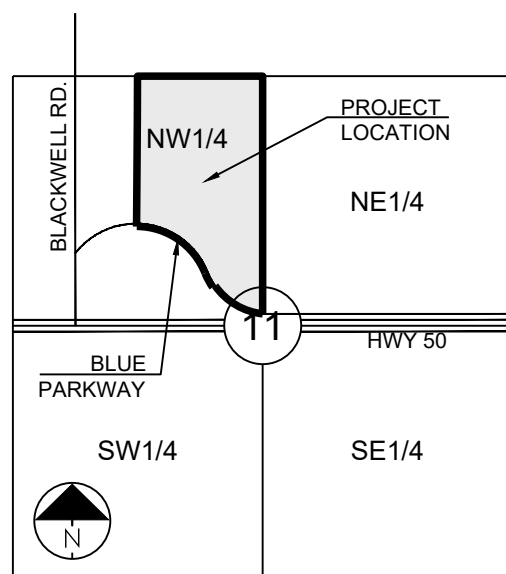


# ET, STORMWATER, MASTER DRAINAGE AND EROSION & SEDIMENT CONTROL FOR RESIDENCES AT BLACKWELL

IN THE CITY OF LEE'S SUMMIT  
JACKSON COUNTY, MO

C	- ACCESS EASEMENT
CB	- BACK OF CURB
VB	- BACK TO BACK
M	- BENCHMARK
OB or B.L.	- BUILDING LINE
JO	- CLEANOUT
JB	- TELEPHONE JUNCTION BOX
&G	- CURB AND GUTTER
E	- DRAINAGE EASEMENT
/E	- ELECTRICAL EASEMENT
L	- ELEVATION
L	- FLOW LINE
/E	- GAS LINE EASEMENT
HDPE	- HIGH-DENSITY POLYETHYLENE
L	- LANDSCAPE EASEMENT
MSFE	- MINIMUM SERVICEABLE FLOOR ELEVATION
VC	- POLYVINYL CHLORIDE
/L	- PROPERTY LINE
UB/E	- PUBLIC EASEMENT
CCP	- REINFORCED CONCRETE PIPE
OW or RW	- RIGHT-OF-WAY
L	- SANITARY SEWER EASEMENT
L	- SERVICE LINE
/W	- SIDEWALK
E	- TOP ELEVATION
/E	- UTILITY EASEMENT
/SE	- WATER SURFACE ELEVATION
/E	- WATERLINE EASEMENT



SECTION 11-47-31

**LOCATION MAP**  
SCALE 1" = 2000'

**UTILITY CONTACTS:**MISSOURI DEPARTMENT OF  
TRANSPORTATION (MODOT)

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

## SPIRE

Brent Jones  
3025 SE Clover Drive  
Lee's Summit, MO 64082  
(816) 399-0663 [brent.jones@spireenergy.com](mailto:brent.jones@spireenergy.com)

EVERGY

Philip Ingram  
1300 SE Hamblin Road  
Lee's Summit, MO 64081  
Office: (816) 347-347-4339  
[philip.ingram@evergy.com](mailto:philip.ingram@evergy.com)

## CITY OF LEES SUMMIT PUBLIC WORKS

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

AT&T

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

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

## CITY OF LEE'S SUMMIT WATER UTILITIES

Mark Schaufler  
1200 SE Hamblen Road  
Lee's Summit, MO 64081  
(816) 969-1900



811 or  
1-800-344-7483  
mo1call.com

SUMMARY OF QUANTITIES			
	ITEM	QUANTITY	UNITS
1	2" TYPE 5 OR 6 ASPHALT PAVEMENT	4,222	SY
2	5.5" TYPE 5 ASPHALT PAVEMENT	4,222	SY
3	6" TYPE 5 BASE	4,973	SY
4	9" SUBGRADE STABILIZATION	4,973	SY
5	TYPE CG-1 CURB AND GUTTER	1,965	LF
6	5" CONCRETE SIDEWALK	1641	LF
7	TYPE A SIDEWALK RAMPS	6	EA
8	TYPE B SIDEWALK RAMPS	4	EA
9	"END OF ROAD" MARKERS (6 LOCATIONS)	15	EA
10	6 X 4 CURB INLET	8	EA
11	15" HDPE STORM SEWER PIPE	787	LF
12	15" RCP STORM SEWER PIPE	129	LF
13	TRENCHING UNDER FUTURE STREET	129	LF
14	CLEARING, GRUBBING & DISPOSAL	1	LS
15	EARTHWORK	1	LS
16	SILT FENCE	2490	LF
17	INLET PROTECTION (SILT FENCE)	10	EA
18	INLET PROTECTION (GRAVEL FILTER BAGS)	10	EA
19	SEEDING & MULCHING	1	LS
20	STRIPING & SIGNAGE	1	LS
21	BONDS	1	LS

**DESIGN SPEED = 30 MPH**

**POSTED SPEED = 25 MPH**

### EARTHWORK:

2. It is recommended that a Geotechnical Engineer observe and document all earthwork activities.
3. Contours have been shown at 1-foot or 2-foot intervals, as indicated. Grading shall consist of completing the earthwork required to bring the physical ground elevations of the existing site to the finished grade (or sub-grade) elevations provided on the plans as spot grades, contours or others means as indicated on the plans.
4. The existing site topography depicted on the plans by contouring has been established by aerial photography and field verified by g.p.s. observation near 11/11/2021. The contour elevations provided may not be exact ground elevations, but rather interpretations of such. Accuracy shall be considered to be such that not more than 10 percent of spot elevation checks shall be in error by more than one-half the contour interval provided, as defined by the National Map Accuracy Standards. Any quantities provided for earthwork volumes are established using this topography contour accuracy, and therefore the inherent accuracy of any earthwork quantity is assumed from the topography accuracy.
5. Proposed contours are to approximate finished grade.
6. Unless otherwise noted, payment for earthwork shall include backfilling of the curb and gutter, sidewalk and further manipulation of utility trench spoils. The site shall be left in a movable condition and positive drainage maintained throughout.
7. Unless otherwise noted, all earthwork is considered Unclassified. No additional compensation will be provided for rock or shale excavation, unless specifically stated otherwise.
8. Prior to earthwork activities, pre-disturbance erosion and sediment control devices shall be in place per the Storm Water Pollution Prevention plan and/or the Erosion and Sediment Control Plan prepared for this site.
9. All topsoil shall be stripped off and all the graded and stockpiled adjacent to the site at an area specified by the project owner or his appointed representative. Vegetation (grass, trees, brush, tree roots and limbs, rock fragments greater than 6-inches and other deleterious materials) shall be removed and properly disposed of offsite or as directed by the owner or his appointed representative.
10. Unless otherwise specified in the Geotechnical Report, all fills shall be placed in maximum 6-inch lifts and compacted to 95-percent of maximum density as defined using a standard proctor test (AASHTO T99/ASTM 698).
11. Subgrade for pavements shall be proctor-rolled prior to paving operations utilizing a fully loaded tandem axle dump truck. All areas exhibiting excessive pumping and heaving shall be removed, filled and compacted with suitable materials and retested until acceptable results are achieved and final approval has been obtained from the Geotechnical Engineer.
12. Subgrade for building pad shall include a minimum of 18-inches of Low Volume Change (LVC) material, or as identified in the site specific Geotechnical Report.
13. Fill materials shall be per Geotechnical Report and shall not include organic material, debris or topsoil. All fills placed on slopes shall be less than 6:1 (horizontal:vertical).
14. The Contractor shall be responsible for redistributing the topsoil over proposed turf and landscaped areas to a minimum depth of 6-inches below final grade.
15. All areas shall be graded for positive drainage. Unless noted otherwise the following grades shall apply:
  - a. Turf Areas – 2.5% Minimum, 4H:1V Maximum
  - b. Paved Areas – 1.2% Minimum, 5% Maximum
16. A.D.A. parking stalls shall not be sloped greater than 2% in any direction and constructed per A.D.A. requirements.
17. All disturbed areas shall be fertilized, seeded and mulched immediately after earthwork activities have ceased. Seeding shall be per the Erosion and Sediment Control Plan and/or Landscape Plan. If not specified seeding shall be per APWA Section 2400, latest edition. Unless otherwise noted, seeding shall be subsidiary to the contract price for earthwork and grading activities.
18. All disturbed areas in the right-of-way shall be sodded.
19. Underdrains are recommended for all paved areas adjacent to irrigated turf and landscaped beds.
20. Contractor shall adhere to the reporting requirements outlined in the Storm Water Pollution Prevention Plan (SWPPP) prepared for this project. Erosion and Sediment control devices shall be properly maintained and kept clean of silt and debris and in good working order. Additional erosion and sediment control measures shall be installed as required.

**UTILITIES:**

1. Existing utilities have been shown to the greatest extent possible based upon information provided to the Engineer. The contractor is responsible for contacting the respective utility companies and field locating utilities prior to construction and identifying any potential conflicts. All conflicts shall immediately be brought to the attention of the Engineer.
2. The contractor shall be responsible for coordinating any required utility relocations. Utilities damaged through the construction of the project shall be repaired by the contractor.
3. Contractor shall verify flow-lines and structure tops prior to construction, and shall notify Engineer of any discrepancies. Provide shop drawings for all precast and manufactured utility structures for review by the Engineer prior to construction of the structures.
4. Utility Separation: Waterlines shall have a minimum of 10 feet horizontal and 2 feet vertical separation from all sanitary sewer lines, manholes, and sanitary sewer structures, as measured from clean-up edge. If minimum separations cannot be maintained, concrete encasement shall be provided. The sanitary line shall be exposed 10 feet in each direction of the conflict.
5. Payment for trenching, backfilling, pipe embedment, flowable fill, backfill materials, edge up, seeding, sodding and any other items necessary for the construction of the utility line shall be included in the contract price for the utility installation.
6. The Contractor shall be responsible for contacting respective utility companies 48-hours in advance for the inspection of any proposed utility main extension or service line or service connection to any existing main.
7. Spoils shall be neatly placed onsite adjacent to the trench, and compacted to prevent rutting, rut migration and excess sediment runoff. Unsuitable materials, excess rock and shale, asphalt, concrete, trees, brush etc. shall be properly disposed of offsite. Materials may be waste onsite at the direction of the Owner or his appointed representative.
8. All excavation is considered unclassified, unless noted otherwise. Unclassified excavation for utility trenching is subsidiary to the unit price provided for the pipe. Any quantity provided for rock excavation is physical based on the information provided to the Project Engineer. The Engineer has the authority to identify and define the physical characteristics to determine the classification of the excavation. The excavation shall be paid at a trench width of the nominal pipe diameter of the installed main plus 18 inches. Contractor is required to dispose of excess rock from their trenches by disposing it in areas as specified by the Project Engineer.

Sheet List Table	
Sheet Number	Sheet Title
1	COVER SHEET
2	GENERAL LAYOUT - OVERALL
3	GENERAL LAYOUT - SHENANDOAH DRIVE
4	OVERALL GRADING PLAN
5	OVERALL DRAINAGE MAP
6	SHENANDOAH DRIVE - DRAINAGE MAP
7	PRE-CONSTRUCTION EROSION CONTROL PLAN
8	EROSION CONTROL PLAN
9	POST-CONSTRUCTION EROSION CONTROL PLAN
10	EROSION CONTROL DETAILS
11	SHENANDOAH DRIVE - PLAN & PROFILE
12	INTERSECTION DETAILS
13	INTERSECTION DETAILS
14	STORM PLAN
15	STORM CALCS
16	STORM PROFILES
17	STREET DETAILS
18	STREET DETAILS
19	STORM DETAILS
20	STORM DETAILS
21	STREET SIGN & PAVEMENT MARKING PLAN
22	STREET SIGN & PAVEMENT MARKING DETAILS

**APPROVED BY:**

CITY ENGINEER  
APPROVED FOR ONE YEAR FROM THIS DATE

**OWNER/DEVELOPER:**

GRIFFIN RILEY PROPERTY GROUP  
 JAKE LOVELESS, VICE PRESIDENT  
 21 SE 29TH TERRACE  
 LEE'S SUMMIT  
 p 816-366-7900  
 JAKE@GRIFFINRILEY.COM

**MO GRS BENCHMARK:**

STATION NAME - JA-90

KC METRO ALUMINUM GRS DISK SET IN CONCRETE STAMPED "JA-90, 1988"  
LOCATED NEAR THE INTERSECTION OF LANGSFORD ROAD AND OLD  
LANGSFORD ROAD, 43 FEET SOUTHEAST OF THE CENTER OF LANGSFORD  
ROAD AND 32 FEET NORTH OF THE CENTER OF OLD LANGSFORD ROAD.  
N:1001052.8503, E:2845604.8272

ELEV. 997.045

### PROJECT BENCHMARK:

"SQUARE" CUT IN TOP OF CONCRETE STORM MANHOLE  
STORM MANHOLE IS LOCATED APPROX. 130 FEET EAST OF THE  
INTERSECTION OF SE JOEL AVE & BLUE PARKWAY AND 26 FEET SOUTH  
OF THE CENTERLINE OF BLUE PARKWAY.  
N:996874.9690, E:2840937.1365

ELEV. 1005.719

PREPARED BY:



SCHLAGEL &amp; ASSOCIATES, P.A.

RESIDENCES AT BLACKWELL  
STREET, STORMWATER, MASTER DRAINAGE  
PLAN AND EROSION & SEDIMENT CONTROL  
SEE SHENANDOAH DRIVE LEE'S SUMMIT, MO

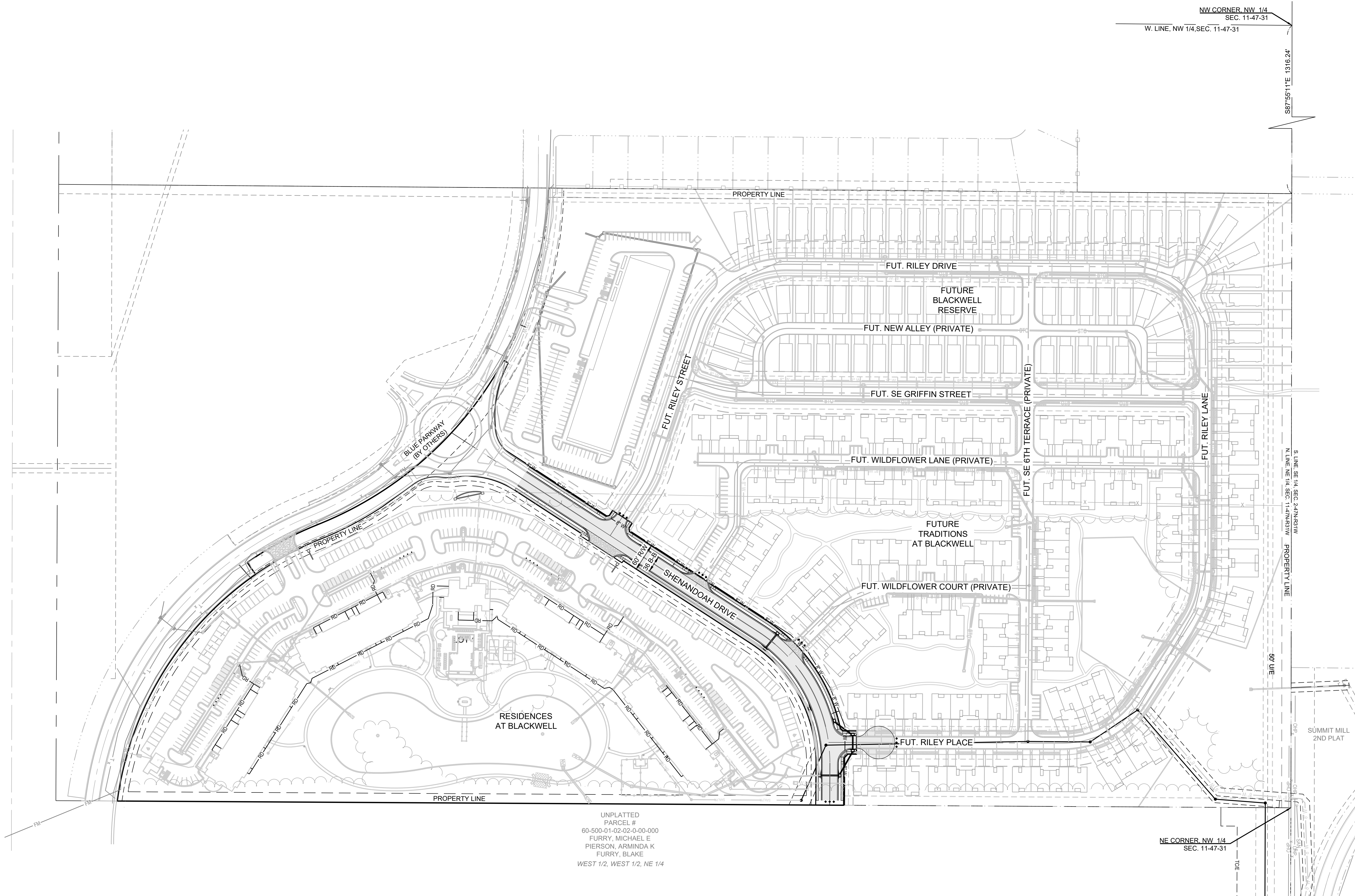
DRAWN BY:	DATE	DESCRIPTION
TRC	11/23/2023	PER CITY COMMENTS
	1	
	2	
	3	
CHECKED BY:	4	
MAB	5	
	6	
DATE PREPARED:	7	
11/30/2022	8	
PROJ. NUMBER:		

## COVER SHEET

SHEET



I:\PROJECTS\2022\22-102\3.0 Design\3.0 DWG Plans\3.0 SS92-102- SS - GEN - OVERALL.dwg, 2 GENERAL LAYOUT - OVERALL, 1:1



#### STREET NOTES:

- ALL STREET CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE CITY OF LEE'S SUMMIT DESIGN AND CONSTRUCTION MANUAL. ALL APPLICABLE AASHTO STANDARDS HAVE BEEN MET.
- THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL EXISTING UTILITY LOCATIONS PRIOR TO EXCAVATION.
- ALL INSPECTION OF STREET CONSTRUCTION TO BE PERFORMED BY THE CITY OF LEE'S SUMMIT DEVELOPMENT ENGINEERING.
- CURB RETURN RADII SHALL BE 30' AT BACK OF CURB UNLESS OTHERWISE NOTED.
- SUBGRADE TO BE COMPACTED TO 95% STANDARD PROCTOR DENSITY.
- ASSUMED DESIGN SPEED = 30 MPH (RESIDENTIAL COLLECTOR).
- MINIMUM STOPPING SIGHT DISTANCE = 200 FEET.
- MINIMUM K, SAG CURVE = 37 (20 WITH LIGHTING), CREST CURVE = 19.
- GRADE INTERSECTIONS TO DRAIN AS SHOWN.
- SSD = STOPPING SIGHT DISTANCE.
- ALL ADA SIDEWALK RAMPS SHALL BE CONSTRUCTED BY THE DEVELOPER WITH THE PUBLIC INFRASTRUCTURE.

#### MO GRS BENCHMARK:

STATION NAME - JA-90

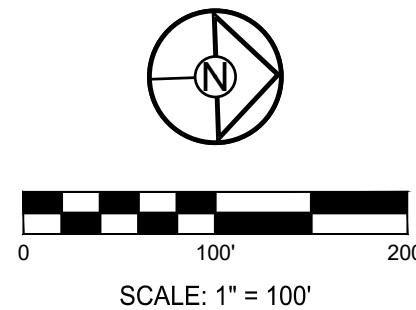
KC METRO ALUMINUM GRS DISK SET IN CONCRETE STAMPED "JA-90, 1988" LOCATED NEAR THE INTERSECTION OF LANGSFORD ROAD AND OLD LANGSFORD ROAD, 43 FEET SOUTHEAST OF THE CENTER OF LANGSFORD ROAD AND 32 FEET NORTH OF THE CENTER OF OLD LANGSFORD ROAD. N:1001052.8503, E:2845604.8272

ELEV. 997.045

#### PROJECT BENCHMARK:

"SQUARE" CUT IN TOP OF CONCRETE STORM MANHOLE STORM MANHOLE IS LOCATED APPROX. 130 FEET EAST OF THE INTERSECTION OF SE JOEL AVE & BLUE PARKWAY AND 26 FEET SOUTH OF THE CENTERLINE OF BLUE PARKWAY. N:996874.9690, E:2840937.1365

ELEV. 1005.719



## RESIDENCES AT BLACKWELL STREET, STORMWATER, MASTER DRAINAGE PLAN AND EROSION & SEDIMENT CONTROL SE SHENANDOAH DRIVE LEE'S SUMMIT, MO

REVISION DATE	DESCRIPTION
01/23/2023	PER CITY COMMENTS
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

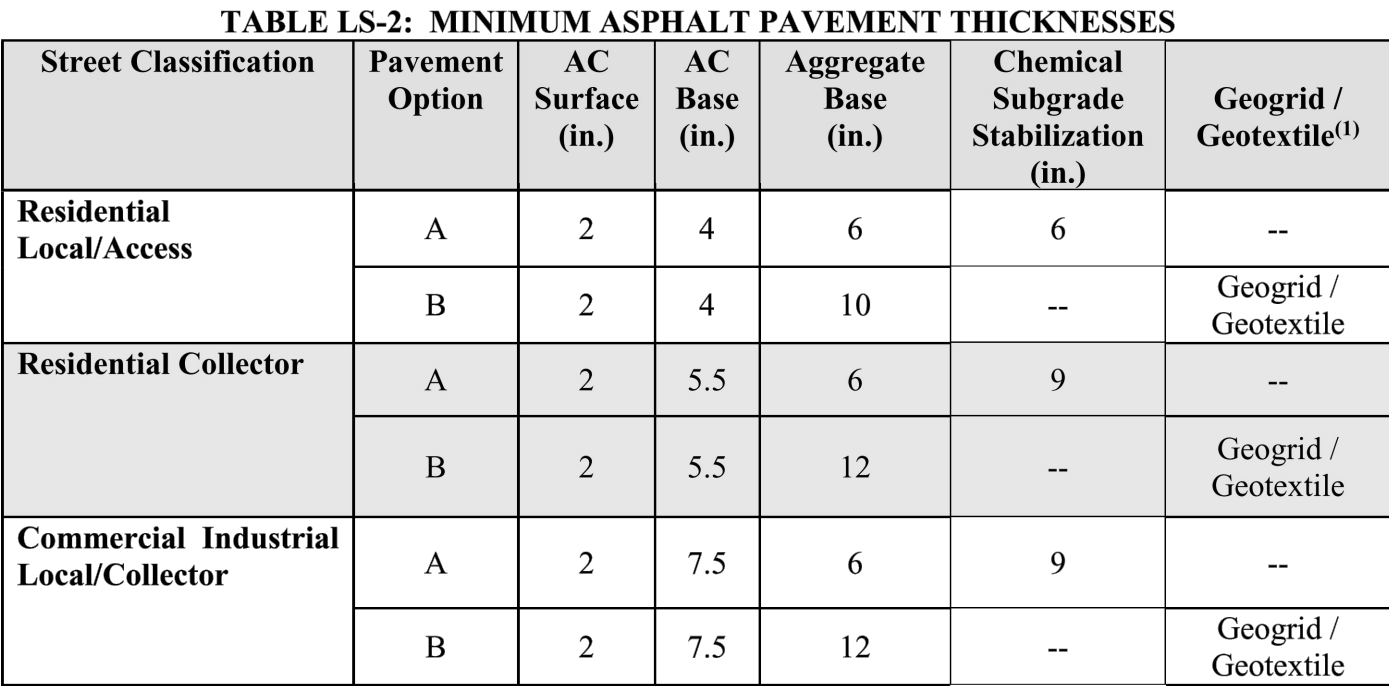
DRAWN BY: ###	CHECKED BY: ###	DATE PREPARED: 11/30/2022	PROJ. NUMBER: 22-102
------------------	--------------------	------------------------------	-------------------------

#### GENERAL LAYOUT - OVERALL

SHEET

2





## **STREET NOTES:**

1. ALL STREET CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE CITY OF LEE'S SUMMIT DESIGN AND CONSTRUCTION MANUAL. ALL APPLICABLE AASHTO STANDARDS HAVE BEEN MET.
2. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL EXISTING UTILITY LOCATIONS PRIOR TO EXCAVATION.
3. ALL UTILIZATION OF STREET CONSTRUCTION TO BE PERFORMED BY THE CITY OF LEE'S SUMMIT DEVELOPMENT ENGINEERING.
4. CURB RETURN RADII SHALL BE 30' AT BACK OF CURB UNLESS OTHERWISE NOTED.
5. SUBGRADE TO BE COMPACTED TO 95% STANDARD PROCTOR DENSITY.
6. ASSUMED DESIGN SPEED = 30 MPH (RESIDENTIAL COLLECTOR).
7. MINIMUM STOPPING SIGHT DISTANCE = 200 FEET.
8. MINIMUM K, SAG CURVE = 37 (20 WITH LIGHTING), CREST CURVE = 19.
9. GRADE INTERSECTIONS TO DRAIN AS SHOWN.
10. SSD = STOPPING SIGHT DISTANCE.
11. ALL ADA SIDEWALK RAMPS SHALL BE CONSTRUCTED BY THE DEVELOPER WITH THE PUBLIC INFRASTRUCTURE.

NOTE: 5' CONC. WALK (BOTH SIDES)

3-1 (MAX.)

3-1 (MAX.)

12'

30'

60'

36'

30'

12'

18" (TYP)

16" (TYP)

2'

1/4" (TYP.)

1/4" (TYP.)

1.5% MAX

1'

1.5% MAX

1/4" (TYP.)

1.5% MAX

1'

3-1 (MAX.)

3-1 (MAX.)

TYPE CG-1 C & G

1/4" (TYP.)

2" TYPE 5 OR 6 ASPHALTIC CONCRETE SURFACE

5.5" TYPE 5 ASPHALTIC CONCRETE BASE

6" TYPE 5 BASE & MINIMUM - 9" SUBGRADE STABILIZATION (12" TYPE 5 BASE IF GEOGRID IS USED)

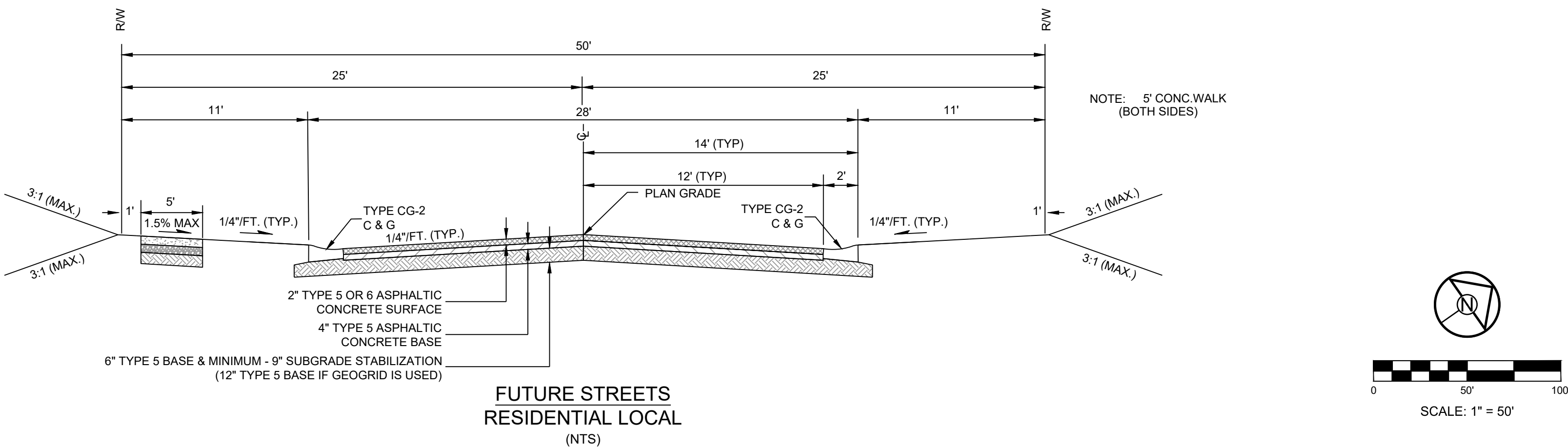
PLAN GRADE

TYPE CG-1 C & G

SHENANDOAH DRIVE STREET

RESIDENTIAL COLLECTOR

(NTS)



SHEET	GENERAL LAYOUT - SHENANDOAH DRIVE		DRAWN BY:	A	1/12/2023	REVISION DATE
			TRC	A		
			CHECKED BY:	A		
			MAB	A		
			DATE PREPARED:	A		
			1/10/2022	A		
			PROJ. NUMBER:	A		
			22-102	A		
						PER CITY COMMENTS
						DESCRIPTION

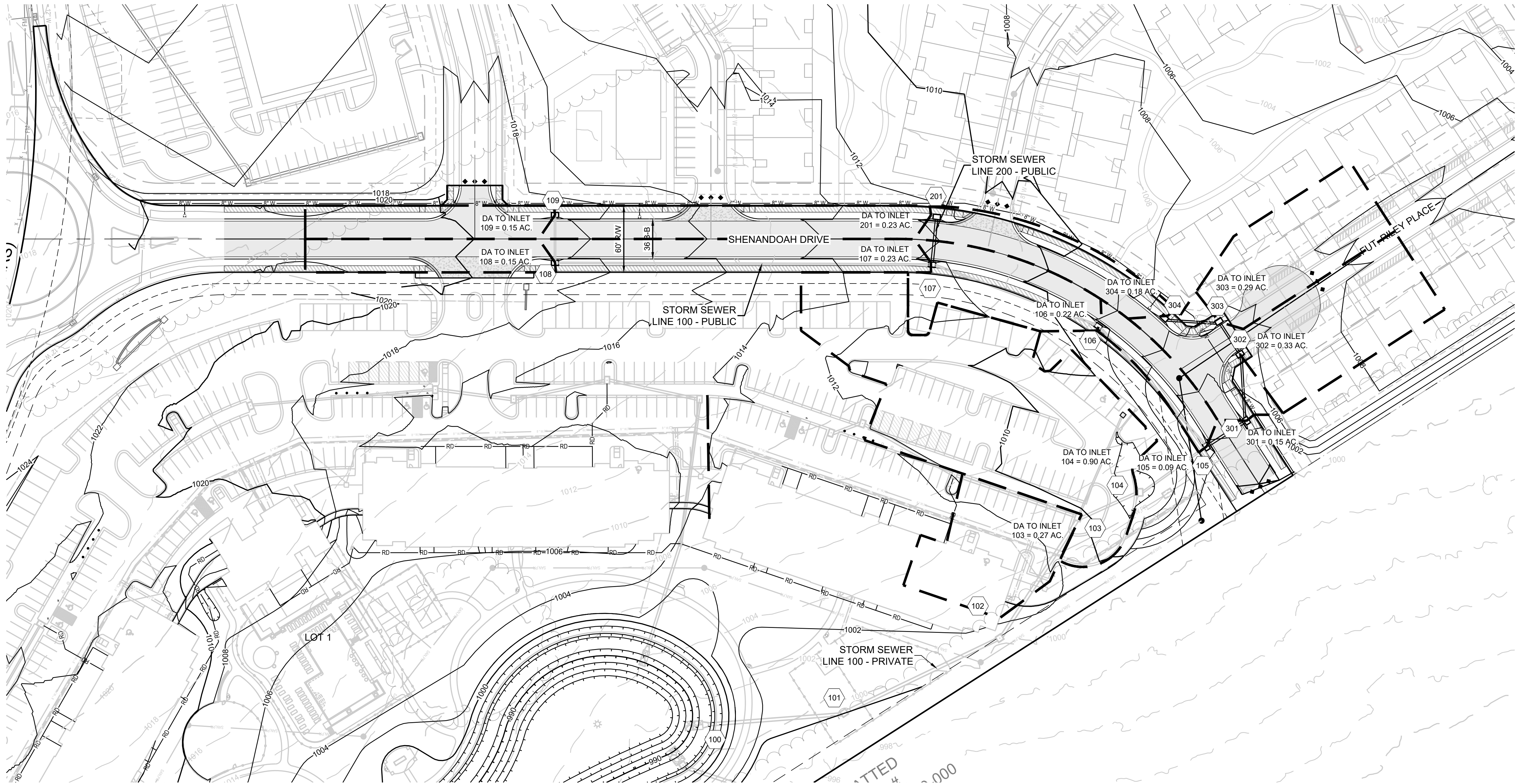












**GRADING LEGEND:**  
--- 1000 --- EXISTING CONTOUR  
—— 1000 —— PROPOSED CONTOUR (FINISHED GRADE)

- NOTES:**
- ALL CONSTRUCTION ON THIS PROJECT SHALL CONFORM TO THE CITY OF LEE'S SUMMIT TECHNICAL SPECIFICATIONS.
  - THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL EXISTING UTILITY LOCATIONS PRIOR TO EXCAVATION.

**MO GRS BENCHMARK:**

STATION NAME - JA-90  
KC METRO ALUMINUM GRS DISK SET IN CONCRETE STAMPED "JA-90, 1988" LOCATED NEAR THE INTERSECTION OF LANGSFORD ROAD AND OLD LANGSFORD ROAD, 43 FEET SOUTHEAST OF THE CENTER OF LANGSFORD ROAD AND 32 FEET NORTH OF THE CENTER OF OLD LANGSFORD ROAD.  
N: 1001052.8503, E: 2845604.8272  
ELEV. 997.045

**PROJECT BENCHMARK:**

"SQUARE" CUT IN TOP OF CONCRETE STORM MANHOLE STORM MANHOLE IS LOCATED APPROX. 130 FEET EAST OF THE INTERSECTION OF SE JOEL AVE & BLUE PARKWAY AND 26 FEET SOUTH OF THE CENTERLINE OF BLUE PARKWAY.  
N: 996874.9690, E: 2840937.1365  
ELEV. 1005.719

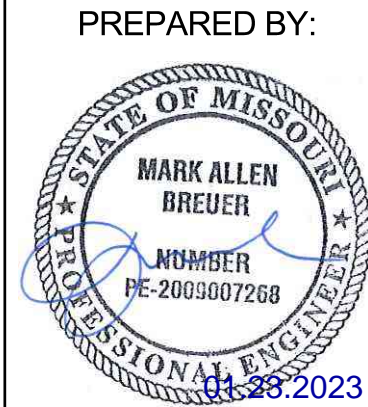


**RESIDENCES AT BLACKWELL STREET, STORMWATER, MASTER DRAINAGE PLAN AND EROSION & SEDIMENT CONTROL SE SHENANDOAH DRIVE LEE'S SUMMIT, MO**

REVISION DATE	DESCRIPTION
01/23/2023	PER CITY COMMENTS
01/23/2023	PER CITY COMMENTS
01/23/2023	PER CITY COMMENTS
01/23/2023	PER CITY COMMENTS
01/23/2023	PER CITY COMMENTS
01/23/2023	PER CITY COMMENTS
01/23/2023	PER CITY COMMENTS
01/23/2023	PER CITY COMMENTS
01/23/2023	PER CITY COMMENTS
01/23/2023	PER CITY COMMENTS

SHENANDOAH DRIVE - DRAINAGE MAP

SHEET  
**6**

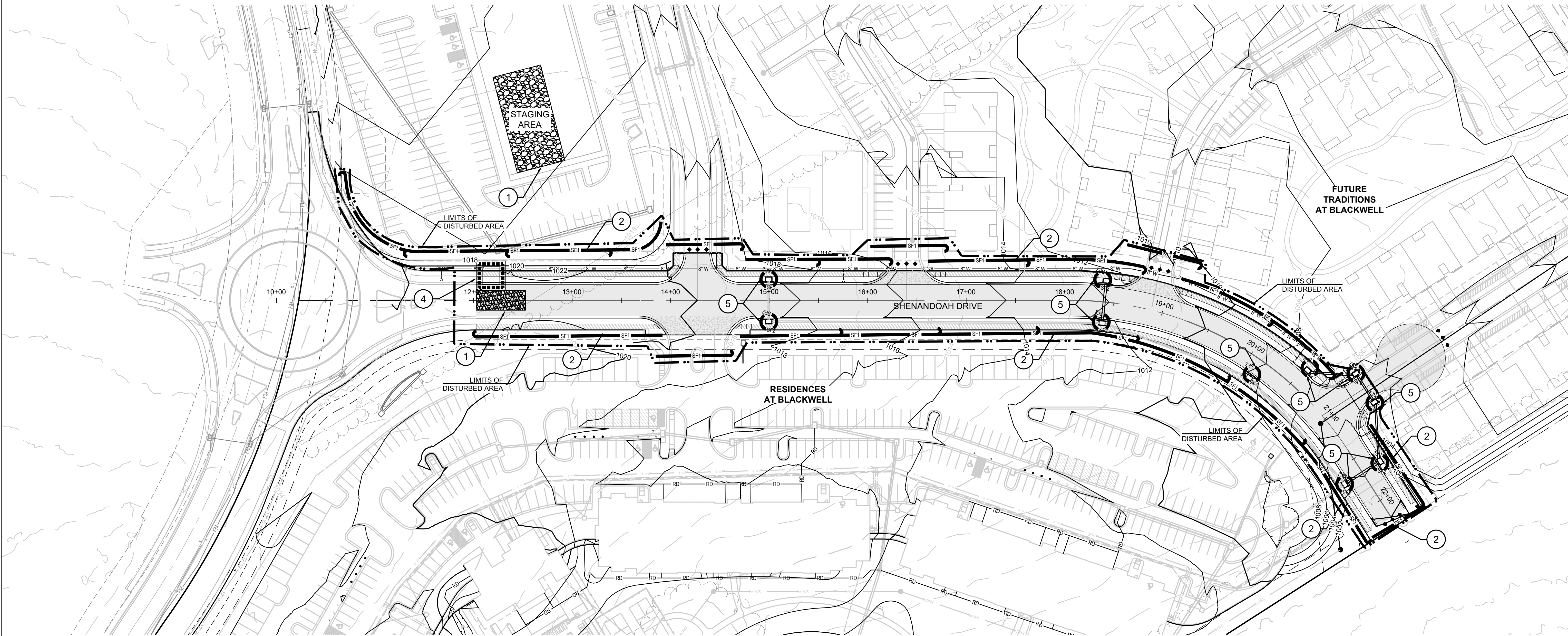


SCHLAGEL & ASSOCIATES, P.A.









**GRADING LEGEND:**

- 1000 --- EXISTING CONTOUR  
—— 1000 —— PROPOSED CONTOUR (FINISHED GRADE)

**EROSION CONTROL NOTE:**

1. SEE SHEET 7 FOR EROSION AND SEDIMENT LEGEND, NOTES AND STAGING CHART.

**MO GRS BENCHMARK:**

STATION NAME - JA-90  
KC METRO ALUMINUM GRS DISK SET IN CONCRETE STAMPED "JA-90, 1988"  
LOCATED NEAR THE INTERSECTION OF LANGSFORD ROAD AND OLD  
LANGSFORD ROAD, 43 FEET SOUTHEAST OF THE CENTER OF LANGSFORD  
ROAD AND 32 FEET NORTH OF THE CENTER OF OLD LANGSFORD ROAD.  
N:1001052.8503, E:2845604.8272

ELEV. 997.045

**PROJECT BENCHMARK:**

"SQUARE" CUT IN TOP OF CONCRETE STORM MANHOLE  
STORM MANHOLE IS LOCATED APPROX. 130 FEET EAST OF THE  
INTERSECTION OF SE JOEL AVE & BLUE PARKWAY AND 26 FEET SOUTH  
OF THE CENTERLINE OF BLUE PARKWAY.  
N:996874.9690, E:2840937.1365

ELEV. 1005.719



RESIDENCES AT BLACKWELL  
STREET, STORMWATER, MASTER DRAINAGE  
PLAN AND EROSION & SEDIMENT CONTROL  
SE SHENANDOAH DRIVE LEE'S SUMMIT, MO

REVISION DATE	DESCRIPTION
01/23/2023	PER CITY COMMENTS
01/23/2023	TRC
01/23/2023	MAB
01/23/2023	DATE PREPARED
11/30/2022	PROJ. NUMBER:
22-102	

EROSION  
CONTROL PLAN

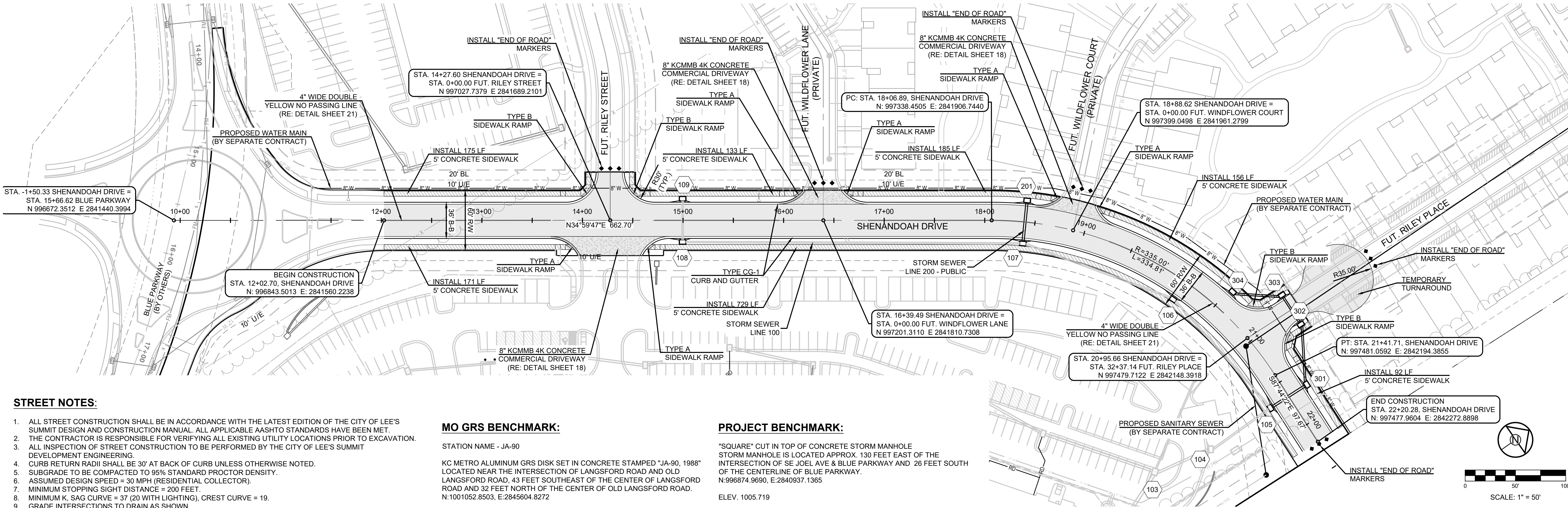












STREET NOTES:

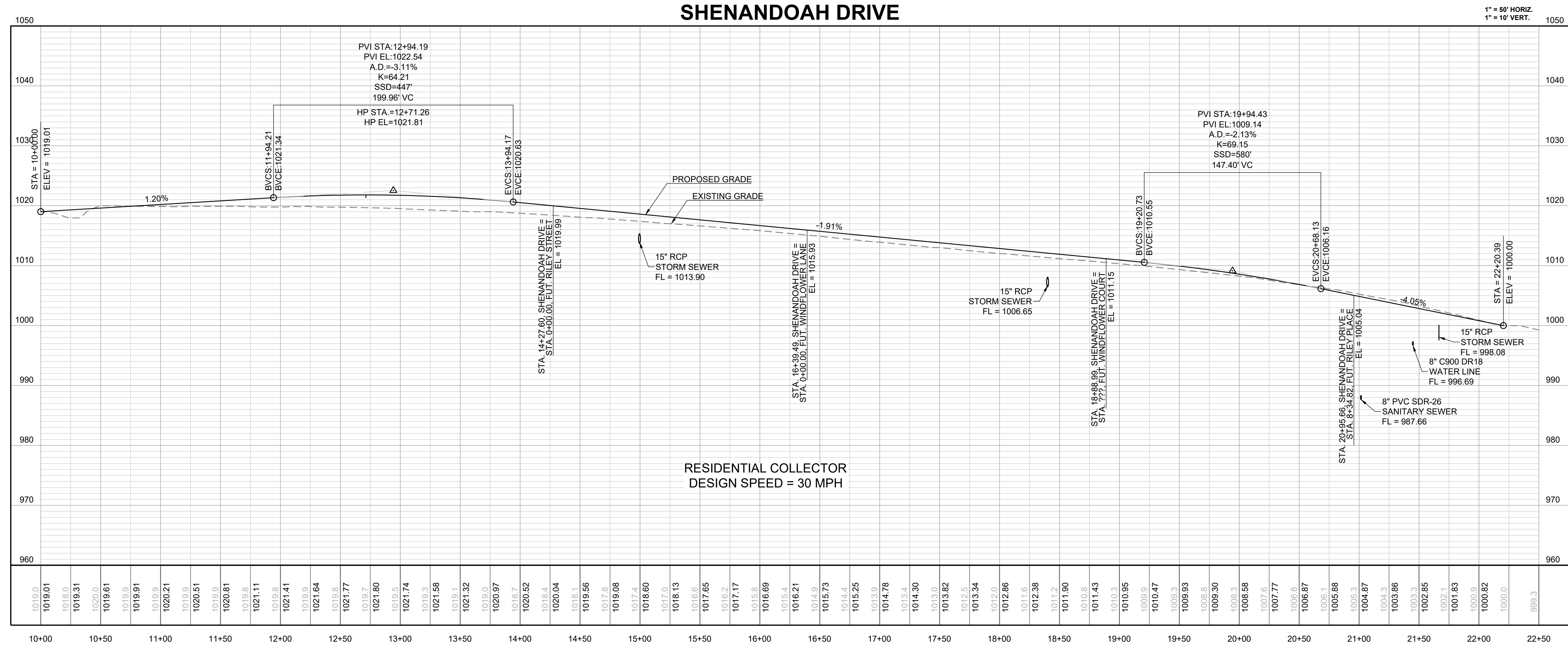
- 1. ALL STREET CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE CITY OF LEE'S SUMMIT DESIGN AND CONSTRUCTION MANUAL. ALL APPLICABLE AASHTO STANDARDS HAVE BEEN MET.
- 2. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL EXISTING UTILITY LOCATIONS PRIOR TO EXCAVATION.
- 3. ALL INSPECTION OF STREET CONSTRUCTION TO BE PERFORMED BY THE CITY OF LEE'S SUMMIT DEVELOPMENT ENGINEERING.
- 4. CURB RETURN RADII SHALL BE 30' AT BACK OF CURB UNLESS OTHERWISE NOTED.
- 5. SUBGRADE TO BE COMPACTED TO 95% STANDARD PROCTOR DENSITY.
- 6. ASSUMED DESIGN SPEED = 30 MPH (RESIDENTIAL COLLECTOR).
- 7. MINIMUM STOPPING SIGHT DISTANCE = 200 FEET.
- 8. MINIMUM K, SAG CURVE = 37 (20 WITH LIGHTING), CREST CURVE = 19.
- 9. GRADE INTERSECTIONS TO DRAIN AS SHOWN.
- 10. SSD = STOPPING SIGHT DISTANCE.
- 11. ALL ADA SIDEWALK RAMPS SHALL BE CONSTRUCTED BY THE DEVELOPER WITH THE PUBLIC INFRASTRUCTURE.

MO GRS BENCHMARK:

STATION NAME - JA-90  
KC METRO ALUMINUM GRS DISK SET IN CONCRETE STAMPED "JA-90, 1988"  
LOCATED NEAR THE INTERSECTION OF LANGSFORD ROAD AND OLD LANGSFORD ROAD, 43 FEET SOUTHEAST OF THE CENTER OF LANGSFORD ROAD AND 32 FEET NORTH OF THE CENTER OF OLD LANGSFORD ROAD.  
N:1001052.8503, E:2845604.8272  
ELEV. 997.045

PROJECT BENCHMARK:

"SQUARE" CUT IN TOP OF CONCRETE STORM MANHOLE  
STORM MANHOLE IS LOCATED APPROX. 130 FEET EAST OF THE INTERSECTION OF SE JOEL AVE & BLUE PARKWAY AND 26 FEET SOUTH OF THE CENTERLINE OF BLUE PARKWAY.  
N:996874.9690, E:2840937.1365  
ELEV. 1005.719

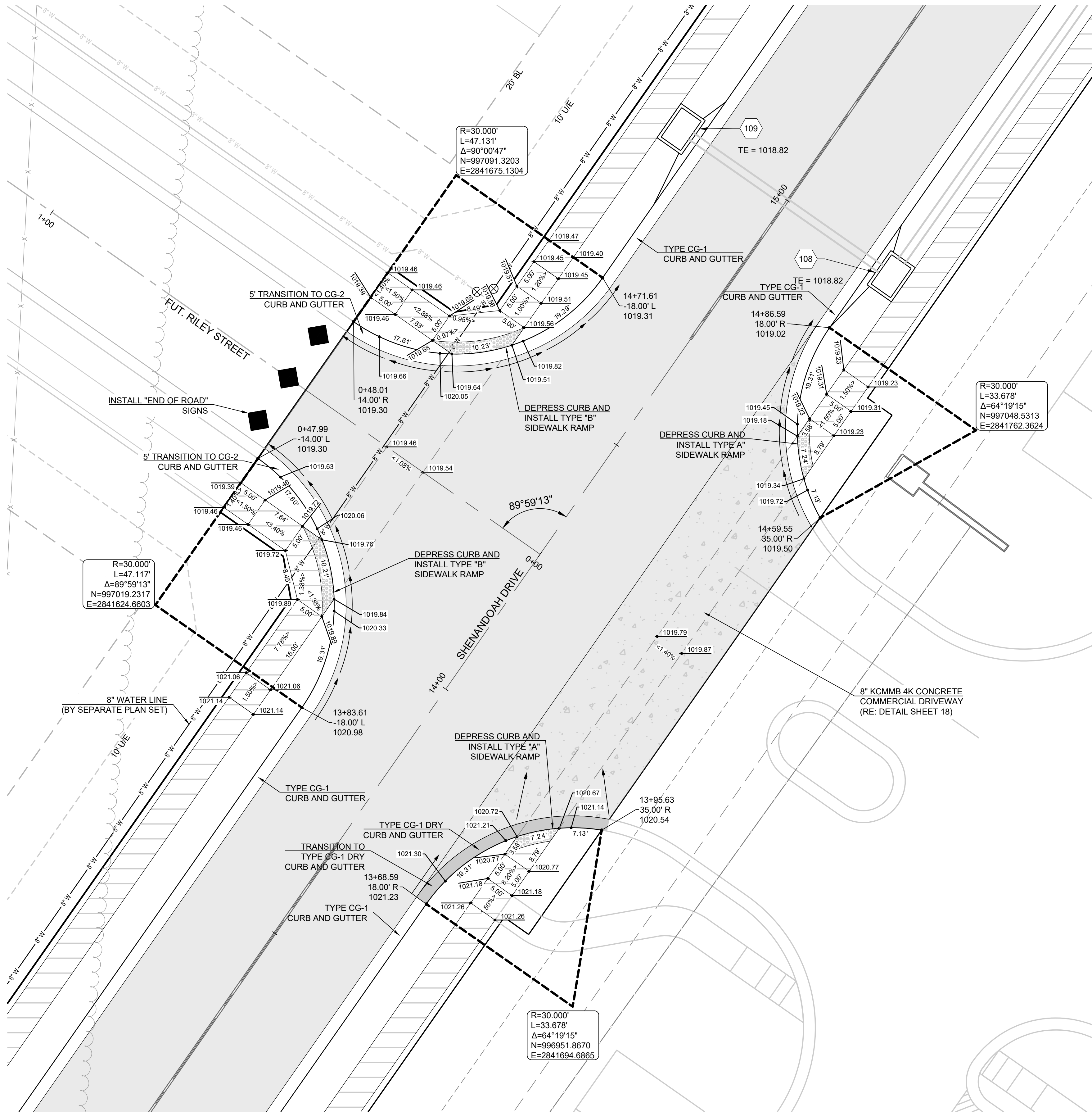


REVISION DATE	DESCRIPTION	PER CITY COMMENTS
01/23/2023	1	
	2	
	3	
	4	
	5	
	6	
	7	
	8	
	9	
	10	

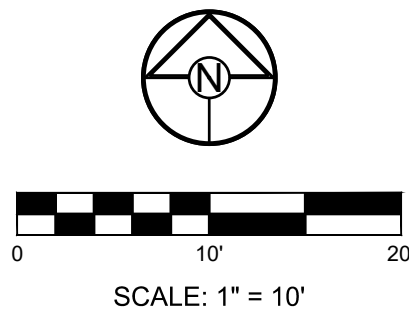
DRAWN BY: ###	CHECKED BY: ###	DATE PREPARED: 11/30/2022	PROJ. NUMBER: 22-102
------------------	--------------------	------------------------------	-------------------------

SCHENANDOAH DRIVE - PLAN & PROFILE





HERITAGE STREET & FUT. RILEY STREET



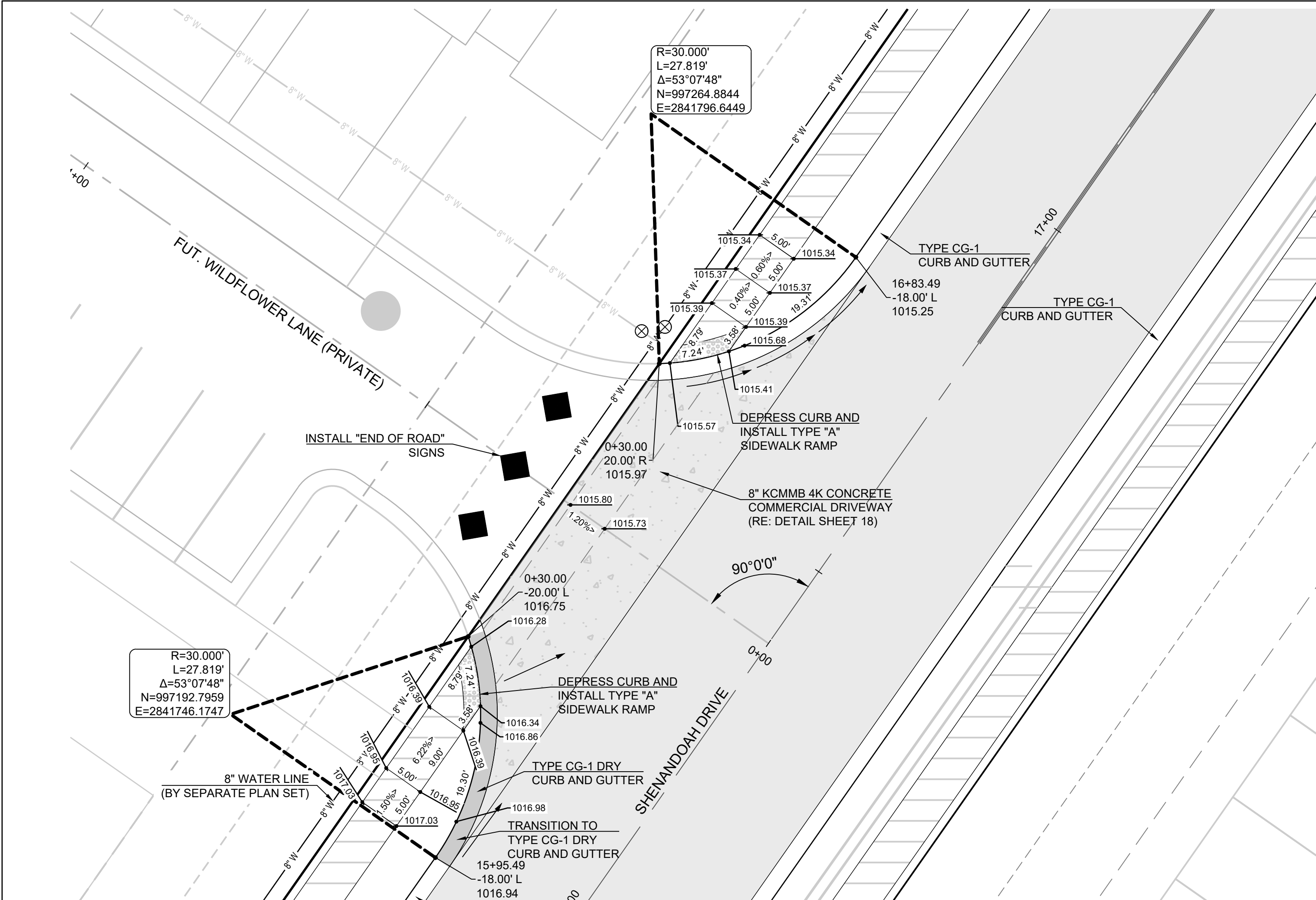
RESIDENCES AT BLACKWELL  
STREET, STORMWATER, MASTER DRAINAGE  
PLAN AND EROSION & SEDIMENT CONTROL  
SE SHENANDOAH DRIVE LEE'S SUMMIT, MO

REVISION	DATE	DESCRIPTION
1	01/23/2023	PER CITY COMMENTS
2		
3		
4		
5		
6		
7		
8		
9		
10		

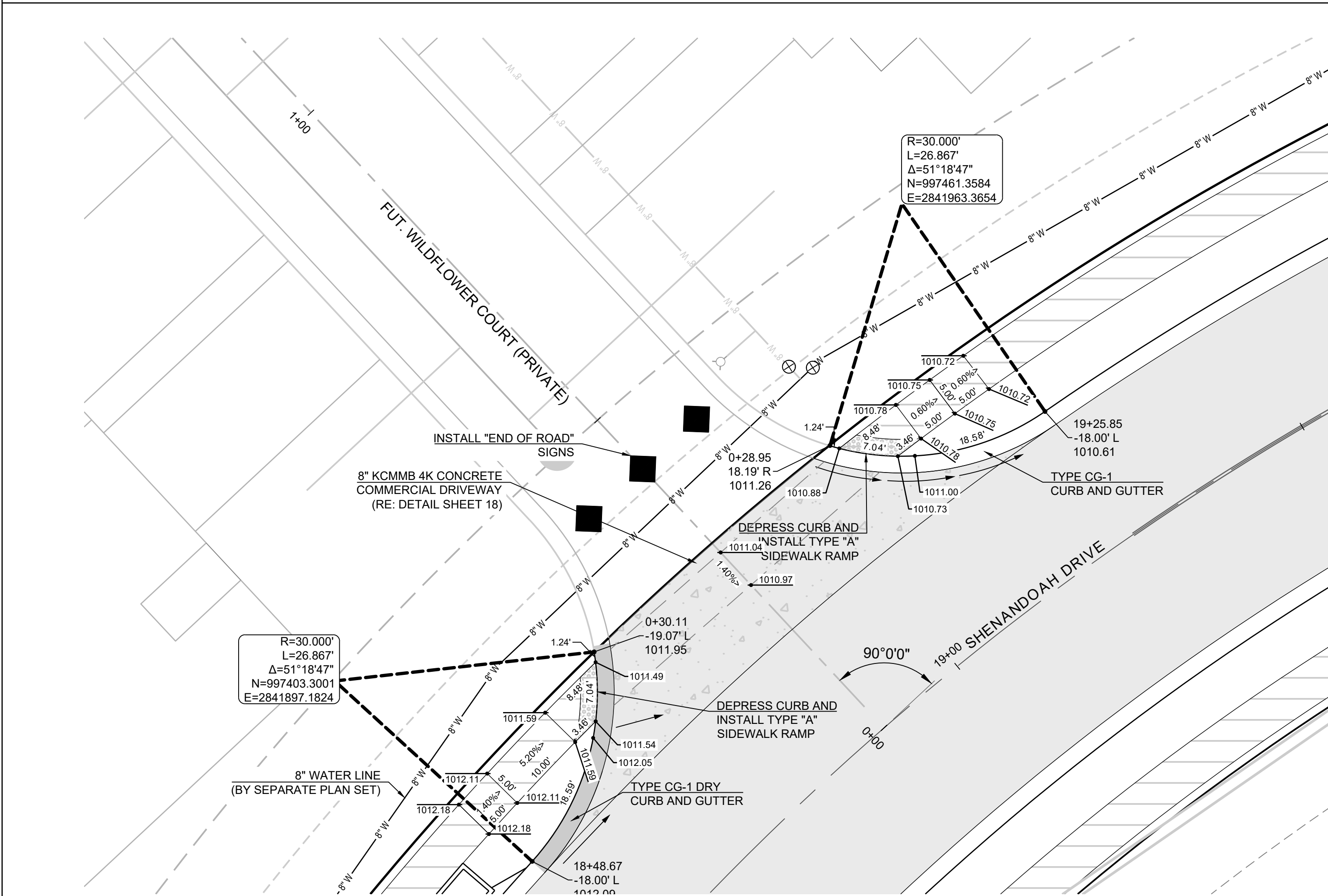
DRAWN BY:	TRC
CHECKED BY:	MAB
DATE PREPARED:	11/30/2022
PROJ. NUMBER:	22-102

INTERSECTION  
DETAILS

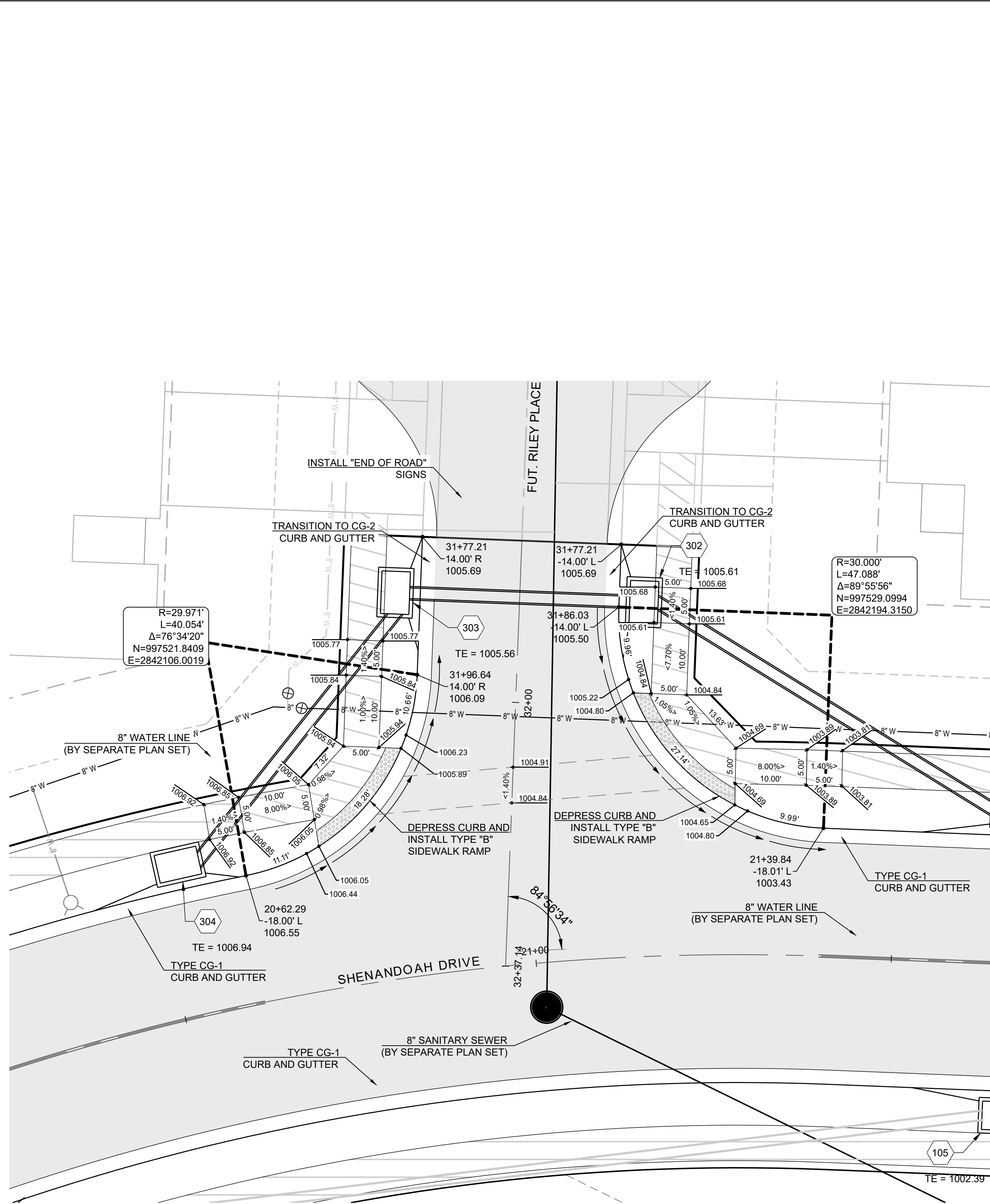




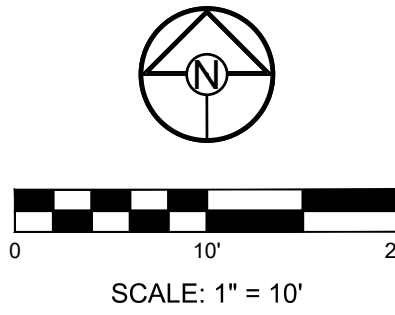
HERITAGE STREET & FUT. WILDFLOWER LANE



HERITAGE STREET & FUT. WILDFLOWER COURT



HERITAGE STREET & FUT. RILEY PLACE



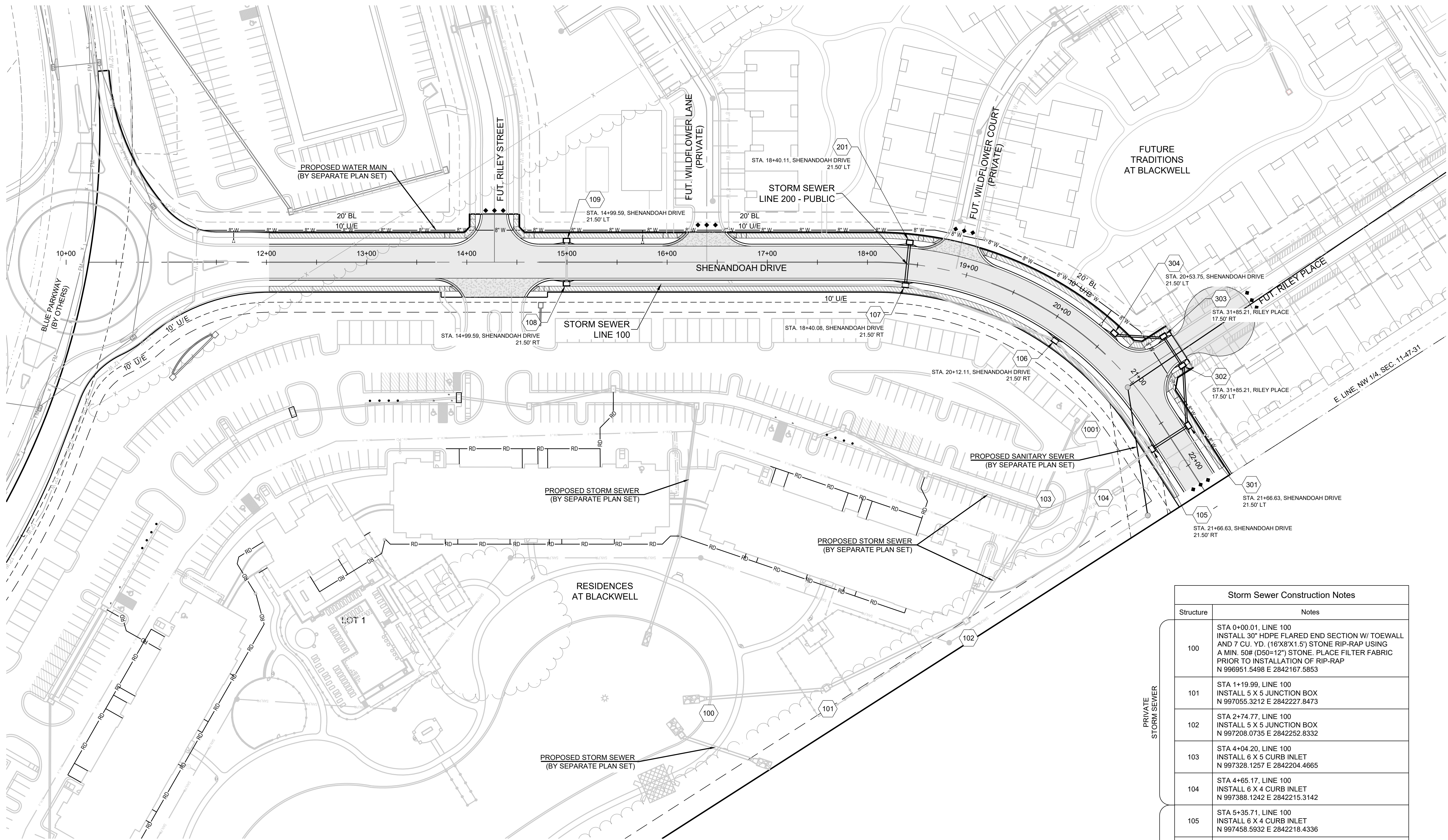
RESIDENCES AT BLACKWELL  
STREET, STORMWATER, MASTER DRAINAGE  
PLAN AND EROSION & SEDIMENT CONTROL  
SE SHENANDOAH DRIVE LEE'S SUMMIT, MO

REVISION	DATE	DESCRIPTION
1	01/23/2023	PER CITY COMMENTS
2		
3		
4		
5		
6		
7		
8		

DRAWN BY:	TRC
CHECKED BY:	MAB
DATE PREPARED:	11/30/2022
PROJ. NUMBER:	22-102

INTERSECTION  
DETAILS





NOTES:

- ALL CONSTRUCTION ON THIS PROJECT SHALL CONFORM TO THE CITY OF LEE'S SUMMIT TECHNICAL SPECIFICATIONS.
- THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL EXISTING UTILITY LOCATIONS PRIOR TO EXCAVATION.

MO GRS BENCHMARK:

STATION NAME - JA-90  
KC METRO ALUMINUM GRS DISK SET IN CONCRETE STAMPED "JA-90, 1988" LOCATED NEAR THE INTERSECTION OF LANGSFORD ROAD AND OLD LANGSFORD ROAD, 43 FEET SOUTHEAST OF THE CENTER OF LANGSFORD ROAD AND 32 FEET NORTH OF THE CENTER OF OLD LANGSFORD ROAD.  
N:1001052.8503, E:2845604.8272

ELEV. 997.045

PROJECT BENCHMARK:

"SQUARE" CUT IN TOP OF CONCRETE STORM MANHOLE  
STORM MANHOLE IS LOCATED APPROX. 130 FEET EAST OF THE INTERSECTION OF SE JOEL AVE & BLUE PARKWAY AND 26 FEET SOUTH OF THE CENTERLINE OF BLUE PARKWAY.  
N:990874.9690, E:2840937.1365

ELEV. 1005.719

Storm Sewer Construction Notes	
Structure	Notes
PRIVATE STORM SEWER	100 STA 0+00.01, LINE 100 INSTALL 30" HDPE FLARED END SECTION W/ TOEWALL AND 7' C.U. YD. (16'X8'X1.5') STONE RIP-RAP USING A MIN. 50# (D50=12") STONE. PLACE FILTER FABRIC PRIOR TO INSTALLATION OF RIP-RAP N 996951.5498 E 2842167.5853
	101 STA 1+19.99, LINE 100 INSTALL 5 X 5 JUNCTION BOX N 997055.3212 E 2842227.8473
	102 STA 2+74.77, LINE 100 INSTALL 5 X 5 JUNCTION BOX N 997208.0735 E 2842252.8332
	103 STA 4+04.20, LINE 100 INSTALL 6 X 5 CURB INLET N 997328.1257 E 2842204.4665
	104 STA 4+65.17, LINE 100 INSTALL 6 X 4 CURB INLET N 997388.1242 E 2842215.3142
PUBLIC STORM SEWER	105 STA 5+35.71, LINE 100 INSTALL 6 X 4 CURB INLET N 997458.5932 E 2842218.4336
	106 STA 6+80.76, LINE 100 INSTALL 6 X 4 CURB INLET N 997441.0920 E 2842074.4403
	107 STA 8+39.99, LINE 100 INSTALL 6 X 4 CURB INLET N 997350.6401 E 2841943.3993
	108 STA 11+78.31, LINE 100 INSTALL 6 X 4 CURB INLET N 997074.3791 E 2841748.1097
	109 STA 12+21.31, LINE 100 INSTALL 6 X 4 CURB INLET N 997099.0406 E 2841712.8846
	201 STA 0+43.02, LINE 200 - PUBLIC INSTALL 6 X 4 CURB INLET N 997378.6818 E 2841910.8017
	301 STA 0+43.00, LINE 300 - PUBLIC INSTALL 6 X 4 CURB INLET N 997501.5598 E 2842220.1297
	302 STA 1+02.95, LINE 300 - PUBLIC INSTALL 6 X 4 CURB INLET N 997530.9285 E 2842167.8656
	303 STA 1+37.95, LINE 300 - PUBLIC INSTALL 6 X 4 CURB INLET N 997532.2676 E 2842132.8913
	304 STA 1+86.96, LINE 300 - PUBLIC INSTALL 6 X 4 CURB INLET N 997493.9804 E 2842102.2912



PREPARED BY:



SCHLAGEL & ASSOCIATES, P.A.

RESIDENCES AT BLACKWELL  
STREET, STORMWATER, MASTER DRAINAGE  
PLAN AND EROSION & SEDIMENT CONTROL  
SE SHENANDOAH DRIVE LEE'S SUMMIT, MO

REVISION DATE	DESCRIPTION	PER CITY COMMENTS
01/23/2023	TRC	
	CHECKED BY: MAB	
	DATE PREPARED: 11/30/2022	
	PROJ. NUMBER: 22-102	

STORM PLAN

SHEET

14



I:\PROJECTS\2022\22-1023.0 Design\3.0 DWG Plans\3.0 SS - STORM.dwg, 15 STORM CALCS, 11

Design Storm: 25  
"K" Value: 1.10  
"F" Factor: 1.00

PRIVATE STORM

LINE 100

101 0.00 0.66 3.90 2.88 7.5 7.73 0.00 24.52 31.42 6.40 0.00 0.00 101 100 HDPE 0.012 30 120.00 0.50 0.50 992.60 992.00 999.50 994.66  
102 0.00 0.66 3.90 2.88 7.1 7.85 0.00 24.89 32.04 6.53 401 1.18 0.78 102 102 HDPE 0.012 30 154.78 0.52 0.50 993.90 993.10 1001.00 995.99  
103 0.27 0.66 3.90 2.88 6.7 7.95 1.56 25.21 32.65 6.65 0.00 0.00 104 103 HDPE 0.012 24 60.97 0.66 0.50 996.01 995.60 1007.82 997.85  
104 0.90 0.66 2.45 1.93 6.6 8.00 5.22 16.95 19.91 6.34 301 0.48 0.63 105 104 HDPE 0.012 24 70.54 0.71 0.75 997.01 996.51 1002.39 998.50  
105 0.09 0.66 1.55 1.33 6.4 8.05 0.53 11.81 20.65 6.57 201 0.00 0.00 106 105 HDPE 0.012 15 145.05 1.90 0.50 1000.51 997.76 1008.41 1001.73  
106 0.22 0.66 0.98 0.65 6.1 8.15 1.30 5.80 9.63 7.85 0.23 0.15 107 106 HDPE 0.012 15 159.23 3.10 0.50 1005.93 1001.01 1012.31 1006.99  
107 0.23 0.66 0.76 0.50 5.8 8.24 1.38 4.55 12.31 10.03 0.00 0.00 108 107 HDPE 0.012 15 338.32 1.99 0.50 1013.18 1006.43 1018.82 1013.82  
108 0.15 0.66 0.30 0.20 5.1 8.48 0.92 1.85 9.88 8.05 0.00 0.00 109 108 RCP 0.013 15 43.00 1.00 N/A 1014.11 1013.68 1018.82 1014.56  
109 0.15 0.66 0.15 0.10 5.0 8.53 0.93 0.93 6.46 5.26 0.00 0.00 201 107 RCP 0.013 15 43.00 1.00 N/A 1006.86 1006.43 1012.31 1007.42

PUBLIC STORM

LINE 200

201 0.23 0.66 0.23 0.15 5.0 8.53 1.42 1.42 6.46 5.26 0.00 0.00 201 107 RCP 0.013 15 43.00 1.00 N/A 1006.86 1006.43 1012.31 1007.42

LINE 300

301 0.15 0.66 0.48 0.63 5.1 8.48 0.92 5.85 7.94 6.47 0.00 0.00 301 105 RCP 0.013 15 43.00 1.51 0.50 998.41 997.76 1002.39 999.63  
302 0.33 0.66 0.33 0.53 5.0 8.53 2.04 4.95 8.57 6.98 0.00 0.00 302 301 HDPE 0.012 15 59.95 1.50 0.50 999.81 998.91 1005.55 1000.92  
303 0.29 0.66 0.29 0.31 5.0 8.53 1.80 2.91 8.37 6.82 0.00 0.00 303 302 HDPE 0.012 15 35.00 1.43 0.50 1000.81 1000.31 1005.56 1001.63  
304 0.18 0.66 1.36 0.12 5.3 8.41 1.10 1.10 8.37 6.82 0.00 0.00 304 303 HDPE 0.012 15 49.01 1.43 N/A 1002.01 1001.31 1006.94 1002.49

LINE 400

401 0.29 0.66 1.18 0.78 5.2 8.47 1.78 7.25 13.61 11.09 0.00 0.00 401 103 HDPE 0.012 15 113.50 3.78 0.50 1000.64 996.35 1011.94 1002.04  
402 0.60 0.66 0.89 0.59 5.0 8.51 3.71 5.50 15.90 12.95 0.00 0.00 402 401 HDPE 0.012 15 98.48 5.16 0.50 1006.23 1001.14 1012.47 1007.41  
403 0.29 0.66 0.29 0.19 5.0 8.53 1.80 1.80 12.81 10.44 0.00 0.00 403 402 HDPE 0.012 15 29.41 3.35 N/A 1007.71 1006.73 1013.19 1008.34

LINE 500

501 0.00 0.66 3.35 2.21 6.0 8.17 0.00 19.88 32.42 10.32 0.00 0.00 501 500 HDPE 0.012 24 95.00 1.75 0.50 996.66 995.00 1003.41 998.69  
502 0.39 0.66 3.35 2.21 5.9 8.21 2.32 19.96 68.88 21.93 0.00 0.00 502 501 HDPE 0.012 24 130.82 7.90 0.50 1007.50 997.16 1014.83 1009.53  
503 0.24 0.66 2.96 1.95 5.8 8.27 1.44 17.76 25.11 7.99 0.00 0.00 503 502 HDPE 0.012 24 84.77 1.05 0.50 1008.89 1008.00 1015.55 1010.78  
504 0.34 0.66 2.72 1.80 5.6 8.33 2.06 16.45 24.51 7.80 0.00 0.00 504 503 HDPE 0.012 24 85.59 1.00 0.50 1010.24 1009.39 1015.36 1012.05  
505 0.81 0.66 2.38 1.57 5.4 8.38 4.93 14.48 24.51 7.80 0.00 0.00 505 504 HDPE 0.012 24 70.28 1.00 0.50 1011.45 1010.74 1016.56 1013.13  
506 1.57 0.66 1.57 1.04 5.0 8.53 9.72 9.72 11.38 6.44 0.00 0.00 506 505 HDPE 0.012 18 163.59 1.00 N/A 1013.58 1011.95 1018.71 1015.10

LINE 600

601 0.00 0.66 8.09 5.34 5.8 8.26 0.00 48.50 70.43 9.96 0.00 0.00 601 600 HDPE 0.012 36 95.00 0.95 2.20 996.60 994.70 1008.99 998.43  
602 0.00 0.66 8.09 5.34 5.7 8.28 0.00 48.61 76.21 24.26 701 801 6.21 4.10 602 601 HDPE 0.012 24 78.57 9.67 0.75 1005.40 997.80 1021.23 1009.26  
603 1.20 0.66 1.88 1.24 5.6 8.31 7.24 11.35 17.23 14.04 0.00 0.00 603 602 HDPE 0.012 15 94.25 6.06 0.50 1011.86 1008.15 1019.78 1013.78  
604 0.68 0.66 0.88 0.45 5.0 8.53 4.21 4.21 7.54 6.14 0.00 0.00 604 603 HDPE 0.012 15 227.50 1.16 N/A 1015.00 1012.36 1019.06 1016.02

LINE 700

701 0.58 0.66 0.86 0.57 5.3 8.42 3.54 5.26 17.01 13.86 0.00 0.00 701 602 HDPE 0.012 15 166.79 5.91 0.50 1016.01 1006.15 1021.46 1017.16  
702 0.28 0.66 0.28 0.18 5.0 8.53 1.73 1.73 6.89 5.62 0.00 0.00 702 701 HDPE 0.012 15 107.00 0.97 N/A 1017.55 1016.51 1021.34 1018.17

LINE 800

801 0.12 0.66 5.35 3.53 5.1 8.50 0.74 33.00 34.22 10.89 0.00 0.00 801 602 HDPE 0.012 24 163.48 1.95 0.50 1009.09 1005.90 1020.82 1013.08  
802 5.23 0.66 5.23 3.45 5.0 8.53 32.39 32.39 34.49 10.98 0.00 0.00 802 801 HDPE 0.012 24 61.13 1.98 N/A 1010.80 1009.59 1019.00 1014.98

LINE 1000

1001 0.10 0.51 0.10 0.05 5.0 8.53 0.48 0.48 19.34 15.76 0.00 0.00 1001 103 HDPE 0.012 15 100.16 7.64 N/A 1004.01 996.35 1008.00 1004.32

Design Storm: 100  
"K" Value: 1.25  
"F" Factor: 1.00

PRIVATE STORM

LINE 100

101 0.00 0.66 3.90 2.88 7.5 9.39 0.00 33.85 31.42 6.40 0.00 0.00 101 100 HDPE 0.012 30 120.00 0.50 0.50 992.60 992.00 999.50 994.66  
102 0.00 0.66 3.90 2.88 7.1 9.53 0.00 34.35 32.04 6.53 401 1.18 0.78 103 102 HDPE 0.012 30 154.78 0.52 0.50 993.90 993.10 1001.00 995.99  
103 0.27 0.66 3.90 2.88 6.7 9.64 2.15 34.77 32.65 6.65 0.00 0.00 104 103 HDPE 0.012 24 60.97 0.66 0.50 996.01 995.60 1007.82 997.85  
104 0.90 0.66 2.45 1.93 6.6 9.70 7.20 23.37 19.91 6.34 301 0.48 0.63 105 104 HDPE 0.012 24 70.54 0.71 0.75 997.01 996.51 1002.39 998.50  
105 0.09 0.66 1.55 1.33 6.4 9.77 0.73 16.28 20.65 6.57 201 0.00 0.00 106 105 HDPE 0.012 15 145.05 1.90 0.50 1000.51 997.76 1008.41 1001.73  
106 0.22 0.66 0.98 0.65 6.1 9.88 1.79 7.99 9.63 7.85 0.23 0.15 107 106 HDPE 0.012 15 159.23 3.10 0.50 1005.93 1001.01 1012.31 1006.99  
107 0.23 0.66 0.76 0.50 5.8 9.99 1.89 6.26 12.31 10.03 0.00 0.00 108 107 HDPE 0.012 15 338.32 1.99 0.50 1013.18 1006.43 1018.82 1013.82  
108 0.15 0.66 0.30 0.20 5.1 10.27 1.27 2.54 9.88 8.05 0.00 0.00 109 108 RCP 0.013 15 43.00 1.00 N/A 1014.11 1013.68 1018.82 1014.56  
109 0.15 0.66 0.15 0.10 5.0 10.32 1.28 1.28 6.46 5.26 0.00 0.00 201 107 RCP 0.013 15 43.00 1.00 N/A 1006.86 1006.43 1012.31 1007.42

PUBLIC STORM

LINE 200

201 0.23 0.66 0.23 0.15 5.0 10.32 1.96 1.96 6.46 5.26 0.00 0.00 201 107 RCP 0.013 15 43.00 1.00 N/A 1006.86 1006.43 1012.31 1007.42

LINE 300

301 0.15 0.66 0.48 0.63 5.1 10.26 1.27 8.04 7.94 6.47 0.00 0.00 301 105 RCP 0.013 15 43.00 1.51 0.50 998.41 997.76 1002.39 999.63  
302 0.33 0.66 0.33 0.53 5.0 10.32 2.81 6.81 8.57 6.98 0.00 0.00 302 301 HDPE 0.012 15 59.95 1.50 0.50 999.81 998.91 1005.55 1000.92  
303 0.29 0.66 0.29 0.31 5.0 10.32 2.47 4.00 8.37 6.82 0.00 0.00 303 302 HDPE 0.012 15 35.00 1.43 0.50 1000.81 1000.31 1005.56 1001.63  
304 0.18 0.66 1.36 0.12 5.3 10.18 1.51 1.51 8.37 6.82 0.00 0.00 304 303 HDPE 0.012 15 49.01 1.43 N/A 1002.01 1001.31 1006.94 1002.49

LINE 400

401 0.29 0.66 1.18 0.78 5.2 10.25 2.45 9.98 13.61 11.09 0.00 0.00 401 103 HDPE 0.012 15 113.50 3.78 0.50 1000.64 996.35 1011.94 1002.04  
402 0.60 0.66 0.89 0.59 5.0 10.30 5.10 7.57 15.90 12.95 0.00 0.00 402 401 HDPE 0.012 15 98.48 5.16 0.50 1006.23 1001.14 1012.47 1007.41  
403 0.29 0.66 0.29 0.19 5.0 10.32 2.47 2.47 12.81 10.44 0.00 0.00 403 402 HDPE 0.012 15 29.41 3.35 N/A 1007.71 1006.73 1013.19 1008.34

LINE 500

501 0.00 0.66 3.35 2.21 6.0 9.91 0.00 27.39 32.42 10.32 0.00 0.00 501 500 HDPE 0.012 24 95.00 1.75 0.50 996.66 995.00 1003.41 998.69  
502 0.39 0.66 3.35 2.21 5.9 9.95 3.20 27.49 68.88 21.93 0.00 0.00 502 501 HDPE 0.012 24 130.82 7.90 0.50 1007.50 997.16 1014.83 1009.53  
503 0.24 0.66 2.96 1.95 5.8 10.02 1.98 24.46 25.11 7.99 0.00 0.00 503 502 HDPE 0.012 24 84.77 1.05 0.50 1008.89 1008.00 1015.55 1010.78  
504 0.34 0.66 2.72 1.80 5.6 10.09 2.83 22.64 24.51 7.80 0.00 0.00 504 503 HDPE 0.012 24 85.59 1.00 0.50 1010.24 1009.39 1015.36 1012.05  
505 0.81 0.66 2.38 1.57 5.4 10.15 6.78 19.93 24.51 7.80 0.00 0.00 505 504 HDPE 0.012 24 70.28 1.00 0.50 1011.45 1010.74 1016.56 1013.13  
506 1.57 0.66 1.57 1.04 5.0 10.32 13.37 13.37 11.38 6.44 0.00 0.00 506 505 HDPE 0.012 18 163.59 1.00 N/A 1013.58 1011.95 1018.71 1015.10

LINE 600

601 0.00 0.66 8.09 5.34 5.8 10.01 0.00 66.79 70.43 9.96 0.00 0.00 601 600 HDPE 0.012 36 95.00 0.95 2.20 996.60 994.70 1008.99 998.43  
602 0.00 0.66 8.09 5.34 5.7 10.03 0.00 66.93 76.21 24.26 701 801 6.21 4.10 602 601 HDPE 0.012 24 78.57 9.67 0.75 1005.40 997.80 1021.23 1009.26  
603 1.20 0.66 1.88 1.24 5.6 10.07 9.97 15.62 17.23 14.04 0.00 0.00 603 602 HDPE 0.012 15 94.25 6.06 0.50 1011.86 1008.15 1019.78 1013.78  
604 0.68 0.66 0.88 0.45 5.0 10.32 5.79 5.79 7.54 6.14 0.00 0.00 604 603 HDPE 0.012 15 227.50 1.16 N/A 1015.00 1012.36 1019.06 1016.02

LINE 700

701 0.58 0.66 0.86 0.57 5.3 10.19 4.88 7.23 17.01 13.86 0.00 0.00 701 602 HDPE 0.012 15 166.79 5.91 0.50 1016.01 1006.15 1021.46 1017.16  
702 0.28 0.66 0.28 0.18 5.0 10.32 2.38 2.38 6.89 5.62 0.00 0.00 702 701 HDPE 0.012 15 107.00 0.97 N/A 1017.55 1016.51 1021.34 1018.17

LINE 800

801 0.12 0.66 5.35 3.53 5.1 10.28 1.02 45.39 34.22 10.89 0.00 0.00 801 602 HDPE 0.012 24 163.48 1.95 0.50 1009.09 1005.90 1020.82 1013.08  
802 5.23 0.66 5.23 3.45 5.0 10.32 44.54 44.54 34.49 10.98 0.00 0.00 802 801 HDPE 0.012 24 61.13 1.98 N/A 1010.80 1009.59 1019.00 1014.98

LINE 1000

1001 0.10 0.51 0.10 0.05 5.0 10.32 0.66 0.66 19.34 15.76 0.00 0.00 1001 103 HDPE 0.012 15 100.16 7.64 N/A 1004.01 996.35 1008.00 1004.32

GUTTER SPREAD AND INLET CAPACITY CALCULATIONS - RESIDENCES AT BLACKWELL

DESIGN STORM 10  
"K" FACTOR 1.00

CURB TYPE "A" = LAZY BACK  
CURB TYPE "B" = HIGH BACK

RUNOFF CALCULATIONS												INLET DESIGN					GUTTER DESIGN					
INLET #	COMPOSITE "C"	AREA	INLET Tc	INTENSITY	RUNOFF	UPSTREAM INLET	UPSTREAM INLET	UPSTREAM INLET	UPSTREAM INLET	BYPASS FROM UPSTREAM INLET	TOTAL RUNOFF	STREET GRADE	STREET CROSS SLOPE	CURB TYPE	INLET LENGTH	EFFECTIVE LENGTH 80% CAP	INLET INTERCEPTION	BYPASS TO DOWNSTREAM INLET	STREET GRADE	STREET CROSS SLOPE	DEPTH AT CURB	SPREAD OF FLOW
LINE 1																						
101	0.66	0.00	5	7.35	0.00					0.00	0.00	N/A	N/A	B	6	4.8	N/A	N/A	N/A	N/A	N/A	N/A
102	0.66	0.00	5	7.35	0.00					0.00	0.00	N/A	N/A	B	6	4.8	N/A	N/A	N/A	N/A	N/A	N/A
103	0.66	0.27	5	7.35	1.31	103				0.00	1.31	SUMP	N/A	B	6	4.8	12.00	0.00	SUMP	N/A	< 0.21	< 10.50
104	0.66	0.90	5	7.35	4.37	105				0.00	4.37	SUMP	2.08	B	6	4.8	12.00	0.00	SUMP	2.08	< 0.21	< 10.50
105	0.66	0.10	5	7.35	0.49	106	301			0.03	0.52	3.87	2.08	B	8	6.4	0.52	0.00	3.87	2.08	0.08	4.56
106	0.66	0.23	5	7.35	1.12	107				0.01	1.13	3.87	2.08	B	6	4.8	1.09	0.03	3.87	2.08	0.11	5.93
107	0.66	0.23	5	7.35	1.12	108	201			0.01	1.13	1.91	2.08	B	6	4.8	1.12	0.01	1.91	2.08	0.13	6.70
108	0.66	0.15	5	7.35	0.73	109				0.00	0.73	1.91	2.08	B	6	4.8	0.73	0.00	1.91	2.08	0.11	5.76
109	0.66	0.15	5	7.35	0.73					0.00	0.73	1.91	2.08	B	6	4.8	0.73	0.00	1.91	2.08	0.11	5.76
LINE 2																						
201	0.66	0.23	5	7.35	1.12					0.00	1.12	1.91	2.08	B	6	4.8	1.11	0.01	1.91	2.08	0.13	6.67
LINE 3																						
301	0.66	0.04	5	7.35	0.19	302				0.07	0.26	3.87	2.08	B	6	4.8	0.26	0.00	3.87	2.08	0.07	3.63
302	0.66	0.28	5	7.35	1.36					0.00	1.36	3.87	2.08	B	6	4.8	1.29	0.07	3.87	2.08	0.12	6.32

NOTES:

1. CAPACITY OF INLETS ON GRADE DETERMINED USING ROUTINE OUTLINED ON PGS 56-95 TO 56-97, SECTION 5600 APWA

2. CAPACITY OF SUMP INLETS CALCULATED USING FIGURE 5604-21, SECTION 5600 APWA

3. MANNINGS "n" VALUE FOR COMBINED ASPHALT PAVEMENT AND CONCRETE CURB = 0.014

ENGINEERS

PLANNERS

SURVEYORS

LANDSCAPE ARCHITECTS

14920 West 107th Street • Lenexa, Kansas 66215

(913) 492-5158 • Fax: (913) 492-8400

WWW.SCHLAGELASSOCIATES.COM

Missouri State Certificates of Authority

#E2002003600-F #LAC2001005237 #LS2002008659-F

PREPARED BY:

STATE OF MISSOURI

MARK ALLEN BREUER

REGISTERED PROFESSIONAL ENGINEER

RE-2005007268

EXPIRES 08-28-2023

SCHLAGEL & ASSOCIATES, P.A.

RESIDENCES AT BLACKWELL STREET, STORMWATER, MASTER DRAINAGE PLAN AND EROSION & SEDIMENT CONTROL SE SHENANDOAH DRIVE LEE'S SUMMIT, MO

DRAWN BY: TRC

CHECKED BY: MAB

DATE PREPARED: 11/30/2022

PROJ. NUMBER: 22-102

REVISION DATE: 01/23/2023

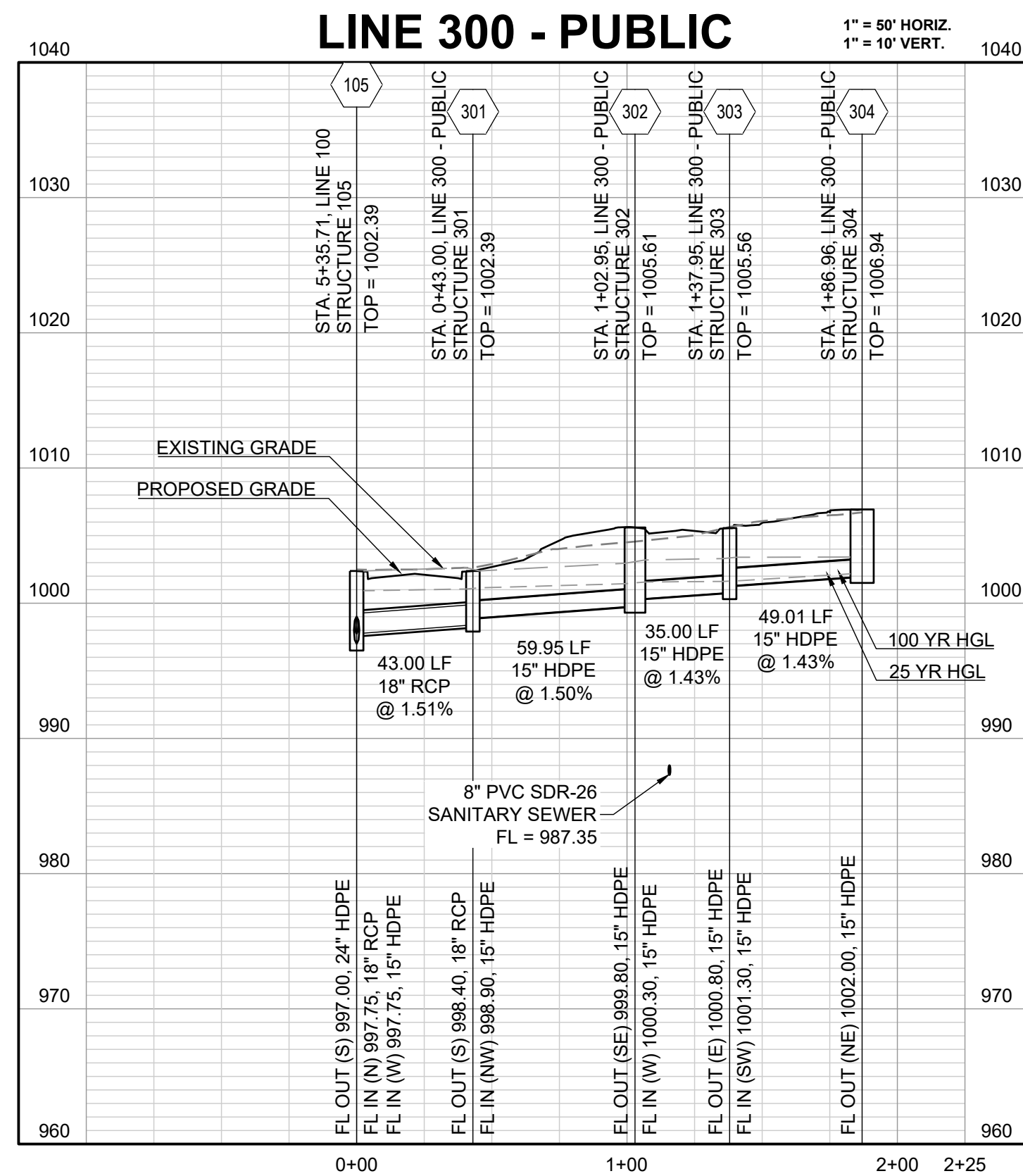
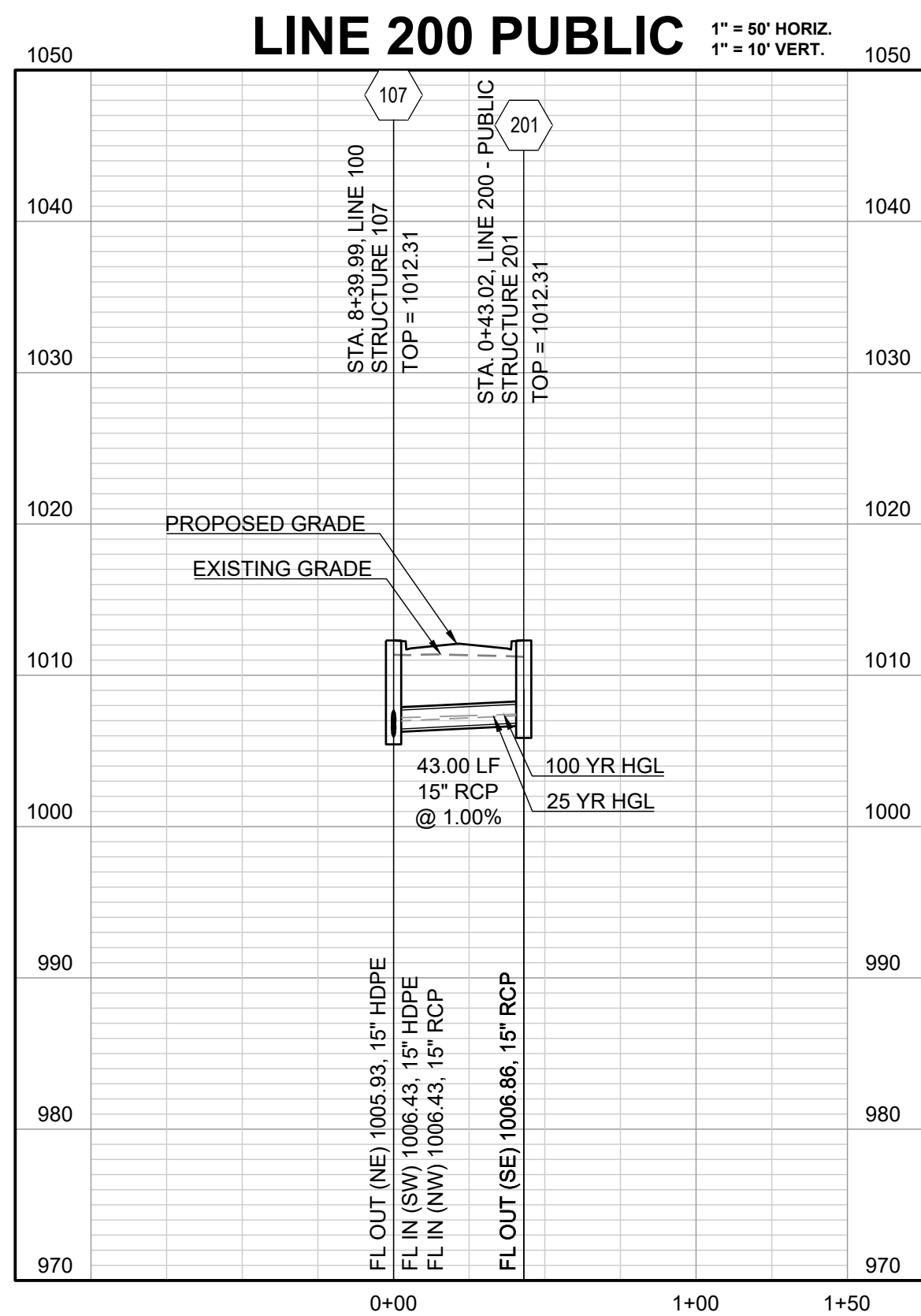
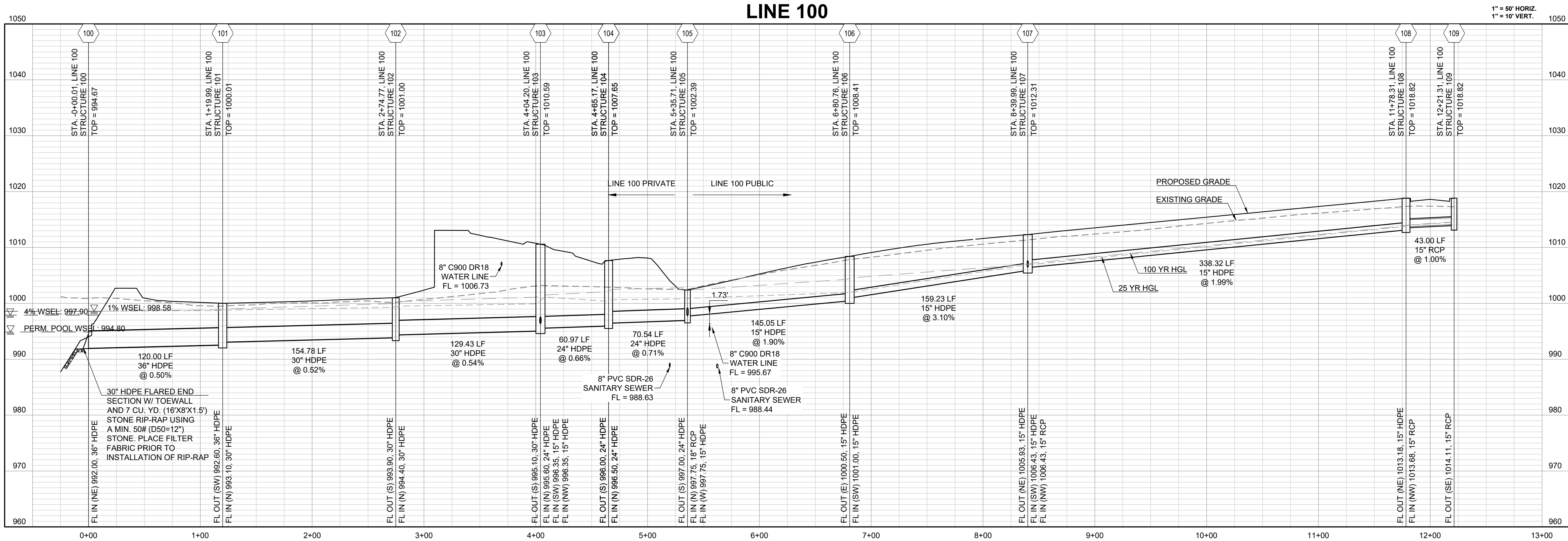
PER CITY COMMENTS

DESCRIPTION

STORM CALCS

SHEET 15





PREPARED BY:



SCHLAGEL & ASSOCIATES, P.A.

RESIDENCES AT BLACKWELL  
STREET, STORMWATER, MASTER DRAINAGE  
PLAN AND EROSION & SEDIMENT CONTROL  
SE SHENANDOAH DRIVE LEE'S SUMMIT, MO

REVISION DATE	DESCRIPTION	PER CITY COMMENTS
01/23/2023	TRC	
	CHECKED BY: MAB	
	DATE PREPARED: 11/30/2022	
	PROJ. NUMBER: 22-102	

STORM  
PROFILES

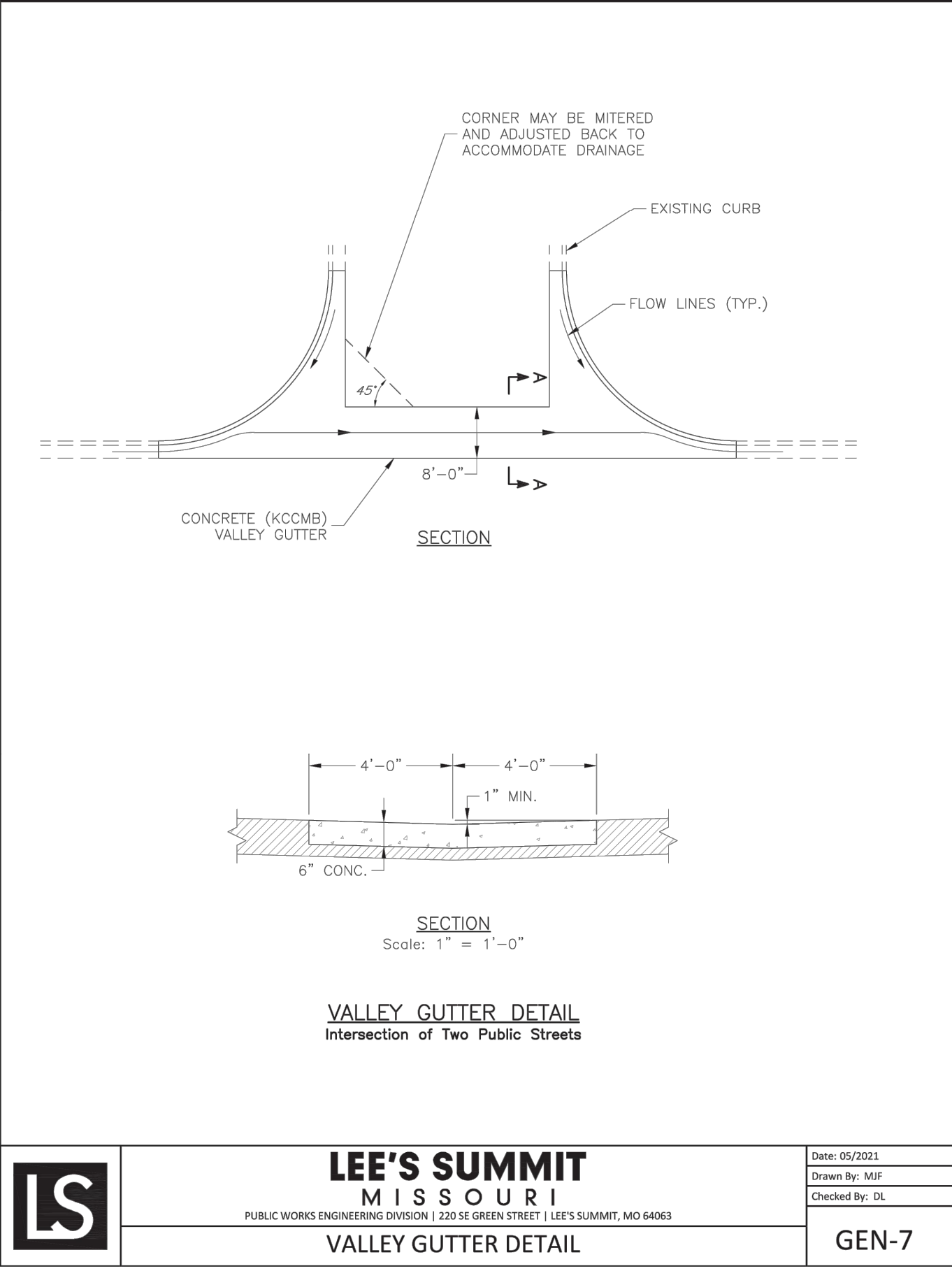
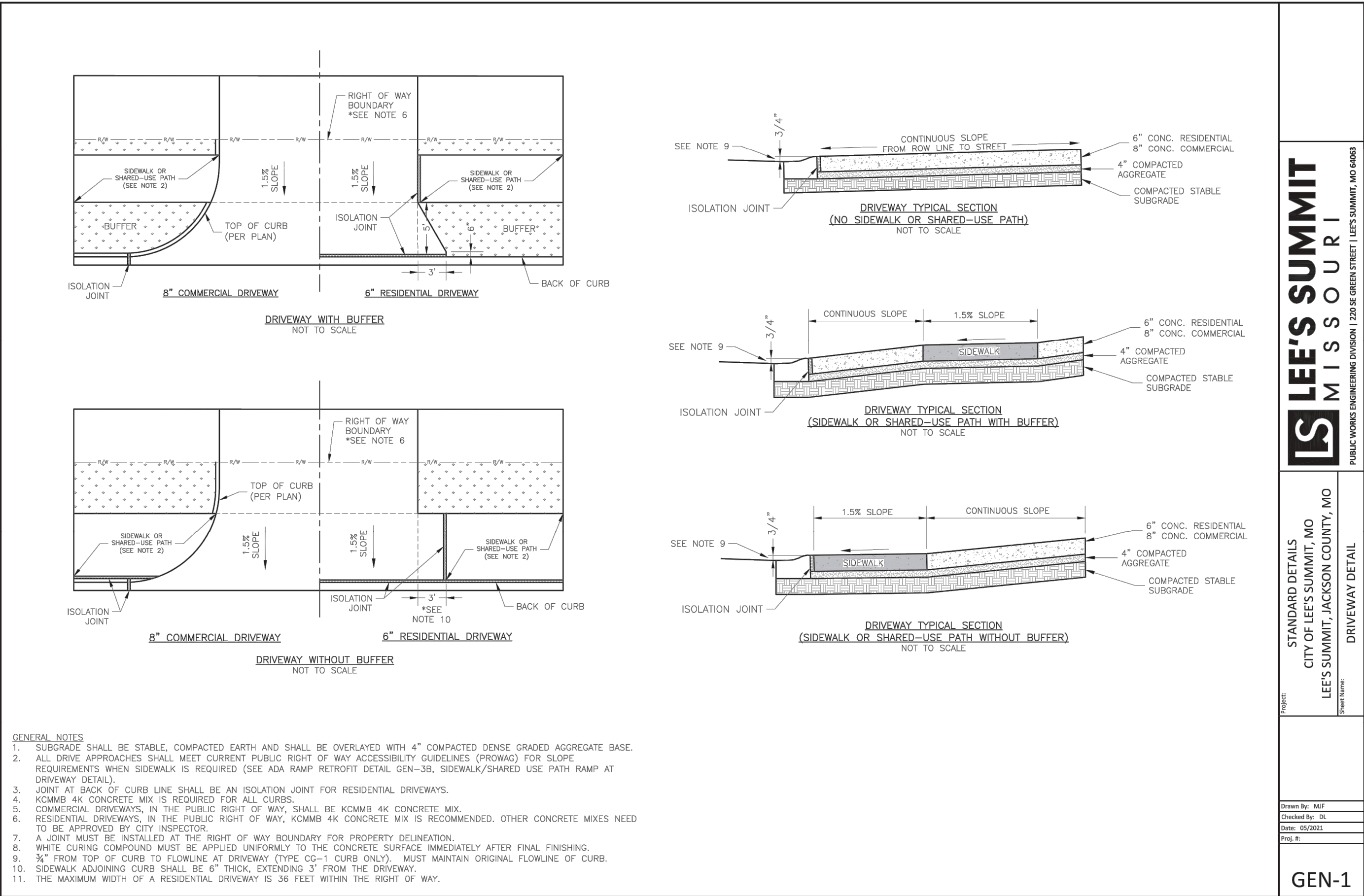
SHEET

16









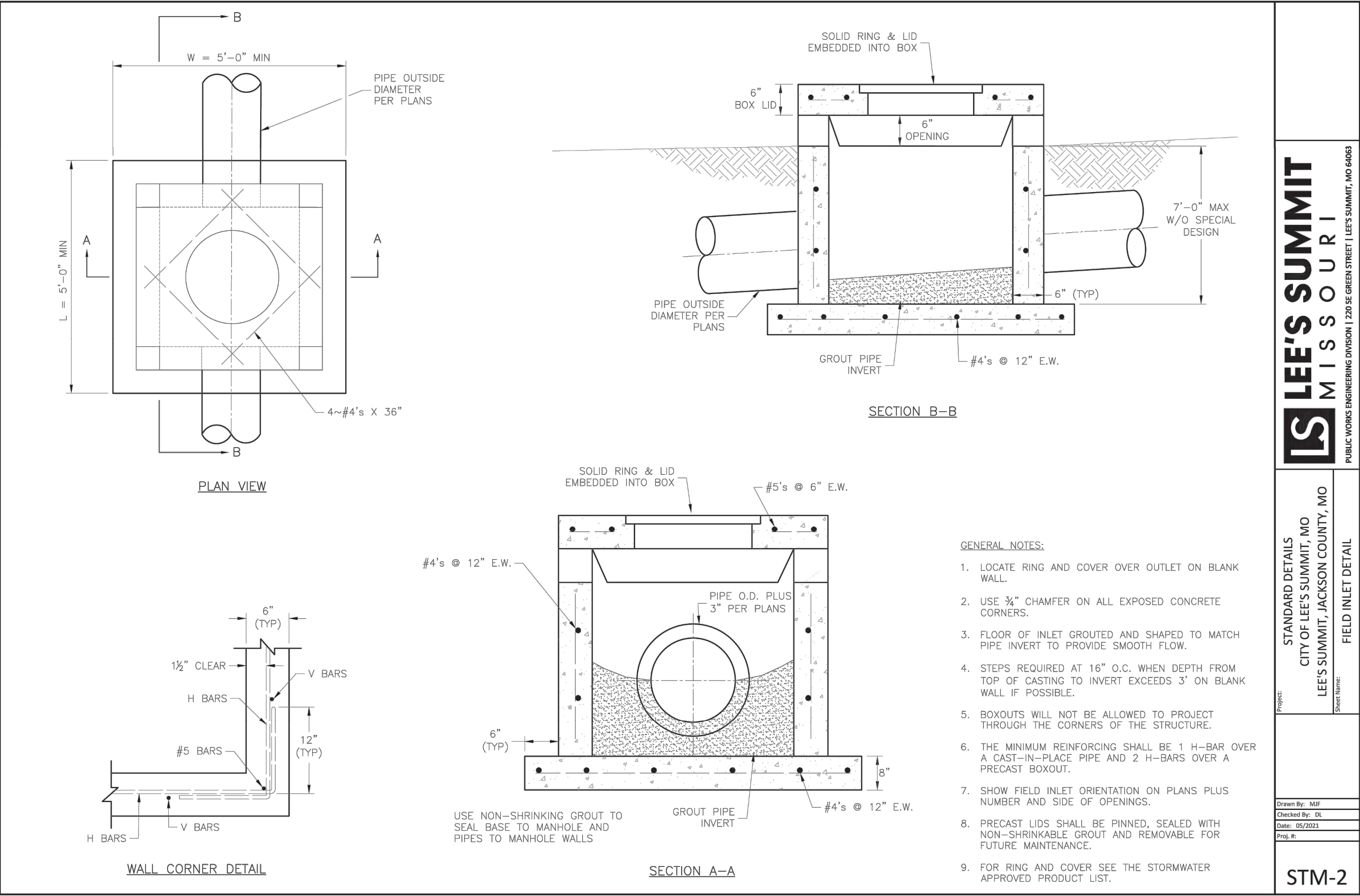
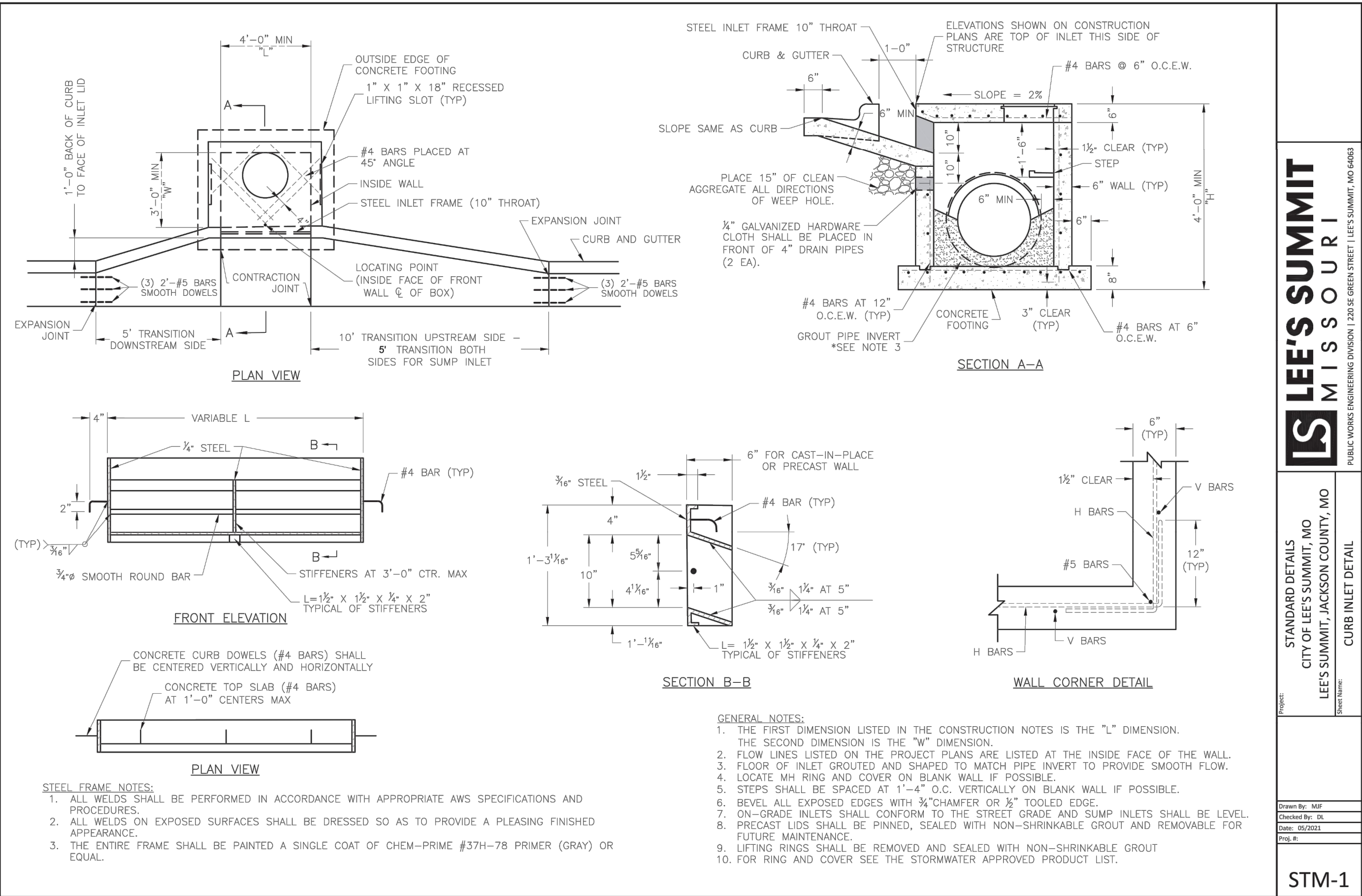
RESIDENCES AT BLACKWELL  
STREET, STORMWATER, MASTER DRAINAGE  
PLAN AND EROSION & SEDIMENT CONTROL  
SE SHENANDOAH DRIVE LEE'S SUMMIT, MO

REVISION DATE	DESCRIPTION
1 01/23/2023	PER CITY COMMENTS
2	
3	
4	
5	
6	
7	
8	

DRAWN BY:	TRC
CHECKED BY:	MAB
DATE PREPARED:	11/30/2022
PROJ. NUMBER:	22-102

STREET DETAILS



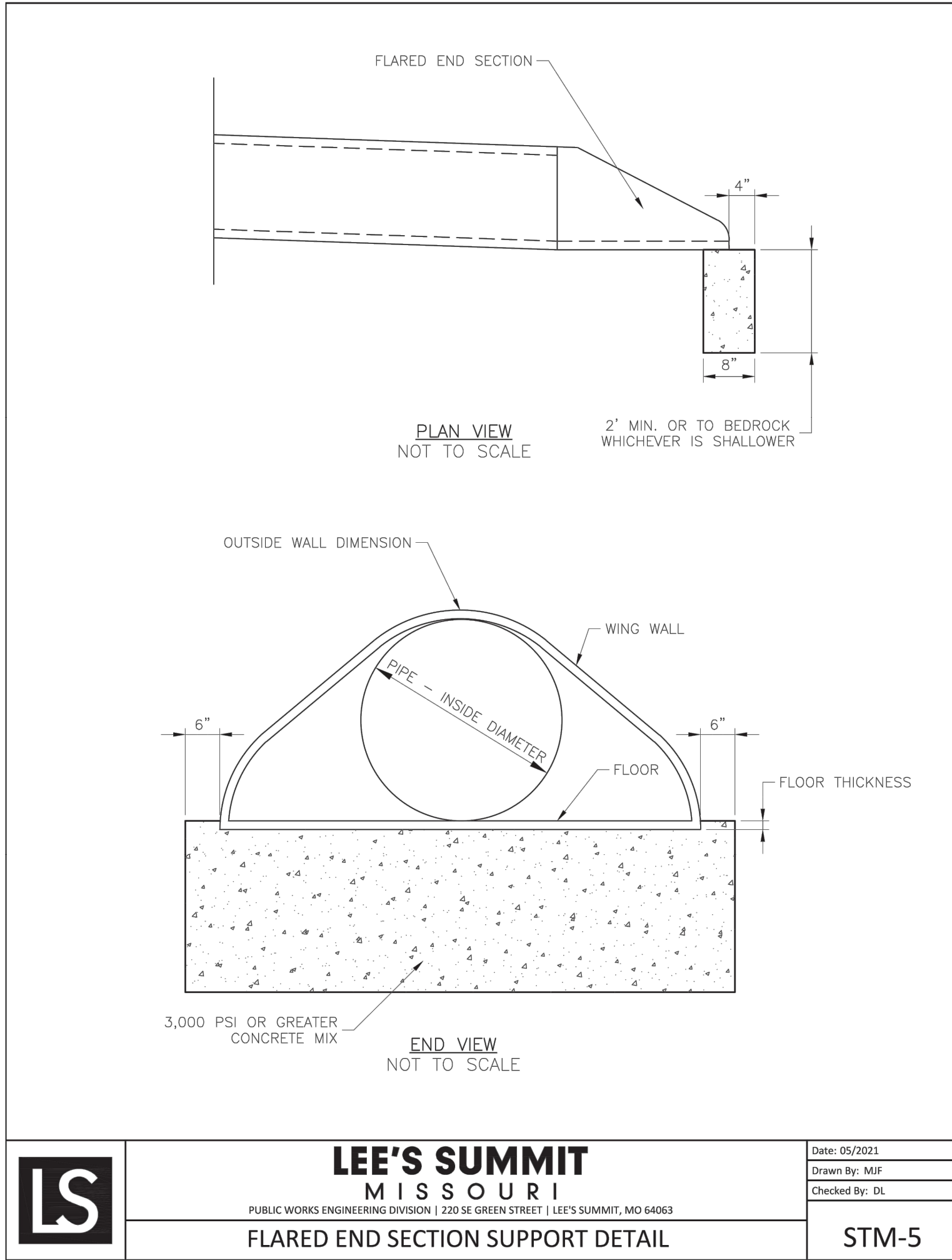
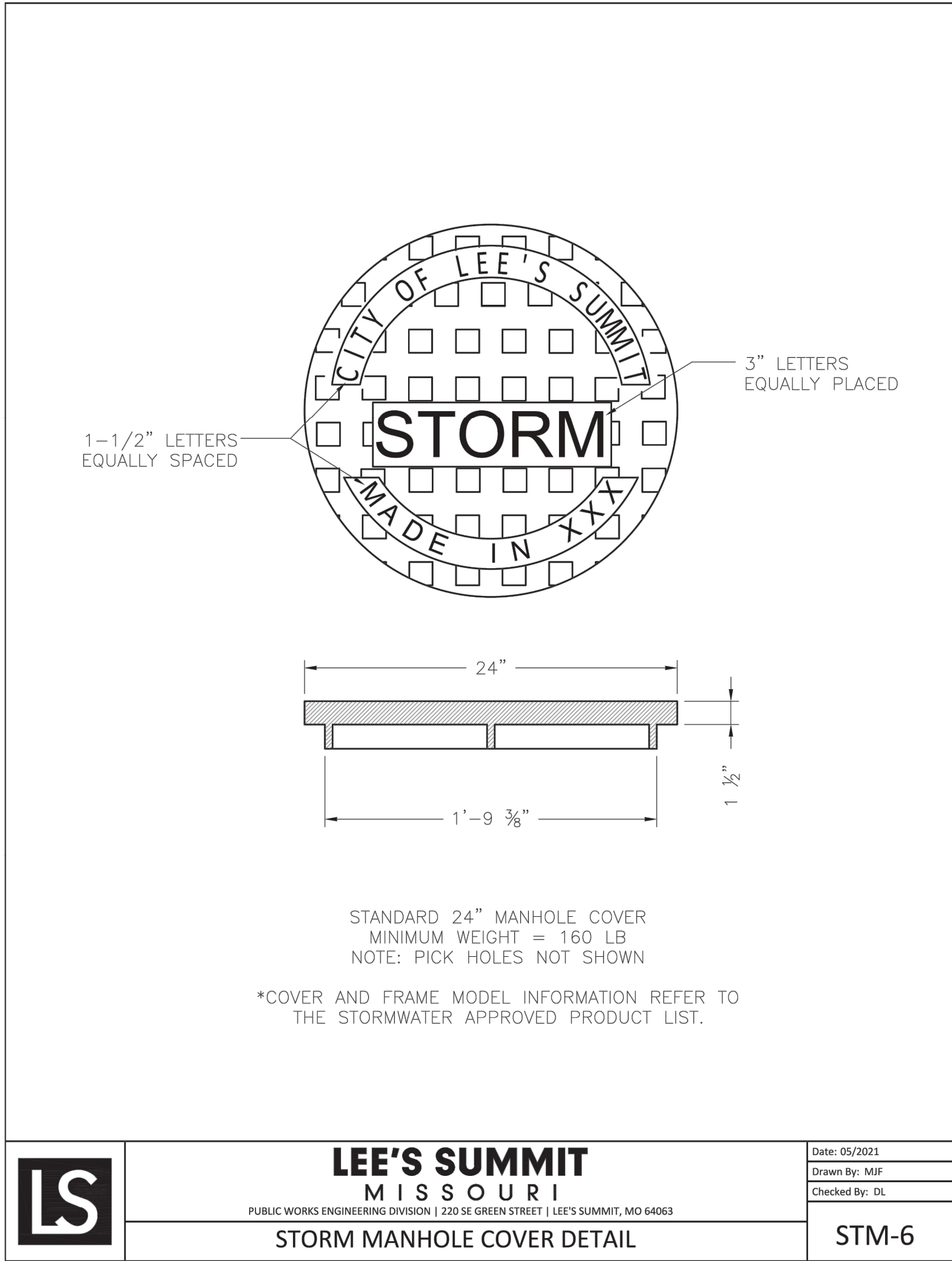
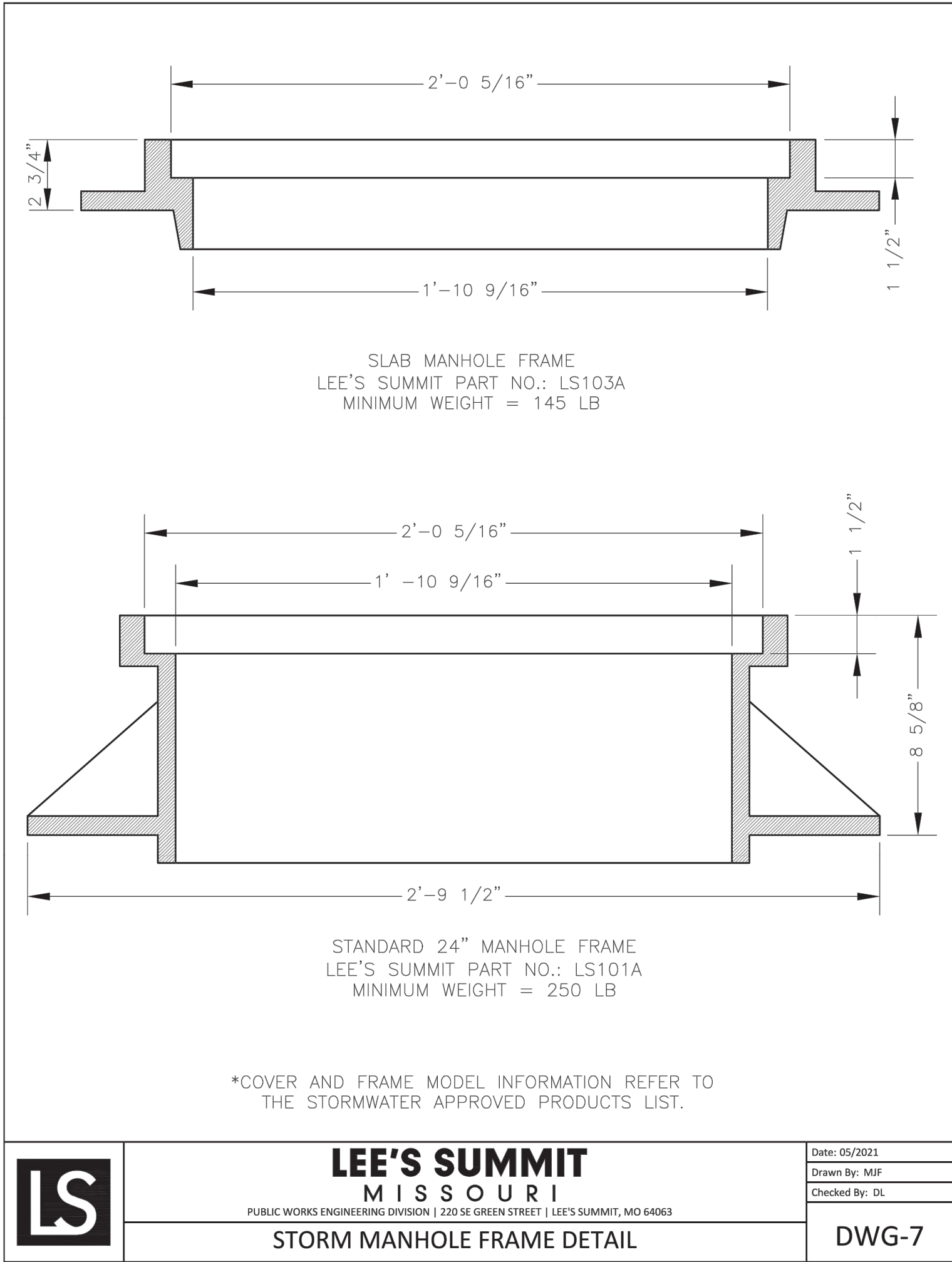


RESIDENCES AT BLACKWELL  
STREET, STORMWATER, MASTER DRAINAGE  
PLAN AND EROSION & SEDIMENT CONTROL  
SE SHENANDOAH DRIVE LEE'S SUMMIT, MO

REVISION DATE	DESCRIPTION
01/23/2023	PER CITY COMMENTS
02/01/2023	
02/01/2023	
02/01/2023	
02/01/2023	
02/01/2023	
02/01/2023	
02/01/2023	
02/01/2023	
02/01/2023	

DRAWN BY: TRC	CHECKED BY: MAB	DATE PREPARED: 11/30/2022	PROJ. NUMBER: 22-102
---------------	-----------------	---------------------------	----------------------





#### SECTION 2104 BACKFILL DETAILS

Figure 1

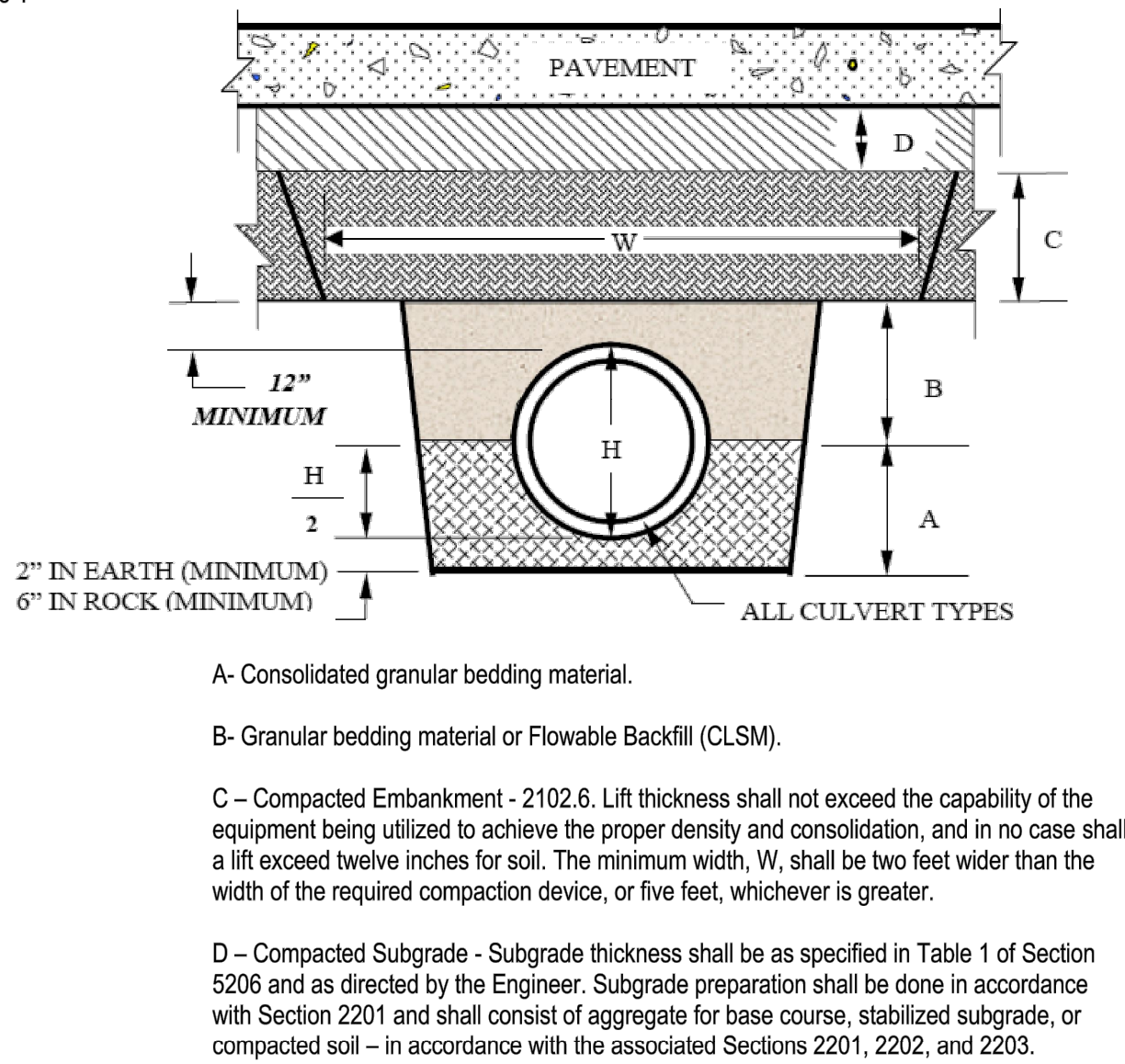


Figure 1  
(Deep Sewer Lines Using Earth Compaction Equipment,  
or in Depths Exceeding 30" of Cover)

Figure 2

The following cross-sectional view of typical storm sewer trench construction under street, alley pavements, and entrances Figure 2, shall apply to all storm sewer backfill areas where deep trenches are not widened to allow heavy roadway compaction equipment. Figure 2 shall also apply to shallow (30" to 18" from top of pipe to bottom of pavement) roadway trenches:

Backfilling shall be placed as shown in Figure 2.

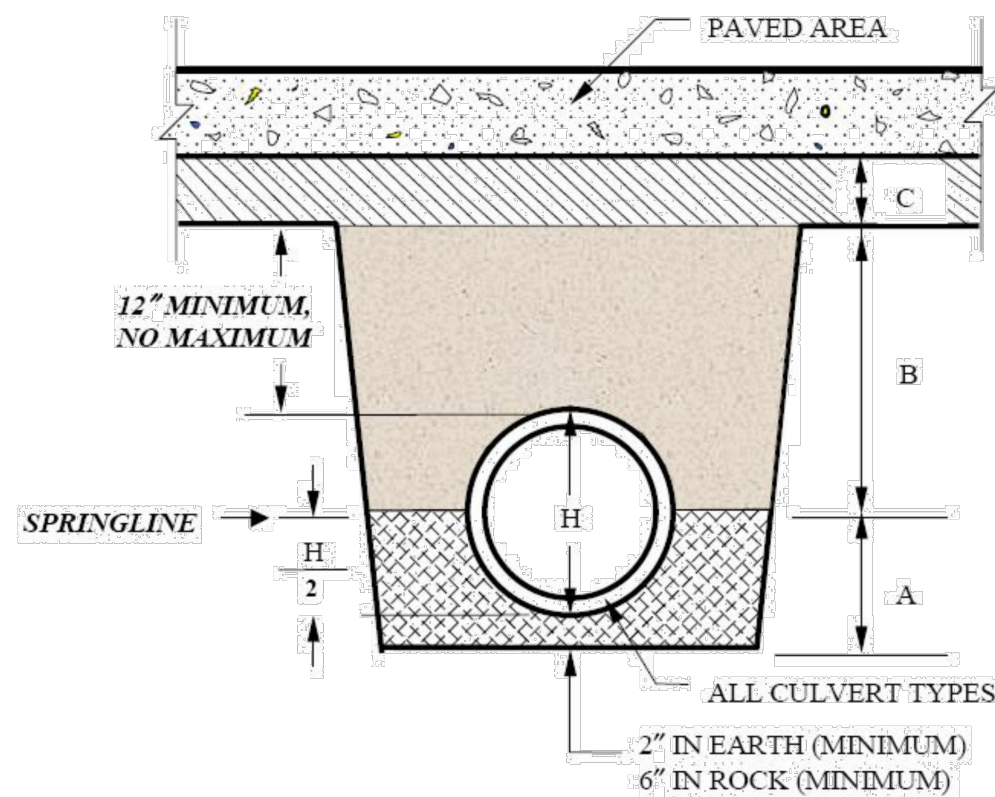


Figure 2  
(For Deep Trenches Without Roadway Compaction Equipment,  
or Shallow Trenches Having Less than 30" of Cover)

Figure 3

Trench backfilling in areas other than street and alley pavements where the near edge of trench is behind the back of curb:

Backfilling shall be placed as shown in Figure 3.

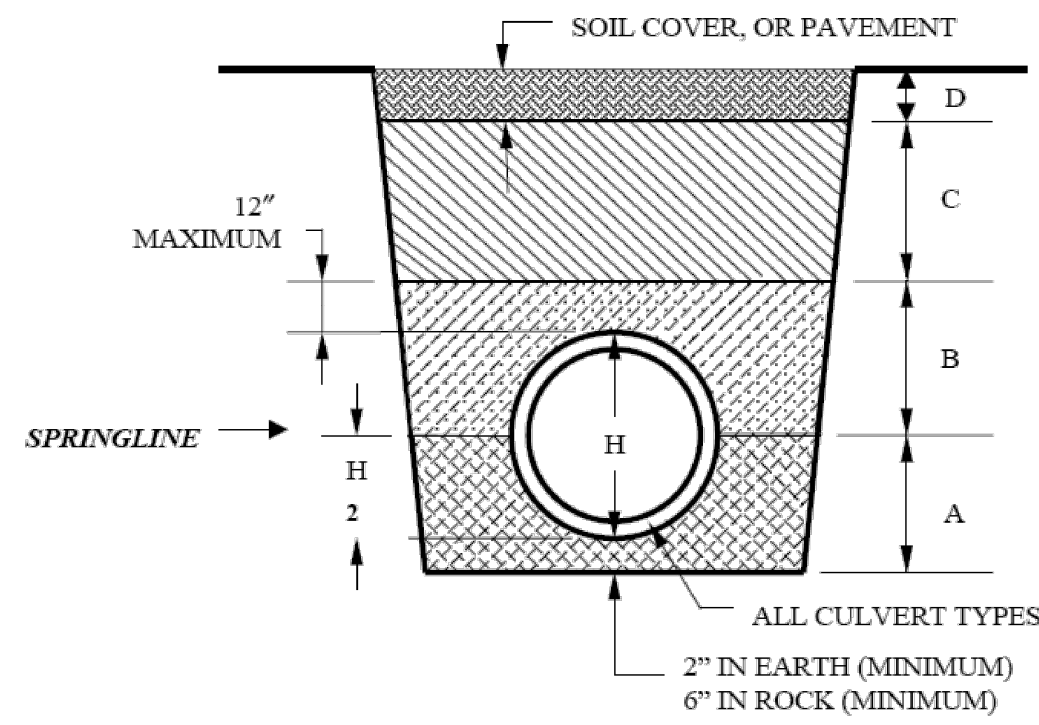


Figure 3  
(Trenches Outside of Street Pavements)

PREPARED BY:



SCHLAGEL & ASSOCIATES, P.A.

RESIDENCES AT BLACKWELL  
STREET, STORMWATER, MASTER DRAINAGE  
PLAN AND EROSION & SEDIMENT CONTROL  
SE SHENANDOAH DRIVE LEE'S SUMMIT, MO

REVISION DATE	DESCRIPTION
1	01/23/2023 PER CITY COMMENTS
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
21	
22	
23	
24	
25	
26	
27	
28	
29	
30	
31	
32	
33	
34	
35	
36	
37	
38	
39	
40	
41	
42	
43	
44	
45	
46	
47	
48	
49	
50	
51	
52	
53	
54	
55	
56	
57	
58	
59	
60	
61	
62	
63	
64	
65	
66	
67	
68	
69	
70	
71	
72	
73	
74	
75	
76	
77	
78	
79	
80	
81	
82	
83	
84	
85	
86	
87	
88	
89	
90	
91	
92	
93	
94	
95	
96	
97	
98	
99	
100	

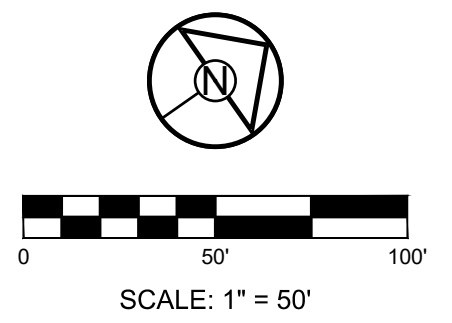
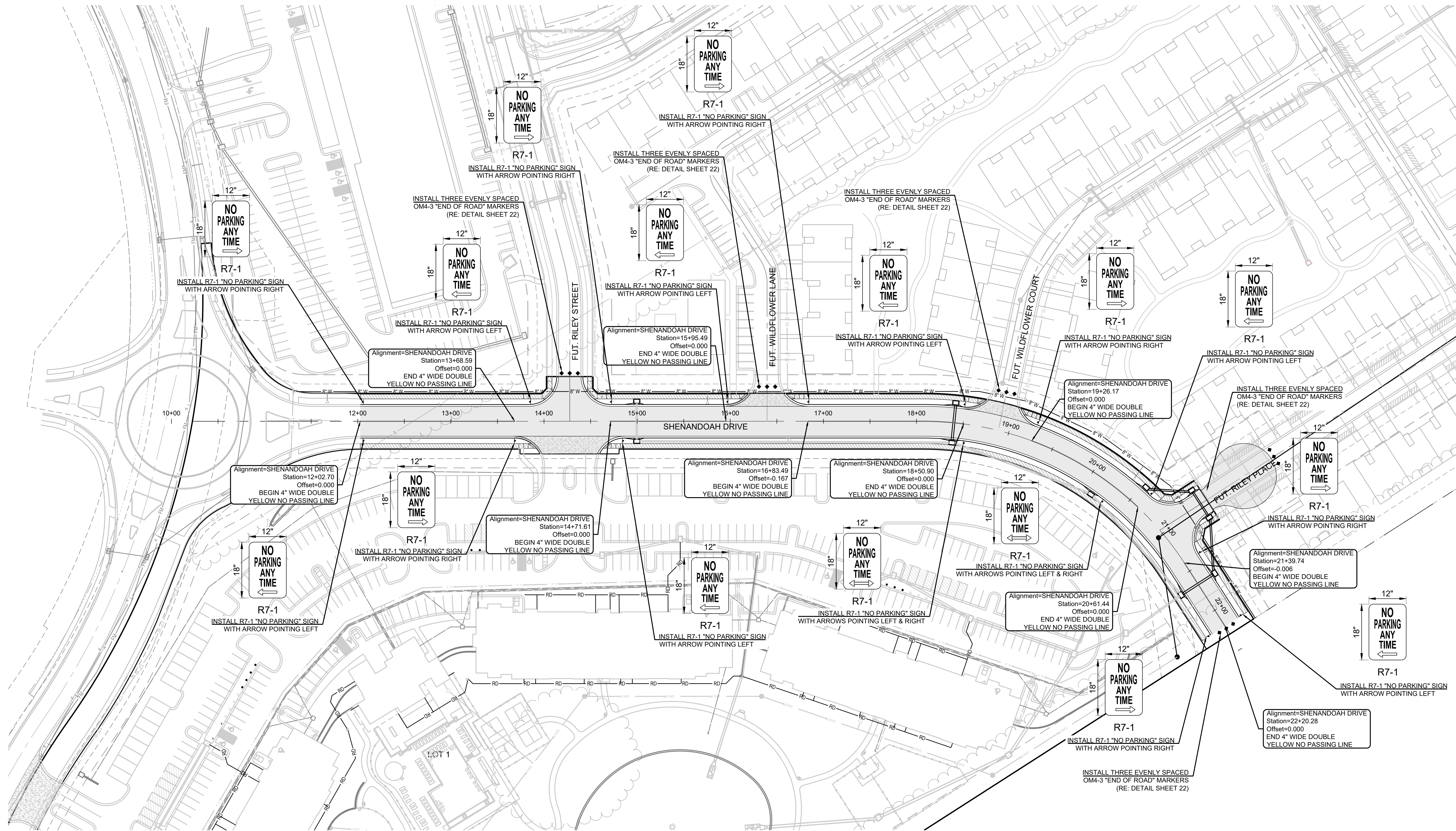
STORM DETAILS

SHEET

20



I:\PROJECTS\2022\22-102\3.0 Design\3.0 DWG Plans\3.0 SS- SIGN.dwg, 21 STREET SIGN & PAVEMENT MARKING PLAN, 1:1



SCHLAGEL

ENGINEERS

PLANNERS

SURVEYORS

LANDSCAPE ARCHITECTS

14920 West 107th Street • Lenexa, Kansas 66215  
(913) 492-5158 • Fax: (913) 492-8400  
WWW.SCHLAGELASSOCIATES.COM  
Missouri State Certificates of Authority  
#E2002003600-F #LAC2001005237 #LS2002008659-F

PREPARED BY:

MARK ALLEN  
BREWER  
MEMBER  
RE-2009007268  
08-28-2023

SCHLAGEL & ASSOCIATES, P.A.

RESIDENCES AT BLACKWELL  
STREET, STORMWATER, MASTER DRAINAGE  
PLAN AND EROSION & SEDIMENT CONTROL  
SE SHENANDOAH DRIVE LEE'S SUMMIT, MO

REVISION DATE	DESCRIPTION	PER CITY COMMENTS
01/23/2023	1	
	2	
	3	
	4	
	5	
	6	
	7	
	8	
	9	
	10	

DRAWN BY:	TRC
CHECKED BY:	MAB
DATE PREPARED:	11/30/2022
PROJ. NUMBER:	22-102

STREET SIGN & PAVEMENT  
MARKING PLAN

SHEET  
21





RESIDENCES AT BLACKWELL  
STREET, STORMWATER, MASTER DRAINAGE  
PLAN AND EROSION & SEDIMENT CONTROL  
SE SHENANDOAH DRIVE LEE'S SUMMIT, MO

DRAWN BY:	REVISION DATE	DESCRIPTION
TRC	1 01/23/2023	PER CITY COMMENTS
	2	
	3	
CHECKED BY:	4	
IMB	5	
	6	
DATE PREPARED:	7	
11/30/2022	8	
PROJ. NUMBER:		

## STREET SIGN & PAVEMENT MARKING DETAILS

SHEET

22

