

MASS GRADING PLANS
FOR
PARAGON STAR DEVELOPMENT

Sections 33 & 34–Township 48–Range 32
City of Lee’s Summit
Jackson County, Missouri

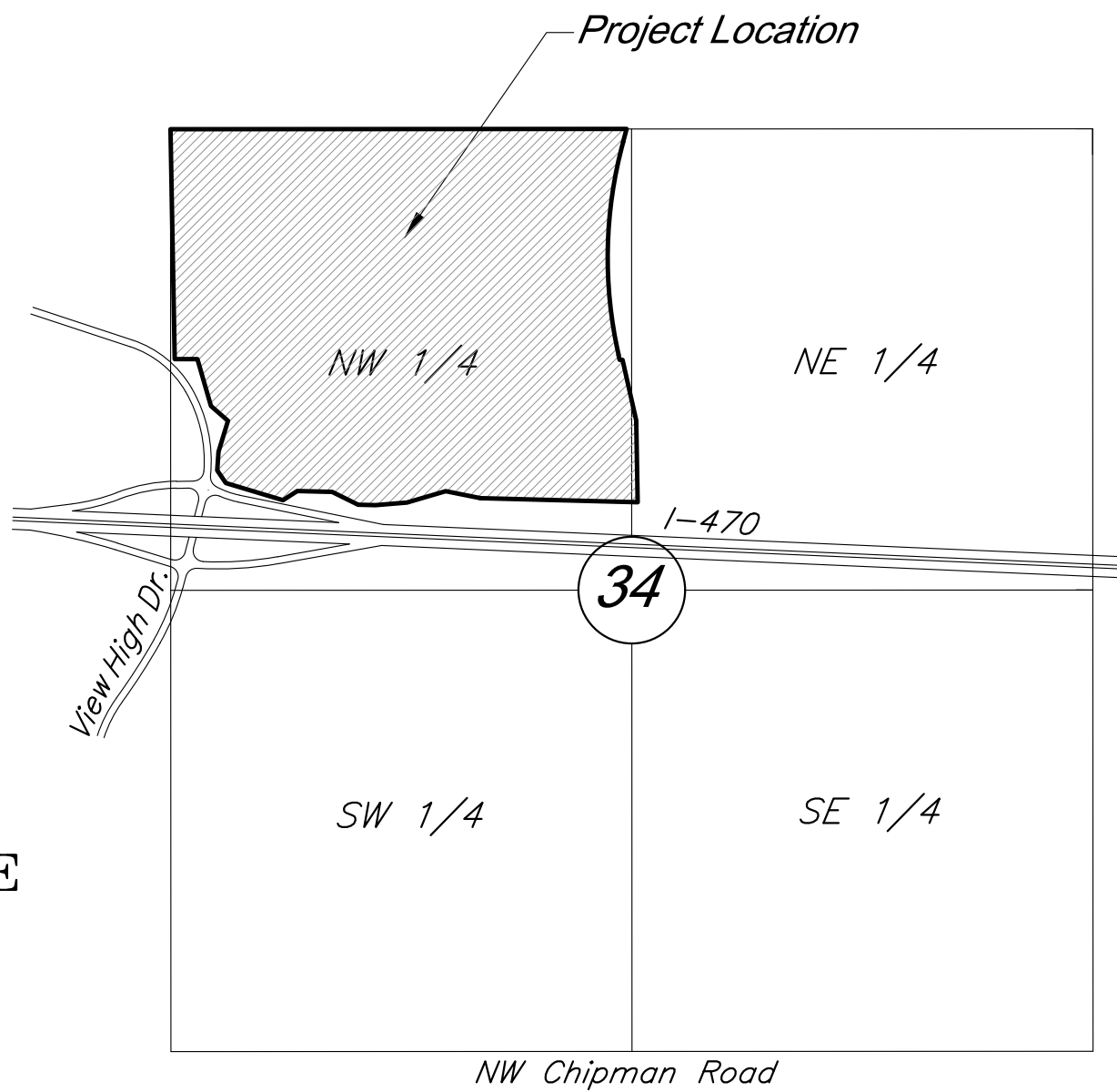
SUMMARY OF QUANTITIES

No.	DESCRIPTION	UNIT	QUANTITY
1	Fill (15% shrinkage)	C.Y.	400,008*
2	Cut (Unadjusted)	C.Y.	70,094
3	Sediment Fence	L.F.	5,044
4	Rock Check Dam	EA.	8
5	Straw Wattle	L.F.	1,613
6	Turf Reinforcement Mat (TRM)	S.Y.	16,150
7	Temporary Construction Entrance	EA.	4
8	5'x4' Curb Inlet	EA.	2
9	7'x4' Curb Inlet	EA.	1
10	8'x4' Curb Inlet	EA.	1
11	9'x4' Curb Inlet	EA.	1
12	7'x4' Junction Box	EA.	1
13	8'x4' Junction Box	EA.	1
14	18" HDPE	L.F.	75
15	30" RCP	L.F.	116.55
16	42" RCP	L.F.	128.77
17	48" RCP	L.F.	117.11
18	60" RCP	L.F.	215.58
19	72" RCP	L.F.	204.00
20	8'x8'x166' RCB	Ea.	1
21	30" RCP End Section w/ Conc. Toewall	Ea.	1
22	30" RCP Headwall w/ Conc. Toewall and Flapgate	Ea.	1
23	42" RCP End Section w/ Conc. Toewall	Ea.	1
24	48" RCP End Section w/ Conc. Toewall	Ea.	1
25	60" RCP End Section w/ Conc. Toewall	Ea.	1
26	60" RCP Headwall w/ Conc. Toewall and Flapgate	Ea.	1
27	72" RCP End Section w/ Conc. Toewall	Ea.	2
28	Caged Reinforced Concrete Encasement	L.F.	110
29	Adjust Existing Sanitary Sewer Manhole	Ea.	6
30	Riprap	S.Y.	450
31	Seeding (Temporary)	LS	1
32	Seeding (Permanent)	Ac.	3.2

* Base Earthwork: 400,008 CY Fill, 70,094 CY Cut
Floodway: 57,100 CY Fill
Topsoil Removed by Clearing Plan: 46,500 CY Fill
Total Fill Required: 433,514 CY

UTILITY CONTACTS

Sanitary Sewers	Mr. Jeff Thorn, PE City of Lee's Summit Water Utilities 220 SE Green Street 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
Water	Mr. Jeff Thorn, PE City of Lee's Summit Water Utilities 220 SE Green Street 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
	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		
Electric Service			



VICINITY MAP

Section 33 & 34-T48N-R32W

INDEX OF SHEETS

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DEVELOPED AND OWNED BY:
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PROJECT ENGINEER: DATE:

APPROVED: DATE:

CITY ENGINEER: DATE:

PREPARED & SUBMITTED BY:
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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

Architect: 00212, Professional Engineer: 000133, Landscape Architect: 000025, Professional Land Surveyor: 000059
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EROSION AND SEDIMENT CONTROL NOTES

The layout of erosion control best management practices (BMPs) shown on the engineering plans is intended to control erosion and minimize, if not eliminate, the transport of sediment from the disturbed areas. The Contractor shall be responsible for the evaluation of existing surface drainage patterns and for making adjustments to the BMP locations to best control erosion and minimize, if not eliminate, the transport of sediment from the disturbed areas. The following are measures to achieve the control of erosion and sediment.

1. Stabilization Practices – Stabilization practices are very effective at preventing erosion by shielding the soil surface from the impact of rain, slowing the velocity of runoff, holding soils in place, and increasing infiltration of runoff and allowing the soil to absorb more rainfall.

a. Temporary Seeding Stabilization – During acceptable growing periods (see Table 1 below); temporary seeding of annual vegetation with a straw mulch cover shall be used as a temporary cover until permanent vegetation is established. If there is a possibility that a vegetative cover will be required to control erosion for more than 1 year, then consider the addition of a perennial/permanent grass species as part of a seeding mixture.

Table 1. Temporary Seeding Dates and Minimum Application Rates

Seeding Dates	Temporary Seed Species	Minimum Application Rates (pure live seed lbs. per acre)	Straw Mulch (tons per acre)
Jan. 1 – Jan. 31	None	Not Applicable	2.5
Feb. 1 – May 31	Annual Ryegrass	120	1.5
June 1 – Aug.4	None	Not Applicable	2.5
Aug. 15 – Nov. 15	Cereal/Winter Rye	120	1.5
Nov. 16 – Dec. 31	None	Not Applicable	2.5

Seedbed Preparation – For broadcast seeding or drilling, loosen soil to depth of 3 inches. For no till drilling, loosen soil if it is compacted. Loosen compacted, hard or crusted soil surfaces with a disk, ripper, chisel, harrow or other tillage equipment. Avoid preparing the seedbed under excessively wet conditions. For establishment and long-term growth, apply a complete fertilizer at rates recommended by soil tests or as specified in plans and specifications. If soil pH is less than 6.0, apply lime according to soil tests. Incorporate necessary lime and fertilizer to a depth of 3 to 6 inches of soil.

Installation – For the best results use certified seed. Apply seed uniformly using a cyclone seeder, drop-type spreader, drill, cultipacker seeder or hydroseeder. When using a drill seeder, plant rye or other grains about 1 inch deep and plant grasses no more than ½ inch. A vegetative straw mulch cover shall be applied over the seed mixture to help germinate and establish plant cover, control weeds, and protect seed mixture against temperature extremes. Follow straw mulch preparation and application procedures described herein.

b. Temporary Mulch Stabilization – During non-growing periods, a straw mulch cover shall be applied in unseeded areas to protect against erosion until temporary or permanent vegetation is established.

Site Preparation – Divert runoff water from areas above the site that will be mulched. Remove stumps, roots and other debris from the construction area. Grade area as needed to permit the use of equipment for seeding, mulching and maintenance. Shape area so that it is relatively smooth.

Application – Spread straw mulch uniformly over the area with a power blower, hydroseeder, or by hand. No more than 25% of the ground surface should be visible after spreading. Apply straw mulch at a rate of 1.5 tons per acre as a seed cover or 2.5 tons per acre as a stand alone cover. The straw should be dry, unchopped, unweathered; free of weed seeds and rot. In areas of steep slopes or high winds, or in critical areas such as swales, mulching may need to be secured to the ground with a binder, netting, or tacking.

c. Permanent Seeding Stabilization – All disturbed areas shall be permanently seeded with a cool season grass mixture as specified in the Standards and Specifications of the City of Lee's Summit, Missouri..

Seedbed Preparation – loosen soil to depth of 3 inches. For no till drilling, loosen soil if it is compacted. Loosen compacted, hard or crusted soil surfaces with a disk, ripper, chisel, harrow or other tillage equipment. Avoid preparing the seedbed under excessively wet conditions. For establishment and long-term growth, apply a complete fertilizer at rates recommended by soil tests or as specified in plans and specifications. If soil pH is less than 6.0, apply lime according to soil tests. Incorporate necessary lime and fertilizer to a depth of 3 to 6 inches of soil.

Installation – For the best results use certified seed. Apply seed uniformly using a hydroseeder. A vegetative straw mulch cover shall be applied over the seed mixture to help germinate and establish plant cover, control weeds, and protect seed mixture against temperature extremes. Follow straw mulch preparation and application procedures described in the Standards and Specifications of the City of Lee's Summit, Missouri.

2. Structural Practices

a. Silt Fence – A temporary sediment barrier consisting of a geotextile fabric shall be installed as shown on the attached engineering plans and details. Silt fencing shall be installed to maintain sediment onsite.

Minimum Requirements:

Location – Fence should be built on a nearly level grade and at least 10 feet from the toe of the slope to provide a broad shallow sediment pool. Install on the contour, where fence can intercept runoff as a sheet flow; not located crossing channels, waterways or other concentrated flow paths; not attached to existing trees.

Spacing of Support Posts – 10 feet maximum for fence supported by wire; 6 feet maximum for high strength fabric without supportive wire backing. Support posts should be driven into the ground a minimum of 10 inches deep.

Trench – Bottom 1 foot of fence must be buried minimum of 4 inches deep.

b. Inlet Protection – When installation of the storm drainage system is complete, gravel curb inlet sediment traps will be placed at the drainage system inlets. Construction shall be in accordance with attached engineering plans and details.

c. Stockpiles – The toe of stockpiles shall be placed a minimum of 10 feet from erosion control measures. If stockpiles are to remain for more than 14 days, they shall be temporarily stabilized with vegetative mulch and temporary seeding.

3. Maintenance – The contractor shall repair all erosion control measures or re-seed areas that are disturbed or damaged as a result of weather or other situations, within 2 days after the occurrence. This will include all areas bare of vegetation.

EROSION CONTROL GENERAL NOTES

1. The Contractor is responsible for erosion control during construction and until the Owner and City accepts the work as complete. The erosion control measures shown on this plan are a typical minimum installation. The Contractor shall be responsible for adjusting or adding to these measures as necessary during the phasing of the construction to assure adequate control.

2. Clearing and grubbing within 50' of a defined drainage course should be avoided when possible. Where changes to a defined drainage course occur, work should be delayed until all materials and equipment necessary to protect and complete the drainage change are on site. Changes shall be completed as quickly as possible once the work has been initiated. The area impacted by the construction activities shall be revegetated or protected from erosion as soon as possible, areas within 50' of a defined drainage ways should be recontoured as needed or otherwise protected within five (5) working days after grading has ceased.

3. Where soil disturbing activities cease in an area for more than 14 days, the disturbed areas shall be protected from erosion by stabilizing the area with mulch or other similarly effective erosion control measures. If the slope of the area is greater than 3:1 or if the slope is greater than 3% and greater than 150 feet in length, then the disturbed areas shall be protected from erosion by stabilizing the area with mulch or other similarly effective erosion control measures if activities cease for more than seven (7) days.

4. Existing vegetation shall be preserved to the extent and where practical. In no case shall disturbed areas remain without vegetative ground cover for a period in excess of 60 days.

5. Additional site management practices which shall be adhered to during the construction process shall include:

–Solid and hazardous waste management including providing trash containers and regular site clean up for proper disposal of solid waste such as building and construction material, product/material shipping waste, food containers and cups, and providing containers for the proper disposal of waste paints solvents, and cleaning compounds.

–Provisions of portable toilets for proper disposal of sanitary sewage.

–Storage of construction materials away from drainage courses and low areas.

–Installation of containment berms and use of drip pans at petroleum product and liquid storage tanks and containers.

6. All disturbed areas shall be seeded, fertilized and mulched, or sodded, in accordance with the Standards and Specifications adopted by the City of Lee's Summit, Missouri and good engineering

practices. This shall be completed within fourteen (14) days after completing the work, in any area. If this is outside of the seeding period, silt barriers or other similarly effective measures shall be provided until such time that the areas can be seeded.

7. All erosion control measures, temporary or permanent, require maintenance to preserve their effectiveness. All erosion control devices shall be inspected immediately after each heavy rainstorm and at least daily during prolonged rainfall. Any required repairs should be made immediately. All costs associated with the repair work including related incidentals will be the contractor's responsibility and shall be included in the Contractor's bid for the proposed work. Only after the project is complete and accepted can the erosion control be removed.

8. 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 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.

9. During the dates Dec. 15 through May 30 ALL lime, 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, lime, fertilizer, seed, and mulch shall be applied at the following rates:

Lime – 100% of the specified quantity
Fertilizer – 75% of the specified quantity
Seed – 50% of the specified quantity
Mulch – 100% of the specified quantity

10. Mulch shall be Vegetative type, cereal straw form 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. Apply straw mulch at a rate of 1.5 tons per acre as a seed cover or 2.5 tons per acre as a stand alone cover. 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.

General Notes:

- All Construction shall conform to the City of Lee's Summit Technical Specifications in effect at the time of the City's approval date shown on the approved plans and incorporated herein by reference.
- All traffic control shall be the responsibility of the Contractor and shall be in conformance with the Manual of Uniform Traffic Control Devices (MUTCD).
- 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.
- 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.
- All work shall be confined within easements and/or construction limits as shown on the plans.
- 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.
- All trash and debris identified on site shall be properly handled and disposed of in accordance with state of Missouri regulations.
- All measurements on these plans are horizontal distances, not slope distances.
- This project will include numerous activities occurring on site including storm sewer, sanitary sewer, grading, erosion control, etc. Contractor shall coordinate his work with other contractors on site.
- Initial construction staking will be performed by GBA – Refer to Bid Documents.
- All concrete shall be KCMMB 4,000 psi.

Permitting:

- Contractor is responsible for obtaining all required permits, paying all fees, and for otherwise complying with all applicable regulations governing the work.
- No work shall be completed within the existing floodway until the CLOMR has been issued.
- No work shall be completed within the delineated wetland or regulatory stream channels until the U.S. Corps of Engineers Section 404 permit is issued. All work shall adhere to the terms and conditions of this permit.
- All work within KCMO city limits shall adhere to KCMO Site disturbance requirements.

Erosion Control:

- 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.
- 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.
- The Contractor shall sod all disturbed areas within the Public Street Right-of-Way unless otherwise noted in the plans.
- No trees shall be damaged or removed without prior authorization from owner unless otherwise shown on this plan.

Earthwork:

- Slopes shall be constructed to a maximum slope of 3:1 (Horiz:Vert) unless specifically noted otherwise in the referenced Geotechnical reports.
- Refer to "Geotechnical Engineering Report – Paragon Star Roadways and Borrow Site" Dated December 8, 2016 – along with Addendum #1 dated 1/4/17, and "Geotechnical Engineering Report – Soccer Fields" Dated July 27, 2016 prepared by Terracon Consultants, Inc. for grading recommendations and boring logs. All earthwork shall conform to the recommendations of the Reports.
- Unless otherwise noted, all spot elevations and contours are shown to "finish" grade surface.
- 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).
- Existing contours depicted on plans do not reflect topsoil root zone stripping completed under tree clearing scope. Existing grade will be approximately 4.5" average depth lower than shown. Refer to "Tree Clearing Plans for Paragon Star Development" for details.
- Earthwork Quantities shown on plans do not account for stripped topsoil from previously issued Tree Clearing Plans.
- Earthwork for this phase of development is intended to balance. Contractor to cut only enough fill material from the borrow source at the north end of the project as required to accomplish the fills shown on this plan set.
- All Permanent seeded shall be dressed with 12" topsoil and permanent seed. All other disturbed areas shall be seeded with the temporary seed mix.
- Shale fill shall be capped with a minimum of 24" of clay material.
- All Soccer fields shall be provided with a minimum 24" of clay above shale or 3" minus material.
- Final tolerance for graded areas shall be +/- 0.2'.
- The west borrow area at the NW portion of the site is considered the primary borrow area and shall be cut and graded to the contours shown. Cuts shown in this area must be performed to completion before utilizing the eastern borrow area for the balance of fill required on the project.
- Earthwork quantities shown on the plans assume 15% shrinkage for all fill material. The Contractor shall perform the fill to achieve the grades shown on the drawings. The determination of the actual adjustment of fill required due to shrink/swell of various materials shall be the responsibility of the Contractor.

Utility:

- All Manholes, Catch Basins, Utility Valves, Meter Pits, and other utility equipment shall be adjusted or rebuilt to grade as required.
- 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.

Storm Sewer:

- All RCP shall be Class III.
- Pipe Lengths are called out from center of structure to center of structure.
- Drainage across the project site during construction shall be the Contractor's responsibility. Surface drainage shall be controlled to reduce or prevent the flow of surface water onto adjacent grounds. Contractor shall control downstream erosion and silting during construction. Flexibility is given to the Contractor to make minor grading revisions along roads or between building pads to improve drainage during construction, with prior approval of the engineer.
- Prior to ordering precast storm sewer structures, Contractor shall provide shop drawings to the Engineer for review and approval.

General Notes

Architect: 00212, Professional Engineer: 000133, Landscape Architect: 000025, Professional Land Surveyor: 000059
G:\12720\Civil 3D\Production Drawings\Mass Grading\Lee's Summit\1272002020.dwg Layout: 3 General Layout -- Wednesday, June 13, 2018, 10:40am -- Copyright 2018, George Butler Associates, Inc.

PROJECT BENCHMARK:

BM #11 – Chiseled “L” on top
Northeast corner of concrete guardrail
at the Northeast corner of I-470 bridge
spanning View High Drive.
EL=833.80

STATE OF MISSOURI
REGISTERED PROFESSIONAL ENGINEER
BRADLEY D. BURTON
NUMBER
E-25862
5/21/18

Bradley D. Burton
Professional Engineer
License No. 25862

DATE: 1/10/17
DESIGN BY: CEL
DRAWN BY: DRV
PROJECT NO.: 12720
SHEET NO. 3
TOTAL SHEETS 33

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Mass Grading Plans
Paragon Star Development
Lee's Summit, Missouri

NO.	DATE	REVISIONS	BY	APPROVED
	5/15/18	Revised Field Elevations		

Boundary Description:

All that part of the Northwest Quarter of Section 34, Township 48 North, Range 32 West, of the 5th P.M., and all of GRAHAM COMMERCIAL CENTER, a subdivision in the in the City of Lee's Summit, Jackson County, Missouri, being more particularly described as follows:

BEGINNING at the Northwest corner of said Northwest Quarter of Section 34; thence South 86°33'45" East, along the North line of said Northwest Quarter, a distance of 2611.91 feet, to a point on the Westerly Right-of-Way line of Union Pacific Railroad, as now established; thence South 18°46'13" West, departing said North line, along said Westerly Right-of-Way line, a distance of 76.95 feet, to a point of curvature; thence Southwesterly and Southeasterly, continuing along said Westerly Right-of-Way line, along a curve to the left, having a radius of 2508.01 feet, and a central angle of 28°06'45", a distance of 1230.57 feet, to a point of tangency; thence South 09°20'32" East, continuing along said Westerly Right-of-Way line, a distance of 30.31 feet, to a point on the South line of the North half of said Northwest Quarter; thence South 86°26'21" East, continuing along said Westerly Right-of-Way line, and along said South line of the North half of the Northwest Quarter, a distance of 16.41 feet; thence South 09°20'32" East, departing said South line of the North half of the Northwest Quarter, continuing along said Westerly Right-of-Way line, a distance of 354.98 feet, to a point on the East line of said Northwest Quarter; thence South 02°29'17" West, continuing along said Westerly Right-of-Way line, and along said East line of the Northwest Quarter, a distance of 468.48 feet, to a point on the North Right-of-Way line of Interstate 470, as now established; thence North 85°05'37" West, departing said Westerly Right-of-Way line, along said North Right-of-Way line of Interstate 470, a distance of 899.87 feet; thence North 75°10'03" West, continuing along said North Right-of-Way line, a distance of 203.04 feet; thence South 77°15'22" West, continuing along said North Right-of-Way line, a distance of 228.93 feet, to a point on the East line of the Southwest Quarter of said Northwest Quarter, said point also being the Southeast corner of said GRAHAM COMMERCIAL CENTER; thence continuing South 77°15'22" West, continuing along said North Right-of-Way line, and along the South line of said subdivision, a distance of 1.94 feet; thence South 88°33'58" West, continuing along said North Right-of-Way line, and along said South line of said subdivision, a distance of 181.11 feet; thence North 85°01'31" West, continuing along said North Right-of-Way line, and said South line of said subdivision, a distance of 97.23 feet; thence North 69°50'05" West, continuing along said North Right-of-Way line, and said South line of said subdivision, a distance of 342.03 feet, to the Southwest corner of said subdivision; thence North 30°28'52" West, continuing along said North Right-of-Way line, and along the West line of said subdivision, a distance of 87.88 feet; thence North 07°21'08" East, continuing along said North Right-of-Way line and it's transition to the East Right-of-Way line of View High Drive, as now established, and said West line of said subdivision, a distance of 106.53 feet; thence North 20°25'39" East, departing said West line of said subdivision, continuing along said East Right-of-Way line of View High Drive, a distance of 185.39 feet; thence North 45°30'34" West, continuing along said East Right-of-Way line, a distance of 129.40 feet; thence North 12°40'32" West, continuing along said East Right-of-Way line, a distance of 278.96 feet, to a point on said South line of the North half of the Northwest Quarter; thence North 86°26'21" West, continuing along said East Right-of-Way line, and along said South line of the North half of the Northwest Quarter, a distance of 130.00 feet, to the Southwest corner of said North half of the Northwest Quarter; thence North 02°25'47" East, along the West line of said Northwest Quarter, a distance of 1316.45 feet, to the POINT OF BEGINNING, containing 5,217,462.56 square feet or 119.78 acres, more or less.

FLOODPLAIN NOTE:

According to FEMA Flood Insurance Rate Map (FIRM) Community Panel No. 290173 0070 B, revised August 5, 1986, the tract lies partially within an area designated as Zone B and partially within an area designated as Zone AH. Zone B is defined as an area of moderate flood hazard, such as areas protected by levees from 100-year flood, or shallow flooding areas with average depths of less than one foot or drainage areas less than 1 square mile. Zone AH is defined areas with a 1% annual chance of shallow flooding, usually in the form of a pond, with an average depth ranging from 1 to 3 feet. Base flood elevations derived from detailed analyses are shown at selected intervals within Zone AH. On FIRM Community Panel No. 290173 0070 B, Zone AH elevations are shown as 726 FT. The site is protected by the Birmingham District Levee. The proposed elevation of the finished floor is 734 FT, above the 726 FT elevation of FIRM Zone AH.

Total Disturbed Area:

68.69 Ac.



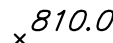






General Layout

C:\12720\Civil 3D\Production Drawings\Mass Grading\Lee's Summit\12720C4000.dwg Layout: 6 Grading Plan -- Wednesday June 13, 2018, 10:41am -- Copyright 2018, George Butler Associates, Inc. Architect 00212, Professional Engineer 000133, Landscape Architect 000025, Professional Land Surveyor 000059

PROJECT 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

Legend

-  Proposed Contour
-  Existing Contour
-  Proposed Spot Grade
-  Drainage Flow Arrow
-  Drainage Swale
-  Geotechnical Boring Location
-  Grading Limits
-  Exist. Construction Fence for Tree Protection
(to be maintained)
-  Exist. Sediment Fence
(to be maintained)



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DATE:	1/10/17
DESIGN BY:	CEL
DRAWN BY:	DRV
PROJECT NO.:	12720
SHEET NO.	TOTAL SHEETS
6	33

Bradley D. Burton
Professional Engineer
License No. 25862

Mass Grading Plans
Paragon Star Development
Lee's Summit, Missouri

NO.	DATE
5/15/18	

REVISIONS	BY	APPROVED
Revised Field Elevations		



Grading Plan

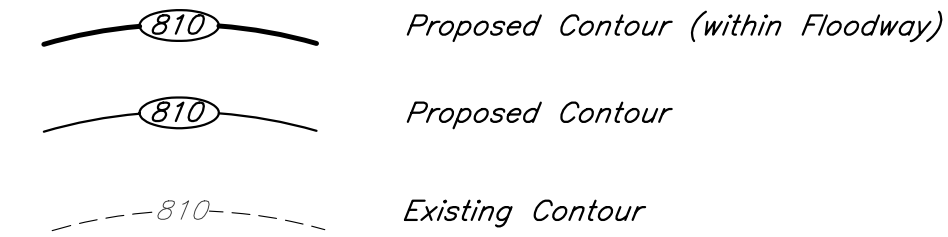
PROJECT BENCHMARK:

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

Earthwork Quantities:

Fill: 57,093 C.Y. (Area within Effective Floodway)

Legend



GBA
architects
engineers

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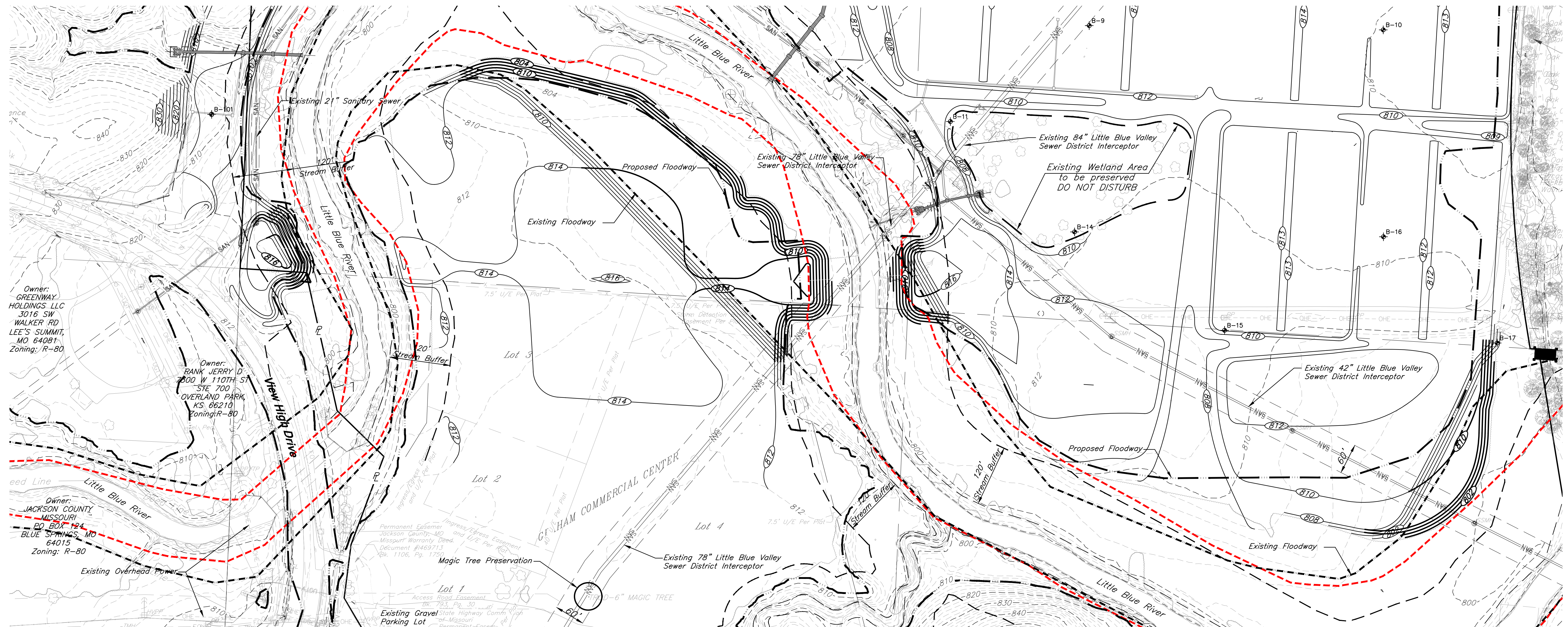
DATE:	1/10/17
DESIGN BY:	CEL
DRAWN BY:	DRV
PROJECT NO.:	12720
SHEET NO.	TOTAL SHEETS

7 | 33

Bradley D. Burton
Professional Engineer
License No. 25862

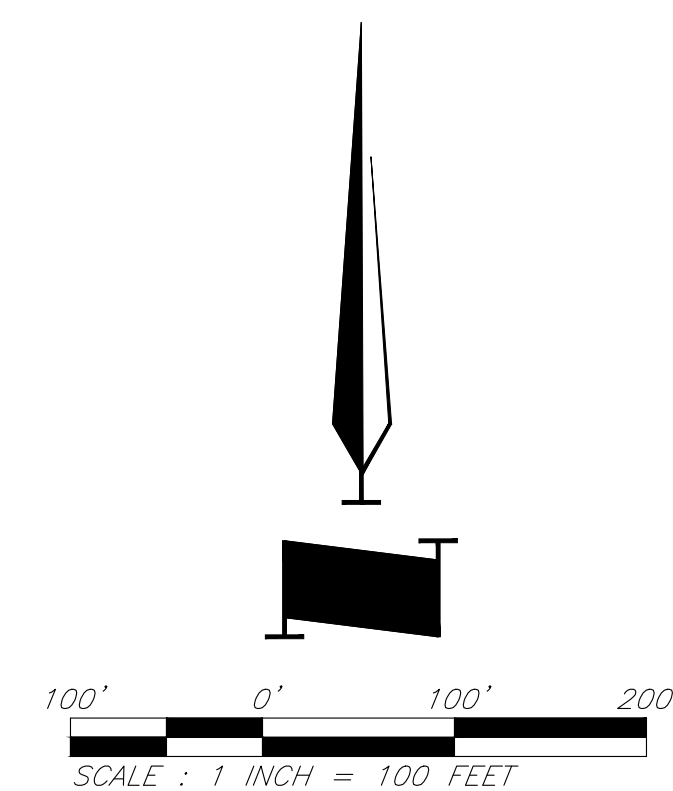
Mass Grading Plans
Paragon Star Development
Lee's Summit, Missouri

NO.	DATE	REVISIONS	BY	APPROVED
	5/15/18	Revised Field Elevations		

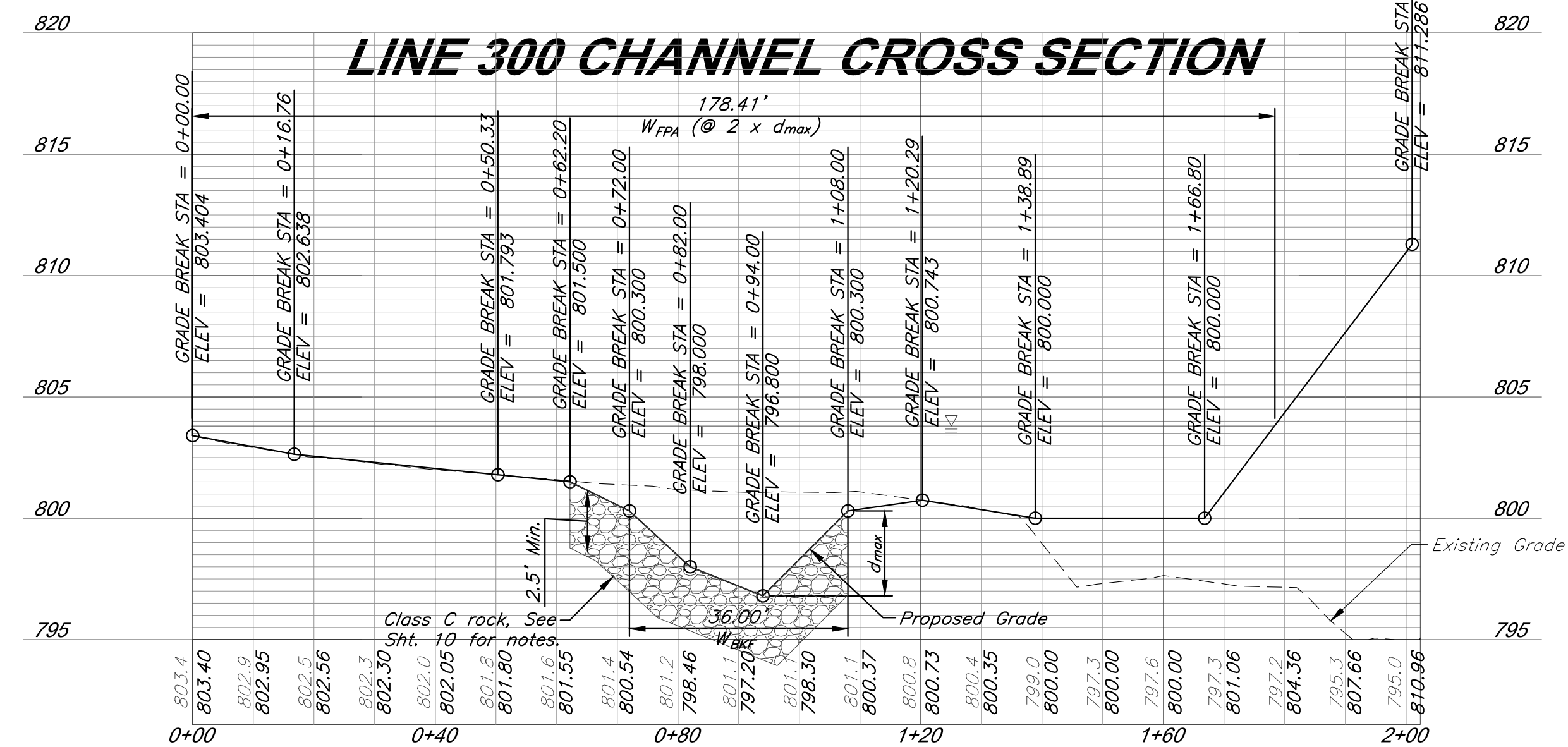
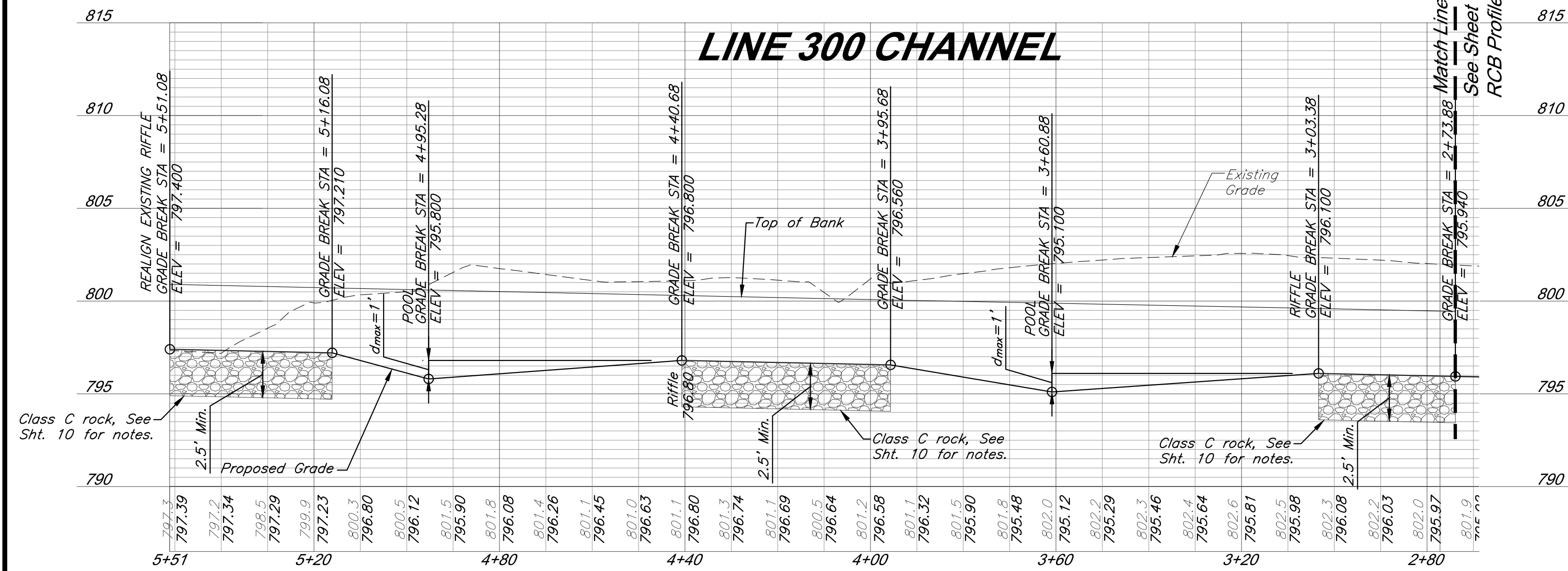
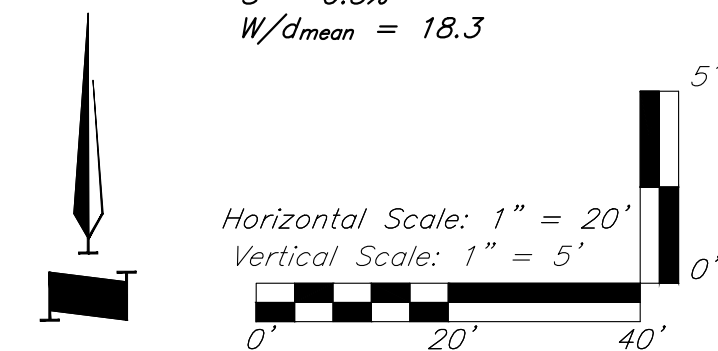
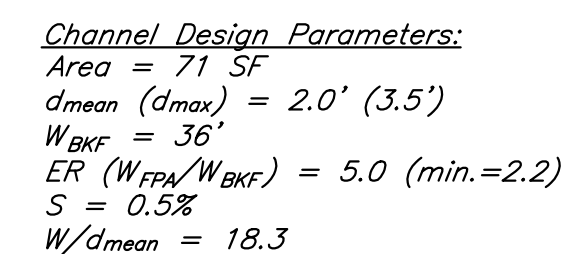
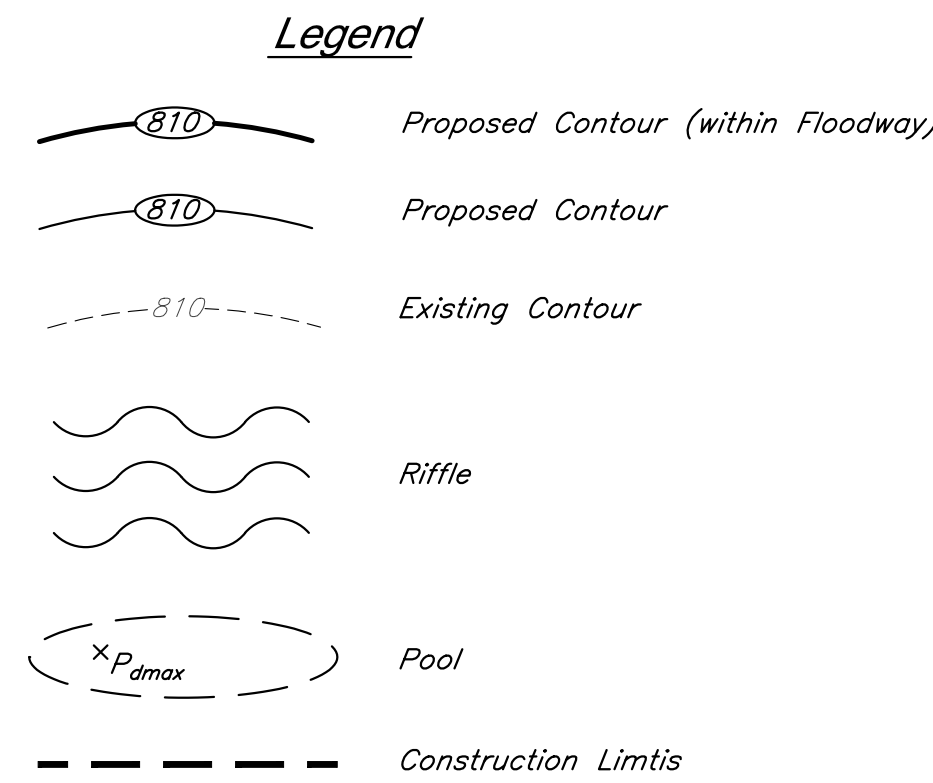


Note:

This scope of work shall not proceed until the FEMA issued Conditional Letter of Map Revision (CLOMR) has been obtained.



Floodway Grading Plan



Line 300 Channel Grading Plan

Architect: 00212, Professional Engineer: 000133, Landscape Architect: 000025, Professional Land Surveyor: 000059
G:\12220\Civil 3D\Production Drawings\Mass Grading\Lee's Summit\1222000900.dwg Layout: 9 Utility Plan -- Wednesday June 13, 2018, 10:45am -- Copyright 2018, George Buller Associates, Inc.

Storm Sewer General Notes:

1. All RCP shall be class III.
2. Storm sewer lengths are calculated from center of structure to center of structure.
3. All pipe connections to inlets shall occur at center of structure wall unless specifically noted otherwise.
4. All work shall conform to City of Lee's Summit, MO standards.
5. Precast structures shall be constructed with KCMMB 4,000 psi concrete. Shop drawings shall be submitted to the Engineer for review prior to casting.
6. All in grade inlets shall match adjacent slope.
7. Drainage across the project site during construction shall be the Contractor's responsibility. Surface drainage shall be controlled to reduce or prevent the flow of surface water onto adjacent grounds. Contractor shall control downstream erosion and silting during construction. Flexibility is given to the Contractor to make minor grading revisions along roads or between building pads to improve drainage during construction, with prior approval of the engineer.
8. See Sheets 10 - 12 and 16 - 18 for rip rap details and construction details.

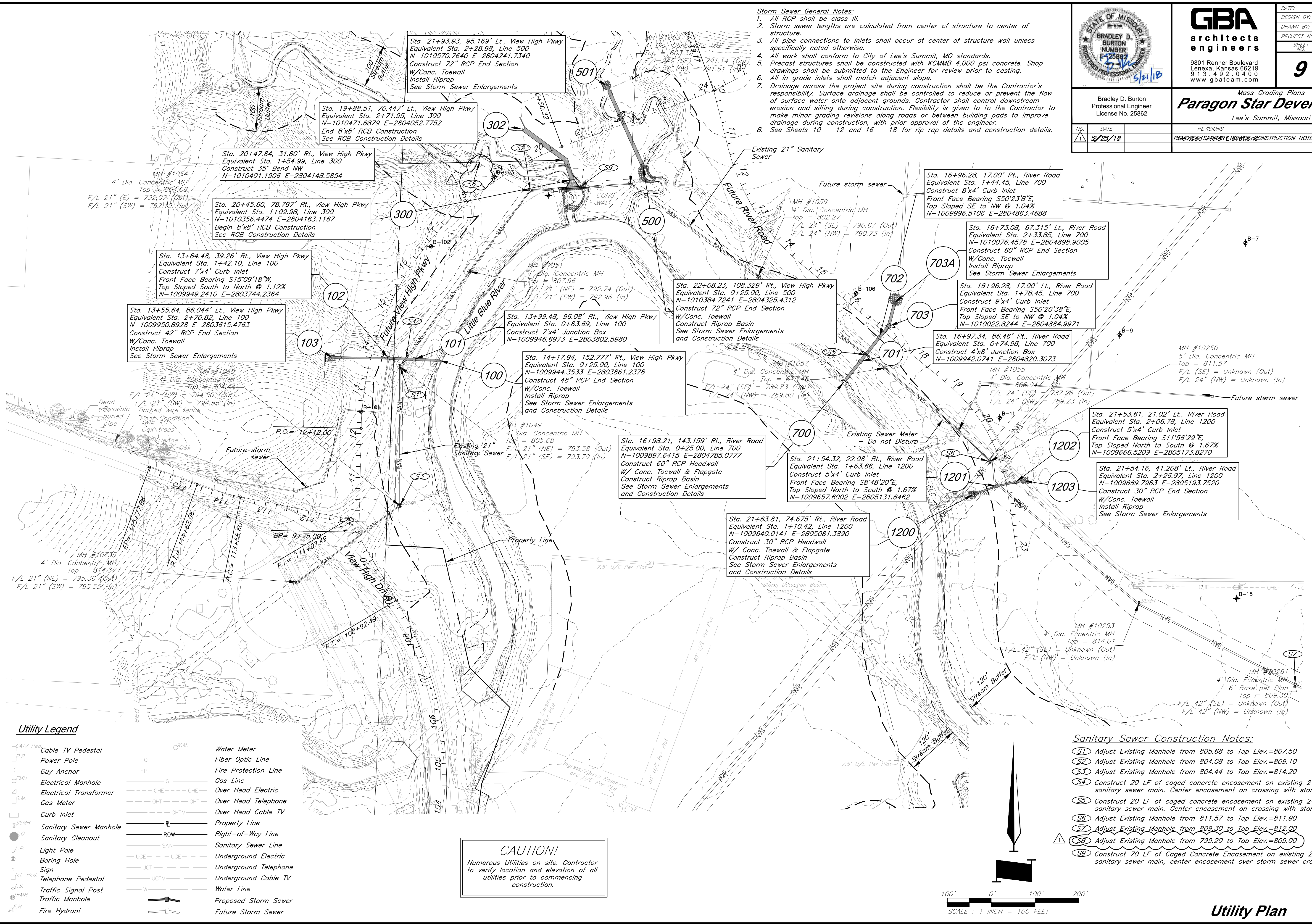
STATE OF MISSOURI
BRADLEY D. BURTON
REGISTERED PROFESSIONAL ENGINEER
No. 25862
5/21/18

GBA
architects
engineers
9801 Renner Boulevard
Lenexa, Kansas 66219
913.492.0400
www.gbateam.com

DATE: 1/10/17
DESIGN BY: CEL
DRAWN BY: DRV
PROJECT NO.: 12720
SHEET NO. 9
TOTAL SHEETS 33

Mass Grading Plans
Paragon Star Development
Lee's Summit, Missouri

NO.	DATE	REVISIONS	BY	APPROVED
1	5/23/18	REVISED SANITARY SEWER CONSTRUCTION NOTE	DRV	CEL



- Sanitary Sewer Construction Notes:**
- (S1) Adjust Existing Manhole from 805.68 to Top Elev.=807.50
 - (S2) Adjust Existing Manhole from 804.08 to Top Elev.=809.10
 - (S3) Adjust Existing Manhole from 804.44 to Top Elev.=814.20
 - (S4) Construct 20 LF of caged concrete encasement on existing 21" sanitary sewer main. Center encasement on crossing with storm sewer.
 - (S5) Construct 20 LF of caged concrete encasement on existing 24" sanitary sewer main. Center encasement on crossing with storm sewer.
 - (S6) Adjust Existing Manhole from 811.57 to Top Elev.=811.90
 - (S7) Adjust Existing Manhole from 809.30 to Top Elev.=812.00
 - (S8) Adjust Existing Manhole from 799.20 to Top Elev.=809.00
 - (S9) Construct 70 LF of Caged Concrete Encasement on existing 21" PVC sanitary sewer main, center encasement over storm sewer crossing.

- Utility Legend**
- | | | | |
|--|------------------------|--|-----------------------|
| | Cable TV Pedestal | | Water Meter |
| | Power Pole | | Fiber Optic Line |
| | Guy Anchor | | Fire Protection Line |
| | Electrical Manhole | | Gas Line |
| | Electrical Transformer | | Over Head Electric |
| | Gas Meter | | Over Head Telephone |
| | Curb Inlet | | Over Head Cable TV |
| | Sanitary Sewer Manhole | | Property Line |
| | Sanitary Cleanout | | Right-of-Way Line |
| | Light Pole | | Sanitary Sewer Line |
| | Boring Hole | | Underground Electric |
| | Sign | | Underground Telephone |
| | Telephone Pedestal | | Underground Cable TV |
| | Traffic Signal Post | | Water Line |
| | Traffic Manhole | | Proposed Storm Sewer |
| | Fire Hydrant | | Future Storm Sewer |

Architect: 00212, Professional Engineer: 000133, Landscape Architect: 000025, Professional Land Surveyor: 000059
G:\12720\Civil 3D Production Drawings\Mass Grading\Lee's Summit\127200001.dwg Layout: 10 Storm Sewer Enlargements --- Wednesday, June 13, 2018, 10:46am --- Copyright 2018, George Butler Associates, Inc.

STATE OF MISSOURI
BRADLEY D. BURTON
REGISTERED PROFESSIONAL ENGINEER
NUMBER E-25862
5/21/18

GBA

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Bradley D. Burton
Professional Engineer
License No. 25862

DATE: 1/10/17
DESIGN BY: CEL
DRAWN BY: DRV
PROJECT NO.: 12720
SHEET NO. 10
TOTAL SHEETS 33

Mass Grading Plans
Paragon Star Development
Lee's Summit, Missouri

NO. DATE
5/15/18
REVISIONS
Revised Field Elevations
BY APPROVED

CATV Ped
Cable TV Pedestal
P.P.
Power Pole
Guy Anchor
FMH
Electrical Manhole
ET
Electrical Transformer
G.M.
Gas Meter
Curb Inlet
SSMH
Sanitary Sewer Manhole
S.C.
Sanitary Cleanout
L.P.
Light Pole
B.H.
Boring Hole
el. Ped
Telephone Pedestal
T.S.
Traffic Signal Post
RMH
Traffic Manhole
Proposed Storm Sewer
Future Storm Sewer

F.H.
Fire Hydrant
W.M.
Water Meter
F.O.L.
Fiber Optic Line
F.P.L.
Fire Protection Line
G
Gas Line
O.H.E.
Over Head Electric
O.H.T.
Over Head Telephone
O.H.C.T.V.
Over Head Cable TV
P.L.
Property Line
R.O.W.
Right-of-Way Line
S.A.N.
Sanitary Sewer Line
U.G.E.
Underground Electric
U.G.T.
Underground Telephone
U.G.T.V.
Underground Cable TV
W
Water Line
800
Proposed Contours
800
Existing Contour

Riprap Material Notes:

- Line 300 Composite Riprap Materials shall consist of the following properties:
75% Boulders with D50=2' and D100=3'
20% Class B Rock
5% Class C Rock
- Weir Backfill Materials shall consist of the following properties:
65% Class B Rock
35% Class C Rock

Class B Gradation		
Size	Rock	Spec
14"	D100	
9"	D85	
7"	D60	
6"	D50	
3"	D15	
2.5"	D10	

Class C Gradation		
Size	Rock	Spec
8"	D100	
3"	D85	
2"	D65	
1.5"	D50	
1 1/4"	D15	
3/8"	D10	

Section A-A Riprap Protection
NTS

Section D-D
NTS

Section C-C
NTS

Section B-B
NTS

Note: Engineer shall inspect and approve final placement and composition of outlet protection

Storm Sewer Enlargements

STATE OF MISSOURI
BRADLEY D. BURTON
NUMBER E-25862
REGISTERED PROFESSIONAL ENGINEER
5/24/18

GBA

architects
engineers

9801 Renner Boulevard
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DATE: 1/10/17
DESIGN BY: CEL
DRAWN BY: DRV
PROJECT NO.: 12720
SHEET NO. 11
TOTAL SHEETS 33

Bradley D. Burton
Professional Engineer
License No. 25862

Mass Grading Plans
Paragon Star Development
Lee's Summit, Missouri

NO. DATE
5/15/18

REVISIONS
Revised Field Elevations

BY APPROVED

Legend

Cable TV Pedestal

Power Pole

Guy Anchor

Electrical Manhole

Electrical Transformer

Gas Meter

Curb Inlet

Sanitary Sewer Manhole

Sanitary Cleanout

Light Pole

Boring Hole

Sign

Telephone Pedestal

Traffic Signal Post

Traffic Manhole

Proposed Storm Sewer

Future Storm Sewer

FO

FP

G

OHE

OHT

OHTV

ROW

SAN

UGE

UGT

UGTV

W

800

800

F.H.

W.M.

Fire Hydrant

Water Meter

Fiber Optic Line

Fire Protection Line

Gas Line

Over Head Electric

Over Head Telephone

Over Head Cable TV

Property Line

Right-of-Way Line

Sanitary Sewer Line

Underground Electric

Underground Telephone

Underground Cable TV

Water Line

Proposed Contours

Existing Contour

Class A Gradation

Size	Rock Spec
20"	D100
16"	D85
13"	D65
12"	D50
5"	D15
4"	D10

20'

0'

20'

40'

SCALE : 1 INCH = 20 FEET

Riprap Material Notes:
1. Line 500 Composite Riprap Materials shall consist of the following properties:
20% Class A Rock
60% Class B Rock
20% Class C Rock
2. See Sheet 10 for Class B and Class C Rock Gradations.

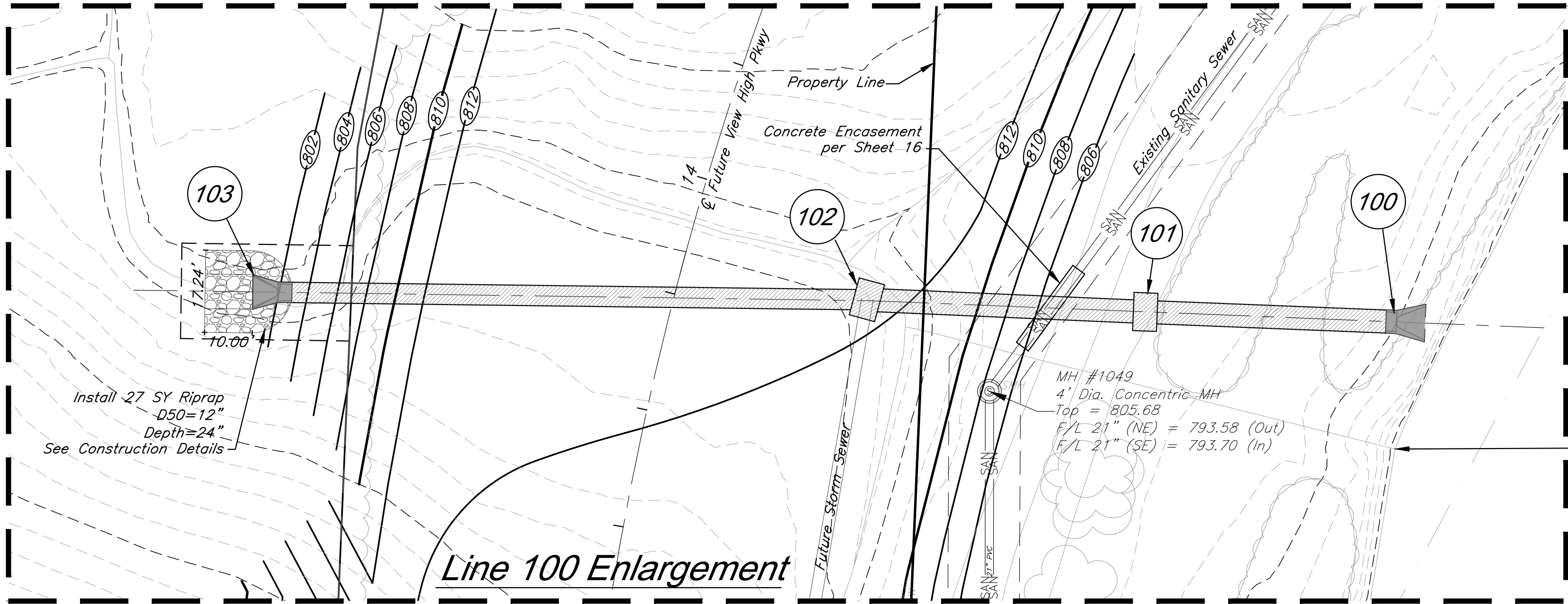
Section F-F
NTS

Section H-H
NTS

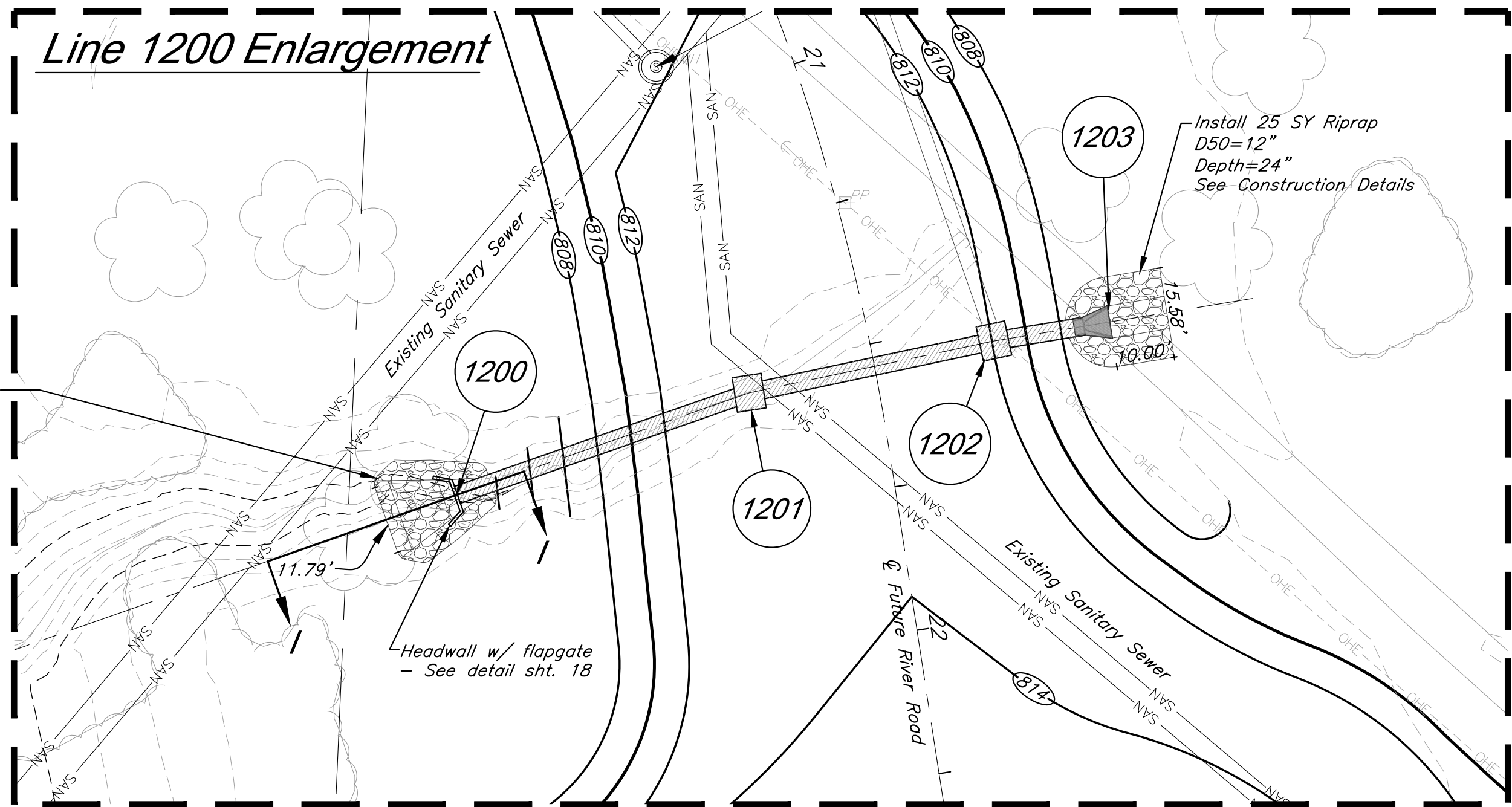
Section G-G
NTS

Note: Engineer shall inspect and approve final placement and composition of outlet protection

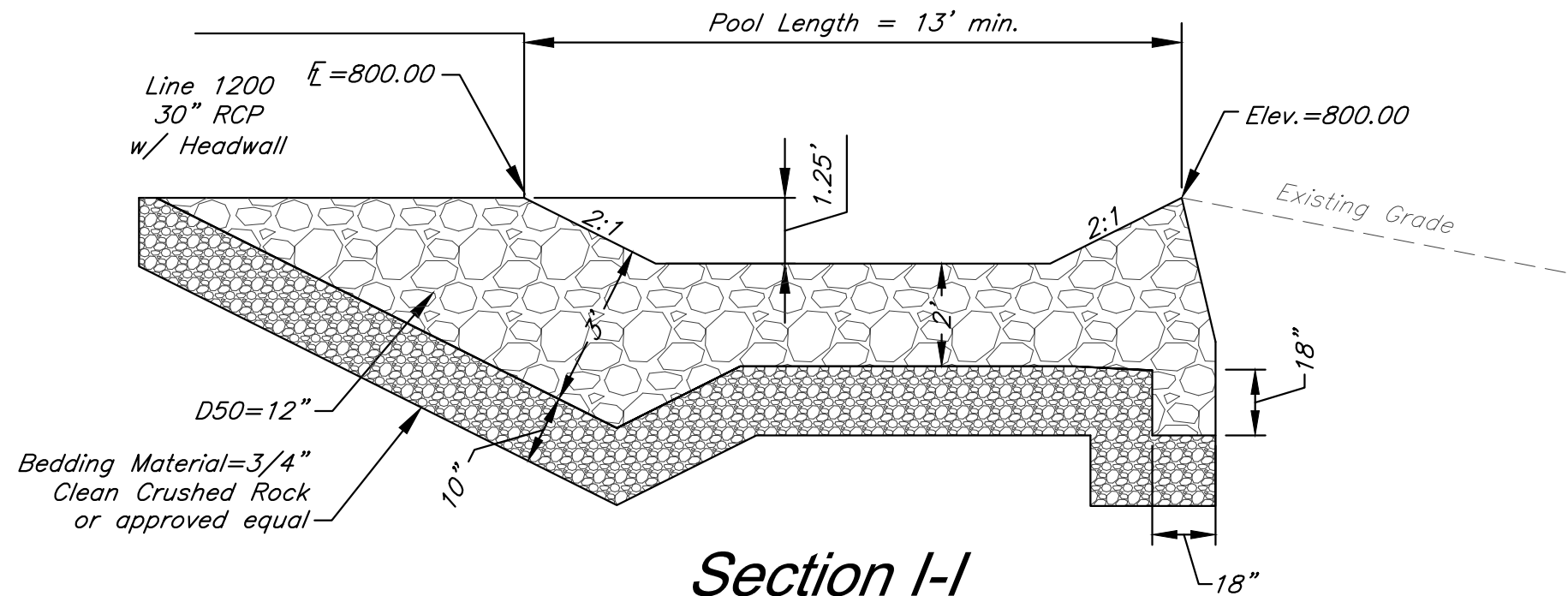
Storm Sewer Enlargements



Line 100 Enlargement




Line 1200 Enlargement


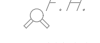

















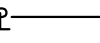

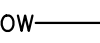














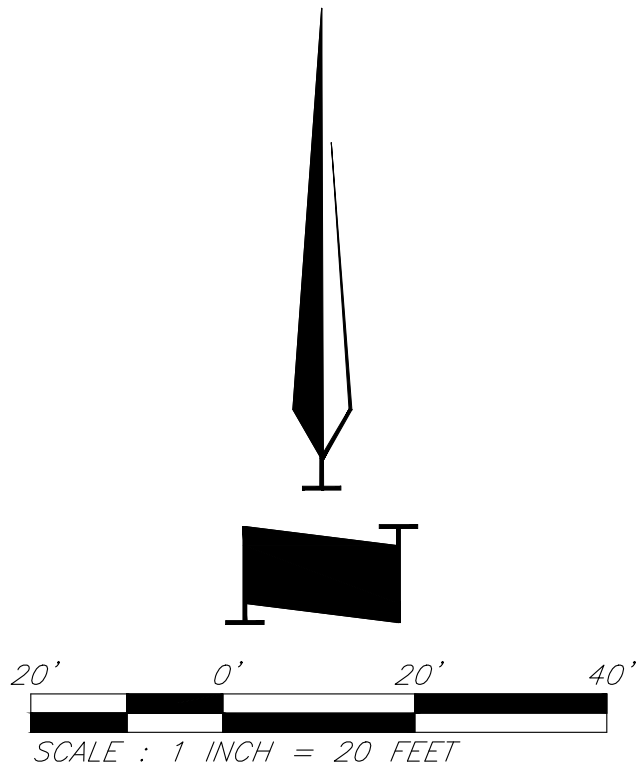
Section I-I
Line 1200 Riprap Basin
NTS

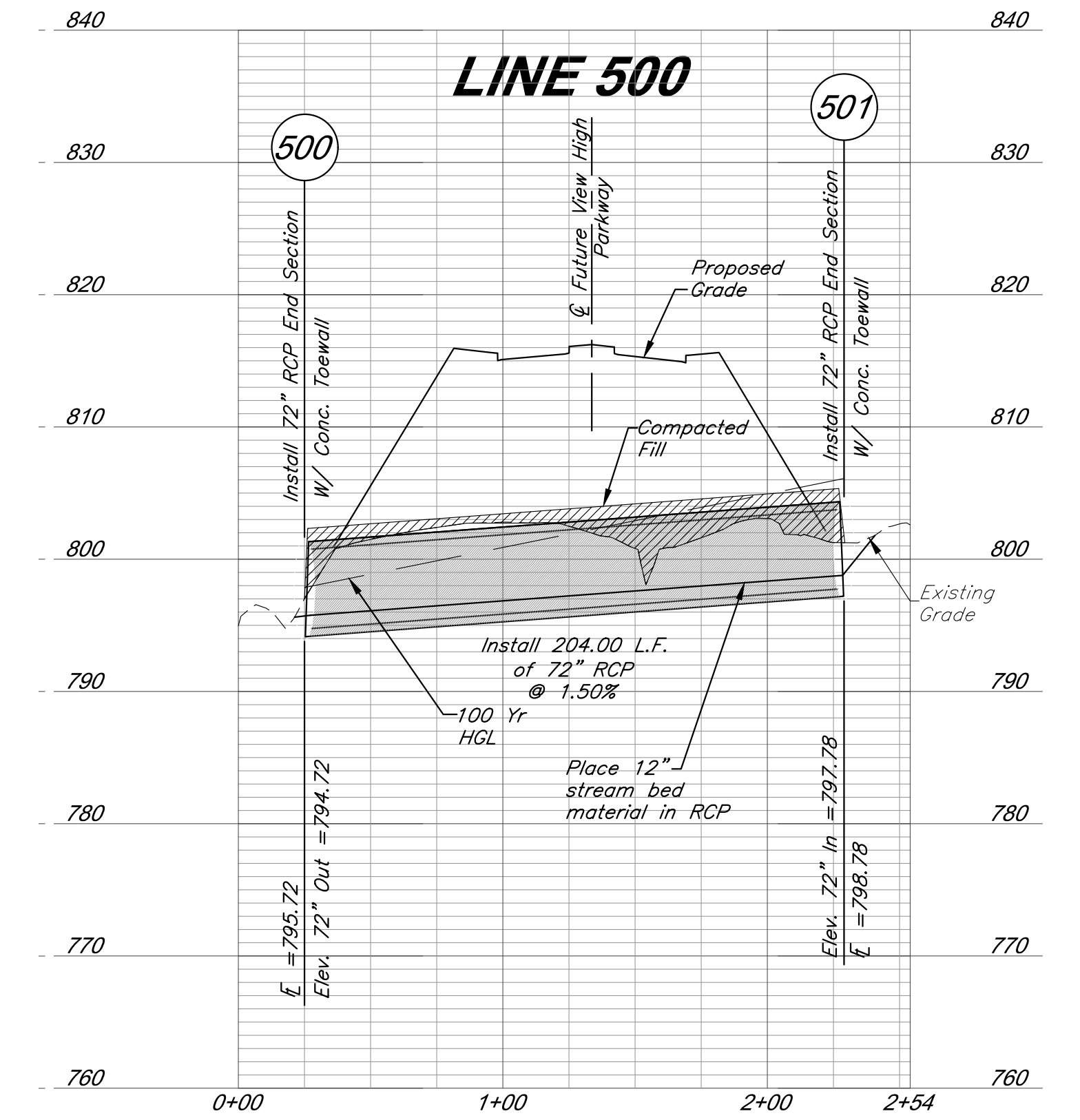
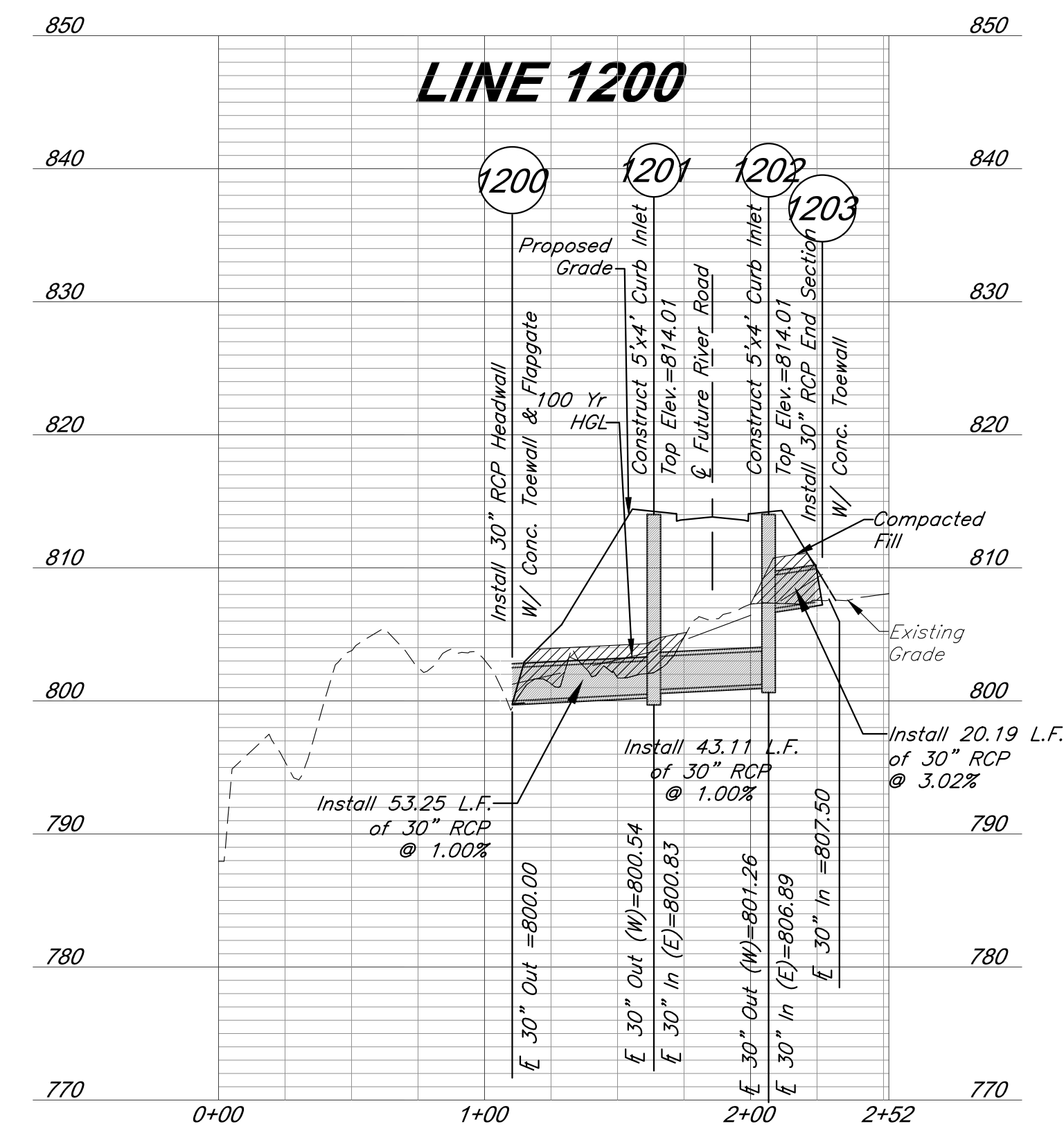
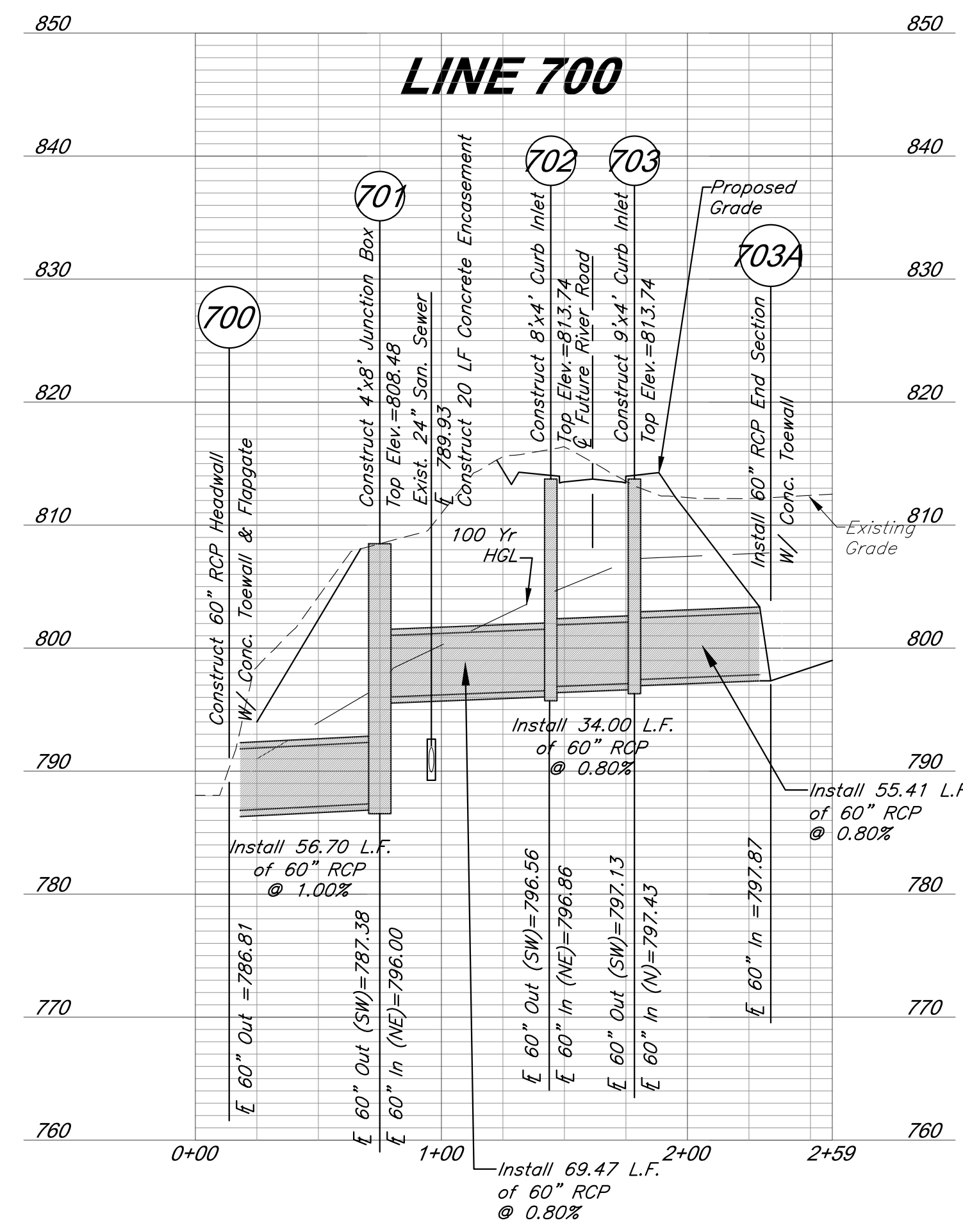
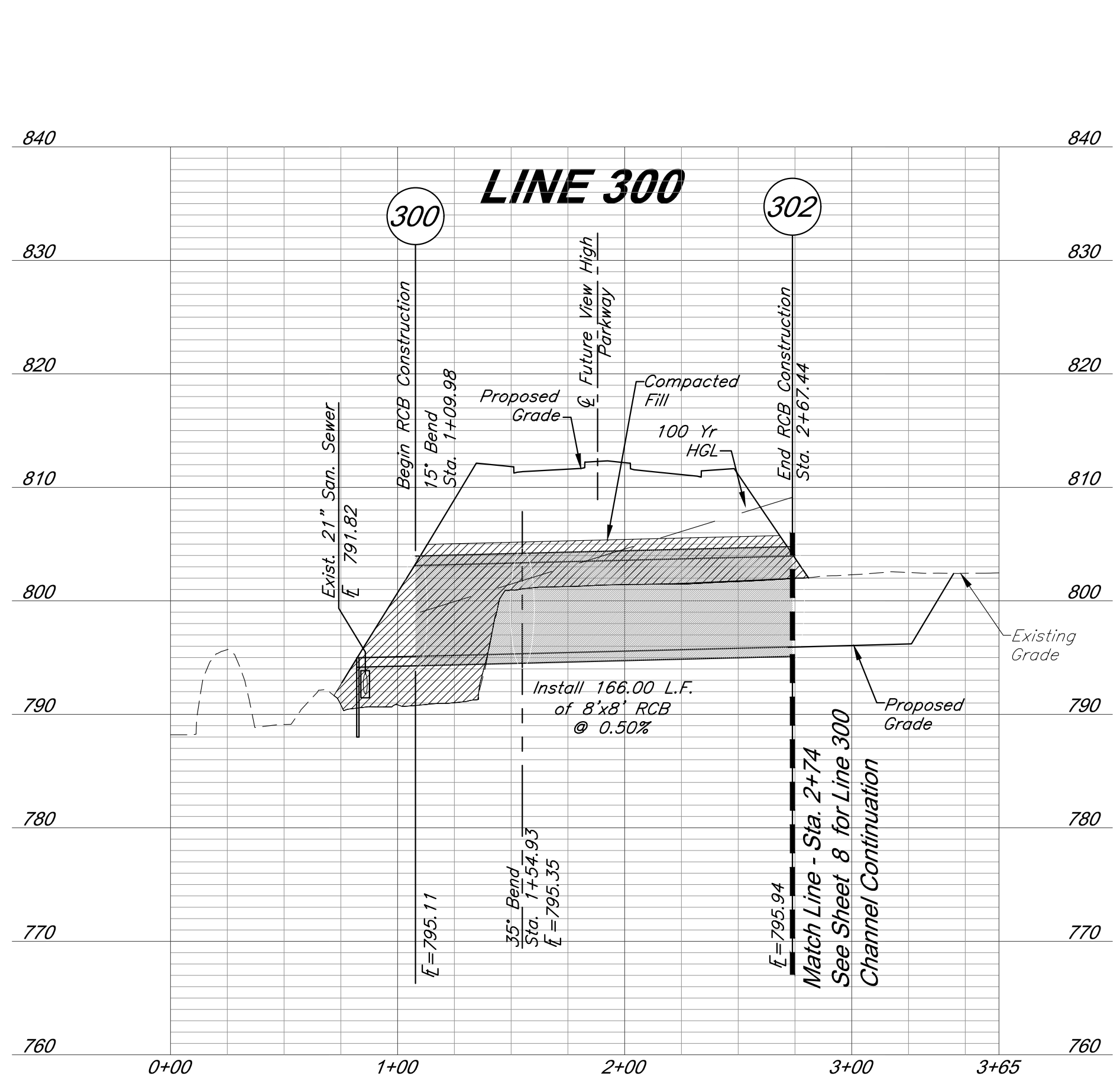
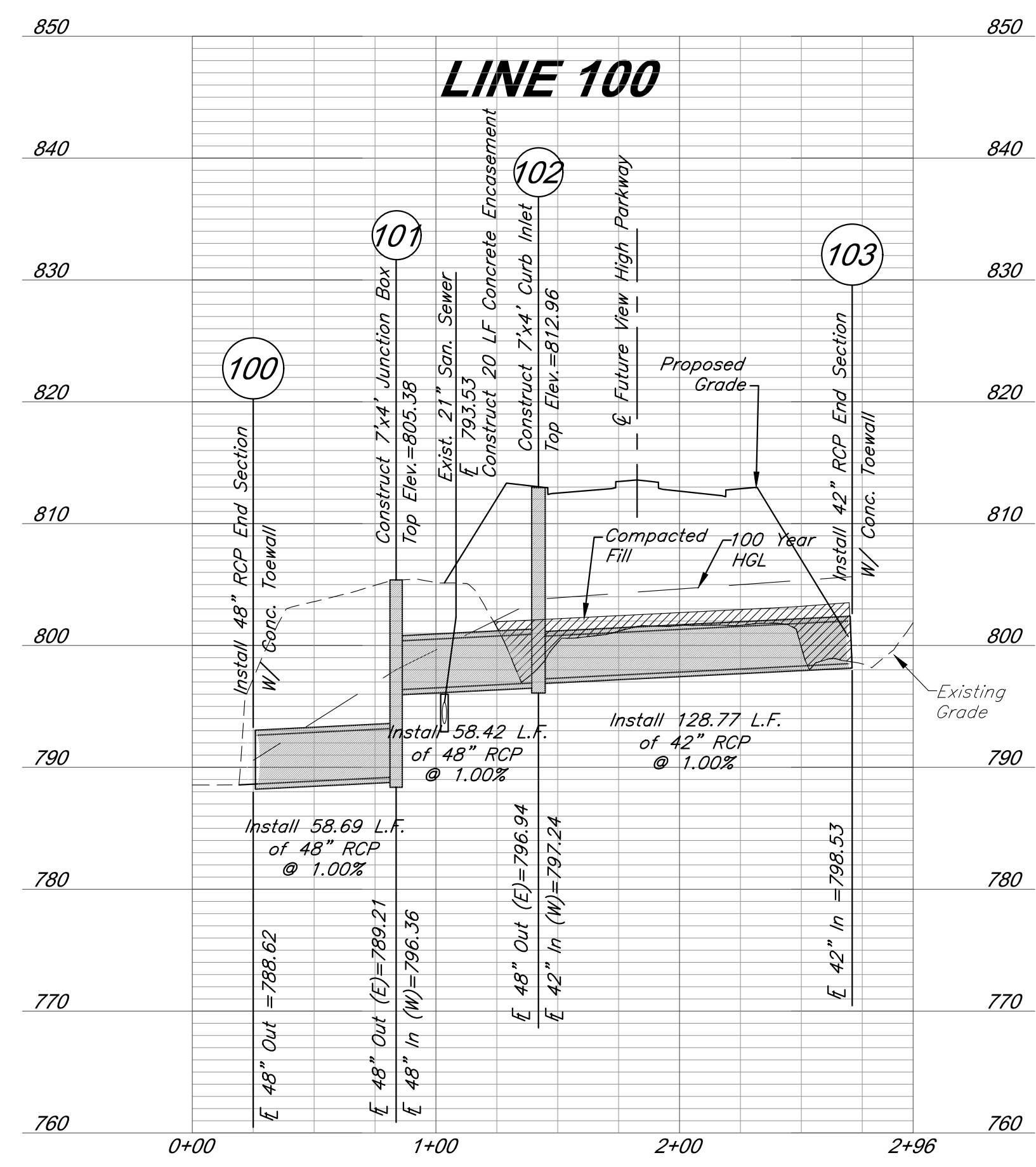
Note: Engineer shall inspect and approve final placement and composition of outlet protection

	GBA architects engineers 9801 Renner Boulevard Lenexa, Kansas 66219 913.492.0400 www.gbateam.com	DATE: 1/10/17	
		DESIGN BY: CEL	
		DRAWN BY: DRV	
		PROJECT NO.: 12720	
SHEET NO. 12	TOTAL SHEETS 33		
Bradley D. Burton Professional Engineer License No. 25862		Mass Grading Plans Paragon Star Development Lee's Summit, Missouri	
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Legend

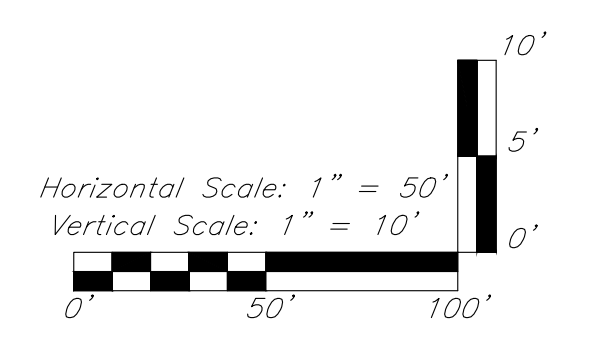
 Cable TV Pedestal	 Fire Hydrant
 Power Pole	 Water Meter
 Guy Anchor	 Fiber Optic Line
 Electrical Manhole	 Fire Protection Line
 Electrical Transformer	 Gas Line
 Gas Meter	 Over Head Electric
 Curb Inlet	 Over Head Telephone
 Sanitary Sewer Manhole	 Over Head Cable TV
 Sanitary Cleanout	 Property Line
 Light Pole	 Right-of-Way Line
 Boring Hole	 Sanitary Sewer Line
 Sign	 Underground Electric
 Telephone Pedestal	 Underground Telephone
 Traffic Signal Post	 Underground Cable TV
 Traffic Manhole	 Water Line
 Proposed Storm Sewer	 Proposed Contours
 Future Storm Sewer	 Existing Contour





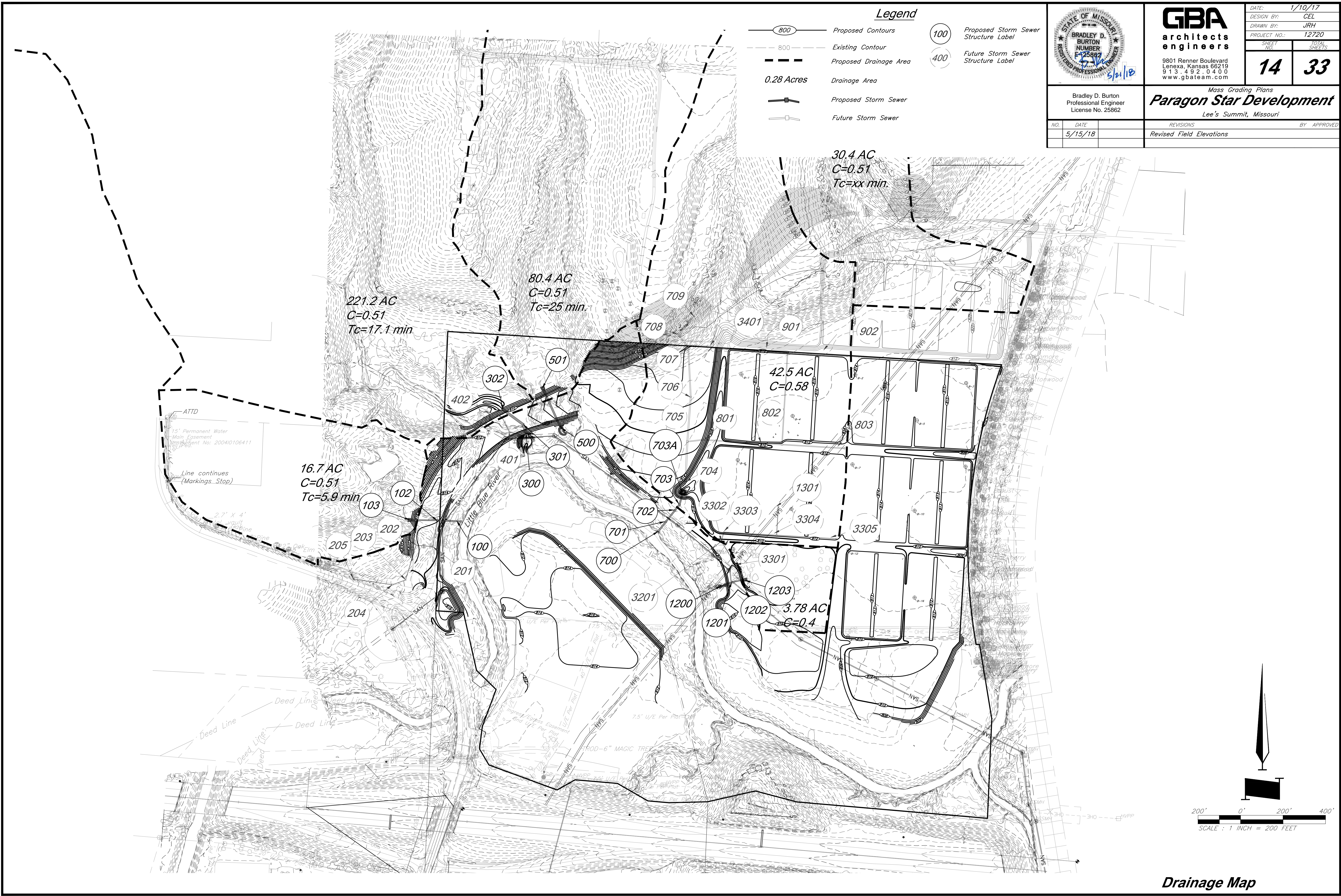
Legend

Compacted Fill to be placed prior to excavation



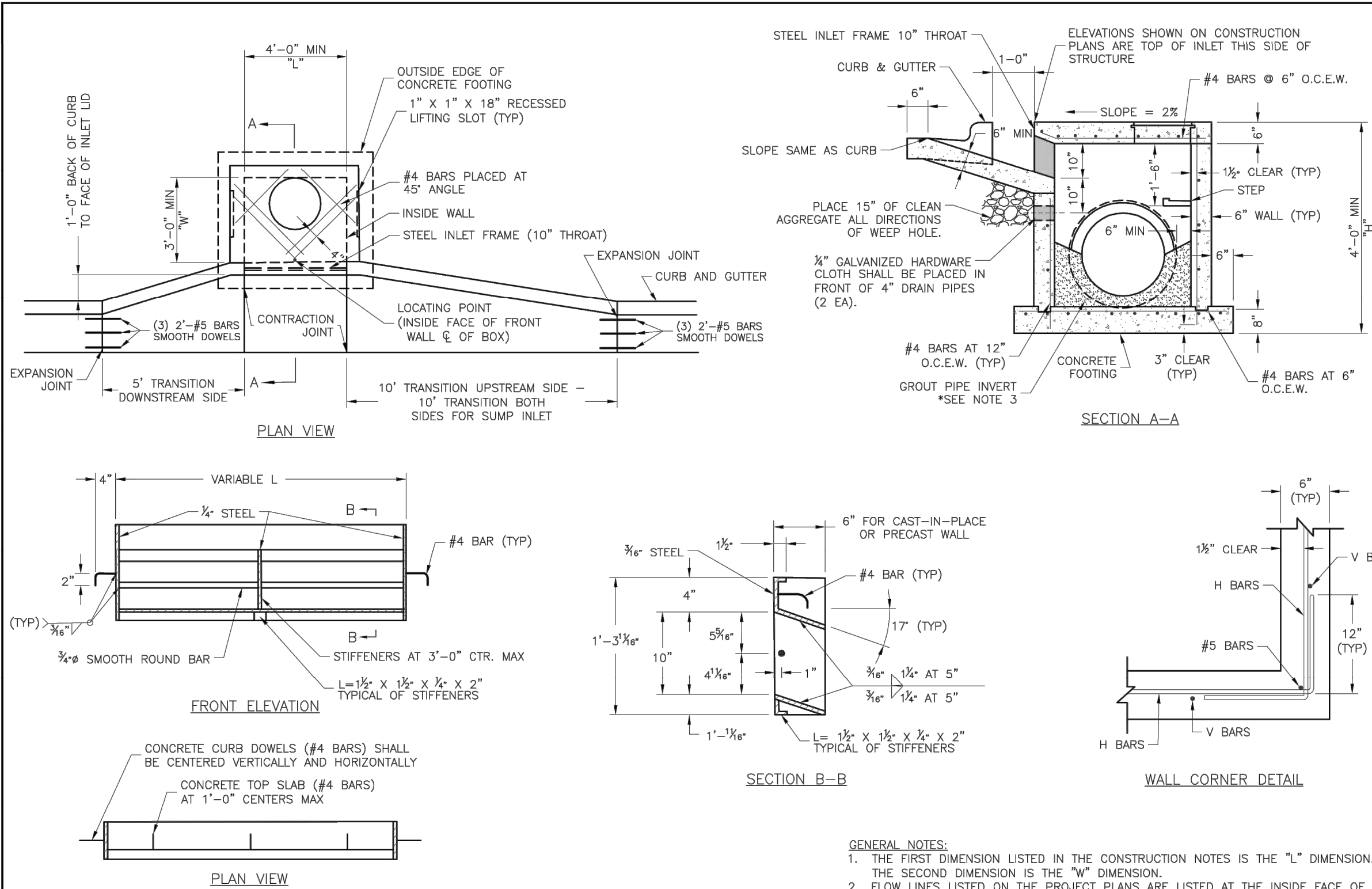
Storm Sewer Profiles

	GBA architects engineers 9801 Renner Boulevard Lenexa, Kansas 66219 913.492.0400 www.gbateam.com	DATE: 1/10/17	
		DESIGN BY: CEL	
		DRAWN BY: DRV	
		PROJECT NO.: 12720	
SHEET NO.	TOTAL SHEETS	13	33
Bradley D. Burton Professional Engineer License No. 25862		Mass Grading Plans Paragon Star Development Lee's Summit, Missouri	
NO.	DATE	REVISIONS	
	5/15/18	Revised Field Elevations	



Drainage Map

10 Year Storm Preliminary - Subject to Change Upon Final Design														Culverts have been designed to the 100 year Storm														Indicates Future Storm Sewer													
Runoff Calculations														Pipe Design														Design Checks													
Structures		Direct Line Area (acre)	In Area (acre)	Total Area (acre)	C	K	Tc (min)	Flow Time (min)	Intensity (in/hr)	Design Q (cfs)	Description	Pipe length (lin ft)	Pipe Slope Slope, %	Pipe dia (in)	Manning's n Value	Q full (cfs)	Pipe Area, sq ft	V full fps	Design V fps	Hu/D	outlet head, H	HV, Inlet Control, (ft)	HV, Outlet Control, (ft)	Inlet Top Elevation	upstream flowline	downstream flowline	Inlet Drop, ft	Downstream water elevation	Hydraulic Grade Elev. (Calculated)	Hydraulic Grade (allowable)	Comments										
Line 100 (100 Yr)	103	16.71			0.51	1.25	5.90		9.96	106.1	End Section														N/A					805.72	813.50										
	102	102	0.00	2.85	0.67	1.25	5.90	0.18	9.96	106.1	RCP	128.77	1.00	42	0.013	100.88	9.62	11.49	11.83	2.1	5.43	805.72	803.44	812.96	798.53	797.24	0.3	798.01	803.94	812.46											
	101	101			15.56	0.54	1.25	6.08	0.08	9.99	106.1	RCP	58.42	1.00	48	0.013	144.03	12.57	10.46	12.95	1.7	3.69	803.94	793.71	812.96	796.94	795.10		790.62	804.88											
	101	100	0.00		0.67	1.25	5.90		10.32	0.0	Junction Box														805.38			7.15	798.01	804.88											
					0.56	0.65	1.25	6.16	0.08	9.86	155.8	RCP	58.69	1.00	48	0.013	144.03	12.57	11.46	12.77	2.2	4.39	798.01	795.01		789.21	788.62		790.62			Tie in from Line 200									
Line 200	205		0.45		0.51	1.00	5.00		7.35	1.7	Curb Inlet														832.00			0.5	817.76	825.41	831.50										
	204	204	0.45		0.45	0.51	1.00	5.00	0.42	7.35	1.7	RCP	184.57	4.00	15	0.013	123.95	1.23	10.56	7.29	0.7	0.31	825.41	818.07	821.80	824.50	817.11	0.5	817.76	817.76	821.30										
	203	203	0.00	0.89	0.51	1.00	5.00		7.35	1.7	Curb Inlet	65.75	4.00	18	0.013	21.07	1.77	11.92	8.67	0.8	0.21	817.76	814.83	819.00	816.61	813.98	0.5	814.63	814.63	818.50											
	202	202	0.00	0.89	0.51	1.00	5.00		7.35	1.7	Manhole	174.11	2.00	18	0.013	14.90	1.77	8.43	6.76	0.8	0.44	814.63	812.84	815.12	813.48	810.00	0.5	812.40	812.40	818.50											
	202	202	1.28	0.00	1.00	5.00	5.42	0.13	7.22	3.3	RCP	6.47	7.4	Curb Inlet											815.12	809.50	807.93	0.5	809.61	809.61	814.62										
	201	201	0.68	2.17	1.00	5.00	5.58	0.14	7.06	3.3	RCP	78.66	2.00	18	0.013	14.90	1.77	8.43	9.25	1.8	2.79	812.15	812.40	815.12	809.50	807.93	0.5	809.61	809.61	814.62											
	201	201		2.85	0.72	1.00	6.12	0.21	7.02	14.4	RCP	125.47	2.00	24	0.013	32.08	3.14	10.21	9.92	1.1	1.52	806.61	806.44		807.43	804.92		804.92			Connect to Line 100										
Line 300 (100 Yr)	302	301	221.23		0.51	1.25	17.10		6.94	978.4	R/CB Headwall														N/A			0	809.03	811.00		Tie in from Line 400									
	301	301	0.00	221.23	0.51	1.25	17.10	0.13	6.94	978.4	R/CB	118.95	0.50	8"x8" RCB	0.013	978.45	49.00	24.73	15.50	2.5	4.49	816.40	813.52	N/A	795.94	795.35	0	809.03	809.03	811.00	35 degree bend South										
	301	301	221.23	0.51	1.25	17.23	0.05	6.91	975.1	R/CB	47.05	0.50	8"x8" RCB	0.013	978.45	49.00	24.73	15.50	2.5	4.49	815.70	793.82		795.35	795.11		789.33														
Line 400	402	401	2.66		0.57	1.00	5.00		7.35	11.1	Curb Inlet														811.50				806.80	811.00											
	401	301	0.70	2.66	0.57	1.00	5.00	0.12	7.35	11.1	RCP	78.00	3.00	24	0.013	39.29	3.14	12.51	10.73	0.9	0.65	805.36	806.80	811.50	803.52	801.18	4	806.14	806.14	811.00	Connect to Line 300										
Line 500 (100 Yr)	501	500	80.40		0.51	1.25	25.00		5.71	292.9	End Section														N/A				806.07	815.50											
		500	80.40	0.51	1.25	25.00	0.18	5.71	292.9	RCP	204.00	1.50	72	0.013	520.09	28.27	18.39	18.90	1.4	4.15	806.07	801.87		797.78	794.72		797.72														
Line 700 (100 Yr)	709	708	18.09		0.51	1.25	18.82		6.61	76.2	End Section														N/A				827.48	828.00											
	708	707	1.03		0.57	1.25	5.50		10.12	8.7	Curb Inlet														827.82			1	824.74	826.08	827.32										
	707	706	3.01	7.09	18.12	0.62	1.25	10.06	0.12	6.59	81.7	RCP	78.01	2.00	48	0.013	203.69	12.57	16.21	10.90	1.1	1.34	819.02	826.08	827.82	814.66	813.10	0.1	824.74	826.08	827.32										
	706	705	0.12	29.22	0.51	1.25	6.21		9.84	18.9	RCP	235.90	1.00	48	0.013	144.03	10.57	11.46	13.74	1.7	3.28	819.05	824.74	820.00	812.10	809.74	0.5	818.46	818.46	819.50											
	705	704	0.00	13.63	29.34	0.54	1.25	19.46	0.32	6.52	129.9	RCP	210.34	1.00	54	0.013	197.18	15.90	12.40	10.90	1.3	6.27	814.91	816.19	817.10	800.24	807.13	0.5	815.19	815.19	816.60										
	704	703	0.68	2.00	42.97	0.67	1.25	5.90		10.12	10	Curb Inlet	190.21	0.80	60	0.013	233.57	19.63	11.90	11.68	1.5	4.26	807.48	815.19	817.10	800.13	798.61	7	810.93	810.93	814.00	Tie in from Line 800									
	703	702	0.17	45.65	0.67	1.25	20.06	0.12	6.42	210.5	RCP	110.83	0.80	60	0.013	233.57	19.63	11.90	15.71	1.6	3.74	806.24	810.93	817.10	798.31	797.42	0.3	807.19	807.19	813.24											
	702	701	0.17	45.82	0.58	1.25	20.17	0.03	6.40	211.9	RCP	34.00	0.80	60	0.013	233.57	19.63	11.90	16.31	1.6	3.64	805.07	807.19	817.10	797.12	796.85	0.3	804.54	804.54	813.24											
	701	700	0.00	45.99	0.58	1.25	20.21	0.09	6.40	211.9	RCP	69.47	0.80	60	0.013	233.57	19.63	11.90	12.62	1.6	3.19	804.54	798.55	808.48	796.55	796.00	0.3	795.37	795.37	807.98	Tie in from Line 3500										
	700	700	0.00	45.82	0.58	1.25	20.21	0.07	6.40	211.9	RCP	56.70	1.00	60	0.013	261.14	19.63	13.30	12.62	1.6	3.00	795.37	792.31		787.38	786.81	8.62	789.31	789.31												
	Line 800 (100 Yr)	803	802	2.03		0.61	1.25	5.00		10.32	15.9	Area Inlet														811.00				810.41	810.50										
		802	801	2.03	7.09	2.03	0.61	1.25	5.00	0.83	10.32	15.9	HDPE	355.09	0.80	36	0.01	77.76	7.07	11.00	7.11	0.7	0.54	808.77	810.41	811.00	806.55	803.71	0.3	809.87	809.87	810.50									
801		801	11.14	0.62	1.25	14.58	0.63	7.45	9.40	10.32	15.9	Area Inlet	268.59	0.50	42	0.01	92.73	9.62	9.64	7.11	1.2	3.22	807.52	809.87	811.00	803.41	802.07	0.3	806.65	806.65	810.50										
705		801	2.49	13.63	0.62	1.25	15.21	0.19	7.31	76.7	Area Inlet	79.72	0.80	42	0.01	117.30	9.62	12.19	7.11	1.4	2.21	806.65	804.90	811.00	801.77	801.13	0.3	802.69	802.69		Connect to Line 700										
Line 900 (100 Yr)	902	901	2.17		0.51	1.25	12.13		8.02	11.1	Area Inlet														812.00				809.71	811.50											
	901	707	2.92	2.00	2.17	0.51	1.25	12.13	0.89	8.02	11.1	HDPE	268.65	0.50	30	0.01	37.81	4.91	7.70	5.01	0.8	0.53	809.57	809.71	812.00	807.69	806.35	0.3	809.19	809.19	811.50										
Line 1200	1203	1202	4.52		0.51	1.00	8.33		6.45	14.9	End Section														N/A				809.54	813.50											
	1202	1201	0.12	2.99	4.52	0.51	1.00	8.33	0.03	6.45	14.9	RCP	20.19	3.00	30	0.013	71.24	4.91	14.51	11.45	0.8	0.23	809.54	804.82	814.01	807.50	806.89		804.59	804.59	813.51	Tie in from Line 3300									
	1201	1200	0.12	7.63	0.67	1.00	6.36	0.06	6.44	14.9	Area Inlet	43.11	1.00	30	0.013	41.13	4.91	8.38	11.62	1.2	1.05	804.23	804.59	814.01	801.26	800.83	5.63	803.54	804.59	813.51											
	1200	1200		7.75	0.57	1.00	5.00		7.35	0.6	Curb Inlet	53.25	1.00	30	0.013	41.13	4.91	8.38	11.79	1.2	1.19	803.54	802.44		800.53	800.85		801.25													
Line 1300	1301	1203	0.08		0.90	1.00	5.00		7.35	0.5	Area Inlet														811.00				809.11	810.50											
		1203		0.08	0.90	1.00	5.00	0.41	7.35	0.5	HDPE	179.41	2.00	15	0.01	11.91	1.23	9.70	7.29	0.7	0.93	809.11	803.44	811.00	808.27	804.68		803.41			Connect to Line 3300										
Line 3200	3201	3502	0.09		0.67	1.00	5.00		7.35	0.4	Curb Inlet														811.00				805.18	810.50											
		3502		0.09	0.67	1.00	5.00	0.16	7.35	0.4	RCP	34.00	1.00	15	0.013	6.48	1.23	5.28	3.63	0.7	0.01	805.18	804.63		804.34	804.00		804.62			Connect to Line 3300										
	3305	3304	0.00		0.64	1.00	5.00		7.20	0.0	Area Inlet														812.50				809.56	812.00											
	3304	3303	1.59	0.08	0.67	1.00	5.92		7.08	7.5	HDPE	266.64	0.80	18	0.01	12.25	1.77	6.93	6.44	0.7	0.00	810.01	809.56	812.00	809.01	806.87	0.3	809.56	809.56	811.50											
	3303	3302	1.14	1.67	0.68	1.00	6.19	0.54	7.00	8.0	HDPE	237.26	0.80	18	0.01	12.25	1.77	6.93	6.17	1.2	3.39	808.39																			



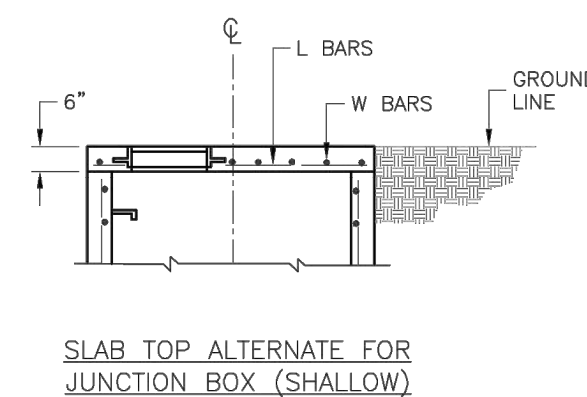
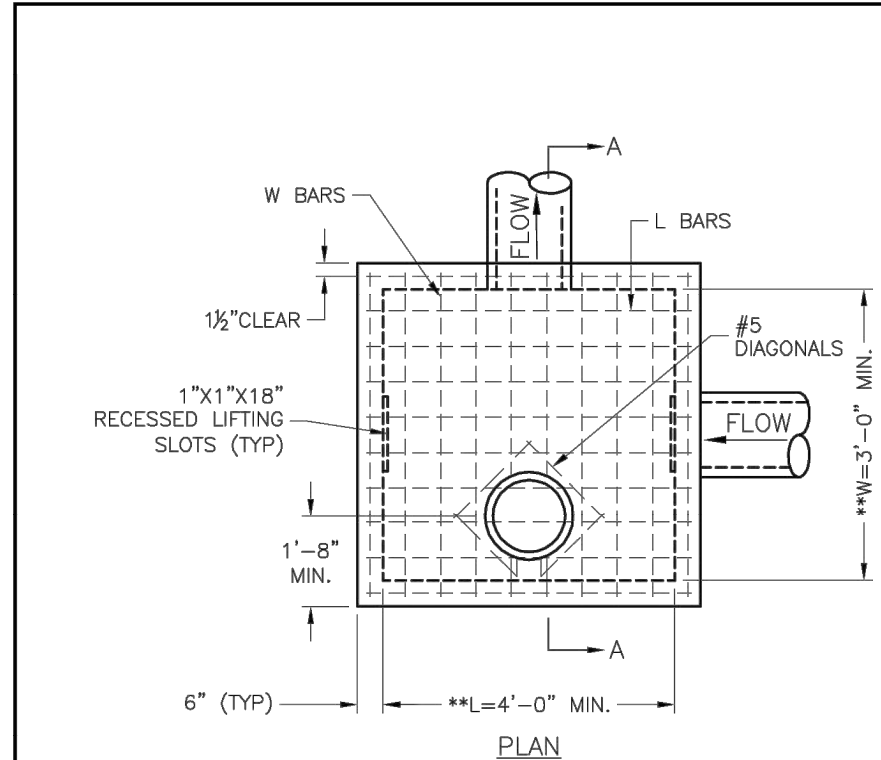
- STEEL FRAME NOTES:**
1. ALL WELDS SHALL BE PERFORMED IN ACCORDANCE WITH APPROPRIATE AWS SPECIFICATIONS AND PROCEDURES.
 2. ALL WELDS ON EXPOSED SURFACES SHALL BE DRESSED SO AS TO PROVIDE A PLEASING FINISHED APPEARANCE.
 3. THE ENTIRE FRAME SHALL BE PAINTED A SINGLE COAT OF CHEM-PRIME #37H-78 PRIMER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

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

STANDARD DETAILS
CITY OF LEE'S SUMMIT, MO
LEE'S SUMMIT, JACKSON COUNTY, MO
Curb Inlet Detail

Drawn By: MIF
Checked By: DL
Date: 04/17
Proj. #: STM-1

STM-1



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

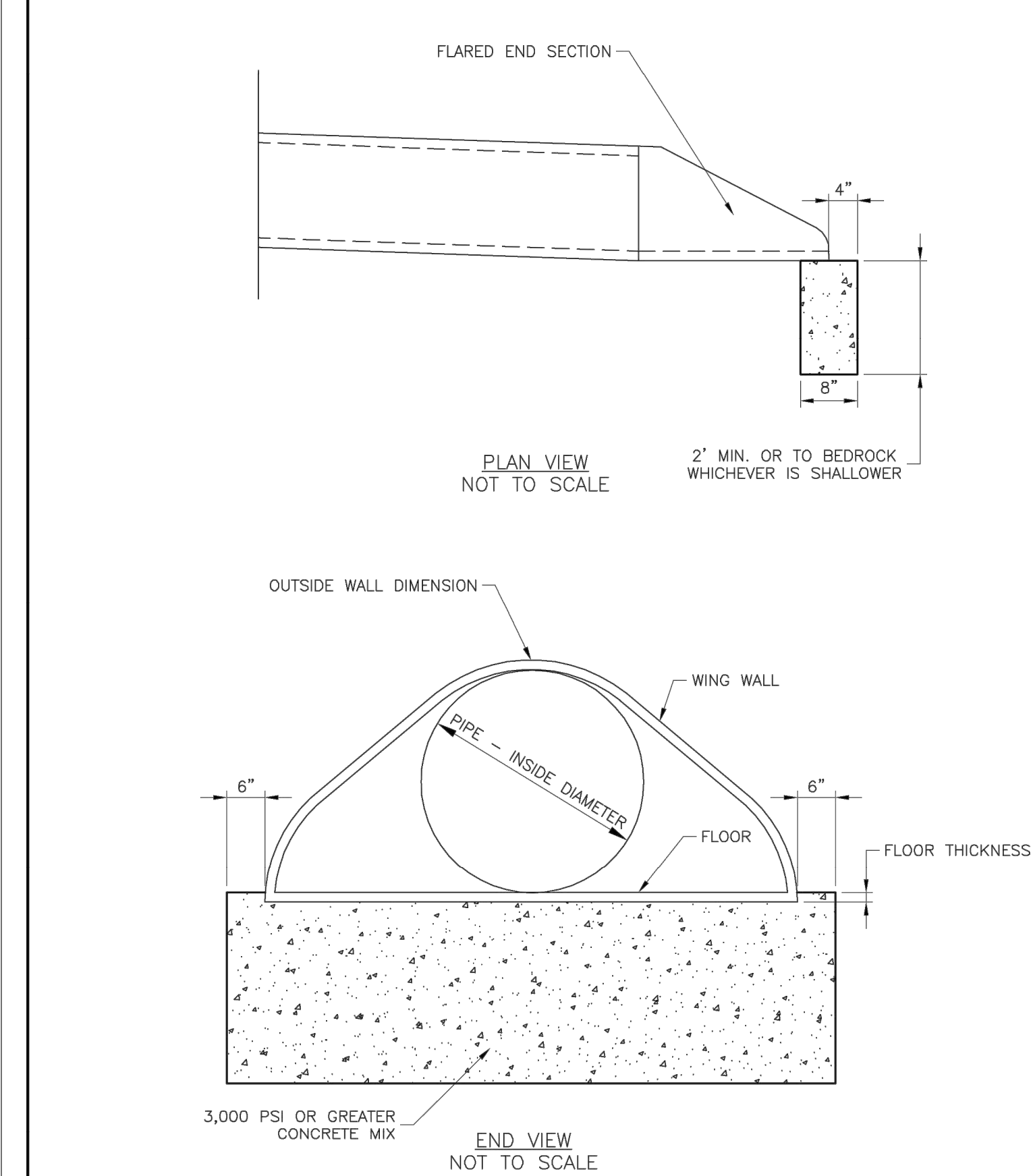
- GENERAL NOTES:**
1. LOCATE RING AND COVER ON BLANK WALL.
 2. USE 3/4" CHAMFER STRIP OR 1/2" R EDGER TOOL ON ALL EXPOSED CONCRETE CORNERS.
 3. STEPS REQUIRED AT 18" O.C. WHEN DEPTH FROM TOP OF CASTING TO INVERT EXCEEDS 4' ON BLANK WALL IF POSSIBLE.
 4. BOXOUTS WILL NOT BE ALLOWED TO PROJECT THROUGH 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.
 6. PRECAST LIDS SHALL BE PINNED, SEALED WITH NON-SHRINKABLE GROUT AND REMOVABLE FOR FUTURE MAINTENANCE.
 7. REINFORCING OF COVERS IN STREETS REQUIRE SPECIAL DESIGN.
 8. FOR RING AND COVER SEE THE STORMWATER APPROVED PRODUCT LIST.

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

STANDARD DETAILS
CITY OF LEE'S SUMMIT, MO
LEE'S SUMMIT, JACKSON COUNTY, MO
Junction Box Detail

Drawn By: MIF
Checked By: DL
Date: 04/17
Proj. #: STM-3

STM-3



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: MIF
Checked By: DL

STM-5

REINFORCING BY ENGINEER
AS FOLLOWS:
#4 @ 12" O.C. each way

"C" = 6" FOR PIPE 18" & LESS
8" FOR PIPE 21" THRU 36"

REINFORCING BY ENGINEER
AS FOLLOWS:
#5 @ 6" O.C. each way

"C" = 6" for pipe 18" & less
8" for pipe 21" thru 36"

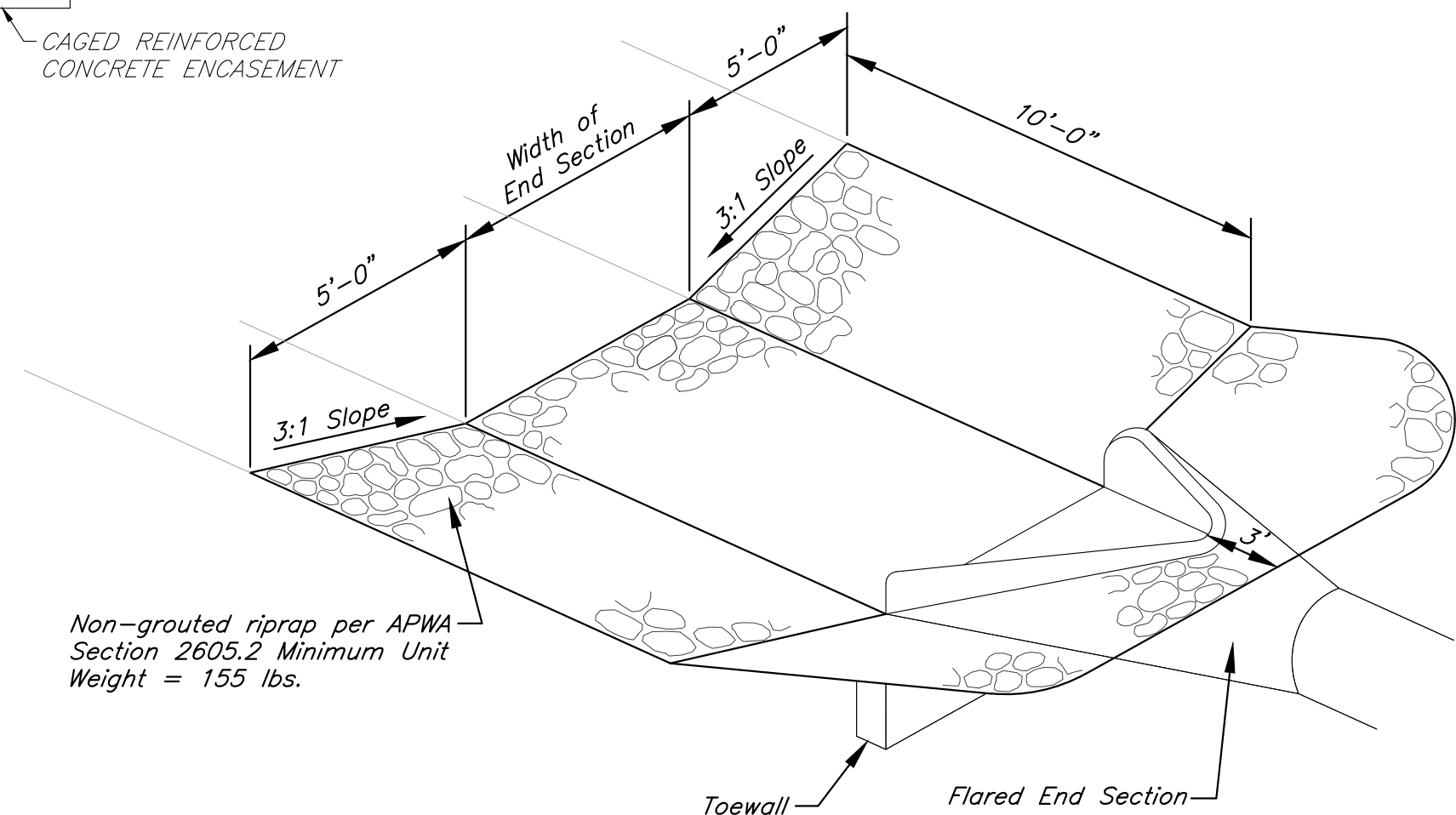
- Notes:**
1. All encasements shall be centered on the crossing.
 2. All concrete shall be KCMMB 4K

CAGED REINFORCED CONCRETE ENCASEMENT

Not to Scale

PIPE BEDDING DETAILS

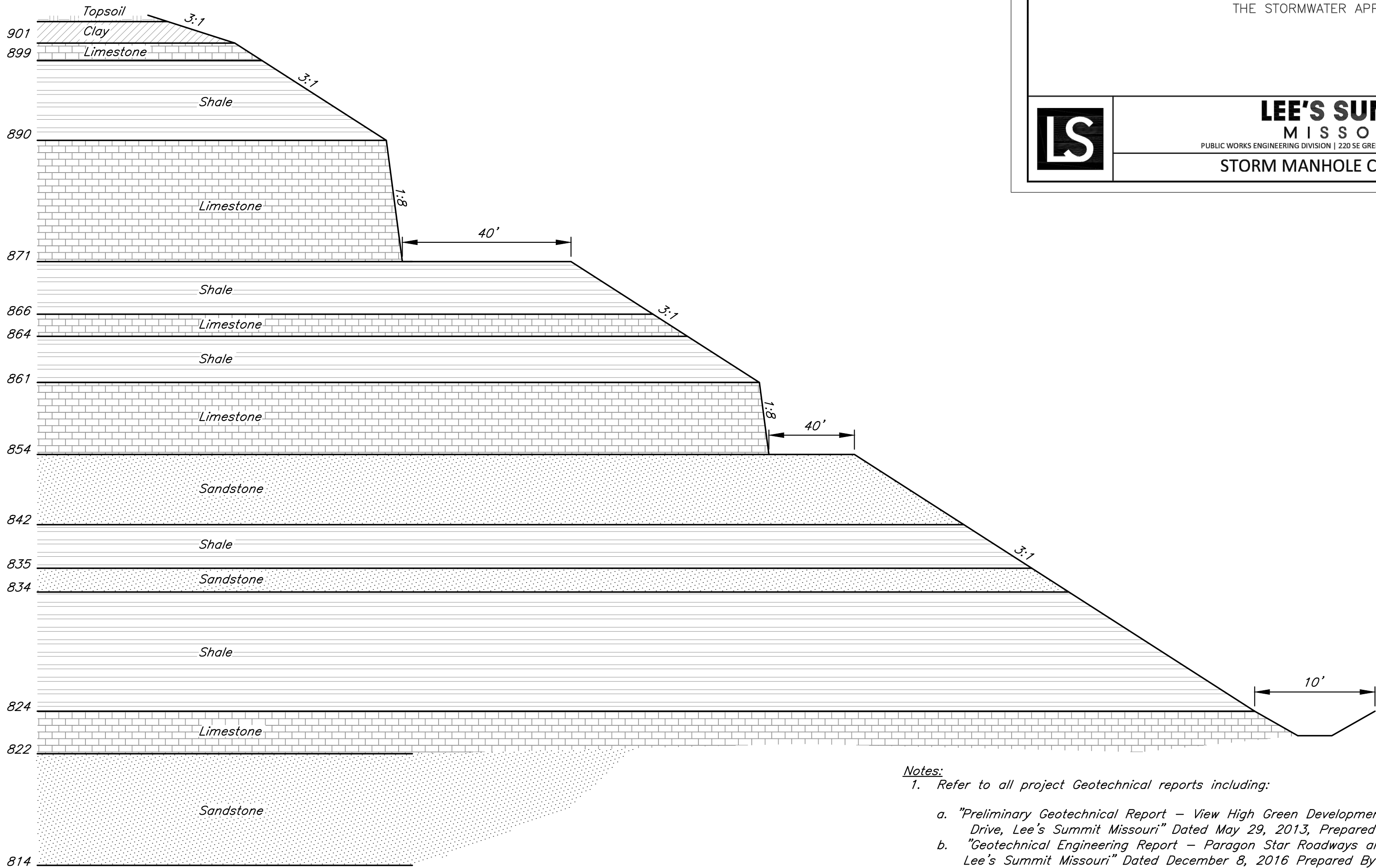
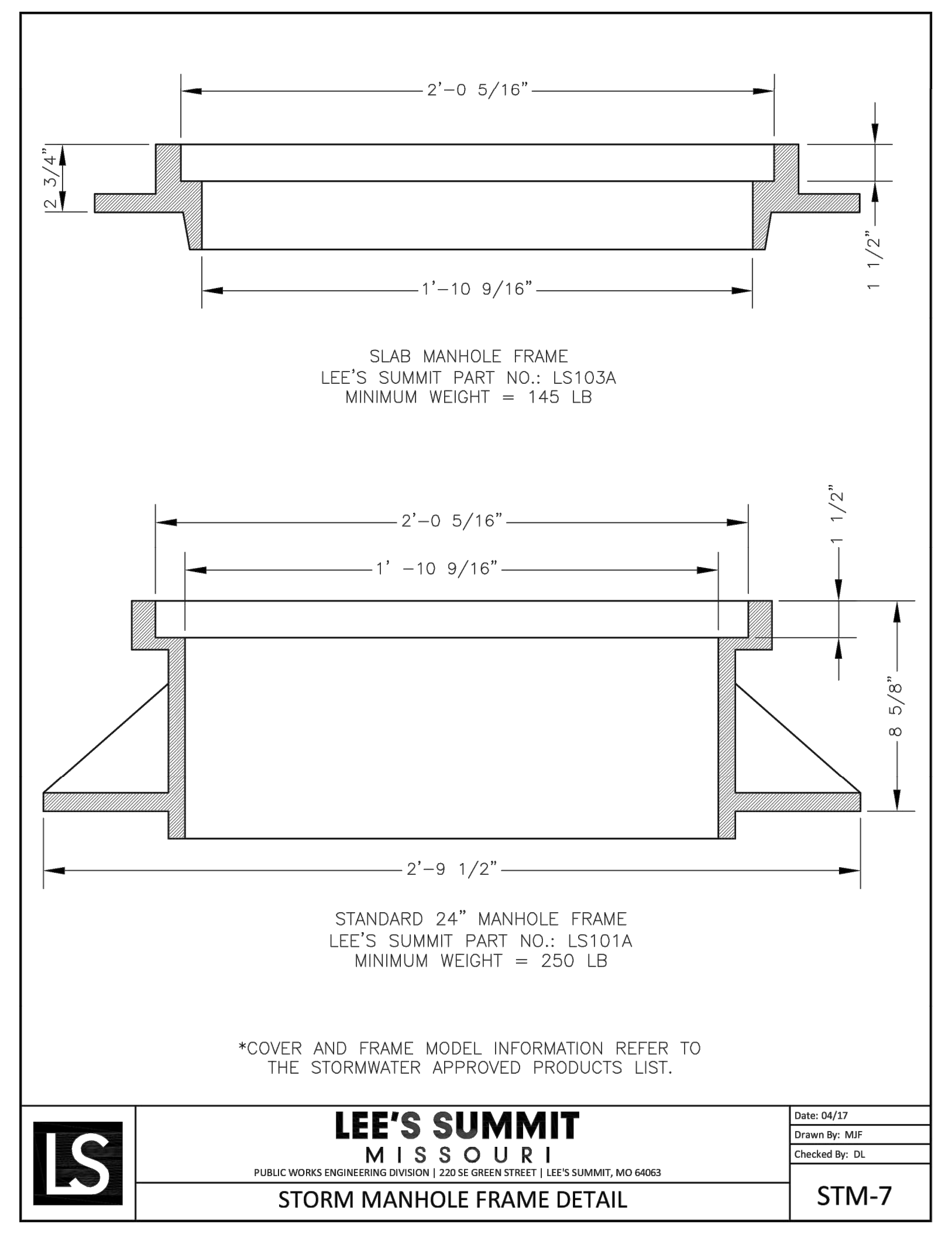
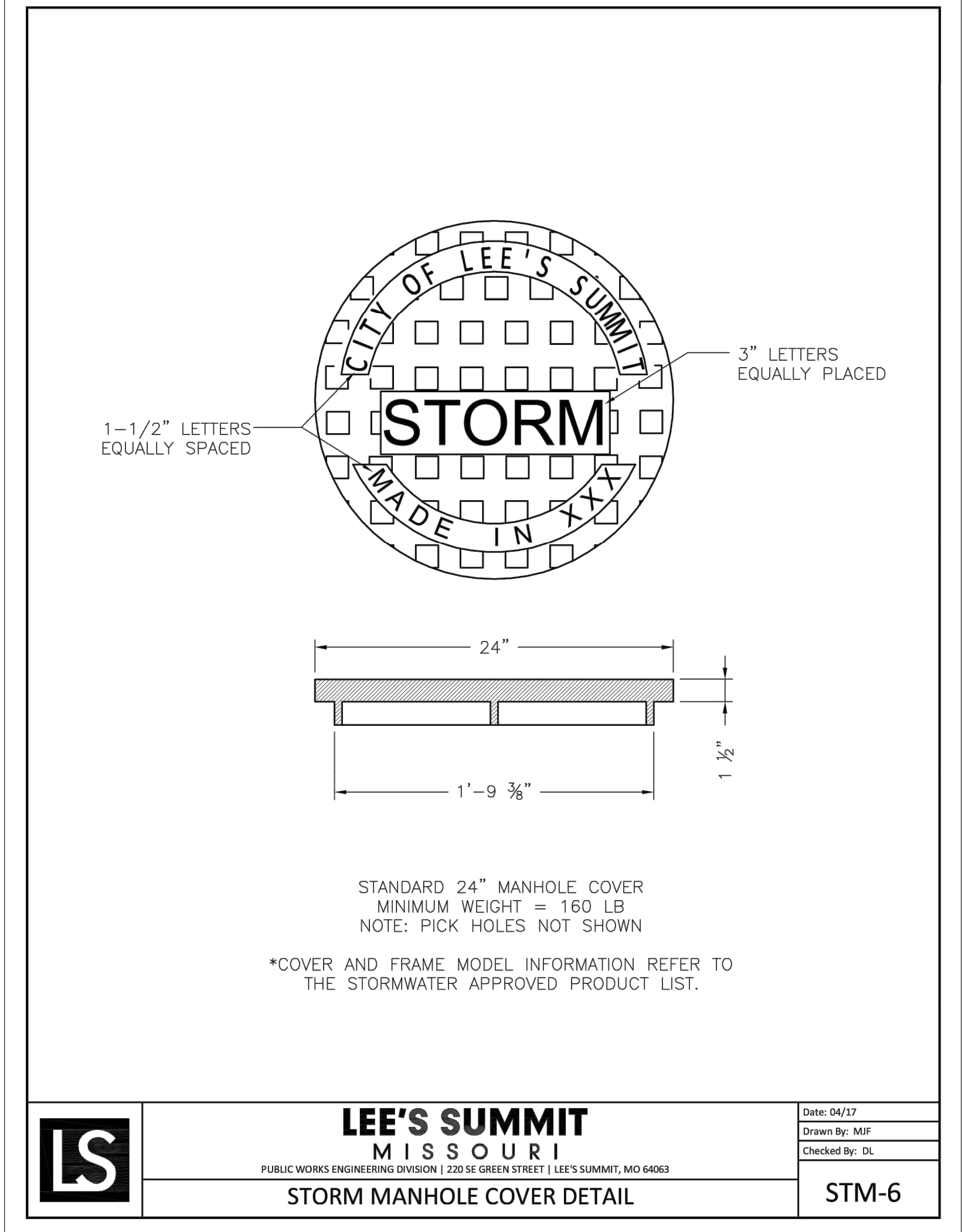
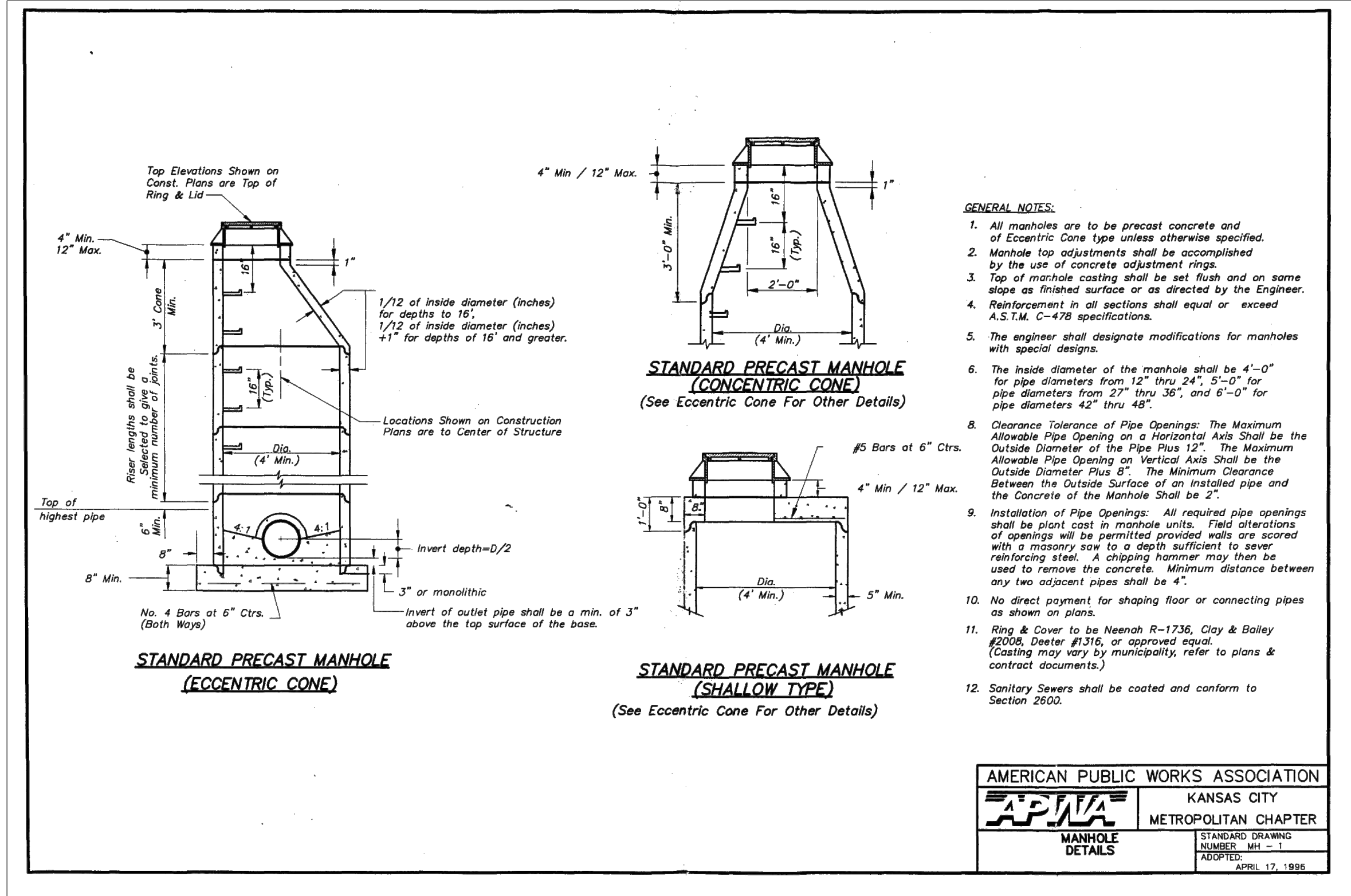
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Non-grouted riprap per APWA
Section 2605.2 Minimum Unit
Weight = 155 lbs.

ENTRANCE EROSION PROTECTION - RIPRAP

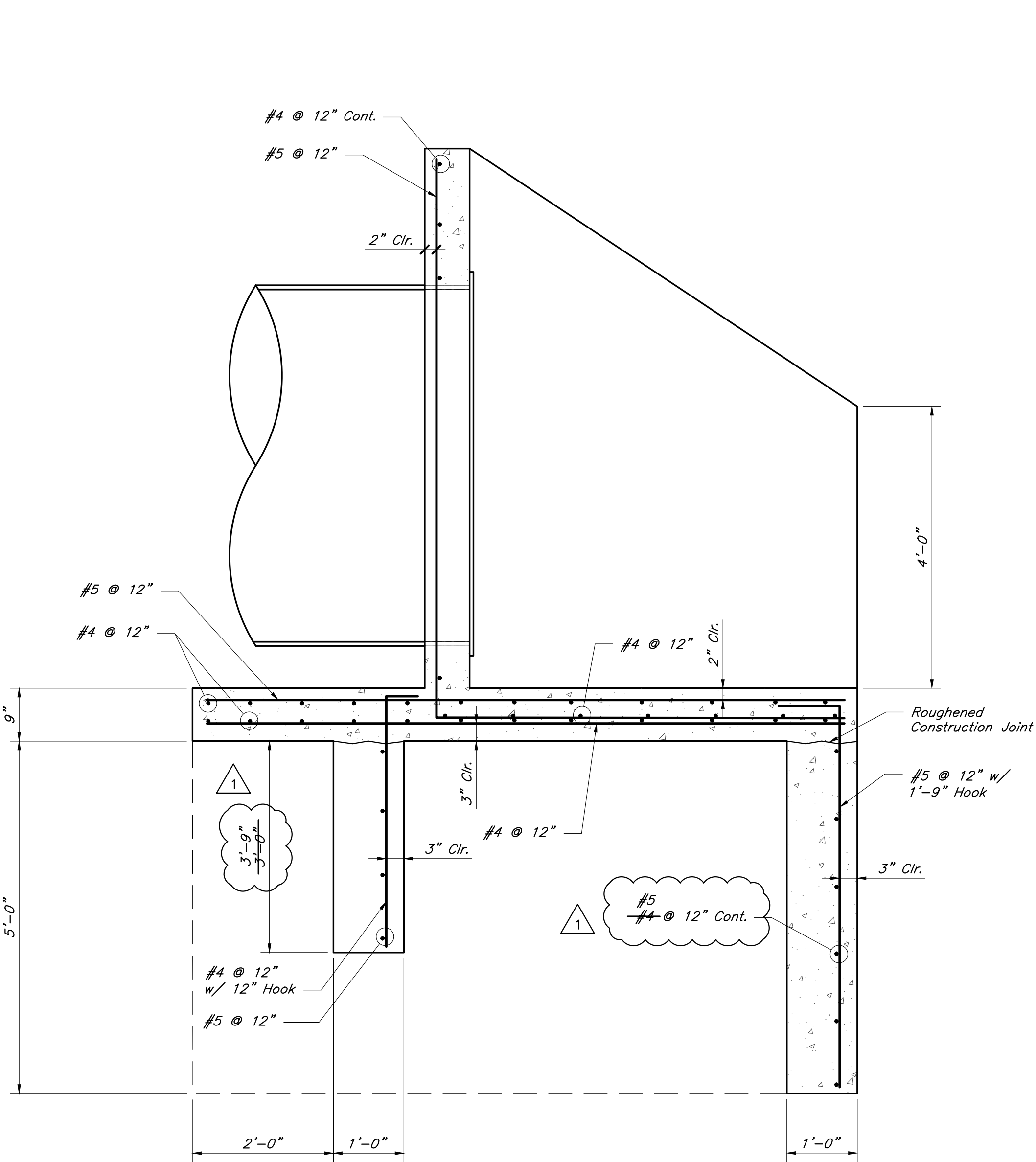
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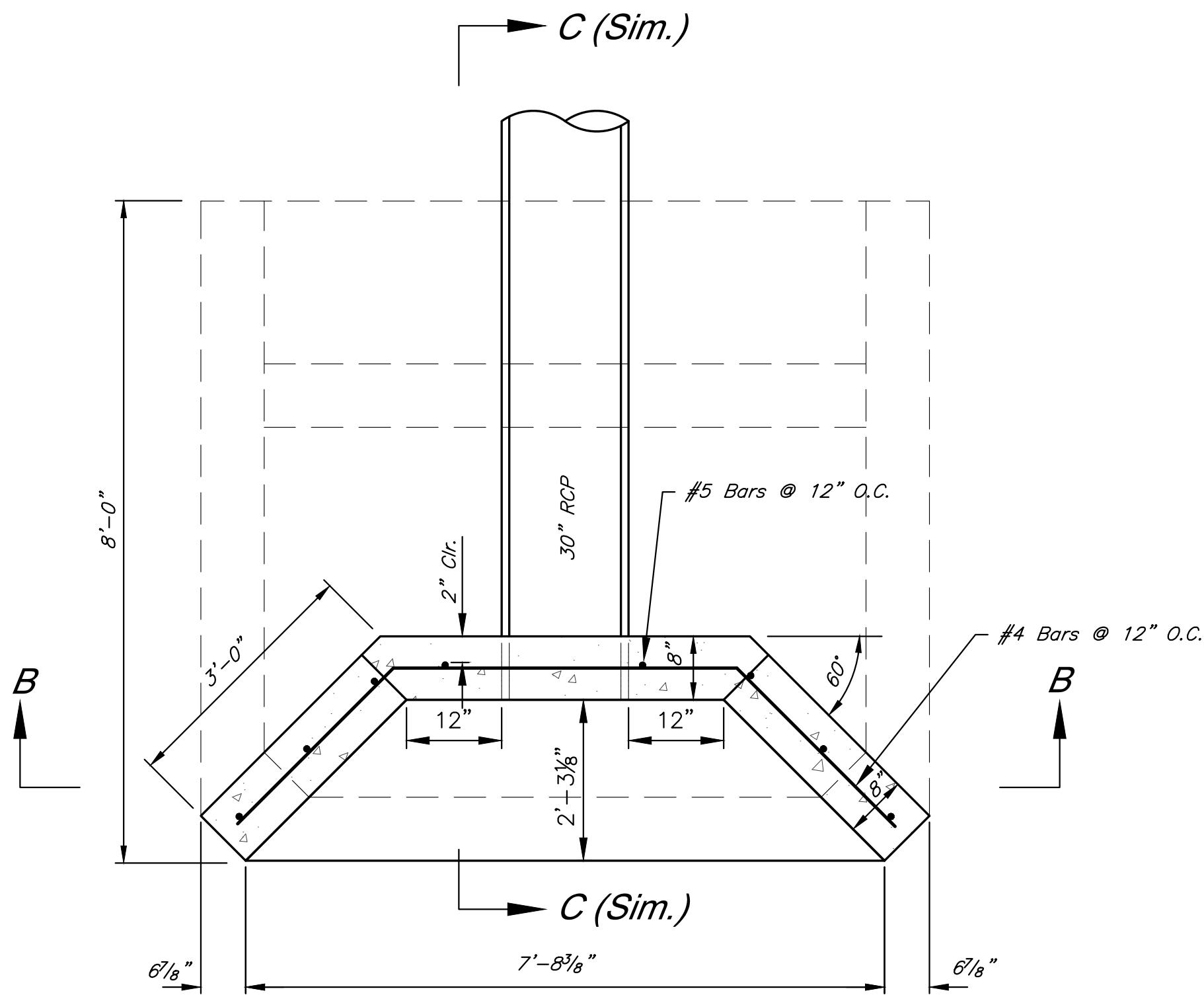
- Notes:**
1. Refer to all project Geotechnical reports including:
 - a. "Preliminary Geotechnical Report - View High Green Development, I-470 & View high Drive, Lee's Summit Missouri" Dated May 29, 2013, Prepared By Terracon Consultants, Inc.
 - b. "Geotechnical Engineering Report - Paragon Star Roadways and Borrow Source, Lee's Summit Missouri" Dated December 8, 2016 Prepared By Terracon Consultants, Inc.
 - c. "Geotechnical Engineering Report Addendum #1 Paragon Star Roadways and Borrow Source - Rock Slopes" Dated January 4, 2017 Prepared By Terracon Consultants, Inc.
 2. Section Based off of Boring B-109, Actual elevations of each geological strata may vary on site.
 3. On-Site Geotechnical Engineer will identify limits of each strata, and resulting slope recommendations.

	GBA architects engineers 9801 Renner Boulevard Lenexa, Kansas 66219 913.492.0400 www.gbateam.com	DATE: 1/10/17	
		DESIGN BY: CEL	
		DRAWN BY: DRV	
PROJECT NO.: 12720		SHEET NO. 17	TOTAL SHEETS 33
Bradley D. Burton Professional Engineer License No. 25862		Mass Grading Plans Paragon Star Development Lee's Summit, Missouri	
NO. DATE 5/15/18		REVISIONS BY APPROVED Revised Field Elevations	

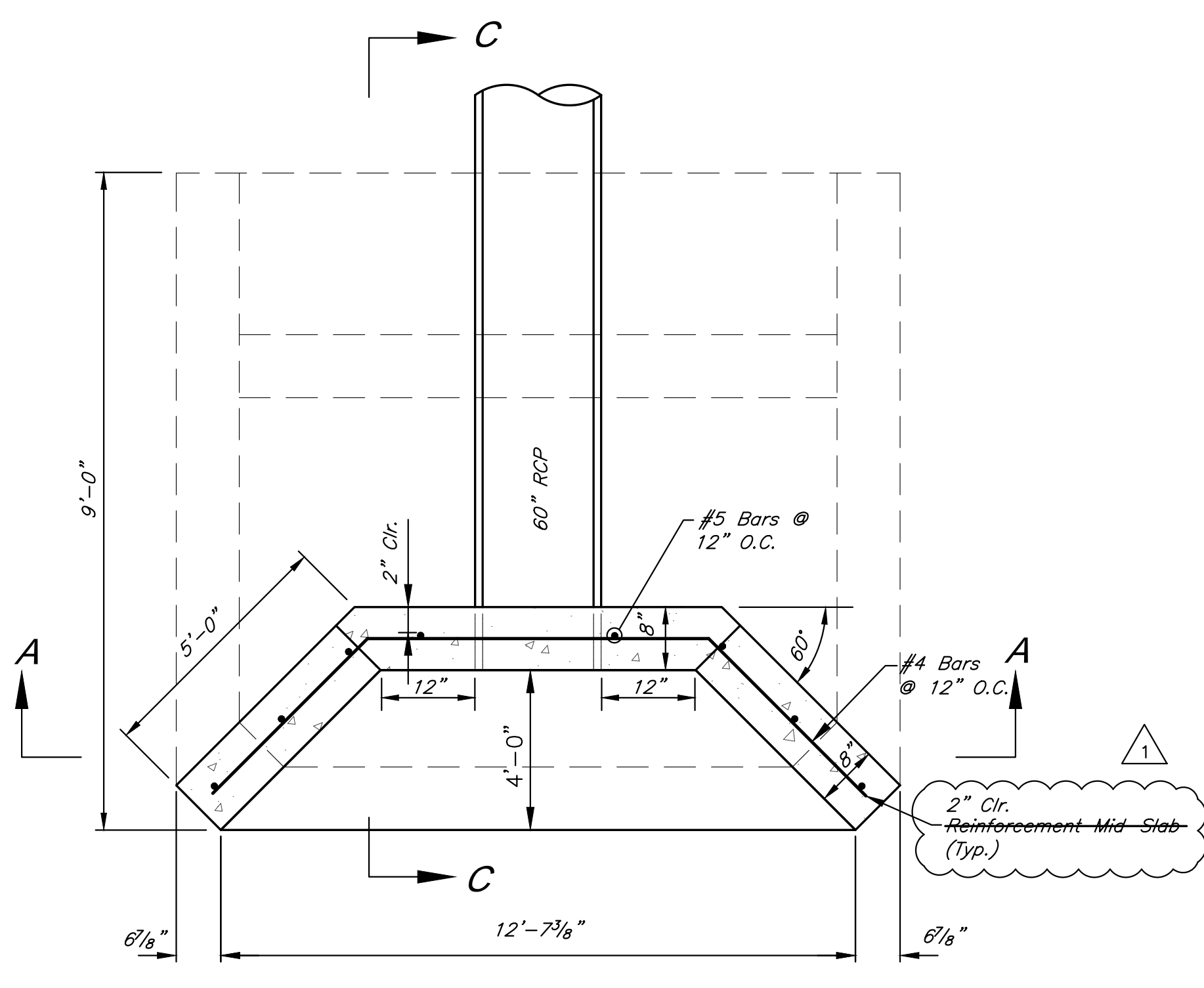
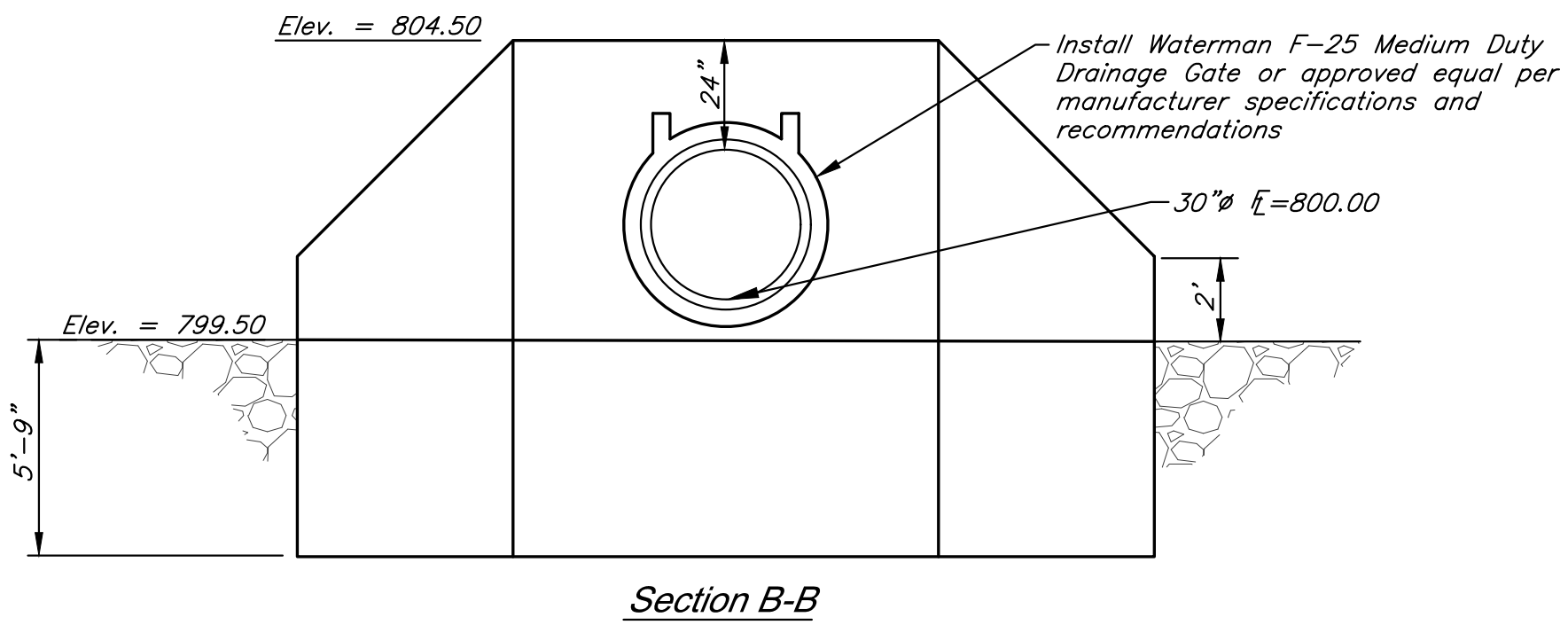
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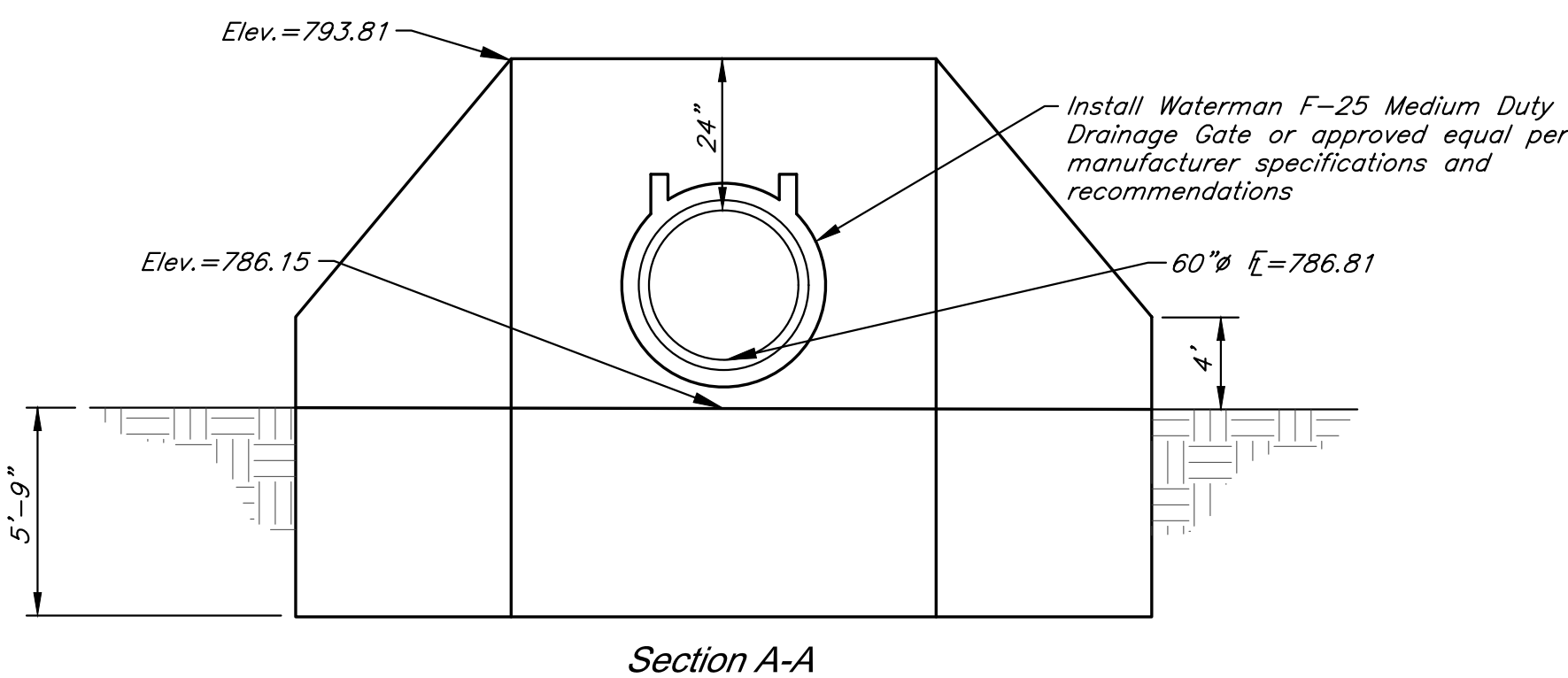
SECTION C-C - STRUCTURE 700
Not to Scale




HEADWALL DETAIL - STRUCTURE 1200
Not to Scale



HEADWALL DETAIL - STRUCTURE 700
Not to Scale



	GBA architects engineers 9801 Renner Boulevard Lenexa, Kansas 66219 913.492.0400 www.gbateam.com	DATE: 1/10/17	
		DESIGN BY: CEL	
		DRAWN BY: DRV	
		PROJECT NO.: 12720	
		SHEET NO.	TOTAL SHEETS
		18	33
Bradley D. Burton Professional Engineer License No. 25862		Mass Grading Plans Paragon Star Development Lee's Summit, Missouri	
NO. DATE		REVISIONS BY APPROVED	
1 5/25/18		REVISIONS BY APPROVED	

G:\12720\Civil_3D\Production Drawings\Mass Grading\Lee's Summit\12720_S000.dwg, Layout: 19 Structural General Notes -- Wednesday, June 13, 2018, 10:49am -- Copyright 2018, George Butler Associates, Inc. Architect: 00212, Professional Engineer: 000133, Landscape Architect: 000025, Professional Land Surveyor: 000059

GENERAL NOTES – STRUCTURAL

DESIGN SPECIFICATIONS: ACI 318R–11, AISC 14TH EDITION

GENERAL:

1. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY OBSERVED DISCREPANCIES IN DIMENSIONS, DETAILING, OR OTHER ITEMS AS SHOWN ON THE PLANS OR SPECIFIED PRIOR TO PROCEEDING WITH WORK RELATING TO SAID DISCREPANCIES.
2. THE CONTRACTOR SHALL NOT ALTER OR MODIFY WORK SHOWN ON THE STRUCTURAL DRAWINGS WITHOUT RECEIVING WRITTEN APPROVAL FROM THE ENGINEER.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SUPPLYING SHOP DRAWINGS REINFORCING STEEL, HANDRAILS AND POST–INSTALLED ANCHORS. SHOP DRAWINGS MUST BE REVIEWED FOR CONFORMANCE WITH THE MEANS, METHODS, TECHNIQUES, SEQUENCES, AND OPERATIONS OF CONSTRUCTION, AND SAFETY PRECAUTIONS AND PROGRAMS INCIDENTAL THERETO, ALL OF WHICH ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR, AND SHALL BE STAMPED "APPROVED" BY THE CONTRACTOR PRIOR TO SUBMITTAL. SHOP DRAWINGS SUBMITTED WITHOUT THE CONTRACTOR’S STAMPED APPROVAL WILL BE RETURNED REJECTED. ALL SHOP DRAWINGS SHALL BE REVIEWED BY THE STRUCTURAL ENGINEER PRIOR TO CONSTRUCTION.
4. THE STRUCTURAL SYSTEMS SHOWN ON THESE DOCUMENTS HAVE BEEN DESIGNED FOR THE FINAL IN PLACE USAGE OF THE STRUCTURE BASED ON THE INTENDED OCCUPANCY AND CODE REQUIREMENTS. WHILE GENERAL CONSTRUCTABILITY HAS BEEN CONSIDERED, THE STRUCTURAL SYSTEMS HAVE NOT BEEN DESIGNED TO ACCOMMODATE SPECIFIC CONSTRUCTION MEANS AND METHODS THAT MIGHT BE UTILIZED BY THE CONTRACTOR.
5. THE CONTRACT STRUCTURAL DRAWINGS AND SPECIFICATIONS REPRESENT THE FINISHED STRUCTURE, AND EXCEPT WHERE SPECIFICALLY SHOWN, DO NOT INDICATE THE METHOD OR MEANS OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, PROCEDURES, TECHNIQUES, SEQUENCE, AND SAFETY PRECAUTIONS AND PROGRAMS. THE ENGINEER WILL NOT BE RESPONSIBLE FOR THE ACTS OR OMISSION OF THE CONTRACTOR, SUBCONTRACTOR, OR ANY OTHER PERSONS PERFORMING ANY OF THE WORK, OR FOR THE FAILURE OF ANY OF THEM TO CARRY OUT THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
6. PERIODIC SITE OBSERVATION BY FIELD REPRESENTATIVES OF GBA, IF PROVIDED, IS SOLELY FOR THE PURPOSE OF DETERMINING IF THE WORK OF THE CONTRACTOR IS PROCEEDING IN GENERAL ACCORDANCE WITH THE STRUCTURAL CONTRACT DOCUMENTS. THIS LIMITED SITE OBSERVATION SHOULD NOT BE CONSTRUED AS EXHAUSTIVE OR CONTINUOUS TO CHECK THE QUALITY OR QUANTITY OF THE WORK, BUT RATHER PERIODIC IN AN EFFORT TO GUARD THE OWNER AGAINST DEFECTS OR DEFICIENCIES IN THE WORK OF THE CONTRACTOR.
7. MDT SPECIFICATIONS SHALL APPLY TO ALL ITEMS NOT SPECIFICALLY ADDRESSED IN THESE PLANS.

FOUNDATIONS:

1. FOUNDATIONS FOR THIS PROJECT HAVE BEEN DESIGNED IN ACCORDANCE WITH REQUIREMENTS SET FORTH IN A SOILS REPORT PREPARED BY TERRACON CONSULTANTS, INC. DEC. 8, 2016 (TERRACON PROJ. NO. 02165208). WALLS HAVE BEEN DESIGNED FOR AN ALLOWABLE SOIL BEARING VALUE OF 1500 PSF. THE CONTRACTOR SHALL REFER TO SOIL REPORT FOR ALL REQUIREMENTS AND RECOMMENDATIONS PERTINENT TO THIS PROJECT.

CONCRETE AND REINFORCING STEEL:

1. CONCRETE MIX DESIGNS SHALL MEET THE FOLLOWING REQUIREMENTS: (TAKEN FROM ACI 211.1)

MINIMUM COMPRESSIVE STRENGTH (psi)	MAXIMUM AGGREGATE SIZE (IN.)	MIN. CEMENT (LBS.)	MAXIMUM WATER/CEMENT RATIO	MAXIMUM SLUMP (IN.)	AIR ENTRAINMENT PERCENT (%)
4000	¾	611	.48	4	6±1

NOTE: DO NOT ADD WATER TO CONCRETE DURING DELIVERY, AT PROJECT SITE, OR DURING PLACEMENT. THE INTENT OF THESE SPECIFICATIONS IS THAT THE CONTRACTOR SUPPLY CONCRETE MIXES WITH A MINIMUM AMOUNT OF MIX WATER IN ORDER TO LIMIT PLASTIC SHRINKAGE CRACKING. IT IS EXPECTED THAT WORKABILITY FOR CONCRETE MIXES WILL REQUIRE THE ADDITION OF WATER–REDUCING AND/OR SUPER–PLASTICIZING ADMIXTURES.

2. LAP SPlice LENGTHS FOR HORIZONTAL #4 AND #5 BARS ARE 2’–0” AND 2’–6” RESPECTIVELY.
3. ALL CONCRETE IS REINFORCED UNLESS SPECIFICALLY CALLED OUT AS UN–REINFORCED. REINFORCE ALL CONCRETE NOT OTHERWISE SHOWN WITH SAME STEEL AS IN SIMILAR SECTIONS OR AREAS.
4. NO ALUMINUM ITEMS SHALL BE EMBEDDED IN ANY CONCRETE OR PLACED IN CONTACT WITH CONCRETE.
5. CAST–IN–PLACE CONCRETE CONSTRUCTION SHALL CONFORM TO THE LATEST AMERICAN CONCRETE INSTITUTE DOCUMENTS. ACI301, 305, 306, 315, 318, AND 347 UNLESS OTHERWISE NOTED IN THESE CONTRACT DOCUMENTS.
6. PRIOR TO PLACING CONCRETE IN ANY LOCATION, IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO HAVE THOROUGHLY CHECKED AND COORDINATED ALL DIMENSIONS, ELEVATIONS, OPENINGS, RECESSES, AND BLOCKOUTS SHOWN ON THE ARCHITECTURAL, STRUCTURAL AND MECHANICAL/ELECTRICAL/PLUMBING DRAWINGS. IN THE EVENT ERRORS, CONFLICTS, OR OMISSIONS EXIST, IT SHALL BE THE CONTRACTOR’S RESPONSIBILITY TO CONTACT THE ARCHITECT OR ENGINEER FOR NECESSARY CORRECTIVE ACTION.
7. REINFORCING BARS #4 AND LARGER (EXCEPT TIES AND STIRRUPS) SHALL MEET ASTM A615 WITH SUPPLEMENTARY REQUIREMENTS (S1), GRADE 60. SMALLER BARS SHALL BE GRADE 40.
8. CONCRETE COVERAGE OF REINFORCEMENT SHALL HAVE THE FOLLOWING CLEAR DISTANCES UNLESS NOTED OTHERWISE ON THE DRAWINGS:
- CAST AGAINST EARTH _____3”

FORMED CONCRETE EXPOSED
TO EARTH OR WEATHER _____2”

NOT EXPOSED TO EARTH
OR WEATHER _____1” SLABS, 1–½” BEAMS AND COLUMNS
9. EMBEDDED AND ALL REINFORCING BARS MARKED CONTINUOUS SHALL BE EMBEDDED TO DEVELOP THE FULL TENSION CAPACITY OF THE BAR. LAPS SHALL BE CLASS B TENSION LAPS UNLESS SPECIFIED OTHERWISE ON THE DRAWINGS.
10. ALL BARS ARE TO BE SUPPORTED IN FORMS AND SPACED WITH WIRE BAR SUPPORTS PER ACI "MANUAL OF STANDARD PRACTICE FOR DETAILING CONCRETE STRUCTURES" (LATEST EDITION). BARS SHALL BE SECURELY WIRED PER LATEST EDITION OF CRSI'S "RECOMMENDED PRACTICE FOR PLACING REINFORCING BARS." ACCESSORIES FOR EXPOSED CONCRETE SHALL BE PLASTIC OR HAVE PLASTIC–TIPPED FEET.
11. CONCRETE PLACED DURING COLD WEATHER SHALL CONFORM TO THE REQUIREMENTS OF ACI 306R–88. COLD WEATHER IS DEFINED AS A PERIOD WHEN, FOR MORE THAN 3 SUCCESSIVE DAYS, THE MEAN DAILY TEMPERATURE DROPS BELOW 40°F.
12. CONCRETE PLACED DURING HOT WEATHER SHALL CONFORM TO THE REQUIREMENTS OF ACI 305R–99. HOT WEATHER IS DEFINED AS THAT COMBINATION OF AIR TEMPERATURE, RELATIVE HUMIDITY AND WIND SPEED THAT WILL CAUSE A RATE OF EVAPORATION OF 0.2 LB/SQ.FT./HR. OR MORE AS DEFINED BY FIGURE 2.1.5 OF ACI 305R–99.
13. CHAMFER ALL EXPOSED CORNERS OF CONCRETE SLABS, WALLS, BEAMS AND COLUMNS ¾”, UNLESS NOTED OTHERWISE ON DETAILS.

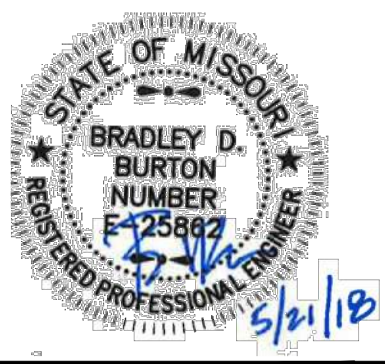
POST–INSTALLED ANCHORS AND REBAR:

1. POST–INSTALLED ANCHORS AND REBAR SHALL BE INSTALLED USING AN ADHESIVE UNLESS SPECIFICALLY NOTED OTHERWISE. ANCHORS SHALL CONSIST OF THE FOLLOWING ANCHOR TYPES, AS PROVIDED BY HILTI, INC.:
- a) ANCHORAGE TO CONCRETE

(1) HILTI HIT–HY 200 SAFE SET SYSTEM WITH HILTI HOLLOW DRILL BIT (TE–CD OR TE–YD)

(2) STEEL ANCHOR ELEMENT SHALL BE HILTI HAS–E THREADED ROD PER ICC ESR–3187.
- b) REBAR DOWELING INTO CONCRETE

(1) HILTI HIT–HY 200 SAFE SET SYSTEM WITH HILTI HOLLOW DRILL BIT (TE–CD OR TE–YD) AND CONTINUOUSLY DEFORMED REBAR PER ICC ESR–3187.
2. CONTACT HILTI AT (800) 879–8000 FOR PRODUCT RELATED QUESTIONS.
3. IF THE CONTRACTOR CHOOSES TO SUBMIT A SUBSTITUTION FOR APPROVAL, THEY MUST ATTACH CALCULATIONS SIGNED AND SEALED BY A PROFESSIONAL ENGINEER LICENSED IN THE JURISDICTION WHERE THE PROJECT IS LOCATED SHOWING THAT THE SUBSTITUTION IS "EQUAL". THE ICC–ES EVALUATION REPORT FOR THE "EQUAL" PRODUCT MUST ALSO BE SUBMITTED FOR REVIEW. THE CONTRACTOR SHALL NOTE THAT THE ICC–REPORT MAY INDICATE ADDITIONAL SPECIAL INSPECTION REQUIREMENTS. ANY ADDITIONAL SPECIAL INSPECTION REQUIREMENTS MUST BE PERFORMED AT NO ADDITIONAL COST TO THE OWNER.
4. INSTALL ANCHORS PER THE MANUFACTURER INSTRUCTIONS, AS INCLUDED IN THE ANCHOR PACKAGING.
5. THE CONTRACTOR SHALL ARRANGE AN ANCHOR MANUFACTURER'S REPRESENTATIVE TO PROVIDE ONSITE INSTALLATION TRAINING FOR ALL OF THEIR ANCHORING PRODUCTS SPECIFIED. THE STRUCTURAL ENGINEER OF RECORD MUST RECEIVE DOCUMENTED CONFIRMATION THAT ALL OF THE CONTRACTOR'S PERSONNEL WHO INSTALL ANCHORS ARE TRAINED PRIOR TO THE COMMENCEMENT OF INSTALLING ANCHORS.
6. OVERHEAD ADHESIVE ANCHORS MUST BE INSTALLED USING THE HILTI PROFIL SYSTEM.
7. ANCHOR CAPACITY IS DEPENDANT UPON SPACING BETWEEN ADJACENT ANCHORS AND PROXIMITY OF ANCHORS TO EDGE OF CONCRETE. INSTALL ANCHORS IN ACCORDANCE WITH SPACING AND EDGE CLEARANCES INDICATED ON THE DRAWINGS.
8. EXISTING REINFORCING BARS IN THE CONCRETE STRUCTURE MAY CONFLICT WITH SPECIFIC ANCHOR LOCATIONS. UNLESS NOTED ON THE DRAWINGS THAT THE BARS CAN BE CUT, THE CONTRACTOR SHALL REVIEW THE EXISTING STRUCTURAL DRAWINGS AND SHALL UNDERTAKE MEASURES TO LOCATE THE POSITION OF THE EXISTING REINFORCING BARS AT THE LOCATIONS OF THE CONCRETE ANCHORS, BY HILTI FERROSCAN, GPR, X–RAY, OR OTHER MEANS.



GBA
architects
engineers

9801 Renner Boulevard
Lenexa, Kansas 66219
913.492.0400
www.gbateam.com

DATE: 1/10/17
DESIGN BY: CEL
DRAWN BY: DRV
PROJECT NO.: 12720

SHEET NO. 19TOTAL SHEETS 33

Bradley D. Burton
Professional Engineer
License No. 25862

Mass Grading Plans
Paragon Star Development
Lee's Summit, Missouri

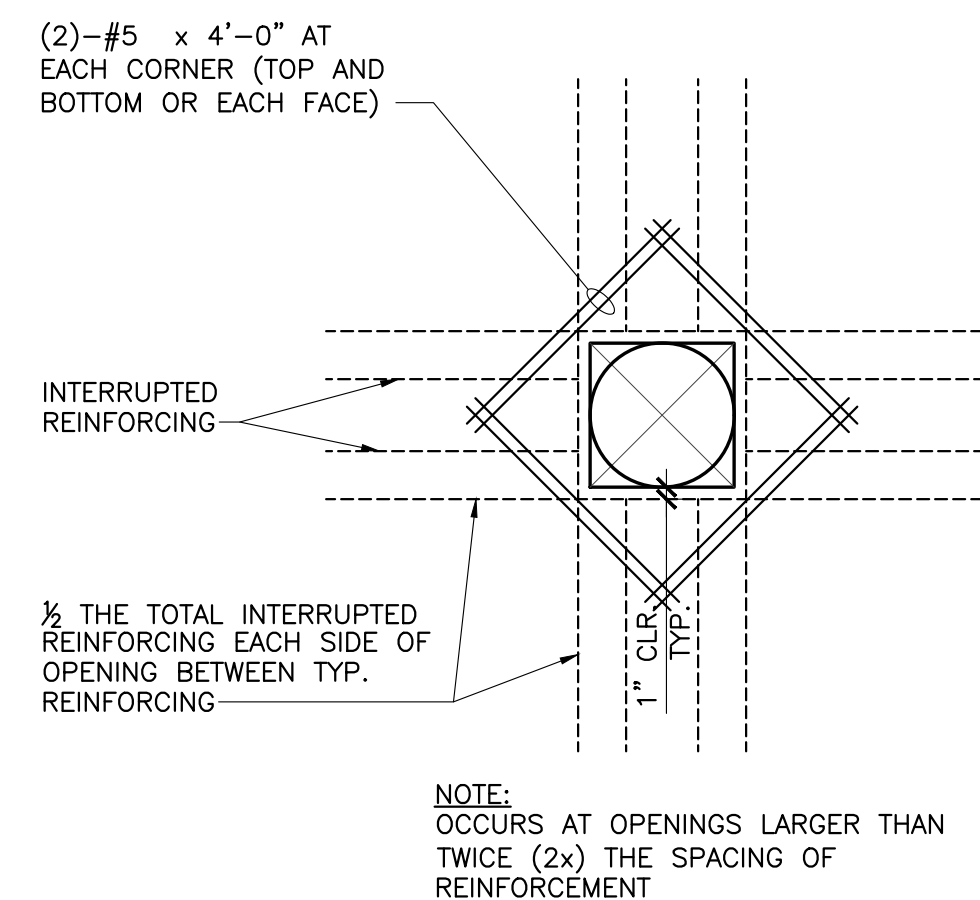
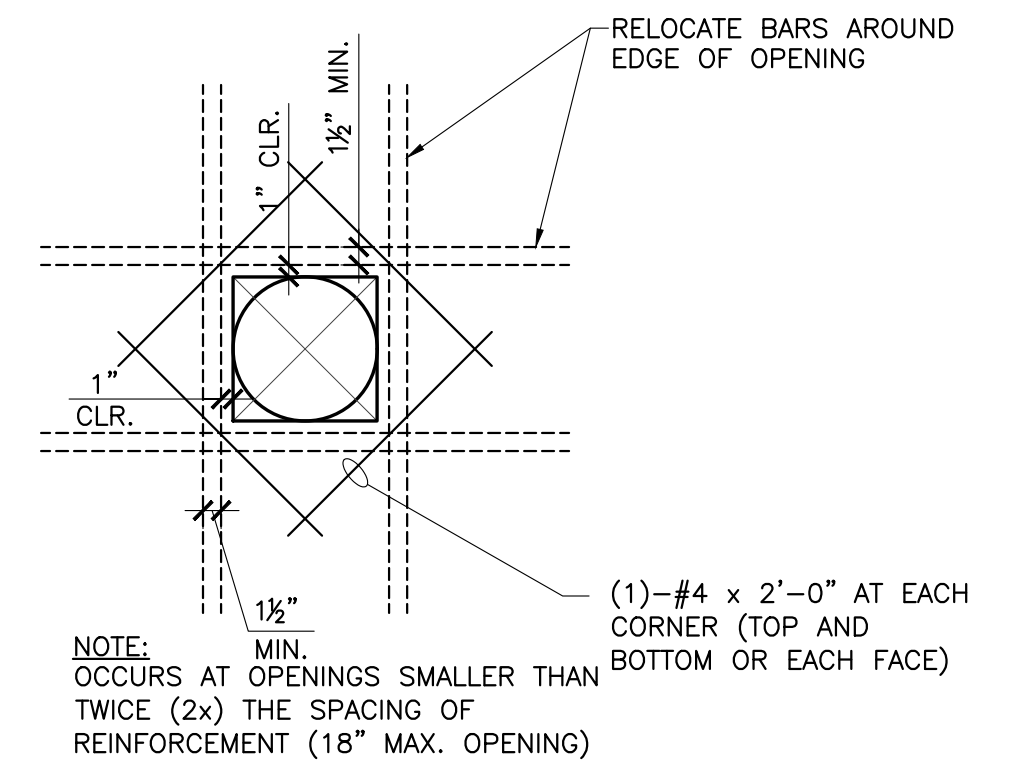
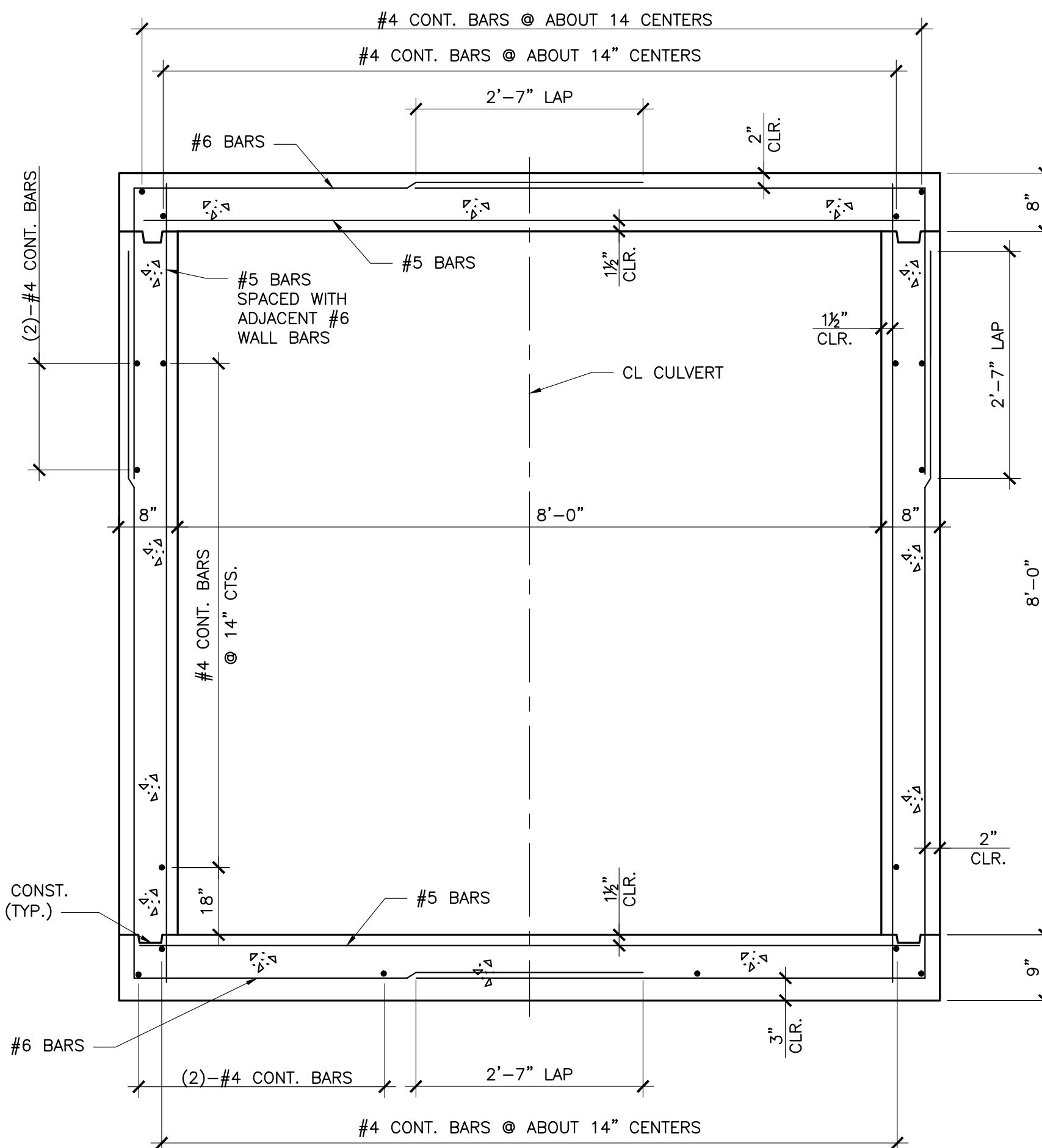
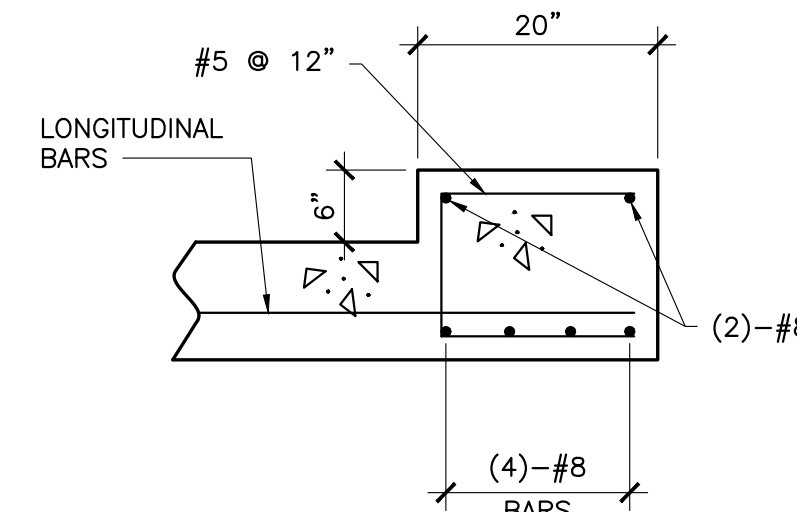
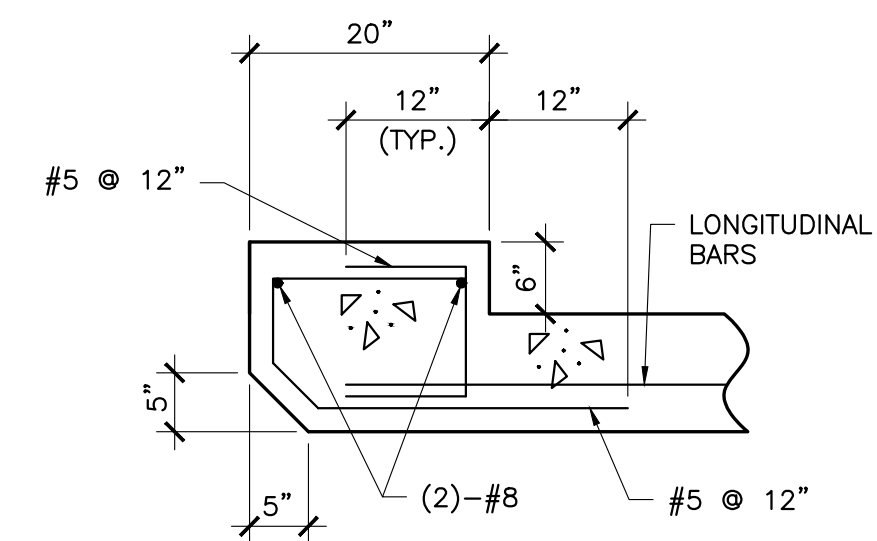
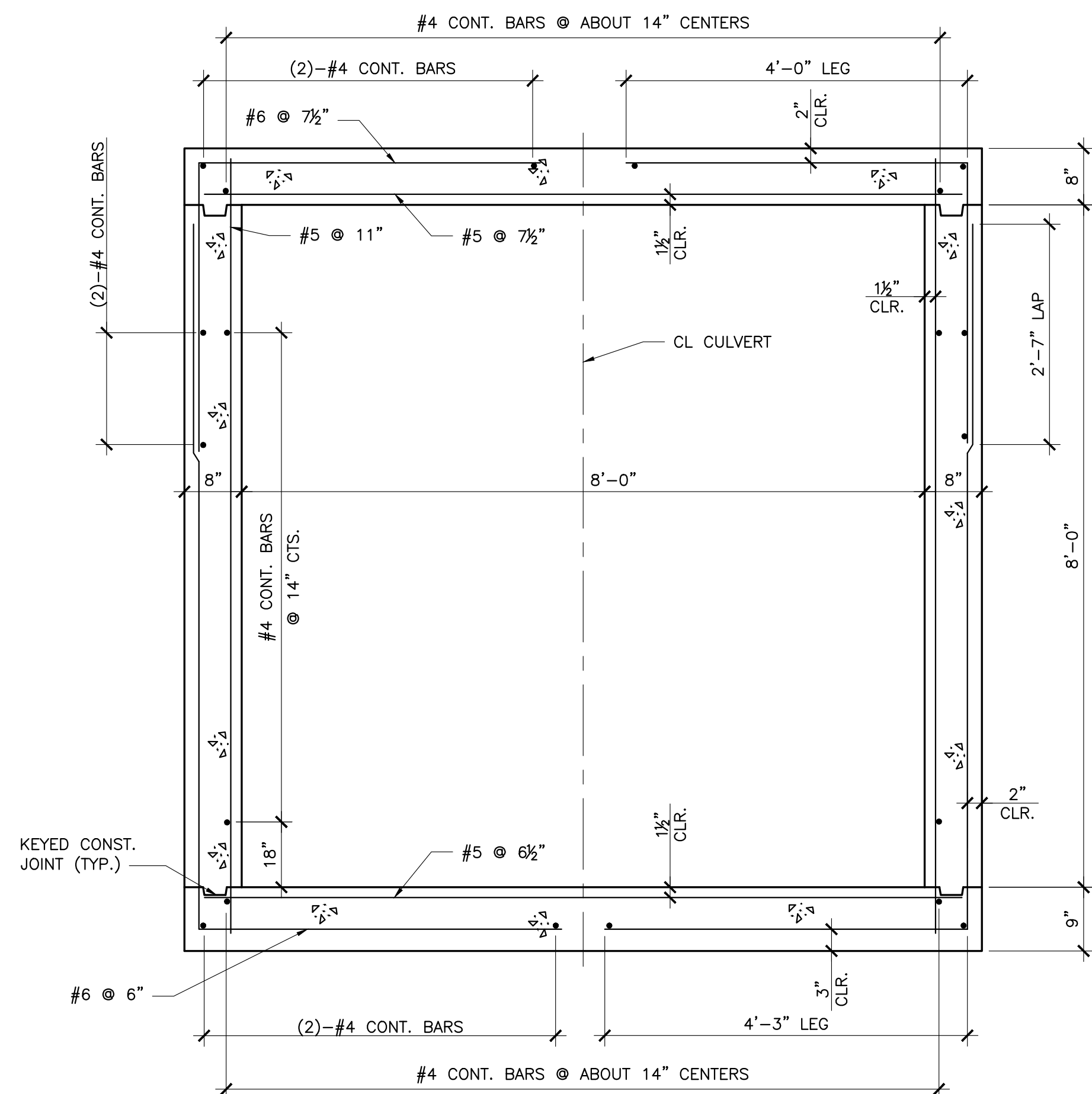
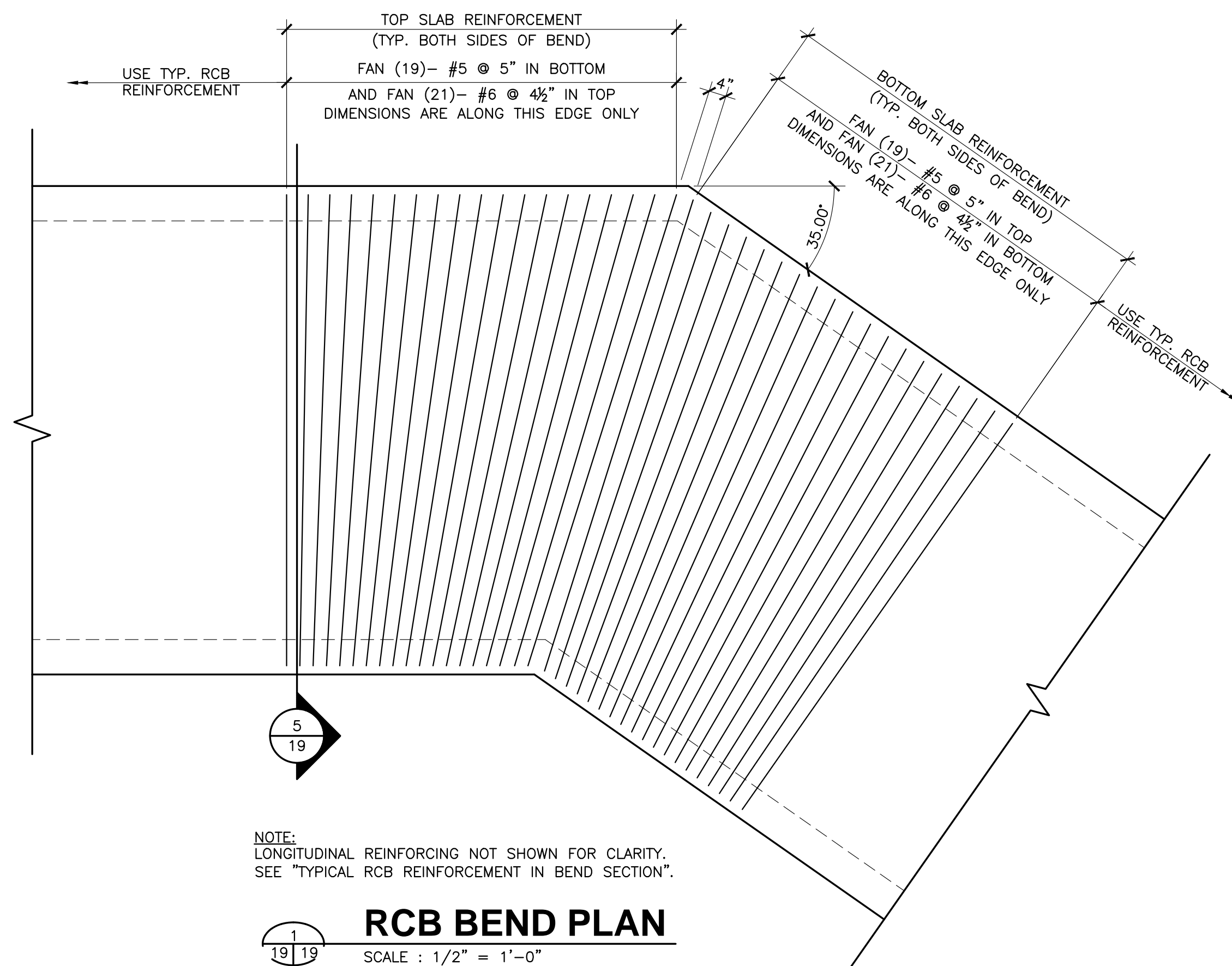
NO. DATE

5/15/18

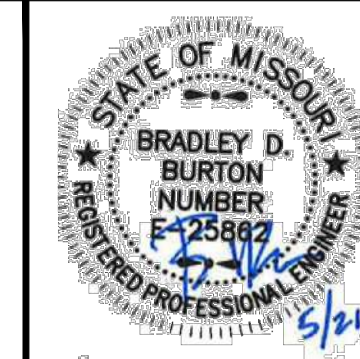
REVISIONS

Revised Field Elevations

BY APPROVED



- GENERAL NOTES:**



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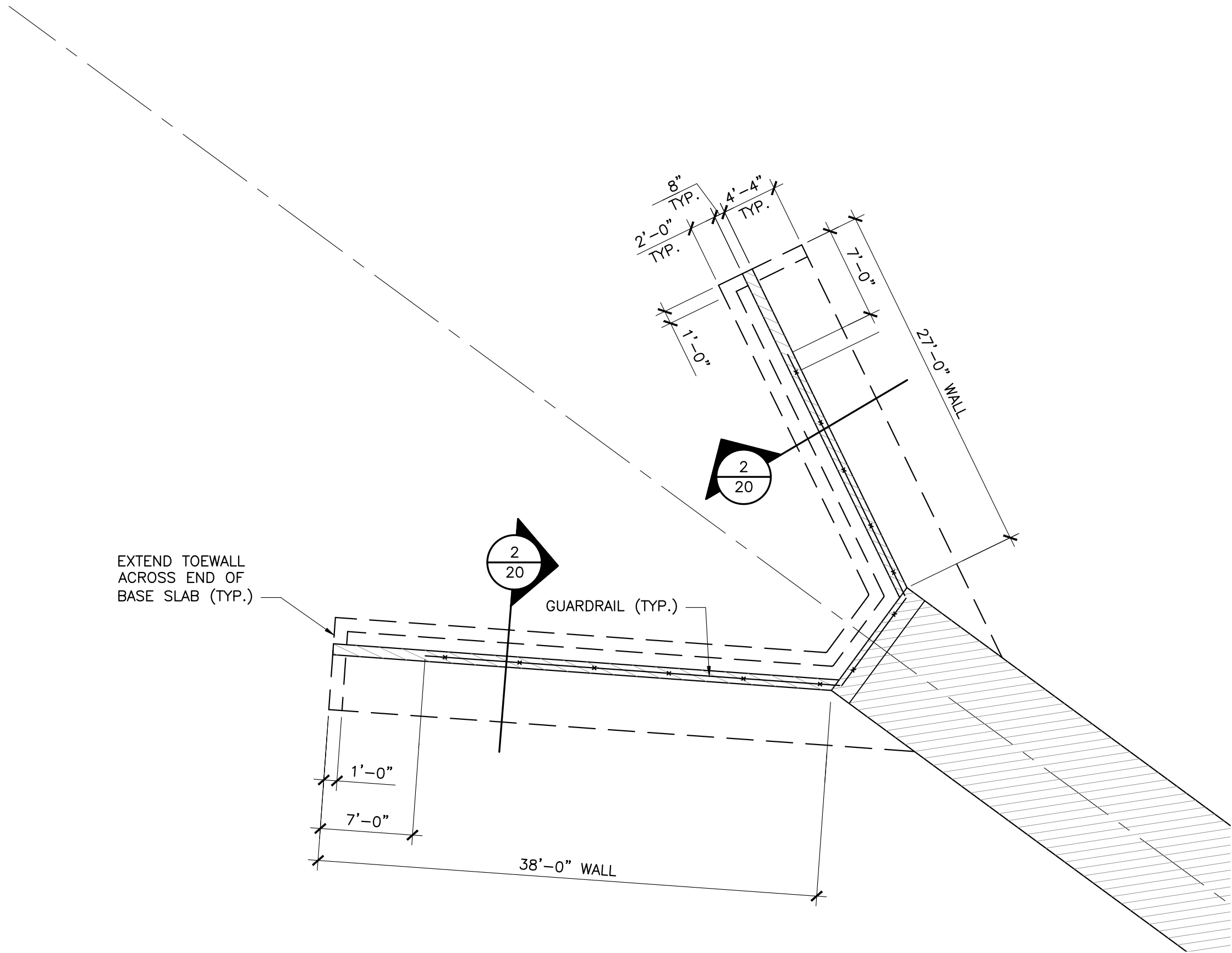
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DATE: 1/10/17	
DESIGN BY: CEL	
DRAWN BY: DRV	
PROJECT NO.: 12720	
SHEET NO.	TOTAL SHEETS
20	33

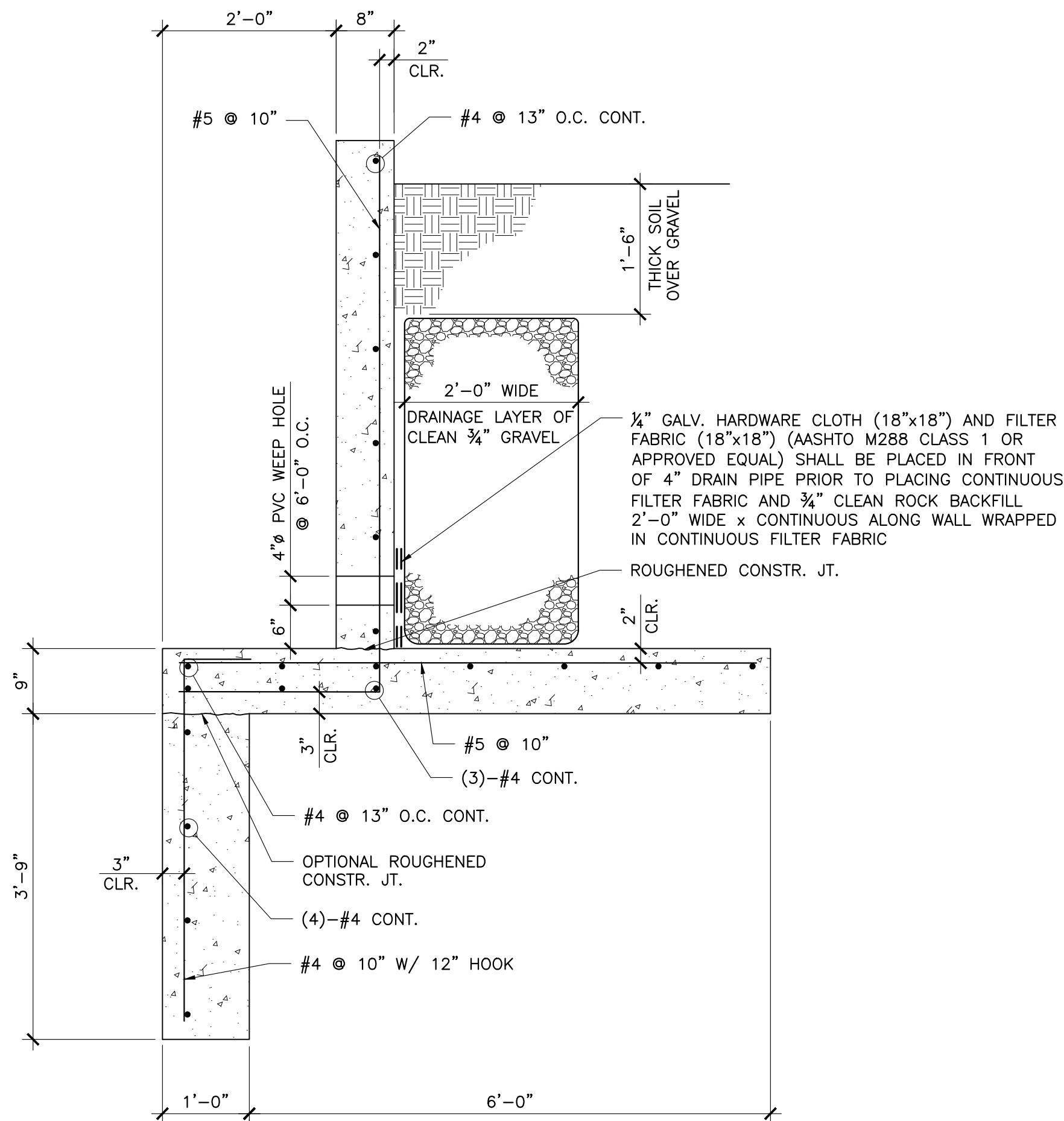
Bradley D. Burton
Professional Engineer
License No. 25862

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Paragon Star Development
Lee's Summit, Missouri

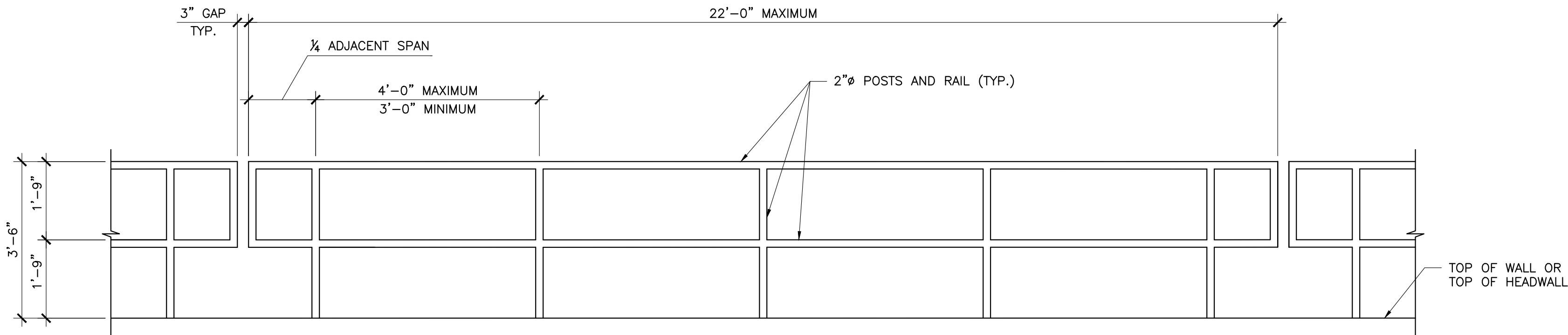
NO.	DATE	REVISIONS	BY	APPROVED
	5/15/18	Revised Field Elevations		



PLAN OF UPSTREAM WINGWALLS
SCALE : 1/8" = 1'-0"



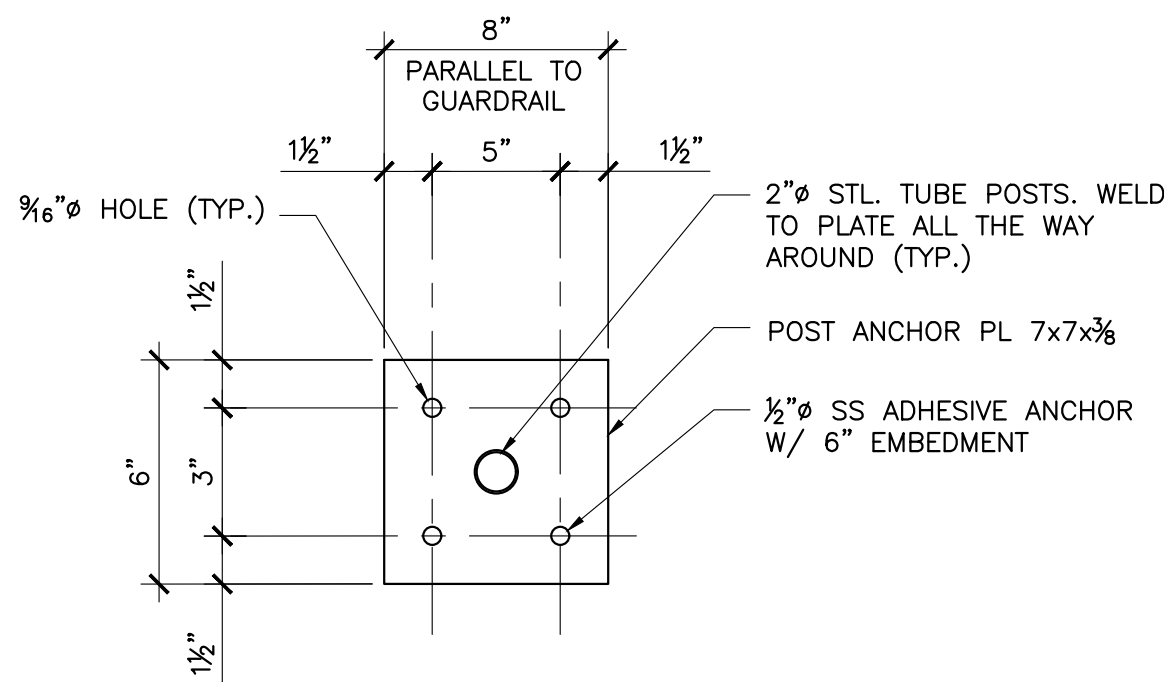
SECTION
SCALE : 3/4" = 1'-0"



GUARDRAIL DETAIL
SCALE: N.T.S.

NOTES:

1. WINGWALLS AND HEADWALL TO BE COMPLETED BEFORE FABRICATION OF GUARDRAIL. GUARDRAIL IS TO BE INSTALLED WITH MEMBERS VERTICAL. HANDRAIL SHALL BE CONSTRUCTED IN PANELS THAT HAVE MAX. LENGTH OF 22'-0".
2. GUARDRAIL AND ANCHOR PLATES TO BE POWDER COATED BLACK.
3. ALL PIPES SHALL BE A53 GRADE B (EXTRA STRONG) AND PLATES SHALL BE A36.

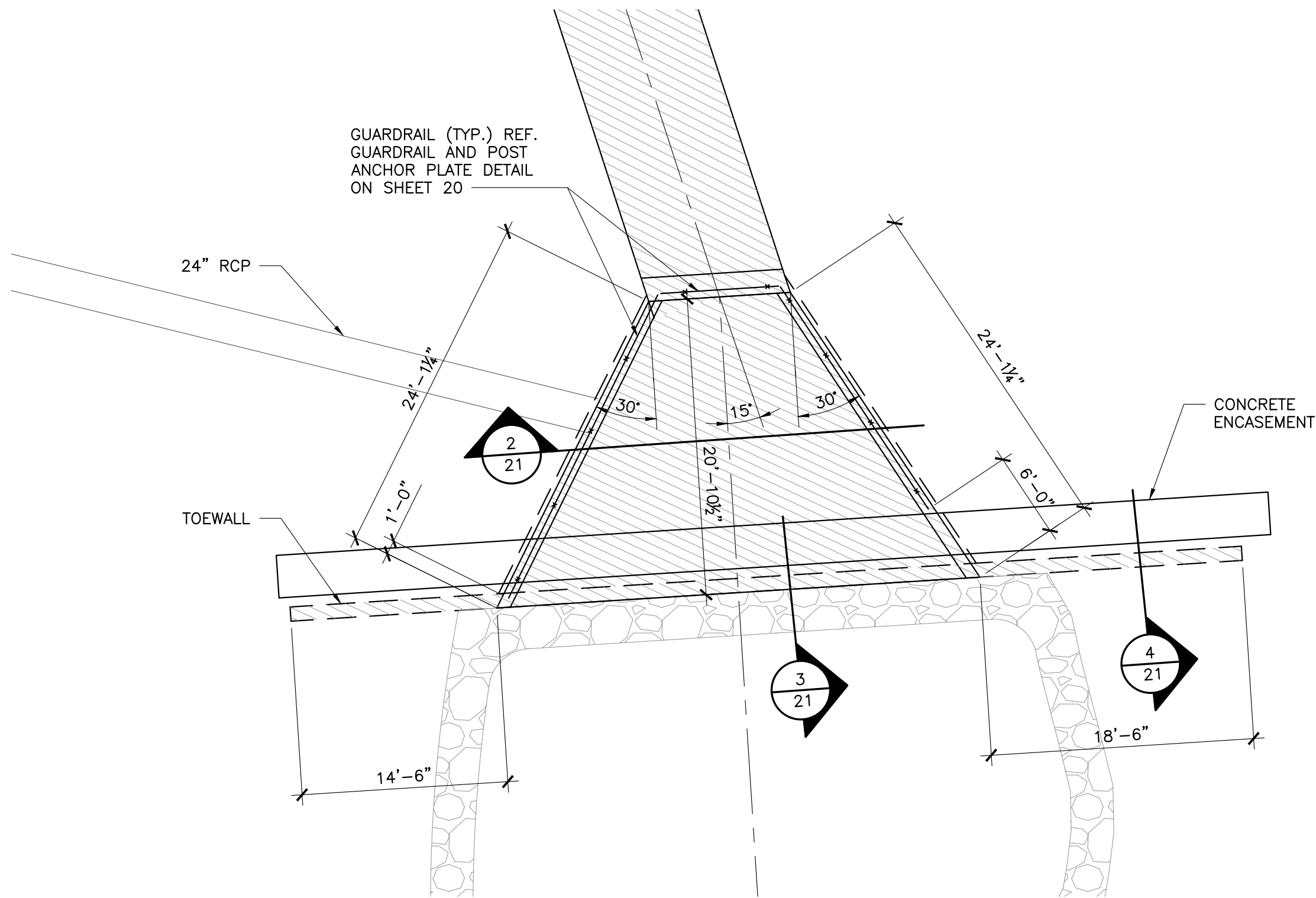


POST ANCHOR PLATE
SCALE: N.T.S.

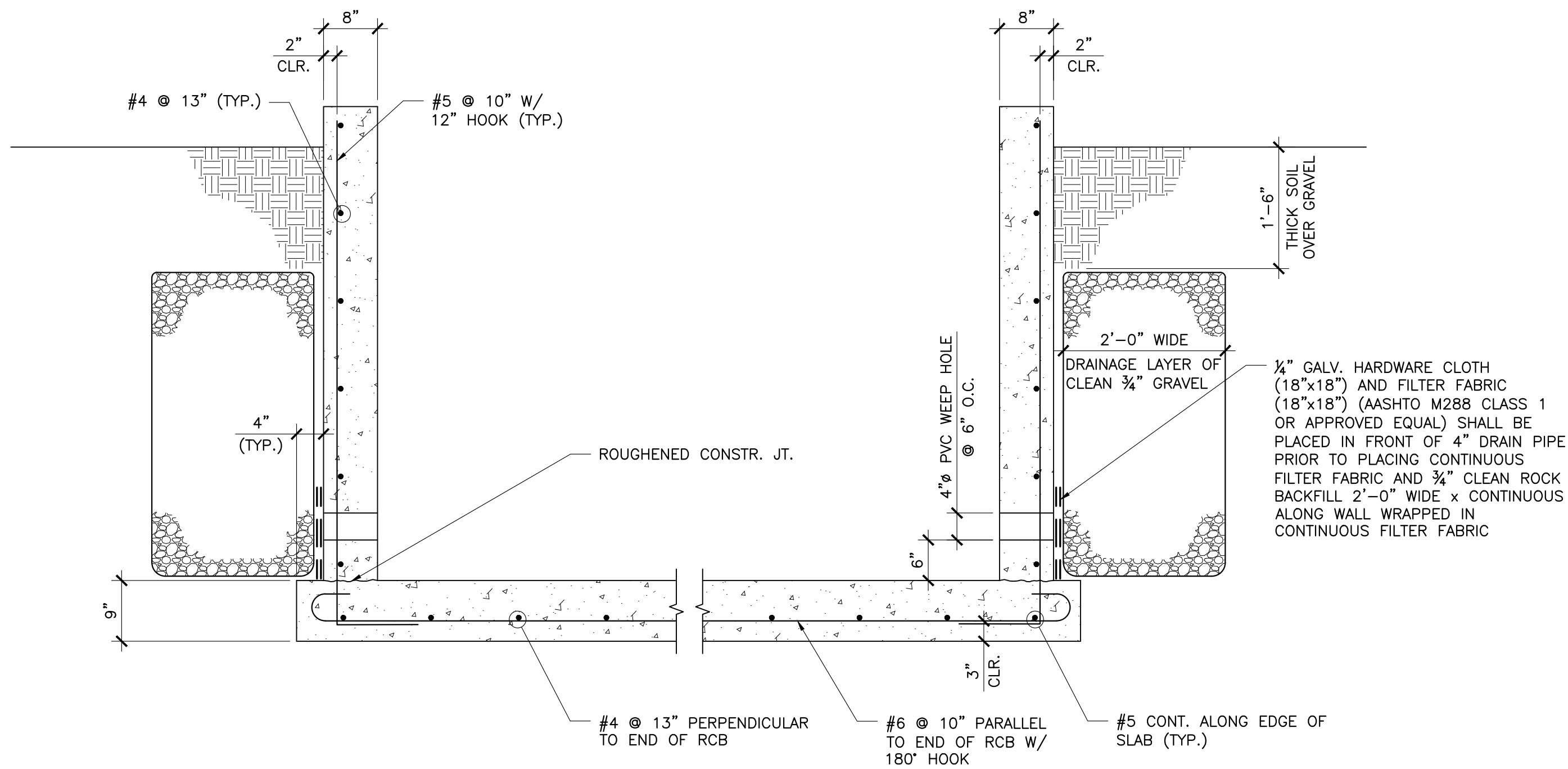
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	DESIGN BY: CEL
	DRAWN BY: DRV
	PROJECT NO.: 12720
	SHEET NO. 21
	TOTAL SHEETS 33
Bradley D. Burton Professional Engineer License No. 25862	Mass Grading Plans Paragon Star Development Lee's Summit, Missouri
NO. DATE	REVISIONS BY APPROVED
5/15/18	Revised Field Elevations

LAP LENGTH TABLE	
Bar Size	Length
HORIZ. #4	24"
VERT. #4	17"

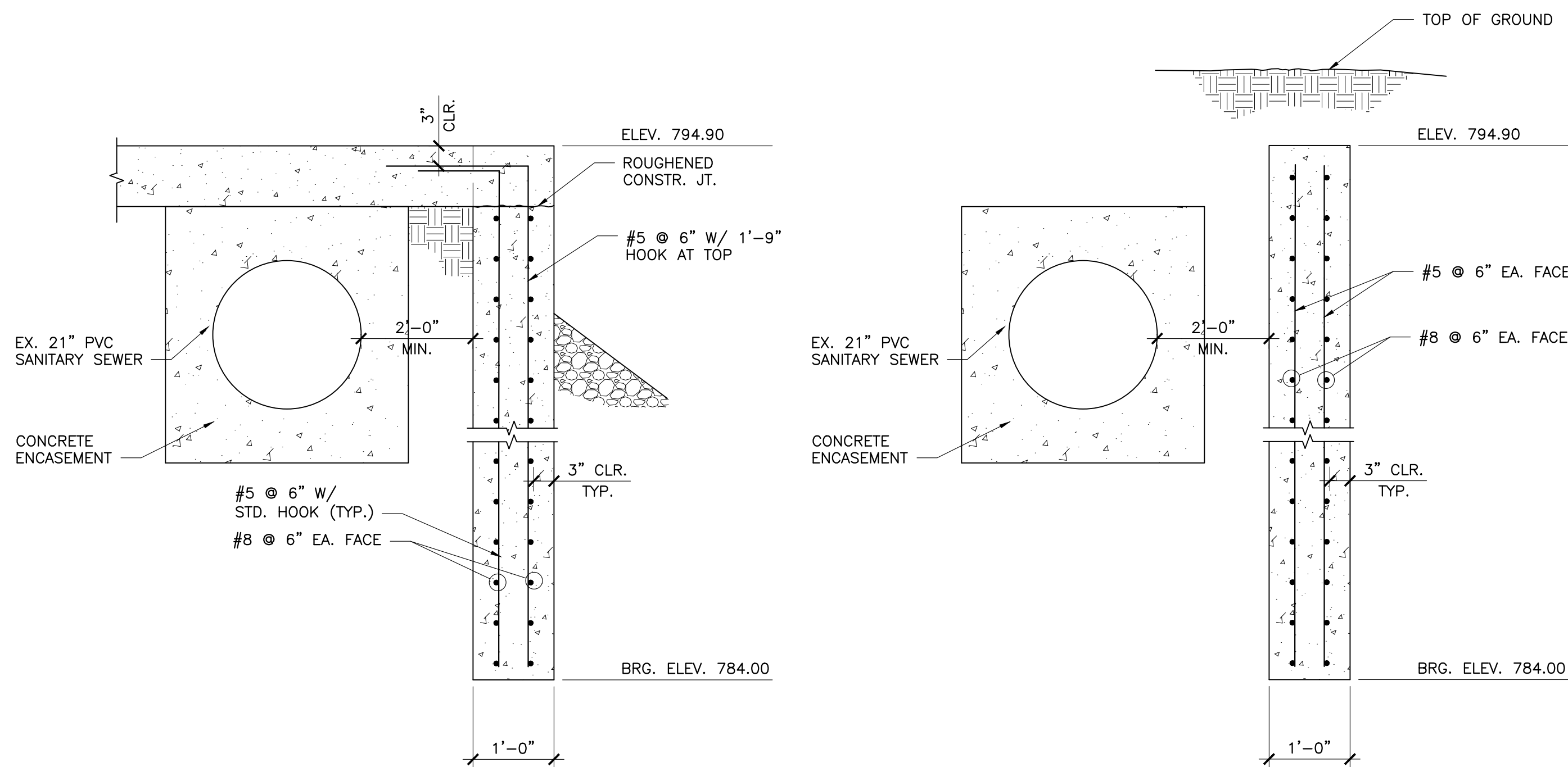
C:\12720\Civil 3D\Production Drawings\Mass Grading\Lee's Summit\12720_S113.dwg, Layout: 22 RCB Details --- Wednesday June 13, 2018, 10:50am --- Copyright 2018, George Butler Associates, Inc. Architect 00212, Professional Engineer 000133, Landscape Architect 000025, Professional Land Surveyor 000059



PLAN OF DOWNSTREAM WINGWALLS
SCALE : 1/8" = 1'-0"



SECTION
SCALE : 3/4" = 1'-0"



SECTION
SCALE : 3/4" = 1'-0"

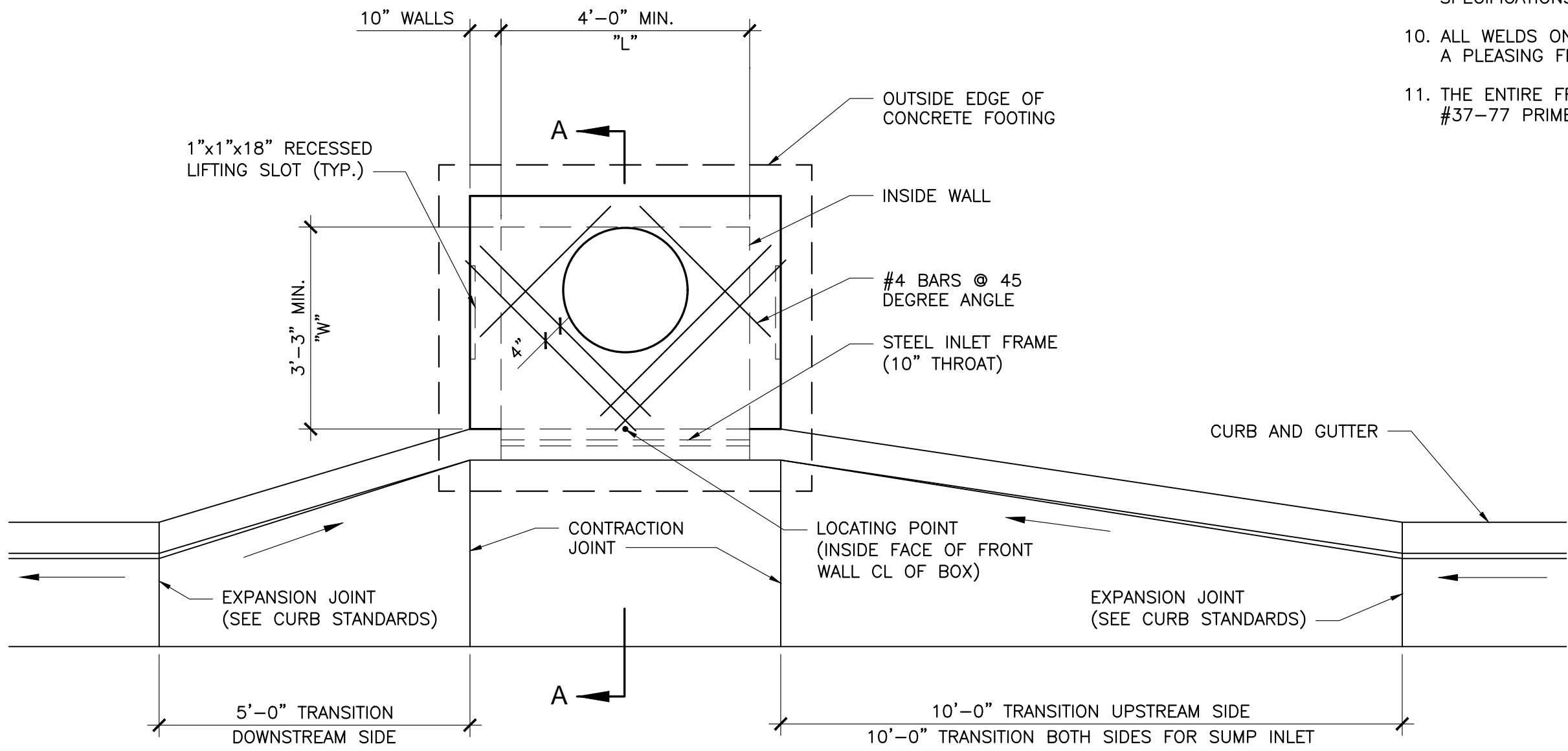
SECTION
SCALE : 3/4" = 1'-0"

RCB Details

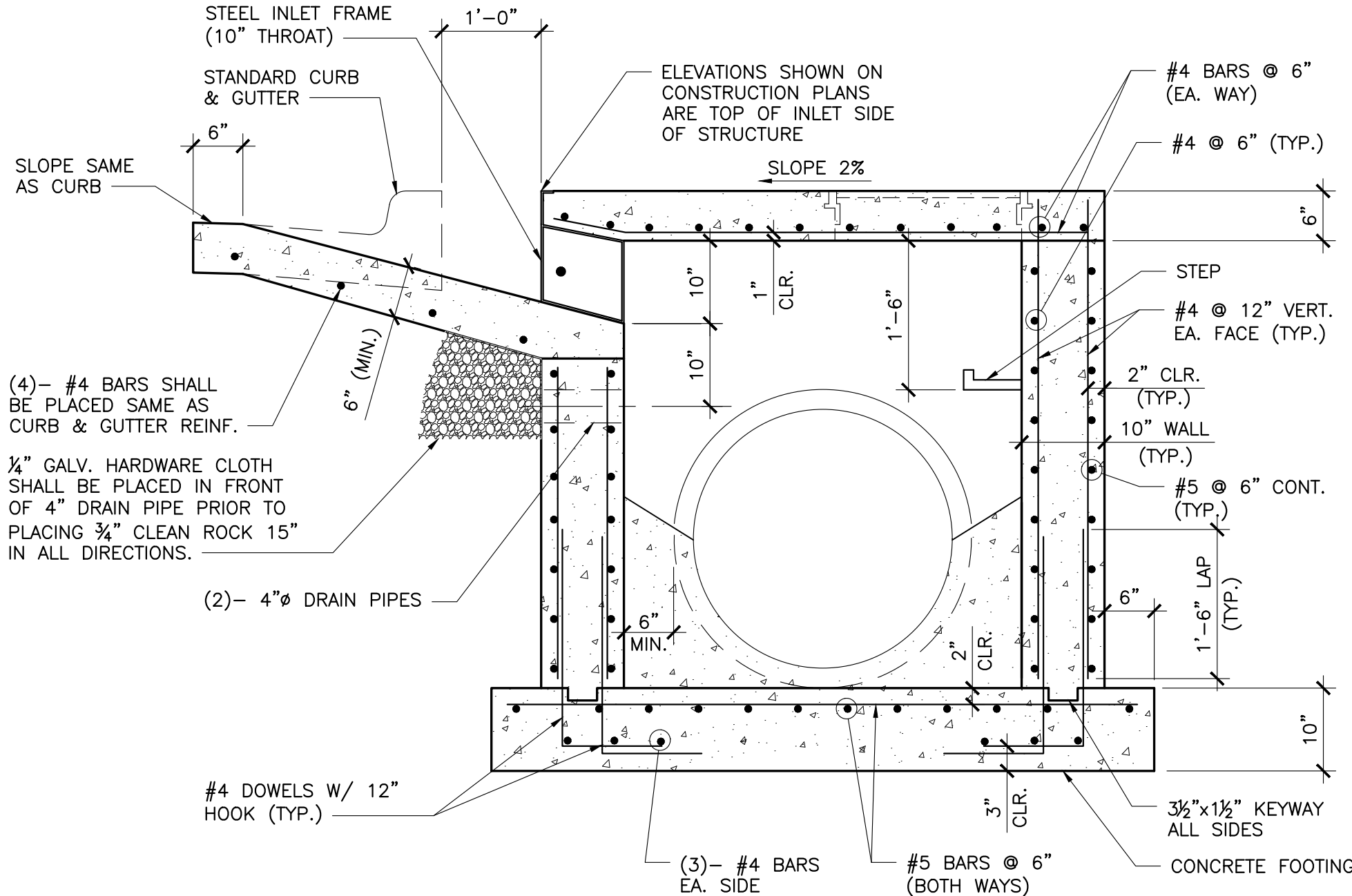
	GBA architects engineers 9801 Renner Boulevard Lenexa, Kansas 66219 913.492.0400 www.gbateam.com	DATE: 1/10/17		
		DESIGN BY: CEL		
		DRAWN BY: DRV		
		PROJECT NO.: 12720		
SHEET NO.	TOTAL SHEETS			
22	33			
Bradley D. Burton Professional Engineer License No. 25862				
Mass Grading Plans Paragon Star Development Lee's Summit, Missouri				
NO.	DATE	REVISIONS	BY	APPROVED
	5/15/18	Revised Field Elevations		

GENERAL NOTES:

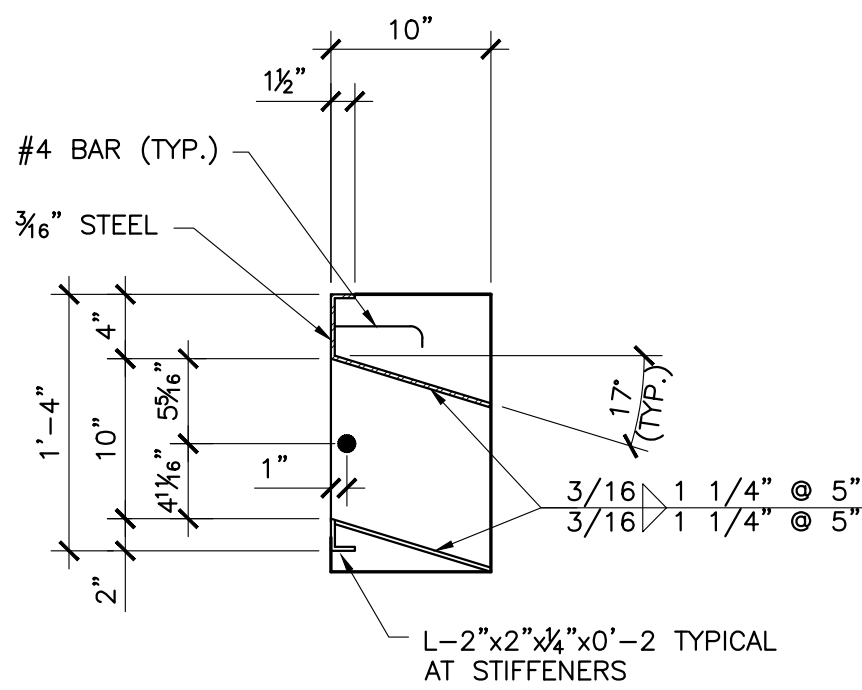
1. THE FIRST DIMENSION LISTED IN THE CONSTRUCTION NOTES IS THE "L" DIMENSION. THE SECOND DIMENSION IS THE "W" DIMENSION. FL'S LISTED ON THE PROJECT PLANS ARE LISTED AT THE INSIDE FACE OF THE WALL.
2. FLOOR OF INLET SHALL BE SHAPED WITH INVERT TO PROVIDE SMOOTH FLOW.
3. LOCATE MH RING AND COVER OVER OUTLET.
4. STEPS SHALL BE SPACED AT 1'-4" O.C. VERTICALLY.
5. BEVEL ALL EXPOSED EDGES WITH 3/4" CHAMFER OR 1/2" TOOLED EDGE.
6. ON-GRADE INLETS SHALL CONFORM TO THE STREET GRADE AND SUMP INLETS SHALL BE LEVEL.
7. RING & COVER TO BE NEENAH R-1537. CLAY & BAILEY #2020, DEETER #2016, OR APPROVED EQUAL. (CASTING MAY VARY BY MUNICIPALITY, REFER TO PLANS & CONTRACT DOCUMENTS.)
8. MODOT SPECS SHALL APPLY TO ALL ITEMS NOT SPECIFICALLY ADDRESSED IN THESE PLANS.
9. ALL WELDS SHALL BE PERFORMED IN ACCORDANCE WITH APPROPRIATE AWS SPECIFICATIONS & PROCEDURES.
10. ALL WELDS ON EXPOSED SURFACES SHALL BE DRESSED SO AS TO PROVIDE A PLEASING FINISHED APPEARANCE.
11. THE ENTIRE FRAME SHALL BE PAINTED A SINGLE COAT OF CHEM-PRIME #37-77 PRIMER (RED) OR EQUAL.



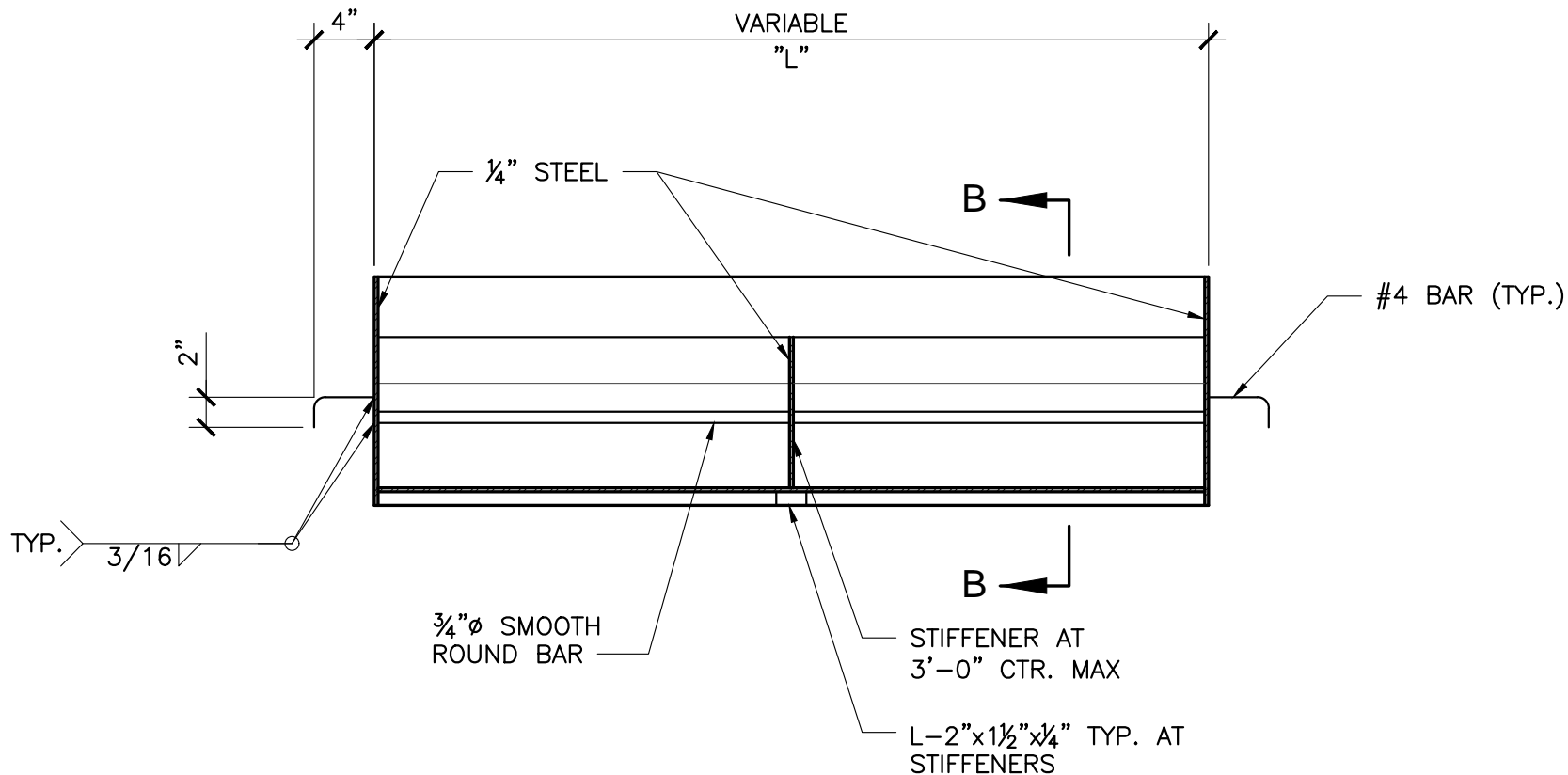
CURB INLET OR JUNCTION BOX PLAN



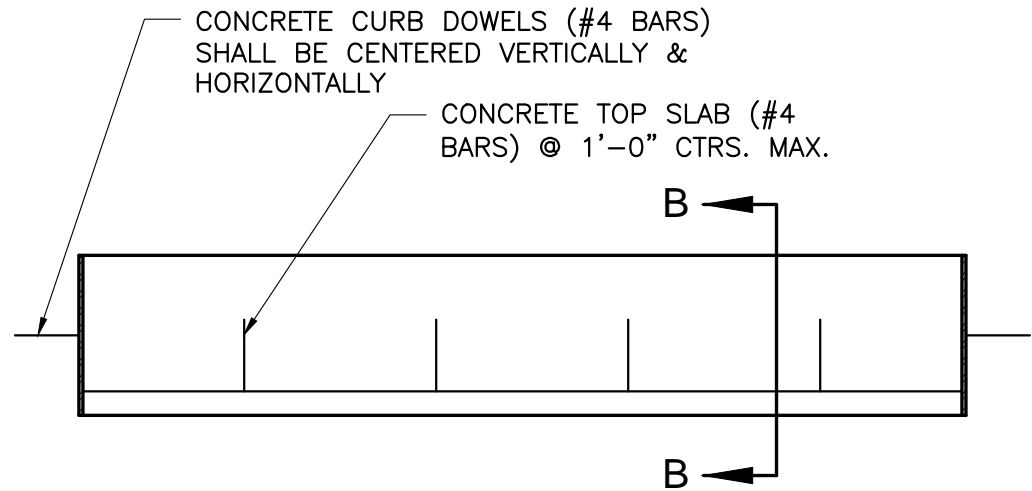
SECTION A-A



SECTION B-B



CURB INLET THROAT FRONT VIEW



TOP VIEW

Architect: 00212, Professional Engineer: 000133, Landscape Architect: 000025, Professional Land Surveyor: 000059
G:\12720\Civil 3D Production Drawings\Mass Grading\Lee's Summit\12720-4050.dwg Wednesday June 13, 2018, 10:51am -- Pre-Construction -- Layout: 24 Pre-Construction -- Copyright 2018, George Butler Associates, Inc.


PROJECT BENCHMARK:

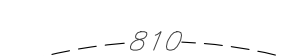
BM #11 - Chiseled "L" on top
Northeast corner of concrete guardrail
at the Northeast corner of I470 bridge
spanning View High Drive.
EL=833.80


CAUTION!

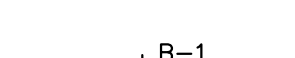
Numerous Utilities on Site.
Contractor to verify location
and elevation of all utilities
prior to commencing
construction.


Legend


- 


Proposed Contour
- 


Existing Contour
- 

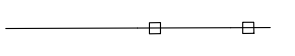
Drainage Swale
- 


Geotechnical Boring Location
- 


Erosion Control Blanket
- 


BMP Plan Reference Number
- 


Straw Wattles
- 


Grading Limits
- 

Exist. Construction Fence for Tree Protection
(to be maintained)
- 

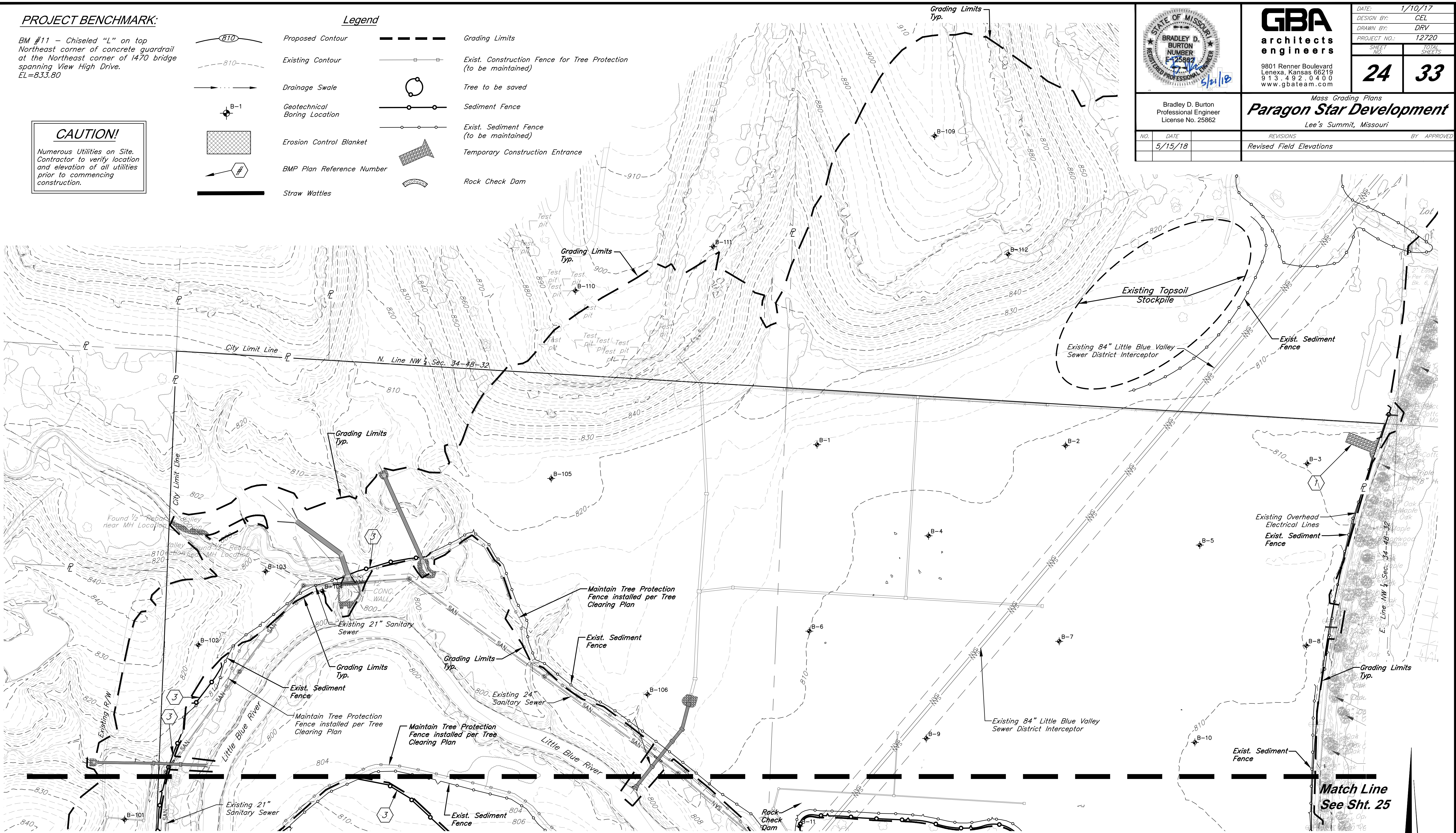
Tree to be saved
- 

Sediment Fence
- 

Exist. Sediment Fence
(to be maintained)
- 

Temporary Construction Entrance
- 

Rock Check Dam



EROSION & SEDIMENT CONTROL STAGING CHART (See Sheets 24 thru 29)

Project Stage	BMP Plan Ref. No.	BMP Description	May Remove after Stage	Notes
A. Prior to Mass Grading	1	Const. Entrance & Staging Area	C	
	2	Install Orange Construction Fence	C	
	3	Perimeter Silt Fence	C	
B. Mass Grading	4	Silt Fence	C	
	5	Ditch Check	C	
	6	Straw Wattles	C	Wattles to be kept on hand for perimeter control where needed.
C. Permanent Stabilization*	7	Seed & Mulch or Blanket or Sod		Erosion control blanket to be installed w/ seed. Check approved seeding dates and install temporary stabilization if out of seeding season. Install blanket according to manufacturer's instructions and stapling pattern.

* Permanent Stabilization will be considered stabilized when 100% of disturbed area is established with perennial vegetation with a density of 70%.

Pre-Construction Erosion Control-Phase 1



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DESIGN BY: CEL
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PROJECT NO.: 12720
SHEET NO. 24
TOTAL SHEETS 33

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Professional Engineer
License No. 25862

Mass Grading Plans
Paragon Star Development
Lee's Summit, Missouri

NO.	DATE	REVISIONS	BY	APPROVED
1	5/15/18	Revised Field Elevations		

100' 0' 100' 200'
SCALE : 1 INCH = 100 FEET

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

CAUTION!

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

Legend

- Proposed Contour
Existing Contour
Drainage Swale
Geotechnical Boring Location
Erosion Control Blanket
BMP Plan Reference Number
Straw Wattles
Grading Limits
Exist. Construction Fence for Tree Protection (to be maintained)
Tree to be saved
Sediment Fence
Exist. Sediment Fence (to be maintained)
Temporary Construction Entrance
Rock Check Dam



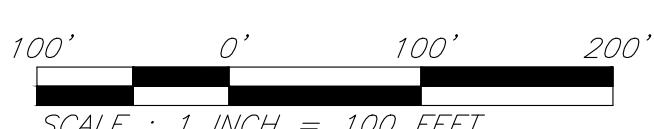
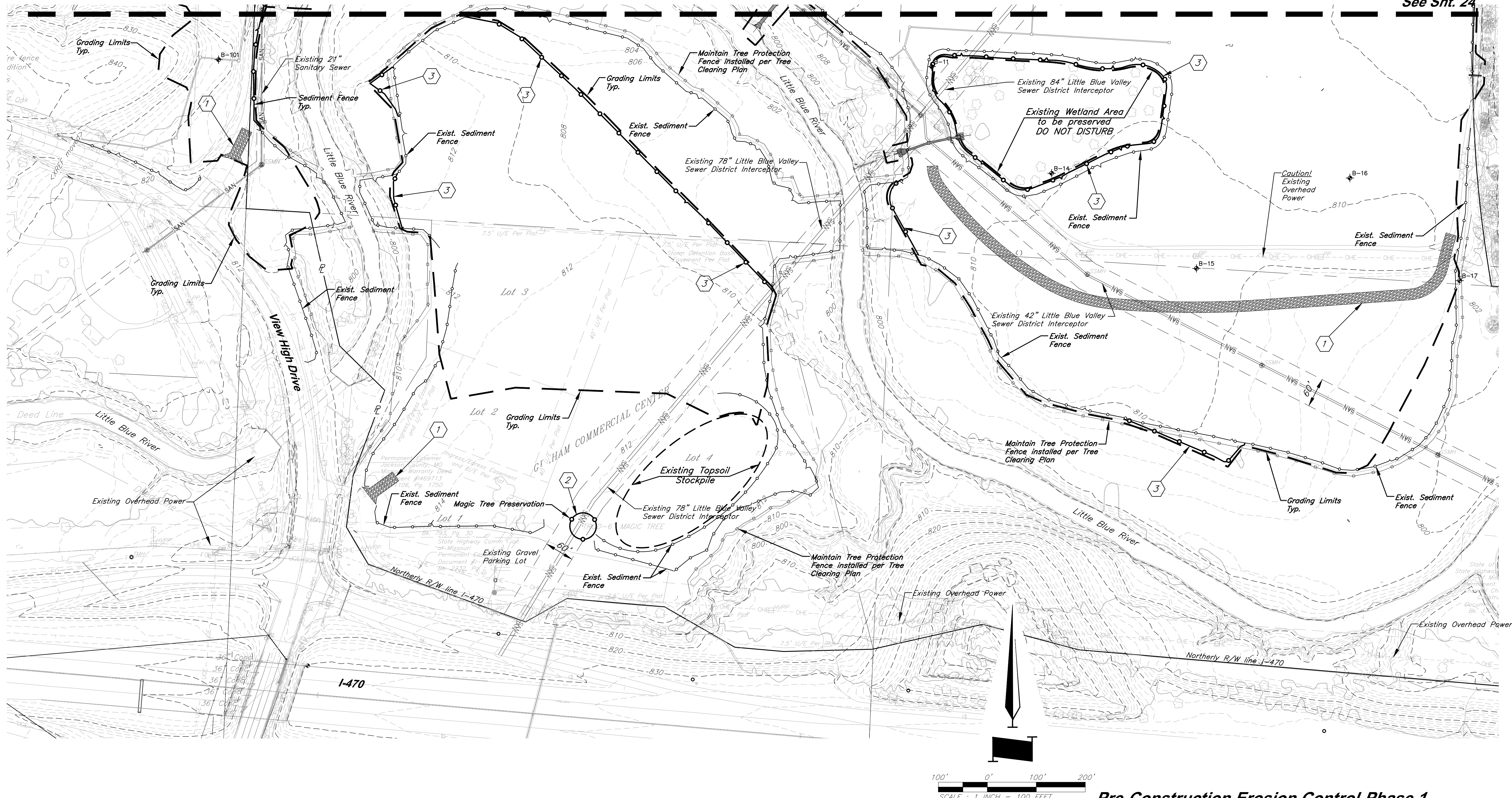
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DATE:	1/10/17
DESIGN BY:	CEL
DRAWN BY:	DRV
PROJECT NO.:	12720
SHEET NO.	TOTAL SHEETS
25	33

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License No. 25862

Mass Grading Plans
Paragon Star Development
Lee's Summit, Missouri
REVISIONS
Revised Field Elevations

Match Line
See Sht. 24



Pre-Construction Erosion Control-Phase 1

Architect: 00212, Professional Engineer: 000133, Landscape Architect: 000025, Professional Land Surveyor: 000059
G:\12720\Civil 3D Production Drawings\Mass Grading\Lee's Summit\12720-4050.dwg Wednesday June 13, 2018, 10:52am Copyright 2018, George Buller Associates, Inc.

PROJECT BENCHMARK:

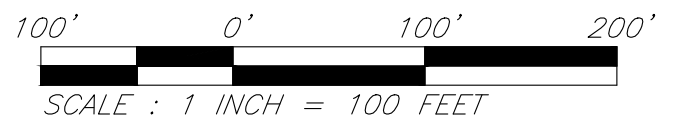
BM #11 - Chiseled "L" on top
Northeast corner of concrete guardrail
at the Northeast corner of I470 bridge
spanning View High Drive.
EL=833.80

Legend

- | | | | |
|--|------------------------------|--|---|
| | Proposed Contour | | Grading Limits |
| | Existing Contour | | Exist. Construction Fence for Tree Protection
(to be maintained) |
| | Drainage Swale | | Tree to be saved |
| | Geotechnical Boring Location | | Sediment Fence |
| | Erosion Control Blanket | | Exist. Sediment Fence
(to be maintained) |
| | BMP Plan Reference Number | | Temporary Construction Entrance |
| | Straw Wattles | | Rock Check Dam |

CAUTION!

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



Erosion Control-Phase 2



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DRAWN BY:	DRV
PROJECT NO.:	12720
SHEET NO.	TOTAL SHEETS
26	33

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Mass Grading Plans
Paragon Star Development
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NO.	DATE
5/15/18	

REVISIONS	BY	APPROVED
Revised Field Elevations		

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

CAUTION!

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

Legend

- Proposed Contour
Existing Contour
Drainage Swale
Geotechnical Boring Location
Erosion Control Blanket
BMP Plan Reference Number
Straw Wattles
Grading Limits
Exist. Construction Fence for Tree Protection (to be maintained)
Tree to be saved
Sediment Fence
Exist. Sediment Fence (to be maintained)
Temporary Construction Entrance
Rock Check Dam



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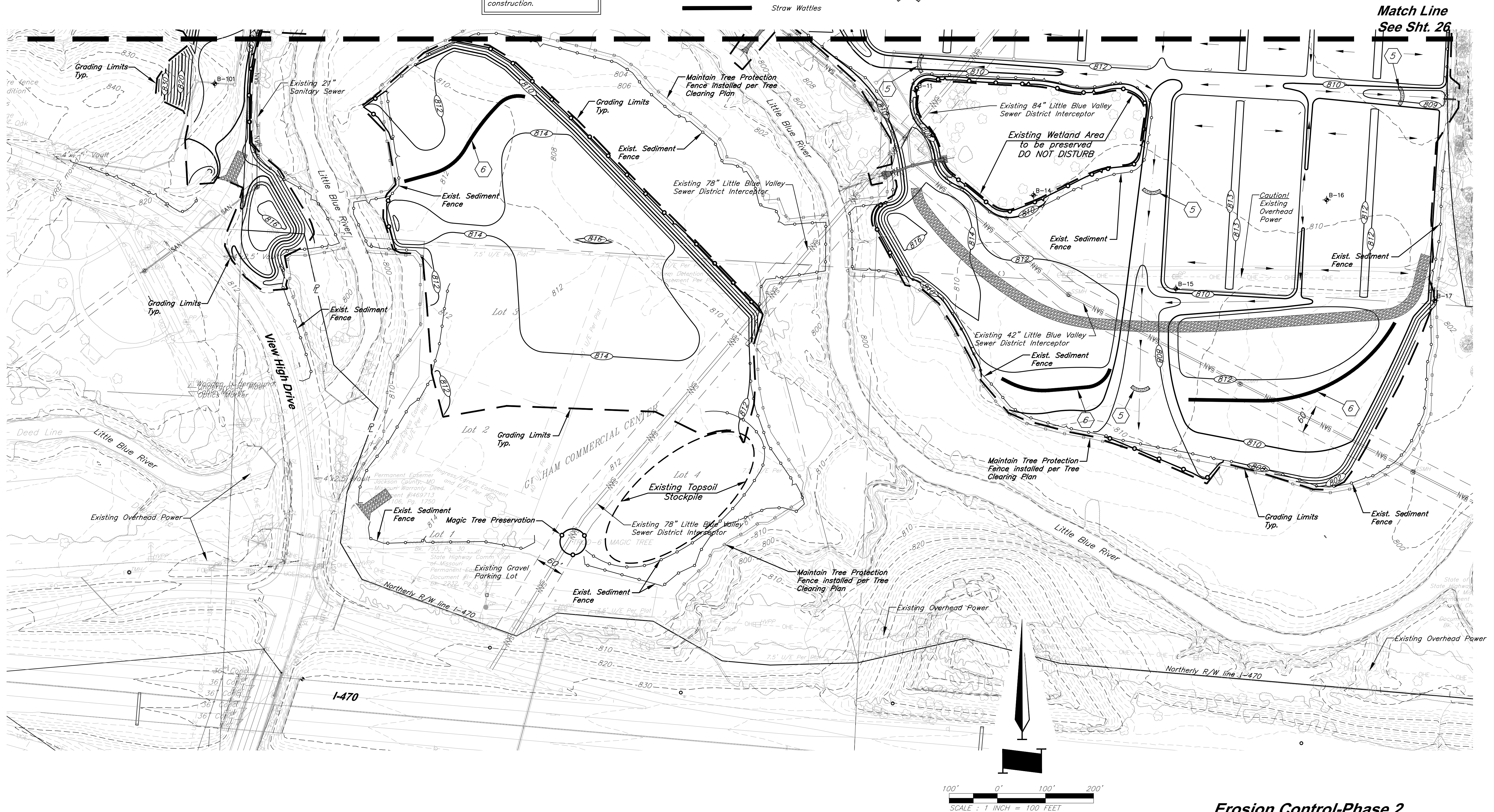
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DATE:	1/10/17
DESIGN BY:	CEL
DRAWN BY:	DRV
PROJECT NO.:	12720
SHEET NO.	TOTAL SHEETS
27	33

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Professional Engineer
License No. 25862

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Lee's Summit, Missouri

NO.	DATE	REVISIONS	BY	APPROVED
1	5/15/18	Revised Field Elevations		



Erosion Control-Phase 2

PROJECT BENCHMARK:

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Northeast corner of concrete guardrail
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spanning View High Drive.
EL=833.80

CAUTION!

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

Legend

- | | | | |
|--|------------------------------|--|---|
| | Proposed Contour | | Grading Limits |
| | Existing Contour | | Exist. Construction Fence for Tree Protection
(to be maintained) |
| | Drainage Swale | | Tree to be saved |
| | Geotechnical Boring Location | | Sediment Fence |
| | Erosion Control Blanket | | Exist. Sediment Fence
(to be maintained) |
| | BMP Plan Reference Number | | Temporary Construction Entrance |
| | Straw Wattles | | Rock Check Dam |



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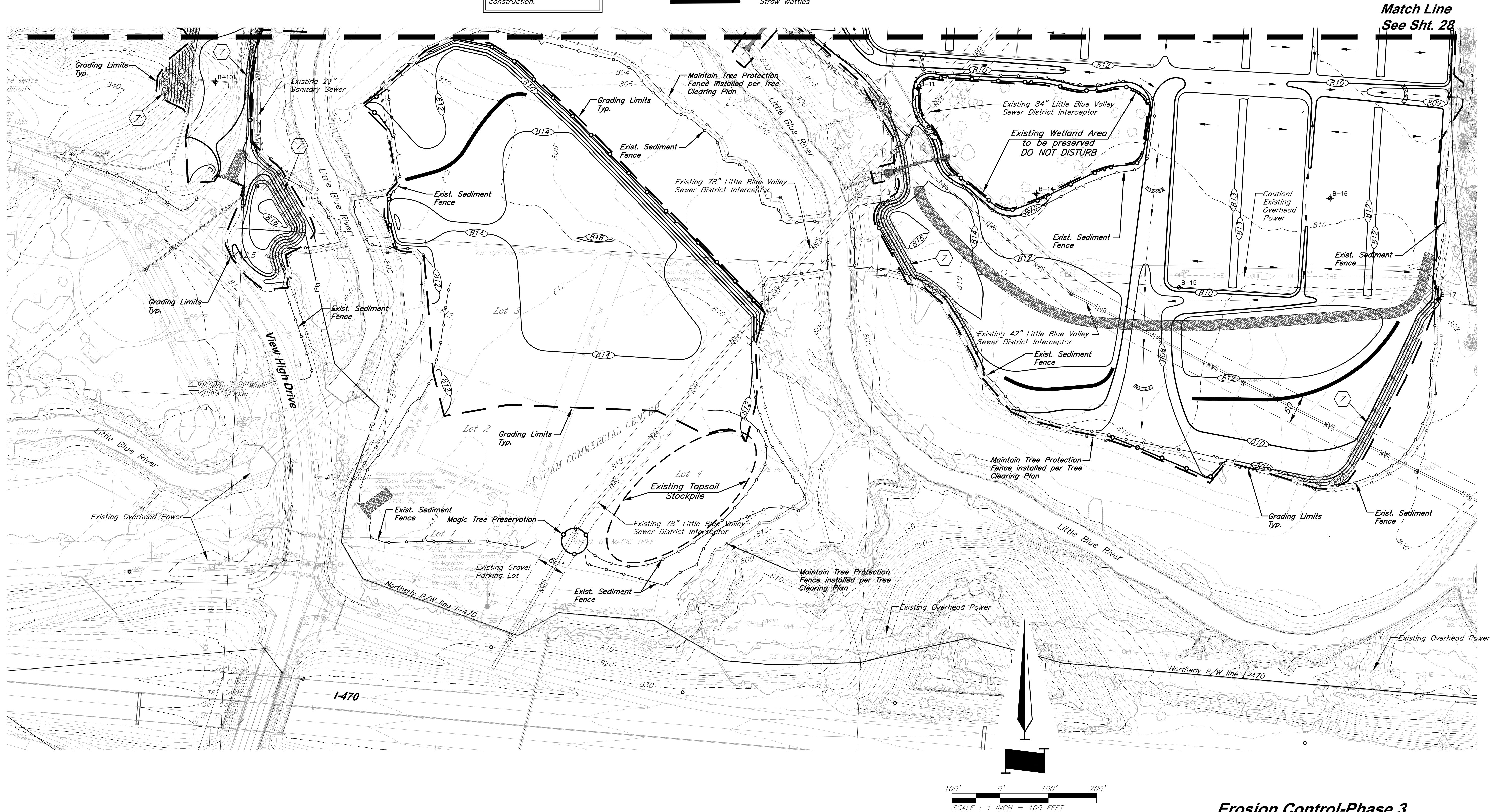
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DRAWN BY:	DRV
PROJECT NO.:	12720
SHEET NO.	TOTAL SHEETS
29	33

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License No. 25862

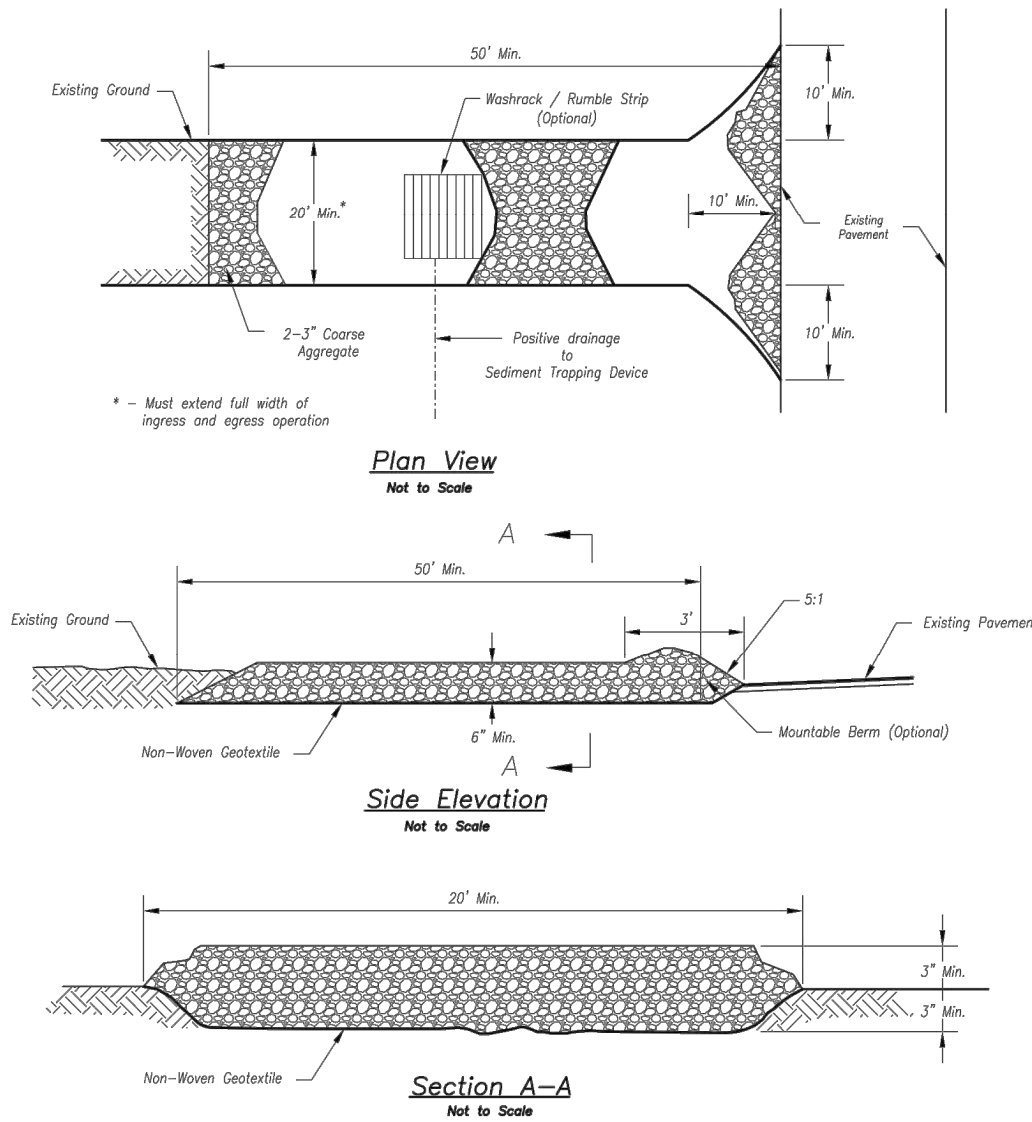
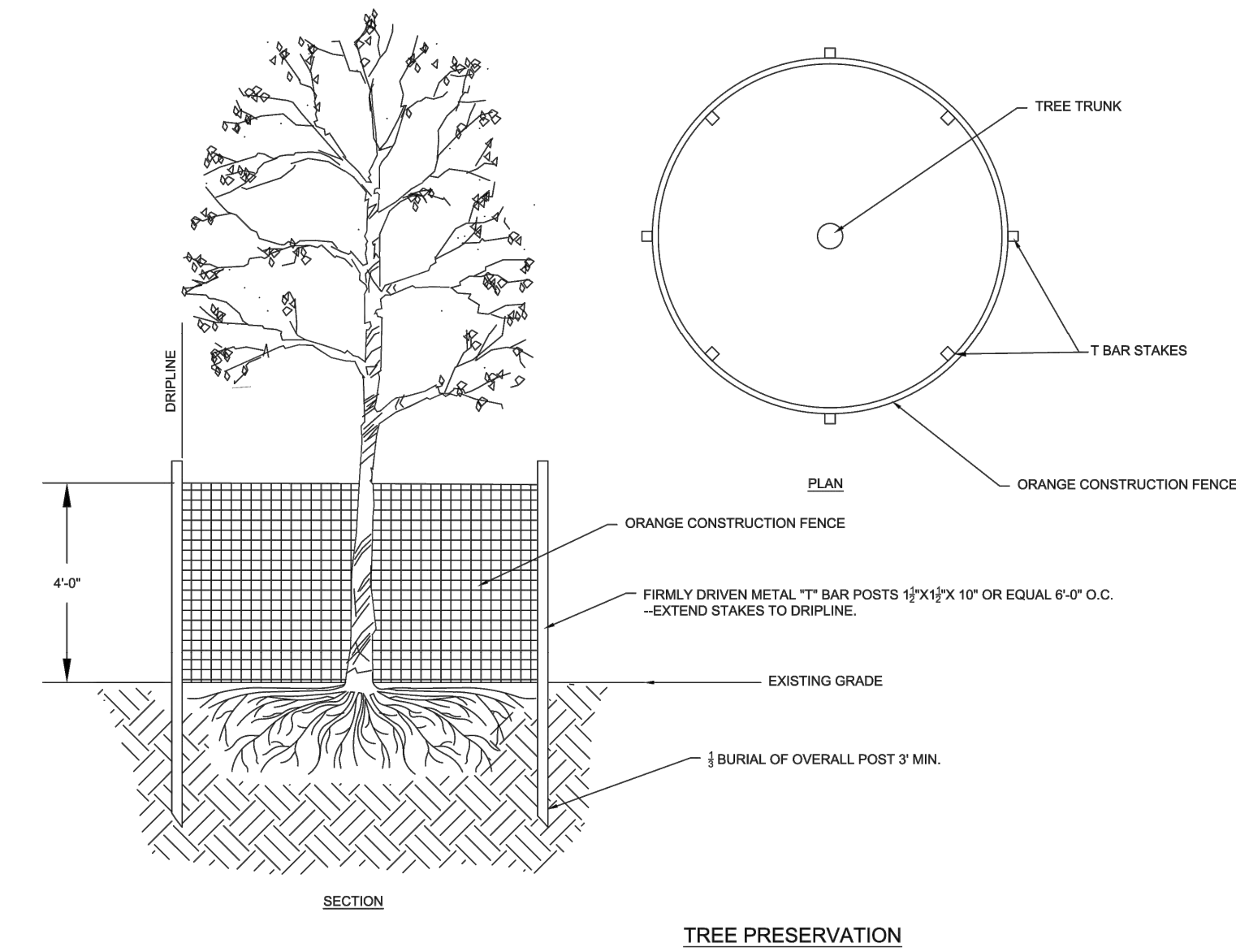
Mass Grading Plans
Paragon Star Development
Lee's Summit, Missouri

NO.	DATE
5/15/18	

REVISIONS	BY	APPROVED
Revised Field Elevations		



Erosion Control-Phase 3



Notes for Construction Entrance:

- Avoid loading on steep slopes, at curves on public roads, or downhill of disturbed area.
- Remove all vegetation and other unsuitable material from the foundation area, grade, and crown for positive drainage.
- If slope towards the public road exceeds 2%, construct a 6- to 8-inch high ridge with 3:1:1 side slopes across the foundation approximately 15 feet from the edge of the public road to divert runoff from it.
- Install pipe under the entrance if needed to maintain drainage ditches along public roads.
- Place stone to dimensions and grade as shown on plans. Leave surface sloped for drainage.
- Divert all surface runoff and drainage from the entrance to a sediment control device.
- If conditions warrant, place geotextile fabric on the graded foundation to improve stability.

Maintenance for Construction Entrance:

- Reshape entrance as needed to maintain function and integrity of installation. Top dress with clean aggregate as needed.

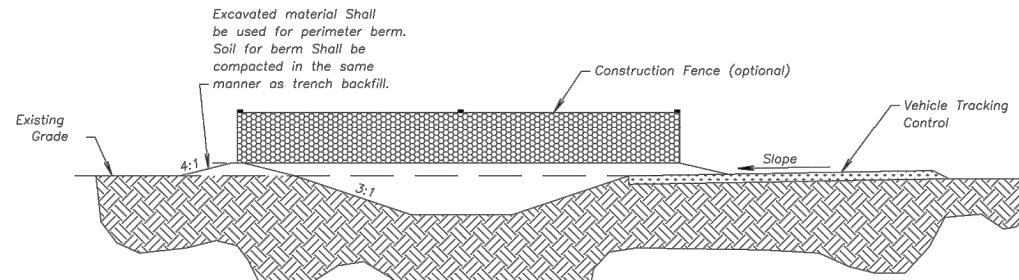
CONSTRUCTION ENTRANCE

Notes for Concrete Washout:

- Concrete washout areas shall be installed prior to any concrete placement on site.
- Concrete washout areas shall include a flat subsurface pit sloped toward the outlet 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 toward the concrete washout area.
- Vehicle tracking control is required at the access point to all concrete washout areas.
- 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.
- 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:

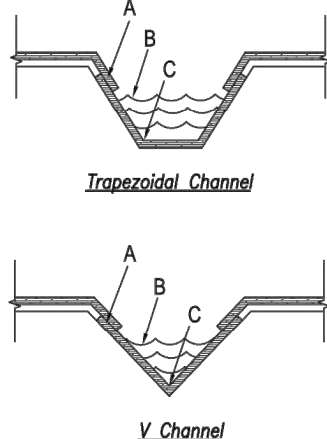
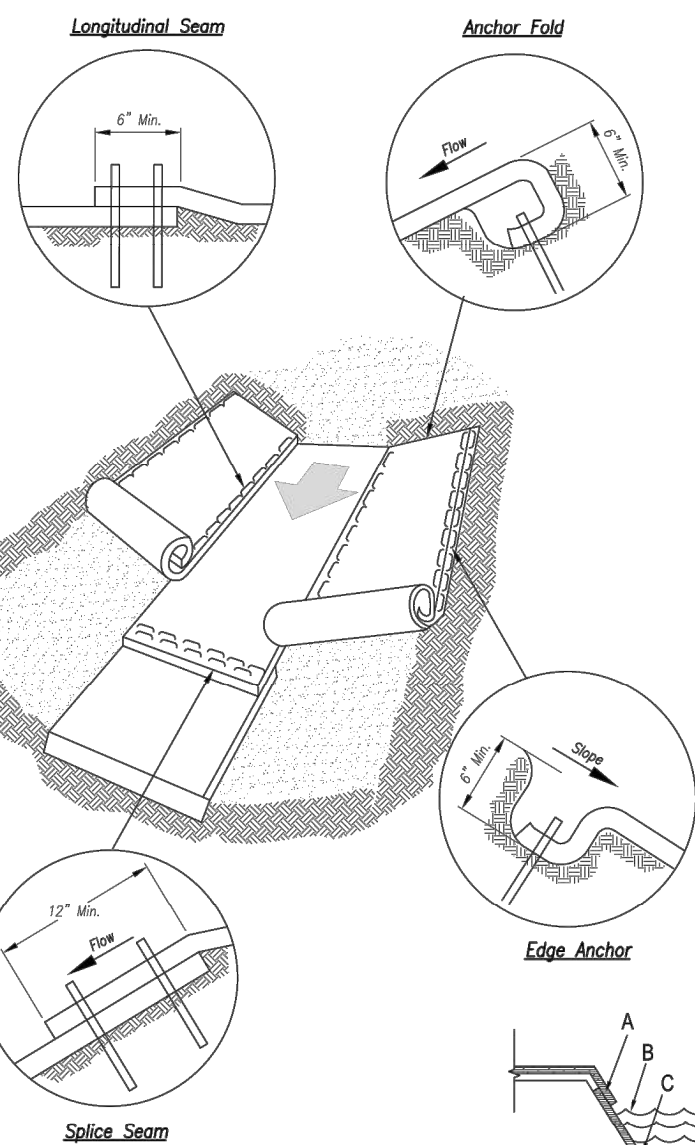
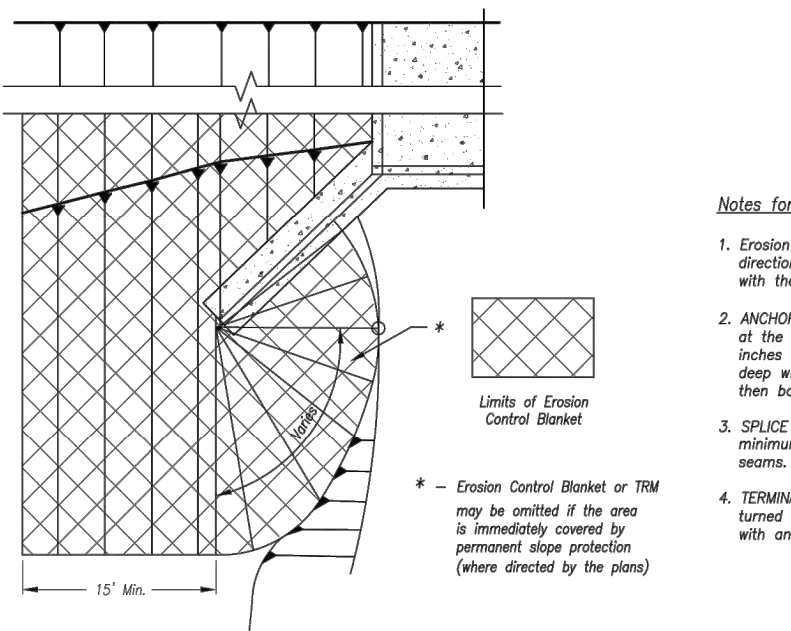
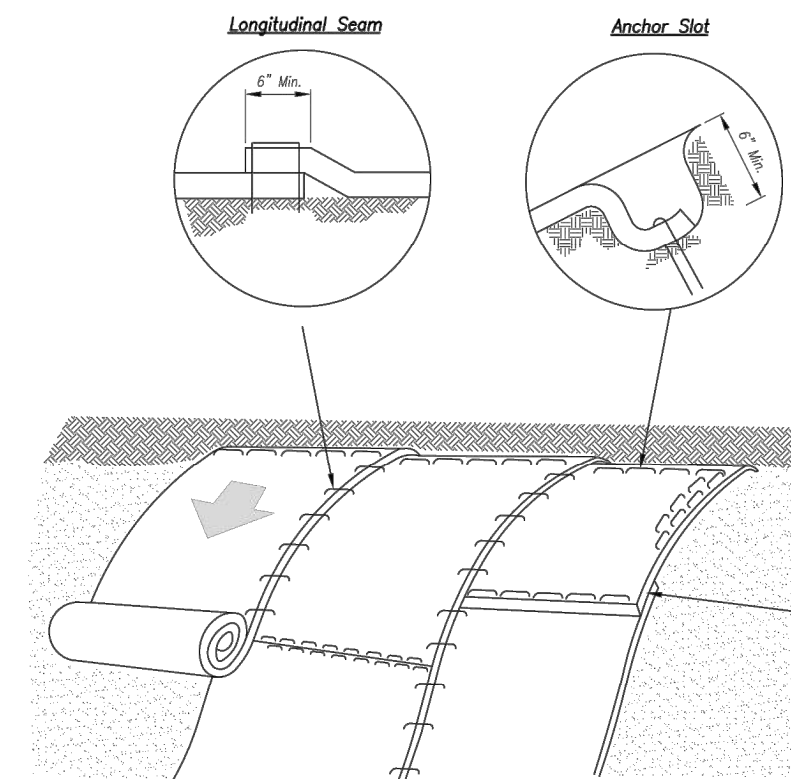
- Concrete washout materials shall be removed once the materials have filled the washout to approximately 75% full.
- Concrete washout areas shall be enlarged as necessary to maintain capacity for washed concrete.
- Concrete washout water, washed pieces of concrete and all other debris in the subsurface pit shall be transported from the job site in a water-tight container and disposed of properly.
- Concrete washout areas shall remain in place until all concrete for the project is placed.
- When concrete washout areas are removed, excavations shall be filled with suitable compacted backfill and topped, any disturbed areas associated with the installation, maintenance, use/removal of the concrete washout areas shall be stabilized.



CONCRETE WASHOUT

AMERICAN PUBLIC WORKS ASSOCIATION	
	KANSAS CITY METRO CHAPTER
CONSTRUCTION ENTRANCE AND CONCRETE WASHOUT	STANDARD DRAWING NUMBER ESC-G1 ADOPTED: 10/24/2016

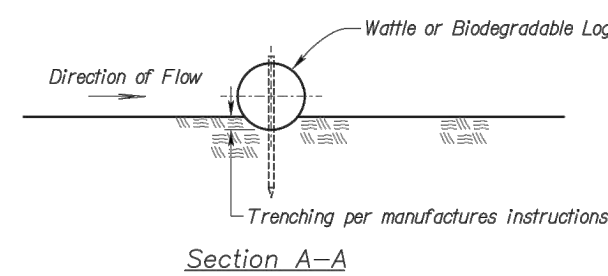
Construction Entrance modified from 2015 Overland Park Standard Details for Erosion and Sediment Control; Concrete Washout modified from 2009 City of Great Bend Standard Drawings.



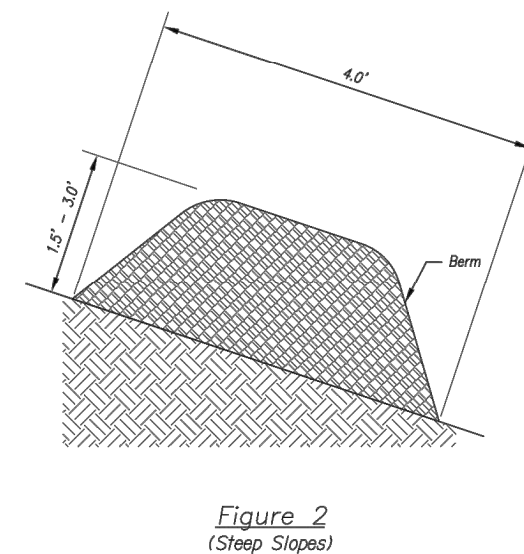
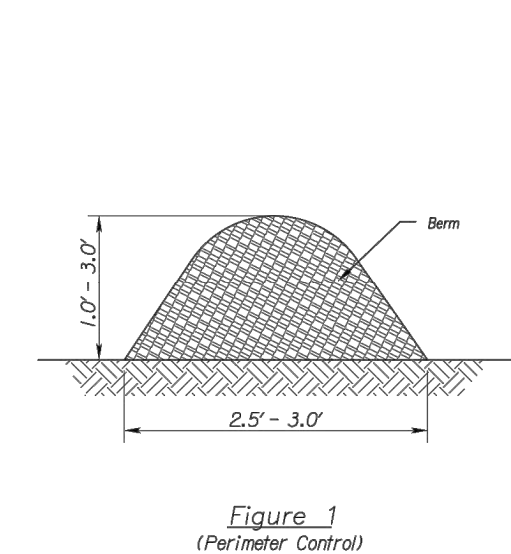
Installation in Channels

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

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



WATTLES AND BIODEGRADABLE LOG



MULCH OR COMPOST FILTER BERMS

Notes for Wattles and Biodegradable Log Slope Protection:

- The Slope barriers shall be placed along contour lines, with a short section turned upstage at each end of the barrier. The maximum length of the slope barrier shall not exceed 250 feet, and the barrier ends need to be stoppered.
- Install wattles and biodegradable logs per manufacturer's instructions.
- Spacing of stakes per manufacturer's instructions with 4' max. spacing. Length of stakes shall be a minimum of 2 times the diameter of the log with minimum of 24".

Notes for Mulch and Compost Filter Berm:

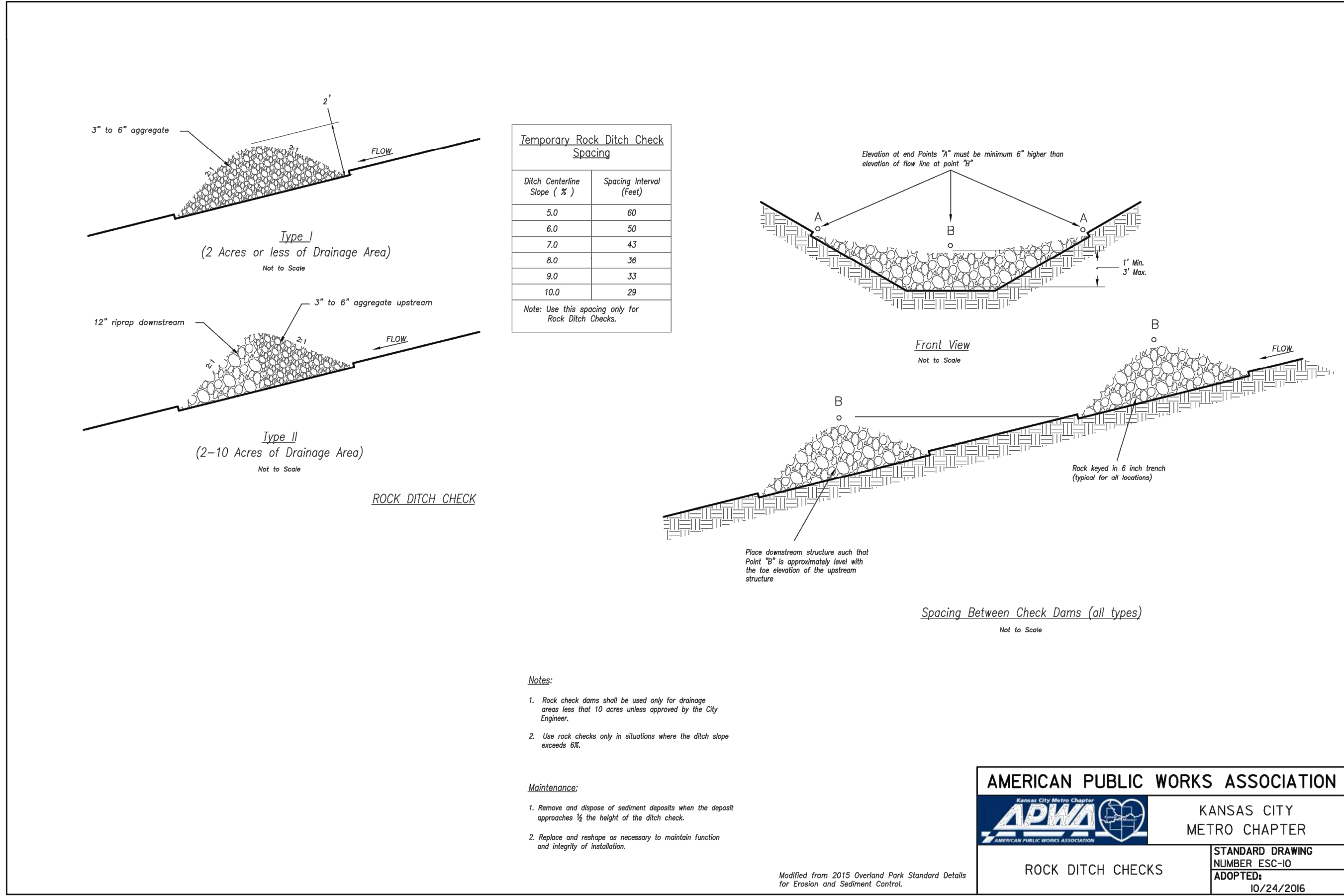
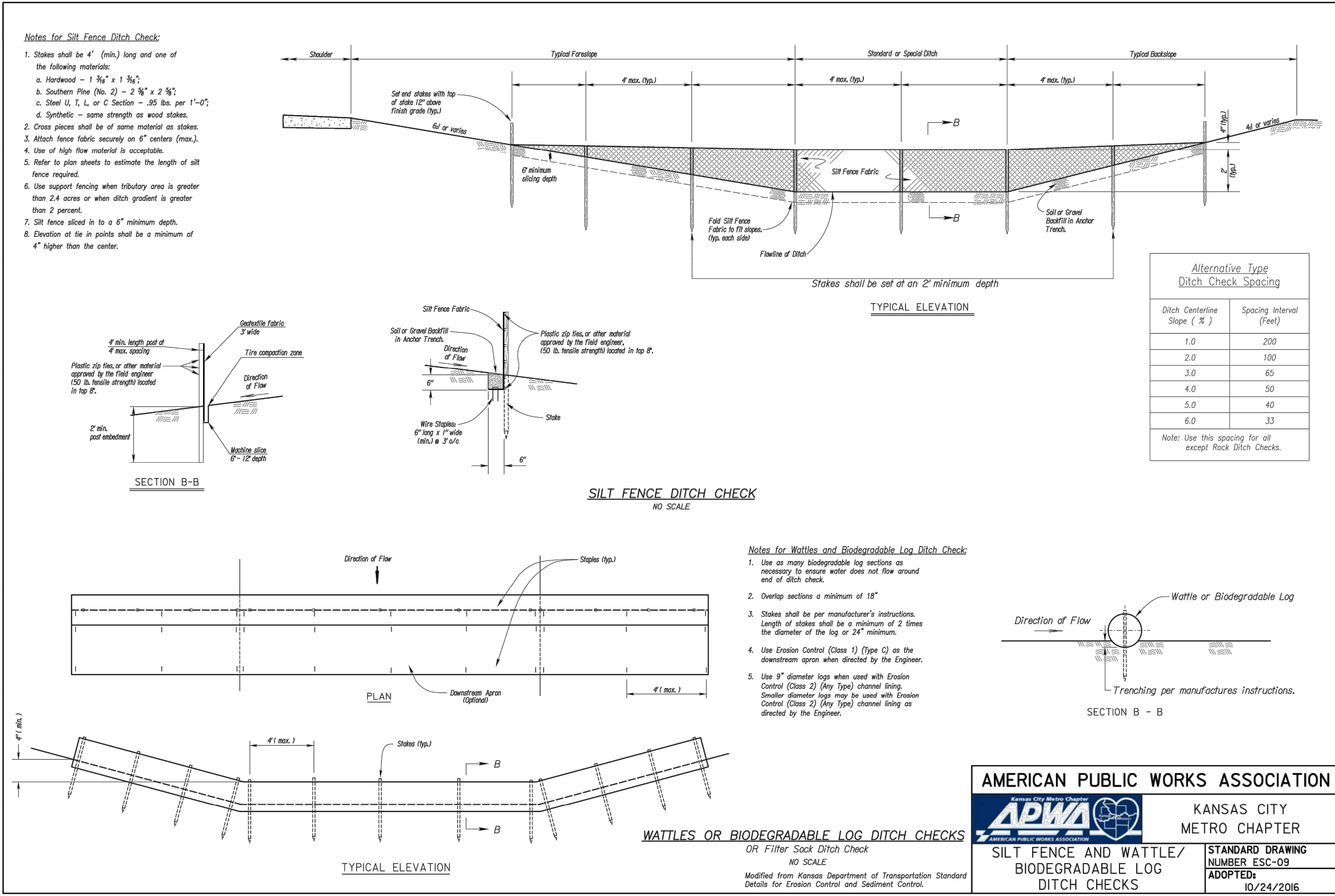
- The sediment control berm shall be placed uncompacted in a window at locations shown on the plans or as directed by the engineer.
- Parallel to the base of the slope, or around the perimeter of other affected areas, construct a 1 to 3 foot high by 2.5 to 3 foot wide berm (see Figure 1). For maximum water treatment ability or for steep slopes, construct a 1.5 to 3 foot high trapezoidal berm that is a minimum of 4 feet wide at the base (see Figure 2). In extreme conditions, or where specified by the engineer, a second berm shall be constructed at the top of the slope. Engineer will specify berm requirements.
- If berm is to be left as permanent or part of the natural landscape, the compost berm may be seeded during application for permanent vegetation.
- Do not use compost or wood mulch berms in any runoff channels or concentrated flow areas.
- Wood mulch shall consist of tree and shrub debris resulting from clearing and grubbing and shall be ground by the mechanical means such as a chipper, hammermill, tub grinder or other approved method. Mulch sizing varies with a maximum width of 2" and a maximum length of 10".

Maintenance for Mulch and Compost Filter Berms:

- Berm shall be reshaped and material added as necessary to maintain function and dimension.
- Breaches in the berm shall be repaired promptly.

AMERICAN PUBLIC WORKS ASSOCIATION	
	KANSAS CITY METRO CHAPTER
WATTLES/BIODEGRADABLE LOG AND MULCH/COMPOST FILTER BERM	STANDARD DRAWING NUMBER ESC-04 ADOPTED: 10/24/2016

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



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DATE: 1/10/17
DESIGN BY: CEL
DRAWN BY: DRV
PROJECT NO.: 12720



SHEET NO.	TOTAL SHEETS
31	33

Bradley D. Burton
Professional Engineer
License No. 25862

Mass Grading Plans
Paragon Star Development
Lee's Summit, Missouri

NO.	DATE	REVISIONS	BY	APPROVED
	5/15/18	Revised Field Elevations		



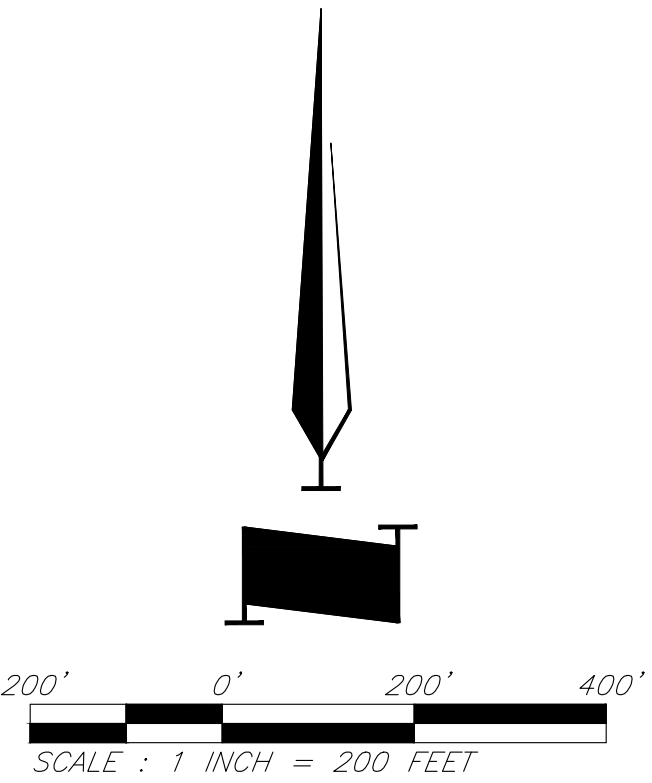
	DATE: 1/10/17	
	DESIGN BY: CEL	
	DRAWN BY: DRV	
	PROJECT NO.: 12720	
	SHEET NO.	TOTAL SHEETS
	32	33
Bradley D. Burton Professional Engineer License No. 25862		
Mass Grading Plans Paragon Star Development Lee's Summit, Missouri		
NO.	DATE	REVISIONS
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Legend



Denotes 12" of Topsoil with Permanent Seeding

NOTE:
All other disturbed areas to be temporary seeded.



Seeding Plan

C:\12720\Civil 3D\Production Drawings\Mass Grading\Lee's Summit\1272000300.dwg Layout: 33 Typical Sections (for reference only) -- Wednesday June 13, 2018, 10:54am -- Copyright 2018, George Butler Associates, Inc. Architect 00212, Professional Engineer 000133, Landscape Architect 000025, Professional Land Surveyor 000059

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Paragon Star Development
Lee's Summit, Missouri

NO. DATE

5/15/18

REVISIONS

Revised Field Elevations

BY APPROVED

This cross-section diagram for a 'VIEW HIGH DRIVE' shows a 76-foot right-of-way (R/W) with a 52-foot base-to-base (B-B) width. The centerline (CL) is marked. On the left side, there is a 6-foot concrete curb (depth 4 inches, 2.00% slope) and a 5-foot concrete walk. The main road surface is 26 feet wide, consisting of a 2-inch asphalt concrete surface over a 6-inch MoDOT Type 5 base and a 7.5-inch asphalt concrete base. A 9-inch flyash subgrade stabilization is shown below the base. The right side mirrors the left with a 5-foot concrete walk and a 6-foot concrete curb (depth 4 inches, 2.00% slope). The overall slope is 3:1 maximum. Labels include 'IN FILL' on the left and 'IN CUT' on the right.

**TYPICAL SECTION
VIEW HIGH DRIVE**
Scale: 1" = 5'

This cross-section diagram for a 'VIEW HIGH PARKWAY' shows a 100-foot R/W with a 28-foot B-B width. The centerline (CL) is marked. On the left, there is a 6-foot concrete curb (depth 4 inches, 2.00% slope) and a 5-foot concrete walk. The main road surface is 28 feet wide, consisting of a 2-inch asphalt concrete surface over a 6-inch MoDOT Type 5 base and a 7.5-inch asphalt concrete base. A 9-inch flyash subgrade stabilization is shown below the base. The right side mirrors the left with a 5-foot concrete walk and a 6-foot concrete curb (depth 4 inches, 2.00% slope). The overall slope is 3:1 maximum. Labels include 'IN FILL' on the left and 'IN CUT' on the right.

**TYPICAL SECTION
VIEW HIGH PARKWAY**
Scale: 1" = 5'

This cross-section diagram for 'PARAGON PARKWAY' shows a 72-foot R/W with a 16-foot B-B width. The centerline (CL) is marked. On the left, there is a 6-foot concrete curb (depth 4 inches, 2.00% slope) and a 5-foot concrete walk. The main road surface is 16 feet wide, consisting of a 2-inch asphalt concrete surface over a 6-inch MoDOT Type 5 base and a 7.5-inch asphalt concrete base. A 9-inch flyash subgrade stabilization is shown below the base. The right side mirrors the left with a 5-foot concrete walk and a 6-foot concrete curb (depth 4 inches, 2.00% slope). The overall slope is 3:1 maximum. Labels include 'IN FILL' on the left and 'IN CUT' on the right.

**TYPICAL SECTION
PARAGON PARKWAY**
Scale: 1" = 5'

This cross-section diagram for 'RIVER DRIVE' shows a 52-foot R/W with a 28-foot B-B width. The centerline (CL) is marked. On the left, there is a 6-foot concrete curb (depth 4 inches, 2.00% slope) and a 5-foot concrete walk. The main road surface is 28 feet wide, consisting of a 2-inch asphalt concrete surface over a 6-inch MoDOT Type 5 base and a 7.5-inch asphalt concrete base. A 9-inch flyash subgrade stabilization is shown below the base. The right side mirrors the left with a 5-foot concrete walk and a 6-foot concrete curb (depth 4 inches, 2.00% slope). The overall slope is 3:1 maximum. Labels include 'IN FILL' on the left and 'IN CUT' on the right.

**TYPICAL SECTION
RIVER DRIVE**
Scale: 1" = 5'

NOTE:
Road Sections shall adhere to all City of
Lee's Summit, Missouri Specifications.

These sections provided for reference only, no street
construction is proposed with this plan set

Typical Sections (for reference only)