

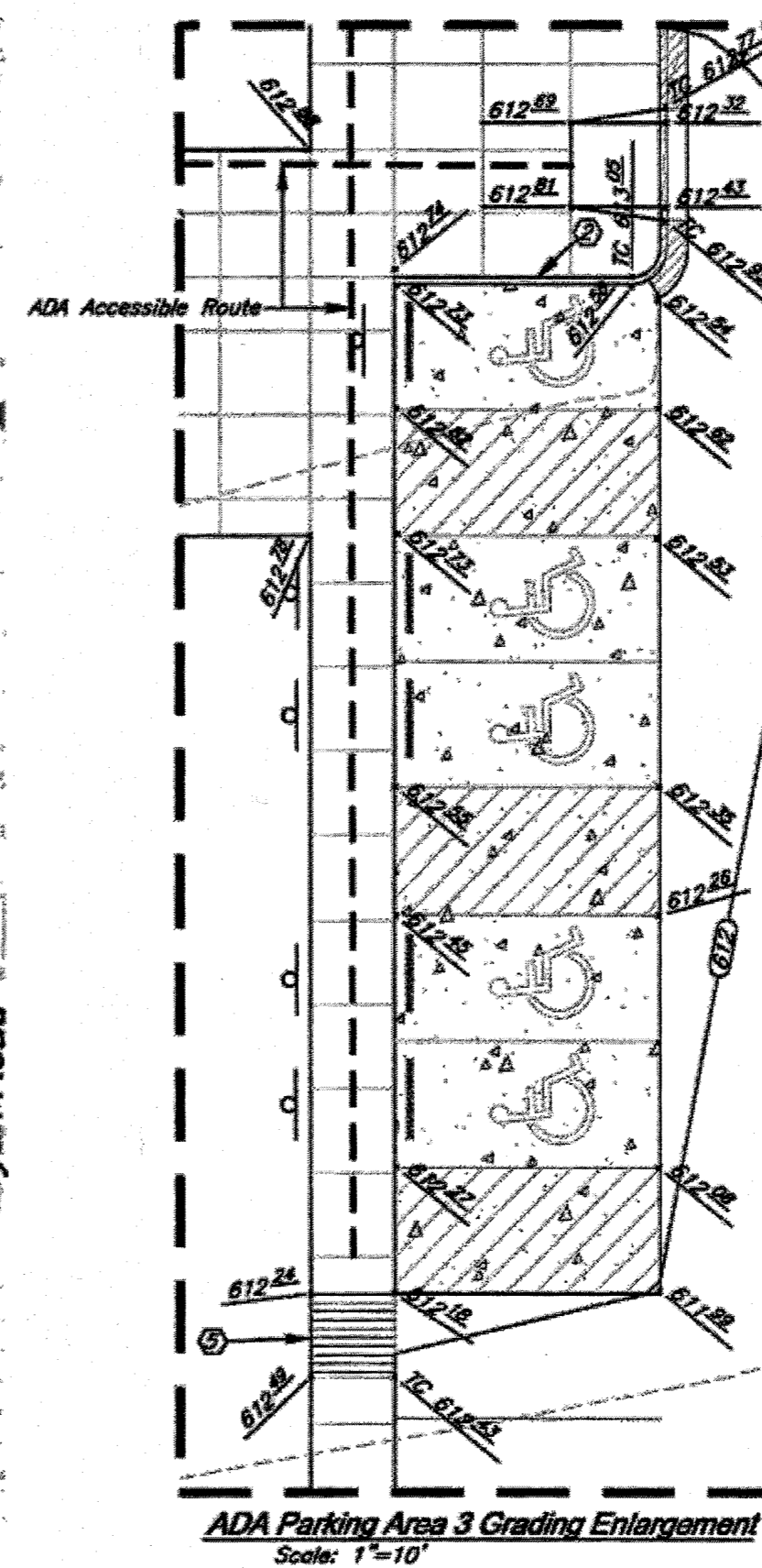
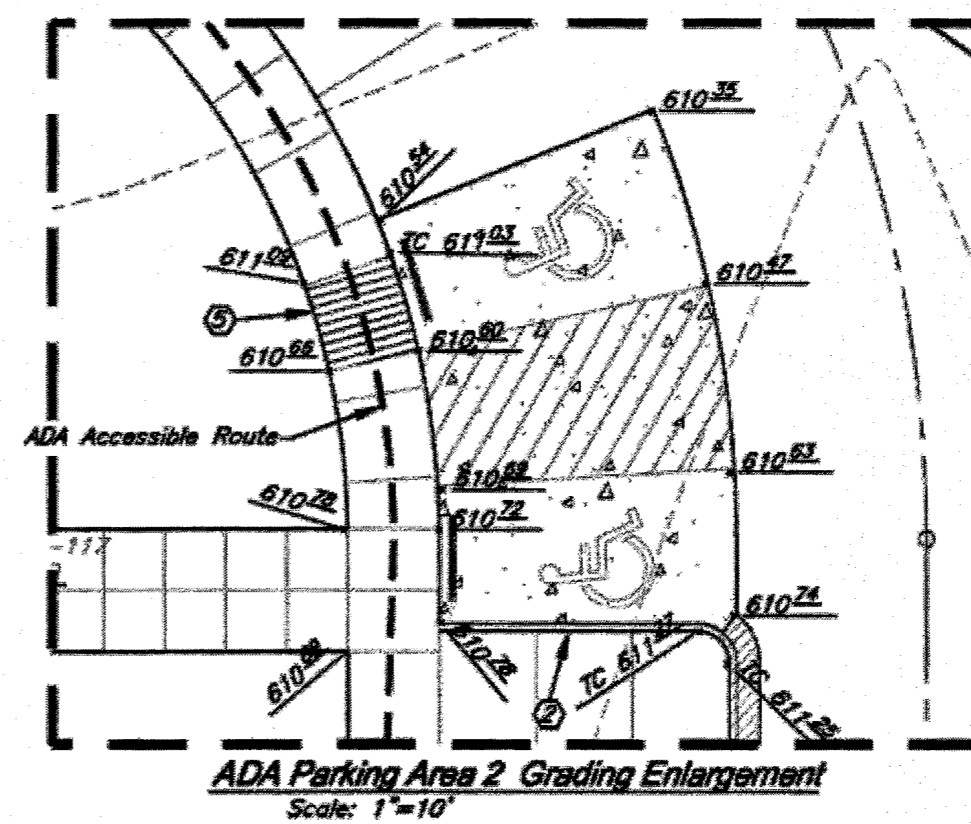
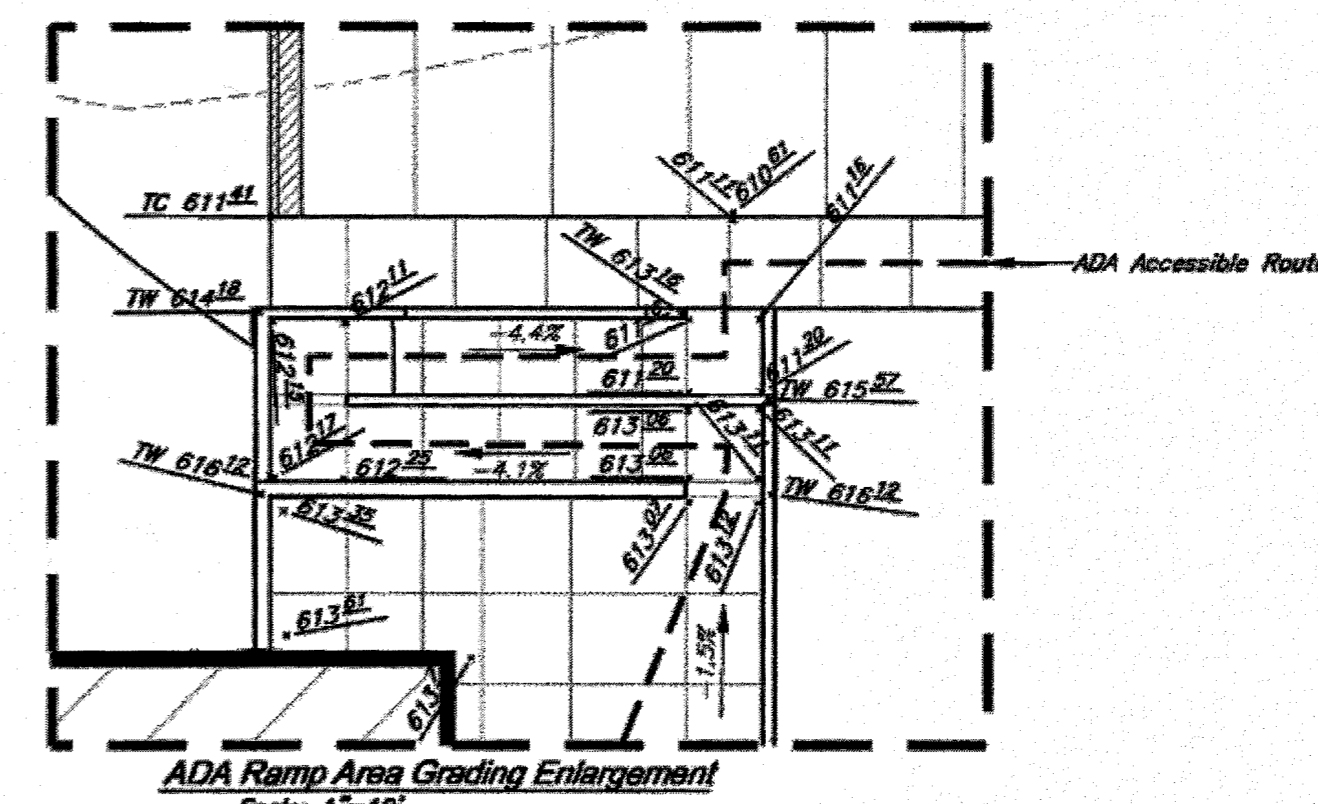
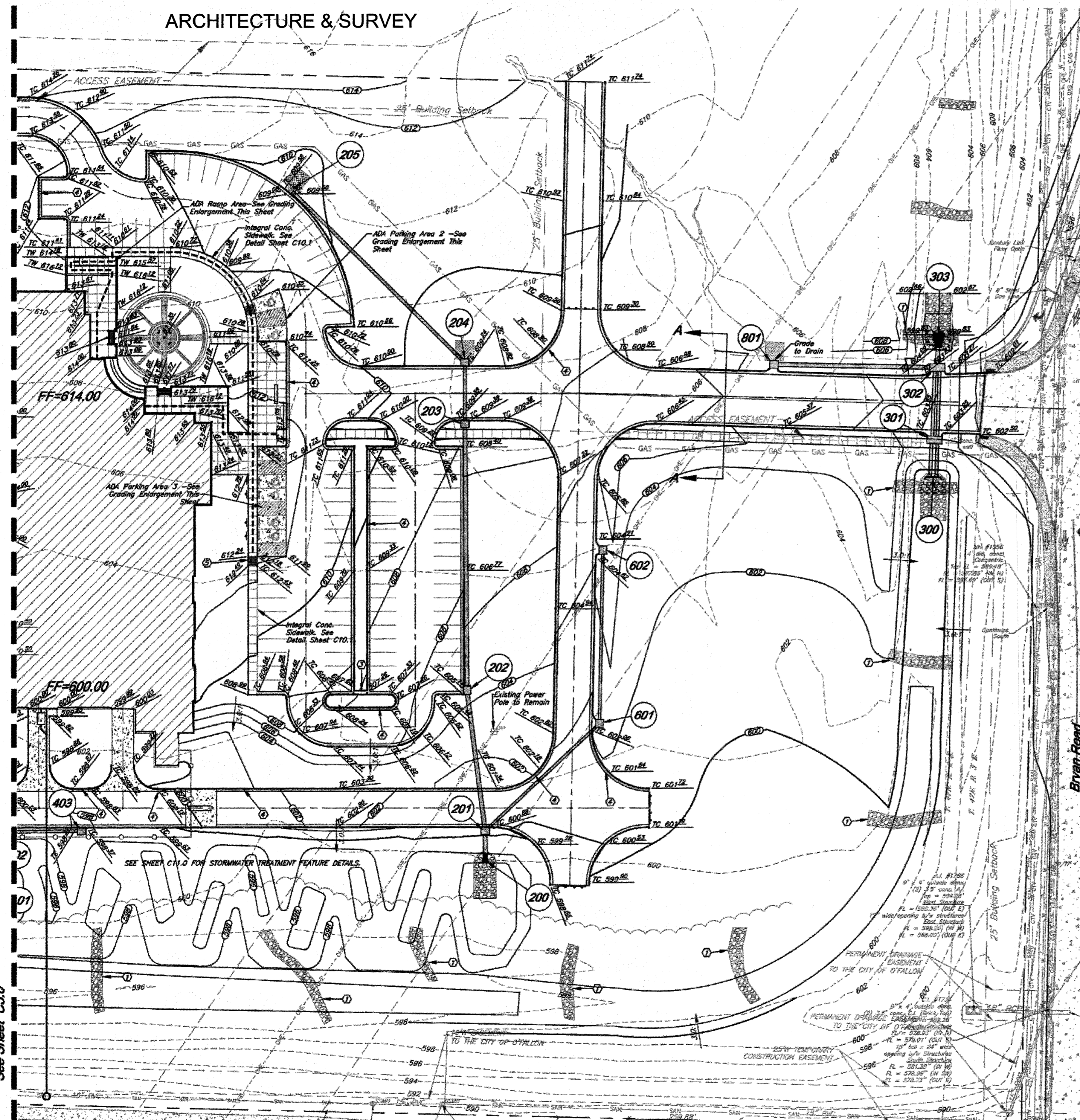
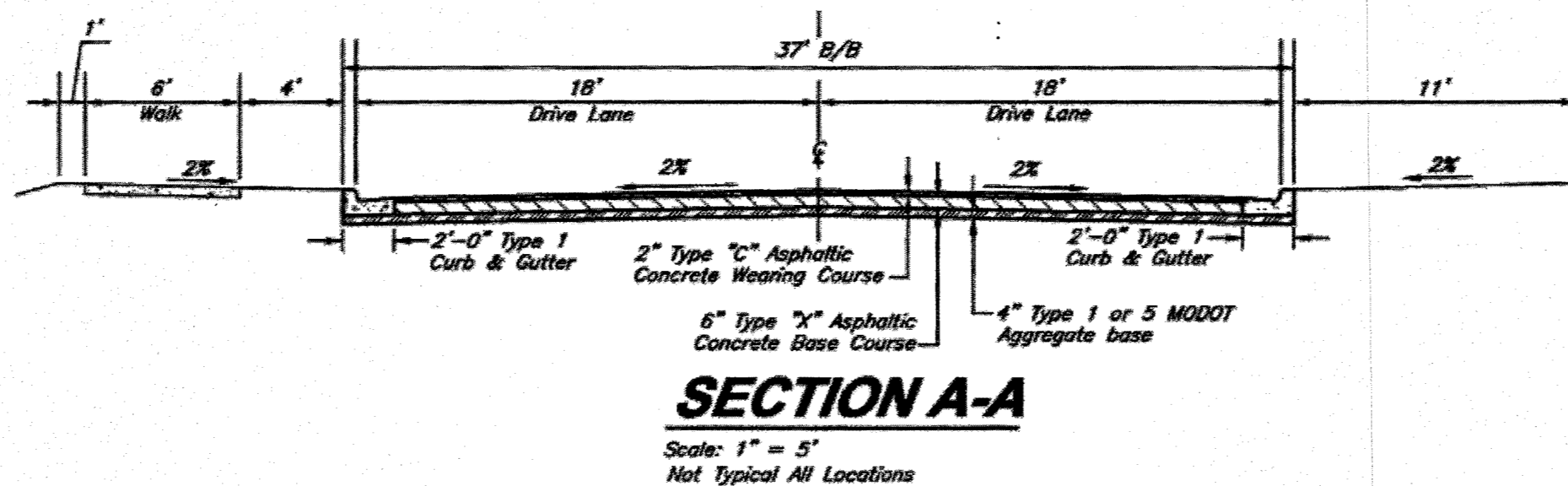




# "AS-BUILT"



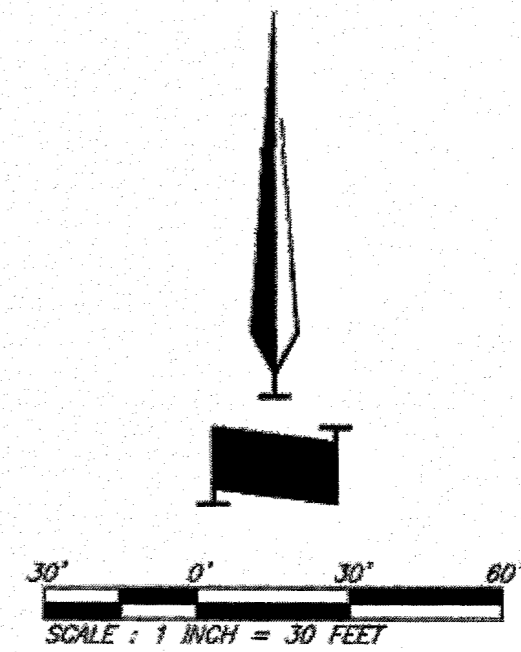
Prepared by: PREMIER ENGINEERING,  
ARCHITECTURE & SURVEY



**Grading Legend**

- 610 Proposed Contour
- 600 Existing Contour
- TC 1000.50 Top of Curb Grades
- 1000.00 Spot Grades
- Ex. TC 1000.50 Existing Top of Curb Grades
- Ex. 1000.00 Existing Spot Grades
- Type 1 Vertical Curb & Gutter
- Type 2 "Dry" Vertical Curb & Gutter
- ADA Accessible Route

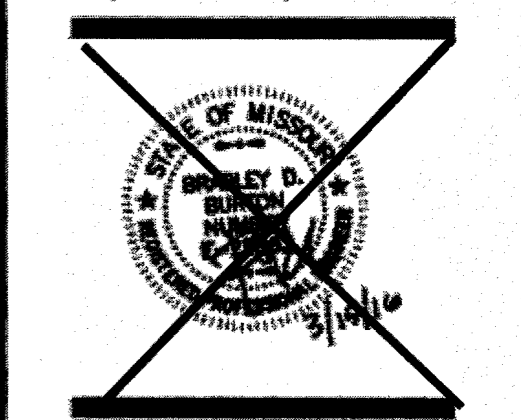
- Construction Notes:**
- Remove Existing Rock Ditch Check
  - Transition Curb to Flush with pavement
  - Construct Concrete Flume. See Detail sheet C10.1.
  - Type 2 "Dry" Curb. See Detail sheet C10.0.
  - Transition Ramp to Flush with pavement
- Grading and Earthwork Notes:**
- All Earthwork shall conform to recommendations outlined in the geotechnical report "O'Fallon Justice Center O'Fallon, Missouri", dated September 2015.
  - TW and BW elevations noted on plans are to the top of the retaining wall and to the surface grade at the base of retaining wall. Any additional depth of wall required for structural purposes is the responsibility of the structural Engineer designing and detailing the retaining wall.
  - All ADA accessible parking spaces are to be constructed at 2.0% maximum slope in any direction. ADA accessible routes shall be constructed with 2.0% maximum cross slope and a maximum 5.0% longitudinal slope.



**GBA**  
architects  
engineers  
225 S. Main, Ste. 200  
O'Fallon, MO 63366  
933.492.0400  
www.gbateam.com

**O'FALLON JUSTICE CENTER**  
CONSTRUCTION DOCUMENTS  
O'FALLON, MISSOURI

REV	DATE	DESCRIPTION



PROJECT NUMBER  
13326.00

DATE  
03/15/16

CONSTRUCTION DOCUMENTS

DESIGNED: HTR/JHM/JRH  
DRAWN: HTR/JHM/JRH  
REVIEWED: HTR/BD8

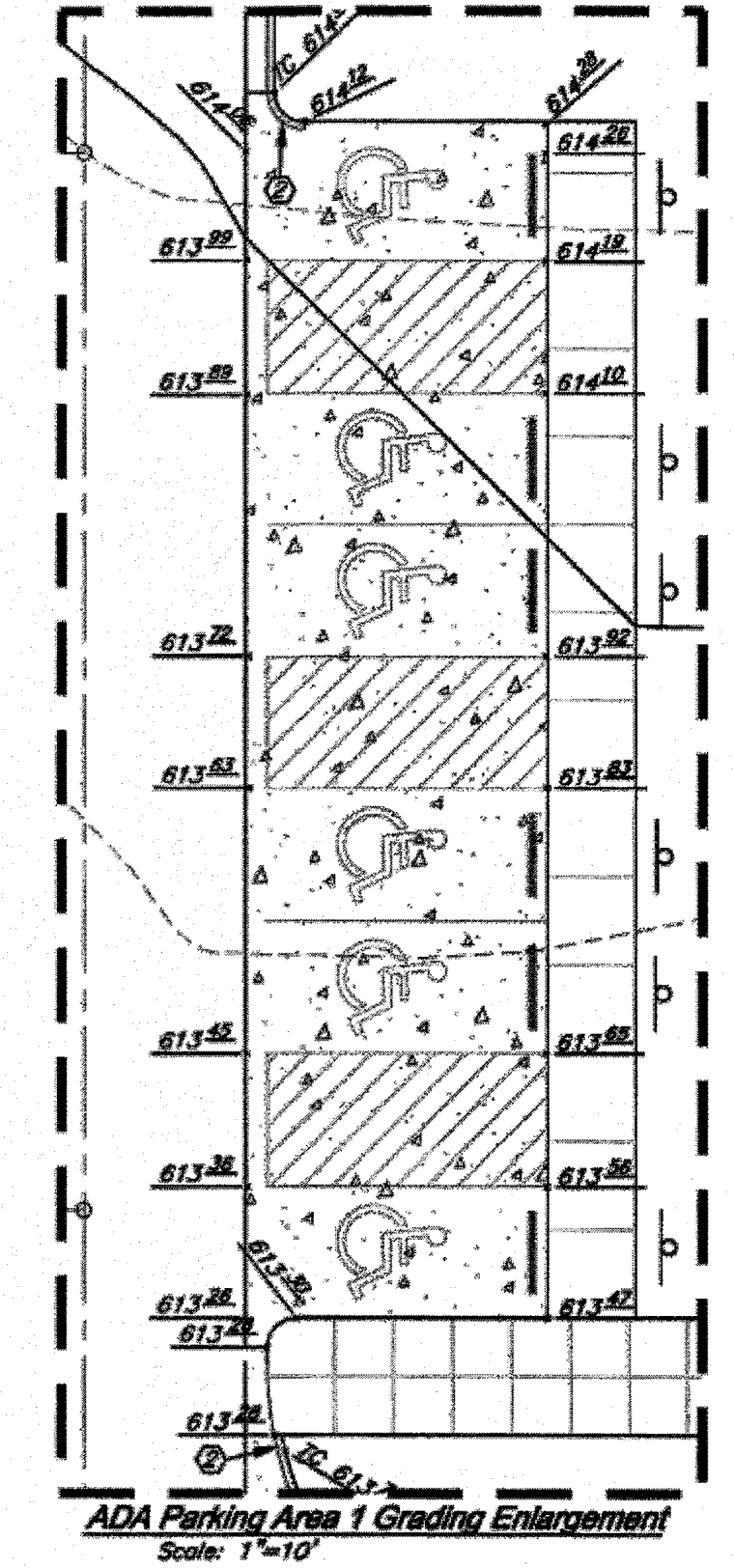
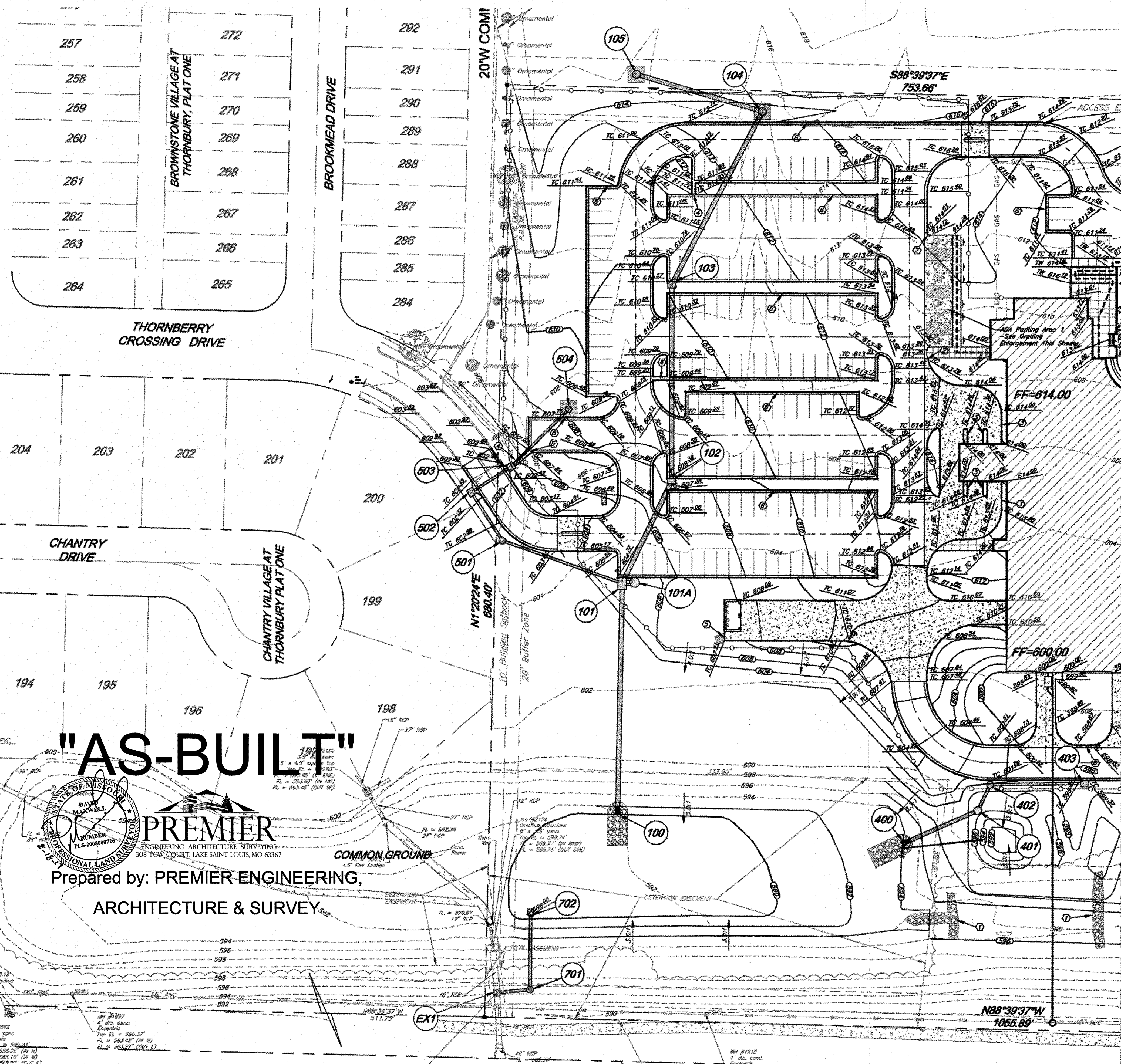
SHEET TITLE  
**GRADING PLAN**

SHEET NUMBER  
**C3.1**

© George Bitter Associates, Inc. 2014  
Engineering CDM 00713  
Missouri Civil 00282  
Land Surveying CSM 00028

G:\13326\Civil\_301\Production Drawings\Construction Site Plans\13326C0703.dwg Layout: C3.1 Grading Plan - Plotted Tuesday, March 15, 2016, 3:41pm by Jmody

See Sheet C3.0

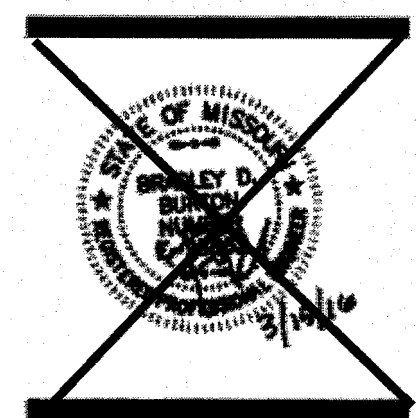


- Construction Notes:**
- Remove Existing Rock Ditch Check
  - Transition Curb to Flush with pavement
  - Transition Curb to Flush Finished Floor
  - Construct Concrete Flume. See Detail sheet C10.1.
  - Construct Curb Cut. See Detail sheet C10.1.
  - Type 2 "Dry" Curb. See Detail sheet C10.0.
- Grading and Earthwork Notes:**
- All Earthwork shall conform to recommendations outlined by SCI ENGINEERING INC in the geotechnical report "O'Fallon Justice Center O'Fallon, Missouri", dated September 2015.
  - TW and SW elevations noted on plans are to the top of the retaining wall and to the surface grade at the base of retaining wall. Any additional depth of retaining wall required for structural purposes is the responsibility of the structural Engineer designing and detailing the retaining walls.
  - All ADA accessible parking spaces are to be constructed at 2.0% maximum slope in any direction. ADA accessible routes shall be constructed with 2.0% maximum cross slope and a maximum 5.0% longitudinal slope.

**Grading Legend**

- 610 Proposed Contour
- 600 Existing Contour
- TC 1000.50 Top of Curb Grades
- 1000.00 Spot Grades
- Ex. TC 1000.50 Existing Top of Curb Grades
- Ex. 1000.00 Existing Spot Grades
- Type 1 Vertical Curb & Gutter
- Type 2 "Dry" Vertical Curb & Gutter
- ADA Accessible Route

REV	DATE	DESCRIPTION



PROJECT NUMBER  
13326.00

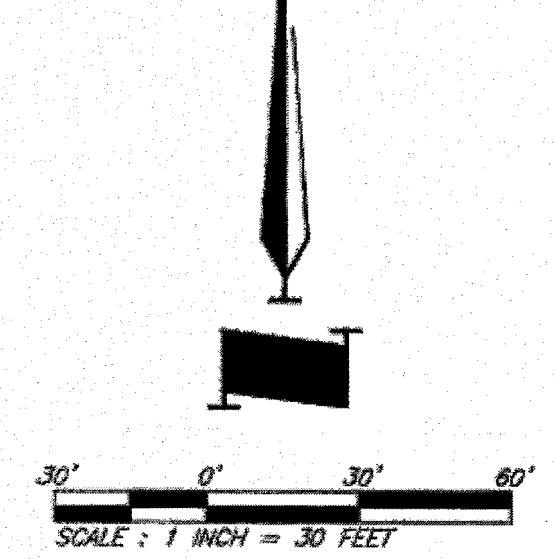
DATE  
03/15/16

CONSTRUCTION DOCUMENTS

DESIGNED: HTR/JWA/JRH  
 DRAWN: HTR/JWA/JRH  
 REVIEWED: HTR/BDG

SHEET TITLE  
**GRADING PLAN**

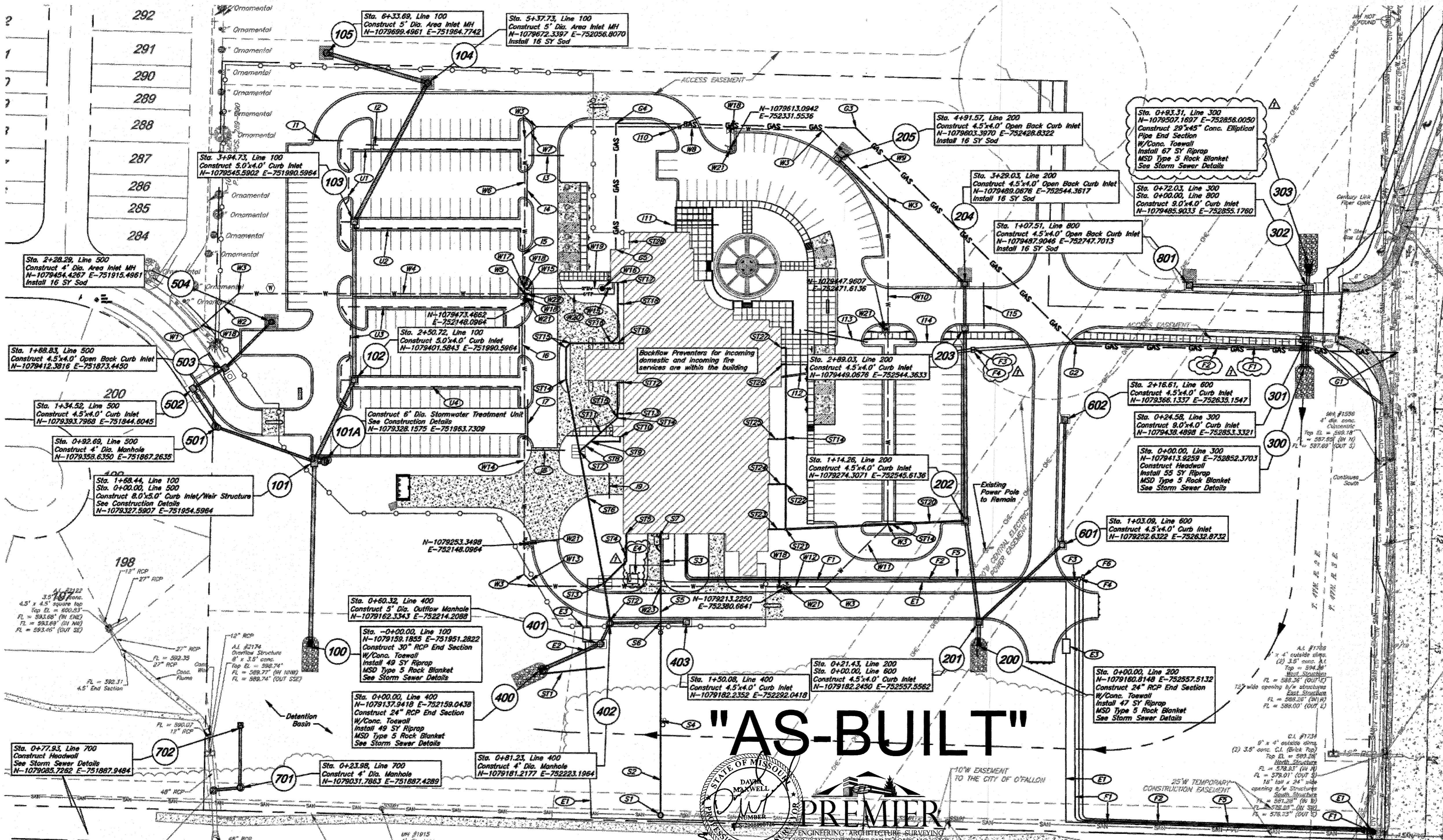
SHEET NUMBER  
**C3.0**



**"AS-BUILT"**

**PREMIER**  
 ENGINEERING ARCHITECTURE SURVEYING  
 308 TSW COURT, LAKE SAINT LOUIS, MO 63367

Prepared by: **PREMIER ENGINEERING,  
 ARCHITECTURE & SURVEY**



- Fiber Optic Construction Notes**
- (F1) Install 3" Schedule 40 PVC Conduit with pull string. Maintain 12" minimum horizontal clearance. Trade Contractor to coordinate construction with Century Link.
  - (F2) Install 3" Schedule 40 PVC Conduit with pull string. Maintain 12" minimum horizontal clearance. Trade Contractor to coordinate construction with Century Link.
  - (F3) 2"x3" CenturyLink Vault
  - (F4) 2"x3" Charter Vault
  - (F5) Install 3" Schedule 40 PVC Conduit with pull string. Maintain 12" minimum horizontal clearance. Trade Contractor to coordinate construction with the City of O'Fallon.
  - (F6) 2"x3" City Vault
- Electrical General Notes:**
1. All electrical work shall conform to American standards.
  2. Electrical routing reflects the latest, although preliminary designs from American. Final routing of conduit shall match final design from American.
  3. Electrical conduit shall be schedule 40 PVC.
  4. Vault installation shall be coordinated by American. See Electrical Plans.
- Electric Construction Notes**
- (E1) Install 4" Schedule 40 PVC Electrical Conduit. Trade Contractor to coordinate electrical utility construction with American. See Electrical Plans.
  - (E2) Deflect electrical conduit under storm sewer.
  - (E3) 3/4" Fiberglass vault
  - (E4) Transformer Pad w/ pipe bollard protection. Coordinate w/ American. Specify transformer. See American Specification. Lines Instruction 58 81 51 10 and Spec 6.
- Intrusion Sensors**
- Installation Notes**
- (I1) Install 32 Lft. 4" Schedule 40 PVC Irrigation sleeve
  - (I2) Install 11 Lft. 4" Schedule 40 PVC Irrigation sleeve
  - (I3) Install 32 Lft. 4" Schedule 40 PVC Irrigation sleeve
  - (I4) Install 38 Lft. 4" Schedule 40 PVC Irrigation sleeve
  - (I5) Install 34 Lft. 4" Schedule 40 PVC Irrigation sleeve
  - (I6) Install 43 Lft. 4" Schedule 40 PVC Irrigation sleeve
  - (I7) Install 42 Lft. 4" Schedule 40 PVC Irrigation sleeve
  - (I8) Install 35 Lft. 4" Schedule 40 PVC Irrigation sleeve
  - (I9) Install 33 Lft. 4" Schedule 40 PVC Irrigation sleeve
  - (I10) Install 31 Lft. 4" Schedule 40 PVC Irrigation sleeve
  - (I11) Install 43 Lft. 4" Schedule 40 PVC Irrigation sleeve
  - (I12) Install 40 Lft. 4" Schedule 40 PVC Irrigation sleeve
  - (I13) Install 58 Lft. 4" Schedule 40 PVC Irrigation sleeve
  - (I14) Install 35 Lft. 4" Schedule 40 PVC Irrigation sleeve
  - (I15) Install 41 Lft. 4" Schedule 40 PVC Irrigation sleeve
- General Utility Notes:**
1. Numerous existing utilities are on site. Contractor shall be responsible for locating all existing utilities.
  2. The Contractor shall determine the exact location of all existing utilities before commencing work. The Contractor is fully responsible for any and all damages occurring from his failure to do so.
  3. The Contractor shall coordinate the relocation of any utilities that may be encountered prior to the start of construction.
- Water Construction Notes**
- (W1) Connect 8" PVC water service line to existing water main via 8" tapping sleeve and gate valve per AWWA standards.
  - (W2) Install 44 LF 8" PVC Water Service Line
  - (W3) Install 45" band
  - (W4) Install 260 LF 8" PVC Water Service Line
  - (W5) Install 8"x8"x6" Water Service line Connection
  - (W6) Install 142 LF 8" PVC Water Service Line
  - (W7) Install 15 LF 8" PVC Water Service Line
  - (W8) Install 259 LF 8" PVC Water Service Line
  - (W9) Install 90 LF 8" PVC Water Service Line
  - (W10) Install 297 LF 8" PVC Water Service Line
  - (W11) Install 80.50 LF 8" PVC Water Service Line
  - (W12) Install 262 LF 8" PVC Water Service Line
  - (W13) Install 15 LF 8" PVC Water Service Line
  - (W14) Install 255 LF 8" PVC Water Service Line
  - (W15) Install 3" Valve-See Details
  - (W16) Install 2" Meter Pit and Sensus Omni C2 2" Meter Meter and Detail to be provided by City
  - (W17) Install 8"x3"x8" Tee
  - (W18) Install 8" Valve-See Details
  - (W19) Install 95 LF 3" PVC Domestic Water Line with 90° band, Connect to building stub
  - (W20) Install 81.50 LF 8" PVC Fire Protection Water Line, Connect to building stub
  - (W21) Install Fire Hydrant with Valve-See Details
  - (W22) Install 6" Valve-See Details
  - (W23) Water line crosses over top of sanitary line. Maintain minimum 18" clearance
- Sanitary Sewer Construction Notes**
- Anticipated Sanitary Sewer Flow = 18,125 Gallons Per Day
- (S1) Station 0+00 Construct 4" Dia. Manhole Top Elev.=599.84 (match existing grade)
  - (S2) Existing 15" (W)=575.592
  - (S3) Install 15" Out (E)=575.522
  - (S4) Manhole to be spool lined with Raven Lining Systems liner Raven 405 OR Neopoxy International NRP-5303 Modified Epoxy. See Specifications on sheet C12.2.
  - (S5) Connect 6" sanitary service line to proposed manhole S1, install 218 LF 8" SDR 26 PVC and 20 LF Ductile Iron Pipe (with 0.3% SDR) Connect to 6" sanitary service line building stub S3
  - (S6) Station 2+38 Connect 6" sanitary service line to building stub, install Cleanout, E=595.29
  - (S7) Station 0+85, install Cleanout
  - (S8) Station 1+84, install Cleanout
  - (S9) Sanitary line crossing under storm line to be 20 LF Ductile Iron pipe centered on crossing
  - (S10) 6" SDR=593.24 (1.62' clear)
  - (S11) See MEP plans for Gross Interceptor details
- Underdrain Construction Notes**
- (U1) Install 289 LF 4" HDPE Perforated Underdrain with Geotextile sock, slope to drain @ minimum 1% with 18" minimum cover, connect to structure 103 via 4"x4"x4" tee
  - (U2) Install 170 LF 4" HDPE Perforated Underdrain with Geotextile sock, slope to drain @ minimum 1% with 18" minimum cover, connect to structure 103
  - (U3) Install 273 LF 4" HDPE Perforated Underdrain with Geotextile sock, slope to drain @ minimum 1% with 18" minimum cover, connect to structure 102 via 4"x4"x4" tee
  - (U4) Install 45" band, install 218 LF 4" gas service line West
- Gas Construction Notes**
- Trade Contractor to coordinate installation with Laclede Gas
- (G1) Connect 4" gas service line to existing gas main, install 292.5 LF 4" gas service line West
  - (G2) Install 45" band, install 281 LF 4" gas service line
  - (G3) Install 45" band, install 218 LF 4" gas service line West
- Storm Sewer Construction Notes**
- (S17) See Sheet C11.0 for Stormwater Treatment Feature and April/June details.
  - (S18) Install 12" HDPE pipe to structure 402, E=595.15
  - (S19) Install 36.55 LF 12" HDPE pipe North @ 2% connect to structure S13
  - (S20) Construct 24" Nyloplast Drain Basin w/ standard grate Top Elev.=601.94
  - (S21) E 6" (N)=596.24
  - (S22) E 6" (W)=596.24
  - (S23) E 6" (S)=596.24
  - (S24) E 6" (E)=605.00
  - (S25) E 6" (W)=605.00
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**"AS-BUILT"**

**PREMIER**  
ENGINEERING ARCHITECTURE SURVEYING  
308 TOW COURT, LAKE SAINT LOUIS, MO 63167

Prepared by: **PREMIER ENGINEERING**  
**ARCHITECTURE & SURVEY**

- Existing Utilities:**
1. Numerous existing utilities are on site. Contractor shall be responsible for locating all existing utilities.
  2. The Contractor shall determine the exact location of all existing utilities before commencing work. The Contractor is fully responsible for any and all damages occurring from his failure to do so.
  3. The Contractor shall coordinate the relocation of any utilities that may be encountered prior to the start of construction.
- Water General Notes:**
1. The City of O'Fallon will supply the meter for domestic service only, contractor to install.
  2. All water lines shall be installed to a minimum depth of 42" over pipe.
  3. All water line work shall comply with City of O'Fallon standards. City of O'Fallon details may be found on the construction details sheet and on their website.
  4. All private fire protection work shall conform to O'Fallon Fire Department and NFPA 24 and NFPA 25 requirements.
  5. Backflow preventer is to be inside the building.
  6. Maintain a minimum 5 FT separation between taps, valves, bells or other fittings on the water main.
  7. Maintain a minimum radius unobstructed clearance of 2 FT from any backflow preventer vault or other object from the domestic meter pit.
  8. Service connection for the fire protection line will be an 8" tapping sleeve and valve.
  9. Contractor will be responsible for all coordination with and notifications to the City of O'Fallon.
  10. The City of O'Fallon is to supply domestic water meter. Contractor to install meter and coordinate ordering meter minimum 1 week in advance prior to installation.
  11. Contractor required to coordinate at a minimum 24 hours in advance for scheduling inspections of the top and meter installation.
  12. Contractor required to provide to the city, the pipe coupon that is removed at the top.
  13. All pipe for proposed water line shall be SDR 21 PVC with rubber gaskets and tracer wire. Minimum length between fittings shall be 10'.
- Sanitary Sewer General Notes:**
1. All exterior sanitary sewer plumbing from the building foundation to the connection point shall meet City of O'Fallon standards.
  2. The minimum of 42 inches of cover shall be maintained over the top of the service lines and sanitary sewer mains.
  3. 90° turns shall not be installed in the service line. 90° turns are to be accomplished with two 45° bends with a minimum of one foot of pipe between the 45° bends.
  4. Ten feet of horizontal separation and two feet of vertical separation shall be provided between water lines and the sanitary sewer main and service lines.
  5. Roof drains and gutters and downspouts shall not be connected to the sanitary sewer.
  6. All service line material including exterior piping for the sand/fat interceptor shall be SDR-26 PVC w/Rubber Gasket Joints per City of O'Fallon Standards.
  7. In the event of work in or on the O'Fallon sanitary sewer main, any trees or plantings placed within the sewer easement may be removed without replacement or compensation there-of and shall be replaced by the property owner as required by the City.
- Storm Sewer General Notes:**
1. All RCP shall be class III.
  2. All HDPE Pipe shall be ADS N-12 with water tight gaskets. (As bid alternate)
  3. Storm sewer lengths are calculated from center of structure to center of structure.
  4. All pipe connections to inlets shall occur at center of structure wall unless specifically noted otherwise.
  5. All work shall conform to City of O'Fallon standards.
  6. Precast structures shall be constructed with 4,000 psi concrete. Shop drawings shall be submitted to the Engineer for review prior to casting.
  7. All in grade inlets shall match adjacent slope.
  8. All underdrains shall be ADS N-12 or approved equal. All fittings shall be considered subsidiary to bit.
  9. All proposed storm structures shall be precast to occur at pipe connections.
  10. All PVC for storm sewer shall be SDR 26.

**Legend**

- Existing Sanitary Sewer
- Proposed Gas Service
- Proposed Domestic Water Line
- Proposed Fire Protection Line
- Existing Light Poles
- Existing Water Valve
- Existing Fire Hydrant
- Existing Gas Mains
- Existing Storm Sewer
- Proposed Fire Hydrant
- Proposed Water Valve
- Sod

**Note:** Future Development to the north will necessitate revisions to the detention basin outflow structure as previously designed.

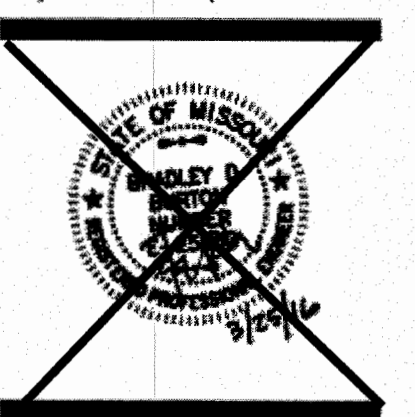
REV	DATE	DESCRIPTION
Δ	3/23/2016	City Comments

PROJECT NUMBER: 13326.00  
DATE: 03/25/16  
CONSTRUCTION DOCUMENTS  
SHEET TITLE: Utility Plan  
SHEET NUMBER: C5.0

DESIGNED: HTR/JMM/JRH  
DRAWN: HTR/JMM/JRH  
REVIEWED: HTR/BDJ

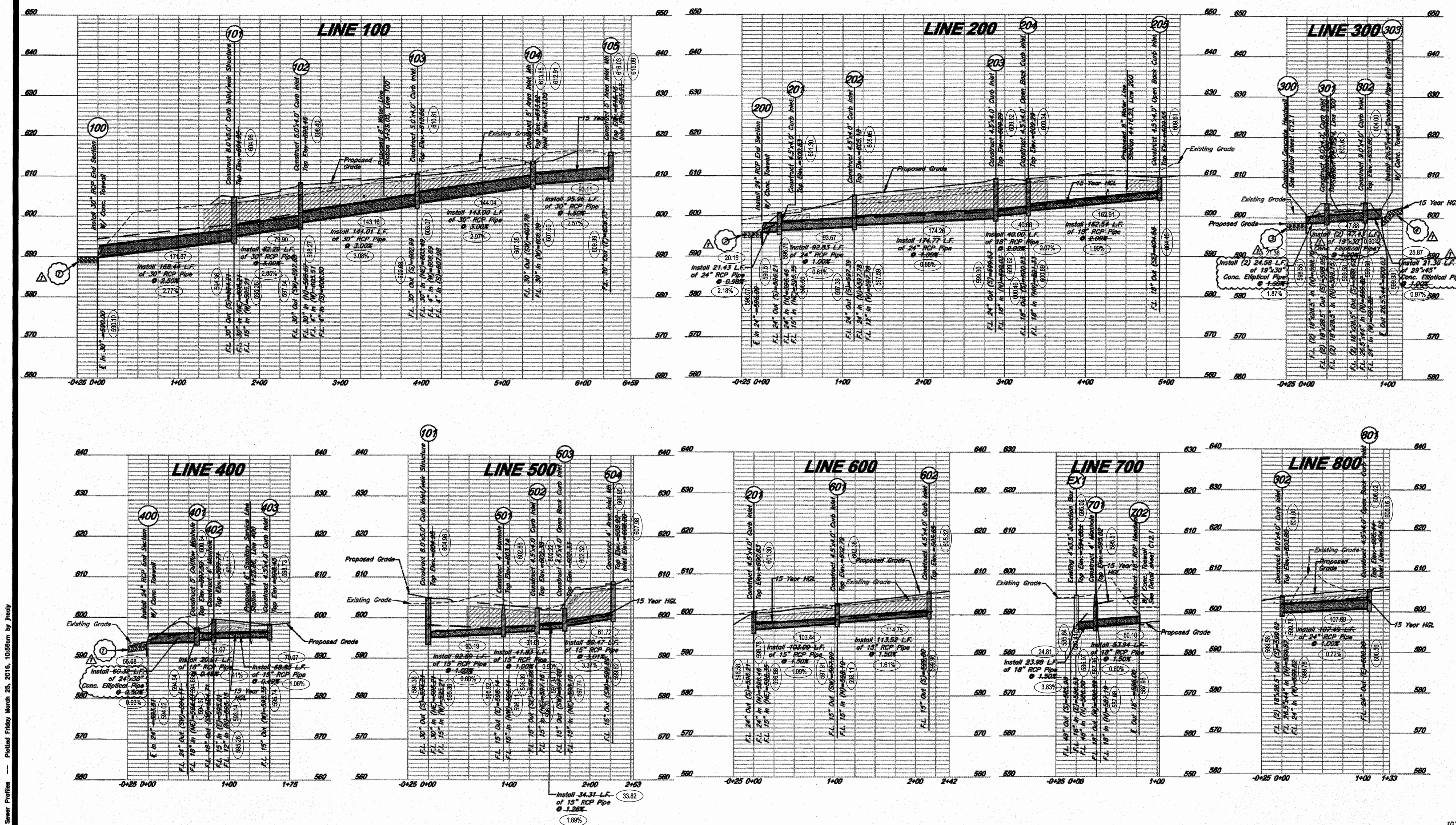
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Revised: 03/25/16  
Last Sample: 03/25/16

REV	DATE	DESCRIPTION
Δ	3/25/2016	City Comments



PROJECT NUMBER  
13326.00  
DATE  
03/25/16  
CONSTRUCTION DOCUMENTS  
DESIGNED: HTR/JMM/JRH  
DRAWN: HTR/JMM/JRH  
REVIEWED: HTR/BDB  
SHEET TITLE  
**Storm Sewer  
Profiles**  
SHEET NUMBER

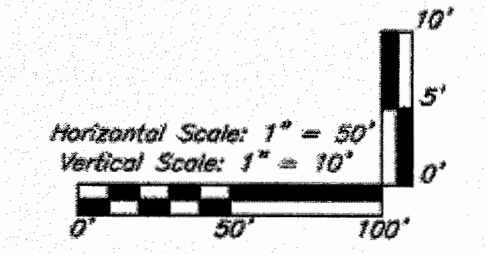
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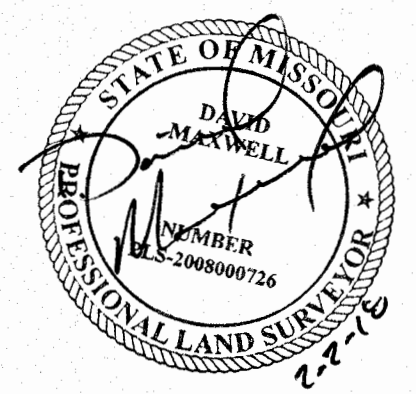
- Riprap Notes:**
- 49 SY MSD Type 5 Rock Blanket  
Length=25'  
Width=14.5'  
Depth=18"
  - 47 SY MSD Type 5 Rock Blanket  
Length=24'  
Width=14.5'  
Depth=18"
  - 55 SY MSD Type 5 Rock Blanket  
Length=26.75'  
Width=16.75'  
Depth=18"
  - 67 SY MSD Type 5 Rock Blanket  
Length=30.30'  
Width=16.75'  
Depth=18"

- Legend**
- 15 Year Hydraulic Grade Line (HGL)
  - Riprap per Sheet C5.0
  - Limits of Granular Limestone and Screenings Backfill Material

- Notes:**
- Class III RCP to be installed with O-Ring rubber type gaskets. See Utility Plan Sheet C5.0 for storm sewer notes.
  - Crushed limestone and screenings backfill shown on profiles under pavement and within the 1:1 pavement shear plane, to pavement sub-grade, and between pipes at utility crossings.
  - Crushed limestone and screenings backfill required in locations of rock cut and is not shown on profiles. Trade contractor to locate and backfill with crushed limestone and screenings in locations of rock cut.

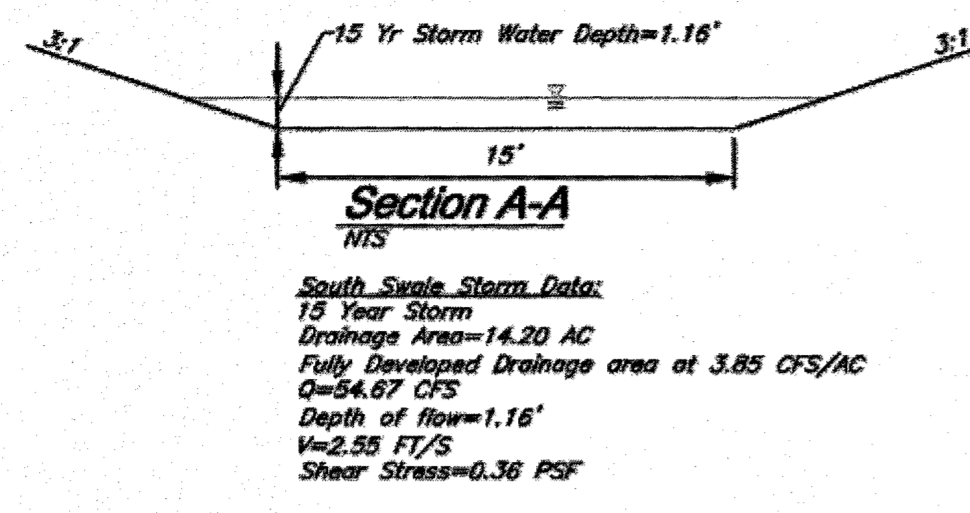


# "AS-BUILT"



**PREMIER**  
ENGINEERING ARCHITECTURE SURVEYING  
308 TCW COURT, LAKE SAINT LOUIS, MO 63367

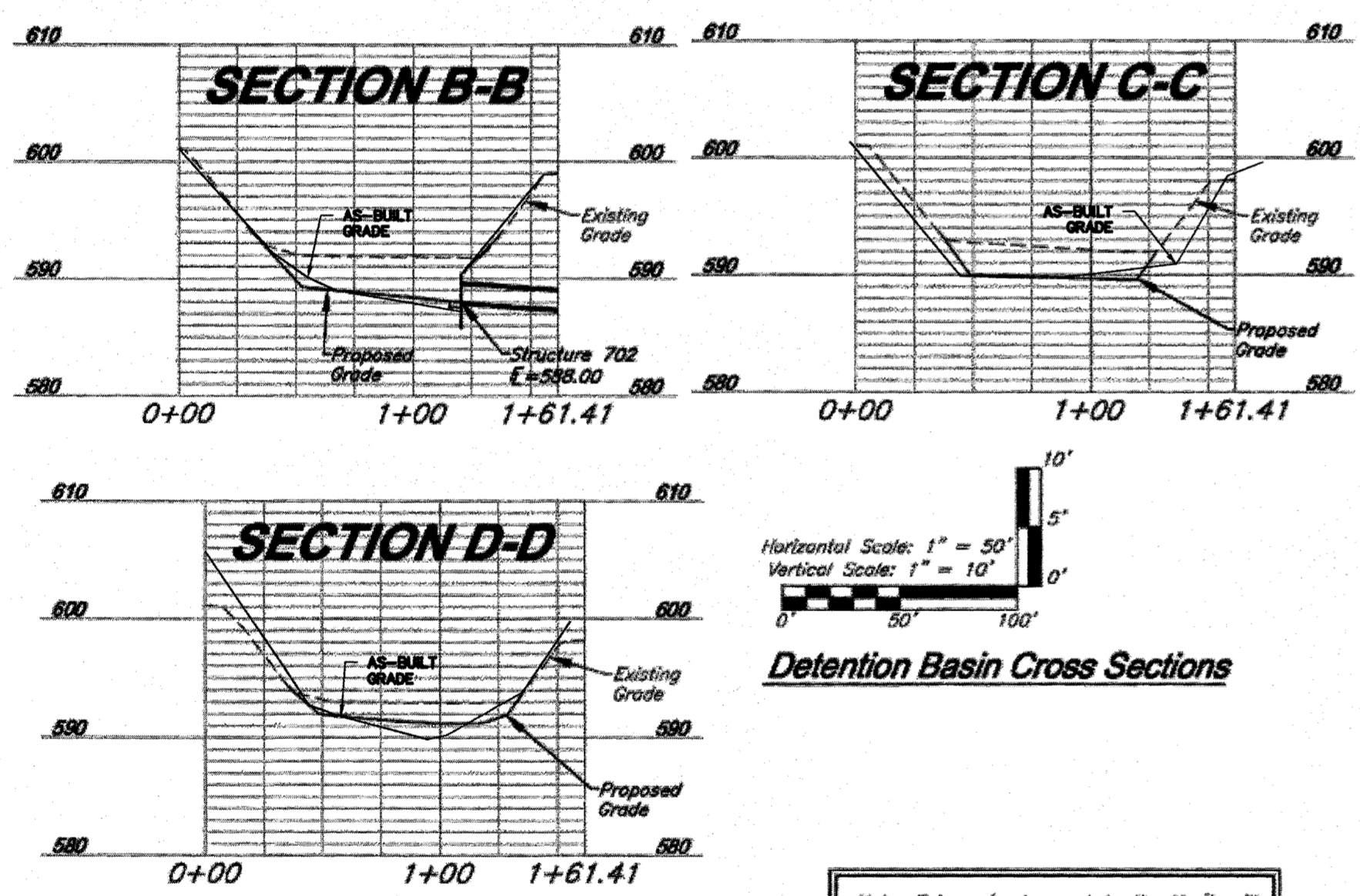
Prepared by: **PREMIER ENGINEERING,**  
ARCHITECTURE & SURVEY



Stormwater Treatment Unit 101A Water Quality Flow Calculation  
Treatment Area = 2.25 AC  
WQ for treatment unit only =  $(1.14 \times 0.8 \times 2.25) / 12 = 0.17$  AC-FT (0.91 IN)  
Modified CN =  $1000 / (10 + 5P + 100 - 10(0.2 + 1.250P)/2)$   
Cn=0.91  
Q=0.91  
Modified CN = 98  
CSM Table 2.1.5-3:  $10/P = 0.036$   
 $T_c = 5$  min  
CSM Table 2.1.5-6:  $q_u = 1000$  CSM/IN  
WQF =  $(1000 \text{ CSM/IN}) \times (1 \text{ AC}/640 \text{ SQM}) \times (0.91 \text{ IN}) = 1.42$  CFS

NOTE: The water quality flow for treatment unit 101A is designed for the Justice Center property only; no offsite drainage area has been included in the calculation. The weir in structure 101 will divert the water quality flow to treatment structure 101A with any additional flow continuing through to the detention basin at structure 100.

Site Water Quality Volume Calculation:  
WQV =  $(P \times R \times A) / 12$   
P = 1.14"  
A = 15.00 AC  
% Impervious =  $(5.08/15) \times 100 = 33.87\%$   
 $R = 0.05 + (0.009 \times 33.87)$   
 $R = 0.05 + (0.009 \times 33.87)$   
 $R = 0.3548$   
WQV =  $(1.14 \times 0.3548 \times 15) / 12$   
WQV = 0.51 AC-FT = 22.025 CF



15 Year Storm - Undeveloped Property to North - Shown on Sheet C7.0										Pipe Design										Design Checks										Comments	
Structures					Runoff Calculations					Pipe Design					Design Checks					Downstream					Hydraulic		Comments				
From	To	Direct Area (ac)	Total Area (ac)	P.I. (cfs/acre)	Design Q (cfs)	Description	Pipe length (ft)	Pipe Slope, %	Pipe Dia. (in)	Q full (cfs)	Pipe Area, sq ft	V full (ft/s)	Design V (ft/s)	Hw/D	Outlet Head, ft	Hw, Inlet Control, (ft)	Hw, Outlet Control, (ft)	Inlet Top Elevation (ft)	Upstream Inlet Elevation (ft)	Downstream Inlet Elevation (ft)	Downstream Outlet Elevation (ft)	Hydraulic Grade Elev. (Calculated) (ft)	Hydraulic Grade Elev. (Proposed) (ft)								
105	104	3.43	3.43	1.87	6.4	Area Inlet MH	85.96	1.50	30	50.37	4.91	10.28	7.02	0.7	0.06	611.47	608.81	613.92	608.73	608.29	608.73	611.47	614.15	614.15	Offsite Drainage						
104	103	3.09	6.52	1.94	6.0	Area Inlet MH	143.12	3.00	30	71.24	4.91	14.51	13.28	1.1	1.72	610.54	607.86	610.88	607.78	603.50	605.94	608.73	611.92	611.92	Offsite Drainage						
103	102	0.98	7.50	2.10	2.2	Curb Inlet	144.01	3.00	30	71.24	4.91	14.51	11.45	0.8	0.58	605.04	603.34	603.00	603.00	598.88	598.95	604.04	606.66	606.66	Offsite Drainage						
102	101	1.06	8.56	2.32	19.0	RCP	82.18	3.00	30	71.24	4.91	14.51	12.28	0.9	0.87	598.98	597.51	604.96	597.88	598.21	598.84	604.96	602.95	602.95	Junction with Line 500 and Treatment Unit						
101	100	0.27	8.83	3.85	24.0	RCP	168.44	2.50	30	85.03	4.91	13.28	12.22	1.1	1.72	598.64	597.72	604.96	594.21	598.00	598.00	604.96	602.95	602.95	Junction with Line 500 and Treatment Unit						
205	204	2.28	2.28	2.90	6.6	Curb Inlet	162.54	2.00	18	14.90	1.77	8.43	8.78	1.0	1.85	605.21	604.83	609.35	604.68	601.44	603.78	609.35	607.55	607.55	Offsite Drainage						
204	203	1.12	3.38	2.93	3.3	Curb Inlet	40.00	2.00	18	14.90	1.77	8.43	8.98	1.5	1.35	603.16	602.78	609.35	600.94	600.14	601.40	609.35	607.29	607.29	Offsite Drainage						
203	202	0.09	3.47	3.85	0.3	Curb Inlet	174.77	1.00	24	22.68	3.14	7.22	7.91	0.9	0.98	601.40	600.84	609.35	598.64	597.89	598.98	609.35	607.29	607.29	Junction with Roof Drain						
202	201	1.08	4.55	3.85	4.2	Curb Inlet	92.83	1.00	24	22.68	3.14	7.22	7.85	1.2	1.59	598.82	598.96	609.35	597.39	598.48	598.37	609.35	603.18	603.18	Junction with Roof Drain						
201	200	0.17	4.72	3.85	18.4	RCP	21.43	1.00	30	41.13	4.91	8.38	7.91	0.9	0.31	598.37	598.31	609.35	598.21	598.00	598.00	609.35	598.83	598.83	Junction with Line 500						
303	302	4.54	4.54	1.87	8.5	End Section	21.30	1.00	36	68.88	7.07	9.46	7.95	0.7	0.03	602.10	601.67	N/A	602.03	599.82	601.63	602.10	605.00	605.00	Offsite Drainage						
302	301	0.03	4.57	3.85	0.1	Curb Inlet	47.43	1.00	24	22.68	3.14	7.22	6.79	0.7	0.07	601.03	600.56	603.80	599.62	599.15	600.49	601.03	601.80	601.80	Calculation shown is for one of two pipes, 24" equivalent						
301	300	0.15	4.72	3.85	0.8	Curb Inlet	24.56	1.00	24	22.68	3.14	7.22	7.25	0.8	0.15	600.49	599.85	603.48	598.95	598.70	598.70	600.49	601.48	601.48	Calculation shown is for one of two pipes, 24" equivalent						
403	402	0.76	0.76	3.85	2.9	Curb Inlet	68.85	0.50	15	4.58	1.23	3.73	3.94	0.9	0.42	598.42	598.43	598.45	598.38	598.02	598.02	598.42	598.45	598.45	Junction with Roof Drain						
402	401	0.37	1.13	3.85	1.4	Manhole	20.91	0.50	18	7.45	1.77	4.21	4.38	0.8	0.19	598.98	598.80	599.71	594.72	594.81	594.81	598.98	598.70	598.70	Junction with Roof Drain						
401	400	3.86	4.99	3.85	4.4	RCP	60.32	0.50	30	28.08	4.91	8.92	6.63	1.1	0.95	598.78	594.78	597.50	594.11	593.81	593.81	598.78	598.50	598.50	BMP Outflow 30" equivalent arch pipe						
504	503	0.43	0.43	3.47	1.8	Area Inlet MH	59.47	3.00	18	11.22	1.23	9.14	6.69	0.7	0.15	600.81	598.82	608.92	598.69	598.10	598.65	600.81	608.92	608.92	Offsite Drainage						
503	502	0.32	0.75	3.58	1.1	Curb Inlet	34.31	1.30	15	7.39	1.23	6.02	5.69	0.9	0.27	598.68	598.33	602.33	597.60	597.16	598.09	598.68	602.33	602.33	Offsite Drainage						
502	501	0.29	1.04	3.63	1.1	Curb Inlet	41.83	1.00	15	8.48	1.23	5.28	5.51	1.0	0.51	598.08	598.05	602.38	598.88	598.44	598.44	598.08	602.38	602.38	Offsite Drainage						
501	101	0.00	1.14	3.54	4.0	RCP	92.89	1.00	15	8.48	1.23	5.28	5.54	1.0	1.00	597.41	596.21	603.14	598.14	595.21	595.21	597.41	601.14	601.14	Junction with Line 100						
602	601	0.24	0.24	3.85	0.9	Curb Inlet	113.52	1.50	15	7.93	1.23	6.46	4.38	0.7	0.06	600.77	599.02	605.65	599.91	598.21	598.96	600.77	603.65	603.65	Junction with Line 200						
601	202	0.30	0.54	3.85	1.2	Curb Inlet	103.09	1.50	15	7.93	1.23	6.46	5.45	0.8	0.29	598.98	598.75	602.70	598.01	598.46	598.46	598.98	600.79	600.79	Junction with Line 200						
702	701	58.42	58.42	3.07	21.3	18" Headwall	53.94	1.50	18	12.90	1.77	7.30	7.30	4.5	7.57	594.78	601.22	N/A	588.00	597.19	603.68	594.95	598.00	598.00	Proposed Detention Basin Low Flow						
701	EX1	0.00	58.42	3.07	21.3	RCP	23.98	1.50	18	12.90	1.77	7.30	7.30	4.5	4.88	593.08	591.39	595.02	588.89	588.53	588.53	593.08	598.74	598.74	Flows and Elevations Calculated using HEC-HMS						
801	302	2.60	2.60	1.95	5.1	Curb Inlet	107.49	1.00	24	22.68	3.14	7.22	5.69	0.7	0.17	602.34	599.99	605.44	600.90	599.82	600.82	602.34	603.44	603.44	Offsite Drainage						

15 Year Storm - Developed Property to North - Shown on Sheet C7.1										Pipe Design										Design Checks										Comments	
From	To	Direct Area (ac)	Total Area (ac)	P.I. (cfs/acre)	Design Q (cfs)	Description	Pipe length (ft)	Pipe Slope, %	Pipe Dia. (in)	Q full (cfs)	Pipe Area, sq ft	V full (ft/s)	Design V (ft/s)	Hw/D	Outlet Head, ft	Hw, Inlet Control, (ft)	Hw, Outlet Control, (ft)	Inlet Top Elevation (ft)	Upstream Inlet Elevation (ft)	Downstream Inlet Elevation (ft)	Downstream Outlet Elevation (ft)	Hydraulic Grade Elev. (Calculated) (ft)	Hydraulic Grade Elev. (Proposed) (ft)								
105	104	6.82	6.82	3.85	26.1	Area Inlet MH	85.96	1.50	30	50.37	4.91	10.28	10.23	1.1	1.28	612.46	611.82	615.15	608.73	608.29	610.54	612.46	614.15	614.15	Offsite Drainage						
104	103	0.10	6.92	3.85	0.4	Area Inlet MH	143.12	3.00	30	71.24	4.91	14.51	13.28	1.1	1.72	610.54	607.86	613.92	607.78	603.50	605.94	610.54	611.92	611.92	Offsite Drainage						
103	102	0.98	7.90	3.85	2.2	Curb Inlet	144.01	3.00	30	71.24	4.91	14.51	13.57	1.2	2.05	608.94	603.07	610.88	603.00	598.99	601.02	608.94	608.66	608.66	Offsite Drainage						
102	101	1.06	8.96	3.85	4.1	Curb Inlet	82.18	3.00	30	71.24	4.91	14.51	14.07	1.3	1.97	601.02	599.99	608.46	597.88	598.21	598.11	608.46	602.95	602.95	Junction with Line 500 and Treatment Unit						
101	100	0.27	9.23	3.85	31.8	RCP	168.44	2.50	30	85.03	4.91	13.28	13.82	1.6	4.92	598.11	594.02	604.96	594.21	598.00	598.00	604.96	602.95	602.95	Junction with Line 500 and Treatment Unit						
205	204	1.18	1.18	3.85	4.5	Open Back Curb Inlet	162.54	2.00	18	14.90	1.77	8.43	7.37	0.8	0.79	605.85	603.23	609.35	604.68	601.33	602.43	609.35	607.55	607.55	Offsite Drainage						
204	203	0.80	1.98	3.85	2.3	Open Back Curb Inlet	40.00	2.00	18	14.90	1.77	8.43	8.25	1.1	0.68	602.43	601.74	609.35	600.63	600.03	601.08	602.43	607.29	607.29	Offsite Drainage						
203	202	0.09	2.07	3.85	0.3	Curb Inlet	174.77	1.00	24	22.68	3.14	7.22	8.40	0.8	0.48	601.06	599.85	609.35	598.64	597.78	598.48	609.35	607.29	607.29	Junction with Roof Drain						
202	201	1.08	3.15	3.85	4.2	Curb Inlet	92.83	1.00	24	22.68	3.14	7.22	7.50	1.0	1.06	598.48	598.28	609.35	597.39	598.48	598.22	609.35	603.18	603.18	Junction with Roof Drain						
201	200	0.17	3.32	3.85	13.4	RCP	21.43	1.00	30	41.13	4.91	8.38	7.58	0.8	0.21	598.32	598.21	609.35	598.21	598.00	598.00	609.35	598.83	598.83	Junction with Line 500						
303	302	4.54	4.54	3.85	17.5	End Section	21.30	1.00	36	68.88	7.07	9.46	7.95	0.8	0.15	602.20	601.93	N/A	602.03	599.82	601.78	602.20	605.00	605.00	Offsite Drainage						
302	301	0.03	4.57	3.85	0.1	Curb Inlet	47.43	1.00	24	22.68	3.14	7.22	6.79	0.8	0.30	601.27	6														