

THE CROSSING AT RIVERSIDE CENTRE

A TRACT OF LAND BEING FUTURE DEVELOPMENT ON THE PLAT OF RIVERSIDE INDUSTRIAL CENTRE
AS RECORDED IN PLAT BOOK 30, PAGE 288
LOCATED IN U.S. SURVEY 731, TOWNSHIP 47 NORTH, RANGE 3 EAST OF THE 5TH PRINCIPAL MERIDIAN
ST. CHARLES COUNTY, MISSOURI

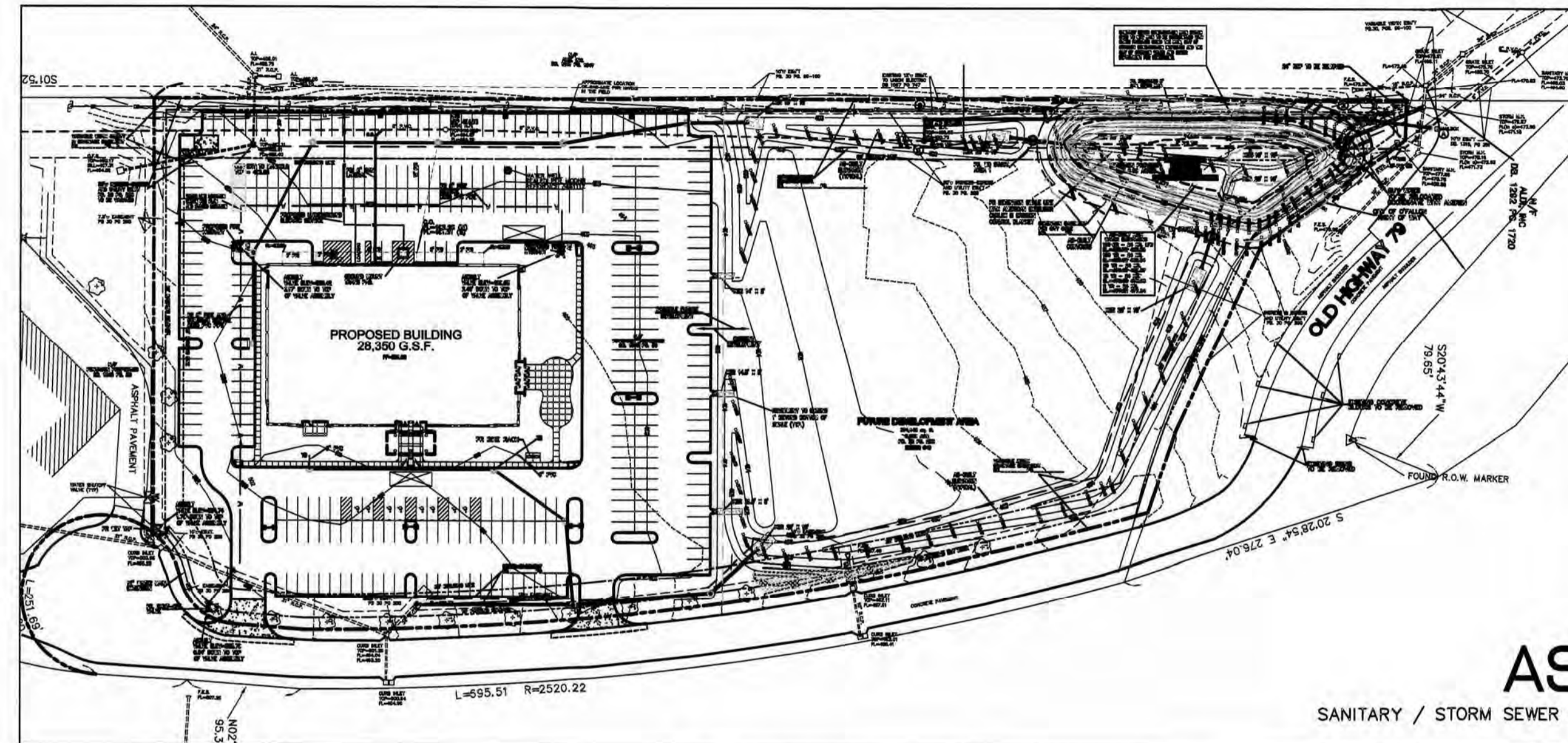
AS-BUILT IMPROVEMENT PLANS

SHEET INDEX

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LEGEND

EXISTING SANITARY SEWER	
EXISTING STORM SEWER	
EXISTING TREE	
EXISTING BUILDING	
EXISTING CONTOUR	
SPOT ELEVATION	
EXISTING UTILITIES	
FOUND 1/2" IRON PIPE	
SET IRON PIPE	
FOUND CROSS	
FOUND STONE	
FIRE HYDRANT	
LIGHT STANDARD	
BUSH	
SIGN	
GUY WIRE	
POWER POLE	
WATER VALVE	
DENOTES RECORD INFORMATION	



SITE DEVELOPMENT PLAN

DIVISION FILE NUMBER: 19 10.02
APPROVAL DATE: 12-02-2010

SITE DEVELOPMENT PLAN REQUIREMENTS:

1. THE SITE PLAN CERTIFICATE SHALL EXPIRE, AND BE OF NO EFFECT, ONE HUNDRED EIGHTY (180) DAYS AFTER THE DATE OF ISSUANCE THEREOF, UNLESS WITHIN SUCH TIME A BUILDING PERMIT FOR ANY PROPOSED WORK AUTHORIZED UNDER SAID SITE CERTIFICATE HAS BEEN ISSUED. THE SITE PLAN CERTIFICATE SHALL EXPIRE AND BE OF NO EFFECT THREE HUNDRED AND SIXTY (360) DAYS AFTER THE DATE OF ITS ISSUANCE, IF CONSTRUCTION HAS NOT BEGUN AND BEEN PURSUED DILIGENTLY ON THE PROPERTY. (ORD. NO. 1181 27.07, 10-15-81)
2. PRIOR TO APPROVAL OF A BUILDING PERMIT, A CONSTRUCTION SITE PLAN MUST BE REVIEWED AND APPROVED BY CITY STAFF.
3. THE APPROPRIATE FIRE DISTRICT WILL NEED TO REVIEW AND APPROVE THE DEVELOPMENT.
4. ANY SIGNAGE TO BE PLACED ON THE SUBJECT PROPERTY REQUIRES A SEPARATE SIGN PERMIT.
5. ANY BUSINESS OCCUPYING THE SITE REQUIRES APPROVAL OF A BUSINESS LICENSE.
6. ALL CONDITIONS OF APPROVAL SHALL BE NOTED ON THE CONSTRUCTION SITE PLANS.

SITE DEVELOPMENT PLAN CONDITIONS:

NO CONDITIONS PER CITY LETTER DATED DECEMBER 3, 2010

SUBJECT PROPERTY LIES WITHIN FLOOD ZONE "X" (AREAS DETERMINED TO BE OUTSIDE THE 500-YEAR FLOODPLAIN) PER NATIONAL FLOOD INSURANCE PROGRAM FLOOD INSURANCE RATE MAP FOR ST. CHARLES COUNTY, MISSOURI, AND INCORPORATED AREAS, THE F.I.R.M. IS IDENTIFIED AS MAP NO. 25183 C 0242E WITH AN EFFECTIVE DATE OF AUGUST 2, 1996.

PERTINENT DATA

SITE ACREAGE	= 8.589 Ac.±
OWNER (CONTRACT)	= WINDSOR CROSSING CHURCH
SITE ADDRESS	= 6000 W GENEVA DRIVE
ZONING	= C-3 "HIGHWAY COMMERCIAL DISTRICT"
FIRE DISTRICT	= CENTRAL COUNTY
SEWER DISTRICT	= CITY OF OFALLON
WATER SERVICE	= CITY OF OFALLON
GAS SERVICE	= LACLEDE GAS COMPANY
ELECTRIC SERVICE	= AmerenUE ELECTRIC COMPANY
PHONE SERVICE	= CENTURYLINK
WATERSHED	= BELLEAU CREEK
WUNNENBERG'S	= PAGE 31, GRID 00-15

PROPERTY DESCRIPTION

A tract of land being the "FUTURE DEVELOPMENT" area of Riverside Industrial Centre as recorded in Plat Book 30 page 288 of the St. Charles County, Missouri records in U.S. Survey 731, Township 47 North, Range 3 East, Fifth Principal Meridian, City of Ofallon, St. Charles County, Missouri, and being more particularly described as follows:

Beginning at the southwest corner of above said "FUTURE DEVELOPMENT" area, also being the northwest corner of Lot 1 of above said Riverside Industrial Centre; thence along the west line of said "FUTURE DEVELOPMENT" area North 01 degree 52 minutes 41 seconds West 1,045.14 feet to the northwest corner of said "FUTURE DEVELOPMENT" area; thence along the northerly line of said "FUTURE DEVELOPMENT" area North 89 degrees 43 minutes 22 seconds East 33.04 feet to the southwesterly line of Old Highway 79; thence along last said southwesterly line the following courses and distances: South 38 degrees 25 minutes 10 seconds East 149.93 feet, South 67 degrees 17 minutes 05 seconds East 168.19 feet, and South 73 degrees 10 minutes 02 seconds East 73.47 feet to a point on a curve on the westerly line of West Geneva Drive, 50 feet wide; thence departing last said southwesterly line along last said westerly line the following courses and distances: Southeasterly along last said curve to the right, for which the radius point bears South 71 degrees 50 minutes 08 seconds West 2,407.22 feet and a chord which bears South 09 degrees 52 minutes 59 seconds East 711.60 feet, an arc distance of 714.08 feet. South 02 degrees 31 minutes 45 seconds West 58.10 feet to the beginning of a curve to the right for which the radius point bears North 87 degrees 28 minutes 15 seconds West 50.00 feet, Southwesterly along last curve with a chord which bears South 38 degrees 58 minutes 45 seconds West 59.41 feet, an arc distance of 63.62 feet to a point of reverse curvature. Southwesterly along a curve to the left for which the radius point bears South 14 degrees 34 minutes 15 seconds East 67.00 feet and a chord which bears South 60 degrees 30 minutes 10 seconds West 43.46 feet, an arc distance of 44.26 feet to the southerly line of above said "FUTURE DEVELOPMENT" area; thence departing last said westerly line along last southerly line South 88 degrees 08 minutes 27 seconds West 363.57 feet to the point of beginning, containing 374,148 square feet or 8,589 acres, more or less.

U.S.G.S. BENCHMARK

STATION SC-06
ELEV. = 529.23 (NGVD 1929 (1981))
THE STATION IS LOCATED ON THE EAST SHOULDER OF NORTH BOUND LANE OF MO. HWY 79 ABOUT 1/2 MILE NORTH OF I-70. IT IS 280± NORTH OF THE NORTH END OF THE RAILROAD OVERPASS AT APPROXIMATE HWY 79 STATION 537+62 AND ON A LINE EXTENDED FROM THE NORTHERLY FENCE ENCLOSING THE LOADING DOCKS OF WAINWRIGHT INDUSTRIES, INC., 14.92 FEET S.E. OF A COTTON PICKER SPINDLE IN THE JOINT OF PAVEMENT AND THE SHOULDER; 14.72' N.E. OF ANOTHER; 12.4 FEET EASTERLY OF THE JOINT BETWEEN THE PAVEMENT AND SHOULDER; AND 2.06' SOUTH OF A CARSONITE WITNESS POST.

UTILITY LOCATES

MISSOURI ONE-CALL
1 800 344-7483
CITY OF OFALLON
TRAFFIC (535) 378-5802
ENGINEERING (535) 378-5555
CONSTRUCTION INSPECTION (535) 378-5568



UTILITY NOTE:

UNDERGROUND FACILITIES, STRUCTURES AND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE SURVEYS, RECORDS AND INFORMATION, AND THEREFORE DO NOT NECESSARILY REFLECT THE ACTUAL EXISTENCE, NON-EXISTENCE, SIZE, TYPE, NUMBER OR LOCATION OF THESE FACILITIES, STRUCTURES AND UTILITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE ACTUAL LOCATION OF ALL UNDERGROUND FACILITIES, STRUCTURES, AND UTILITIES, EITHER SHOWN OR NOT SHOWN ON THESE PLANS. THE UNDERGROUND FACILITIES, STRUCTURES, AND UTILITIES SHALL BE LOCATED IN THE FIELD PRIOR TO ANY GRADING, EXCAVATION OR CONSTRUCTION OF IMPROVEMENTS. THESE PROVISIONS SHALL IN NO WAY ABSOLVE ANY PARTY FROM COMPLYING WITH THE UNDERGROUND FACILITY SAFETY AND DAMAGE PREVENTION ACT, CHAPTER 319 RSMo.

CITY OF OFALLON
COMMUNITY DEVELOPMENT DEPARTMENT
ACCEPTED FOR CONSTRUCTION
BY: _____ DATE _____
PROFESSIONAL ENGINEER'S SEAL
INDICATES RESPONSIBILITY FOR DESIGN

City approval of any construction site plans does not mean that any building can be constructed on the lots without meeting the building setbacks as required by the zoning codes.
All installations and construction shall conform to the approved engineering drawings. However, if the developer chooses to make minor modifications in design and/or specifications during construction, they shall make such changes at their own risk, without any assurance that the City Engineer will approve the completed installation or construction. It shall be the responsibility of the developer to notify the City Engineer of any changes from the approved drawings. The developer may request a letter from the Construction Inspection Division regarding any field changes approved by the City Inspector.
Lighting values will be reviewed on site prior to the final occupancy inspection.

MISSOURI DEPT. OF NATURAL RESOURCES

PERMIT NO. - MOR10D698
EXPIRATION DATE: 02/07/2012

* CITY OF OFALLON CONSTRUCTION WORK HOURS PER CITY ORDINANCE 3429 AS SHOWN IN SECTION 500.420 OF THE MUNICIPAL CODE OF THE CITY OF OFALLON ARE AS FOLLOWS:

OCTOBER 1 THROUGH MAY 31
7:00 A.M. TO 7:00 P.M. MONDAY THROUGH SUNDAY
JUNE 1 THROUGH SEPTEMBER 30
8:00 A.M. TO 8:00 P.M. MONDAY THROUGH FRIDAY

7:00 A.M. TO 8:00 P.M. SATURDAY AND SUNDAY

* THE AREA OF THIS PHASE OF DEVELOPMENT IS: 8.59 AC

THE AREA OF LAND DISTURBANCE IS: 7.21 AC

NUMBER OF PROPOSED LOTS IS: 1

BUILDING SETBACK INFORMATION: FRONT 30 FEET

SIDE 25 FEET

REAR 50 FEET

* THE ESTIMATED SANITARY FLOW IN GALLONS PER DAY IS 6960

* PARKING CALCULATIONS

REQUIRED PARKING BASED ON CLASSIFICATION: CHURCH

REQUIRED PARKING = 1 SPACE PER 3 SEATS

NUMBER OF SEATS IN BUILDING = 1014

TOTAL REQUIRED = 1014/3 = 338 SPACES

TOTAL PROVIDED: 338 SPACES

ACCESSIBLE SPACES

REQUIRED: 301-400 SPACES PROVIDED

REQUIRED: 8 ACCESSIBLE SPACES (1 VAN ACCESSIBLE)

PROVIDED: 8 ACCESSIBLE SPACES (2 VAN ACCESSIBLE)

LOADING CALCULATIONS:

REQUIRED: 1 PER 5000 SF + 1 PER EACH ADDITIONAL 20,000 SF = 2 REQ'D

PROVIDED: 2

BIKE RACK REQUIREMENTS:

4 RACK SPACES REQUIRED PER PLANNING AND ZONING

PROVIDED: 4 RACK SPACES

PREPARED FOR:

OWNER/CONTRACTOR
WINDSOR CROSSING CHURCH
114 NORTH EARTHERTON
CHESTERFIELD, MO 63005
CONTACT: ART KUIPER

Agency Contacts

Sanitary Sewer
City of Ofallon
100 N. Main St.
Ofallon, MO. 63366
Contact: 636-281-2858

Water
City of Ofallon
100 N. Main St.
Ofallon, MO. 63366
Contact: 636-281-2858

Storm Sewer
City of Ofallon
100 N. Main St.
Ofallon, MO. 63366
Contact: 636-281-2858

Central County Fire
1 Timberbrook Dr.
St. Peters, MO 63376
636-970-9700

Ameren UE
200 Callahan Road
Wentzville, MO. 63385
636-639-8312

Gas
Laclede Gas Company
3650 Forest Park Ave.
St. Louis, MO. 63134
314-658-5437

Telephone
Century Link
1151 Century Link Dr.
Wentzville, MO. 63385
636-332-7030

	WATER QUALITY 02/17/11
	CITY APPROVAL 02/01/11
	CITY COMMENTS 01/26/11
	CITY COMMENTS 01/13/11

THE CROSSING AT RIVERSIDE CENTRE

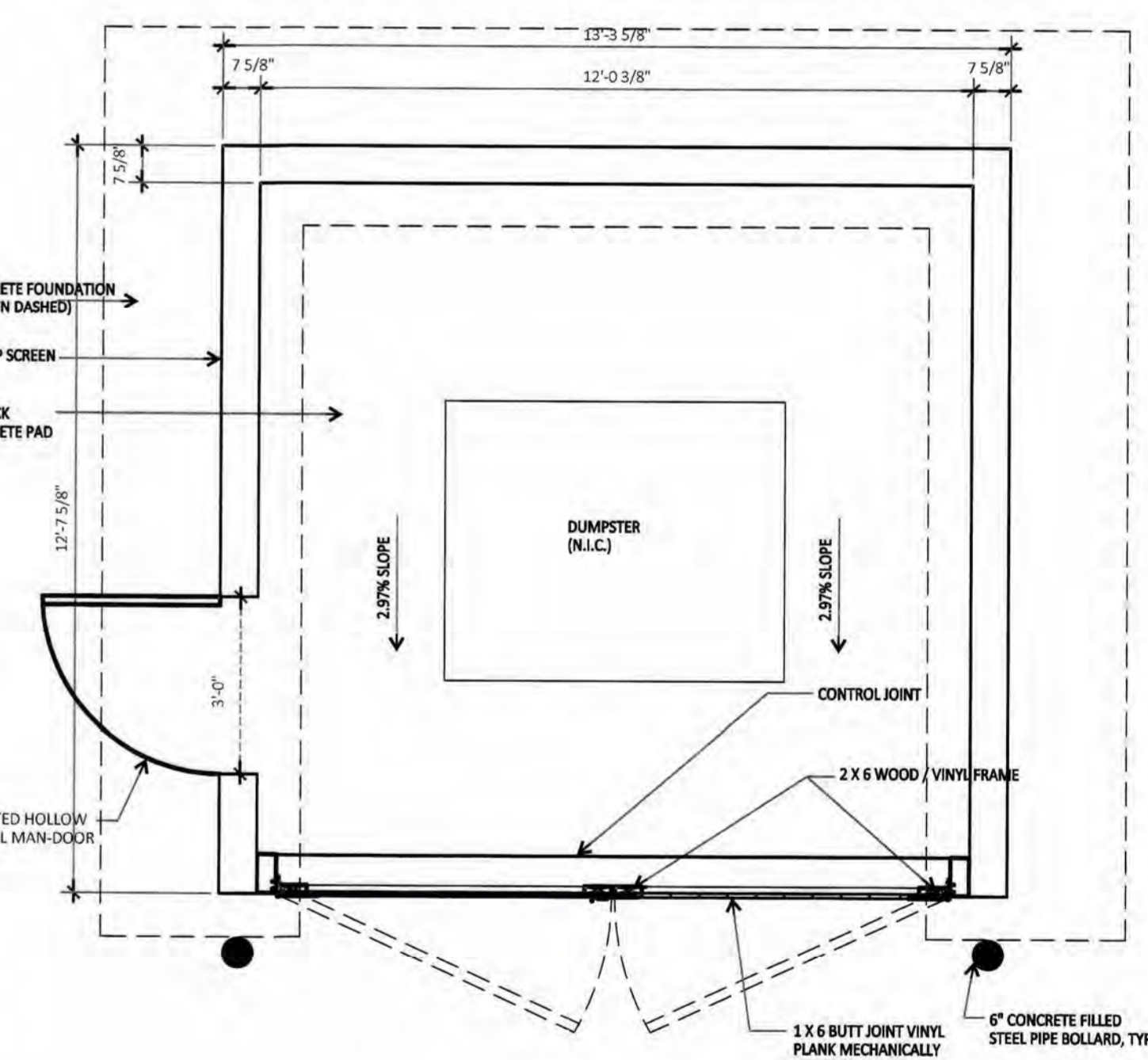
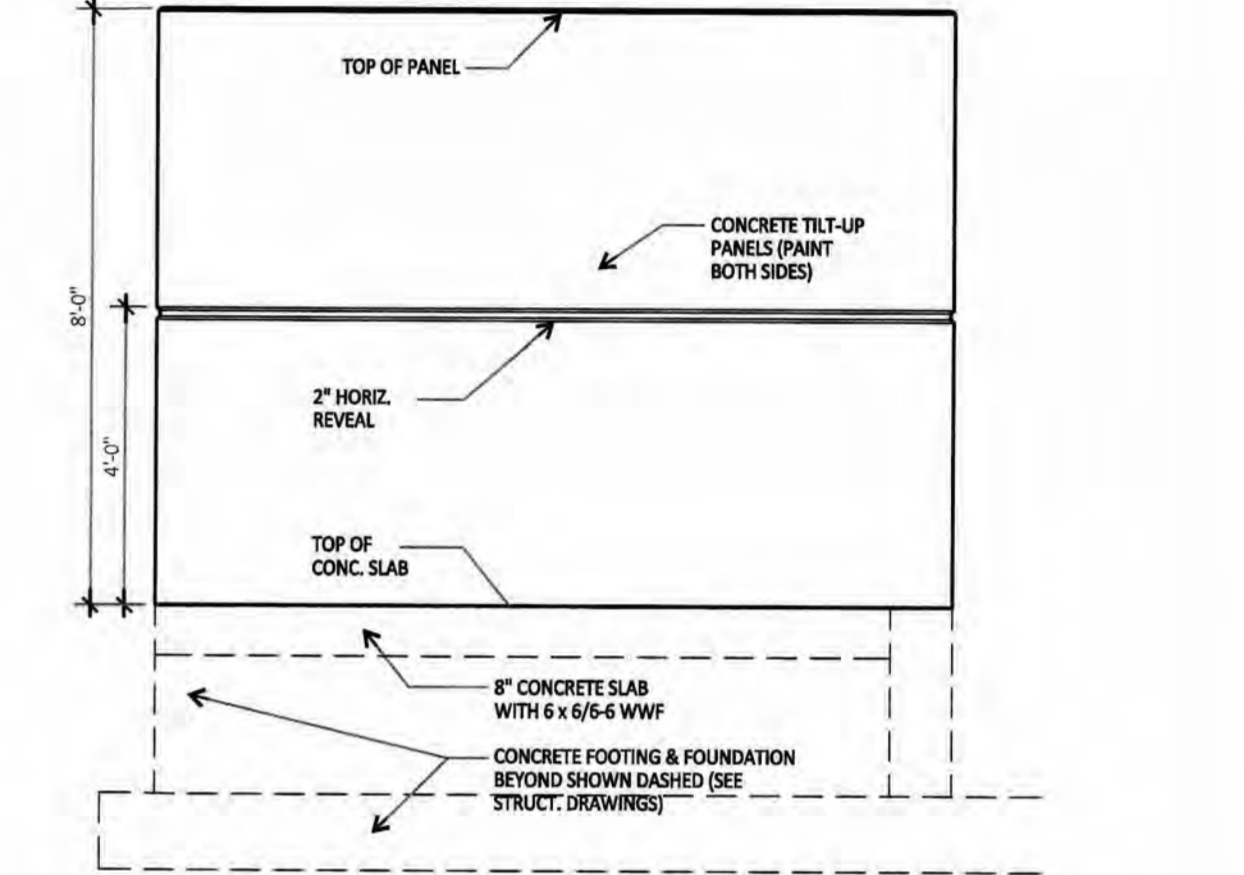
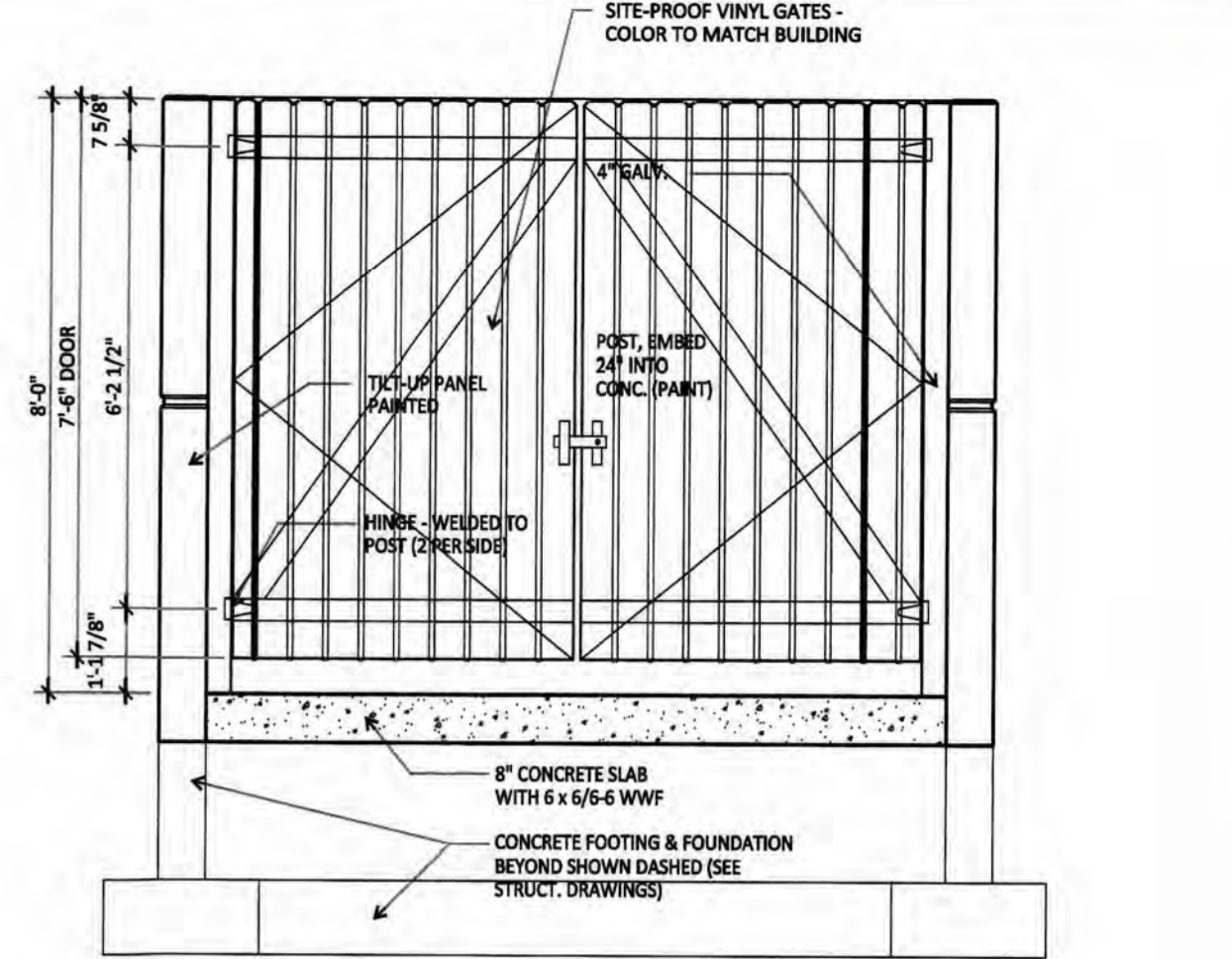
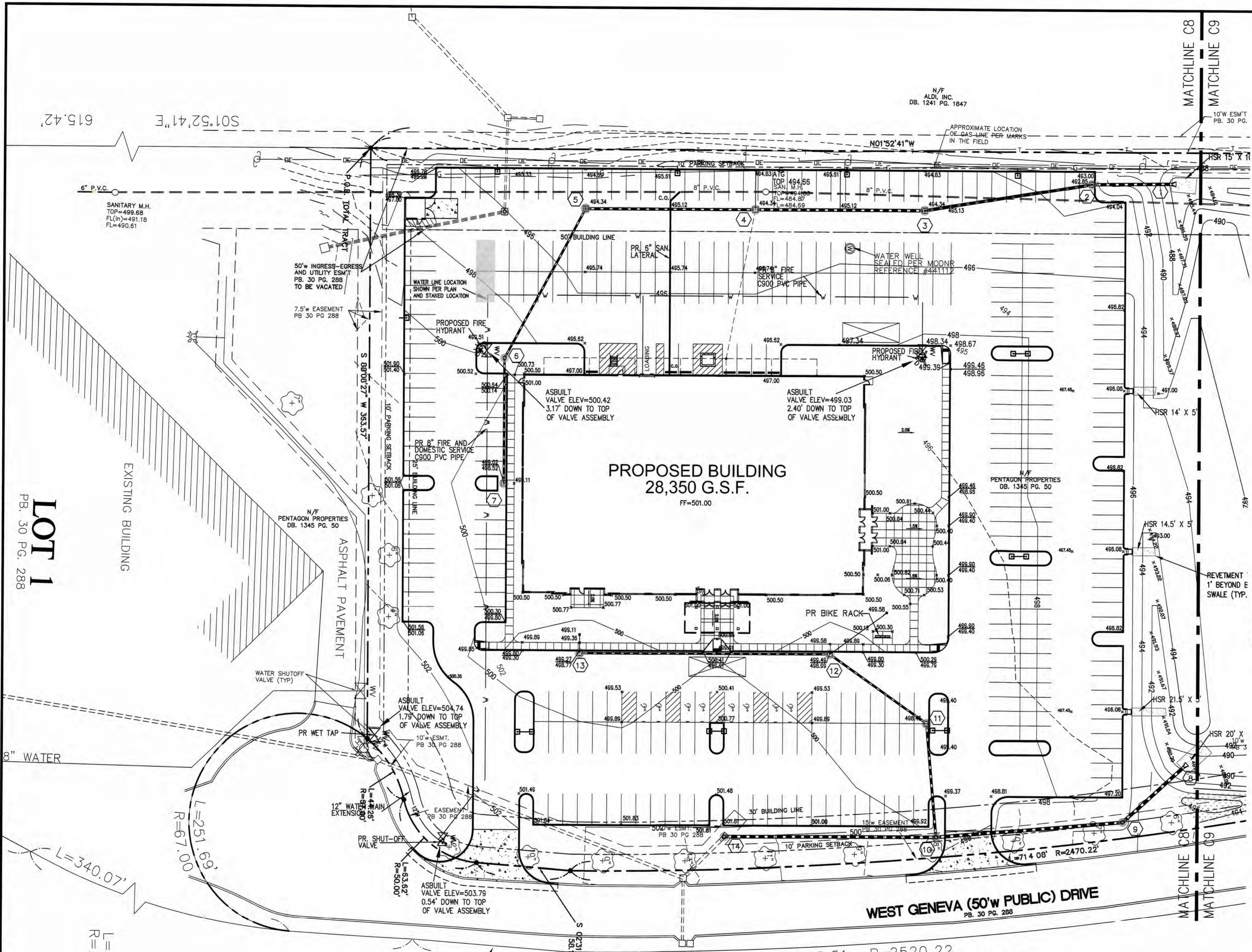
TITLE SHEET

Stock & Associates
Consulting Engineers, Inc.

257 Chesterfield Business Parkway
St. Louis, MO 63005
PH. (636) 530-9100
FAX (636) 530-9130
e-mail: general@stockassoc.com
Web: www.stockassoc.com

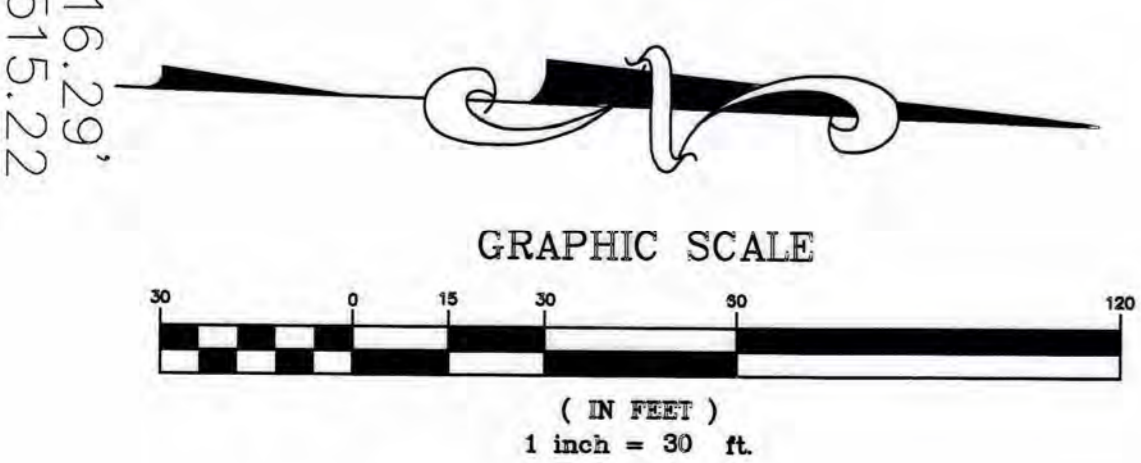
GEORGE M. STOCK E-25116
CIVIL ENGINEER
CERTIFICATE OF AUTHORITY
NUMBER: 000995

DRAWN BY:	DATE:	CHECKED BY:	DATE:	JOB NUMBER:	SHEET:
P.R.G.	12/21/10	G.M.S.	12/21/10	210-4626.2	C1



TRASH ENCLOSURE DETAILS
NTS

- ▲ WATER QUALITY 02/17/11
- ▲ CITY APPROVAL 02/01/11
- ▲ CITY COMMENTS 01/26/11
- ▲ CITY COMMENTS 01/13/11



STATE OF MISSOURI
 RANDALL S. ROSSON
 LICENSE NO. 00056
 PROFESSIONAL LAND SURVEYOR

Randall S. Rosson
 3-9-16
 Date

AS-BUILT
 SANITARY / STORM SEWER - WATER QUALITY FEATURE - WATER LINE

The existing sewer lengths, sizes, flowlines, depths of structures and sewers locations with respect to existing or proposed easements have been measured. Water Quality Features, Retention Basins and drainage swales have been measured. Fire hydrants and valves have been measured. The results of those measurements are shown on this set of Final Measurement plans. Since the sanitary wye locations have been plotted from information provided by the sewer contractor or other sources, I disclaim any responsibility for that specific information.

All public sewers are located within designated existing or proposed easements.

02/17/11

GEORGE M. STOCK E-25115
 CIVIL ENGINEER
 CERTIFICATE OF AUTHORITY
 NUMBER: 00056

THE CROSSING AT RIVERSIDE CENTRE
 SITE AND GRADING PLAN

STOCK & ASSOCIATES
 Consulting Engineers, Inc.

257 Chesterfield Business Parkway
 St. Louis, MO 63005
 PH. (636) 530-9100
 FAX (636) 530-9130
 e-mail: general@stockassoc.com
 Web: www.stockassoc.com

DRAWN BY:	DATE:	CHECKED BY:	DATE:	JOB NUMBER:	SHEET:
P.R.G.	12/21/10	G.M.S.	12/21/10	210-4626	C8

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AS-BUILT

SANITARY / STORM SEWER - WATER QUALITY FEATURE - WATER LINE

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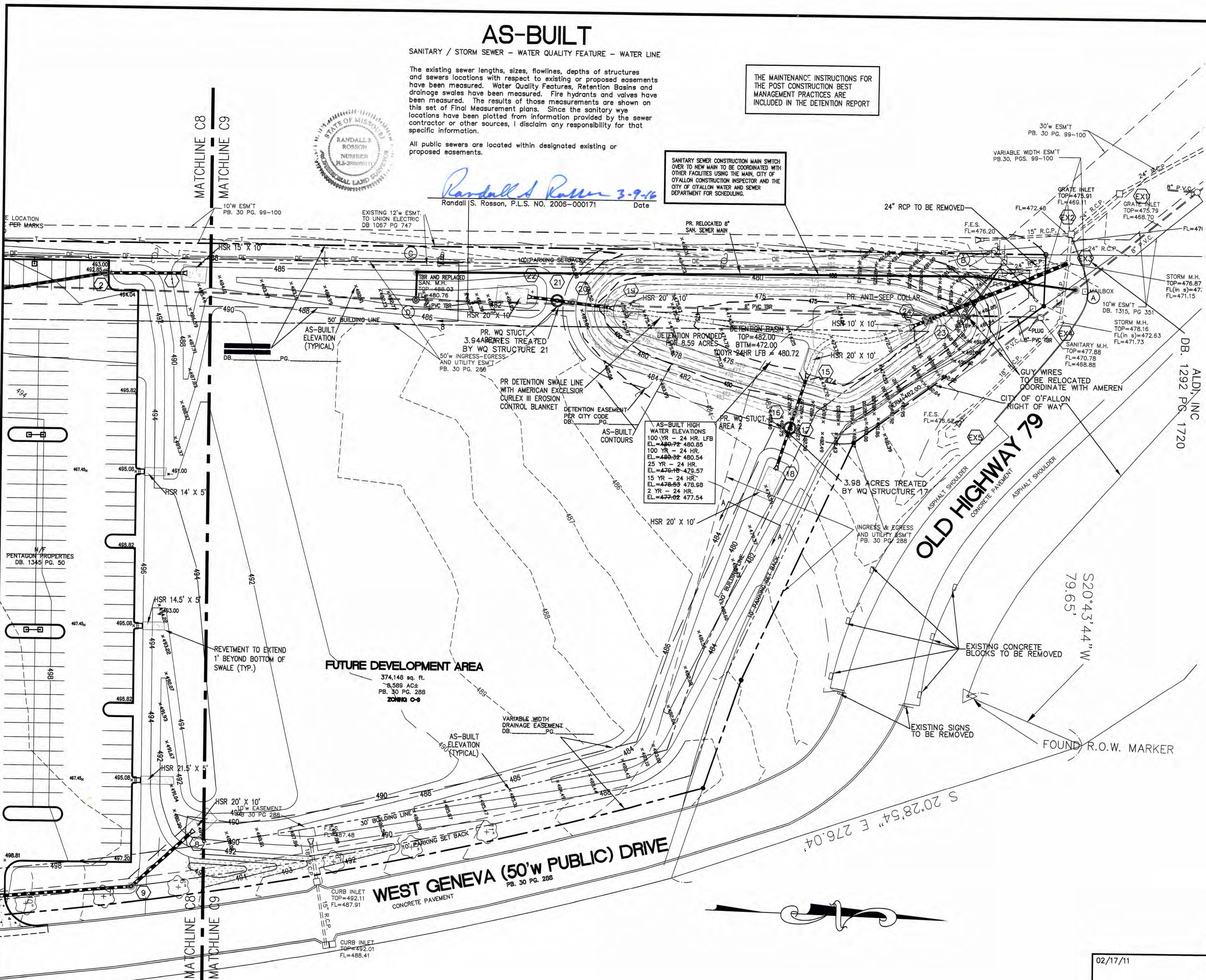
All public sewers are located within designated existing or proposed easements.

THE MAINTENANCE INSTRUCTIONS FOR THE POST CONSTRUCTION BEST MANAGEMENT PRACTICES ARE INCLUDED IN THE DETENTION REPORT

SANITARY SEWER CONSTRUCTION MAIN SWITCH OVER TO NEW MAIN TO BE COORDINATED WITH OTHER FACILITIES USING THE MAIN, CITY OF O'FALLON WATER AND SEWER DEPARTMENT FOR SCHEDULING.



Randall S. Rosson 3-9-16
 Randall S. Rosson, P.L.S. NO. 2005-000171 Date



Stream Channel:

Project #: 210-4626
 Name: Crossing
 Calculated: PRG 12-08-10
 Checked:
 Station #: Swale A-A

Roughness Coefficient (n)	
Concrete	0.012
Asphalt smooth	0.013
Asphalt rough	0.016
Gravel beds, straight	0.025
Gravel beds plus large boulders	0.040
Earth winding w/ grass	0.050
Earth, straight w/ grass	0.026

Manning Equation: $Q = (1.49/n)A R^{2/3} S^{1/2}$

FIND DEPTH OF WATER AND WIDTH OF THE CHANNEL:

INPUT:

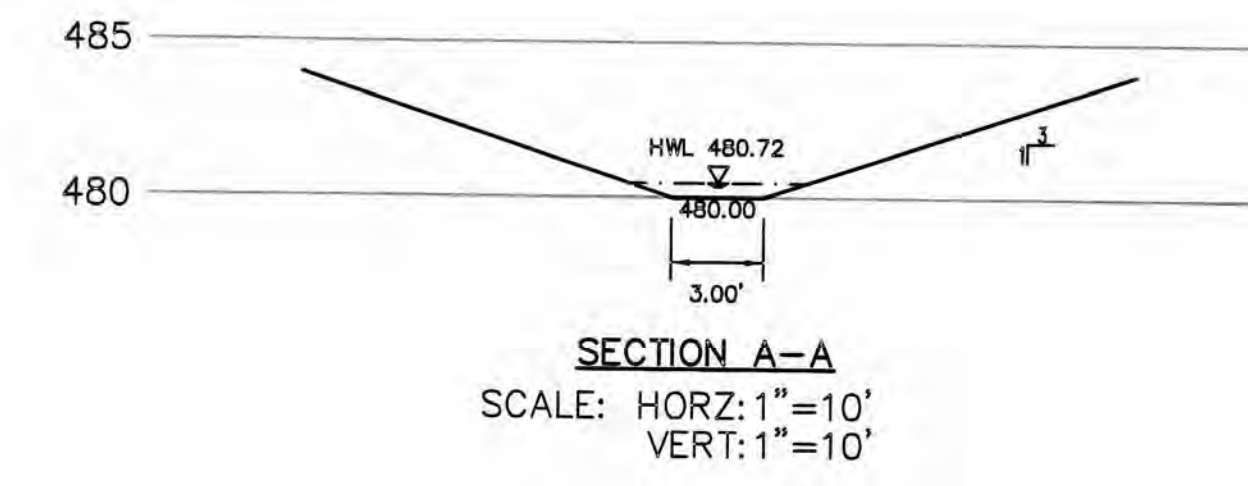
Q = 19.69 (cfs)
 Stream Slope = 0.0223 (ft/ft)
 n = 0.026
 W (Bottom width) = 3 (ft)

Top Of bank Elevation = 484.00
 Bot. Elevation = 480.00
 Side Slope:
 Horizontal (H) = 3
 Vertical (V) = 1

OUTPUT:

Depth = 0.72 (ft)
 Velocity = 5.34 (ft/sec)
 Water Surface Elev. = 480.72
 Free Board = 3.28 (ft)

Water Surface Width = 7.30 (ft)
 $R^{2/3} = 0.82$
 Perimeter = 7.53 (ft)
 Cross section Area = 3.89 (ft²)



Stream Channel:

Project #: 210-4626
 Name: Crossing
 Calculated: PRG 12-08-10
 Checked:
 Station #: Swale A-A

Roughness Coefficient (n)	
Concrete	0.012
Asphalt smooth	0.013
Asphalt rough	0.016
Gravel beds, straight	0.025
Gravel beds plus large boulders	0.040
Earth winding w/ grass	0.050
Earth, straight w/ grass	0.026

Manning Equation: $Q = (1.49/n)A R^{2/3} S^{1/2}$

FIND DEPTH OF WATER AND WIDTH OF THE CHANNEL:

INPUT:

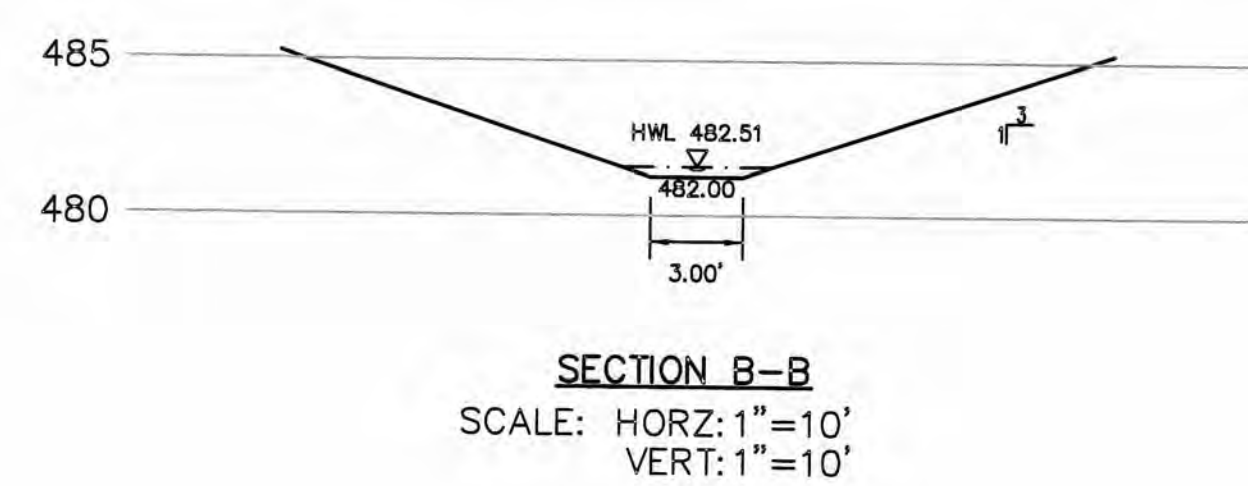
Q = 10.72 (cfs)
 Stream Slope = 0.0223 (ft/ft)
 n = 0.026
 W (Bottom width) = 3 (ft)

Top Of bank Elevation = 486.00
 Bot. Elevation = 482.00
 Side Slope:
 Horizontal (H) = 3
 Vertical (V) = 1

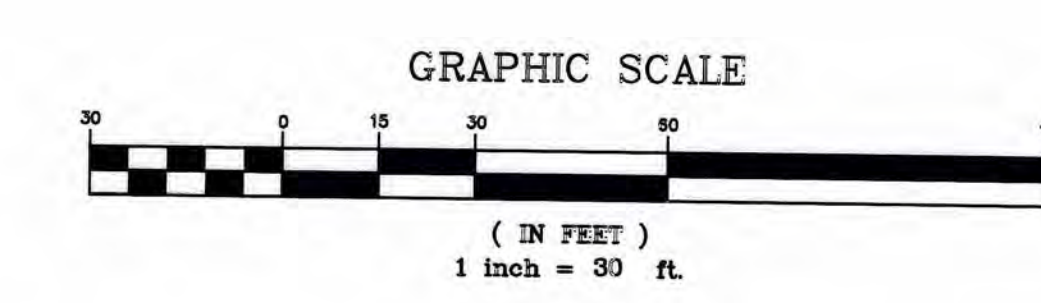
OUTPUT:

Depth = 0.82 (ft)
 Velocity = 4.52 (ft/sec)
 Water Surface Elev. = 482.82
 Free Board = 3.48 (ft)

Water Surface Width = 6.12 (ft)
 $R^{2/3} = 0.82$
 Perimeter = 6.29 (ft)
 Cross section Area = 2.37 (ft²)



- ▲ WATER QUALITY 02/17/11
- ▲ CITY APPROVAL 02/01/11
- ▲ CITY COMMENTS 01/26/11
- ▲ CITY COMMENTS 01/13/11



02/17/11
 GEORGE M. STOCK E-25116
 CIVIL ENGINEER
 CERTIFICATE OF AUTHORITY
 NUMBER: 000995

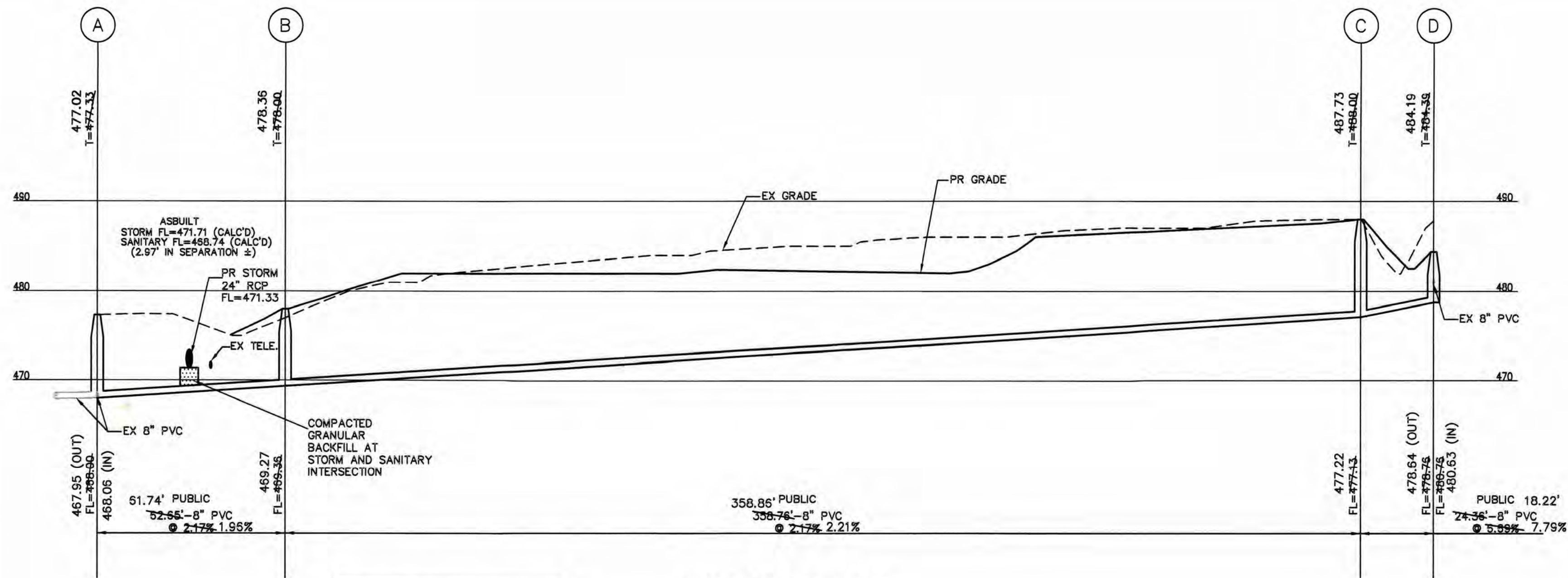
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DRAWN BY: P.R.G. DATE: 12/21/10 CHECKED BY: G.M.S. DATE: 12/21/10 DATE: JOB NUMBER: 210-4626 SHEET: C9

C:\DRAWING\2104626\SURVEY\CITY\AS-BUILT\4626-Base2-Base2-basin berm.dwg Mar 05, 2016 - 11:31am



SANITARY SEWER NOTE
 ALL DETAILS SHOWN ON THIS SHEET ARE FOR THE CONVENIENCE OF THE CONTRACTOR. THE DETAILS ARE TO BE VERIFIED PER MSD STANDARDS FOR SANITARY SEWERS & CITY OF FALLON CONSTRUCTION SPECIFICATIONS.

- CONSTRUCTION NOTES:**
1. ALL R.C.P. SHALL BE CLASS III UNLESS NOTED OTHERWISE.
 2. ALL P.V.C. SHALL BE SDR 35 UNLESS NOTED OTHERWISE.
- ALL SEWERS SHOWN ARE PRIVATE, UNLESS OTHERWISE NOTED.
 ENGINEER APPROVED SHOP DRAWINGS MUST BE SUBMITTED TO THE CITY OF O'FALLON

SANITARY SEWER CONSTRUCTION MAIN SWITCH OVER TO NEW MAIN TO BE COORDINATED WITH OTHER FACILITIES USING THE MAIN, CITY OF O'FALLON CONSTRUCTION INSPECTOR AND THE CITY OF O'FALLON WATER AND SEWER DEPARTMENT FOR SCHEDULING.

SANITARY SEWERS
 SCALE: HORZ: 1"=30'
 VERT: 1"=10'

AS-BUILT

SANITARY / STORM SEWER - WATER QUALITY FEATURE - WATER LINE

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Randall S. Rosson 3-9-16
 Randall S. Rosson, P.L.S. NO. 2006-000171 Date



HYDRAULIC CALCULATION SHEET (SEE DRAINAGE AREA MAP SHEET FOR P.L AND Q (inflow) FOR EACH STRUCTURE)

Project name:		The Crossing at Riverside Centre		Calculated By:		PRG																					
Project number:		210-4626		Checked By:		GMS																					
Project Location:		O'fallon, MO		Date:		7/17/2011																					
LINE		FLOW LINE ELEVATIONS		UPDATED 3/19/12		Bend Coefficients:																					
Structure Number	Upper structure	Lower structure	Upper	Lower	Length (ft)	Flowline Grade ft/ft	Pipe Size (in.)	Full Flow Cap. (cfs)	Total (Q) (cfs)	Mean Full Flow Vel.(V) (ft/s)	Bend Coef.	Velocity Head (Vh) (ft)	QVh (ft ³ /s)	Pipe Coef. (n)	Fr (ft)	Junction (ft)	Bend (ft)	Total H _{fr} + Dia. (ft)	Upper H.L.E. (ft)	Lower H.L.E. (ft)	Lower H.L.E. (ft)	Structure H.L.E. + H _{fr} (ft)	TOP Structure Elevation	Free Board	Structure Number		
EX5	EX5	EX4	476.71	472.70	95.21	0.0422	18	21.63	4.20	2.38	0	0.09	0.37	0.013	0.15	0.00	0.00	0.00	478.21	475.11	474.96	478.21	478.21	0.00	EX5		
EX4	EX4	EX3	472.70	471.26	37.86	0.0379	18	20.51	4.20	2.38	0.43	0.09	0.37	0.013	0.06	0.00	0.04	0.04	474.20	474.92	474.86	474.96	478.19	3.23	EX4		
EX3	EX3	EX2	471.26	470.85	18.74	0.0219	24	33.55	25.84	8.23	0	1.05	27.15	0.013	0.24	1.38	0.00	1.38	473.26	473.48	473.24	474.86	476.85	1.99	EX3		
EX2	EX2	EX1	469.14	468.64	40.30	0.0124	24	25.27	33.47	10.65	0.43	1.76	58.99	0.013	0.88	1.27	0.45	1.72	471.14	471.52	470.64	473.24	475.90	2.66	EX2		
EX1			468.64																			470.64			EX1		
HYDRAULIC FLOW LINE = assume top pipe																											
23	23	EX3	472.04	471.54	96.04	0.0052	24	16.37	21.64	6.89	0	0.74	15.94	0.013	0.88	0.00	0.00	0.00	474.04	475.74	474.86	475.74	479.06	3.32	23		
EX3			471.26																			474.86			EX3		
HYDRAULIC FLOW LINE = assume top pipe																											
22	22	21	480.12	478.76	19.86	0.0685	24	59.36	15.04	4.79	0	0.36	5.35	0.013	0.09	0.00	0.00	0.00	482.12	481.24	481.15	482.12	482.12	0.00	22		
21	21	20	479.15	477.82	10.20	0.1304	24	81.91	15.04	4.79	0	0.36	5.35	0.013	0.05	0.00	0.00	0.00	481.15	479.87	479.82	481.15	485.13	3.98	21		
20	20	19	476.35	476.20	22.25	0.0067	24	18.62	15.04	4.79	DROP	0.36	5.35	0.013	0.10	0.00	0.00	0.00	478.35	478.30	478.20	478.35	484.07	5.72	20		
19			476.20																			478.20			19		
HYDRAULIC FLOW LINE = assume top pipe																											
18	18	17	477.44	476.10	21.20	0.0632	24	57.03	25.09	7.99	0	0.99	24.85	0.013	0.26	0.00	0.00	0.00	479.44	478.77	478.51	479.44	480.00	0.56	18		
17	17	16	476.51	475.13	8.72	0.1583	24	90.24	25.09	7.99	0	0.99	24.85	0.013	0.11	0.00	0.00	0.00	478.51	477.24	477.13	478.51	482.93	4.42	17		
16	16	15	474.43	474.11	23.70	0.0135	27	36.08	25.09	6.31	DROP	0.62	15.51	0.013	0.16	0.00	0.00	0.00	476.68	476.52	476.36	476.68	482.23	5.55	16		
15			474.11																			476.36			15		
HYDRAULIC FLOW LINE = assume top pipe																											
14	14	10	492.84	491.26	130.23	0.0121	24	24.99	7.07	2.25	0	0.08	0.56	0.013	0.13	0.00	0.00	0.00	494.84	493.50	493.37	494.84	501.20	6.36	14		
10			491.06																			493.37			10		
HYDRAULIC FLOW LINE = assume top pipe																											
13	13	12	494.88	493.21	155.24	0.0108	12	3.71	2.62	3.34	0	0.17	0.45	0.013	0.84	0.00	0.00	0.00	495.88	495.69	494.85	495.88	498.96	3.08	13		
12	12	11	493.01	492.23	72.52	0.0108	12	3.70	3.51	4.47	0.43	0.31	1.09	0.013	0.70	0.24	0.07	0.32	494.01	494.54	493.83	494.85	498.81	3.96	12		
11	11	10	492.03	491.28	70.48	0.0106	15	6.68	4.32	3.52	0.47	0.19	0.83	0.013	0.31	0.00	0.15	0.15	493.28	493.69	493.37	493.83	498.51	4.68	11		
10	10	9	491.06	489.87	114.15	0.0104	24	23.16	11.39	3.63	0.06, 0.7	0.20	2.32	0.013	0.29	0.17	0.14	0.31	493.06	492.16	491.87	493.37	499.31	5.94	10		
9	9	8	489.67	489.23	51.11	0.0086	24	21.05	11.39	3.63	0.43	0.20	2.32	0.013	0.13	0.00	0.09	0.09	491.67	491.36	491.23	491.26	496.33	4.57	9		
8			489.23																			491.23			8		
HYDRAULIC FLOW LINE = assume top pipe																											
7	7	6	494.11	493.30	76.92	0.0105	12	3.67	1.27	1.62	0	0.04	0.05	0.013	0.10	0.00	0.00	0.00	495.11	494.40	494.30	495.11	498.51	3.40	7		
6	6	5	490.43	489.36	104.89	0.0102	12	3.61	1.27	1.62	DROP	0.04	0.05	0.013	0.13	0.00	0.00	0.00	491.43	490.70	490.57	491.43	499.83	8.40	6		
5	5	4	489.16	487.99	103.42	0.0113	15	6.89	3.35	2.73	0.65	0.12	0.39	0.013	0.28	0.13	0.03	0.16	490.41	489.83	489.55	490.57	494.21	3.64	5		
4	4	3	487.79	486.70	105.05	0.0104	18	10.73	7.11	4.02	0	0.25	1.79	0.013	0.48	0.26	0.00	0.26	489.29	488.68	488.20	489.55	494.10	4.55	4		
3	3	2	486.50	485.47	104.21	0.0099	18	10.47	7.99	4.52	0	0.32	2.54	0.013	0.60	0.12	0.00	0.12	488.00	487.57	486.97	488.12	494.22	6.10	3		
2	2	1	485.27	484.68	49.04	0.0120	18	11.55	8.72	4.93	0.06	0.38	3.30	0.013	0.34	0.12	0.02	0.14	486.77	486.52	486.18	486.91	492.68	5.77	2		
1			484.68																			486.18			1		
HYDRAULIC FLOW LINE = assume top pipe																											

FORMULAS:
 MEAN FULL FLOW VELOCITY $V = Q_{ACT} / A_{PIPE}$
 FRICTION LOSS (H_f): $H_f = 2.87 n^2 (L V^2 / d^{4.87})$
 VELOCITY HEAD: $V_h = V^2 / 2g$
 JUNCTION LOSSES (JUNC.): $[Q_{in} V_{in} / \sum (Q_{in} V_{in})] \times 1.33 [Q_{out}]$
 BEND LOSSES (BEND) = $(V^3) \cdot \text{ANGLE COEFFICIENT}$
Note:
 1. IF MORE THAN ONE INCOMING LINE, CALC. EACH BEND LOSS AND ADD TOGETHER.
 2. NO STRUCTURE LOSSES TO BE CALCULATED AT A DROP
 3. IF $Q_{V_{in}} > Q_{V_{out}}$, NO JUNCTION LOSSES TO BE CALCULATED.

- WATER QUALITY 02/17/11
- CITY APPROVAL 02/01/11
- CITY COMMENTS 01/25/11
- CITY COMMENTS 01/13/11

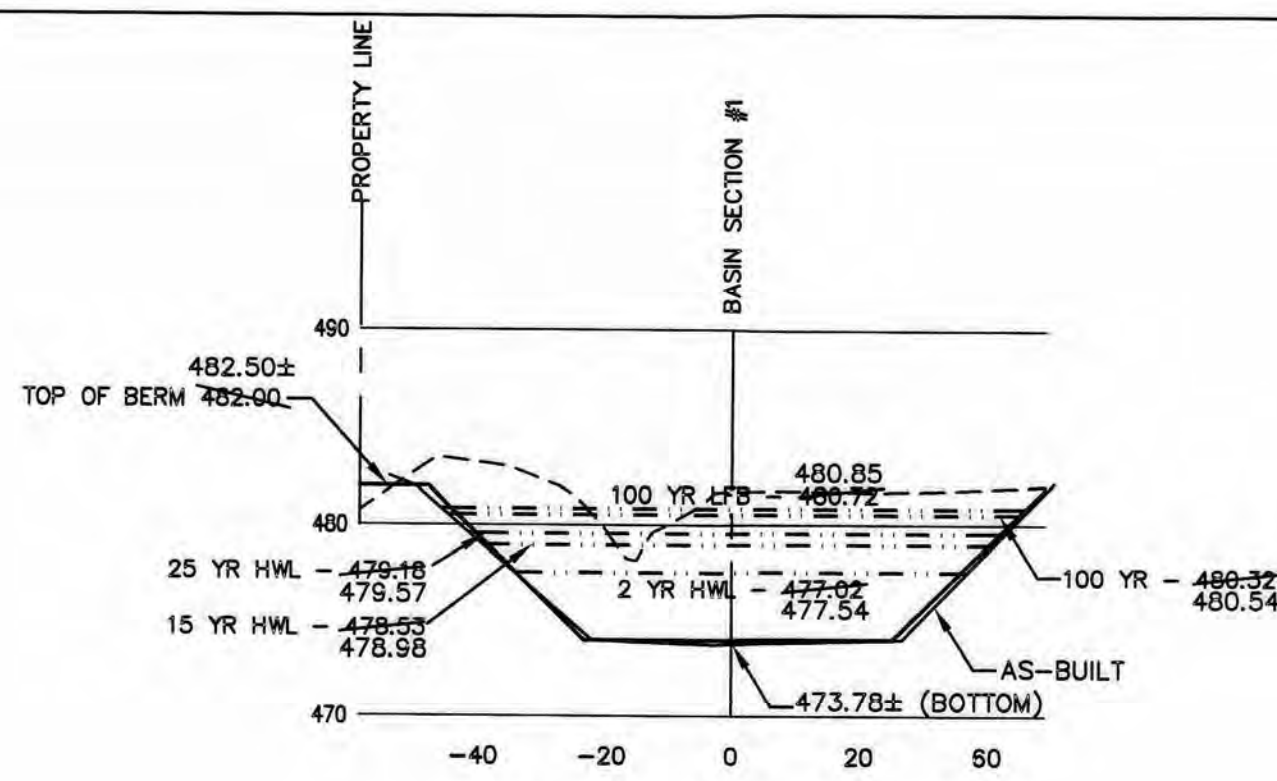
THE CROSSING AT RIVERSIDE CENTRE
 STORM HYDRAULICS AND SANITARY PROFILE

Stock & Associates
 Consulting Engineers, Inc.

257 Chesterfield Business Parkway
 St. Louis, MO 63005
 PH. (636) 530-9100
 FAX (636) 530-9130
 e-mail: general@stockassoc.com
 Web: www.stockassoc.com

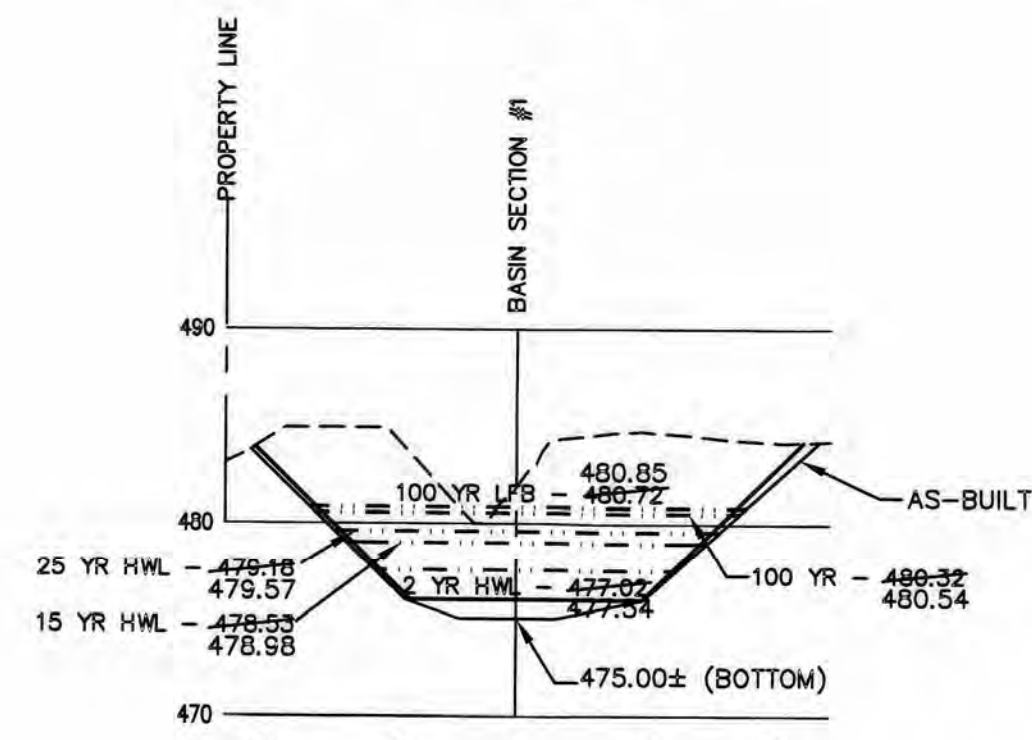
02/17/11
 GEORGE M. STOCK E-25116
 CIVIL ENGINEER
 CERTIFICATE OF AUTHORITY
 NUMBER: 000995

DRWN BY:	DATE:	CHECKED BY:	DATE:	JOB NUMBER:	SHEET:
P.R.G.	12/21/10	G.M.S.	12/21/10	210-4626	C14



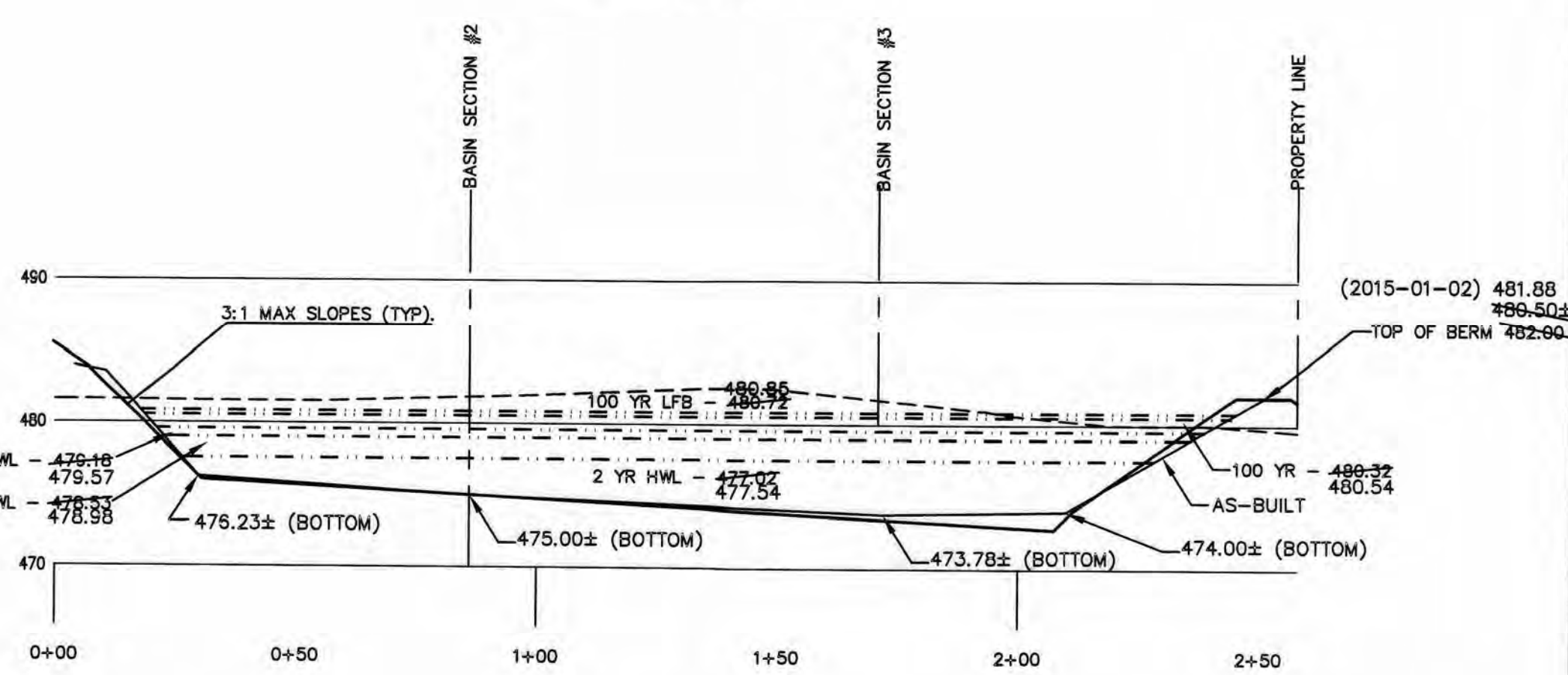
BASIN SECTION #3

SCALE: HORZ: 1"=30'
VERT: 1"=10'



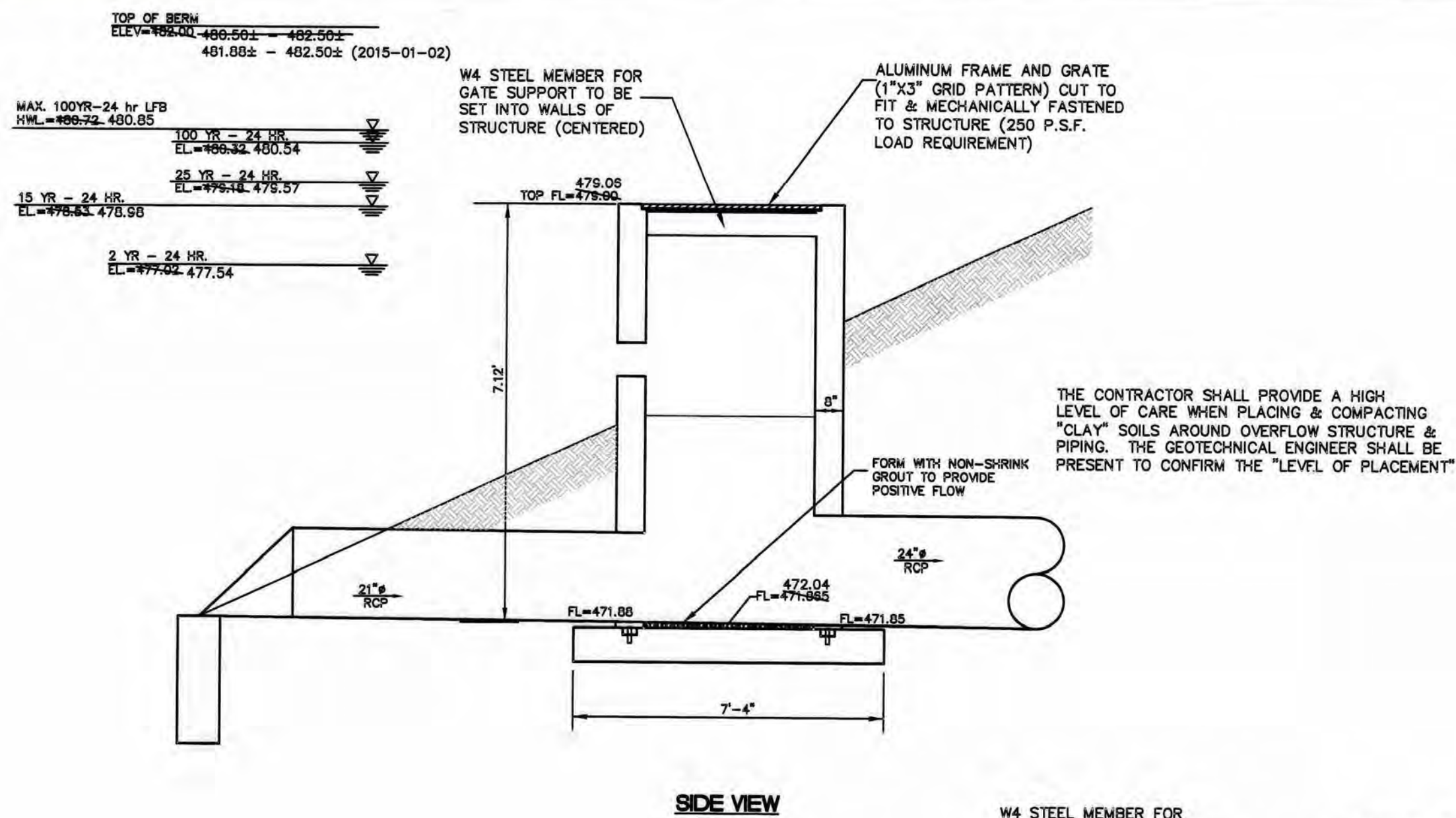
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SCALE: HORZ: 1"=30'
VERT: 1"=10'

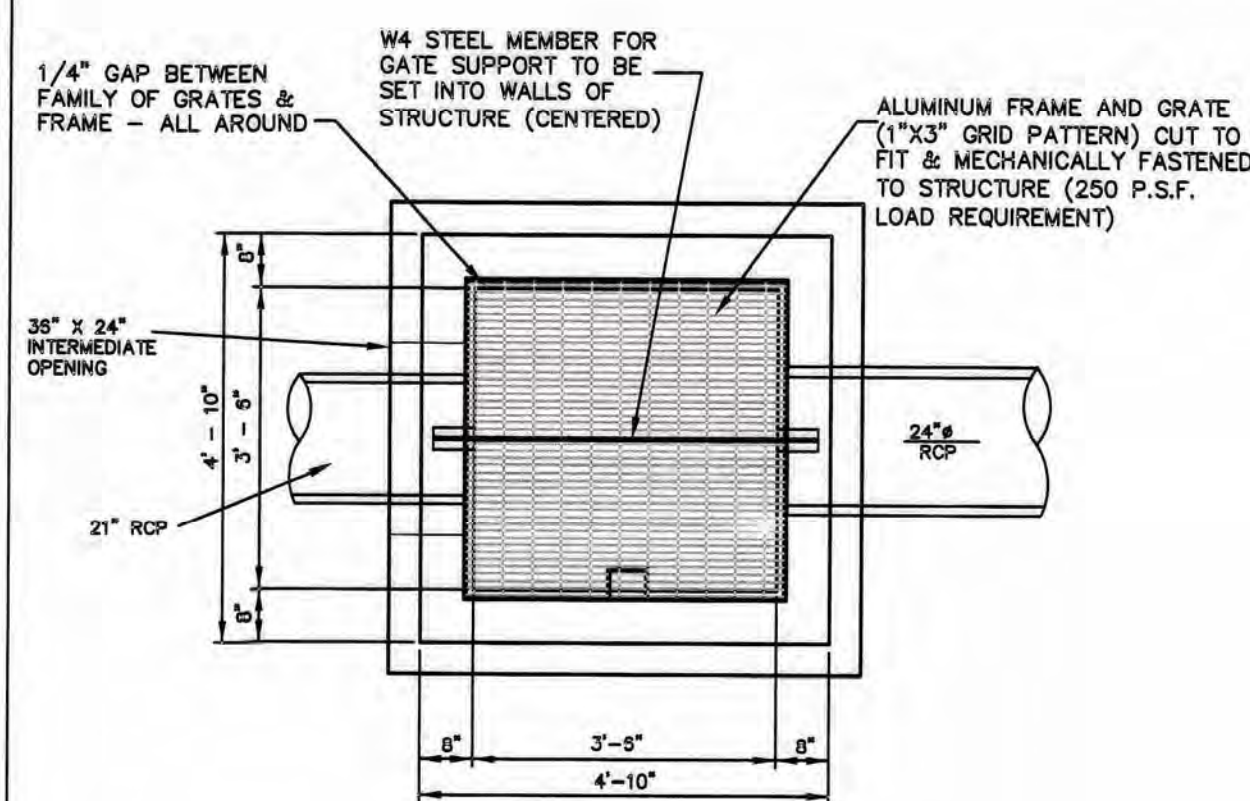


BASIN SECTION #1

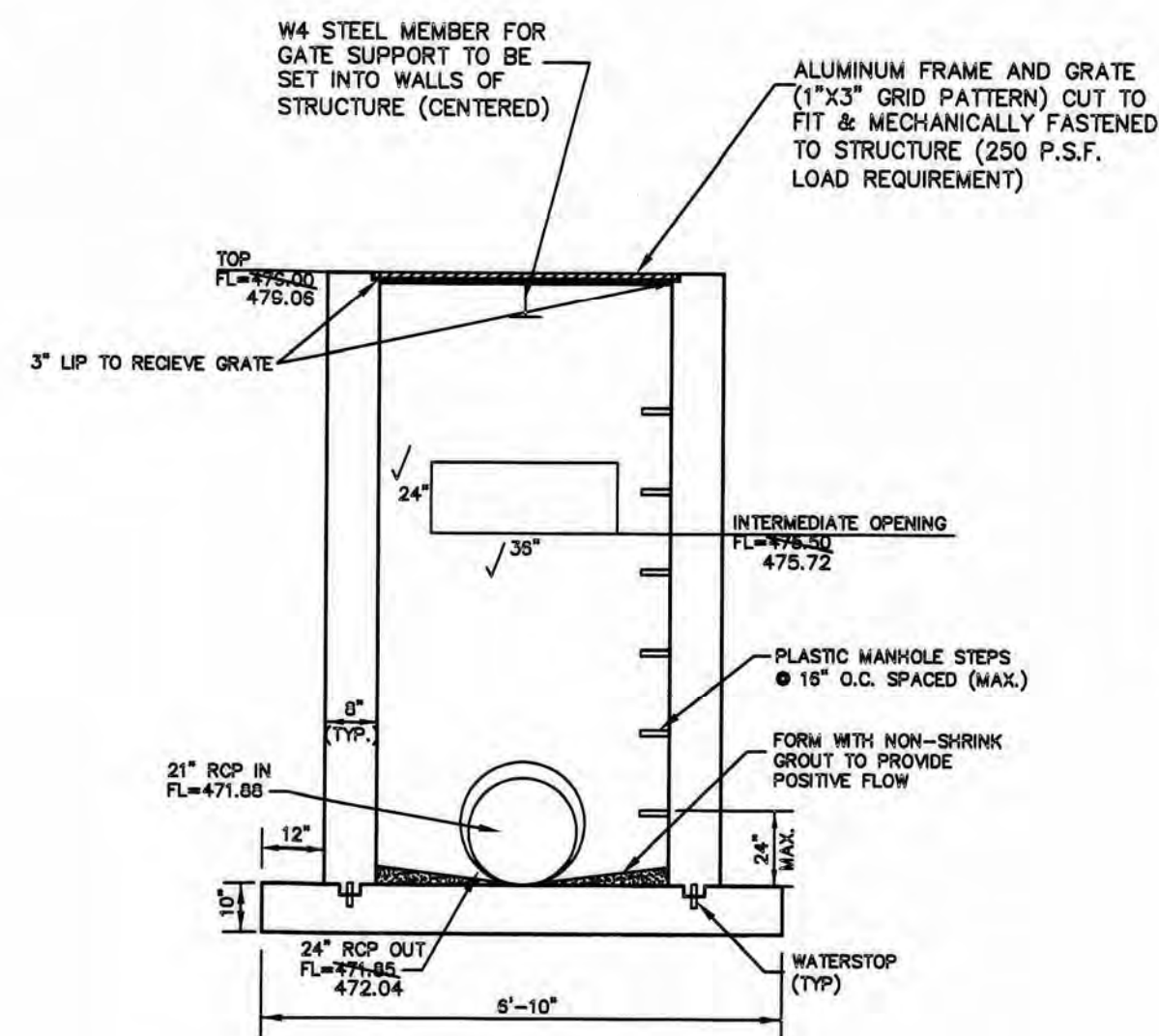
SCALE: HORZ: 1"=30'
VERT: 1"=10'



SIDE VIEW



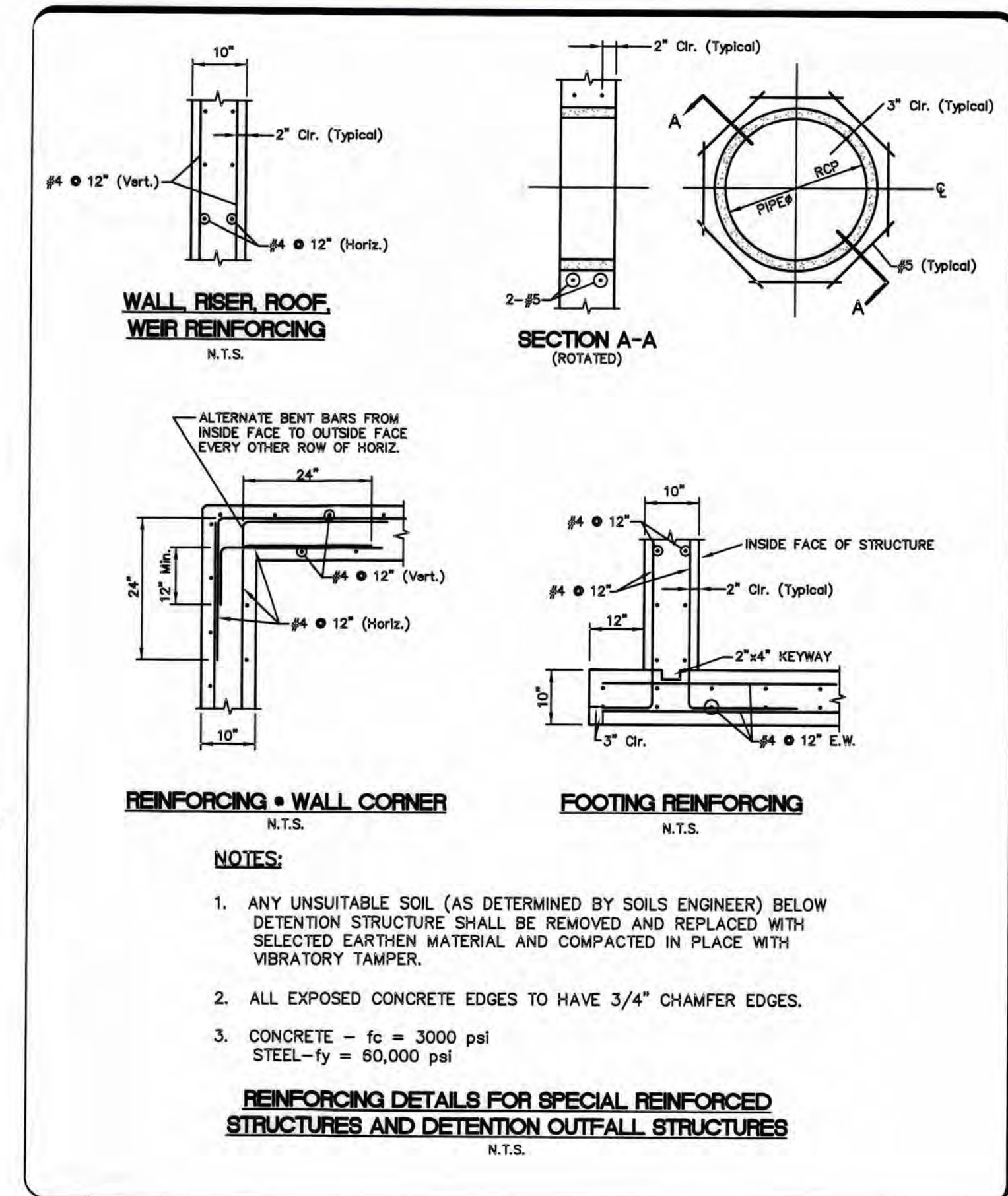
TOP VIEW



END VIEW

DETENTION STRUCTURE DETAILS

N.T.S.
NOTE: ENGINEER APPROVED SHOP DRAWINGS MUST BE SUBMITTED TO THE CITY OF O'FALLON FOR REVIEW AND APPROVAL PRIOR TO THE CONSTRUCTION OF THE STRUCTURE.

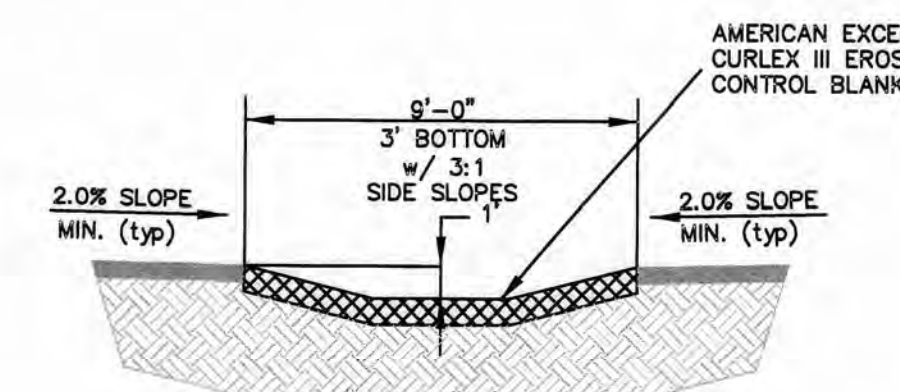


NOTES:

1. ANY UNSUITABLE SOIL (AS DETERMINED BY SOILS ENGINEER) BELOW DETENTION STRUCTURE SHALL BE REMOVED AND REPLACED WITH SELECTED EARTHEN MATERIAL AND COMPACTED IN PLACE WITH VIBRATORY TAMPER.
2. ALL EXPOSED CONCRETE EDGES TO HAVE 3/4" CHAMFER EDGES.
3. CONCRETE - $f_c = 3000$ psi
STEEL - $f_y = 60,000$ psi

REINFORCING DETAILS FOR SPECIAL REINFORCED STRUCTURES AND DETENTION OUTFALL STRUCTURES

N.T.S.



GRASS SWALE - DETENTION BASIN AREA

(n.t.s.)

Stream Channel:

Project #: 210-4626
Name: Crossing
Calculated: PRG 12-17-10
Checked:
Station #: Detention Swale

Roughness Coefficient (n)	Manning Equation: $Q = (1.48/n) A R^{2/3} S^{1/2}$
Concrete	0.012
Asphalt smooth	0.013
Asphalt rough	0.016
Gravel beds, straight	0.025
Gravel beds plus large boulders	0.040
Earth winding w/ grass	0.050
Earth, straight w/ grass	0.026

FIND DEPTH OF WATER AND WIDTH OF THE CHANNEL:

INPUT:

Stream Slope = 0.015 (ft/ft)
n = 0.026
W (Bottom width) = 3 (ft)

Top Of bank Elevation = 2.00
Bot. Elevation = 1.00
Side Slope = 3
Horizontal (H) = 3
Vertical (V) = 1

OUTPUT:

Depth = 0.94 (ft)
Velocity = 5.07 (ft/sec)
Water Surface Elev = 1.94
Free Board = 0.06 (ft)

Water Surface Width = 8.62 (ft)
 $R^{2/3} = 0.72$
Perimeter = 8.62 (ft)
Cross section Area = 5.24 (ft²)

2YR 20MIN SWALE CALCULATIONS

- WATER QUALITY 02/17/11
- CITY APPROVAL 02/01/11
- CITY COMMENTS 01/26/11
- CITY COMMENTS 01/13/11

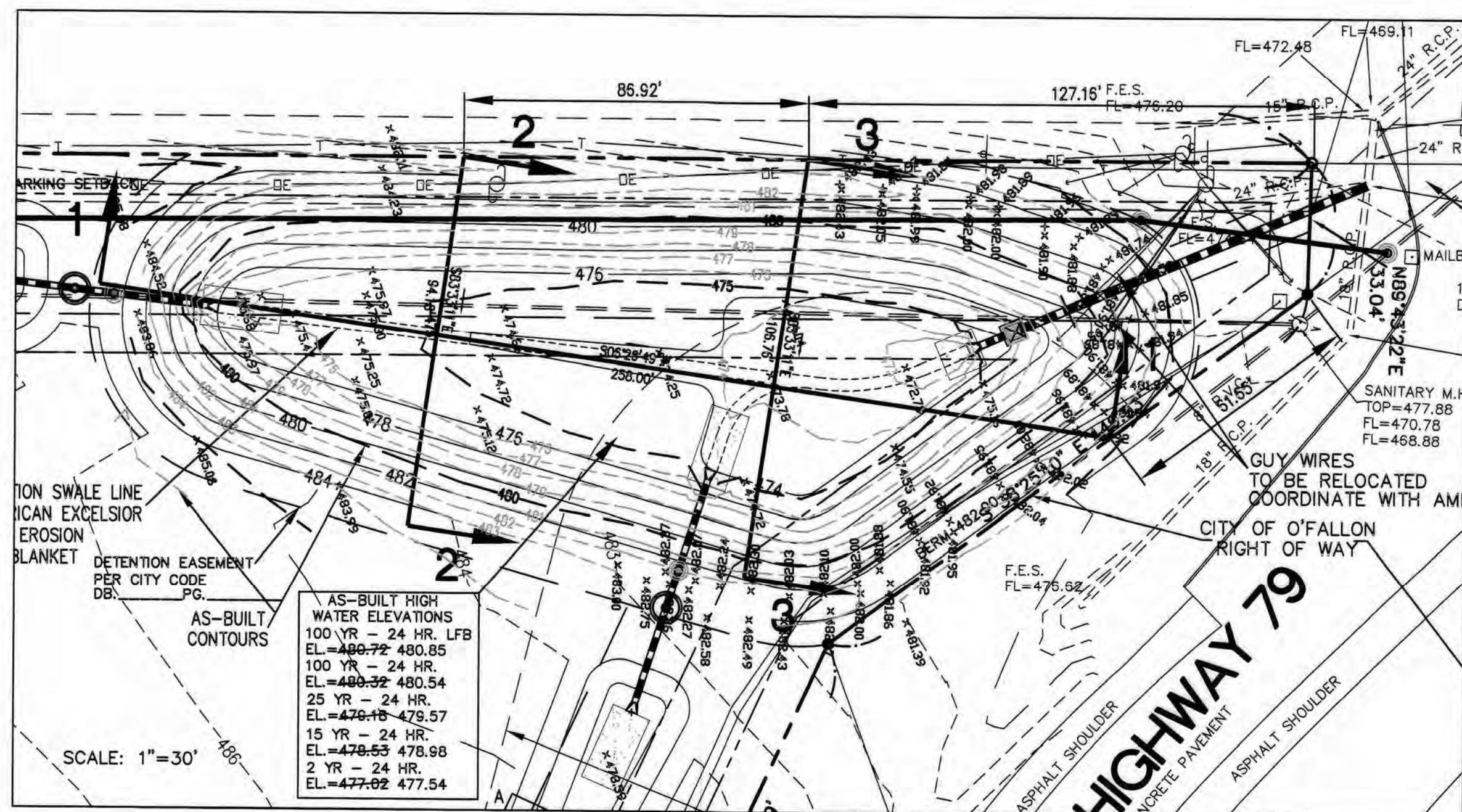
AS-BUILT

SANITARY / STORM SEWER - WATER QUALITY FEATURE - WATER LINE

The existing sewer lengths, sizes, flowlines, depths of structures and sewers locations with respect to existing or proposed easements have been measured. Water Quality Features, Retention Basins and drainage swales have been measured. Fire hydrants and valves have been measured. The results of those measurements are shown on this set of Final Measurement plans. Since the sanitary wye locations have been plotted from information provided by the sewer contractor or other sources, I disclaim any responsibility for that specific information.

All public sewers are located within designated existing or proposed easements.

Randall S. Rosson 3-9-16
Randall S. Rosson, P.L.S. NO. 2005-000171 Date



AS-BUILT HIGH WATER ELEVATIONS
100 YR - 24 HR. LFB EL=480.72 480.85
100 YR - 24 HR. EL=480.32 480.54
25 YR - 24 HR. EL=478.18 478.57
15 YR - 24 HR. EL=478.53 478.98
2 YR - 24 HR. EL=477.82 477.54

02/17/11

THE CROSSING AT RIVERSIDE CENTRE
DETENTION DETAILS

Stock & Associates
Consulting Engineers, Inc.

257 Chesterfield Business Parkway
St. Louis, MO 63005
PH. (636) 530-9100
FAX (636) 530-9130
e-mail: general@stockassoc.com
Web: www.stockassoc.com

GEORGE M. STOCK E-25116
CIVIL ENGINEER
CERTIFICATE OF AUTHORITY
NUMBER: 000595

DRAWN BY: P.R.G. DATE: 12/21/10
CHECKED BY: G.M.S. DATE: 12/21/10
JOB NUMBER: 210-4626
SHEET: C16

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PLAN VIEW
CDS 21

SECTION A-A

SECTION B-B

MATERIALS LIST - PROVIDED BY CONTECH

COUNT	DESCRIPTION	INSTALLED BY
1	FIBERGLASS INLET & CYLINDER	CONTECH
1	2400 MICRON SEP. SCREEN	CONTECH
1	SEALANT FOR JOINTS	CONTRACTOR
1	GRADE RINGS/ RISERS	CONTRACTOR
1	824\"/>	

SITE DESIGN DATA

WATER QUALITY FLOW RATE	3.78 CFS
PEAK FLOW RATE	15.04 CFS
RETURN PERIOD OF PEAK FLOW	25 YRS

GENERAL NOTES

- CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
- DIMENSIONS MARKED WITH () ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
- FOR SITE SPECIFIC DRAWINGS WITH DETAILED DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH CONSTRUCTION PRODUCTS REPRESENTATIVE. www.contech-us.com
- CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
- STRUCTURE SHALL MEET AASHTO H20 AND CASTINGS SHALL MEET AASHTO M208 LOAD RATING, ASSUMING GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION.
- PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.

INSTALLATION NOTES

- ANY SUB-BASE BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
- CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE (LIFTING CLUTCHES PROVIDED).
- CONTRACTOR TO ADD JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS, AND ASSEMBLE STRUCTURE.
- CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH PIPE INVERTS WITH ELEVATIONS SHOWN.
- CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

STRUCTURE WEIGHT
APPROXIMATE HEAVIEST PICK = 14,500 LBS.

CONTECH PROPOSAL DRAWING

CDS3035-6-C-430435-01
THE CROSSING AT RIVERSIDE CTR
OF FALLON, MO
SITE DESIGNATION: WQ AREA 1

DATE: 02/02/11
DESIGNED: DRA N/A
CHECKED: APPROVED: N/A
PROJECT NO: 430435
SHEET NO: 01
SHEET: 1 OF 1

PLAN VIEW
CDS 17

SECTION A-A

SECTION B-B

MATERIALS LIST - PROVIDED BY CONTECH

COUNT	DESCRIPTION	INSTALLED BY
1	FIBERGLASS INLET & CYLINDER	CONTECH
1	2400 MICRON SEP. SCREEN	CONTECH
1	SEALANT FOR JOINTS	CONTRACTOR
1	GRADE RINGS/ RISERS	CONTRACTOR
1	824\"/>	

SITE DESIGN DATA

WATER QUALITY FLOW RATE	2.31 CFS
PEAK FLOW RATE	25.09 CFS
RETURN PERIOD OF PEAK FLOW	25 YRS

GENERAL NOTES

- CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
- DIMENSIONS MARKED WITH () ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
- FOR SITE SPECIFIC DRAWINGS WITH DETAILED DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH CONSTRUCTION PRODUCTS REPRESENTATIVE. www.contech-us.com
- CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
- STRUCTURE SHALL MEET AASHTO H20 AND CASTINGS SHALL MEET AASHTO M208 LOAD RATING, ASSUMING GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION.
- PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.

INSTALLATION NOTES

- ANY SUB-BASE BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
- CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE (LIFTING CLUTCHES PROVIDED).
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- CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH PIPE INVERTS WITH ELEVATIONS SHOWN.
- CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

STRUCTURE WEIGHT
APPROXIMATE HEAVIEST PICK = 14,500 LBS.

CONTECH PROPOSAL DRAWING

CDS3025-6-C-430435-02
THE CROSSING AT RIVERSIDE CTR
OF FALLON, MO
SITE DESIGNATION: WQ AREA 2

DATE: 2/2/11
DESIGNED: DRA N/A
CHECKED: APPROVED: N/A
PROJECT NO: 430435
SHEET NO: 02
SHEET: 1 OF 1

PROJECT: The Crossing at Riverside Centre PROJ. NO: 210-4626

Table 4: Drainage to CDS Hydrodynamic Separator Area 1

STEP 1: Compute Rv(Volumetric Runoff Coefficient)

Drainage Area(A):	2.56 A(Acres - to BMP)
% Impervious	86.0 (%)
Rv(Volumetric Runoff Coefficient):	0.82 Rv=.05+.009*1

STEP 2: Compute Curve Number(CN)

Rainfall Depth(P)	1.14 P(Inches)*	*Rainfall Depth = 1.14" for WQ Storm
Compute Runoff Volume(Qa)	0.94 Qa=P*Qv	
Compute CN:	98.1 CN=1000/((10+5P+10Qa-10(Qa)^2 + 1.25QaP)^.5)	

STEP 3: Compute Peak Runoff Rate for Water Quality(WQ) Storm

Time of Concentration(tc):	6 Minutes (Assumed)
(tc):	0.10 Hours
Compute Initial Abstraction(Ia)	0.038 Ia=(200/CN)-2
Compute Ia/P Ratio	0.03344 Ia/P
Unit Peak Factor(qu)	1000 From Figure D.11.2
Drainage Area(Am):	0.0040 sq. mi. (Am=A/640)
Post-Developed Peak Discharge for Water Quality(WQ) Storm (Qp):	3.76 cfs Qp=qu*Am*Qa

STEP 4: Water Quality Volume (WQV)

Drainage Area(A):	2.56 A(Acres - to BMP)
% Impervious	86.0 (%)
(WQv):	8,729 Cu. FT [WQv=[1.14*(.05+.0091)*A/12]*43560]

Wq Flow Rate Capacity Required: 3.76 c.f.s.
Wq Flow Rate Capacity Provided: 3.80 c.f.s.
BMP Selected: CDS-3035

Table 5: Drainage to CDS Hydrodynamic Separator Area 2

STEP 1: Compute Rv(Volumetric Runoff Coefficient)

Drainage Area(A):	1.96 A(Acres - to BMP)
% Impervious	67.8 (%)
Rv(Volumetric Runoff Coefficient):	0.66 Rv=.05+.009*1

STEP 2: Compute Curve Number(CN)

Rainfall Depth(P)	1.14 P(Inches)*	*Rainfall Depth = 1.14" for WQ Storm
Compute Runoff Volume(Qa)	0.75 Qa=P*Qv	
Compute CN:	95.9 CN=1000/((10+5P+10Qa-10(Qa)^2 + 1.25QaP)^.5)	

STEP 3: Compute Peak Runoff Rate for Water Quality(WQ) Storm

Time of Concentration(tc):	6 Minutes (Assumed)
(tc):	0.10 Hours
Compute Initial Abstraction(Ia)	0.085 Ia=(200/CN)-2
Compute Ia/P Ratio	0.07434 Ia/P
Unit Peak Factor(qu)	1000 From Figure D.11.2
Drainage Area(Am):	0.0031 sq. mi. (Am=A/640)
Post-Developed Peak Discharge for Water Quality(WQ) Storm (Qp):	2.31 cfs Qp=qu*Am*Qa

STEP 4: Water Quality Volume (WQV)

Drainage Area(A):	1.96 A(Acres - to BMP)
% Impervious	67.8 (%)
(WQv):	5,357 Cu. FT [WQv=[1.14*(.05+.0091)*A/12]*43560]

Wq Flow Rate Capacity Required: 2.31 c.f.s.
Wq Flow Rate Capacity Provided: 3.00 c.f.s.
BMP Selected: CDS-3025

ALTHOUGH WATER QUALITY STRUCTURES PROVIDE ENOUGH STORM WATER CLEANSING TO MEET THE REQUIREMENTS FOR THIS PHASE OF THE REQUIREMENT ANY FUTURE DEVELOPMENT WILL REQUIRE THAT THE WATER QUALITY BE REEVALUATED

AS-BUILT

SANITARY / STORM SEWER - WATER QUALITY FEATURE - WATER LINE

The existing sewer lengths, sizes, flowlines, depths of structures and sewers locations with respect to existing or proposed easements have been measured. Water Quality Features, Retention Basins and drainage swales have been measured. Fire hydrants and valves have been measured. The results of those measurements are shown on this set of Final Measurement plans. Since the sanitary sewer locations have been plotted from information provided by the sewer contractor or other sources, I disclaim any responsibility for that specific information.

All public sewers are located within designated existing or proposed easements.

Randall S. Rosson
Randall S. Rosson, P.L.S. NO. 2005-000171 Date: 3-9-16

THE CROSSING AT RIVERSIDE CENTRE

WATER QUALITY DETAILS

STOCK & ASSOCIATES

Consulting Engineers, Inc.

257 Chesterfield Business Parkway
St. Louis, MO 63005
PH. (636) 530-9100
FAX (636) 530-9130
e-mail: general@stockassoc.com
Web: www.stockassoc.com

257 Chesterfield Business Parkway
St. Louis, MO 63005
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FAX (636) 530-9130
e-mail: general@stockassoc.com
Web: www.stockassoc.com

DRAWN BY: P.R.G. DATE CHECKED BY: G.M.S. DATE: 12/21/10 JOB NUMBER: 210-4626 SHEET: C18

GEORGE M. STOCK E-25116
CIVIL ENGINEER
CERTIFICATE OF AUTHORITY
NUMBER: 000955