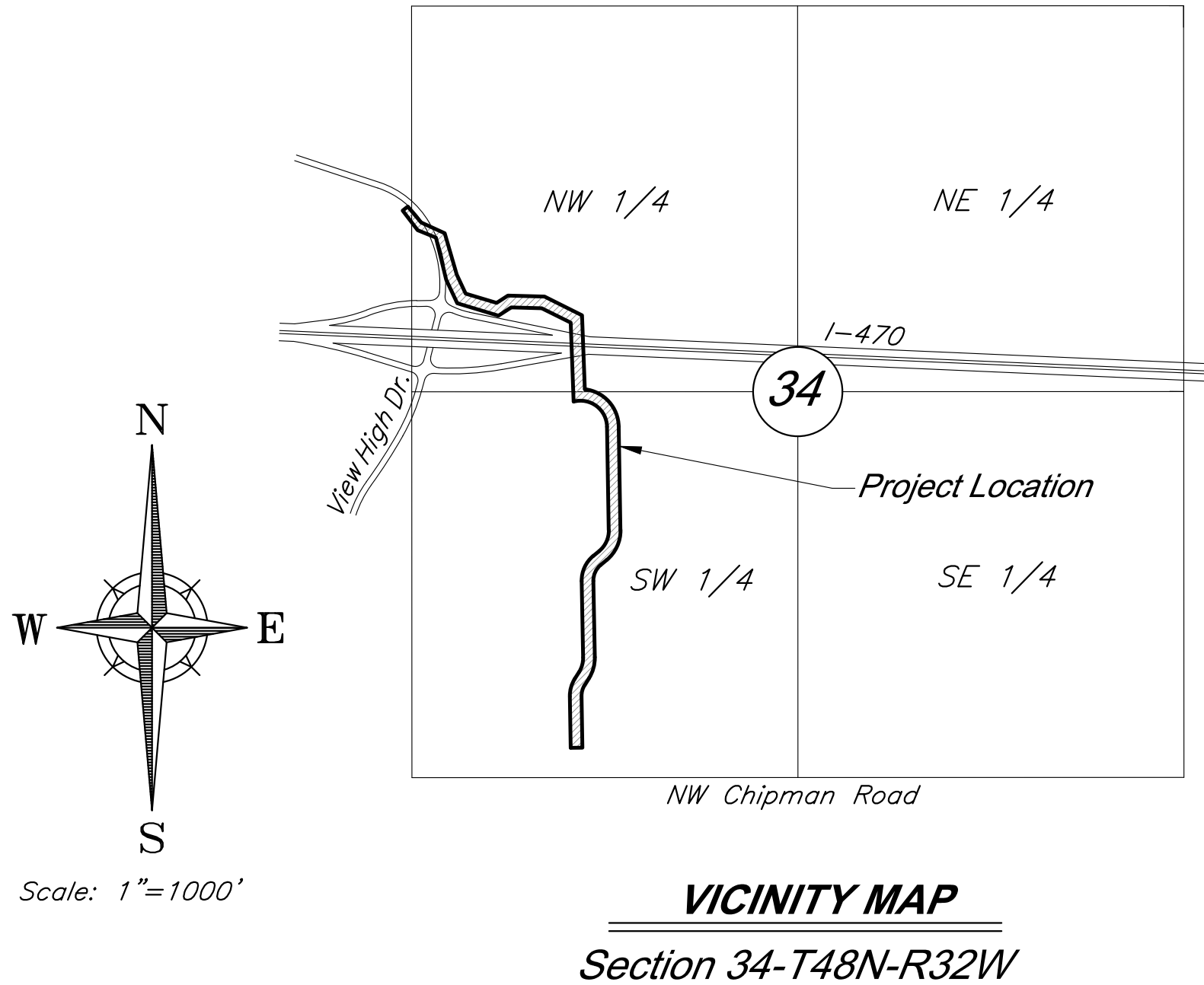


G:\12720\Civil 3D\Production Drawings\Water Main Plans\Lee's Summit\1272000100.dwg Layout: 1 Title Sheet -- Monday, May 16, 2020, 1:49pm -- Copyright 2020, George Butler Associates, Inc\Architect 00212, Professional Engineer 000133, Landscape Architect 000025, Professional Land Surveyor 000059

WATER MAIN EXTENSION PLANS
FOR
PARAGON STAR DEVELOPMENT
Sections 34–Township 48–Range 32
City of Lee’s Summit
Jackson County, Missouri

SUMMARY OF QUANTITIES

Item No.	Description	Unit	Approx. Unit Quantity
1	12" C900, Class 235 PVC	LF	2,500
2	12" C900, Class 305 PVC	LF	2,755
3	8" C900, Class 235 PVC	LF	255
4	Fire Hydrant Assembly	EA	12
5	Straddle Block	EA	6
6	Air Release Valve	EA	2
7	12" Gate Valve	EA	14
8	8" Gate Valve	EA	1
9	Tees	EA	8
10	Plugs	EA	5
11	Bends	EA	24
12	Reducers	EA	4
13	12" Meter	EA	1
14	Backflow Preventer	EA	1
15	20" Steel Casing Pipe	LF	419
16	Chipman Rd Patching	LS	1
17	Restoration	AC	5
18	Cut	CY	69
19	Fill	CY	217
20	Gravel	SY	3,000
21	Erosion Control	LS	1



INDEX OF SHEETS	
Sht. No.	Description
1	Title Sheet
2	General Layout
3-7	Water Main Plan & Profile - Line A
8	Water Main Plan & Profile - Line B
9-10	Water Main Details
11-13	Grading and Erosion Control Plan
14-15	Construction Details

APPROVED BY:
STATE OF MISSOURI
DEPARTMENT OF HEALTH & ENVIRONMENT
DIVISION OF ENVIRONMENT

ENGINEER:	DATE:
PROJECT ENGINEER:	DATE:
APPROVED:	
CITY ENGINEER:	DATE:



DEVELOPED AND OWNED BY:
PARAGON STAR LLC
801 NORTHWEST COMMERCE CENTER
LEE’S SUMMIT, MISSOURI 64086
PHONE: (816) 802-6801
CONTACT: Mr. Flip Short
EMAIL: fshort@legacytouch.com

PREPARED & SUBMITTED BY:
GEORGE BUTLER ASSOCIATES, INC.
9801 RENNER BOULEVARD
LENEXA, KANSAS 66219
PHONE: 913-492-0400
FAX: 913-577-8312
CONTACT: CLINT LOUMASTER P.E.
EMAIL: CLOUMASTER@GBATEAM.COM

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engineers

9801 Renner Boulevard
Lenexa, Kansas 66219
913.492.0400
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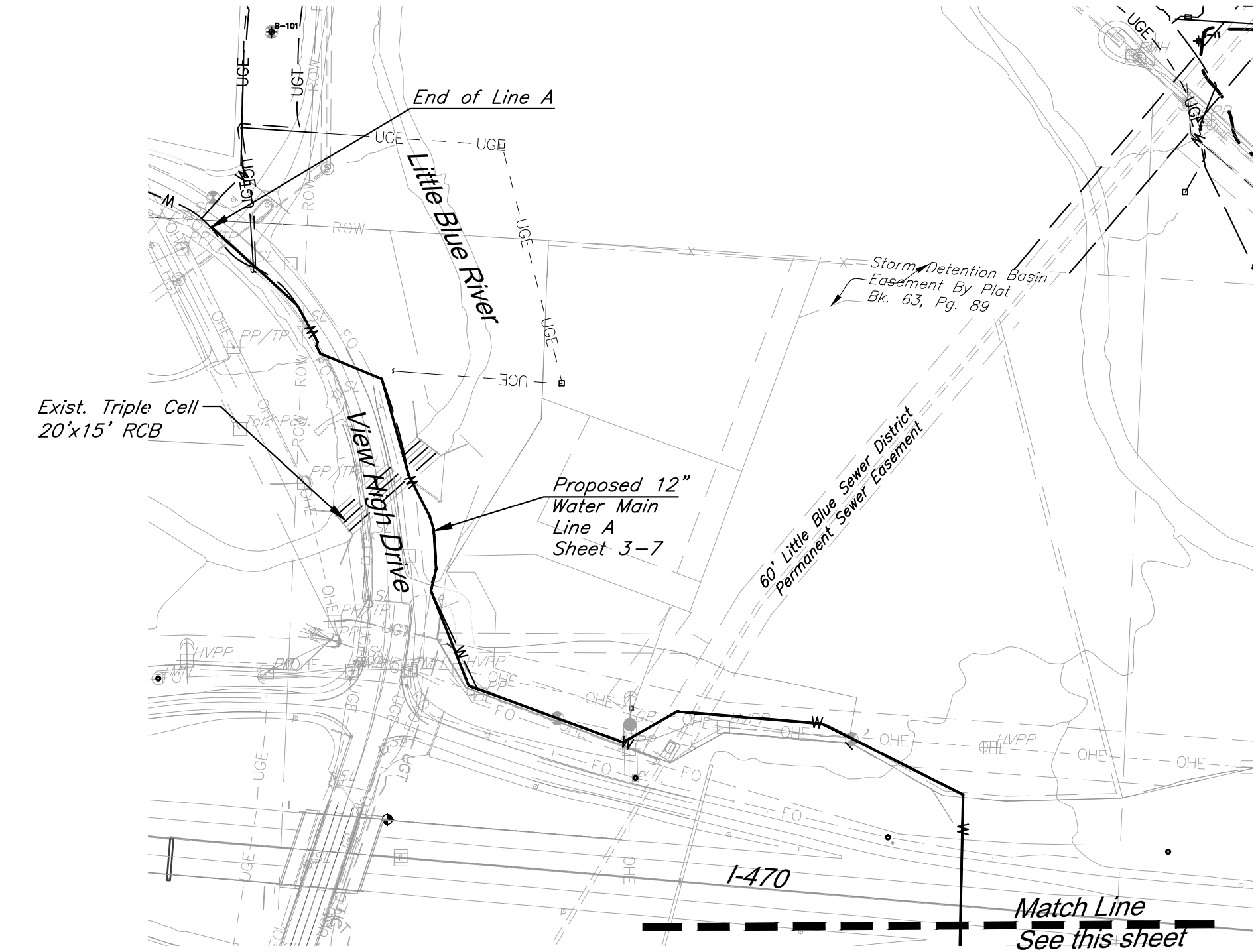
UTILITY CONTACTS

Sanitary Sewers	Mr. Jeff Thorn, PE City of Lee’s Summit Water Utilities 1200 SE Hamblen Road Lee’s Summit, MO 64063 (816) 969-1922 email: jeff.thorn@cityofLS.net	Gas	Mr. Donnie Richards Missouri Gas Energy 7500 E. 35th Terrace Kansas City, MO 64129 (816) 472-9464 Fax (816) 472-3488 email: donnie.richards@sug.com
	Mr. Jeff Shook Little Blue Valley Sewer District 21101 East 78 Highway Independence, MO 64057 (816) 285-1522 email: jshook@lbvsd.net	Cable Television	Mr. Greg Thomas Time Warner Cable 8221 W. 119th Street Overland Park, KS 66213 (913) 643-1950 email: greg.thomas@twcable.com
Water	Mr. Jeff Thorn, PE City of Lee’s Summit Water Utilities 1200 SE Hamblen Road Lee’s Summit, MO 64063 (816) 969-1922 email: jeff.thorn@cityofLS.net	Telephone	Ms. Glenda Charles AT&T 1425 Oak Street Kansas City, MO 64106 (816) 365-1669 Fax (816) 275-1109 email: gc6954@att.com
Electric Service	Mr. Nathan Michael Kansas City Power & Light P.O. Box 418679 Kansas City, MO 64141 (816) 220-5210 Fax (816) 245-3623 email: Nathan.Michael@kcpl.com		

PROJECT BENCHMARK:

BM #11 – Chiseled “L” on top
Northeast corner of concrete guardrail
at the Northeast corner of I470 bridge
spanning View High Drive.
EL=833.80

C:\12720\Civil 3D\Production Drawings\Water Main Plans\Lee's Summit\1272002000.dwg, Layout: 2 General Layout -- Monday May 18, 2020, 1:51pm -- Copyright 2020, George Butler Associates\detected 00212, Professional Engineer 000025, Landscape Architect 000025, Professional Land Surveyor 000029



General Notes:

1. All traffic control shall be the responsibility of the Contractor and shall be in conformance with the Manual of Uniform Traffic Control Devices (MUTCD).
2. Property Corners and/or Section corners disturbed or damaged by construction activities shall be reset by a Registered Land Surveyor licensed in the state of Missouri at the Contractor's expense.
3. Construction Staking shall be the responsibility of the General Contractor.
4. The Contractor shall be responsible for the restoration of the Right-of-Way and for damaged improvements such as curbs, driveways, sidewalks, street light and traffic signal junction boxes, traffic signal equipment, irrigation systems, etc. Damaged improvements shall be repaired in conformance with the latest City standards and to the City's satisfaction.
5. All work shall be confined within easements and/or construction limits as shown on the plans.
6. The Contractor shall, prior to the commencement of work, investigate surface and subsurface conditions to be encountered across the site and notify the Engineer if any discrepancies or changed conditions are noted.
7. All trash and debris identified on site shall be properly handled and disposed of in accordance with state of Missouri regulations.
8. All measurements on these plans are horizontal distances, not slope distances.
9. Items not listed separately in the Summary of Quantities are subsidiary to other items.
10. All site concrete shall be KCMMB – 4,000 PSI unless otherwise noted.

Permitting:

11. Excavation for Utility work within the Right of Way requires a Right of Way work permit from the Public Works Department, in addition to all other permits.
12. Contractor is responsible for obtaining all required permits, paying all fees, and for otherwise complying with all applicable regulations governing the work.

Erosion Control:

13. The Contractor is responsible for providing erosion and sediment control BMP's to prevent sediment from reaching paved areas, storm sewer systems, drainage courses, and adjacent properties. In the event the prevention measures are not effective, the contractor shall remove any debris, silt, or mud and restore the Right-Of-Way, or adjacent properties to original or better condition.
14. Contractor shall ensure that all construction shall conform to the requirements of the Stormwater Pollution Prevention Plan (SWPPP) a copy of which shall be maintained and updated on site by the Contractor.
15. The Contractor shall sod all disturbed areas within the Public Street Right-of-Way unless otherwise noted in the plans.

Earthwork:

16. The Contractor shall be responsible for removing and disposing of grass and vegetation that is found on site. Contractor shall strip site of organic material to a depth acceptable to the Geotechnical Engineer and prior to the placement of fill. Disposal of all debris shall be performed by the contractor in strict accordance with all applicable codes and ordinances. All clearing and grubbing, stripping, tree removal, and grading operations shall be performed in accordance with the recommendations as found in the Geotechnical Report, and erosion control and grading plans for this site.
17. Slopes shall be constructed to a maximum slope of 3:1 (Horiz:Vert).
18. Refer to "Geotechnical Engineering Report" Dated 4/30/2020 prepared by Terracon Consultants, inc. for grading and pavement recommendations and boring logs. All earthwork shall conform to the recommendations of the Report.
19. Unless otherwise noted, all spot elevations and contours are shown to "finish" grade surface. Contractor shall adjust for any overcut required in paving, parking, landscape, or building pad areas as defined in the Geotechnical Report, these plans, or the project specifications.
20. All temporary slopes and excavations should conform to Occupational Safety and Health Administration (OSHA) standards for the Construction Industry (29 CFR part 1026, subpart P).

Utility:

21. All Manholes, Catch Basins, Utility Valves, Meter Pits, and other utility equipment shall be adjusted or rebuilt to grade as required.
22. Prior to beginning work, the Contractor shall notify all utility companies who have facilities in the vicinity of the project area of the work to be performed.
23. All Utility extensions and construction shall conform to the Standards and Specifications of the applicable Utility Companies.
24. Contractor shall immediately repair any utility service lines damaged during construction.



CAUTION!

Numerous Utilities on Site.
Contractor to verify location
and elevation of all utilities
prior to commencing
construction.

GENERAL NOTES:

1. All work shall be done in accordance with the most recent version of the Design and Construction Manual of Lee's Summit, Missouri.
2. The Contractor shall furnish and install all fittings required to provide proper horizontal and vertical alignment for new water mains, connections to existing water mains, and installation of fire hydrants at the proper location and elevation, whether or not the proper fittings, location or elevations are called out on these drawings, including modification of existing infrastructure required to make all of the work conform to current Lee's Summit Design and Construction Manual.
3. The Contractor shall furnish and install all temporary blow-off assemblies, fittings, thrust blocking, and restraining devices required for temporary connections for flushing, pressure testing, chlorination, and de-chlorination of the new water mains. Prior to placing new mains in service the Contractor shall remove and corporation cocks used for testing or chlorination and replace them with tapered brass plugs.
4. The Contractor shall install polyethylene encasement on all water mains, valves, fittings, and other appurtenances for the full length of the project in accordance with the Design and Construction Manual of the city of Lee's Summit, Missouri.
5. Scheduling of water main shuts and connections to existing mains shall be at the discretion of the Water Utilities Department.
6. All fire hydrant branches shall be restrained using approved restraining devices. Hydrants shall be installed so that the centerline of the outlet nozzle is between eighteen and twenty-one inches (18"-21") above grade, and so that there is a minimum clear area of 5' in each direction to allow operation of the hydrant.
7. Sections of water main requiring multiple bends, such as cul-de-sacs, shall be restrained with approved joint restraining devices and straddle blocks in lieu of backing blocks.
8. The locations of existing utilities, as shown, are approximate. It shall be the responsibility of the Contractor to verify the locations and elevations of all existing utilities.
9. The Contractor shall comply with state law requiring any person or firm doing excavation on the public right-of-way to do so only after giving notice to and obtaining information from utility companies.
10. Streets and parking areas are to be to grade and curbs in place prior to construction of water mains. Water mains shall be installed with a minimum ground cover of 42 inches below finished grade. Sixteen (16)-inch and larger water mains shall be installed with a minimum ground cover of 60 inches below finished grade.
11. Water mains shall be laid at least 10 feet, horizontally from any sewer. When local considerations prevent a horizontal separation of 10 feet, a water main may be laid closer than 10 feet to a sewer, provided that the water main is laid in a separate trench, or on an undisturbed earth shelf located on one side of the sewer, at such an elevation that the bottom of the water main is at least 18 inches above the top of the sewer. Water mains shall be laid such that there is a minimum of 18 inches clearance between the pipe wall and the exterior of any manhole and/or inlet on the sewer line.

Whenever a water main must cross above a sewer, a vertical separation of 18 inches between the bottom of the water main and the top of the sewer shall be maintained. Whenever a water main must cross under a sewer, a vertical separation of 18 inches between the bottom of the sewer and the top of the water main shall be maintained. A full length of water main pipe shall be centered on the sewer to be crossed so that the joints will be equally distant from the sewer and as far away as possible. The 18 inch vertical separation shall be maintained for that portion of the water main located within 10 feet horizontally, of any sewer it crosses.

When it is impossible to obtain proper horizontal separation as stipulated above, or when a water main must cross under a sewer, the sewer must be reconstructed of ductile iron pipe meeting the requirements of Section 3901C of the Design and Construction Manual; Pre-stressed concrete cylinder pipe meeting the requirements of Section 3901E; of PVC pressure pipe conforming to AWWA C-900 or C905, and must be pressure tested to assure water tightness before backfilling; the required length of sewer to be replaced or constructed of pressure pipe will be the length necessary to achieve 10 feet horizontal separation.

Where these conditions cannot be met, the Water Utilities Department shall be consulted as to the precautions to be taken to protect the public water supply.

12. An excavation permit must be obtained from the City Engineer prior to commencing construction within the public right-of-way. Contact the Public Works Department permit counter at City Hall.
13. A street closure permit may be required for this work. Contact the Street and Traffic Division at City Hall.
14. Proposed fire hydrants shall be installed at the station and offset locations as shown on the plans. Fire hydrant connection to the main shall be constructed per construction detail on sheet 9.

NOTES:

All Water Mains shall be PVC C900, Class 235 Unless otherwise indicated. All Valves and fittings shall be Ductile Iron unless otherwise noted.

All disturbed areas shall be seeded in accordance with the specifications.

Seeding Notes:

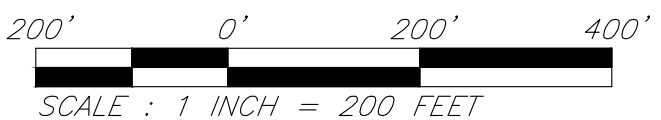
1. Contractor shall uniformly spread the topsoil over disturbed area. Seed and straw mulch shall be placed as soon as practicable.
2. Between November 1 and March 15, temporary stabilization shall include a straw mulch cover at 2.25 tons/acre.
3. Between March 15 and May 31, drill or hydroseed all disturbed areas with K-31 fescue at 90 lbs PLS per acre and rye grass at 50 lbs PLS per acre. Reapply straw mulch cover at 1.5 tons per acre.
4. Immediately water after seeding and continue to water as necessary to establish permanent vegetation.

NOTES:

D.E. = Drainage Easement
U.E. = Utility Easement
P = Property Line
R/W = Right-of-Way

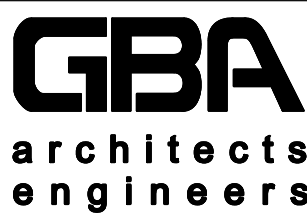
BENCHMARK:

BM #11 – Chiseled "L" on top Northeast corner of concrete guardrail at the Northeast corner of I470 bridge spanning View High Drive.
EL=833.80



General Layout

*Numerous Utilities on Site.
Contractor to verify location
and elevation of all utilities
prior to commencing
construction.*



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DATE: 7-26-19	
DESIGN BY: CEL	
DRAWN BY: DRV/DGL	
PROJECT NO.: 12720	
SHEET NO.	TOTAL SHEETS

4

15

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Professional Engineer
License No. 2011009651

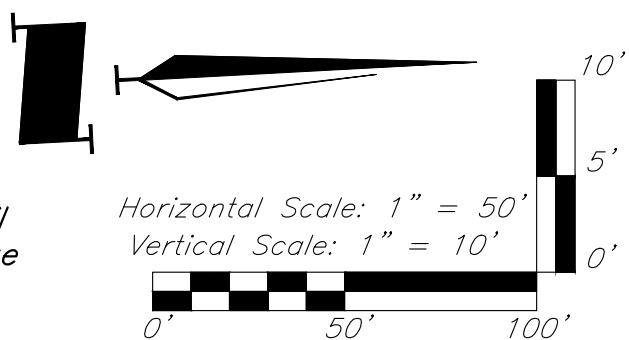
Water Main Extension Plans
Paragon Star Development

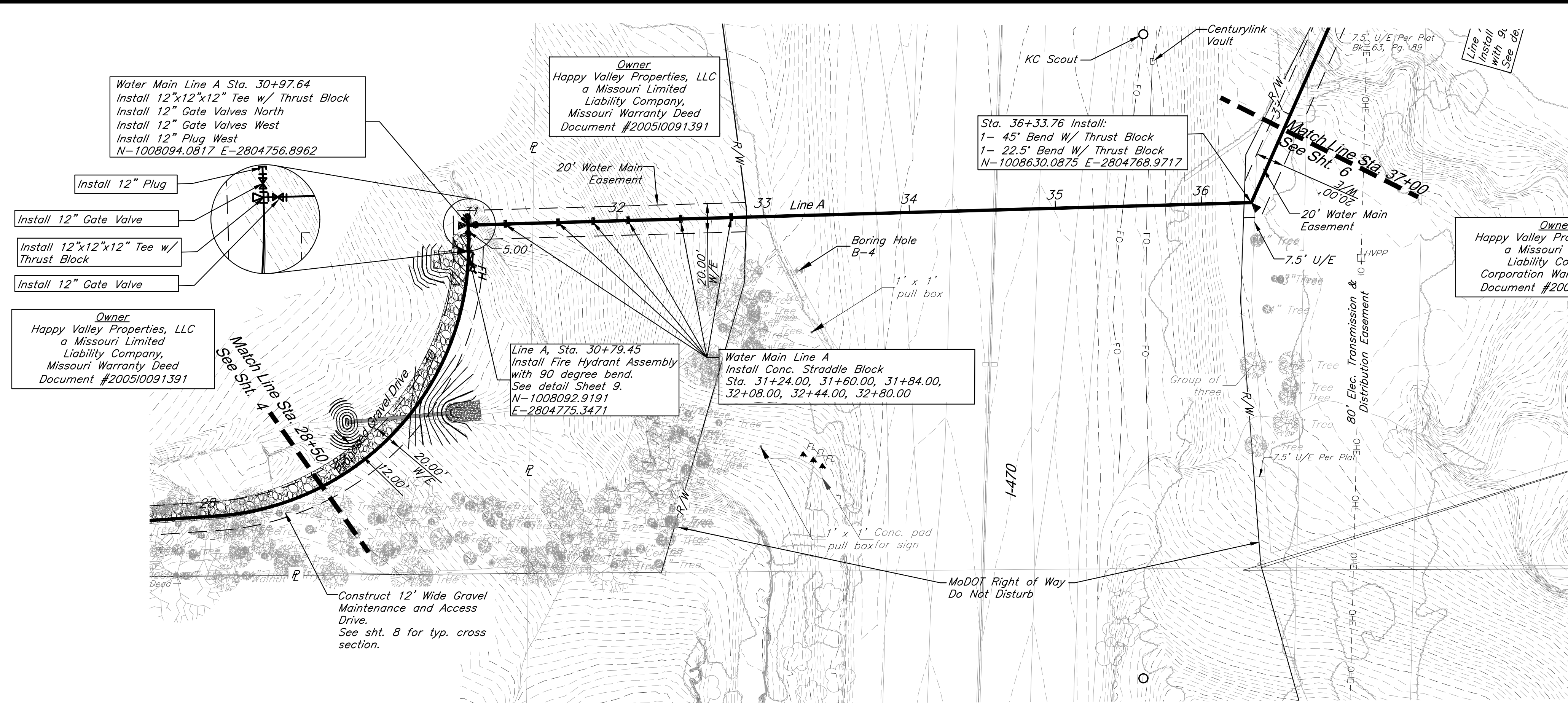
Lee's Summit, Missouri

NO.	DATE	REVISIONS	BY	APPROVED
1	2/20/20	City Comments - 10/21/19		
2	4/17/20	City Comments - 3/1/20		
3	4/28/20	Bid Package		
4	5/15/20	City Resubmittal		

NOTES:
D.E. = Drainage Easement
U.E. = Utility Easement
PL = Property Line
R/W = Right-of-Way
FG = Finished Grade
TP = Top of Pipe
W/E = Water Main Easement

BENCHMARK:
BM #11 - Chiseled "L" on top
Northeast corner of concrete guardrail
at the Northeast corner of 1470 bridge
spanning View High Drive.
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CAUTION!

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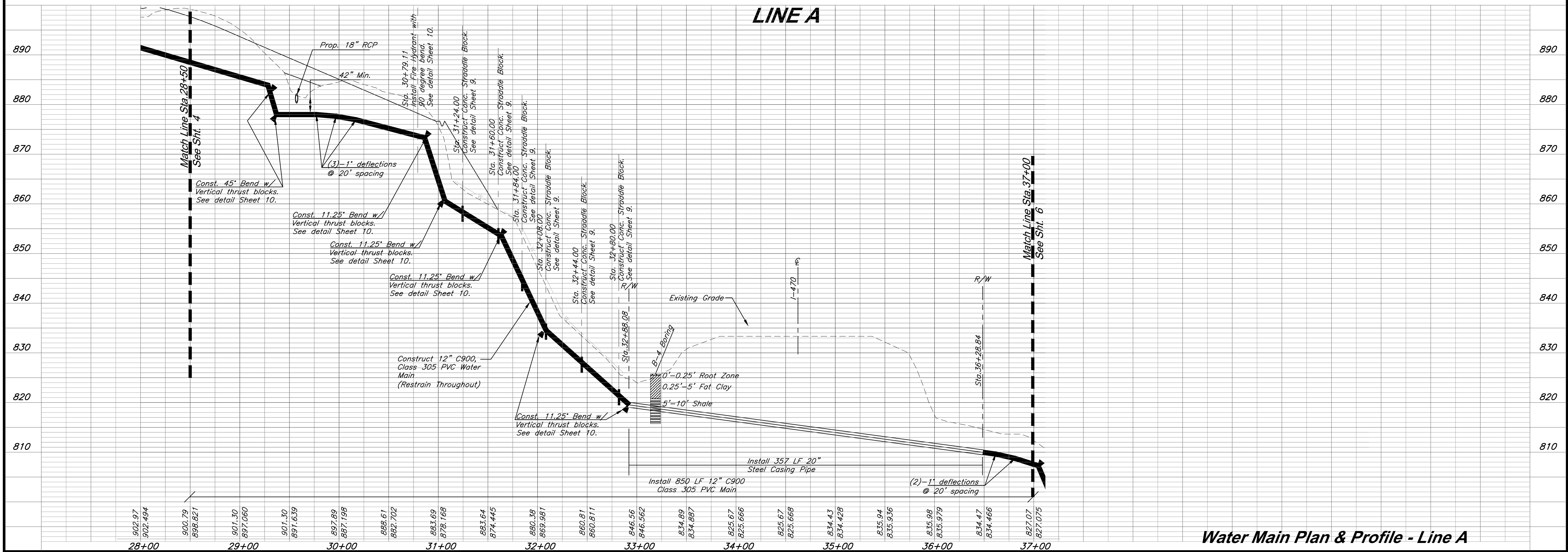
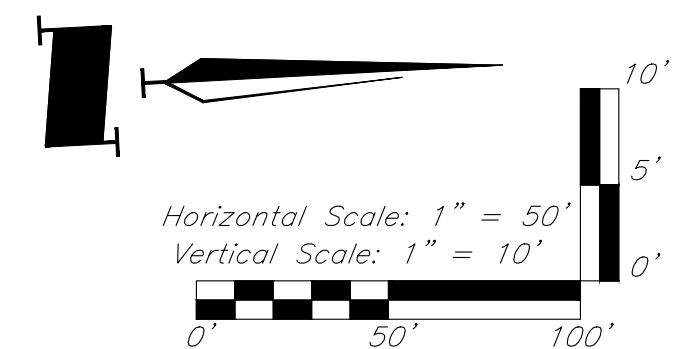
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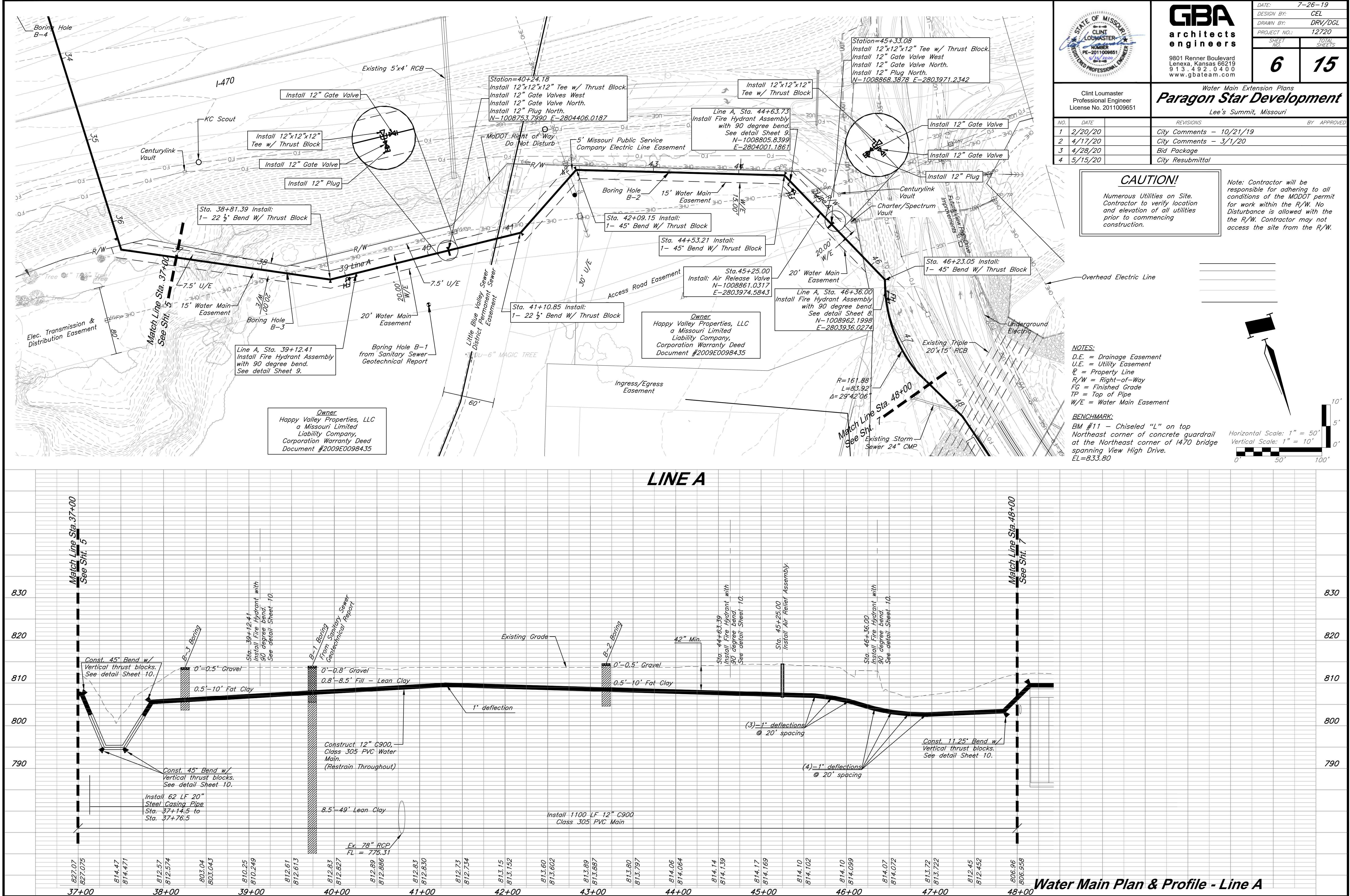
BM #11 - Chiseled "L" on top
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at the Northeast corner of 1470 bridge
spanning View High Drive.
EL=833.80

Note: Contractor will be responsible for adhering to all conditions of the MODOT permit for work within the R/W. No Disturbance is allowed with the the R/W. Contractor may not access the site from the R/W.



Water Main Plan & Profile - Line A

G:\12220\Civil_3D\Production Drawings\Water Main Plans\Lee's Summit\1272001600.dwg Layout: 6 Water Main Plan & Profile - Line A -- Monday, May 13, 2020, 1:55pm -- Copyright 2020, George Loumaster, Professional Engineer, 000133, Landscape Architect, 000025, Professional Land Surveyor, 000029



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DATE: 7-26-19
DESIGN BY: CEL
DRAWN BY: DRW/DGL
PROJECT NO.: 12720
SHEET NO. 7
TOTAL SHEETS 15

Clint Loumaster
Professional Engineer
License No. 2011009651

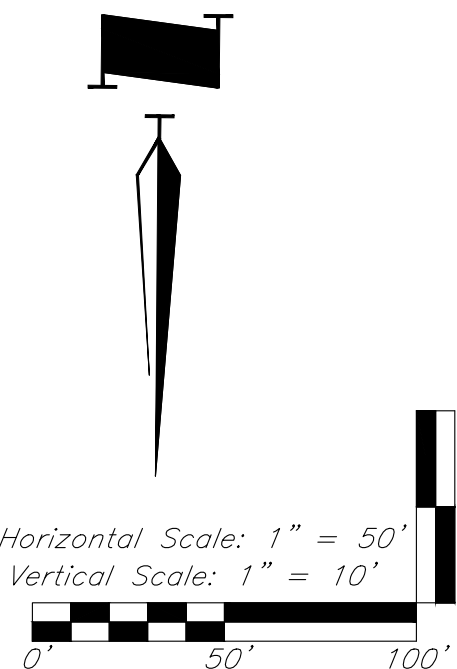
Water Main Extension Plans
Paragon Star Development
Lee's Summit, Missouri

NO.	DATE	REVISIONS	BY	APPROVED
1	2/20/20	City Comments - 10/21/19		
2	4/17/20	City Comments - 3/1/20		
3	4/28/20	Bid Package		
4	5/15/20	City Resubmittal		

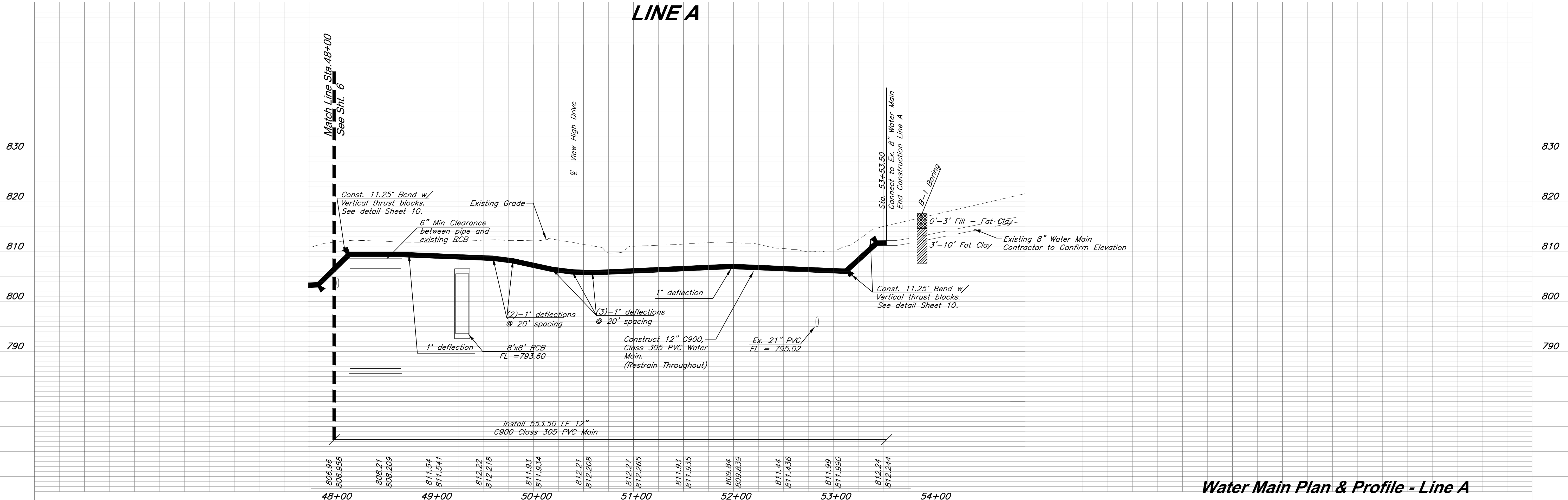
CAUTION!
Numerous Utilities on Site.
Contractor to verify location
and elevation of all utilities
prior to commencing
construction.

NOTES:
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Northeast corner of concrete guardrail
at the Northeast corner of 1470 bridge
spanning View High Drive.
EL=833.80



LINE A



C:\12720\Civil 3D\Production Drawings\Water Main Plans\Lee's Summit\12720C1600.dwg Layout: 8 Water Main Plan & Profile - Line B -- Monday May 18, 2020, 1:57pm -- Copyright 2020, GBA architects engineers, Professional Land Surveyor 0000259

CAUTION!
Numerous Utilities on Site.
Contractor to verify location
and elevation of all utilities
prior to commencing
construction.



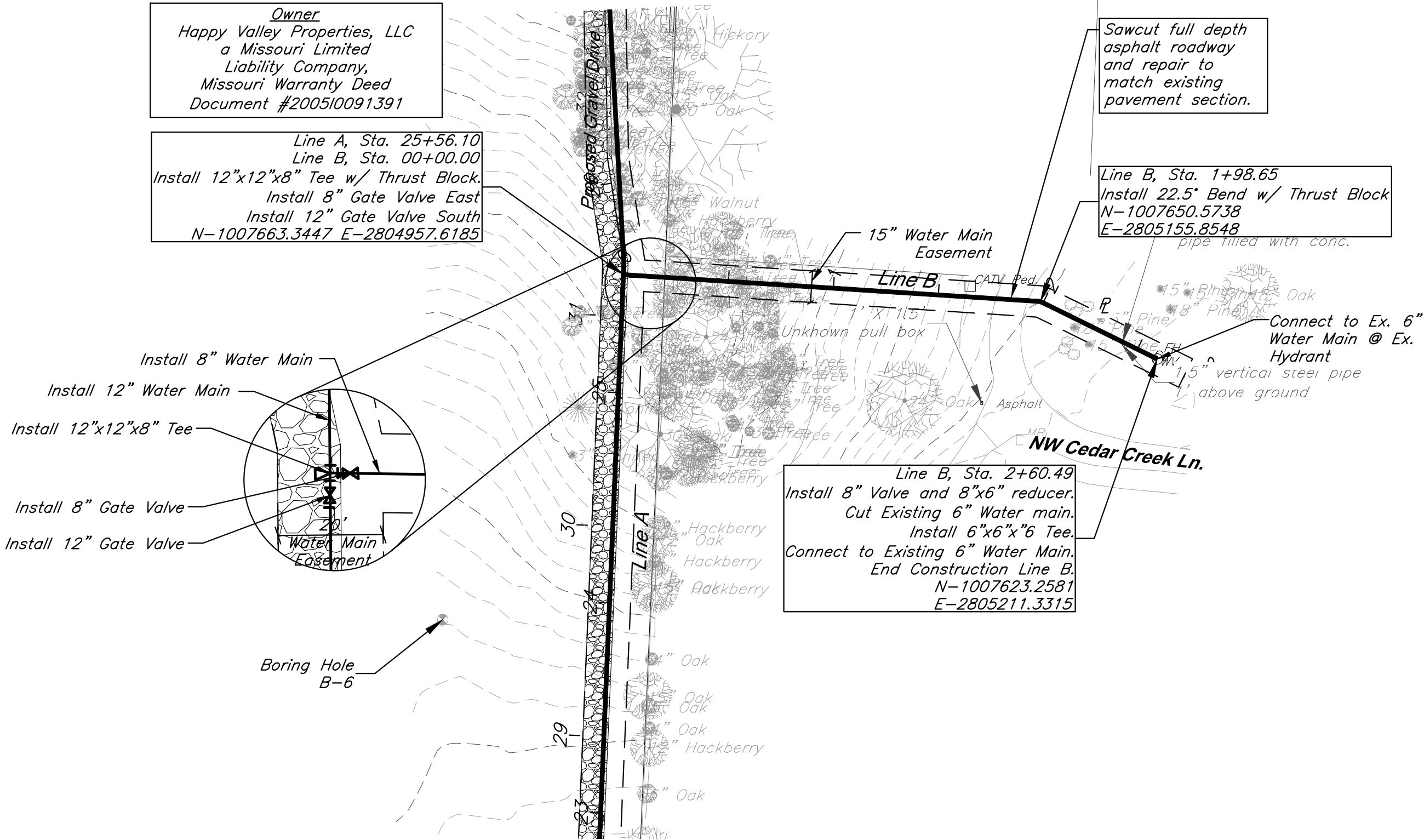
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engineers
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Lenexa, Kansas 66219
913.492.0400
www.gbateam.com

DATE: 7-26-19
DESIGN BY: CEL
DRAWN BY: DRW/DGL
PROJECT NO.: 12720
SHEET NO. 8
TOTAL SHEETS 15

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Professional Engineer
License No. 2011009651

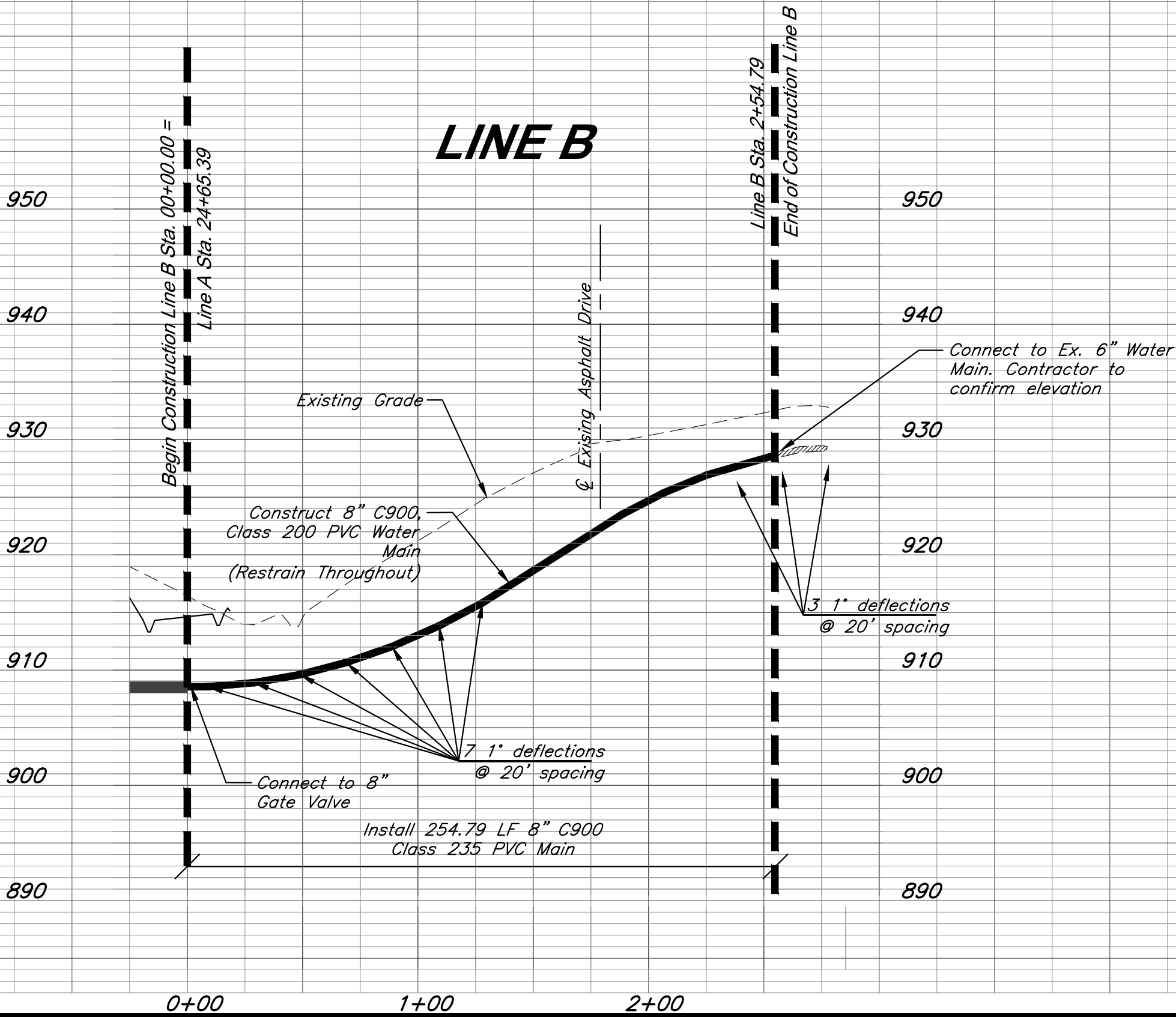
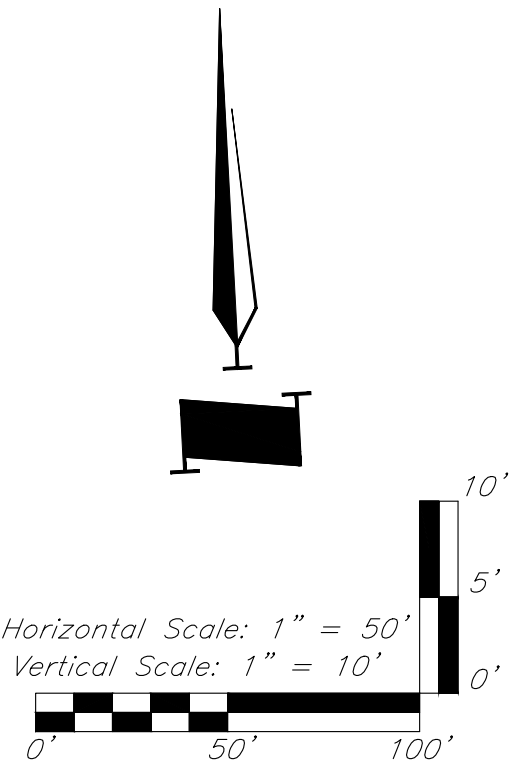
Water Main Extension Plans
Paragon Star Development
Lee's Summit, Missouri

NO.	DATE	REVISIONS	BY	APPROVED
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2	4/17/20	City Comments - 3/1/20		
3	4/28/20	Bid Package		
4	5/15/20	City Resubmittal		



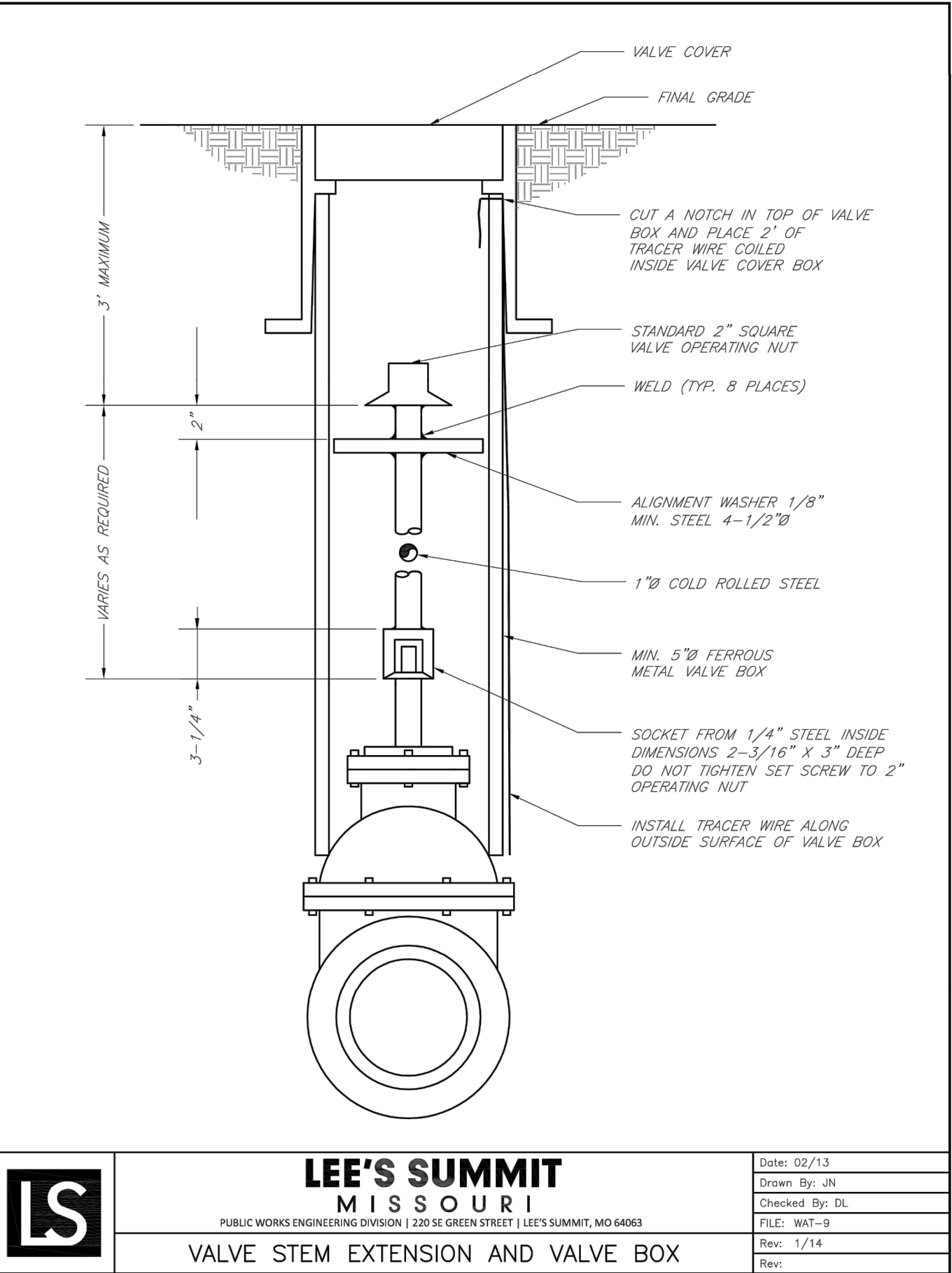
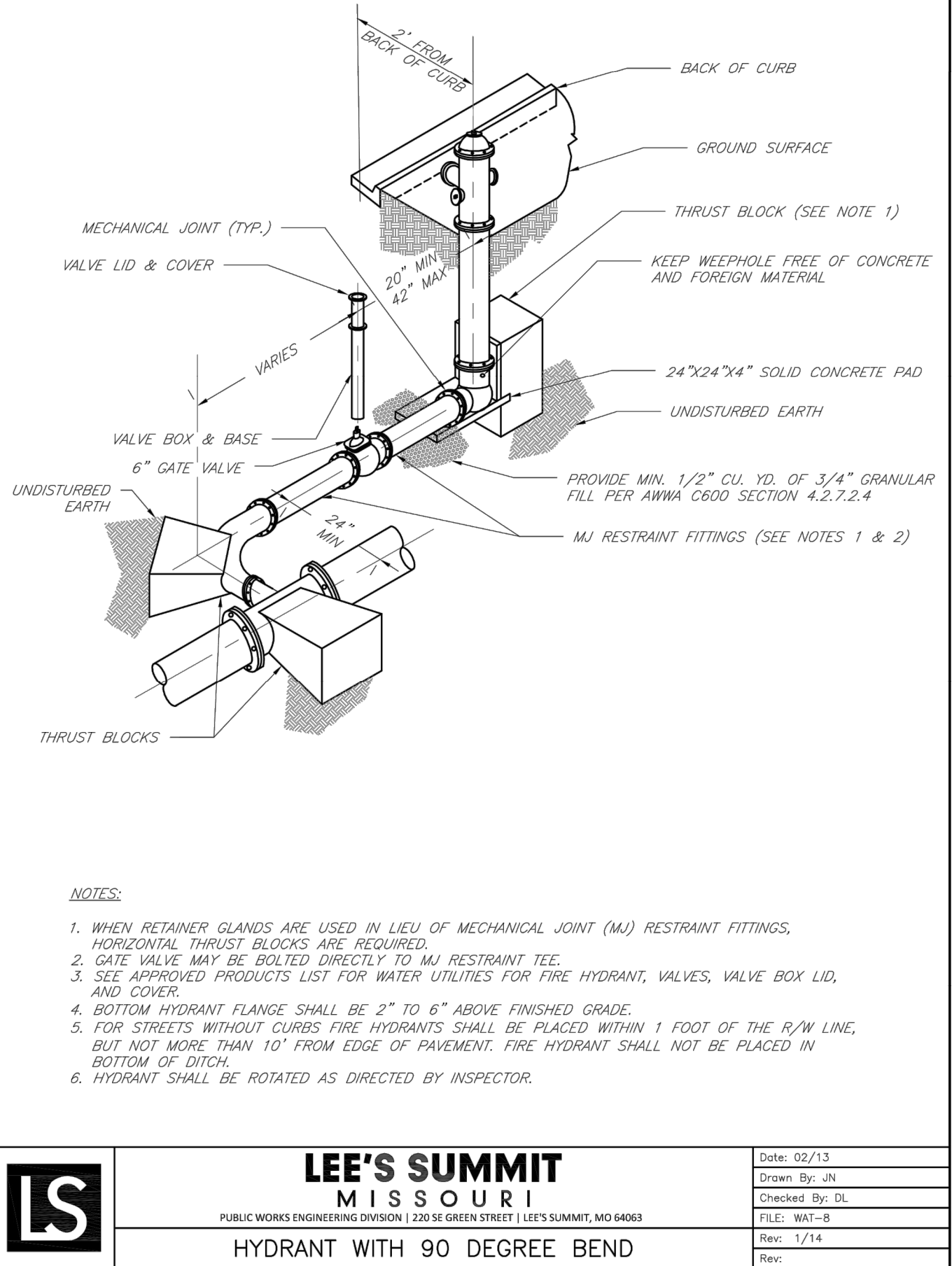
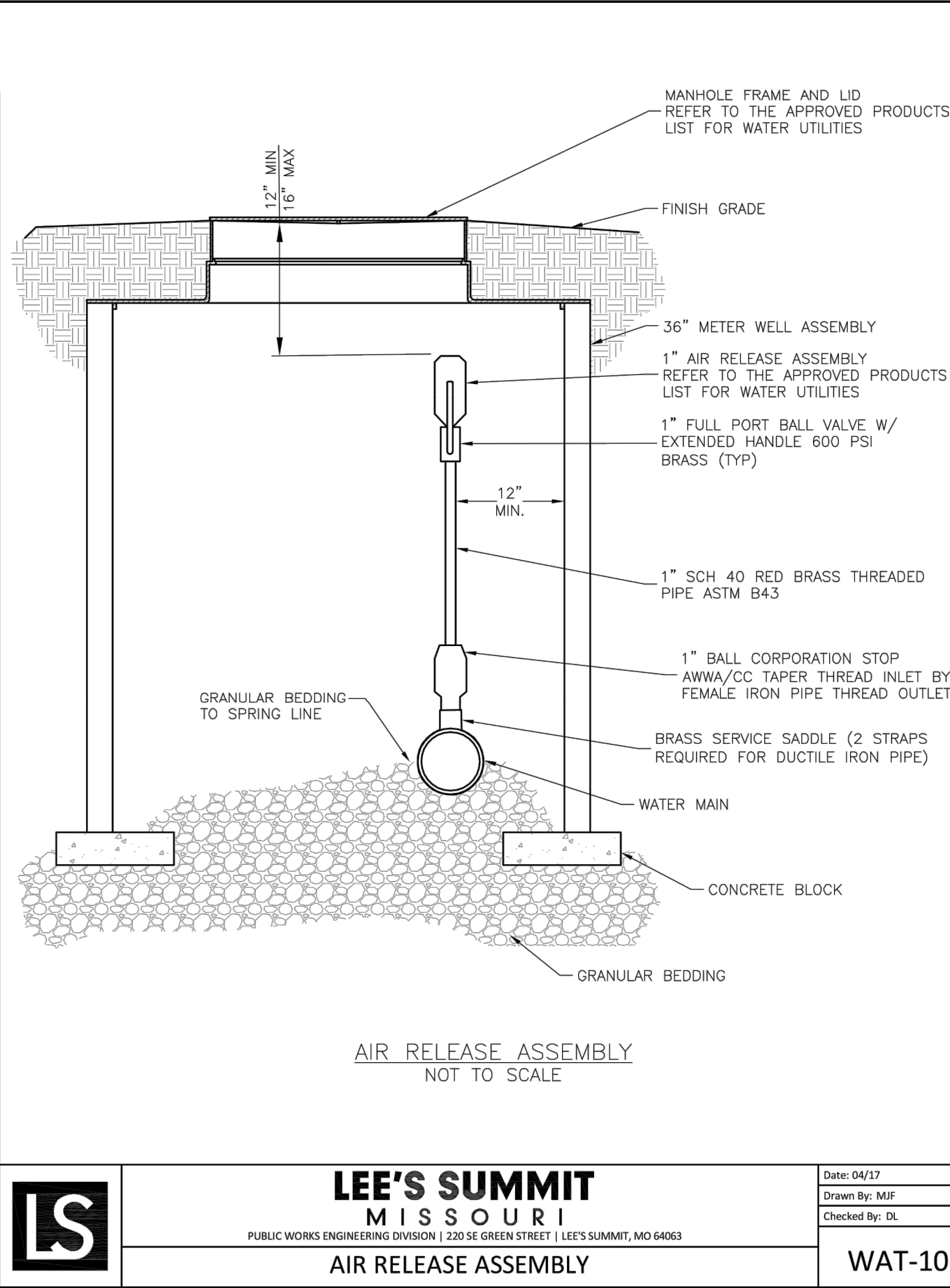
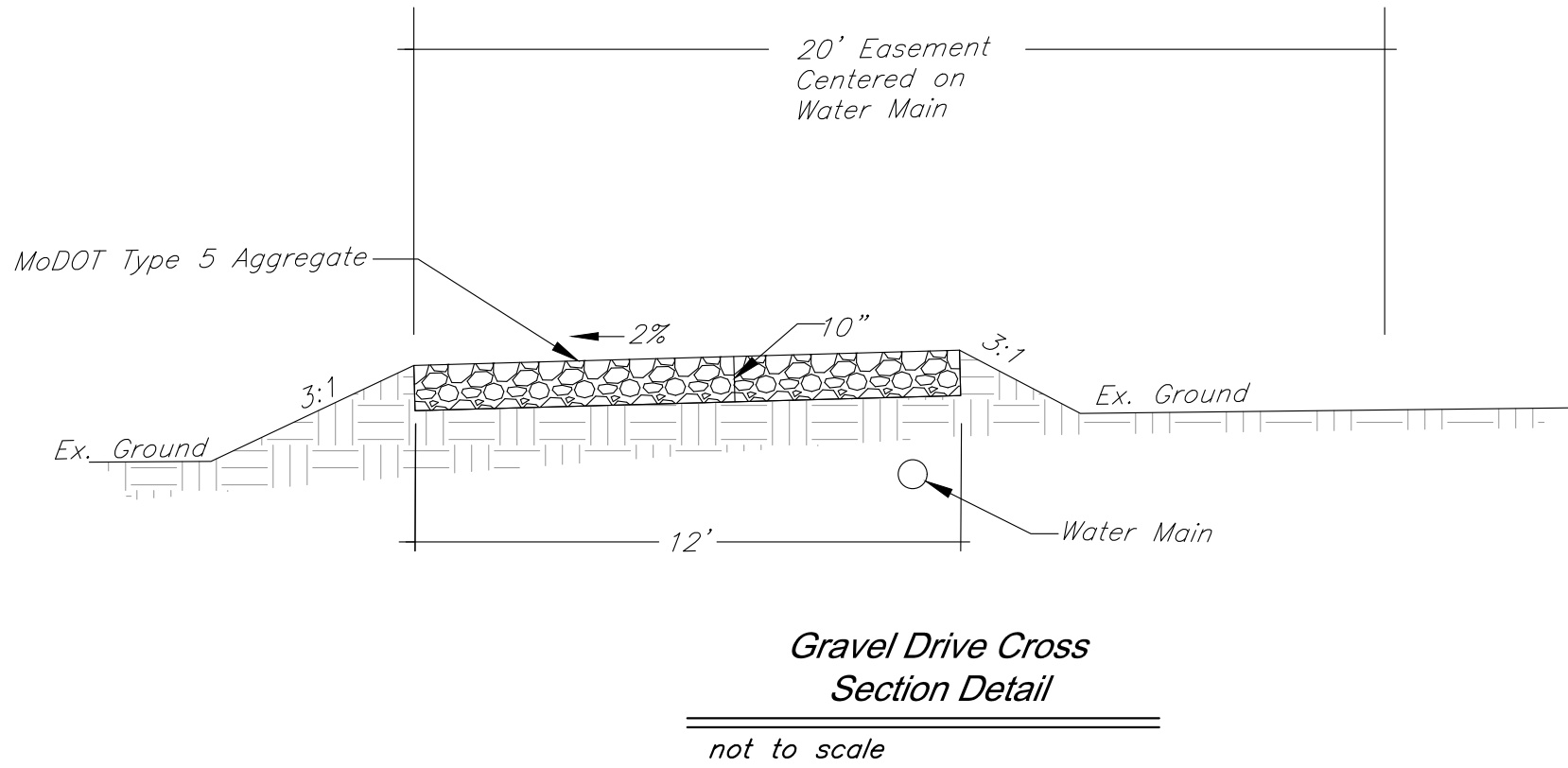
NOTES:
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P = Property Line
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BENCHMARK:
BM #11 - Chiseled "L" on top
Northeast corner of concrete guardrail
at the Northeast corner of 1470 bridge
spanning View High Drive.
EL=833.80



Water Main Plan & Profile - Line B

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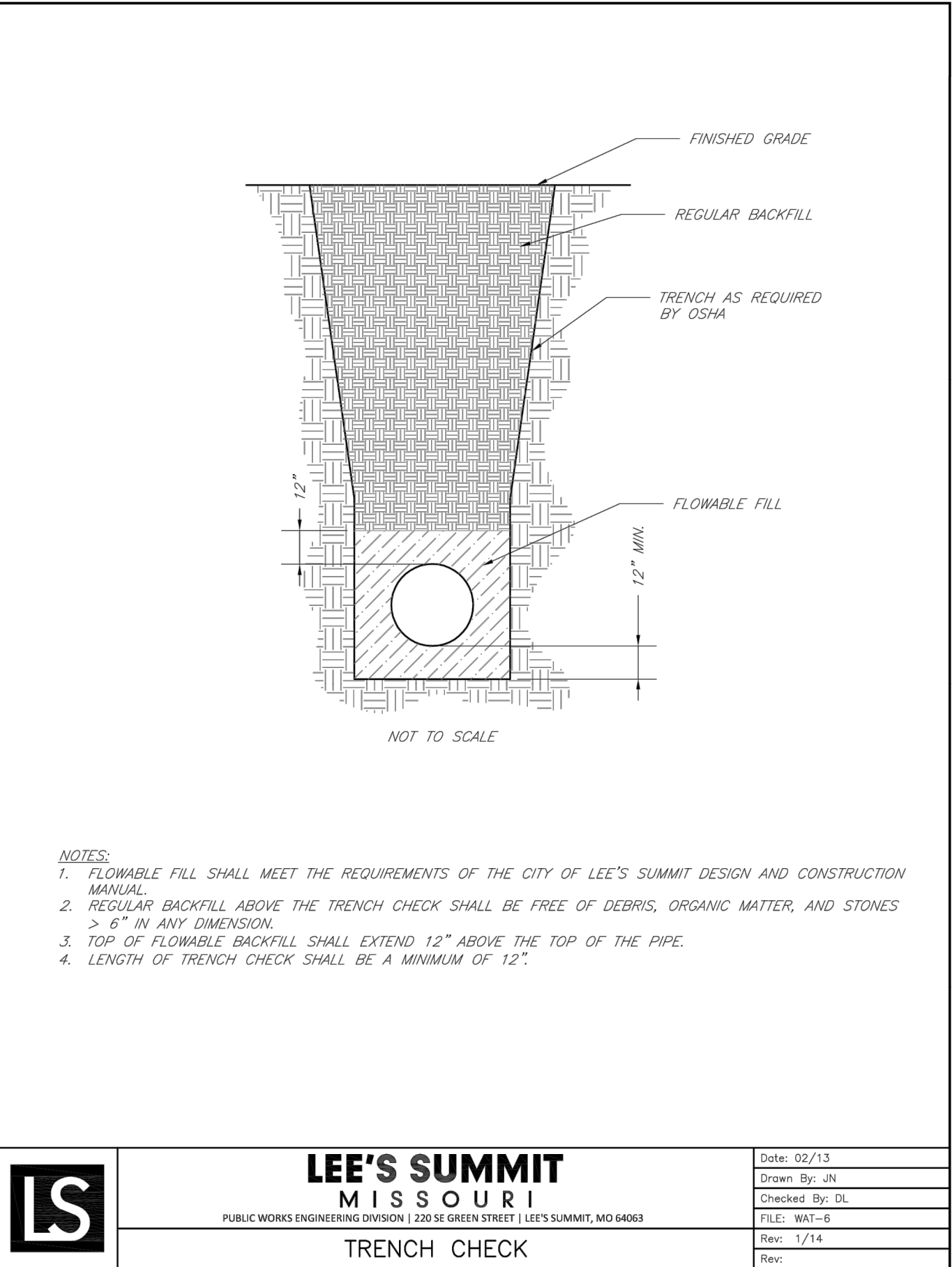
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DATE: 7-26-19
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SHEET NO.: 9
TOTAL SHEETS: 15

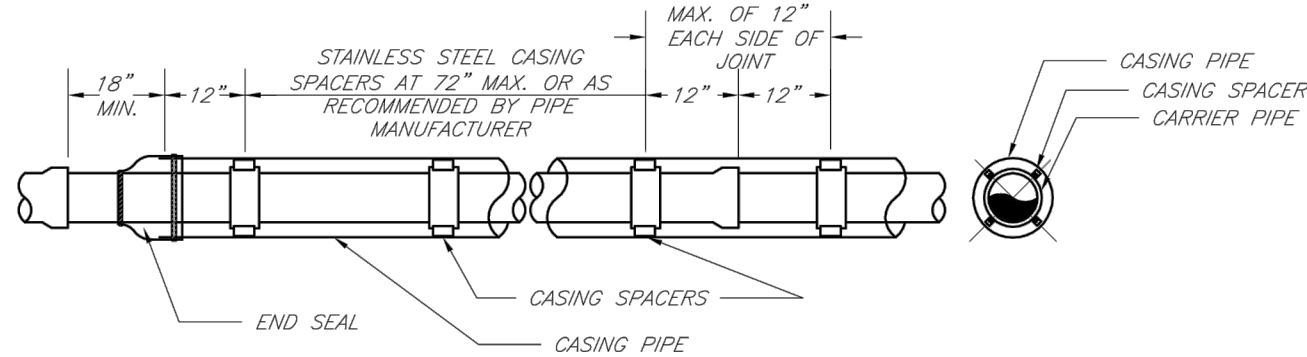
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Professional Engineer
License No. 2011009651

Water Main Extension Plans
Paragon Star Development
Lee's Summit, Missouri

NO.	DATE	REVISIONS	BY	APPROVED
1	2/20/20	City Comments - 10/21/19		
2	4/17/20	City Comments - 3/1/20		
3	4/28/20	Bid Package		
4	5/15/20	City Resubmittal		



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- NOTES:
1. REFER TO SPECIFICATION SECTION 3900 FOR ADDITIONAL INFORMATION.
 2. LENGTH, DIAMETER, AND WALL THICKNESS TO BE SHOWN ON CONSTRUCTION PLANS.

LS

LEE'S SUMMIT

MISSOURI

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

WATER CASING PIPE DETAIL

Date: 02/13

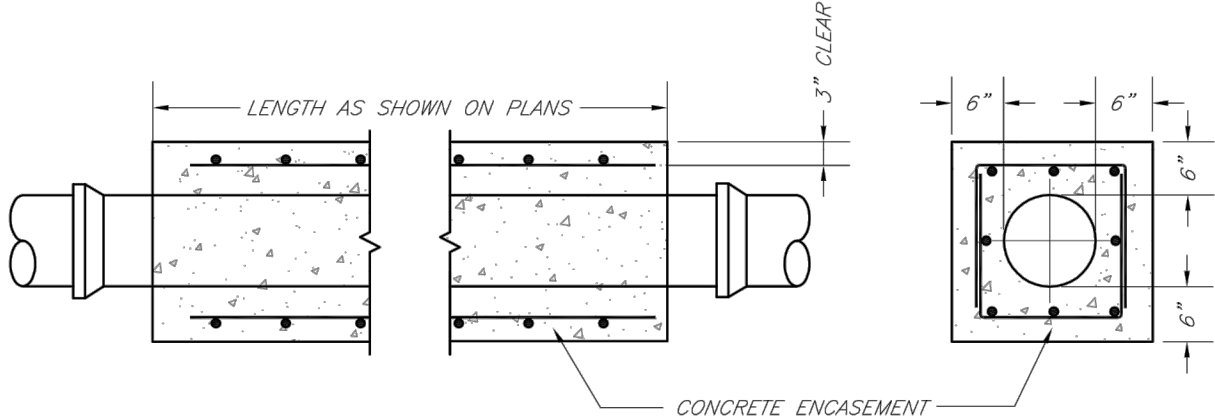
Drawn By: JN

Checked By: DL

FILE: WAT-5

Rev: 1/14

Rev:



- NOTES:
1. INTERMEDIATE BELLS SHALL BE ENCASED.
 2. REINFORCING STEEL SHALL BE #4 @ 12" O.C. EACH WAY WITH A MINIMUM REBAR LAP OF 12".
 3. THIS DETAIL IS FOR PIPES 12" AND SMALLER.

LS

LEE'S SUMMIT

MISSOURI

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

WATER PIPE ENCASEMENT

Date: 02/13

Drawn By: JN

Checked By: DL

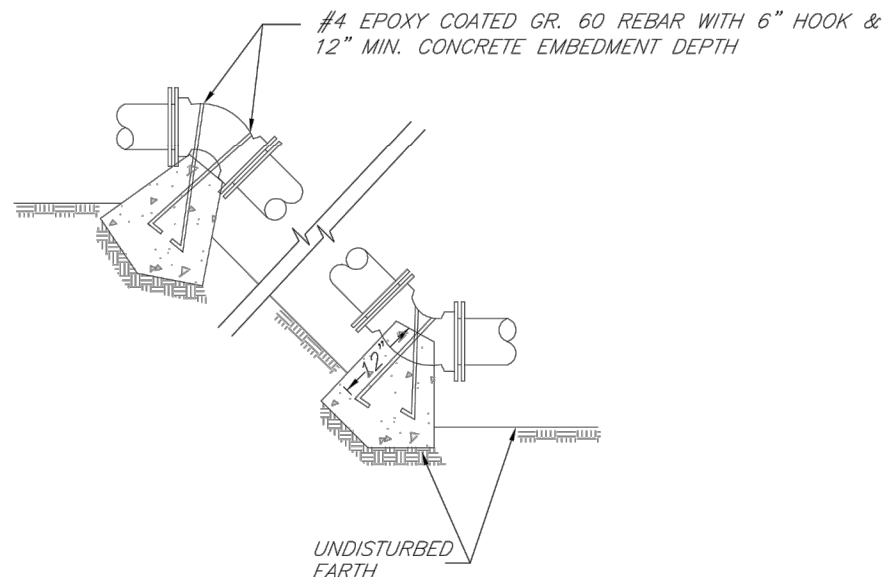
FILE: WAT-4

Rev: 1/14

Rev:

REQUIRED CONCRETE VOLUME (CUBIC FEET - CF)					
NOM. DIA. (INCHES)	TEE, PLUG	BEND	BEND	BEND	BEND
6	50.5	71.4	38.6	19.7	9.9
8	80.8	126.9	68.7	35.0	17.6
10	140.2	198.3	107.3	54.7	27.5
12	202.0	281.1	154.6	78.8	39.6
14	267.0	366.0	200.4	107.3	53.9
16	335.0	453.0	250.0	140.1	70.4
18	405.0	543.0	300.0	177.3	89.1
20	477.0	636.0	350.0	210.0	110.0
24	612.0	816.0	450.0	270.0	158.4

- NOTES:
1. ALL BENDS WITHOUT RESTRAINED JOINTS SHALL HAVE CONCRETE THRUST BLOCKS INSTALLED FOR RESTRAINT.
 2. MEGA LUGS MAY BE USED ONLY IN CONJUNCTION WITH CONCRETE THRUST BLOCKING.
 3. BEARING MUST BE AGAINST UNDISTURBED SOIL.
 4. DO NOT COVER JOINTS OR BOLTS (WHERE APPLICABLE) WITH CONCRETE.



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LEE'S SUMMIT

MISSOURI

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VERTICAL THRUST BLOCKS

Date: 02/13

Drawn By: JN

Checked By: DL

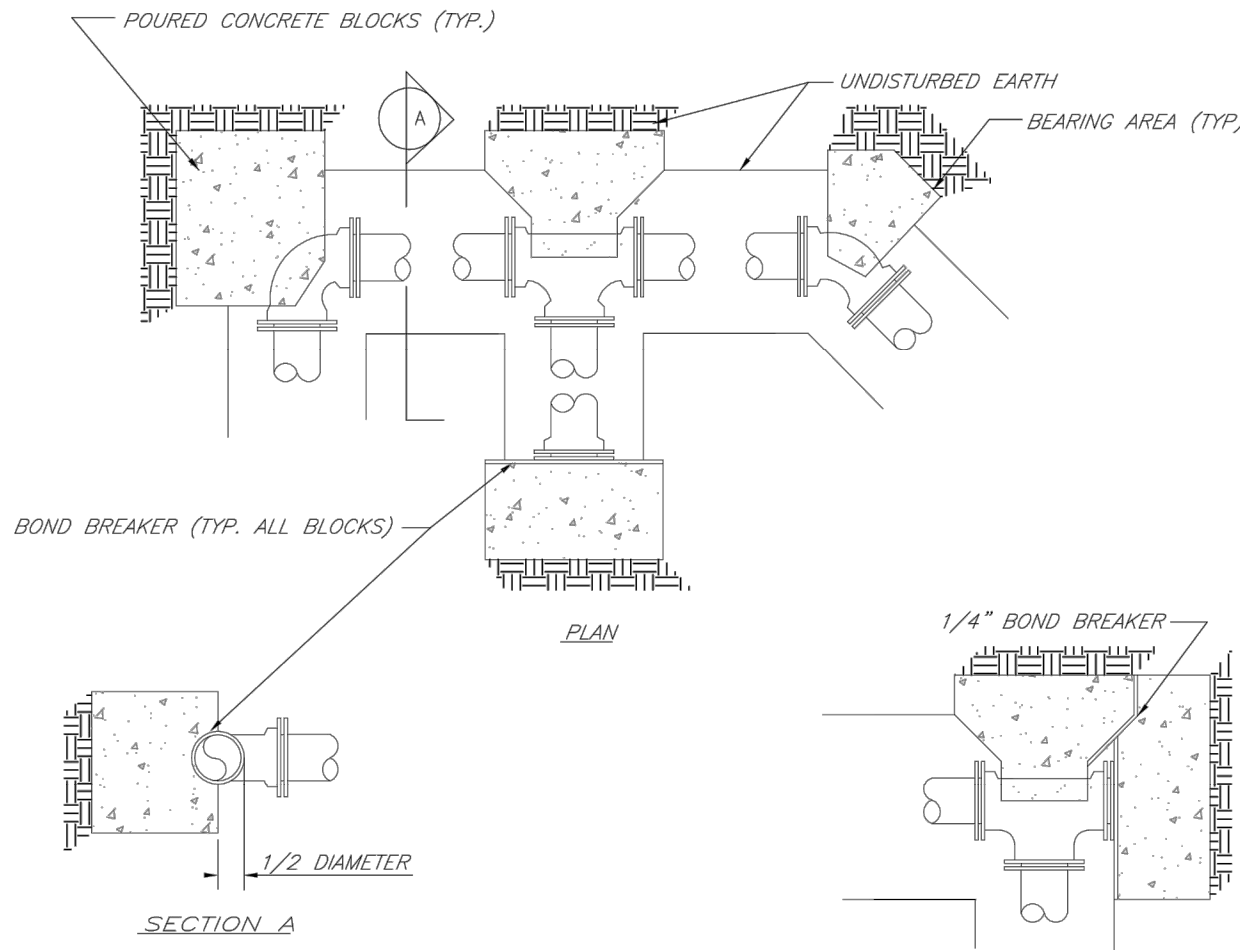
FILE: WAT-2

Rev: 1/14

Rev:

REQUIRED CONCRETE BEARING AREA (SQUARE FEET - SF)					
NOM. DIA. (INCHES)	TEE, PLUG	BEND	BEND	BEND	BEND
6	4.7	6.7	4.0	4.0	4.0
8	8.4	11.8	6.4	4.0	4.0
10	13.1	18.5	10.0	5.1	4.0
12	18.8	26.7	14.4	7.4	4.0
14	25.7	36.3	19.6	10.0	5.0
16	33.5	47.4	25.6	13.1	6.6
18	42.4	59.8	32.5	16.5	8.3
20	51.4	73.6	40.1	20.4	10.3
24	65.0	91.8	50.0	25.4	14.8

- NOTES:
1. ALL BENDS WITHOUT RESTRAINED JOINTS SHALL HAVE CONCRETE THRUST BLOCKS INSTALLED FOR RESTRAINT.
 2. MEGA LUGS MAY BE USED ONLY IN CONJUNCTION WITH CONCRETE THRUST BLOCKING.
 3. BEARING AREA MUST BE AGAINST UNDISTURBED SOIL.
 4. DO NOT COVER JOINTS OR BOLTS (WHERE APPLICABLE) WITH CONCRETE.



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HORIZONTAL THRUST BLOCKS

Date: 02/13

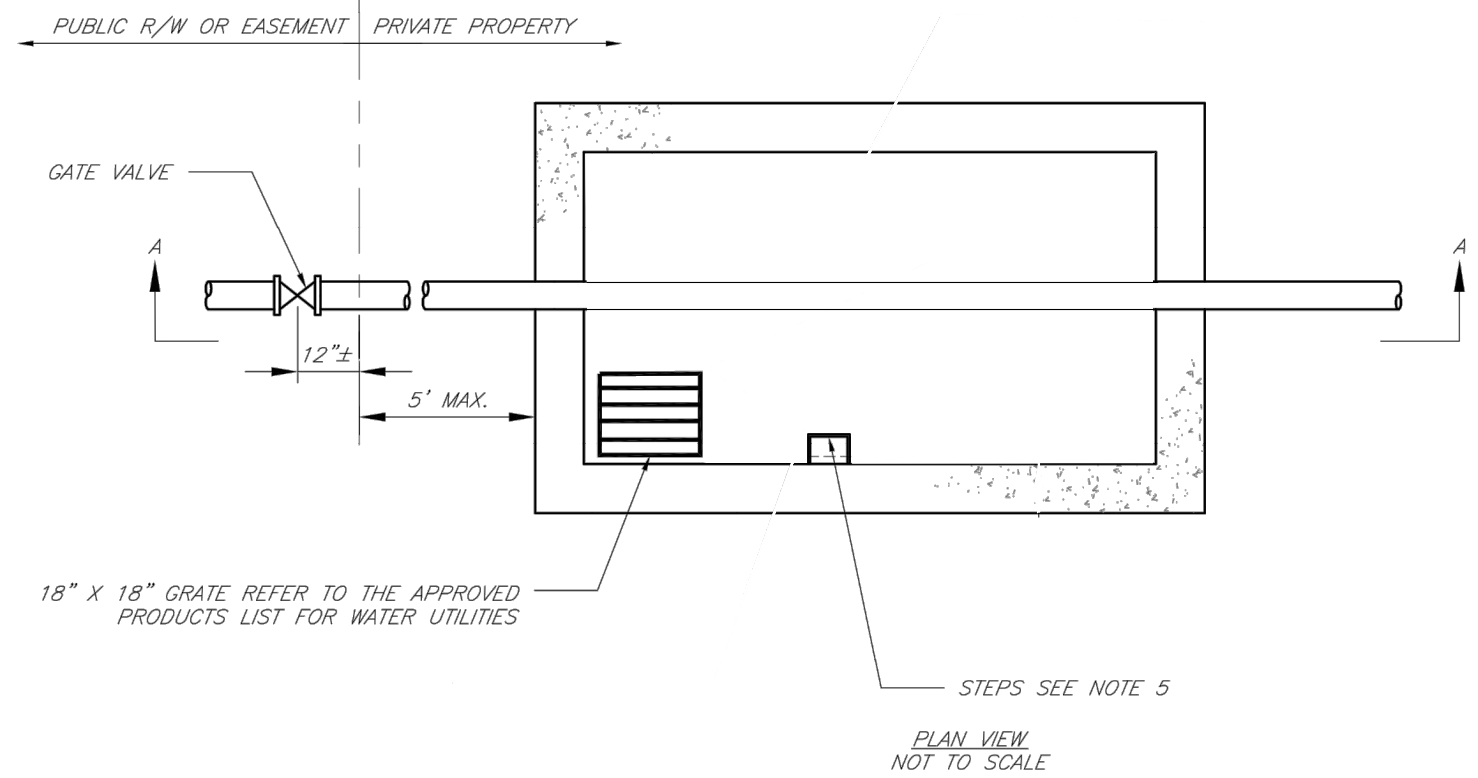
Drawn By: JN

Checked By: DL

FILE: WAT-1

Rev: 1/14

Rev:



- GENERAL NOTES:
1. METER VAULT WALLS TO BE POURED OR PRECAST CONCRETE. METER VAULT ROOF TO BE REINFORCED CONCRETE WITH OPENING CENTERED OVER DETECTOR METER. REINFORCED WALLS AND SLABS ARE TO BE DESIGNED BY THE OWNER'S ENGINEER OR PRECAST ENGINEER.
 2. METER VAULT TO BE LOCATED, WHEN POSSIBLE, OUTSIDE TRAFFIC AREA AND WHERE SURFACE WATER WILL NOT DRAIN INTO IT. PROVIDE CONCRETE SUMP TO DRAIN TO AN ABOVE GROUND DISCHARGE POINT.
 3. ALL PIPE AND FITTINGS FROM THE CITY WATER MAIN THROUGH THE VAULT SHALL BE PROVIDED WITH RESTRAINED JOINT FITTINGS.
 4. ALL FITTINGS FOR THE DETECTOR METER TO BE BRASS.
 5. STEPS SHALL BE IN ACCORDANCE WITH THE APPROVED PRODUCTS LIST FOR WATER UTILITIES AND SHALL BE ON 16" CENTERS.
 7. ALL VALVES SHALL HAVE RISING STEMS.
 8. MANHOLE COVER SHALL BE A BILCO K-1 MODEL UNLESS IN A VEHICLE TRAFFIC AREA. SEE THE APPROVED PRODUCTS LIST FOR WATER UTILITIES FOR TRAFFIC CONDITIONS. THE COVER SHALL HAVE A 1-3/4" Ø HOLE DRILLED FOR A TOUCH/READ DEVICE.
 9. A MINIMUM OF 18" CLEARANCE SHALL BE PROVIDED AROUND ALL PIPING, VALVES, APPURTENANCES, ETC.
 10. CONTACT PUBLIC WORKS ENGINEERING FOR VAULTS THAT INCLUDE A FIRE DEPARTMENT CONNECTION OR A 3" OR LARGER METER.

CITY OF LEE'S SUMMIT, MO

PUBLIC WORKS DEPARTMENT

ENGINEERING DIVISION

LEE'S SUMMIT, MO 64063

STANDARD DRAWINGS

Project: WATER MAIN VAULT

Drawn By: AS

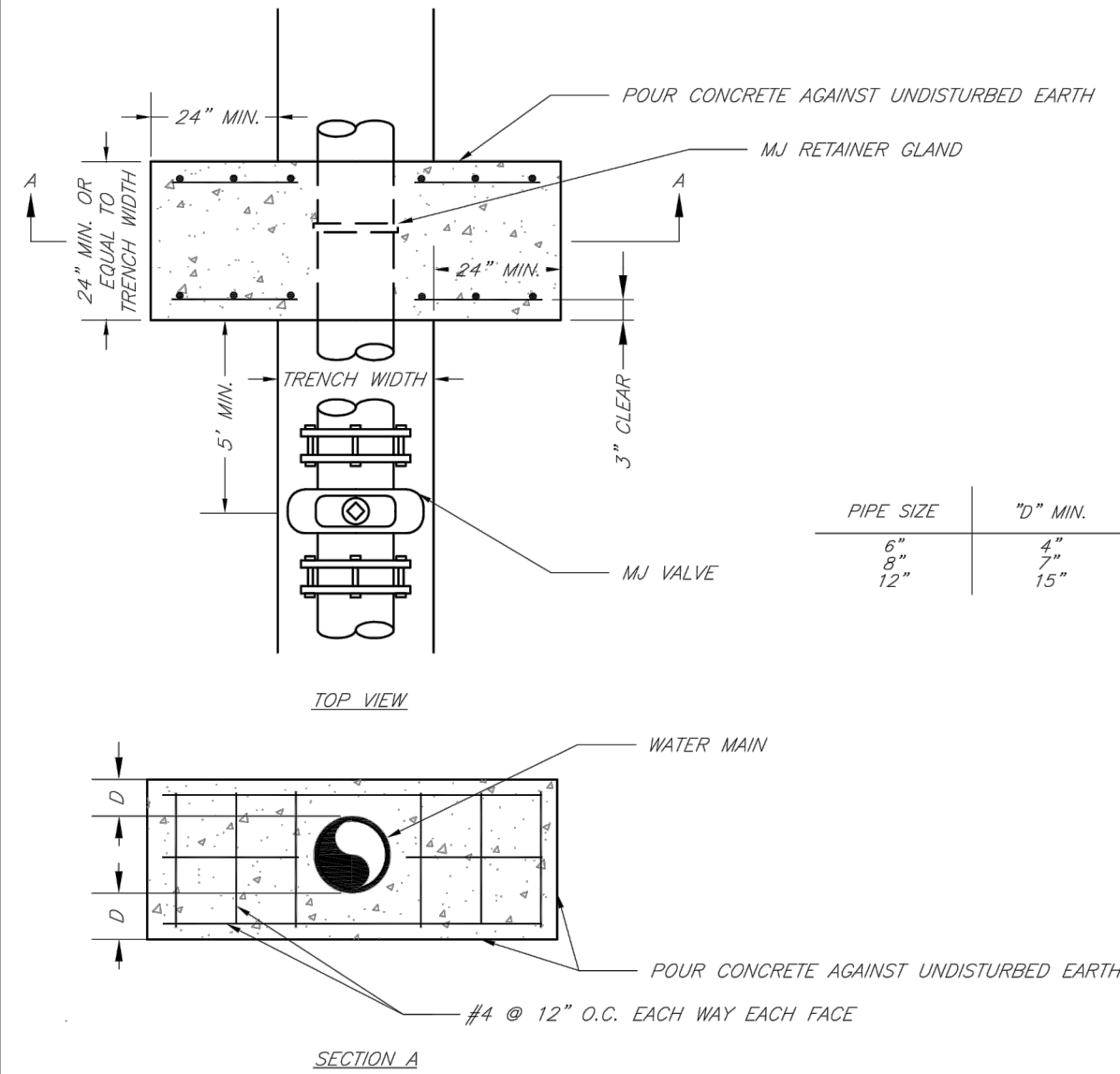
Checked By: JN

Date: 1/14

Rev: 1/14

or

WAT-12



- NOTE:
1. THIS DETAIL NOT TO BE USED FOR PIPE GREATER THAN 12"

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STRADDLE BLOCK

Date: 02/13

Drawn By: JN

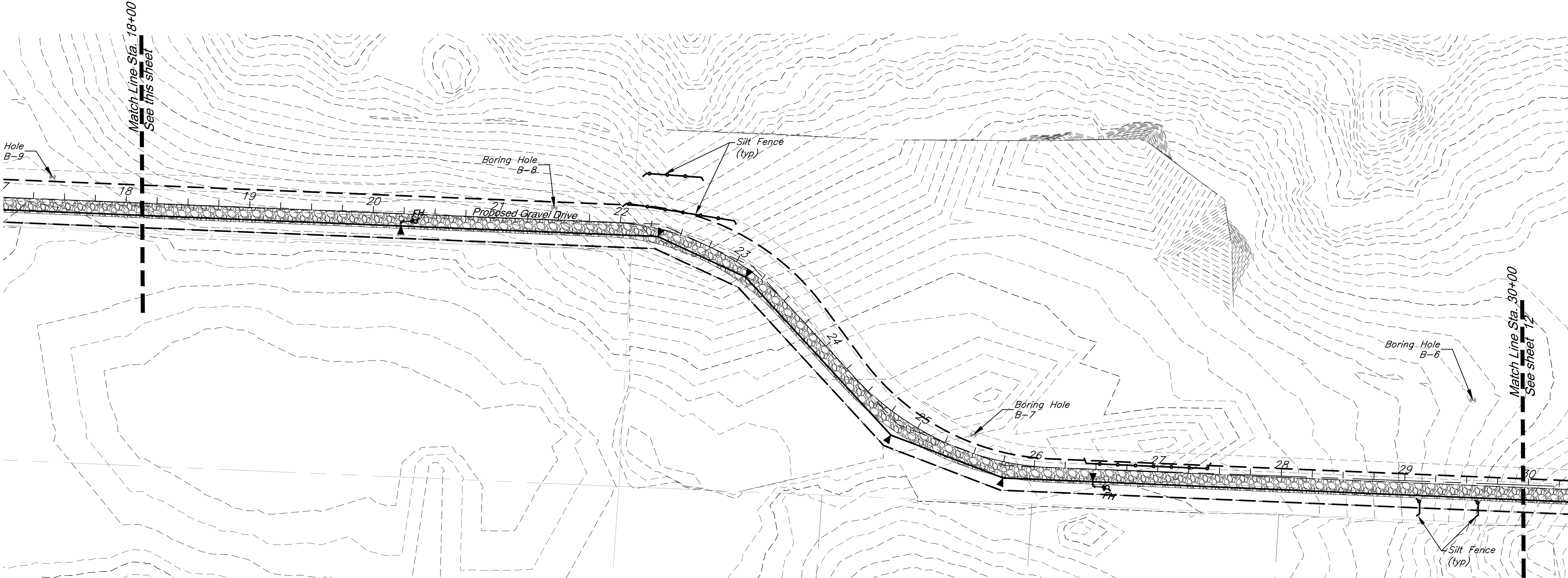
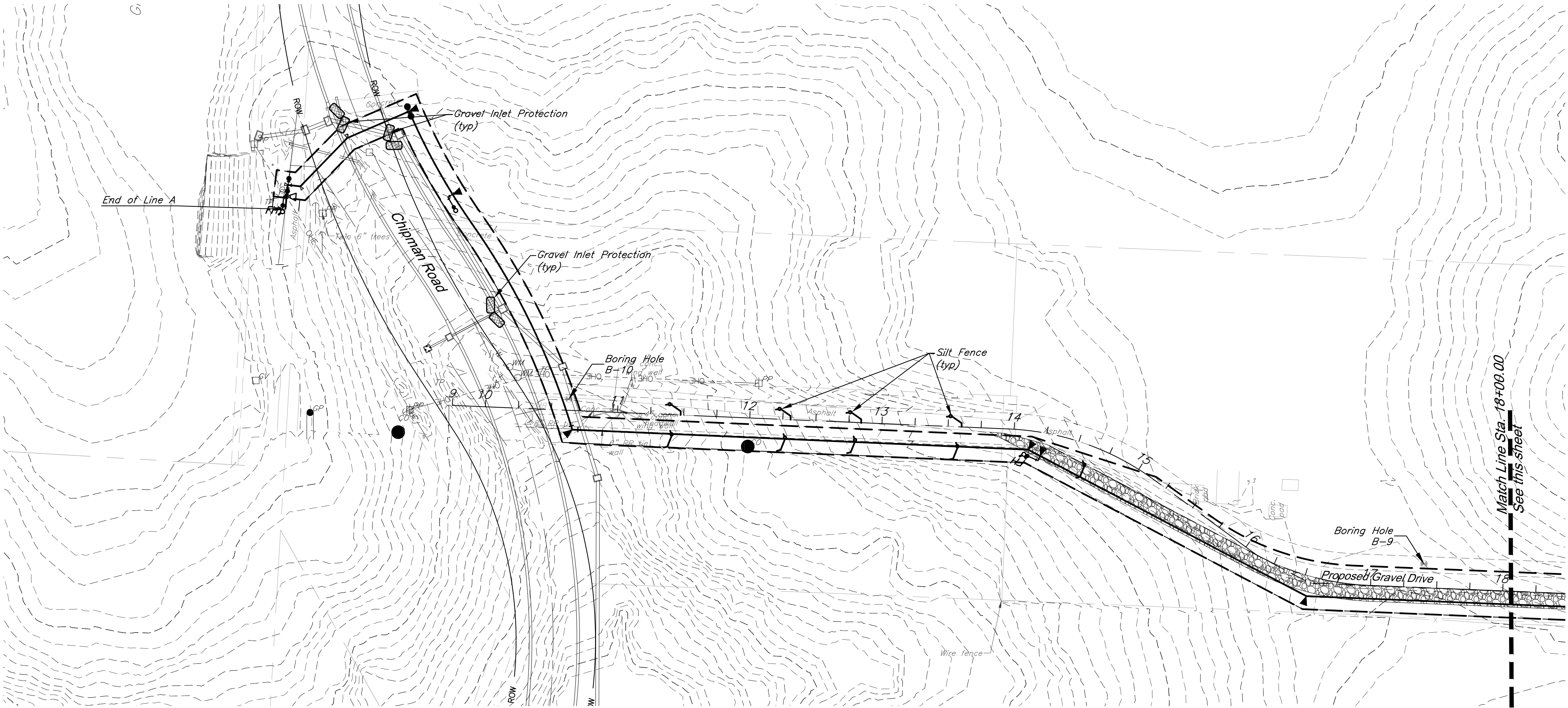
Checked By: DL

FILE: WAT-3

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Rev:

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Grading and Erosion Control Plan



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engineers
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DATE: 7-26-19
DESIGN BY: CEL
DRAWN BY: DRV/DGL
PROJECT NO.: 12720
SHEET NO. 11
TOTAL SHEETS 15

Clint Loumaster
Professional Engineer
License No. 2011009651

Water Main Extension Plans
Paragon Star Development
Lee's Summit, Missouri

NO.	DATE	REVISIONS	BY	APPROVED
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2	4/17/20	City Comments - 3/1/20		
3	4/28/20	Bid Package		
4	5/15/20	City Resubmittal		

Note:
Contractor shall strip vegetation, including trees, along the water main alignment and dispose of off site. Entire disturbed area shall be re-vegetated per seeding notes below.

EROSION CONTROL LEGEND

- Gravel Inlet Protection
 - Silt Fence
 - Rock Ditch Check
- Note: All disturbed area to be seeded.

Seeding Notes:

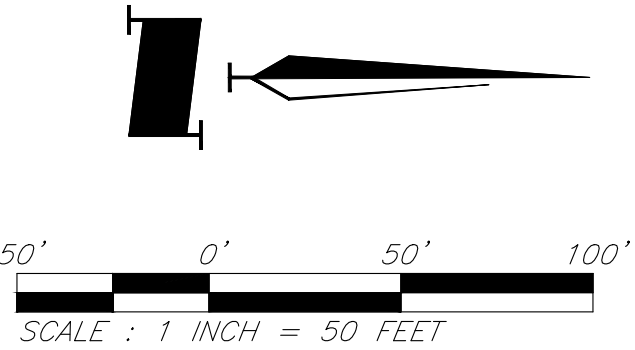
- Contractor shall uniformly spread the topsoil over disturbed area. Seed and straw mulch shall be placed as soon as practicable.
- Between November 1 and March 15, temporary stabilization shall include a straw mulch cover at 2.25 tons/acre.
- Between March 15 and May 31, drill or hydroseed all disturbed areas with K-31 fescue at 90 lbs PLS per acre and rye grass at 50 lbs PLS per acre. Reapply straw mulch cover at 1.5 tons per acre.
- Immediately water after seeding and continue to water as necessary to establish permanent vegetation.

Earthwork

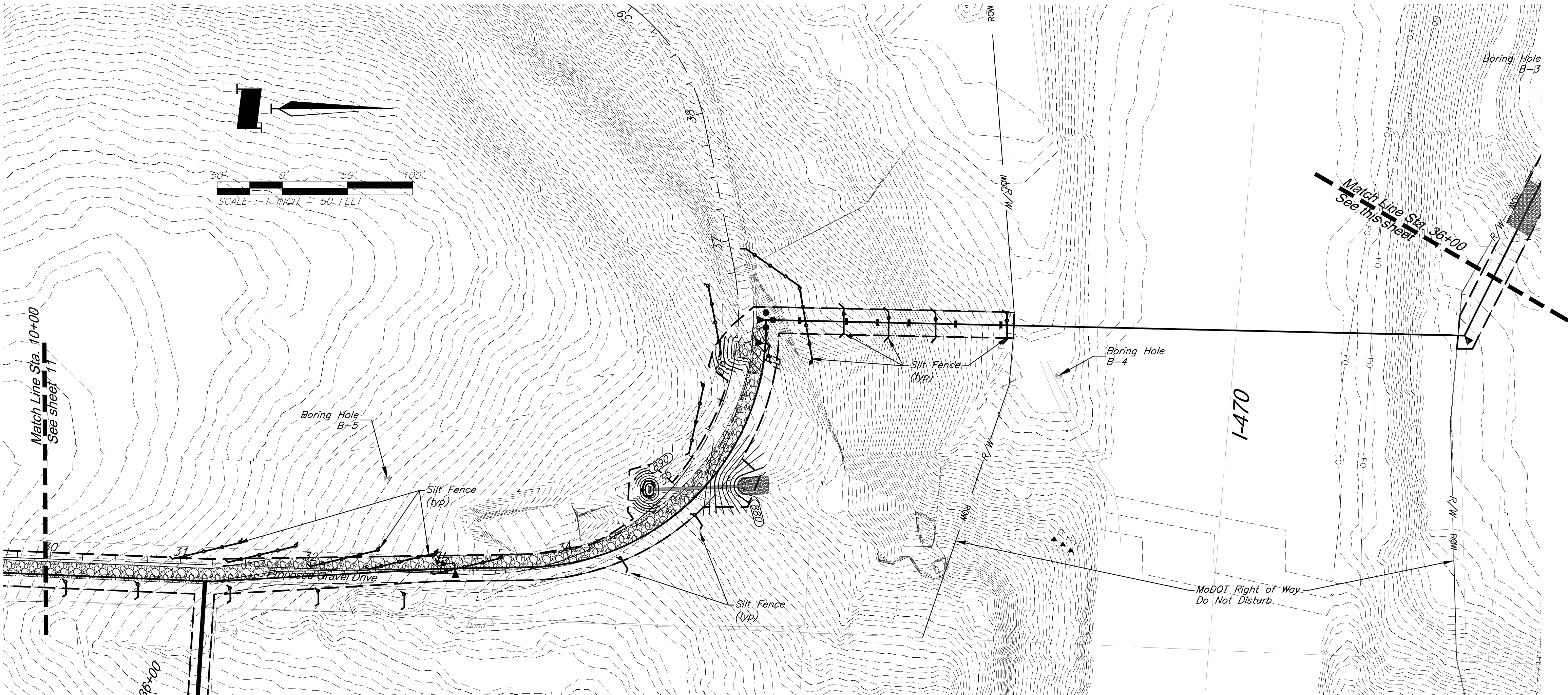
Cut = 69 CY
Fill* = 217 CY
Net = 148 CY Fill
*Fill factor of 1.15

CAUTION!

Numerous Utilities on Site.
Contractor to verify location and elevation of all utilities prior to commencing construction.



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DATE: 7-26-19
DESIGN BY: CEL
DRAWN BY: DRW/DGL
PROJECT NO.: 12720
SHEET NO.: 12
TOTAL SHEETS: 15

Clint Loumaster
Professional Engineer
License No. 2011009651

Water Main Extension Plans
Paragon Star Development
Lee's Summit, Missouri

NO.	DATE	REVISIONS	BY	APPROVED
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4	5/15/20	City Resubmittal		

Note:
Contractor shall strip vegetation, including trees, along the water main alignment and dispose of off site. Entire disturbed area shall be re-vegetated per seeding notes below.

EROSION CONTROL LEGEND

- Gravel Inlet Protection
- Silt Fence
- Rock Ditch Check

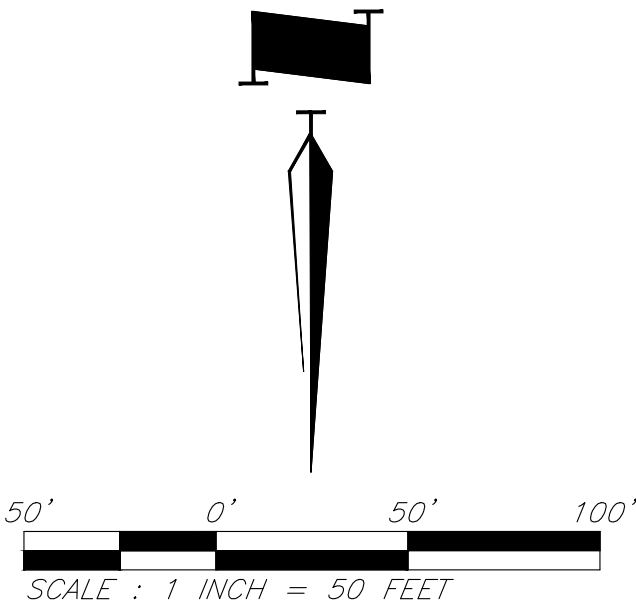
Note: All disturbed area to be seeded.

Seeding Notes:

- Contractor shall uniformly spread the topsoil over disturbed area. Seed and straw mulch shall be placed as soon as practicable.
- Between November 1 and March 15, temporary stabilization shall include a straw mulch cover at 2.25 tons/acre.
- Between March 15 and May 31, drill or hydroseed all disturbed areas with K-31 fescue at 90 lbs PLS per acre and rye grass at 50 lbs PLS per acre. Reapply straw mulch cover at 1.5 tons per acre.
- Immediately water after seeding and continue to water as necessary to establish permanent vegetation.

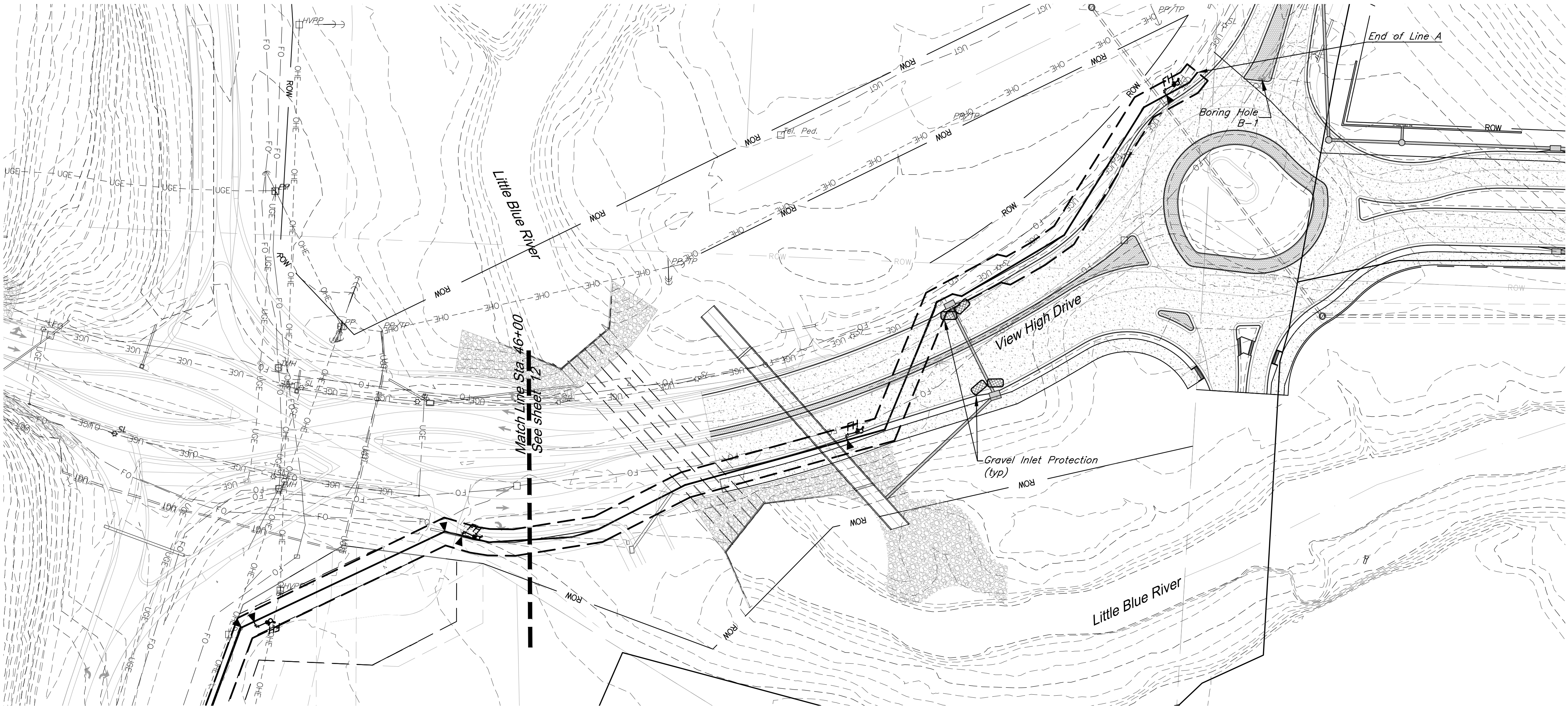
CAUTION!

Numerous Utilities on Site.
Contractor to verify location and elevation of all utilities prior to commencing construction.



Grading and Erosion Control Plan

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EROSION CONTROL LEGEND

- Gravel Inlet Protection
- Silt Fence

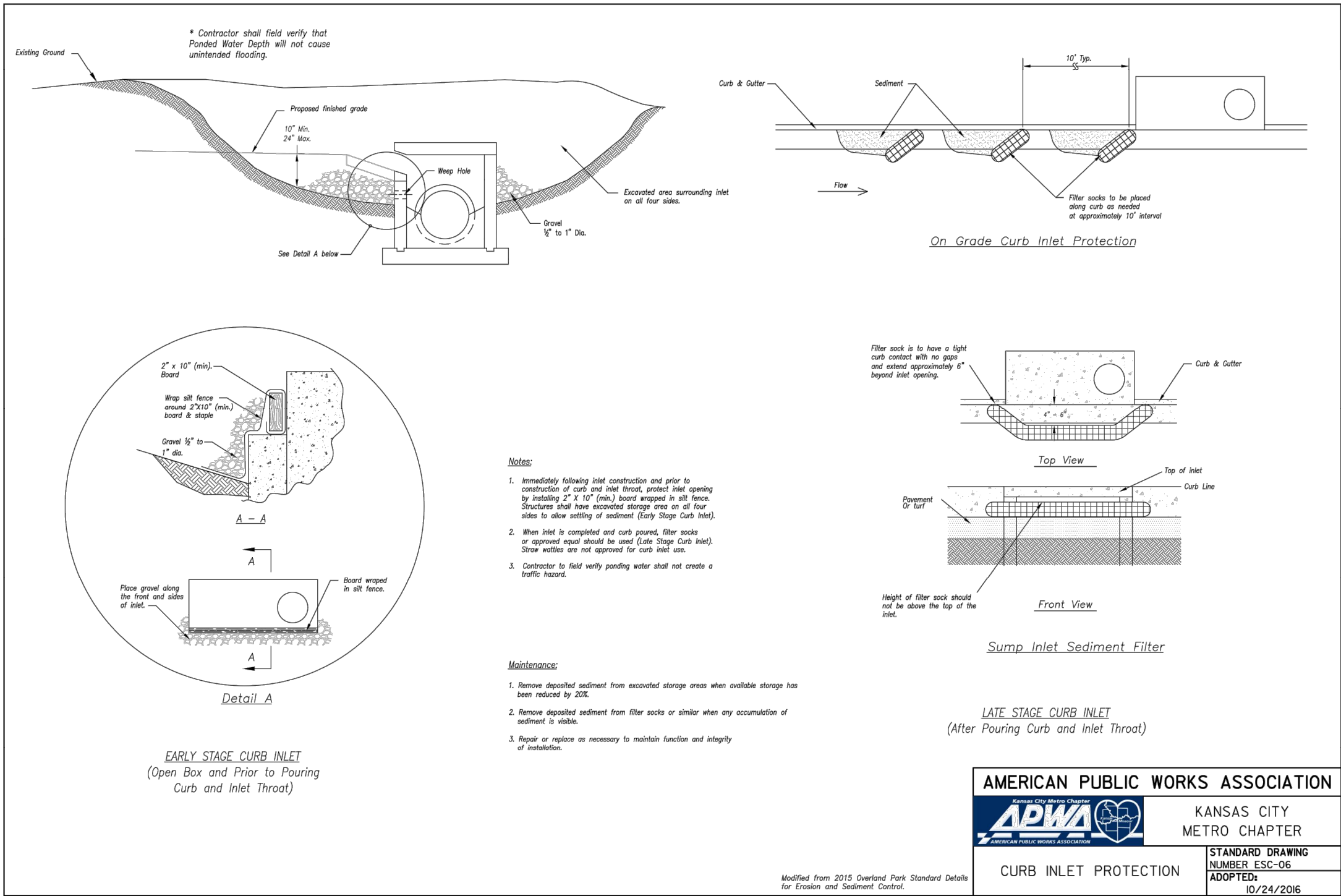
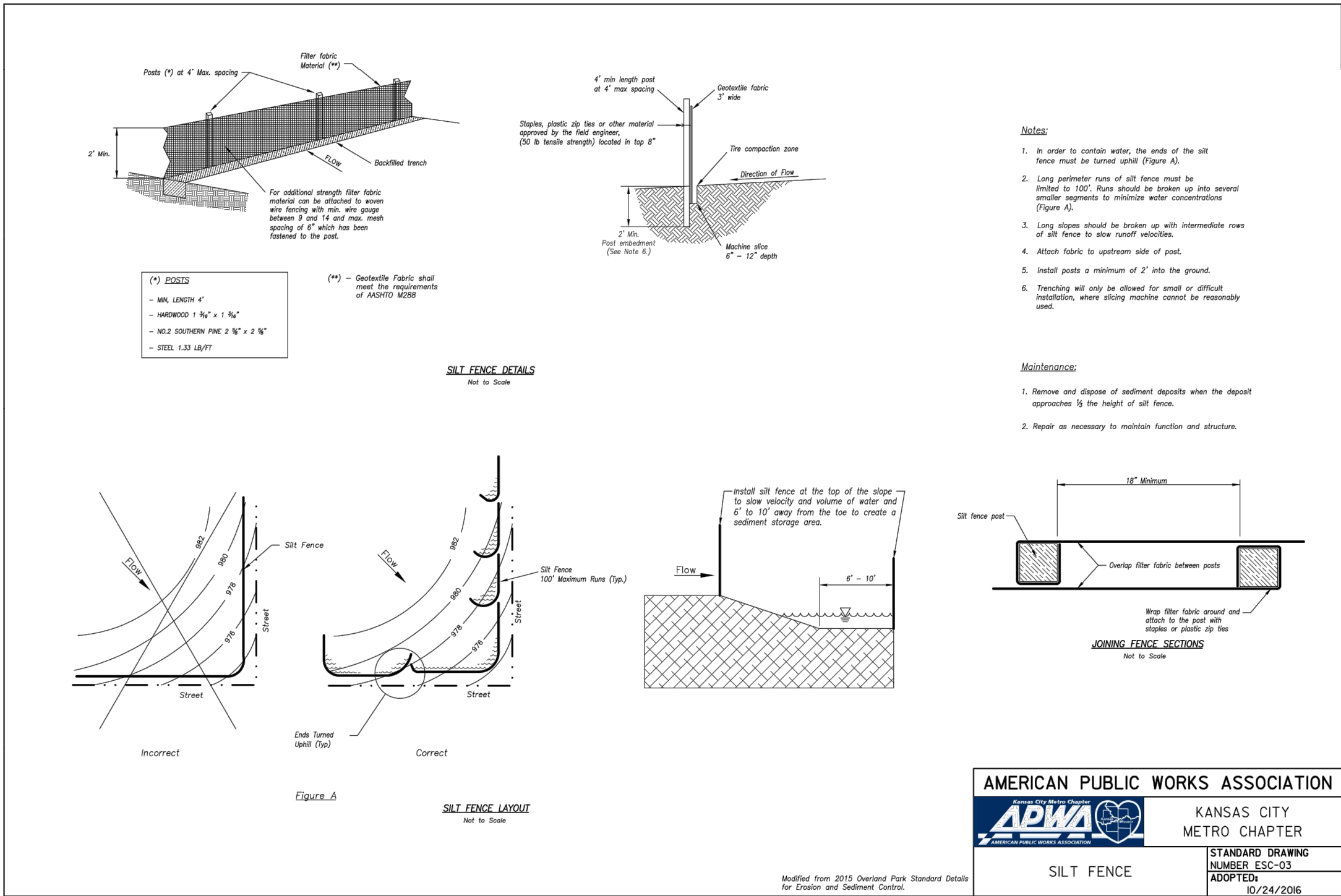
Note: All disturbed area to be seeded.

Seeding Notes:

- Contractor shall uniformly spread the topsoil over disturbed area. Seed and straw mulch shall be placed as soon as practicable.
- Between November 1 and March 15, temporary stabilization shall include a straw mulch cover at 2.25 tons/acre.
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- Immediately water after seeding and continue to water as necessary to establish permanent vegetation.

CAUTION!

Numerous Utilities on Site. Contractor to verify location and elevation of all utilities prior to commencing construction.



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Section 2721

Engineered Surface Drainage Products

GENERAL

PVC surface drainage inlets shall include the drain basin type as indicated on the contract drawing and referenced within the contract specifications. The ductile iron grates for each of these fittings are to be considered an integral part of the surface drainage inlet and shall be furnished by the same manufacturer. The surface drainage inlets shall be as manufactured by Nyloplast a division of Advanced Drainage Systems, Inc., or prior approved equal.

MATERIALS

The drain basins required for this contract shall be manufactured from PVC pipe stock, utilizing a thermoforming process to reform the pipe stock to the specified configuration. The drainage pipe connection stubs shall be manufactured from PVC pipe stock and formed to provide a watertight connection with the specified pipe system. This joint tightness shall conform to ASTM D3212 for joints for drain and sewer plastic pipe using flexible elastomeric seals. The flexible elastomeric seals shall conform to ASTM F477. The pipe bell spigot shall be joined to the main body of the drain basin or catch basin. The raw material used to manufacture the pipe stock that is used to manufacture the main body and pipe stubs of the surface drainage inlets shall conform to ASTM D1784 cell class 12454.

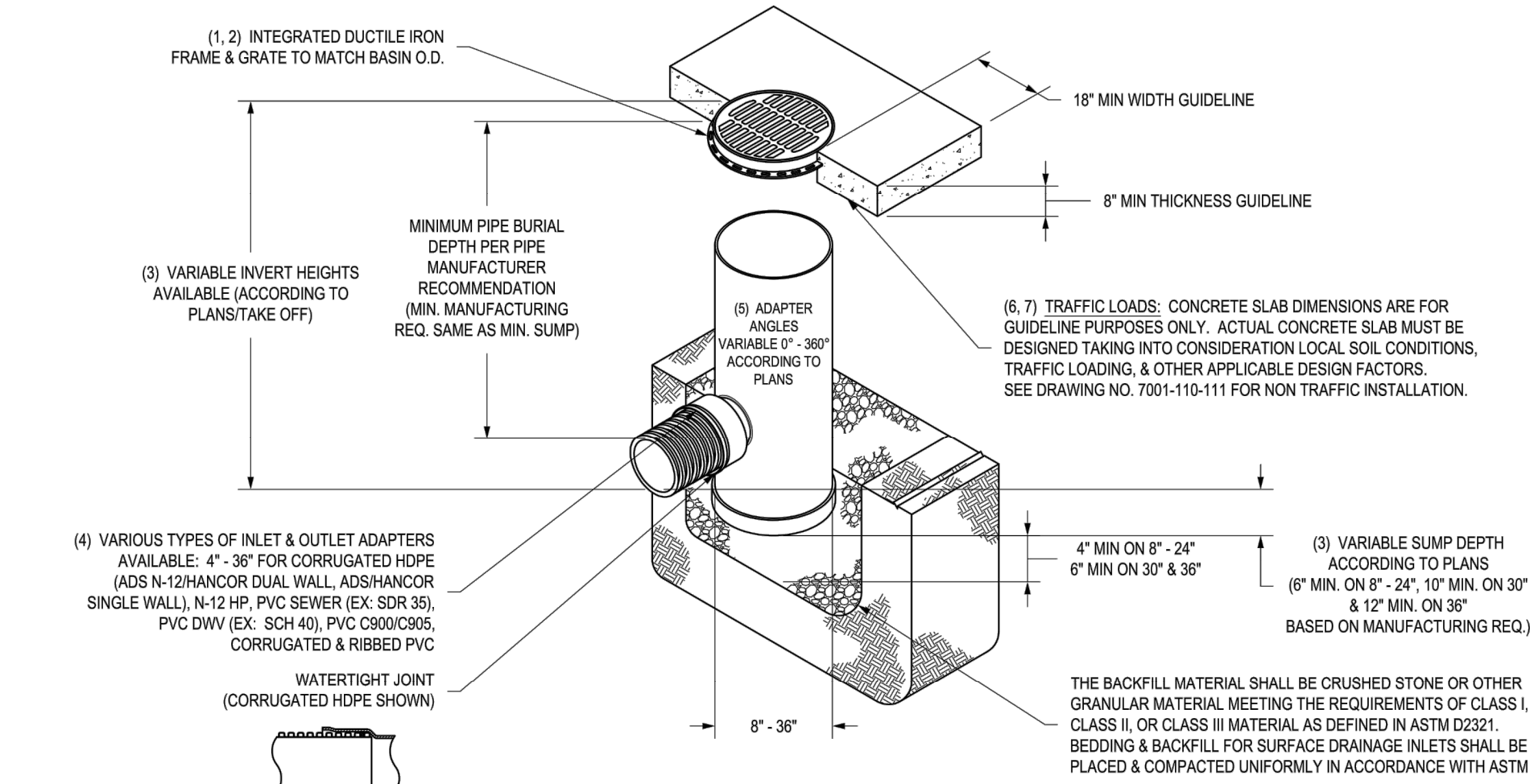
The grates and frames (furnished for all surface drainage inlets) shall be ductile iron for structure sizes 8", 10", 12", 15", 18", 24", 30" and 36" and shall be made specifically for each basin so as to provide a round bottom flange that closely matches the diameter of the surface drainage inlet. Grates for drain basins shall be capable of supporting various wheel loads as specified by Nyloplast. 12" and 15" square grates will be hinged to the frame using pins. Ductile iron used in the manufacture of the castings shall conform to ASTM A536 grade 70-50-05. Grates and covers shall be provided painted black.

INSTALLATION

The specified PVC surface drainage inlet shall be installed using conventional flexible pipe backfill materials and procedures. The backfill material shall be crushed stone or other granular material meeting the requirements of class 1, class 2, or class 3 material as defined in ASTM D2321. Bedding and backfill for surface drainage inlets shall be well placed and compacted uniformly in accordance with ASTM D2321. The drain basin body will be cut at the time of the final grade. No brick, stone or concrete block will be required to set the grate to the final grade height. For load rated installations, a concrete slab shall be poured under and around the grate and frame. The concrete slab must be designed taking into consideration local soil conditions, traffic loading, and other applicable design factors. For other installation considerations such as migration of fines, ground water, and soft foundations refer to ASTM D2321 guidelines.

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		DATE 3-19-06		
		REVISED BY NMH	PROJECT NO./NAME	
		DATE 02-21-18		
DWG SIZE A		SCALE 1:1	SHEET 1 OF 1	TITLE 8 IN. - 36 IN DRAIN BASIN SPECIFICATIONS
DWG NO. 7001-110-011		REV J		

NYLOPLAST DRAIN BASIN WITH STANDARD GRATE

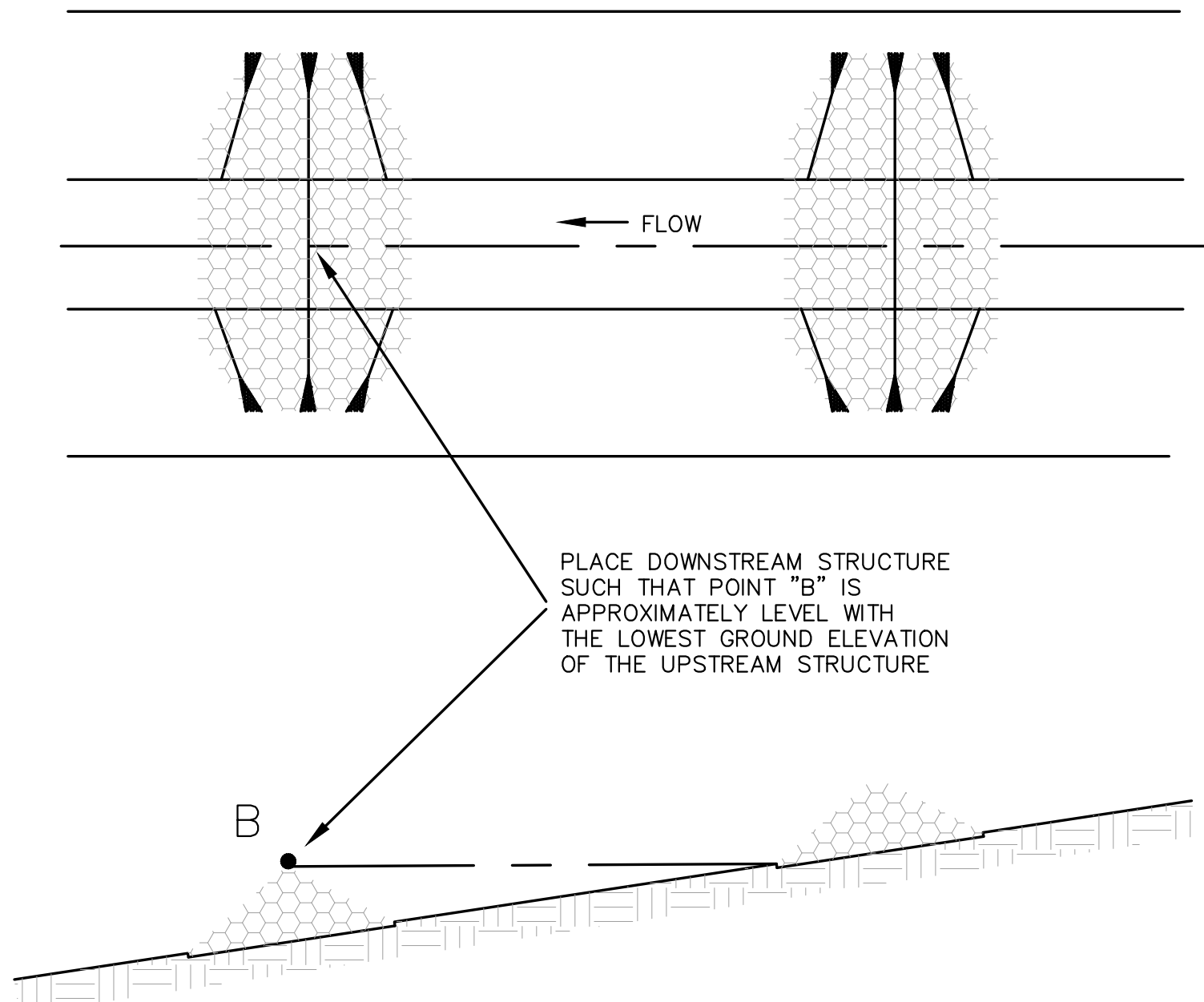


- 1 - 8" - 30" STANDARD GRATES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05.
- 2 - 12" - 30" FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05. 9" & 10" STANDARD GRATES FIT DIRECTLY ONTO DRAIN BASINS WITH THE USE OF A PVC BODY TOP. SEE DRAWING NO. 7001-110-045.
- 3 - DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS. RISERS ARE NEEDED FOR BASINS OVER 84" DUE TO SHIPPING RESTRICTIONS. SEE DRAWING NO. 7001-110-065.
- 4 - DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS N-12/HANCOR DUAL WALL), N-12 HP, & PVC SEWER (4" - 36").
- 5 - ADAPTERS CAN BE MOUNTED ON ANY ANGLE 0° TO 360°. TO DETERMINE MINIMUM ANGLE BETWEEN ADAPTERS SEE DRAWING NO. 7001-110-012.
- 6 - 12" - 30" STANDARD GRATES SHALL MEET H-20 LOAD RATINGS.
- 7 - 8" & 10" STANDARD GRATES ARE RATED FOR LIGHT DUTY APPLICATIONS ONLY. NO CONCRETE COLLAR NEEDED FOR LIGHT DUTY RATINGS.

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		DATE 1-23-06		
		REVISED BY NMH	PROJECT NO./NAME	
		DATE 06-12-18		
DWG SIZE A		SCALE 1:40	SHEET 1 OF 1	TITLE DRAIN BASIN WITH STANDARD GRATE QUICK SPEC INSTALLATION DETAIL
DWG NO. 7001-110-144		REV J		

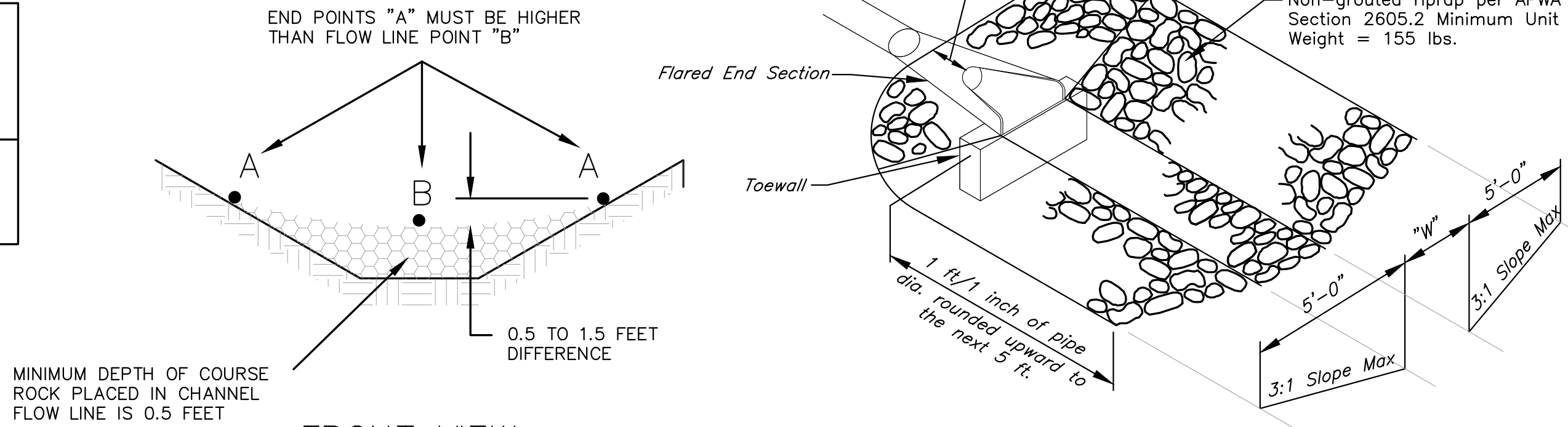
D-50 OF ROCK (INCHES)	DOWNSTREAM FLOWLINE SLOPE OF STRUCTURES (FT/FT)					
	0.35	0.30	0.25	0.20	0.15	0.10
3	0.6	0.7	0.8	1.0	1.3	1.9
6	1.2	1.4	1.6	2.0	2.6	3.9

RECOMMENDED ROCK SIZE & FLOW DEPTHS



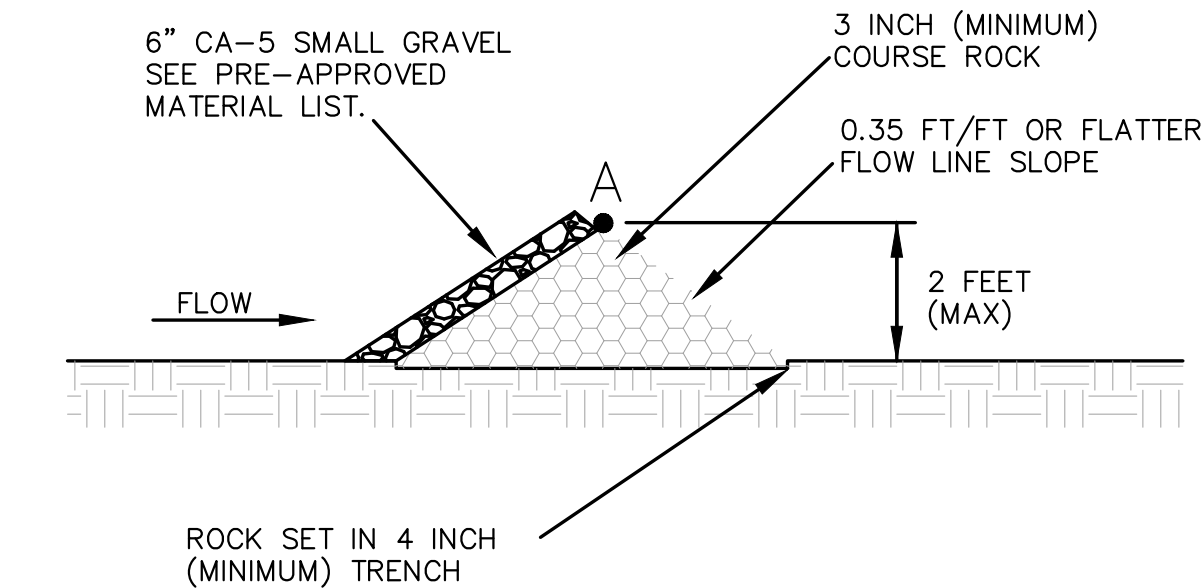
ROCK DITCH CHECK DETAIL

N.T.S.



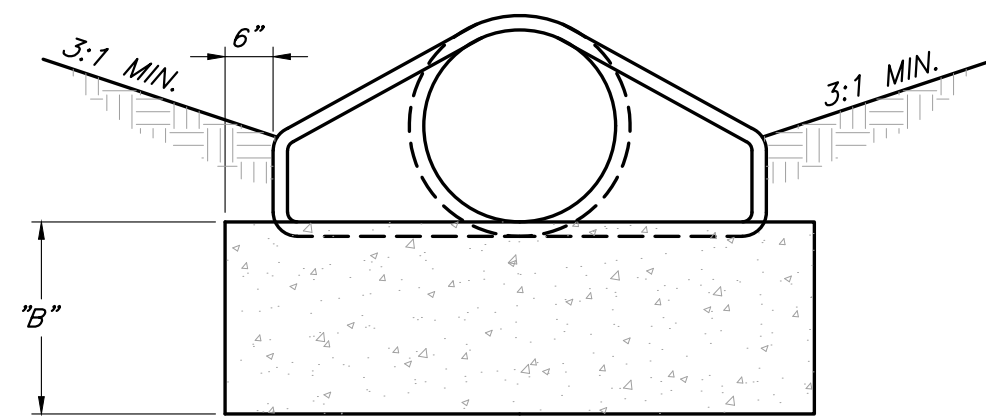
OUTLET EROSION PROTECTION - RIPRAP

Not to Scale



SIDE VIEW

- NOTES:
1. WHEN USED TO CONTROL SEDIMENT FROM STEEP SLOPES, FILTER FENCES SHOULD BE PLACED AWAY FROM THE TOE OF A SLOPE FOR INCREASED HOLDING CAPACITY.
 2. WHEN SEDIMENT FILLS THE AREA BEHIND THE SILT FENCE TO 1/2 THE HEIGHT OF THE SILT FENCE, THE CONTRACTOR SHALL REMOVE THE SEDIMENT.

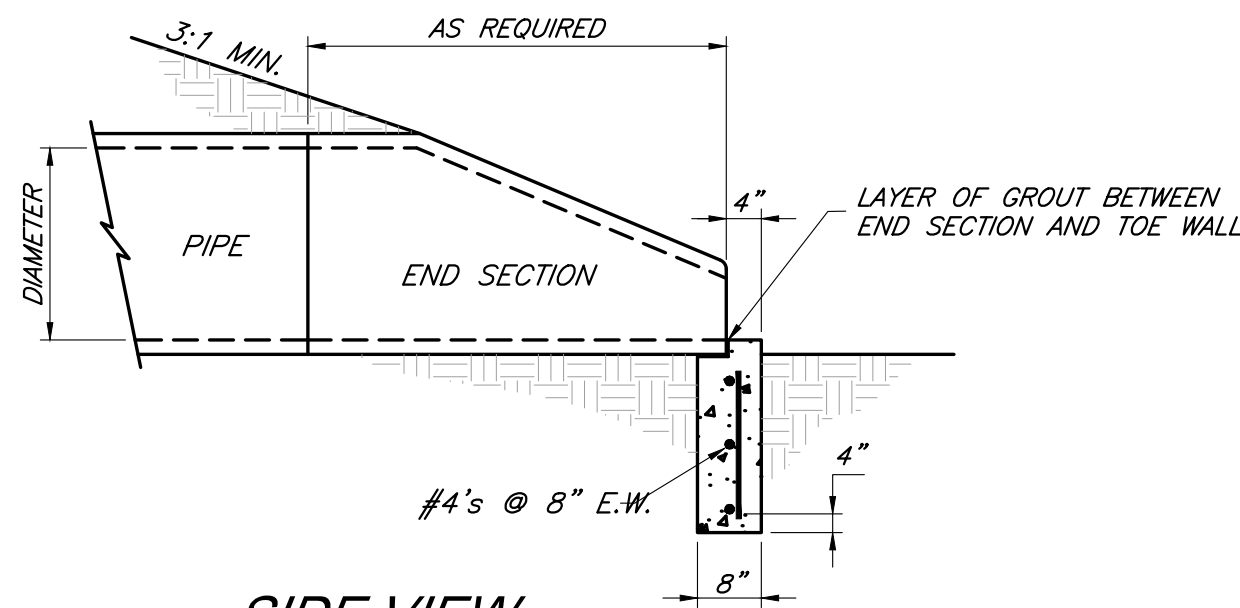


FRONT VIEW

TABLE	
TOE WALL DEPTH	
PIPE DIAMETER	"B"
12" - 21"	18"
24" - 48"	24"
54" - 66"	36"

NOTES:

1. THE DEPTH OF THE TOE WALL SHALL BE PER TABLE. IF BEDROCK IS ENCOUNTERED A MINIMUM OF 12" INTO BEDROCK IS REQUIRED.
2. ALL CONCRETE SHALL BE KCMMB-4K.



SIDE VIEW

END SECTION DETAIL



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DRAWN BY: DRW/DGL
PROJECT NO.: 12720
SHEET NO. 14
TOTAL SHEETS 15

Clint Loumaster
Professional Engineer
License No. 2011009651

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Paragon Star Development
Lee's Summit, Missouri

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SHEET NO. 15
TOTAL SHEETS 15

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