY, MO 64116
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NUMBER PE-2017000367
3/18/21

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

REVISIONS

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

SITE DISTURBANCE DETAILS
STREET AND STORM SEWER PLANS

HAWTHORN RIDGE
SECOND PLAT

LEE'S SUMMIT, MISSOURI

2019

drawn by: D.A.H.O
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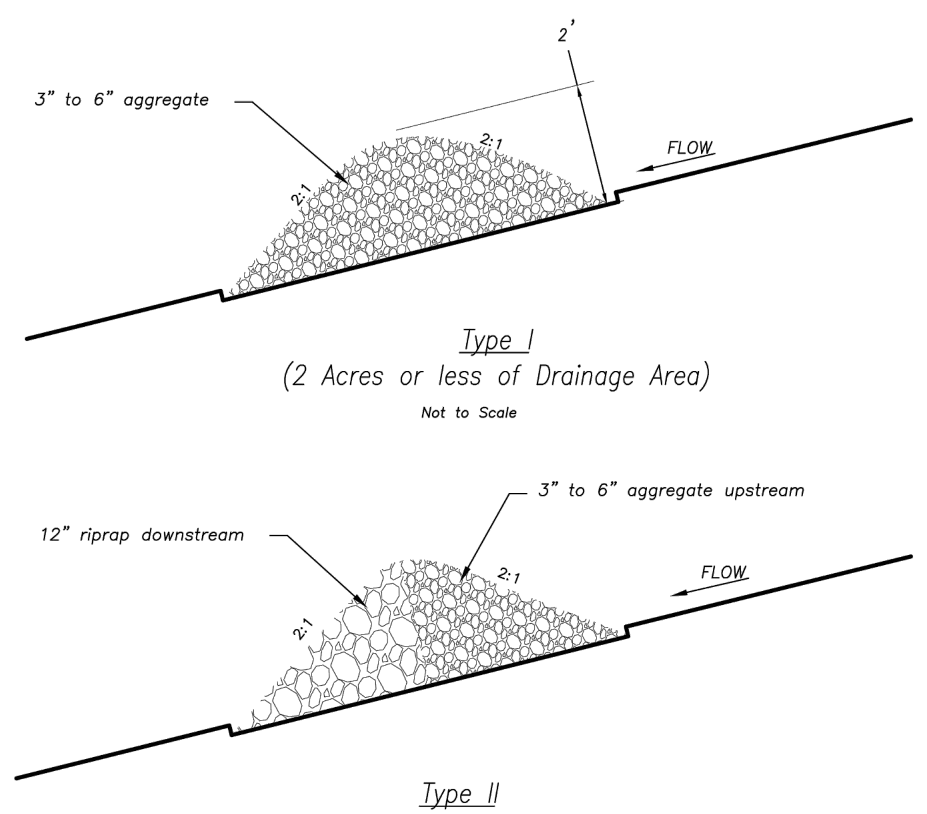
SHEET
C147

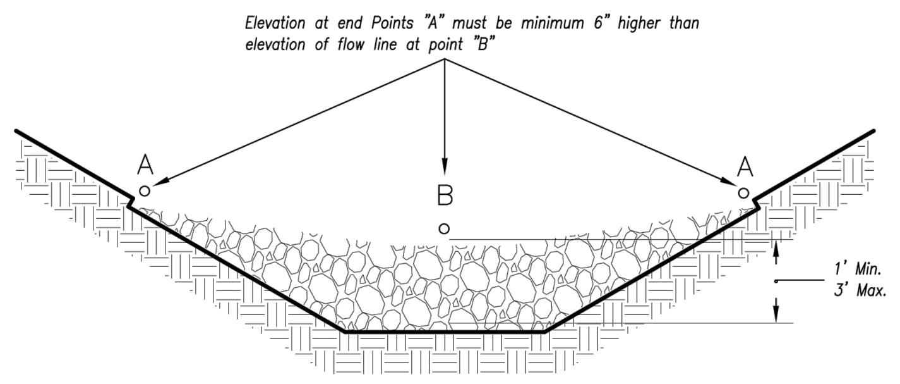

3" to 6" aggregate
2'
2:1
2:1
FLOW
12" riprap downstream
3" to 6" aggregate upstream
2:1
2:1
FLOW

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

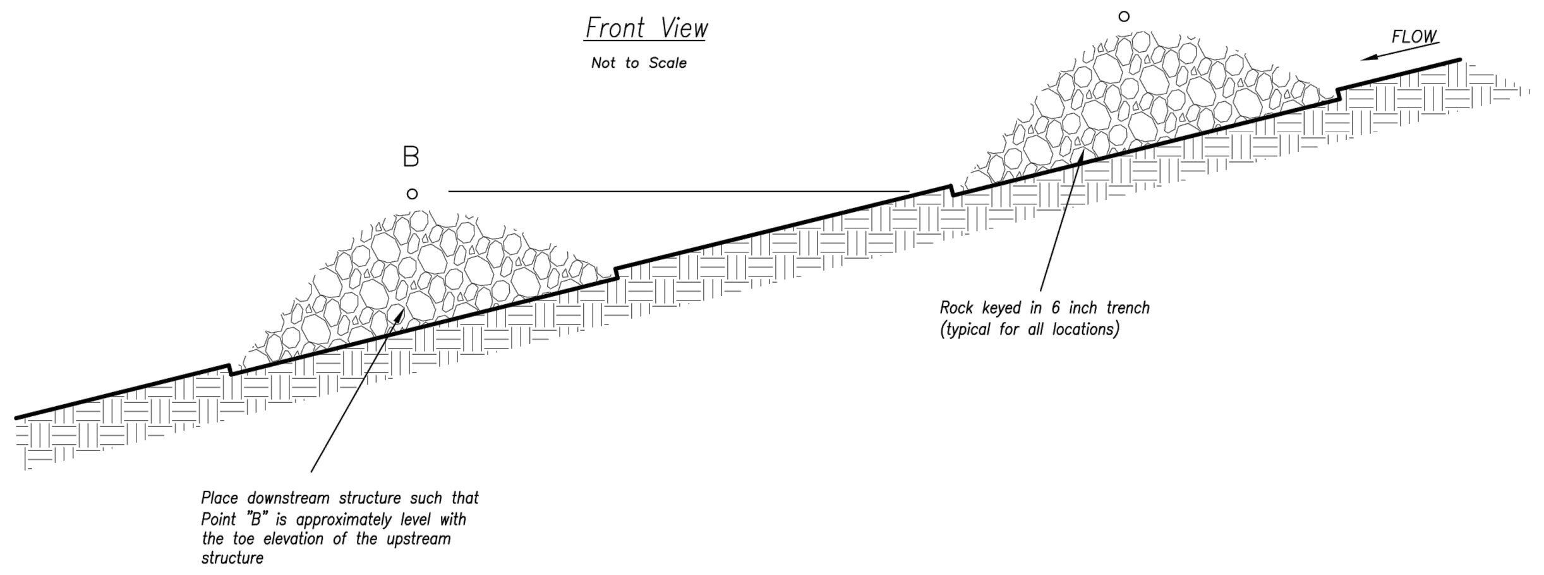
Type II
(2–10 Acres of Drainage Area)
Not to Scale

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.	


Elevation at end Points "A" must be minimum 6" higher than elevation of flow line at point "B"
A
B
A
1' Min.
3' Max.

Front View
Not to Scale


B
B
FLOW
Rock keyed in 6 inch trench (typical for all locations)
Place downstream structure such that Point "B" is approximately level with the toe elevation of the upstream structure

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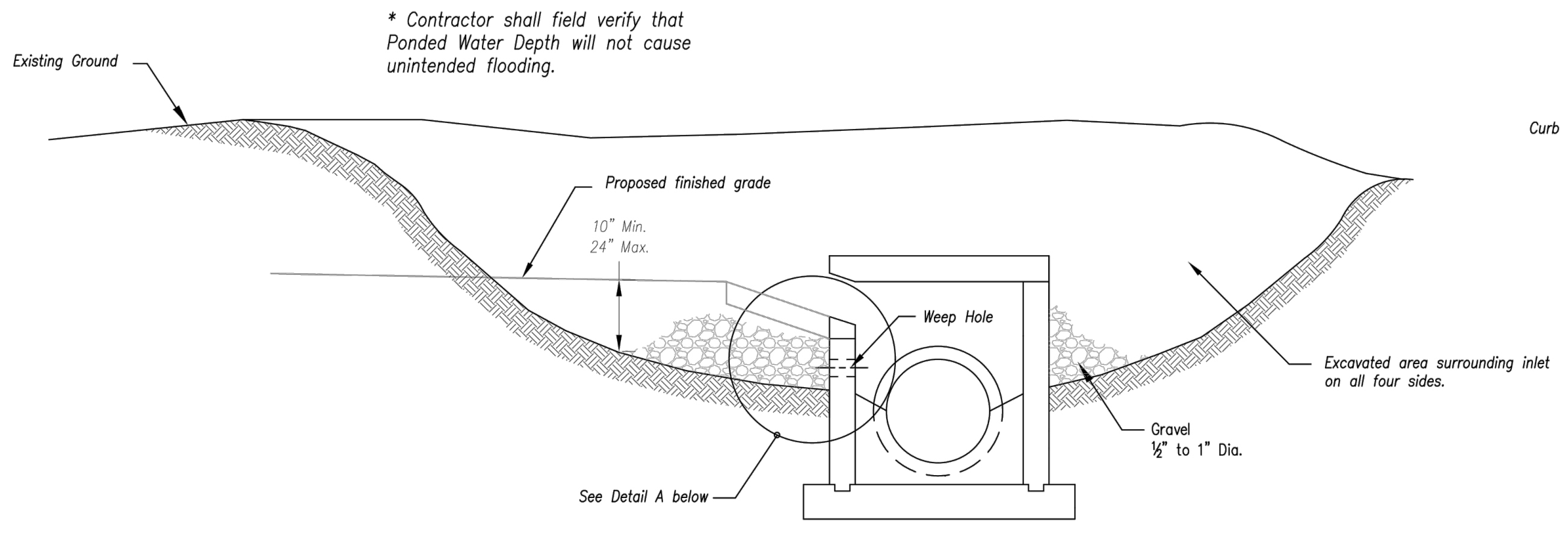
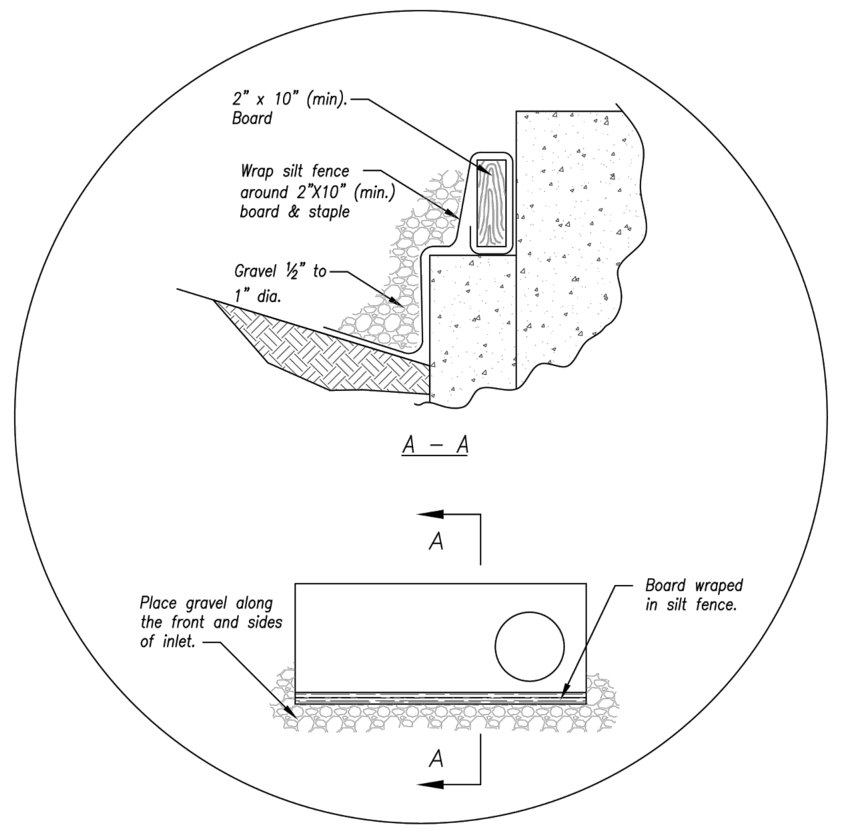
KANSAS CITY
METRO CHAPTER
ROCK DITCH CHECKS
STANDARD DRAWING NUMBER ESC-10
ADOPTED: 10/24/2016


Existing Ground
* Contractor shall field verify that Ponded Water Depth will not cause unintended flooding.
Proposed finished grade
10" Min.
24" Max.
Weep Hole
Excavated area surrounding inlet on all four sides.
Gravel
½" to 1" Dia.
See Detail A below


2" x 10" (min). Board
Wrap silt fence around 2"X10" (min.) board & staple
Gravel ½" to 1" dia.
A – A
A
A
Place gravel along the front and sides of inlet.
Board wraped in silt fence.

Detail A

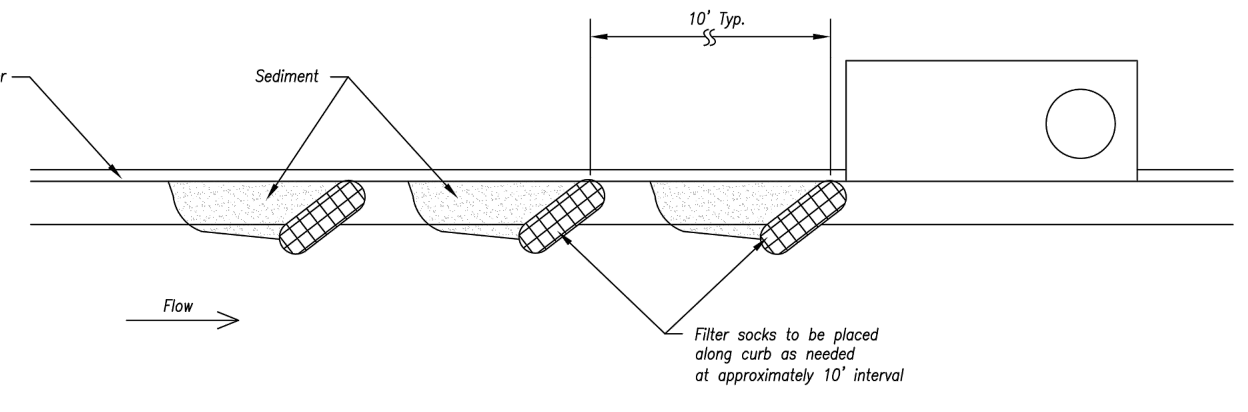
EARLY STAGE CURB INLET
(Open Box and Prior to Pouring Curb and Inlet Throat)

Notes:

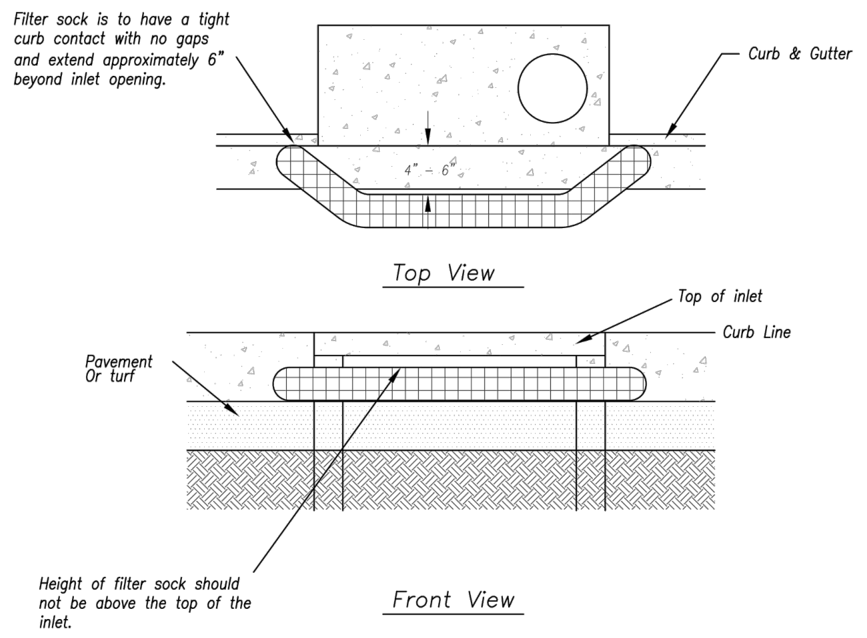
1. Immediately following inlet construction and prior to construction of curb and inlet throat, protect inlet opening by installing 2" X 10" (min.) board wrapped in silt fence. Structures shall have excavated storage area on all four sides to allow settling of sediment (Early Stage Curb Inlet).
2. When 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.


Curb & Gutter
Sediment
10' Typ.
Flow
Filter socks to be placed along curb as needed at approximately 10' interval

On Grade Curb Inlet Protection


Filter sock is to have a tight curb contact with no gaps and extend approximately 6" beyond inlet opening.
Curb & Gutter
4" – 6"
Top View
Top of inlet
Curb Line
Pavement Or turf
Height of filter sock should not be above the top of the inlet.
Front View

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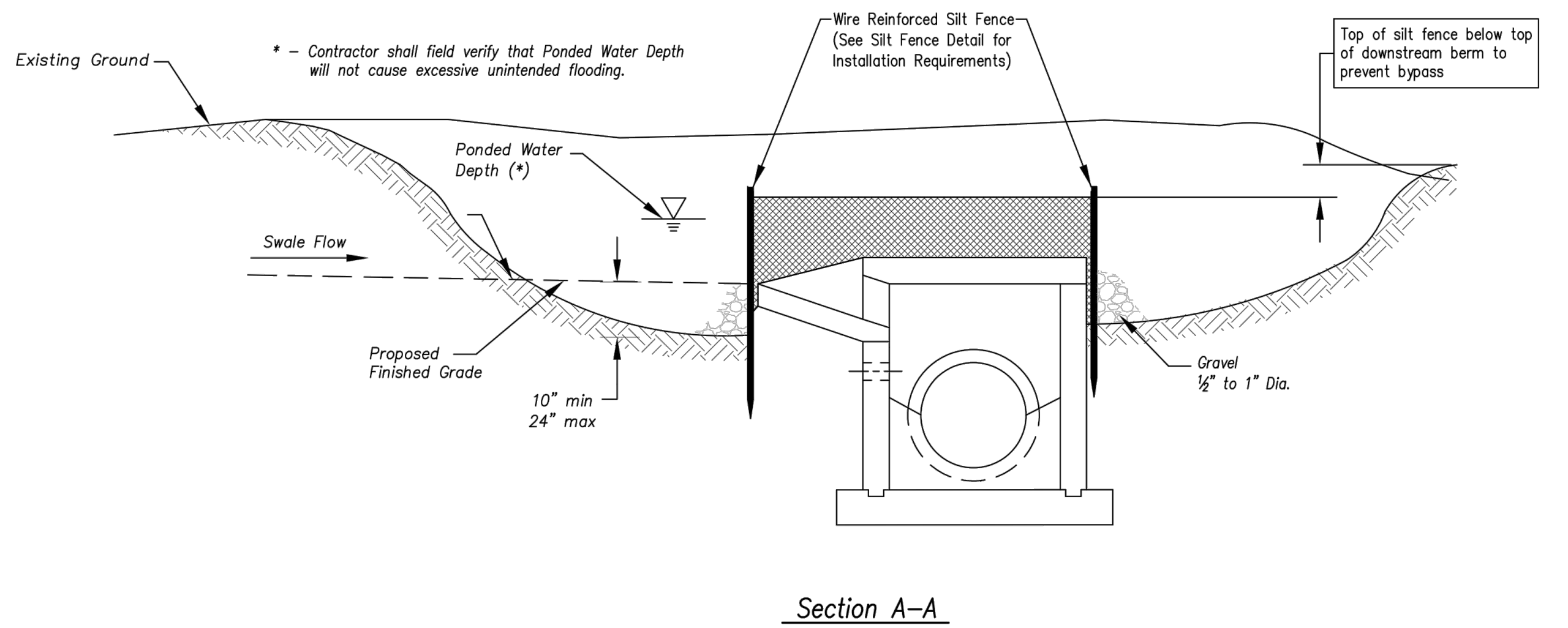
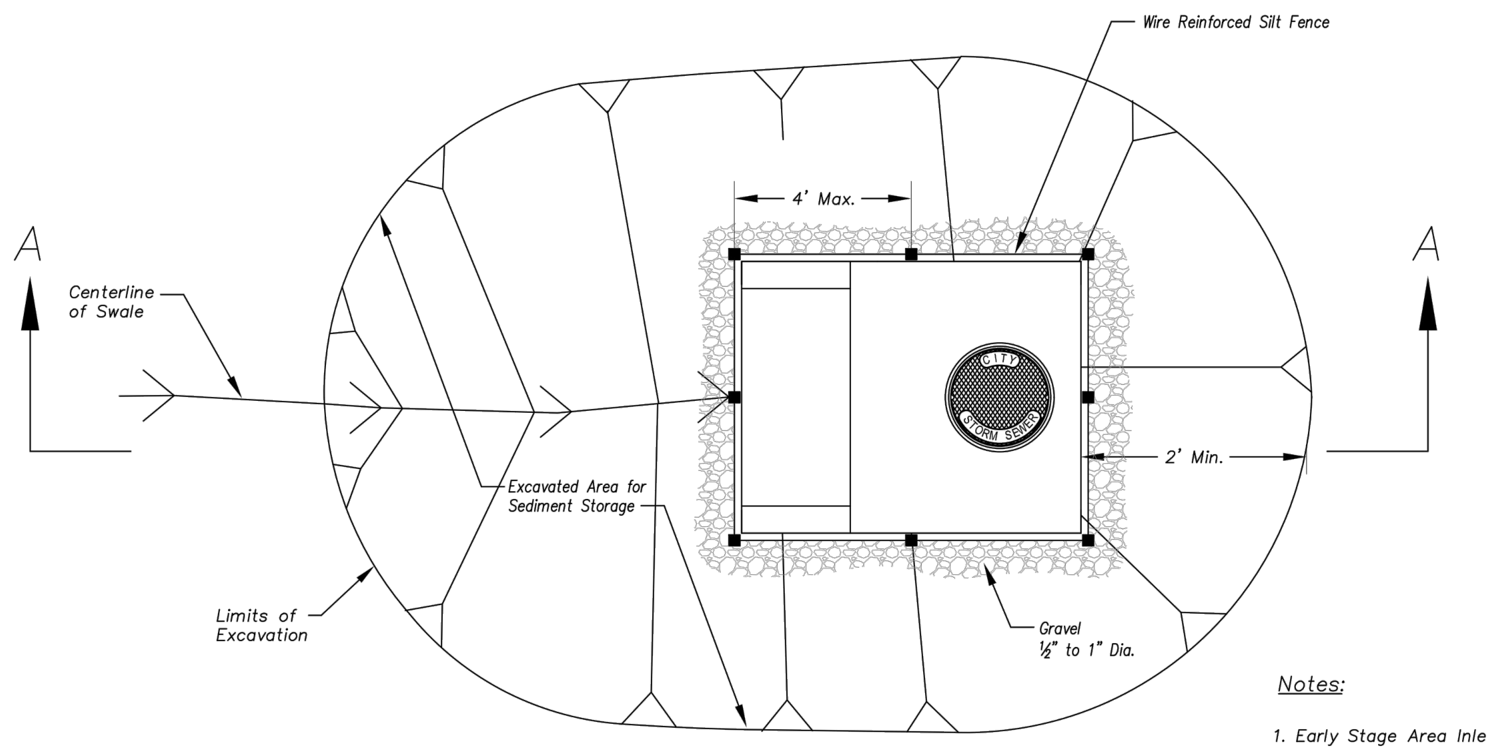
Kansas City Metro Chapter APWA AMERICAN PUBLIC WORKS ASSOCIATION
KANSAS CITY
METRO CHAPTER
CURB INLET PROTECTION
STANDARD DRAWING NUMBER ESC-06
ADOPTED: 10/24/2016


Existing Ground
* – Contractor shall field verify that Ponded Water Depth will not cause excessive unintended flooding.
Wire Reinforced Silt Fence (See Silt Fence Detail for Installation Requirements)
Top of silt fence below top of downstream berm to prevent bypass
Ponded Water Depth (*)
Swale Flow
Proposed Finished Grade
10" min
24" max
Gravel
½" to 1" Dia.

Section A–A
Not to Scale

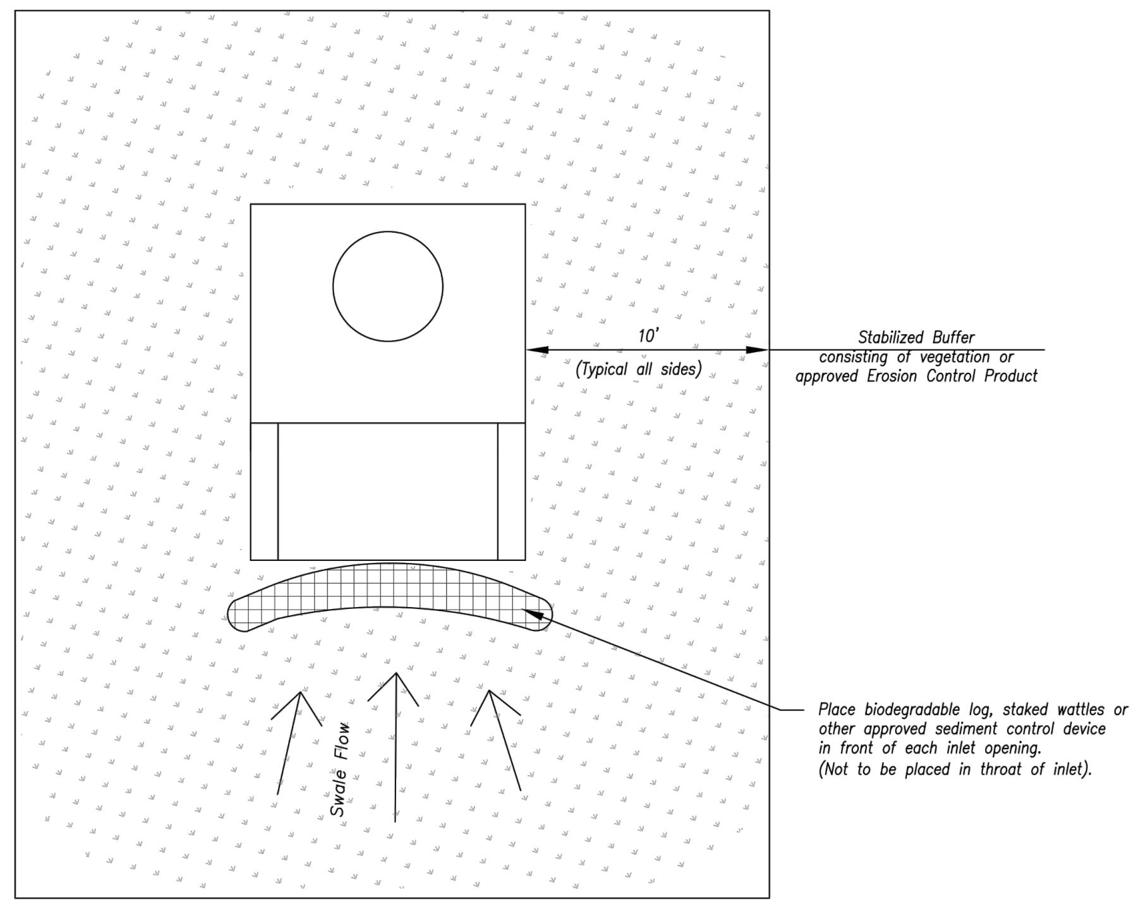

Wire Reinforced Silt Fence
4' Max.
A
A
Centerline of Swale
CITY STORM SEWER
2' Min.
Excavated Area for Sediment Storage
Limits of Excavation
Gravel
½" to 1" Dia.

Plan
Not to Scale

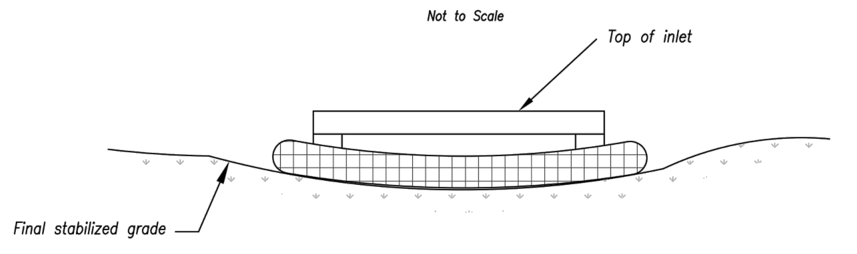
EARLY STAGE AREA INLET
(All open boxes and inlets not at final grade)

Notes:

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


10'
(Typical all sides)
Stabilized Buffer consisting of vegetation or approved Erosion Control Product
Swale Flow
Place biodegradable log, staked wattles or other approved sediment control device in front of each inlet opening. (Not to be placed in throat of inlet).

Plan
Not to Scale


Top of inlet
Final stabilized grade

Front View

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

Maintenance:

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

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

AMERICAN PUBLIC WORKS ASSOCIATION
Kansas City Metro Chapter APWA AMERICAN PUBLIC WORKS ASSOCIATION
KANSAS CITY
METRO CHAPTER
AREA INLET AND JUNCTION BOX PROTECTION
STANDARD DRAWING NUMBER ESC-07
ADOPTED: 10/24/2016

NOT AS-BUILT

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JULIE ELAINE SELLERS
NUMBER PE-2017000367
3/18/21

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

REVISIONS

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

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
C148

DWG: F:\2019\1501-2000\019-1605\40-Design\AutoCAD\As-Built\Sheets\GNCV\STREET, STORM & SITE DISTURBANCE\C_DTL01_0191605.dwg USER: bworthley
DATE: Feb 15, 2021 12:26pm XREFS: C_PTBLK_0191605