SITE CONSTRUCTION PLANS FOR:

dfcu FINANCIAL

PARCEL L-12-02-480-20

2910 CARPENTER ROAD
PITTSFIELD TOWNSHIP
SECTION 2, T03S-R06E
WASHTENAW COUNTY, MI

REVISED 6-18-15
RECEIVED 7-6-15
REVIEWED 7-15-15
✓ WCWRC 6-29-15
✓ WCRC 3-11-15

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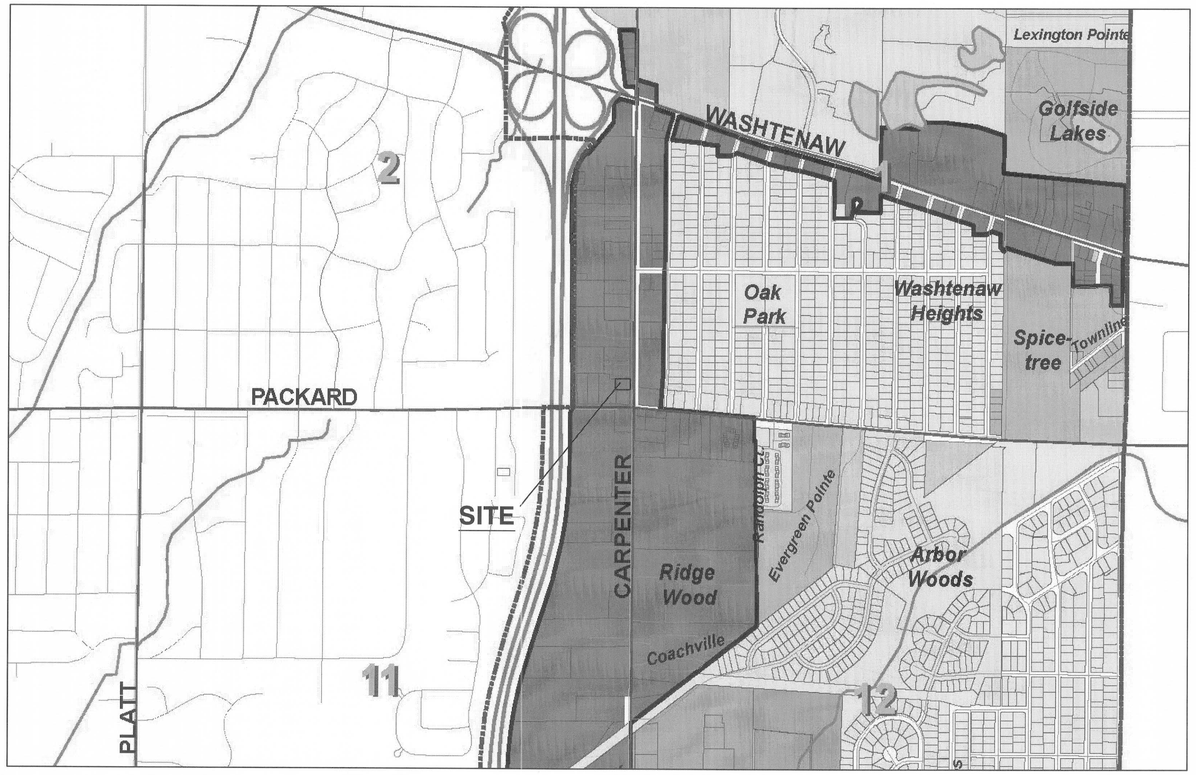
PITTSFIELD TOWNSHIP PLANNING COMMISSION
FINAL SITE PLAN
APPROVED 7/16/15 (DATE)
Matthew Benke
ZONING ADMINISTRATOR



LOCATION MAP
NO SCALE

BULK REGULATIONS

		PROVIDED
GROSS SITE AREA		1.09 AC
NET SITE AREA		1.09 AC
PERVIOUS AREA		0.38 AC (35%)
IMPERVIOUS AREA		0.71 AC (65%)
SETBACKS		
FRONT (E.)	10'	18.75'
SIDE (N.)	NONE	32.83'
SIDE (S.)	NONE	39.66'
REAR (W.)	10'	144.88'
BUILDING DATA		
FLOOR AREA	GSFT	4,583
HEIGHT	FEET	28.00'
NO. OF FLOORS		1
FL. AREA RATIO		9.7%
LOT COVERAGE		9.7%

SITE INFORMATION

PROPERTY INFORMATION
PARCEL L-12-02-480-20

Lot 82, Supervisor's Plat No. 1, a subdivision, as recorded in Liber 9 of Plats, Page(s) 49, Washtenaw County Records. Beginning at the Northeast corner of Lot 1, Supervisor's Plat No. 1, a subdivision, as recorded in Liber 9 of Plats, Page(s) 49, Washtenaw County Records; thence Southerly along the East line of said Lot 1, 37 feet; thence Westerly at right angles 43 feet; thence Southerly at right angles, 14 feet; thence Westerly at right angles 180 feet; thence Northerly at right angles, 51 feet; thence Easterly at right angles to the PLACE OF BEGINNING. Being a part of Lots 1 and 2 of said Supervisor's Plat No. 1.

SITE ADDRESS
2910 CARPENTER RD.
ANN ARBOR, MI

ZONING CLASSIFICATION
CARPENTER ROAD MIXED USE DISTRICT
STREET TYPE URBAN; SITE TYPE A

FOR REVIEW ONLY 06-30-15
NOT FOR CONSTRUCTION

DEVELOPER/OWNER

59 ASSOCIATES, LLC
C/O STRATEGIC PROPERTY SERVICES
ATTN: VINCE PANGLE
5750 NEW KING STREET, SUITE 120
TROY, MI 48908
248-312-7200

ENGINEER

RICHARD L. FOSGITT, PE – CONSULTANT
393 RIVER ROAD
BAY CITY, MI 48706
989-513-4058
FOSGITTR@YAHOO.COM

ARCHITECT

Arconcepts Inc.
17177 N. LAUREL PARK DR.
SUITE 256
LIVONIA, MI 48152
734.591.1090

3 WORKING DAYS
BEFORE YOU DIG
CALL MISS DIG.
DIAL 811
(TOLL FREE)

Reviewed but letter not finalized 7/15/15

RECEIVED
JUL 6 2015
PLANNING DEPARTMENT
CHARTER TOWNSHIP

DFCU FINANCIAL
CSPA 14-28

PREPARED UNDER THE SUPERVISION OF:
STATE OF MICHIGAN
RICHARD L. FOSGITT
ENGINEER
No. 43189
REGISTERED PROFESSIONAL ENGINEER

PROJECT LOG

PER REVIEW COMMENTS	05-14-15
PER REVIEW COMMENTS	06-18-15

FILE # COVER
PROJ MGR: RLF
DESIGN BY: RLF
DRAWN BY: RLF
CHECKED BY:
SCALE: 1"=20' NONE
SHEET: 1 OF 1

RICHARD L. FOSGITT, PE - CONSULTANT
393 River Road - Bay City, MI 48706
989-513-4058

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DFCU FINANCIAL - PITTSFIELD TOWNSHIP
STRATEGIC PROPERTY SERVICES, LLC
2910 CARPENTER ROAD
PITTSFIELD TOWNSHIP
WASHTENAW COUNTY, MICHIGAN

COVER SHEET

CV

131002

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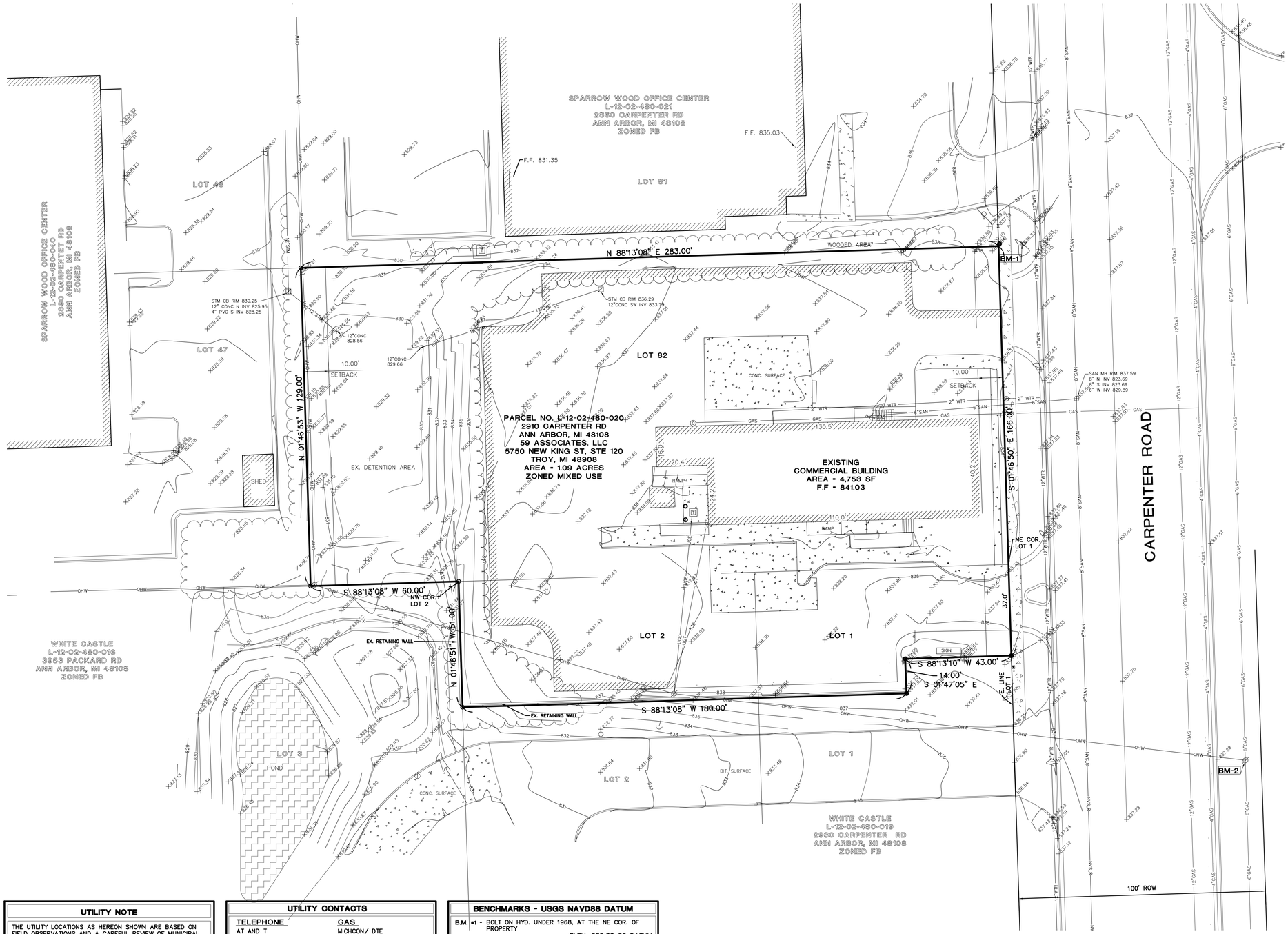
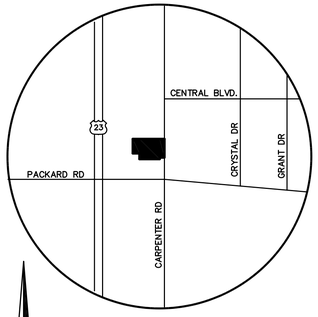
RICHARD L. FOSGITT, P.E.

(2435TB - 10-29-04)





LOCATION MAP

NOT TO SCALE

GRAPHIC SCALE

0 10 20 40

(IN FEET)
1 inch = 20 ft.

LEGEND

	MONUMENT / SECTION CORNER
	FOUND PROPERTY IRON
	SET PROPERTY IRON
	EXISTING CATCHBASIN
	EXISTING MANHOLE/CATCHBASIN
	EXISTING MANHOLE
	EXISTING HYDRANT
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	EXISTING MAILBOX / NEWSPAPER BOX
	EXISTING SIGN
	EXISTING DECIDUOUS TREES
	EXISTING CONIFEROUS TREES
	EXISTING UTILITY POWER POLE
	EXISTING TELEPHONE RISER

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UTILITY NOTE

THE UTILITY LOCATIONS AS HEREON SHOWN ARE BASED ON FIELD OBSERVATIONS AND A CAREFUL REVIEW OF MUNICIPAL AND UTILITY RECORDS. HOWEVER, IT IS NOT POSSIBLE TO DETERMINE THE PRECISE SIZE, LOCATION, DEPTH, PRESSURE, OR ANY OTHER CHARACTERISTICS OF UNDERGROUND UTILITIES, TANKS OR SEPTIC FIELDS WITHOUT EXCAVATION. THEREFORE, WE CANNOT GUARANTEE THE ACCURACY OF COMPLETENESS OF THE BURIED UTILITY INFORMATION HEREON SHOWN. THE CONTRACTOR SHALL CALL MISS DIG (1-800-482-7171) A MINIMUM OF THREE WORKING DAYS PRIOR TO ANY EXCAVATION. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THESE UTILITY LOCATIONS PRIOR TO CONSTRUCTION AND MAKE EVERY EFFORT TO PROTECT AND/OR RELOCATE THEM AS REQUIRED. THE CONTRACTOR SHALL NOTIFY THE ENGINEER/SURVEYOR AS SOON AS POSSIBLE IN THE EVENT A DISCREPANCY IS FOUND.

ZONING INFORMATION

ZONED- MIXED USE
SETBACKS-
FRONT:- 10'
REAR:- 10'
SIDE:- NONE

UTILITY CONTACTS

TELEPHONE
AT AND T
421 E. GRAND RIVER
HOWELL, MI 48843

GAS
MICHCON/ DTE
ONE ENERGY PLAZA
WCB1836
DETROIT, MICHIGAN 48226
1-313-235-5111

ZONING
PITTSFIELD TOWNSHIP
ZONING & PLANNING
6201 W. MICHIGAN AVE.
ANN ARBOR, MICHIGAN 48108
(734) 822-3103

WATER/SEWER
PITTSFIELD TOWNSHIP
WATER AND SEWER SERVICES
6201 W. MICHIGAN AVE.
ANN ARBOR, MICHIGAN 48108
(734) 822-3103

ELECTRIC
DTE
ONE ENERGY PLAZA
ROOM 518 S.B.
DETROIT, MICHIGAN 48226
1-313-235-5632

BENCHMARKS - USGS NAVD88 DATUM

B.M. #1 - BOLT ON HYD. UNDER 1968, AT THE NE COR. OF PROPERTY
ELEV. 838.33 88 DATUM

B.M. #2 - NAIL IN E. FCE OF PP ON E. SIDE OF CARPENTER RD ACROSS FROM THE SE COR. OF SUBJECT PROPERTY
ELEV. 839.20 88 DATUM

SITE SOILS DATA

ALL SOILS ON THE EXISTING SITE ARE CLASSIFIED AS StB

SAINT CLAIR LOAM, 2 TO 6% SLOPES

CERTIFICATION

I, BRIAN D FERGUSON A PROFESSIONAL SURVEYOR, BEING DULY LICENSED BY THE STATE OF MICHIGAN, DO HEREBY CERTIFY THAT I HAVE CAUSED THE PROPERTY HEREON SHOWN, TO BE SURVEYED AND MAPPED IN ACCORDANCE WITH ALL LOCAL AND STATE ACCEPTED PRACTICES FOR THE ACCURACY OF A SURVEY OF THIS TYPE. I ALSO CERTIFY THAT THE EXISTING CONDITIONS OF THE PROPERTY ARE AS SHOWN HEREON.

BRIAN D FERGUSON, PS #26454 DATE

PREPARED UNDER THE SUPERVISION OF:

PROJECT LOG

FILE:	2014.292
PROJECT MGR:	JDM
DESIGNED BY:	
DRAWN BY:	ZAA
CHECKED BY:	
SCALE:	1"=20'
SHEET:	1 OF 1

08-26-14

R.L. FOSGITT ENGINEERING PLC
393 RIVER ROAD
BAY CITY, MICHIGAN
989-513-4058

2910 CARPENTER ROAD

SECTION 2, T3S-R6E
PITTSFIELD TOWNSHIP
WASHTENAW COUNTY, MICHIGAN

TOPOGRAPHIC SURVEY

D&M SITE INC.
Surveying. Inspection. Testing. Engineering
401 BALSAM STREET PO BOX 159, CARROLLTON, MICHIGAN 48724
PHONE (989) 752-6500 FAX (989) 752-6600

S1

2014.292

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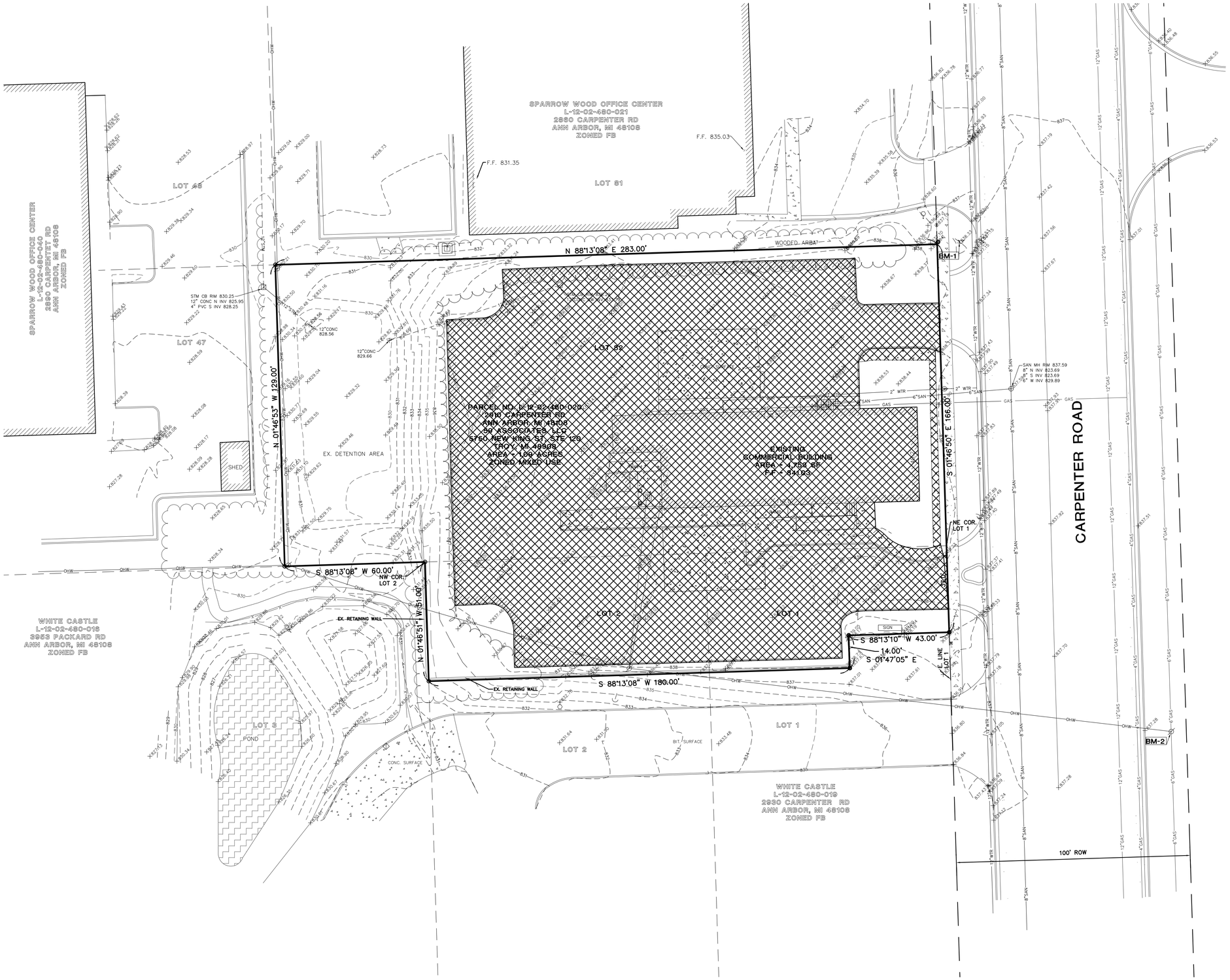

GRAPHIC SCALE

0 10 20 40

(IN FEET)
1 inch - 20 ft.

LEGEND

	MONUMENT / SECTION CORNER
	FOUND PROPERTY IRON
	SET PROPERTY IRON
	EXISTING CATCHBASIN
	EXISTING MANHOLE/CATCHBASIN
	EXISTING MANHOLE
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	EXISTING MAILBOX / NEWSPAPER BOX
	EXISTING SIGN
	EXISTING DECIDUOUS TREES
	EXISTING CONIFEROUS TREES
	EXISTING UTILITY POWER POLE
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REMOVAL NOTES

1. REMOVE ALL EXISTING SITE STORM SEWERS AND UTILITIES UNDER EXISTING BUILDING. BACKFILL AND WITH CLEAN FILL AND COMPACT.

2. REMOVE ALL EXISTING PAVEMENTS, SIDEWALK, CURB AND GUTTER, ETC. FULL DEPTH.

3. REMOVE ALL EXISTING MISC. TREES, BRUSH, AND OTHER PLANT MATERIAL TO THE PROPERTY LINE.

4. REMOVE EXISTING SANITARY SEWER TO FRONT LINE OF PROPOSED BUILDING. EXISTING SANITARY SEWER LEAD TO BE REUSED FOR NEW BUILDING.

5. REMOVE EXISTING 2" WATER LEAD TO EXISTING WATER SHUTOFF. EXISTING WATER SERVICE TAP AND SHUTOFF BOX TO BE REUSED FOR NEW BUILDING.

SITE INFORMATION

SITE ADDRESS
2910 CARPENTER RD.
ANN ARBOR, MI

ZONING CLASSIFICATION
CARPENTER ROAD MIXED USE DISTRICT
STREET TYPE URBAN; SITE TYPE A

CLIENT INFORMATION

STRATEGIC PROPERTY SERVICES, LLC
5750 NEW KING STREET, SUITE 120
TROY, MI 48908

PREPARED UNDER THE SUPERVISION OF:

PROJECT LOG

FOR REVIEW COMMENTS	05-13-15

FILE #:	OVERALL
PROJ. MGR:	RLF
DESIGN BY:	RLF
DRAWN BY:	RLF
CHECKED BY:	
SCALE:	1"=20' NONE
SHEET:	1 OF 1

RICHARD L. FOSGITT, PE - CONSULTANT
393 River Road - Bay City, MI 48706
989-513-4058

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DFCU FINANCIAL - PITTSFIELD TOWNSHIP
STRATEGIC PROPERTY SERVICES, LLC

2910 CARPENTER ROAD
PITTSFIELD TOWNSHIP
WASHTENAW COUNTY, MICHIGAN

REMOVAL PLAN

R1.0

131002

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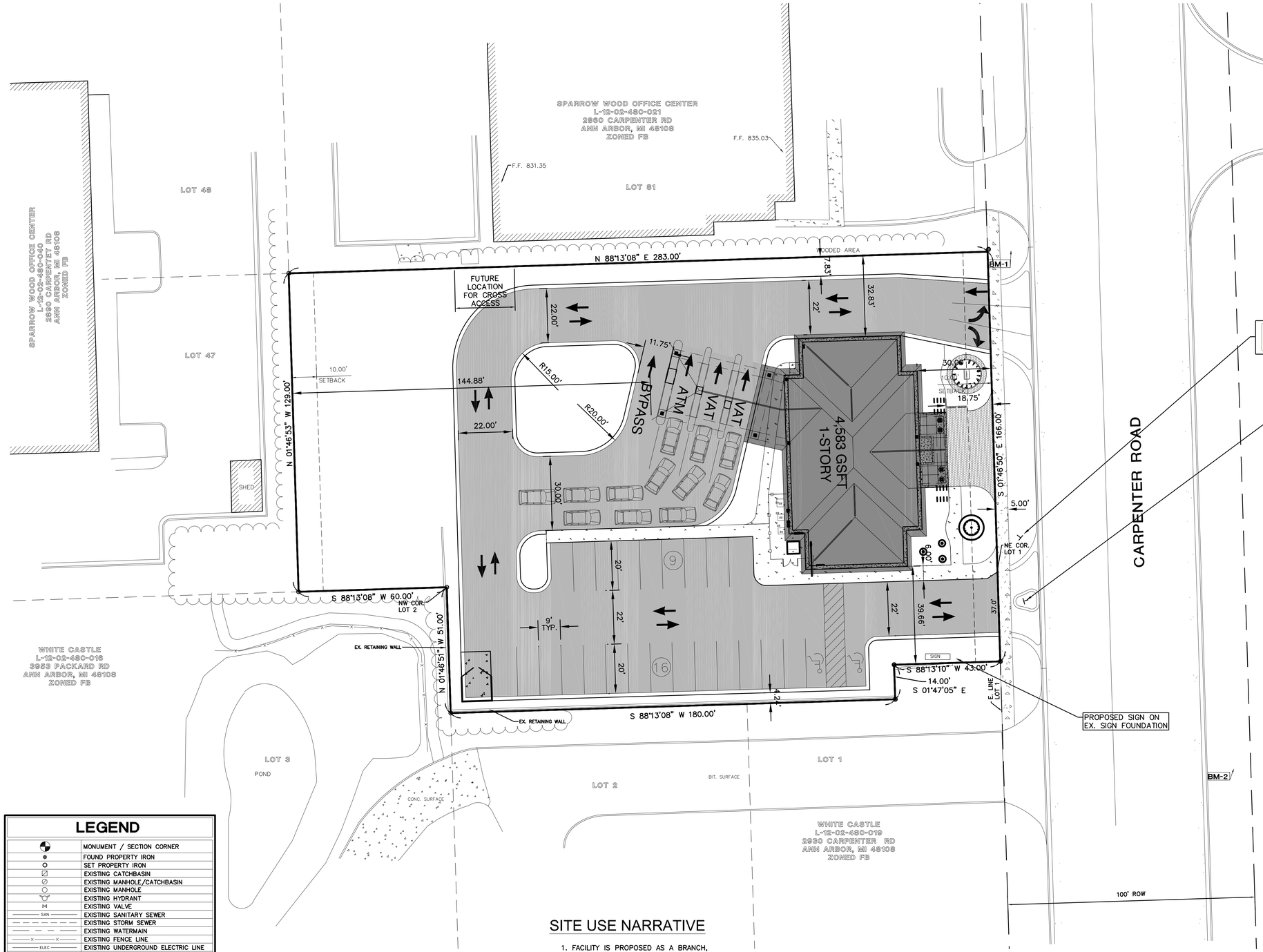
RICHARD L. FOSGITT, P.E.



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LEGEND

	MONUMENT / SECTION CORNER
	FOUND PROPERTY IRON
	SET PROPERTY IRON
	EXISTING CATCHBASIN
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	EXISTING MANHOLE
	EXISTING HYDRANT
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	EXISTING CENTERLINE
// //	EXISTING OVERHEAD ELECTRICAL WIRES
	EXISTING MAILBOX / NEWSPAPER BOX
	EXISTING SIGN
25"	EXISTING DECIDUOUS TREES
	EXISTING CONIFEROUS TREES
	EXISTING UTILITY POWER POLE
	EXISTING TELEPHONE RISER

FULL DEPTH BIT. PAVEMENT

FULL DEPTH CONC. PAVEMENT

CONC. SIDEWALK

SITE USE NARRATIVE

1. FACILITY IS PROPOSED AS A BRANCH, FULL-SERVICE BANKING LOCATION FOR DFCU FINANCIAL.
2. TYPICAL FACILITY HOURS:
   24 HOUR LOBBY AND DRIVE-UP ATM
   MON-FRI 9:30AM TO 6:00PM
   SAT 9:30AM TO 2:00PM
3. THREE DRIVE THROUGH LANES:
   2 – VIDEO ASSIST TELLER (VAT) PROVIDING FULL SERVICE DRIVE-UP BANKING VIA REMOTE VIDEO SYSTEM AND PNEUMATIC TUBE SYSTEMS.
   1 – DRIVE-UP ATM MACHINE.
4. APPROXIMATELY 8 EMPLOYEES.

PARKING DATA

REQUIRED NUMBER OF PARKING SPACES:

	REQUIREMENT		REQUIRED PARKING
BANKS	1 SPACE FOR EACH SQ FT OF GROSS FLOOR AREA	4,583 SFT NET	23 SPACES
	4 STACKING SPACES FOR EACH WINDOW OR ATM		12 STACKS

PROVIDED NUMBER OF PARKING SPACES:
25 PARKING SPACES, INCLUDING 2 ADA SPACES
12 STACKING SPACES (4 EACH LANE AND AT ATM)

BULK REGULATIONS

		PROVIDED
TOTAL SITE AREA		1.09 AC
PERVIOUS AREA		0.38 AC
IMPERVIOUS AREA		0.71 AC
SETBACKS		
FRONT (E.)	10'	18.75'
SIDE (N.)	NONE	32.83'
SIDE (S.)	NONE	39.66'
REAR (W.)	10'	144.88'
BUILDING DATA		
FLOOR AREA	GSFT	4,583
HEIGHT	FEET	28.00'

SITE INFORMATION

SITE ADDRESS
2910 CARPENTER RD.
ANN ARBOR, MI

ZONING CLASSIFICATION
CARPENTER ROAD MIXED USE DISTRICT
STREET TYPE URBAN; SITE TYPE A

CLIENT INFORMATION

STRATEGIC PROPERTY SERVICES, LLC
5750 NEW KING STREET, SUITE 120
TROY, MI 48908

PREPARED UNDER THE SUPERVISION OF:

PROJECT LOG

FSR REVIEW COMMENTS	05-13-15
FSR PLANNING COMMENTS	06-30-15

FILE #:	OVERALL
PROJ. MGR:	RLF
DESIGN BY:	RLF
DRAWN BY:	RLF
CHECKED BY:	
SCALE:	1"=20' NONE
SHEET:	1 OF 1

RICHARD L. FOSGITT, PE - CONSULTANT
393 River Road - Bay City, MI 48706
989-513-4058

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DFCU FINANCIAL - PITTSFIELD TOWNSHIP
STRATEGIC PROPERTY SERVICES, LLC

2910 CARPENTER ROAD
PITTSFIELD TOWNSHIP
WASHTENAW COUNTY, MICHIGAN

OVERALL SITE PLAN

C1.0

131002

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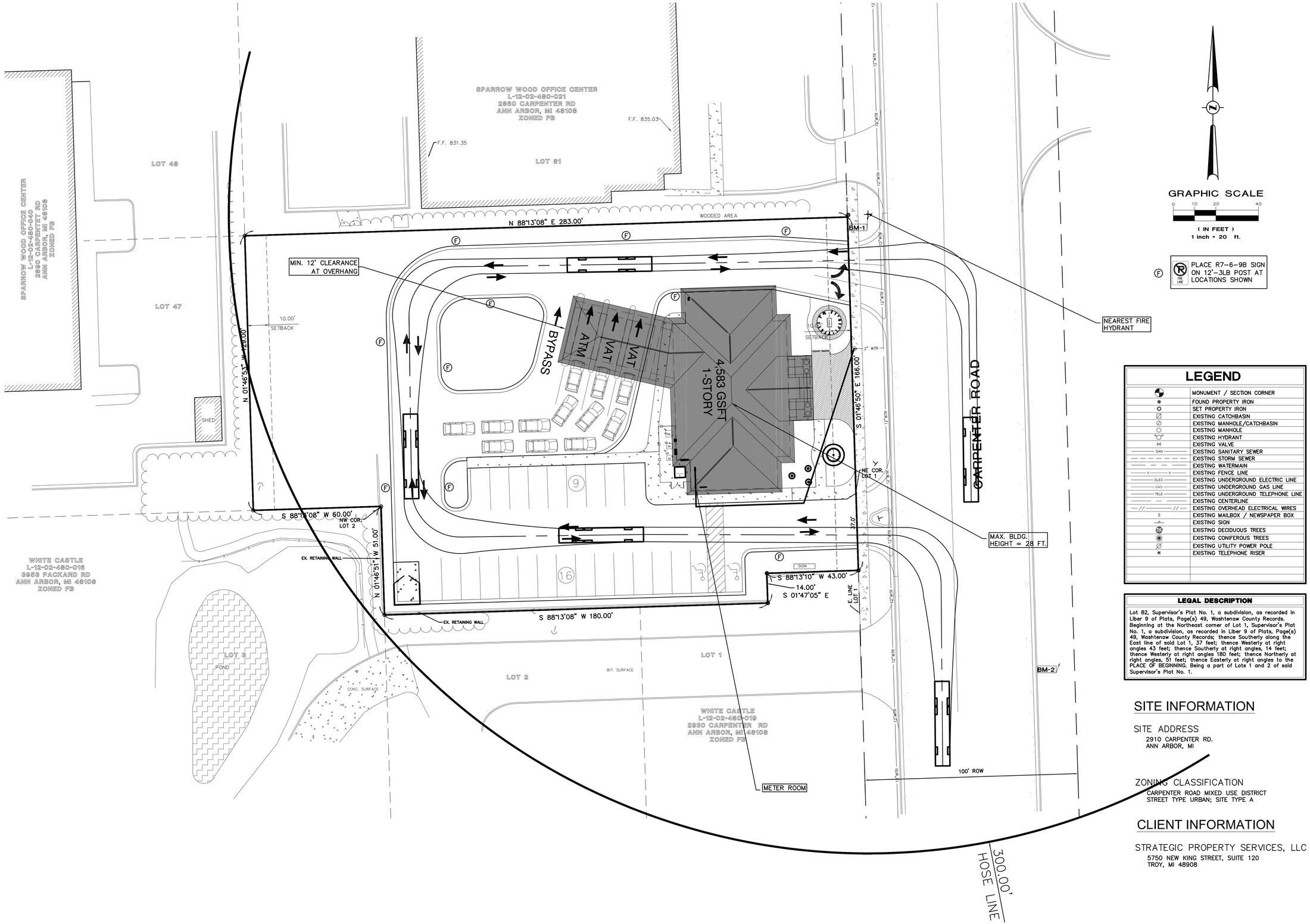

LEGEND

	MONUMENT / SECTION CORNER
	FOUND PROPERTY IRON
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	EXISTING CATCHBASIN
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SITE INFORMATION

SITE ADDRESS

2910 CARPENTER RD.
ANN ARBOR, MI

ZONING CLASSIFICATION

CARPENTER ROAD MIXED USE DISTRICT
STREET TYPE URBAN; SITE TYPE A

CLIENT INFORMATION

STRATEGIC PROPERTY SERVICES, LLC

5750 NEW KING STREET, SUITE 120
TROY, MI 48908

PREPARED UNDER THE SUPERVISION OF:

PROJECT LOG

FIR: REVIEW COMMENTS	05-13-15
FIR: TOWNSHIP COMMENTS	06-18-15

FILE #:	FIRE
PROJ. MGR:	RLF
DESIGN BY:	RLF
DRAWN BY:	RLF
CHECKED BY:	
SCALE:	1"=20' NONE
SHEET:	1 OF 1

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DFCU FINANCIAL - PITTSFIELD TOWNSHIP
STRATEGIC PROPERTY SERVICES, LLC

2910 CARPENTER ROAD
PITTSFIELD TOWNSHIP
WASHTENAW COUNTY, MICHIGAN

FIRE PROTECTION SHEET

C1.1

131002

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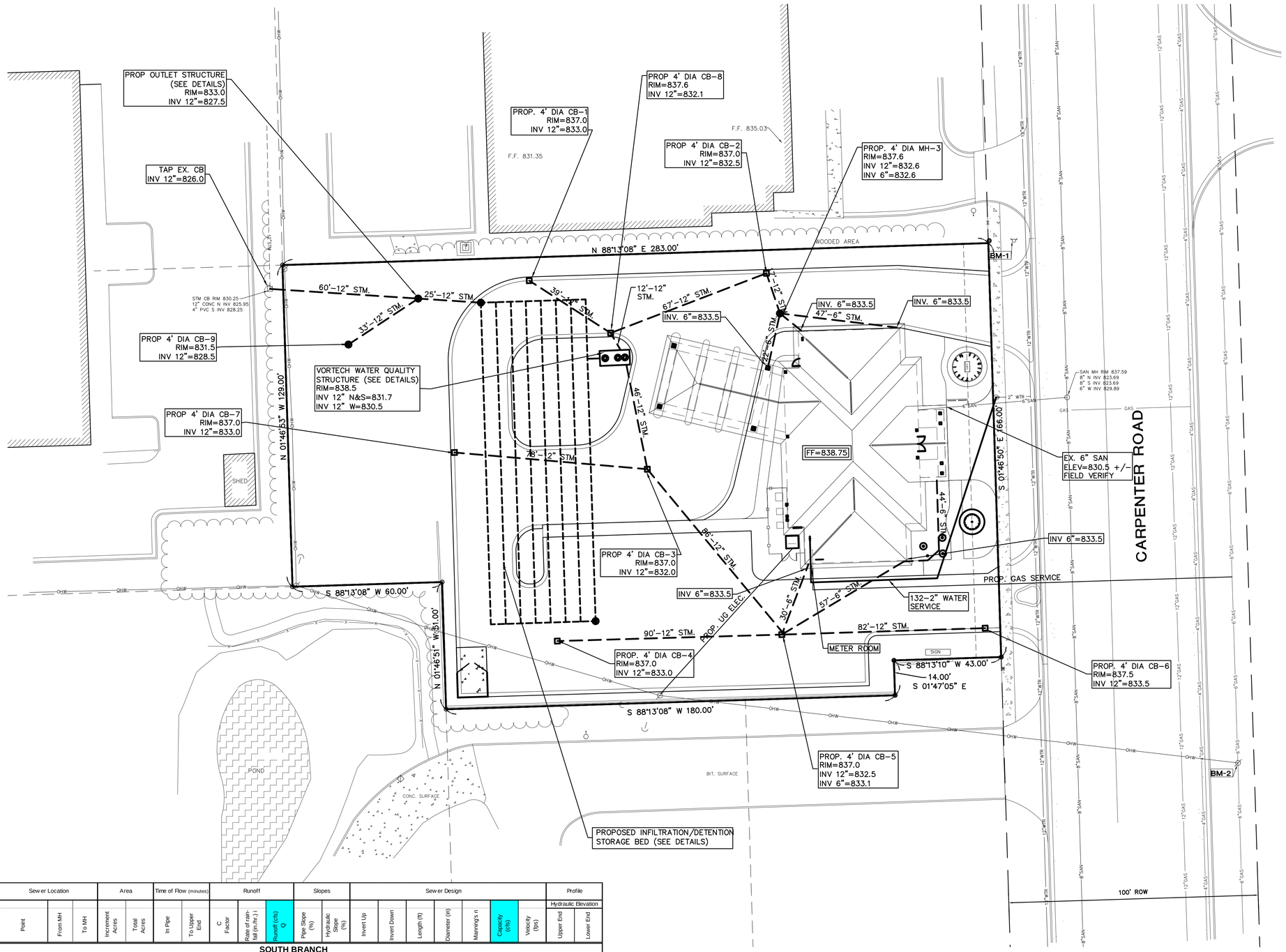
RICHARD L. FOSGITT, P.E.



GRAPHIC SCALE

0 10 20 40

(IN FEET)
1 inch = 20 ft.

LEGEND

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	EXISTING CONIFEROUS TREES
	EXISTING UTILITY POWER POLE
	EXISTING TELEPHONE RISER

UTILITY NOTES

1. ALL 12" AND LARGER STORM SEWER SHALL BE C76-IV REINFORCED CONC. PIPE INSTALLED WITH FULL SAND BACKFILL PER TOWNSHIP STD. DETAIL "TRENCH B".

2. ALL 10" AND SMALLER STORM SEWER AND ROOF DRAIN LEADS SHALL BE PVC SDR-26 PIPE INSTALLED WITH FULL SAND BACKFILL PER TOWNSHIP STD. DETAIL "TRENCH B".

3. ALL STORM SEWER SHALL BE CONSTRUCTED WITH PREMIUM GASKETED JOINTS.

4. SANITARY SEWER LEADS SHALL BE PVC SDR-26 PIPE INSTALLED WITH FULL SAND BACKFILL AND BEDDING PER TOWNSHIP STANDARD DETAILS.

SITE INFORMATION

SITE ADDRESS
2910 CARPENTER RD.
ANN ARBOR, MI

ZONING CLASSIFICATION
CARPENTER ROAD MIXED USE DISTRICT
STREET TYPE URBAN; SITE TYPE A

CLIENT INFORMATION

STRATEGIC PROPERTY SERVICES, LLC
5750 NEW KING STREET, SUITE 120
TROY, MI 48908

	Sewer Location			Area		Time of Flow (minutes)		Runoff			Slopes		Sewer Design							Profile	
																				Hydraulic Elevation	
Line #	Point	From MH	To MH	Increment Acres	Total Acres	In Pipe	To Upper End	C Factor	Rate of rainfall (in./hr.) i	Runoff (cfs) Q	Pipe Slope (%)	Hydraulic Slope (%)	Invert Up	Invert Down	Length (ft)	Diameter (in)	Manning's n	Capacity (cfs)	Velocity (fps)	Upper End	Lower End
SOUTH BRANCH																					
1	South Driveway	CB-6	CB-5	0.08	0.08	2.727	15.000	0.90	4.350	**0.313**	1.22%	0.0076%	833.50	832.50	82	12	0.013	**0.39**	0.5	834.83	833.83
2		CB-4	CB-5	0.14	0.14	4.434	17.727	0.90	4.034	**0.508**	0.56%	0.0210%	833.00	832.50	90	12	0.013	**0.27**	0.3	833.83	833.33
3		CB-5	CB-3	0.19	0.41	4.142	22.161	0.90	3.609	**1.332**	0.58%	0.1510%	832.50	832.00	86	12	0.013	**0.27**	0.3	833.33	832.83
4	Vortech	CB-3	VORT	0.10	0.51	2.092	26.303	0.90	3.286	**1.508**	0.65%	0.2210%	832.00	831.70	46	12	0.013	**0.29**	0.4	832.83	832.53
NORTH BRANCH																					
1	North Driveway	CB-2	CB-8	0.23	0.23	3.184	15.000	0.90	4.350	**0.900**	0.60%	0.0537%	832.50	832.10	67	12	0.013	**0.28**	0.4	833.73	833.33
2		CB-1	CB-8	0.09	0.09	0.943	18.184	0.90	3.986	**0.323**	2.31%	0.0093%	833.00	832.10	39	12	0.013	**0.54**	0.7	833.33	832.43
3	Vortech	CB-8	VORT	0.00	0.32	0.241	19.127	0.90	3.890	**1.120**	3.33%	0.0969%	832.10	831.70	12	12	0.013	**0.65**	0.8	832.43	832.03
REAR SLOPE AREA																					
1	Slope CB	CB-9	OUT	0.21	0.21	0.696	15.000	0.70	4.350	**0.639**	3.03%	0.0537%	828.50	827.50	33	12	0.013	**0.62**	0.8	828.50	827.50

PREPARED UNDER THE SUPERVISION OF:

PROJECT LOG
02-14-15 FOR PLAN REVIEW COMMENTS
06-18-15 ESA WORK COMMENTS

FILE #:	OVERALL	
PROJ. MGR:	RLF	
DESIGN BY:	RLF	
DRAWN BY:	RLF	
CHECKED BY:		
SCALE:	1"=20' NONE	
SHEET:	1 OF 1	

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STRATEGIC PROPERTY SERVICES, LLC

2910 CARPENTER ROAD
PITTSFIELD TOWNSHIP
WASHTENAW COUNTY, MICHIGAN

OVERALL UTILITY PLAN

C2.0

131002

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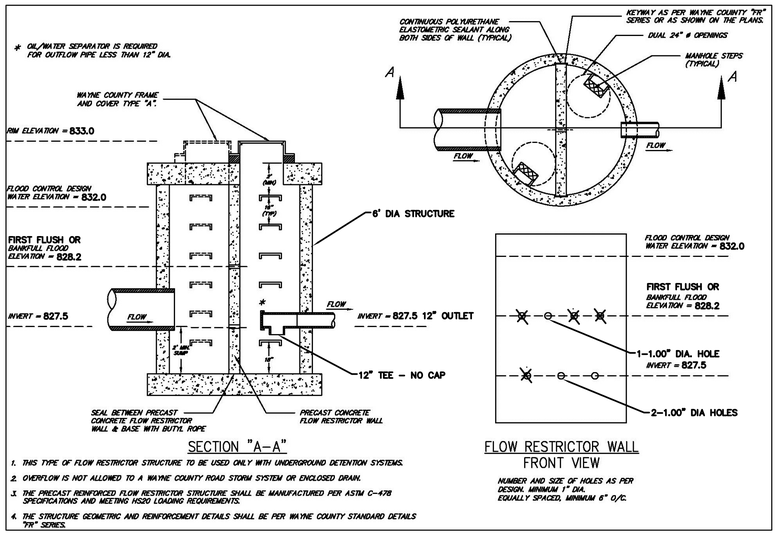


SECTION "A–A"

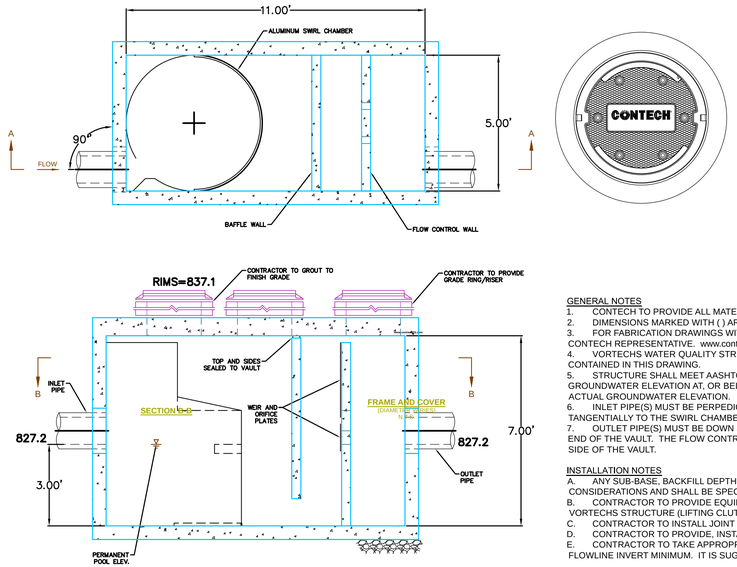
FLOW RESTRICTOR WALL FRONT VIEW

NUMBER AND SIZE OF HOLES AS PER DESIGN. MINIMUM 1" DIA. EQUALLY SPACED, MINIMUM 6" O/C.

1. THIS TYPE OF FLOW RESTRICTOR STRUCTURE TO BE USED ONLY WITH UNDERGROUND DETENTION SYSTEMS.
2. OVERFLOW IS NOT ALLOWED TO A WAYNE COUNTY ROAD STORM SYSTEM OR ENCLOSED DRAIN.
3. THE PRECAST REINFORCED FLOW RESTRICTOR STRUCTURE SHALL BE MANUFACTURED PER ASTM C–478 SPECIFICATIONS AND MEETING HS20 LOADING REQUIREMENTS.
4. THE STRUCTURE GEOMETRIC AND REINFORCEMENT DETAILS SHALL BE PER WAYNE COUNTY STANDARD DETAILS "FR" SERIES.

OUTLET CONTROL STRUCTURE

NO SCALE



SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID			VORTECH
WATER QUALITY FLOW RATE (CFS)			1.87
PEAK FLOW RATE (CFS)			1.87
RETURN PERIOD OF PEAK FLOW (YRS)			10
PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	831.7	CONC	12"
INLET PIPE 2	831.7	CONC	12"
OUTLET PIPE	830.5	DWPE	12"
RIM ELEVATION			838.5
ANTI-FLOTATION BALLAST	WIDTH	HEIGHT	
	NA	NA	
NOTES/SPECIAL REQUIREMENTS:			
* PER ENGINEER OF RECORD			

GENERAL NOTES

1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH REPRESENTATIVE. www.contechES.com
4. VORTECHS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
5. STRUCTURE SHALL MEET AASHTO HS20 AND CASTINGS SHALL MEET AASHTO M306 LOAD RATING, ASSUMING GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION.
6. INLET PIPE(S) MUST BE PERPEDICULAR TO THE VAULT AND AT THE CORNER TO INTRODUCE THE FLOW TANGENTIALLY TO THE SWIRL CHAMBER. DUAL INLETS NOT TO HAVE OPPOSING TANGENTIAL FLOW DIRECTIONS.
7. OUTLET PIPE(S) MUST BE DOWN STREAM OF THE FLOW CONTROL BAFFLE AND MAY BE LOCATED ON THE SIDE OR END OF THE VAULT. THE FLOW CONTROL WALL MAY BE TURNED TO ACCOMODATE OUTLET PIPE KNOCKOUTS ON THE SIDE OF THE VAULT.

INSTALLATION NOTES

A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE VORTECHS STRUCTURE (LIFTING CLUTCHES PROVIDED).
C. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH PIPE INVERTS WITH ELEVATIONS SHOWN.
E. 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.

VORTECH 3000 WATER QUALITY UNIT

NO SCALE

Washtenaw County Detention Calculations

Input Data

Site Area, A (ac)	1.09

Rational Method Runoff Coefficient

Cover Type	Soil Type	Area (sft)	Area (ac)	Runoff Coefficient (C-factor)	(Cf) x (Area)
Parking lot	NA	23,280	0.53	0.95	0.51
Sidewalks	NA	2,894	0.07	0.95	0.06
Building	NA	4,583	0.11	0.95	0.10
Landscape	D	16,521	0.38	0.45	0.17
TOTAL		**47,278**	**1.09**		**0.84**
			Weighted C-Factor		**0.78**

NRCS Variables - Pervious

Cover Type	Soil Type	Area (sft)	Area (ac)	Runoff Curve Number	(Cf) x (Area)
Landscape	D	16,521	0.38	80	30.34
TOTAL		**16,521**	**0.38**		**30.34**
			Weighted Curve Number		**80**

NRCS Variables - Impervious

Cover Type	Soil Type	Area (sft)	Area (ac)	Runoff Curve Number	(Cf) x (Area)
Parking lot	NA	23,280	0.53	98	52.37
Sidewalks	NA	2,894	0.07	98	6.51
Building	NA	4,583	0.11	98	10.31
TOTAL		**30,757**	**0.71**		**69.20**
			Weighted Curve Number		**98**

Time of Concentration

Flow Type	K	Length	Slope (%)	Velocity (ft/Sec)	Tconc (hours)
Sheet Flow	0.48	125	0.80	0.43	0.08
Waterway	1.2	100	0.50	0.85	0.03
Small Tributary	2.1	200	0.40	1.33	0.04
TOTAL Tc		**425**			**0.16**

Runoff Volume Calculations

	Unit	Vbf-pre	Vbf-per-post	Vbf-imp-post	Vbf-per-post	Vbf-imp-post
Event		2-Year	2-year	2-year	100-year	100-year
Rainfall	inches	2.35	2.35	2.35	5.11	5.11
Curve Number		79	80	98	80	98
S	inch	2.66	2.50	0.20	2.50	0.20
Runoff, Q	inch	0.74	0.79	2.12	2.99	4.87
Area	SFT	47,480	16,521	30,757	16,521	30,757
Runoff Volume	**CFT**	**2,922**	**1,083**	**5,438**	**4,115**	**12,490**

Runoff Volume Summaries

First Flush Volume	**CFT**	**3,068**
FF Volume % of Total		15.6%
First Flush Runoff Peak	CFS	1.86
Total BF Volume	CFT	6,521
Total 100-Year Volume	CFT	16,605
Bankfull Volume Diff	CFT	3,599
Infiltration Requirement	**CFT**	**0**

Q=CIA; I = 2.2 inches

Site soils not suitable for infiltration
Infiltration bed provided, but not

Detention Requirement

Peak of Unit Hydrgraph	cfs/in-mi2	1098
Total Site Area, A	acres	1.09
Q-100	inch	7.86
Qp, Peak Flow (PF)	cfs	14.70
Delta	cfs	14.54
Qa, Allowable Release	cfs	0.164
Vdet = Required Detention	CFT	16,420
Plus 20% (No infiltration)	CFT	3,284
Total Detention Required	**CFT**	**19,704**
Required Forebay (5%)	**CFT**	**985**

Available Storage Calculations

Underground Detention Storage

	Length	Width	Depth	Stone Volume	% Voids	Total Volume
Main Storage Area Stone	136.0	53.5	5.0	22,544	30%	6,763
(Net of Storage Pipe Volume)	(13,836)	CFT				
		Diameter			*Area*	
48" Diameter Storage Laterals	1000.0	4.0			12.57	12,566
48" Diameter Storage Headers	101.0	4.0			12.57	1,269
				Total Volume (CFT)		**20,599**

Total Volume (CFT)	**20,599**
Total Volume (AC-FT)	**0.47**
Required Volume (CFT)	**19,704**
	O.K.

First Flush Elevation Calculation

100-Yr Design High Water Elevation	832.00
Storage Invert (outlet) Elevation	827.50
Storage Depth	4.50
First Flush % of Total	15.57%
First Flush Depth	0.70
First Flush Elevation	**828.20**

Restrictor Calculations

Outlet Control Structure Calculations

Vt, Total Detention Volume	=	19704	cft
Vff, First Flush Required	=	3068	cft
Z100, Design High Water	=	832.00	
Zff, First Flush Elev	=	828.20	
Zo, Invert in Control Struct		827.50	
Zout, Outlet Elev	=	827.50	
ht, Total Head	=	4.500	feet
hbf, First Flush Head	=	0.700	feet

First Flush Flood Orifice Calculations

Release time should be less than 40 hours

Qavg, First Flush	=	0.021	cfs	Vfbf / (40 *3600)
Havg, Average head	=	0.350	ft	0.5 x (Zff-Zo)+(Zo-Zout)
Ao, Bank Full Orifice Area	=	0.0072	sft	Qavg/(0.62 x 32.2x2xHavg)^0.5)
No. of 1.0" holes	=	1.51	each	Ao/(0.00545)
Elevation of Holes	=	827.50		
Actual Number of Holes	=	2.00		
Aa, Actual Area	=	0.01090	sft	
Qavg, Actual Release Rate	=	0.032	cfs	(0.62 x Aa x (32.2x2xHavg)^0.5
Actual Holding Time	=	26.56	hours	Vff / (Qavg x 3600)

100-Year Flood Orifice Calculations

Qpeak	=	0.164	cfs	Qa
Calculate for First Flush hole contribution				
Havg-bf, Average head bank full	=	4.500	ft	(Z10-Zo)+(Zo-Zout)
Qavg-bf, Actual Release Rate	=	0.115	cfs	(0.62 x Aa x (32.2x2xHavg)^0.5
If additional holes are required				
Qad, Adjusted Flow	=	0.048	cfs	Qpeak - Qavg-bf
Hmax	=	3.800	ft	Z10-Zbf
A, Orifice Area	=	0.0050	sft	Qad/(0.62 x 32.2x2xHmax)^0.5)
No. of 1.0" holes	=	0.92	each	Ao/(0.00545)
Elevation of Holes	=	828.20		
Actual Number of Holes	=	1.00		
Aa, Actual Area	=	0.00545	sft	
Qactual, Actual Release Rate	=	0.168	cfs	Qavg-bf+(0.62 x Aa x (32.2x2xHmax)^0.5

DETENTION CALCULATIONS

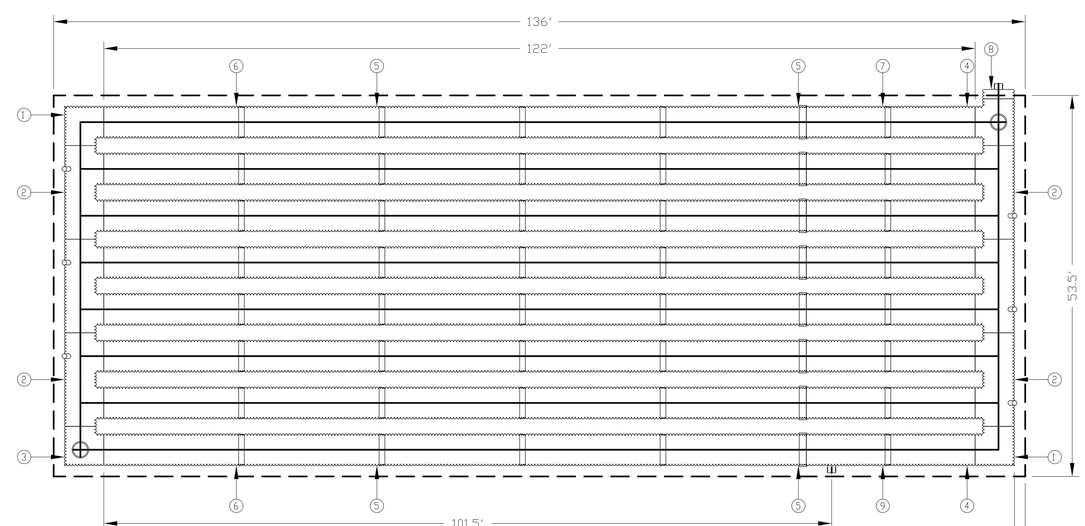
BILL OF MATERIALS

*THE COMPONENTS AND QUANTITIES LISTED HERIN ARE NOT INTENDED TO BE A COMPREHENSIVE MATERIAL LIST. EXTRA COMPONENTS, NOT LISTED HEREIN, MAY BE NECESSARY TO COMPLETE THE CONSTRUCTION OF THE SYSTEM.

ITEM	QTY	PART #	DESCRIPTION
1	2	4898AN	48" X 90 DEGREE MANIFOLD BEND
2	6	4852ANC_1	48" DOUBLE MANIFOLD TEE W/8" CLEANOUT
3	1	4898ANC_1	48" X 90 DEGREE MANIFOLD BEND W/24" RISER
4	8	Stick 1	48" PIPE STICK : PERFORATED (FIELDCUT)
5	32	48810020IB	48" PIPE STICK : PERFORATED
6	8	Stick 2	48" PIPE STICK : PERFORATED (FIELDCUT)
7	7	Stick 3	48" PIPE STICK : PERFORATED (FIELDCUT)
8	1	4851ANC_2	48" SINGLE MANIFOLD TEE W/24" RISER, W/48" X 12" REDUCER
9	1	Stick 4	48" PIPE STICK : PERFORATED (FIELDCUT) W/12" STUB
	24	4865AA	48" SPLIT COUPLER

STORMWATER DETENTION DATA:

BOTTOM OF STONE = 827.5
FIELD PIPE INVERT ELEVATION = 828.00
FIRST FLUSH ELEVATION = 828.20
DESIGN HIGH WATER = 832.00
TOP OF STONE = 832.5



STORMWATER DETENTION SYSTEM DETAIL

NO SCALE

PREPARED UNDER THE SUPERVISION OF:

PROJECT LOG

08-01-15	FOR WCDC REVIEW
08-18-15	REVISE COMMENTS

FILE #: STORMDET	
PROJ. MGR:	RLF
DESIGN BY:	RLF
DRAWN BY:	RLF
CHECKED BY:	
SCALE:	1"=10' NONE
SHEET:	1 OF 1

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STRATEGIC PROPERTY SERVICES, LLC

2910 CARPENTER ROAD
PITTSFIELD TOWNSHIP
WASHTENAW COUNTY, MICHIGAN

STORMWATER DETAILS

C2.1

131002

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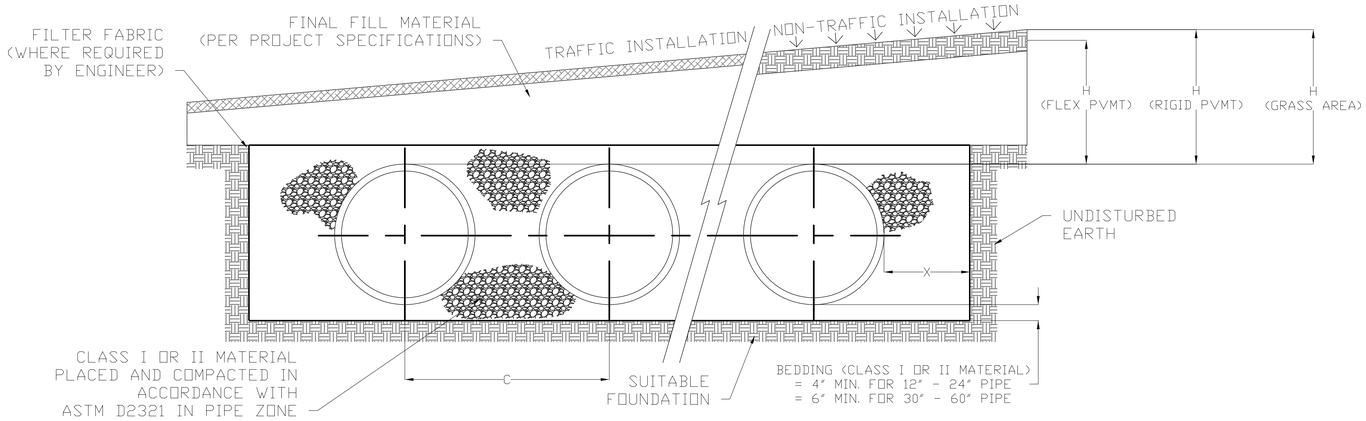
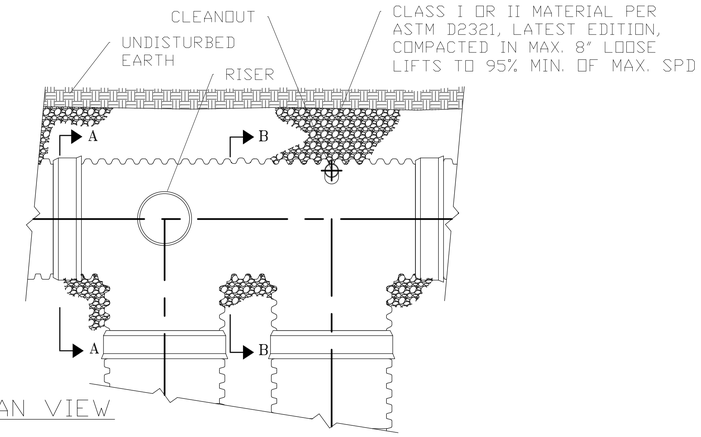
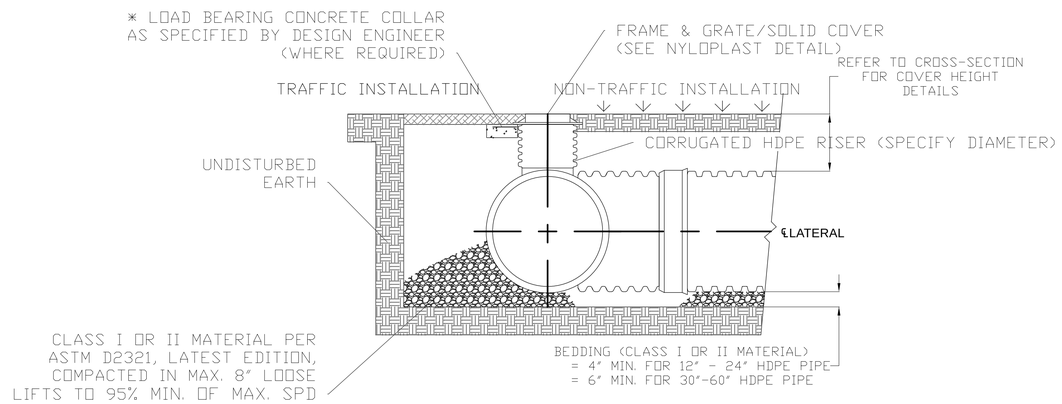




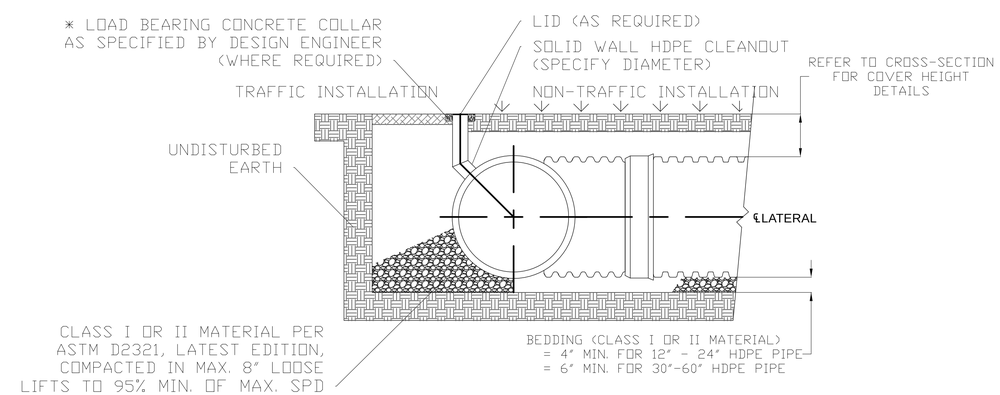
PLAN VIEW

NOMINAL DIAMETER	NOMINAL O.D.	TYPICAL SPACING "C"	TYPICAL SIDE WALL "X"	MIN. H (NON-TRAFFIC)	MIN. H (TRAFFIC)	MAX. H*
12" (300 MM)	14.5" (368 MM)	25.4" (645 MM)	8" (203 MM)	12" (292 MM)	12" (292 MM)	8' (2.4 M)
15" (375 MM)	18" (457 MM)	28.9" (734 MM)	8" (203 MM)	12" (292 MM)	12" (292 MM)	8' (2.4 M)
18" (450 MM)	21" (533 MM)	33.9" (862 MM)	9" (229 MM)	12" (292 MM)	12" (292 MM)	8' (2.4 M)
24" (600 MM)	28" (711 MM)	40.7" (1034 MM)	10" (254 MM)	12" (292 MM)	12" (292 MM)	8' (2.4 M)
30" (750 MM)	36" (914 MM)	53.1" (1347 MM)	18" (457 MM)	12" (292 MM)	12" (292 MM)	8' (2.4 M)
36" (900 MM)	42" 1067 MM)	63" (1600 MM)	18" (457 MM)	12" (292 MM)	12" (292 MM)	8' (2.4 M)
42" (1050 MM)	48" (1219 MM)	71.9" (1826 MM)	18" (457 MM)	12" (292 MM)	24" (610 MM)	8' (2.4 M)
48" (1200 MM)	54" (1372 MM)	78.5" (1994 MM)	18" (457 MM)	12" (292 MM)	24" (610 MM)	8' (2.4 M)
60" (1500 MM)	67" (1702 MM)	90" (2286 MM)	18" (457 MM)	12" (292 MM)	24" (610 MM)	8' (2.4 M)

* MAXIMUM FILL HEIGHTS OVER MANIFOLD FITTINGS. CONTACT MANUFACTURER'S REPRESENTATIVE FOR INSTALLATION CONSIDERATIONS WHEN COVER EXCEEDS 8-FT.
**60" SYSTEMS REQUIRE CLASS I BACKFILL AROUND ALL FITTINGS.



SECTION A-A



SECTION B-B

* LOAD BEARING CONCRETE COLLAR SHALL BE CONSTRUCTED IN TRAFFIC AREAS SUCH THAT THE LIVE LOAD IS TRANSMITTED TO THE SURROUNDING SOIL AND NOT DIRECTLY TO THE RISER.

NOTES:

1. ALL REFERENCES TO CLASS I OR II MATERIAL ARE PER ASTM D2321 "STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY FLOW APPLICATIONS", LATEST EDITION.

2. ALL RETENTION AND DETENTION SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321, LATEST EDITION AND THE MANUFACTURER'S PUBLISHED INSTALLATION GUIDELINES.

3. MEASURES SHOULD BE TAKEN TO PREVENT THE MIGRATION OF NATIVE FINES INTO THE BACKFILL MATERIAL, WHEN REQUIRED. SEE ASTM D2321.

4. FILTER FABRIC: A GEOTEXTILE FABRIC MAY BE USED AS SPECIFIED BY THE ENGINEER TO PREVENT THE MIGRATION OF FINES FROM THE NATIVE SOIL INTO THE SELECT BACKFILL MATERIAL.

5. FOUNDATION: WHERE THE TRENCH BOTTOM IS UNSTABLE. THE CONTRACTOR SHALL EXCAVATE TO A DEPTH REQUIRED BY THE ENGINEER AND REPLACE WITH SUITABLE MATERIAL AS SPECIFIED BY THE ENGINEER. AS AN ALTERNATIVE AND AT THE DISCRETION OF THE DESIGN ENGINEER, THE TRENCH BOTTOM MAY BE STABILIZED USING A GEOTEXTILE MATERIAL.

6. BEDDING: SUITABLE MATERIAL SHALL BE CLASS I OR II. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. UNLESS OTHERWISE NOTED BY THE ENGINEER, MINIMUM BEDDING THICKNESS SHALL BE 4" (100mm) FOR 4"-24" (100mm-600mm); 6" (150mm) FOR 30"-60" (750mm-900mm).

7. INITIAL BACKFILL: SUITABLE MATERIAL SHALL BE CLASS I OR II IN THE PIPE ZONE EXTENDING NOT LESS THAN 6" ABOVE CROWN OF PIPE. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. MATERIAL SHALL BE INSTALLED AS REQUIRED IN ASTM D2321, LATEST EDITION.

8. COVER: MINIMUM COVER OVER ALL RETENTION/DETENTION SYSTEMS IN NON-TRAFFIC APPLICATIONS (GRASS OR LANDSCAPE AREAS) IS 12" FROM TOP OF PIPE TO GROUND SURFACE. ADDITIONAL COVER MAY BE REQUIRED TO PREVENT FLOATATION. FOR TRAFFIC APPLICATIONS, MINIMUM COVER IS 12" UPTO 36" DIAMETER PIPE AND 24" OF COVER FOR 42" - 60" DIAMETER PIPE, MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TO TOP OF RIGID PAVEMENT. MAXIMUM FILL HEIGHT LIMITED TO 8-FT OVER FITTINGS FOR STANDARD INSTALLATIONS. CONTACT A SALES REPRESENTATIVE WHEN MAXIMUM FILL HEIGHTS EXCEED 8-FT FOR INSTALLATION CONSIDERATIONS.

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PREPARED UNDER THE SUPERVISION OF:

PROJECT LOG

FILE # STORMDET
PROJ MGR: RLF
DESIGN BY: RLF
DRAWN BY: RLF
CHECKED BY:
SCALE: 1"=10' NONE
SHEET: 1 OF 1

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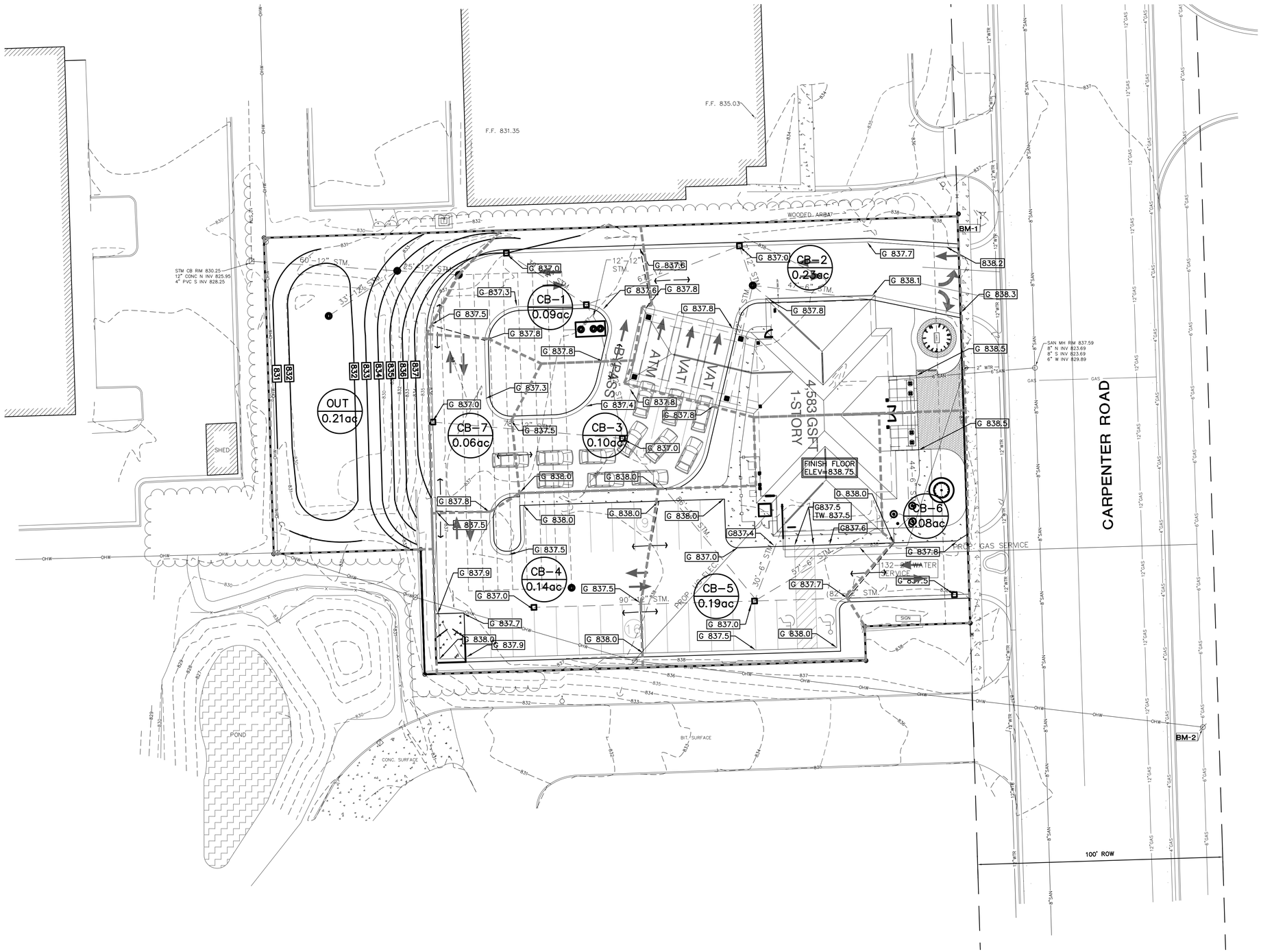
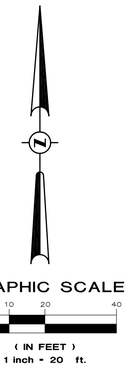
STRATEGIC PROPERTY SERVICES, LLC
2910 CARPENTER ROAD
PITTSFIELD TOWNSHIP
WASHTENAW COUNTY, MICHIGAN

UNDERGROUND DETENTION DETAILS

C2.2

131002





LEGEND

	MONUMENT / SECTION CORNER
	FOUND PROPERTY IRON
	SET PROPERTY IRON
	EXISTING CATCHBASIN
	EXISTING MANHOLE/CATCHBASIN
	EXISTING MANHOLE
	EXISTING HYDRANT
	EXISTING VALVE
SAN	EXISTING SANITARY SEWER
	EXISTING STORM SEWER
	EXISTING WATERMAIN
X	EXISTING FENCE LINE
ELEC	EXISTING UNDERGROUND ELECTRIC LINE
GAS	EXISTING UNDERGROUND GAS LINE
TELE	EXISTING UNDERGROUND TELEPHONE LINE
	EXISTING CENTERLINE
	EXISTING OVERHEAD ELECTRICAL WIRES
	EXISTING MAILBOX / NEWSPAPER BOX
	EXISTING SIGN
	EXISTING DECIDUOUS TREES
	EXISTING CONIFEROUS TREES
	EXISTING UTILITY POWER POLE
	EXISTING TELEPHONE RISER

SITE GRADING NOTES

1. GRADING BASIS OF DESIGN:
   PAVEMENT MIN. 1.0% SLOPE
   CURB AND GUTTER MIN. 0.50% SLOPE
2. APPROXIMATE PAVEMENT AREAS:
   DFCU – 2,150 SYD
3. CONTRACTOR TO PROVIDE SOIL EROSION CONTROL MEASURES AS NECESSARY TO PREVENT ANY EROSION OR SEDIMENTATION. PROTECT ALL DRAINAGE STRUCTURES WITH SILT FENCE, SURFACE SEDIMENT SUMPS, OR OTHER APPROVED MEASURES.

SITE INFORMATION

SITE ADDRESS
2910 CARPENTER RD.
ANN ARBOR, MI

ZONING CLASSIFICATION
CARPENTER ROAD MIXED USE DISTRICT
STREET TYPE URBAN; SITE TYPE A

CLIENT INFORMATION

STRATEGIC PROPERTY SERVICES, LLC
5750 NEW KING STREET, SUITE 120
TROY, MI 48908

PREPARED UNDER THE SUPERVISION OF:

PROJECT LOG

FOR REVIEW COMMENTS	05-13-15
FOR REVIEW COMMENTS	06-12-15
FOR WORK COMMENTS	08-18-15

FILE #	OVERALL
PROJ. MGR:	RLF
DESIGN BY:	RLF
DRAWN BY:	RLF
CHECKED BY:	
SCALE:	1"=20' NONE
SHEET:	1 OF 1

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DFCU FINANCIAL - PITTSFIELD TOWNSHIP
STRATEGIC PROPERTY SERVICES, LLC
2910 CARPENTER ROAD
PITTSFIELD TOWNSHIP
WASHTENAW COUNTY, MICHIGAN

GRADING PLAN

C3.0

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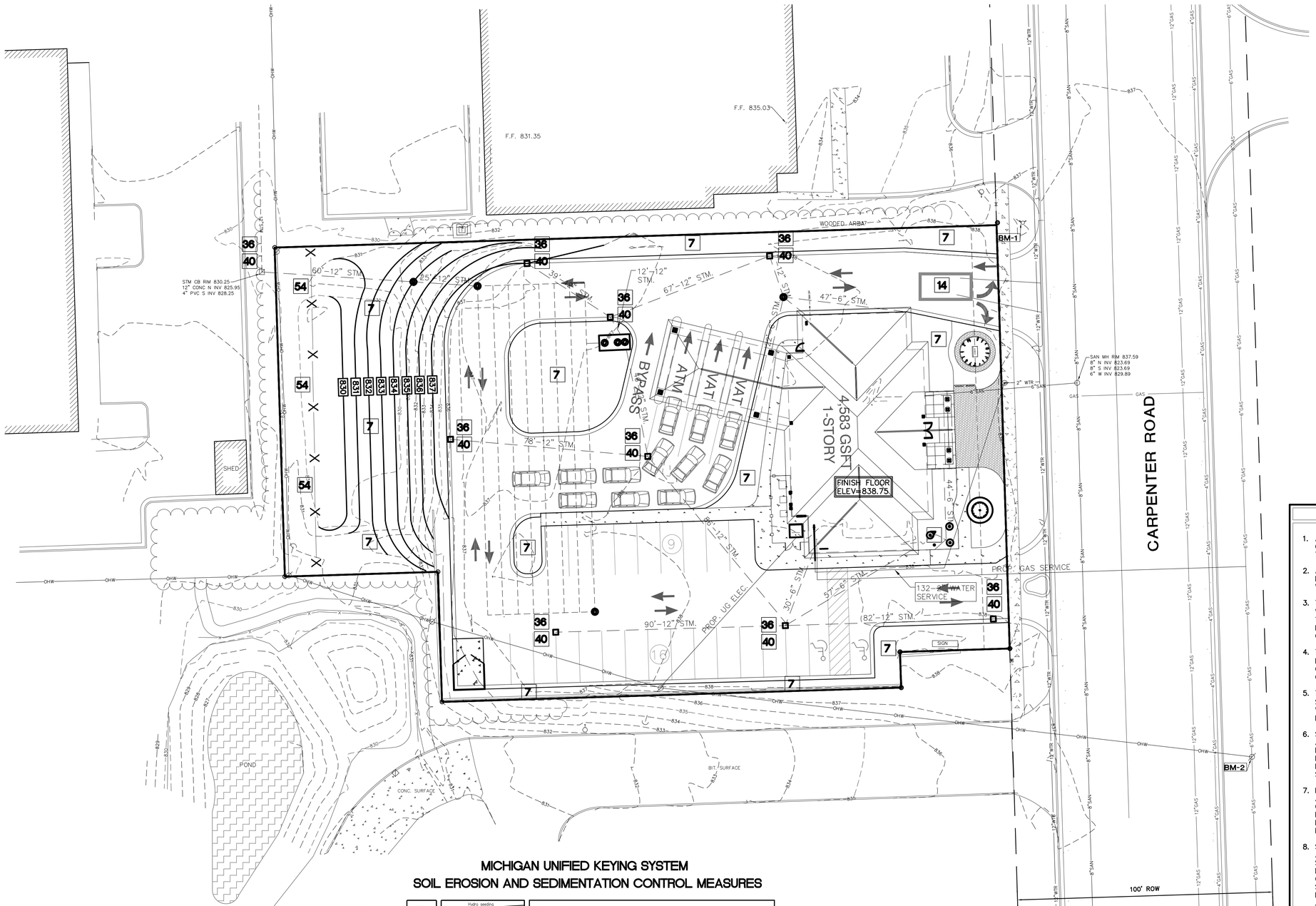

GRAPHIC SCALE

0 10 20 40

(IN FEET)
1 inch = 20 ft.

LEGEND

	MONUMENT / SECTION CORNER
	FOUND PROPERTY IRON
	SET PROPERTY IRON
	EXISTING CATCHBASIN
	EXISTING MANHOLE/CATCHBASIN
	EXISTING MANHOLE
	EXISTING HYDRANT
	EXISTING VALVE
SAN	EXISTING SANITARY SEWER
	EXISTING STORM SEWER
	EXISTING WATERMAIN
X	EXISTING FENCE LINE
ELEC	EXISTING UNDERGROUND ELECTRIC LINE
GAS	EXISTING UNDERGROUND GAS LINE
TELE	EXISTING UNDERGROUND TELEPHONE LINE
	EXISTING CENTERLINE
//	EXISTING OVERHEAD ELECTRICAL WIRES
	EXISTING MAILBOX / NEWSPAPER BOX
	EXISTING SIGN
	EXISTING DECIDUOUS TREES
	EXISTING CONIFEROUS TREES
	EXISTING UTILITY POWER POLE
	EXISTING TELEPHONE RISER

SOIL EROSION NOTES

1. ALL SOIL EROSION/SEDIMENTATION CONTROL WORK SHALL CONFORM TO THE PERMIT REQUIREMENTS OF PITTSFIELD TOWNSHIP.
2. ALL TEMPORARY SOIL EROSION AND SEDIMENTATION CONTROL MEASURES ARE TO BE IN PLACE PRIOR TO STARTING ANY WORK.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLIANCE WITH NPDES REQUIREMENTS INCLUDING, BUT NOT LIMITED TO, THE PRESENCE OF A CERTIFIED STORM WATER OPERATOR FOR INSPECTION OF SOIL EROSION AND SEDIMENTATION CONTROL MEASURES.
4. THE CONTRACTOR SHALL IMPLEMENT AND MAINTAIN THE SOIL EROSION/SEDIMENTATION CONTROL DEVICES SHOWN DURING CONSTRUCTION AND UNTIL ALL PERMANENT SOIL EROSION CONTROLS MEASURES ARE FUNCTIONING AS DESIGNED.
5. THE CONTRACTOR SHALL INSPECT THE SOIL EROSION/ SEDIMENTATION CONTROL DEVICES AT LEAST ONCE EACH WEEK AND WITHIN 24 HOURS OF A RAINFALL EVENT WHICH RESULTS IN A STORM WATER DISCHARGE FROM THE SITE.
6. SILT FENCE MAINTENANCE SHALL INCLUDE THE REMOVAL OF ANY BUILT UP SEDIMENT WHEN THE SEDIMENT HEIGHT EQUALS ONE THIRD TO ONE HALF OF THE HEIGHT OF THE FENCE. THE CONTRACTOR IS RESPONSIBLE TO REMOVE, REPLACE, RETRENCH OR REBACKFILL THE SILTATION FENCE SHOULD IT FAIL OR BE DAMAGED DURING CONSTRUCTION.
7. INLET FILTER MAINTENANCE SHALL INCLUDE THE REMOVAL OF ANY ACCUMULATED SILT OR OTHER DEBRIS. THE REMOVAL OF SILT SHALL BE WITH THE USE OF A STIFF BRISTLE BROOM OR SQUARE POINT SHOVEL. THE CONTRACTOR SHALL REPLACE ANY INLET FILTERS WHICH ARE DAMAGE OR CAN NOT BE CLEANED.
8. SOIL TRACKING MATS SHALL BE MAINTAINED THROUGH THE ADDITION OF AGGREGATE IF RUTTING OCCURS OR IF SURCHARGING OF MATERIAL AFFECTS PERFORMANCE OF THE MATS. THE CONTRACTOR SHALL INSTRUCT ALL DRIVERS TO CLEAN SOIL MATERIALS FROM TIRES PRIOR TO EXITING THE SITE. ANY DIRT OR DEBRIS DEPOSITED ON THE ROADWAYS RESULTING FROM CONSTRUCTION TRAFFIC SHALL BE CLEANED AT THE END OF EACH WORK DAY.
9. THE CONTRACTOR SHALL MAKE A WATER TRUCK AVAILABLE TO WATER DOWN THE SITE ON A DAILY BASIS AS REQUIRED TO MAINTAIN DUST CONTROL.
10. USE TERRATEX SILT BARRIER FENCE OR EQUAL PRIOR TO START OF CONSTRUCTION. SLOPE PROTECTION AND EROSION CONTROL SHALL BE PERFORMED IN ACCORDANCE WITH THE "MICHIGAN SOIL EROSION AND SEDIMENTATION CONTROL GUIDEBOOK" AND "PUBLIC ACT 347." THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ANY MEASURES REQUIRED TO PROPERLY CONTROL EROSION AND SEDIMENTATION AS MAY ARISE FROM CONDITION WHICH MAY DEVELOP DURING CONSTRUCTION. ALL COSTS RELATED TO EROSION OR SEDIMENTATION CONTROL MEASURES WHETHER SHOWN ON THE PLANS OR NOT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
11. EROSION CONTROL BLANKETS SHALL BE PROVIDED ON ALL SLOPES STEEPER THAN 1H:3V, AND IN DRAINAGE SWALES. EROSION CONTROL BLANKETS SHALL BE NORTH AMERICAN GREEN S105 (MINIMUM) OR OTHERWISE APPROVED EQUAL.

MICHIGAN UNIFIED KEYING SYSTEM
SOIL EROSION AND SEDIMENTATION CONTROL MEASURES

7	Hydro seeding	Effective on large areas. Mulch tacking agent used to provide immediate protection until grass is rooted. Should include prepared topsoil bed.
14	Aggregate Cover – Tracking Mat	2"–3" coarse aggregate 6" thick on geo–fabric. 25' wide by 50' long, replenish stone as required due to rutting. Temporary measure, remove after completion of construction.
36	Catch Basin, Drain Inlet	Collects high velocity concentrated runoff. Use filter cloth over inlet. (Alt. Silt–Sak tm.)
40	Inlet Sediment Trap	Easy to shape. Collects sediment. May be cleaned and expanded as needed.
54	Silt Fence	Filters and detains runoff.

TOTAL DISTURBED AREA = 1.09 ACRES

CONSTRUCTION COST ESTIMATE

SOIL EROSION ITEM	EST. COST
SILT FENCE (125')	$500
TRACKING MAT (25'x 50')	$800
INLET SEDIMENT TRAP (9)	$900
CATCH BASIN FILTER (9)	$1800
MISC. EROSION CONTROL	$500
TOTAL	$4,500

SOIL EROSION\SEDIMENTATION CONTROL OPERATION TIME SCHEDULE 2015

CONSTRUCTION SEQUENCE	JAN	FEB	MAR	APR	MAY	JUN	JULY	AUG	SEP	OCT	NOV	DEC
STRIP & STOCKPILE						X						
ROUGH GRADE/SEDIMENT CONTROL						X	X	X				
TEMP. CONTROL MEASURES						X	X	X				
STORM FACILITIES						X	X	X	X			
TEMP. CONSTRUCTION ROADS						X	X	X	X			
FOUNDATION/BLDG. CONSTRUCTION						X	X	X	X	X		
SITE CONSTRUCTION							X	X	X	X		
PERM. CONTROL MEASURES									X	X		
FINISH GRADING									X	X		
LANDSCAPING									X	X		

CONSTRUCTION TIME TABLE

PREPARED UNDER THE SUPERVISION OF:

PROJECT LOG

REF.	REVIEW COMMENTS	DATE

FILE #:	OVERALL
PROJ. MGR:	RLF
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DFCU FINANCIAL - PITTSFIELD TOWNSHIP
STRATEGIC PROPERTY SERVICES, LLC

2910 CARPENTER ROAD
PITTSFIELD TOWNSHIP
WASHTENAW COUNTY, MICHIGAN

EROSION CONTROL PLAN

C3.1

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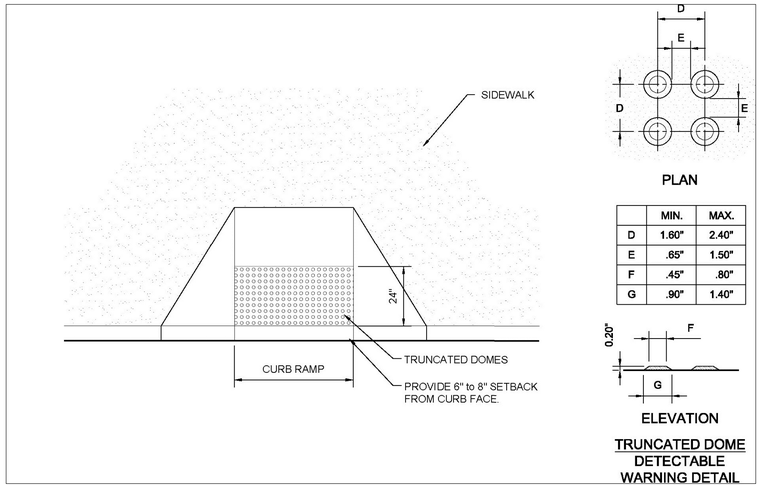
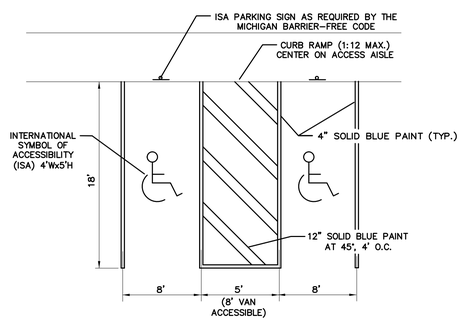
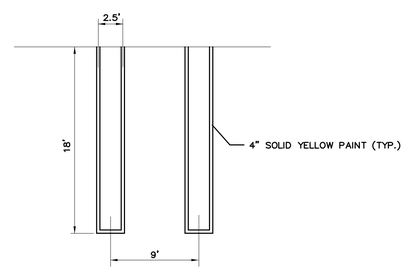


	MIN.	MAX.
D	1.60"	2.40"
E	.65"	1.50"
F	.45"	.80"
G	.90"	1.40"

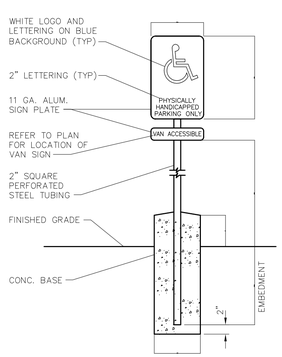
ADA RAMP DETAIL
NO SCALE



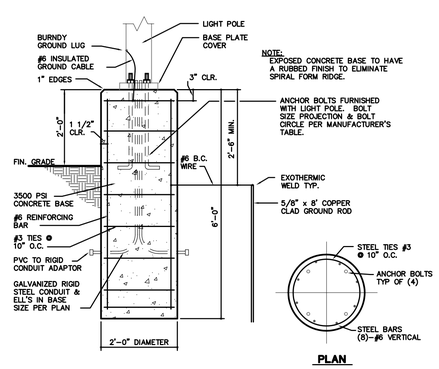
BARRIER-FREE PAVEMENT MARKING DETAIL



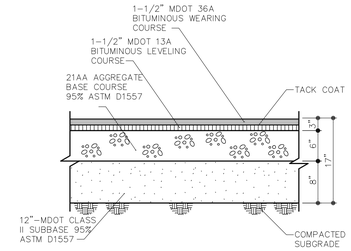
PAVEMENT MARKING DETAIL



TYPICAL HANDICAP SIGN
NO SCALE

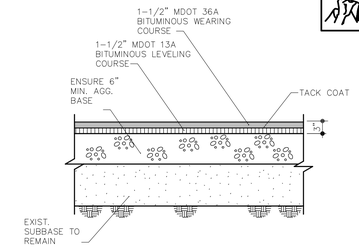


LOT LIGHT POLE CONCRETE BASE DETAIL
NO SCALE



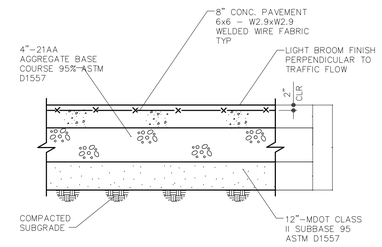
PAVEMENT SECTION FOR FULL DEPTH PAVEMENT REPLACEMENT AREAS

REPLACEMENT BITUMINOUS PAVEMENT
NO SCALE



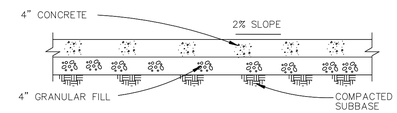
PAVEMENT SECTION FOR PAVEMENT RESURFACING AREA (PARTY STORE)

RESURFACING BITUMINOUS PAVEMENT
NO SCALE



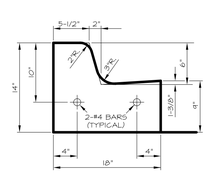
CONCRETE PAVEMENT SECTION FOR DRIVE-THRU, DRIVEWAYS, THICKENEND CONCRETE WALKS, AND DUMPSTER APPROACH AREA

CONCRETE PAVEMENT
NO SCALE

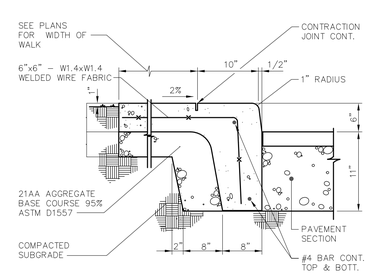


NOTE:
CONTRACTION JOINTS SHALL BE 1/4" x 2 3/4" DEEP, SPACED AT 5'-0" INTERVALS. EXPANSION JOINTS SHALL BE 1/2" PREMOLDED FILLER, SPACED AT A MAXIMUM 30' APART. EXPANSION JOINTS TO BE PLACED BETWEEN NEW AND EXISTING CONCRETE.

CONCRETE WALK
NO SCALE



TYPE A CURB
NO SCALE
ALL SITE CURB



NOTE:
WHERE WALK DOES NOT ABUT ASPHALT PAVEMENT, EXTEND THICKNESS FOR REQUIRED WIDTH AND OMIT CURB PORTION. CONTRACTION JOINTS TO BE 2 1/2" DEEP, SPACED AT 5' INTERVALS (TOOLED). EXPANSION JOINTS TO BE 1/2" PREMOLDED FILLER, SPACED A MAXIMUM OF 30' APART.

CONCRETE CURB WALK
NO SCALE

MISS DIG 3 WORKING DAYS BEFORE YOU DIG CALL MISS DIG 800-482-7171 (TOLL FREE)

PREPARED UNDER THE SUPERVISION OF:

PROJECT LOG

REV.	REVIEW COMMENTS	DATE
		05-13-15

FILE #: DETAILS
PROJ. MGR: RLF
DESIGN BY: RLF
DRAWN BY: RLF
CHECKED BY:
SCALE: 1"=20' NONE
SHEET: 1 OF 1

RICHARD L. FOSGITT, PE - CONSULTANT
393 River Road - Bay City, MI 48706
989-513-4058

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DFCU FINANCIAL - PITTSFIELD TOWNSHIP
STRATEGIC PROPERTY SERVICES, LLC
2910 CARPENTER ROAD
PITTSFIELD TOWNSHIP
WASHTENAW COUNTY, MICHIGAN

SITE DETAILS

C4.0

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LUMINAIRE SCHEDULE

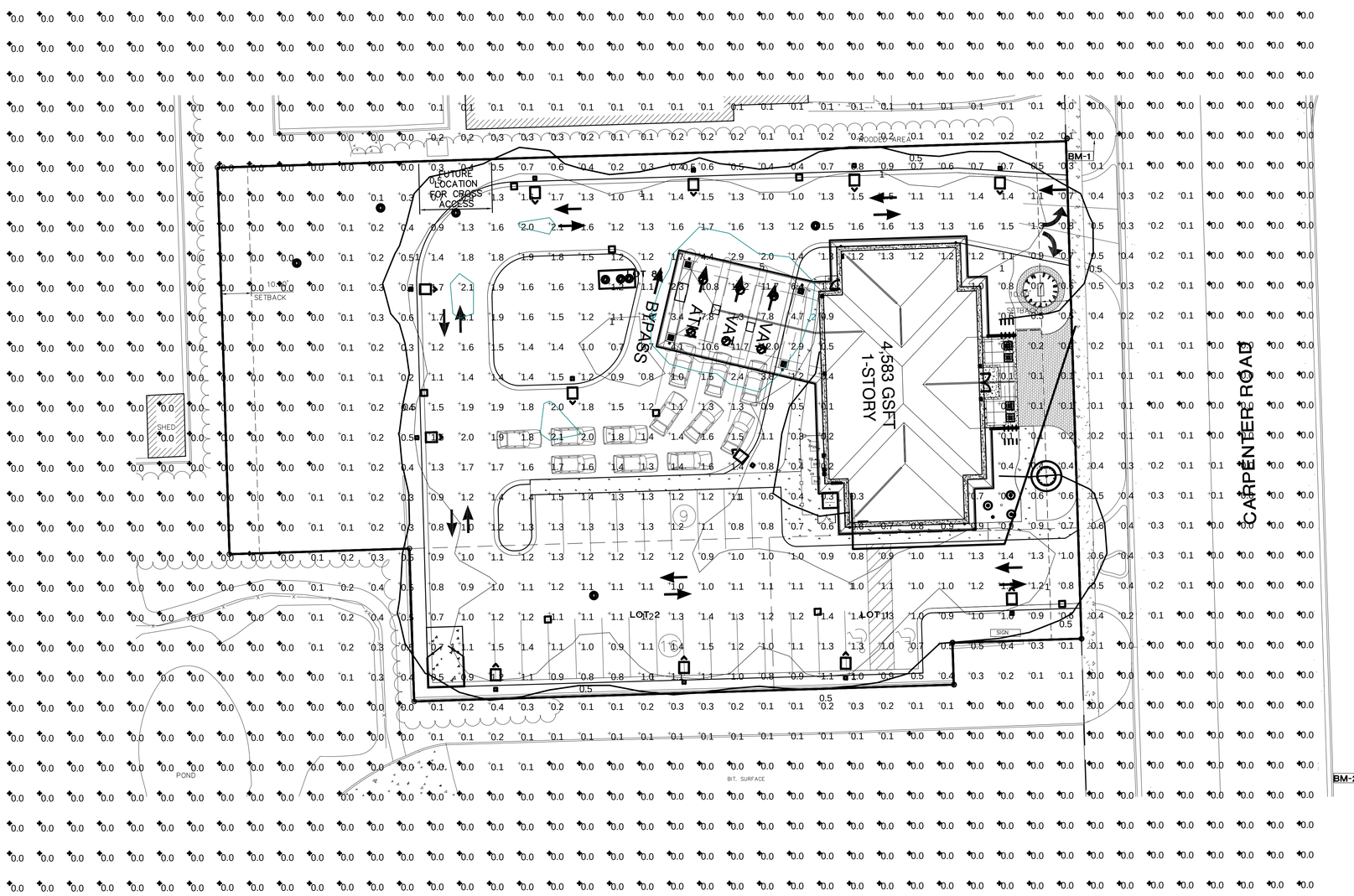
Symbol	Label	Qty	Catalog Number	Description	Lamp	File	Lumens	LLF	Watts
	M	6	EVO 35/18 8AR LS 120	8" LED DOWNLIGHT, 3500K, 1800 LUMENS, STANDARD DISTRIBUTION WITH CLEAR SPECULAR REFLECTOR	LED	EVO_35_18_8AR_LS_120.ies	Absolute	1.00	34.6
	A	12	DSX1 LED 30C 530 40K TFTM MVOLT HS	DSX1 LED WITH (1) 30 LED LIGHT ENGINES, TYPE TFTM OPTIC, 4000K, @ 530mA WITH HOUSE SIDE SHIELD	LED	DSX1_LED_30C_530_40K_TFTM_MVOLT_HS.ies	Absolute	1.00	52

STATISTICS

Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Baseline	+	-1.0 fc	0.0 fc	0.0 fc	N / A	N / A
Calc Zone #2	+	0.4 fc	12.2 fc	0.0 fc	N / A	N / A

LUMINAIRE LOCATIONS

No.	Label	Location X	Location Y	Location Z	MH	Orientation	Tilt	Aim X	Aim Y	Aim Z
1	M	9916.9	10121.1	14.5	14.5	0.0	0.0	9916.9	10121.1	0.0
2	M	9912.8	10103.5	14.5	14.5	0.0	0.0	9912.8	10103.5	0.0
3	M	9929.2	10117.7	14.5	14.5	0.0	0.0	9929.2	10117.7	0.0
4	M	9924.5	10100.6	14.5	14.5	0.0	0.0	9924.5	10100.6	0.0
5	M	9940.5	10115.7	14.5	14.5	0.0	0.0	9940.5	10115.7	0.0
6	M	9936.2	10097.9	14.5	14.5	0.0	0.0	9936.2	10097.9	0.0
7	A	9967.2	10159.2	20.0	20.0	179.1	0.0	9967.2	10158.0	0.0
8	A	9913.6	10157.7	20.0	20.0	179.6	0.0	9913.6	10156.5	0.0
9	A	9860.8	10155.0	20.0	20.0	179.1	0.0	9860.8	10153.8	0.0
10	A	9819.4	10117.9	20.0	20.0	90.4	0.0	9820.7	10117.9	0.0
11	A	9821.4	10068.4	20.0	20.0	88.5	0.0	9822.6	10068.4	0.0
12	A	9847.7	9984.5	20.0	20.0	0.0	0.0	9847.7	9985.7	0.0
13	A	10019.9	10009.8	20.0	20.0	-1.1	0.0	10019.8	10011.0	0.0
14	A	9964.4	9988.3	20.0	20.0	0.3	0.0	9964.4	9989.5	0.0
15	A	9910.5	9986.9	20.0	20.0	0.0	0.0	9910.5	9988.1	0.0
16	A	9933.4	10059.2	20.0	20.0	-52.8	0.0	9932.4	10059.9	0.0
17	A	9873.3	10088.1	20.0	20.0	179.3	0.0	9873.3	10086.9	0.0
18	A	10015.9	10158.2	20.0	20.0	180.5	0.0	10015.9	10157.0	0.0

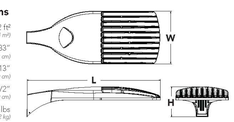


D-Series Size 1
LED Area Luminaire

d*series

Specifications

EPA: 1.2 ft² (0.11 m²)
Length: 33" (83.8 cm)
Width: 13" (33.0 cm)
Height: 7-1/2" (19.0 cm)
Weight (max): 27 lbs (12.2 kg)



Catalog Number
Notes
Type

Hit the Tab key or mouse over this page to see all interactive elements.

Introduction

The modern styling of the D-Series is striking yet unobtrusive - making a bold, progressive statement even as it blends seamlessly with its environment.

The D-Series distills the benefits of the latest in LED technology into a high performance, high efficacy, long-life luminaire. The outstanding photometric performance results in sites with excellent uniformity, greater pole spacing and lower power density. It is ideal for replacing 100 – 400W metal halide in pedestrian and area lighting applications with typical energy savings of 65% and expected service life of over 100,000 hours.

Ordering Information

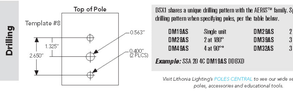
EXAMPLE: DSX1 LED 60C 1000 40K T3M MVOLT SPA DDBXD

DSX1 LED

Series	LEDs	Drive current	Color temperature	Distribution	Voltage	Mounting	Control options	Other options	Finish (required)
DSX1 LED	**Forward optics** 30C 30 LEDs (one engine) 60C 60 LEDs (two engines) 80C 80 LEDs (two engines) **Rotated optics** 60C 60 LEDs (two engines)	530 530 mA 700 700 mA 1000 1000 mA (1 A)	30K 3000K (80 CRI min.) 40K 4000K (70 CRI min.)[1] 50K 5000K (67 CRI)	T1S Type I short T2S Type II short T2M Type II medium T3S Type III short T3M Type III medium T4M Type IV medium TFTM Forward throw medium TSVS Type V very short TSS Type V short TSM Type V medium TSW Type V wide	MVOLT[1] 120[2] 208[2] 240[2] 277[2] 347[2] 480[2]	**Shipped included** SPA Square pole mounting RPA Round pole mounting WBA Wall bracket SPUMRA Square pole universal mounting adapter[4] RPUMRA Round pole universal mounting adapter[4]	**Shipped installed** PER NEMA twist-lock receptacle only (no control)[5] DMG 0-10V dimming driver (no control) DCR Dimmable and controllable via ROAM® (no control)[6] DS Dual switching[7,8] PIR Motion sensor, 8-15' mounting height[9] PIRH Motion sensor, 15-30' mounting height[9] BL30 Bi-level switched dimming, 30%[8,9] BL50 Bi-level switched dimming, 50%[8,9]	**Shipped installed** HS House-side shield[9] WTB Utility terminal block[10] SF Single fuse (120, 277, 347V)[2] DF Double fuse (208, 240, 480V)[2] L90 Left rotated optics[7] R90 Right rotated optics[7]	DDBXD Dark bronze DBLXD Black DNAXD Natural aluminum DWHXD White DDBTXD Textured dark bronze DBLBXD Textured black DNATXD Textured natural aluminum DWHGXD Textured white

Drilling

Top of Pole



DSX1 shows a unique drilling pattern with the AERIS™ family. Specify this drilling pattern when specifying poles, per the table below.

DM19AS	Single unit	DM28AS 2 at 90°*
DM29AS 2 at 180°		DM39AS 3 at 90°*
DM49AS 4 at 90°*		DM32AS 3 at 120°**

Example: SSA 20 4C DM19AS DDBXD

Visit Lithonia Lighting's POLES CENTRAL to see our wide selection of poles, accessories and educational tools.

*Round pole top must be 3.25" O.D. minimum.
**For round pole mounting (RPA) only.

Accessories

Ordered and shipped separately.

DLL127F 1.5 JU Photocell - SSL twist-lock (120-277V) [9]
DLL347F 1.5 CUL JU Photocell - SSL twist-lock (347V) [9]
DLL480F 1.5 CUL JU Photocell - SSL twist-lock (480V) [9]
SC U Shorting cap [9]
DSHS/KIT 3 KC U House-side shield for 3 LED unit
DSHS/KIT 4 KC U House-side shield for 4 LED unit
DSHS/KIT 6 KC U House-side shield for 6 LED unit
PUMRA DDBXD U* Square and round pole universal mounting bracket adapter (specify finish)

For more control options, visit DTL and ROAM online.

Tenon Mounting Slipfitter**

Tenon O.D.	Single Unit	2 at 180°	2 at 90°	3 at 90°	3 at 90°	4 at 90°
3-0/8"	AST20-190	AST20-280	N/A	N/A	N/A	N/A
3-0/8"	AST25-190	AST25-280	N/A	AST25-320	N/A	N/A
4"	AST35-190	AST35-280	AST35-290	AST35-320	AST35-430	AST35-440

NOTES

1 Configured with 4000K (40K) provides the shortest lead times. Consult factory for 2000K (20K) and 5000K (50K) lead times.
2 MVOLT driver operates on any line voltage from 120-277V (50/60 Hz). Specify 120, 208, 240 or 277 options only when ordering with fusing (SF, DF options).
3 Not available with single board, 530mA product (2DC, 530, or 60C 530 DS). Not available with DCR, BL30 or BL50.
4 Available as a separate combination accessory: PUMRA (finish) U.
5 Photocell ordered and shipped as a separate line item from Acuity Brands Controls. See accessories. Not available with DS option.
6 Specifies a ROAM® enabled luminaire with 0-10V dimming capability. PER option ordered and shipped as a separate line item. ROAM® is a wireless network system required for ROAM® deployment; must be purchased separately. Call 1-800-442-6745 or email: sales@roamservices.net. N/A with BL30, BL50, DS, PIR or PIRH.
7 Requires 40C or 60C. Provides 5000 lumen operation via two independent drivers on two separate circuits. N/A with PER, DCR, WTB, PIR, or PIRH.
8 Requires an additional switched circuit.
9 PIR specifies the SensorSwitch SBGR-10-ODP control; PIRH specifies the SensorSwitch SBGR-6-ODP control; see Motion Sensor Guide for details. Dimming driver standard. Not available with DCR.
10 Dimming driver standard. MVOLT only. Not available with DCR.
11 Also available as a separate accessory; see Accessories information.
12 WTB not available with DS.
13 Single fuse (SF) requires 120, 277 or 347 voltage option. Double fuse (DF) requires 208, 240 or 480 voltage option.
14 Available with 60 LEDs (60C option) only.
15 Requires luminaire to be specified with PER option. Ordered and shipped as a separate line item from Acuity Brands Control.

LITHONIA LIGHTING.
One Lithonia Way • Conyers, Georgia 30012 • Phone: 800.279.8041 • Fax: 770.918.1209 • www.lithonia.com
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DFCU PLYTMOUTH TOWNSHIP CANOPY LIGHTS

gotham®

Luminaire Type:
Catalog Number (autopopulated):

Gotham Architectural Downlighting
LED Downlights

8" Evo®
Open Reflector

Solid-State Lighting

FEATURES

OPTICAL SYSTEM
- Self-flanged semi-specular, matte-diffuse or specular lower reflector
- Patented Bounding Ray™ optical design (U.S. Patent No. 5,800,050)
- 45° cutoff to source and source image
- Top-down flash characteristic

MECHANICAL SYSTEM
- 16-gauge galvanized steel construction; maximum 1-1/2" ceiling thickness
- Telescopic mounting bars maximum of 32" and minimum of 15", preinstalled, 4" vertical adjustment
- Tooless adjustments post installation
- Junction box capacity: 8 (4 in, 4 out) 12AWG rated for 90°C
- Light engine and driver accessible through aperture

ELECTRICAL SYSTEM
- Fully serviceable and upgradeable lensed LED light engine
- 70% lumen maintenance at 60,000 hours based on IESNA LM-79-2008
- 120-277VAC, 50/60hz power supply with 0-10V dimming (10-100%)
- Overload and short circuit protected
- LEDs tested under LM80

LISTINGS
- Fixtures are CSA certified to meet US and Canadian standards; wet location, covered ceiling

WARRANTY
- 5-year limited warranty. Complete warranty terms located at: www.acuitybrands.com/Customer/Resources/Terms_and_conditions.aspx

ORDERING INFORMATION

EXAMPLE: EVO 35/18 8AR 120

Series	Color temperature	Nominal lumen values	Aperture/Trim color	Distribution	Finish	Voltage
EVO	27/ 2700 K 30/ 3000 K 35/ 3500 K 41/ 4100 K	18 1800 lumens 22 2200 lumens 29 2900 lumens	8AR Clear 8PR Pewter 8WTR Wheat 8GR Gold 8WR White	(blank) 1.0 s/min VND Very narrow (0.43 s/min) ND Narrow (0.52 s/min) MD Medium (0.80 s/min) WD Wide (1.1 s/min)	(blank) Semi-specular LD Matte diffuse LS Specular	120 277 347[2]

Driver		Options	
(blank)[1] 0-10V dimming driver. Minimum dimming level 10% ECOS2[1,3] Lutron® Hi-Lume® 2-wire forward-phase dimming driver. Minimum dimming level 1% ECOS3[1,4] Lutron® Hi-Lume® 3-wire or EcoSystem® dimming driver. Minimum dimming level 1%		SF Single fuse RRL__ RELOC® -ready luminaire connectors enable a simple and consistent factory installed option across all ABL luminaire brands. Refer to RRL for complete nomenclature. NEPP[5] Interface for Sensor Switch® nLight® network provided with integral power supply. Refer to TN-623-01. NSD[5] Sensor Switch® nLight® one 5A relay with one 0-10 VDC dimming output; requires bus power, such as nFP16 power pack. Refer to nSPS-D. TRW[7] White painted flange	TRBL Black painted flange EL[8] Emergency battery pack with integral test switch ELR[8] Emergency battery pack with remote test switch CP[9] Chicago plenum

ACCESSORIES order as separate catalog numbers (shipped separately)

SCA8	Sloped ceiling adapter. Degree of slope must be specified (10D, 15D, 20D, 25D, 30D). Ex: SCA8 10D. Refer to TECH-190.
CTA4-8 YK	Ceiling thickness adapter (extends mounting frame to accommodate ceiling thickness up to 2").
GVRT	Vandal-resistant trim accessory. Refer to TECH-200.
ISD BC	0-10V wallbox dimmer. Refer to ISD-BC.
NSPS D ER KIT	Sensor Switch nLight secondary relay and dimming pack device used to switch and dim luminaires powered via an emergency circuit. Refer to NSPS D ER KIT.

EVO-8-OPEN
PAGE 1 OF 3

GOTHAM ARCHITECTURAL DOWNLIGHTING | 1400 Lester Road Conyers GA 30012 | P 800.315.4982 | gothamlighting.com
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gotham®

PREPARED UNDER THE SUPERVISION OF:

PROJECT LOG

FOR REVIEW, COMMENTS	05-15-15
FOR PLANNING COMMENTS	06-25-15

FILE #: PHOTOMETRIC
PROJ. MGR: RLF
DESIGN BY: RLF
DRAWN BY: RLF
CHECKED BY:
SCALE: 1"=20' NONE
SHEET: 1 OF 1

RICHARD L. FOSGITT, PE - CONSULTANT
393 River Road - Bay City, MI 48706
989-513-4058

CONFIDENTIAL:
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Reproduction or distribution of drawings or any information contained in these documents is prohibited without the written approval of the Owner.

DFCU FINANCIAL - PITTSFIELD TOWNSHIP
STRATEGIC PROPERTY SERVICES, LLC

2910 CARPENTER ROAD
PITTSFIELD TOWNSHIP
WASHTENAW COUNTY, MICHIGAN

PHOTOMETRIC PLAN

E1.0

131002

NOT PUBLISHED - ALL RIGHTS RESERVED
RICHARD L. FOSGITT, P.E.

STORM SEWER AND DRAINAGE STRUCTURES

1.00 GENERAL

1.01 DESCRIPTION

A. Furnish all labor, tools, equipment and materials to construct all storm sewers, and drainage structures as herein specified. No sewers shall be accepted until the sewer system has passed the system acceptance tests.

1.02 TESTING

A. General

1. The CONTRACTOR shall furnish all equipment and personnel to conduct system acceptance tests as specified herein on all completed sewers. All tests shall be conducted under the supervision of the ENGINEER. No acceptance tests shall be conducted until the entire sewer system is constructed or just prior to placing the line in service providing the sewer pipe has been installed for not less than 30 days.

B. Test for Alignment

1. All sewers shall be laid accurately to the line and grade designed by the ENGINEER. The sewers will be tested for alignment by shining a light through the pipe at a manhole and viewing the light from an adjacent manhole. Any section of sewer in which a light cannot be seen from one manhole to the next shall be corrected to the satisfaction of the ENGINEER to pass this test.

C. Material Tests

1. The CONTRACTOR shall have tests of pipe strength made by an independent testing laboratory. Tests of up to 4 lengths of sewer pipe per hundred lengths may be required to show compliance with the Specifications. All pipe delivered to the job site shall be accompanied with a manufacturer's certificate of compliance to the Specifications.

D. Submittals

1. The CONTRACTOR shall submit shop drawings, or data sheets for all castings, steps and manholes.

2. The CONTRACTOR shall submit certification letters for all pipes. All letters must contain the following: Contractors name, project name, township name, current date, certification of pipe provided and letterhead of the certifying company.

2.00 PRODUCTS

2.01 PIPE

A. Reinforced concrete pipe and manhole tees shall be no less than the latest revision of ASTM C76, with the class designation as shown on the Plans or in the Proposal.

B. Concrete pipe shall have tongue and groove gasketed premium joints.

C. Corrugated steel pipe shall meet the requirements of AASHO M-190 for coated pipe latest revision. Minimum gage thickness shall be as shown on the Plans.

2.02 REINFORCED CONCRETE MANHOLES

A. Manholes shall conform to the current ASTM Specifications for precast reinforced concrete Manhole Sections, serial designation C478. Manhole section joints shall conform to ASTM Designation C990. All cones shall be eccentric with an offset step configuration. Concrete adjustment rings or riser rings shall not be used for adjusting the height of the structure.

B. All manhole component parts shall have the name of the manufacturer stencilled on the inside. The lettering or logo shall be a minimum of 4 inches high.

2.03 MORTAR FOR MANHOLES

A. Mortar for plastering manholes and drainage structures shall be made of one part Portland cement and two parts fine aggregate.

2.04 BRICK AND BLOCK

A. Brick for brick and mortar structures shall conform to the current ASTM Specification C32. Block for block and mortar structures shall conform to the current ASTM Specification C135.

B. The concrete block masonry used to construct manhole and catch basin walls shall be solid curved blocks with the inside and outside surfaces curved to the required radii. The blocks shall have tongue and groove or other approved type of joint at the ends so that the units interlock to form a strong, rigid structure. Curved blocks shall have the inside and outside surfaces parallel.

C. The block shall not exceed 18 inches in length or 8 inches in depth (height). No block shall be less than 6 inches in width (thickness). All blocks in one structure shall be of the same height dimension. The blocks shall be designed for length so that only full-length or half-length blocks are required to lay the circular wall of any one course.

D. Blocks intended for use in the cones or tops of manholes and catch basins shall have such shape as may be required to form the structure as shown on the Plans with inside and outside joint not to exceed 1/4-inch in thickness.

2.05 STRUCTURE FRAMES AND COVERS

A. Structures frames and covers shall weigh not less than 350 lbs. Each frame and cover shall have machined bearing surfaces and shall be suitably notched for convenient removal of the cover. Each solid manhole cover shall be marked Storm Sewer with letters integrally cast into the cover.

B. Frames and Covers shall be as follows:
1. For use on manholes: East Jordan 1040Z, with Type B cover lettered "STORM SEWER", or equal. Structures 24-inches in diameter shall have the 1045 Z frame.
2. For use on drainage structures in paved areas: East Jordan 1040Z, with Type M1 cover, with "DUMP NO WASTE" lettering and trout logo.
3. For use on drainage structures in curbed areas: East Jordan 7045 or 7065, with "DUMP NO WASTE" lettering and trout logo.
4. For use on drainage structures in landscaped areas: East Jordan 1040Z, with 1040 N 7", with "DUMP NO WASTE" lettering and trout logo.

C. All frames and covers shall be coated by the manufacturer with coal tar pitch varnish or other asphaltum coating reviewed by the ENGINEER.

D. All covers for drainage structures shall have storm drain markers affixed to the nearest available flat surface. The storm drain markers shall be manufactured by Das Manufacturing and shall be #SDR "No Dumping. Drains to River." The storm drain markers shall be installed per the manufacturer's recommendations.

2.06 MANHOLE STEPS

A. Steps shall be plastic coated steel. They shall be M.A. Industries PS1-PF for precast manholes, PS1-B for block manholes, or equal.

2.07 DRAINAGE STRUCTURES

A. All manholes and catch basins shall be precast unless otherwise specified.

B. Manhole and catch basin bottoms shall be concrete and top of slab shall have a troweled finish.

C. Upon approval by the ENGINEER, the manhole and catch basin walls may be constructed of concrete block masonry or concrete manhole pipe conforming to the requirements of the specifications previously listed. Construction shall be in accordance with the details for Catch Basin and Storm Sewer Manhole shown on the Plans.

D. A plaster coat of mortar 1/2-inch in thickness shall be applied to the inside and outside surface of all manholes and catch basins constructed with concrete block masonry or sewer brick. The inside coat of mortar shall be applied in a smooth, neat workmanlike manner.

E. Final adjustment of the top of manholes and catch basins, so that the manhole or catch basin cover is at finished elevations as shown on the Plans or meets the finished surface, may be accomplished with sewer brick conforming to the previously listed Specifications. The total height of brick for this purpose shall not exceed 9 inches. The total chimney height shall not exceed 18 inches.

F. All block and brick masonry units shall be laid in a full bed of mortar. The inside joints of the block masonry construction shall be tooled in a neat and workmanlike manner.

3.00 EXECUTION

3.01 EXCAVATION AND BACKFILL

A. All excavation and backfill 12 inches above the crown of pipe shall conform to Section 2.04, Earthwork of these specifications.

B. The trench shall be backfilled closely behind the pipe laying. Unless otherwise directed or permitted by the ENGINEER, the backfilling shall follow and be completed to the top of the trench within four pipe lengths behind pipe laying.

3.02 BEDDING

A. Concrete pipe shall be laid on a compacted granular material placed on the bottom of the trench to a depth of not less than 4 inches. Where indicated on the Plans or required by the ENGINEER, concrete encasement or cradle shall be used.

B. For all pipes, compacted aggregate material shall be placed at the sides of the pipe in 12-inch lifts and cover not less than 12 inches above the crown of the pipe.

C. "Granular Material" shall be MDOT class II, placed in not more than 6-inch layers and compacted to not less than 90% standard density.

3.03 PIPE INSTALLATION

A. All pipe shall be laid true to the required lines and grades. All trenches when pipe laying is in progress, shall be kept dry, and all pipes and fittings shall be uniformly supported on a properly trimmed bedding with holes at each joint to receive bells. All pipe shall be laid with bells uphill.

B. The grade as shown on the profiles is that of the pipe invert and that to which the work must conform. The grade shall be kept by laser or other tools which shall be furnished by the CONTRACTOR at his expense. Each pipe shall be laid accurately to the line and grade as shown on the Plans and in such manner as to form a close concentric joint with the adjoining pipe and prevent sudden offsets of the invert. The interior of sewers shall, as the work progresses, be cleaned of all dirt, cement, debris and other superfluous materials of every description. Bulkheads shall be used to keep foreign materials out of the open end of the sewer when work is not in progress.

C. The location of the piping as shown on the Plans has been determined to avoid, insofar as possible, interference with trees or structures or fixtures above ground and other underground mains, services, utilities or structures. Any change in location or alignment of piping, which may be found more feasible or practicable as the work progresses, shall be made by the CONTRACTOR, as the ENGINEER may direct.

D. All pipe shall be carefully lowered and moved into position in trench or vault in a controlled manner such as will prevent damage to the pipe and any coatings or lining. An excessive amount of scratching on the surface of the concrete pipe will be considered cause for rejection.

E. All cutting of the pipe shall be done in a neat workmanlike manner with the least amount of waste and without damage to existing or new lines. A fine toothsaw, tubing cutter or similar tool may be used to cut concrete pipe. Cuts must be square. Ragged edges shall be removed with a cutting tool or file.

F. Breaks in pipe or joints shall be repaired to the satisfaction of the ENGINEER and at the expense of the CONTRACTOR.

3.04 CONNECTIONS TO EXISTING MANHOLES

A. When a sewer is connected to an existing manhole, a hole adequate to receive the new pipe shall be cored into the manhole.

B. If the existing manhole is of brick construction, a single rowlock of brick shall be turned over the new pipe and the existing manhole brick work shall be cleaned, pointed and given a 1/2-inch mortar coat on the outside surface.

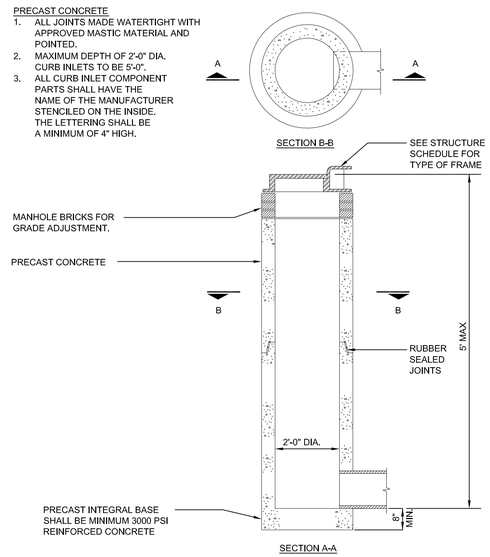
C. For connections to existing precast reinforced concrete manholes, a hole shall be cored into the concrete manhole wall to receive the pipe. Reinforcing steel shall not be cut out shall be bent and replaced in the area that is to be patched. A form shall be constructed over the area of pipe penetration. The formed area shall then be filled with concrete.

D. Closure of the manhole wall shall be made watertight using concrete.

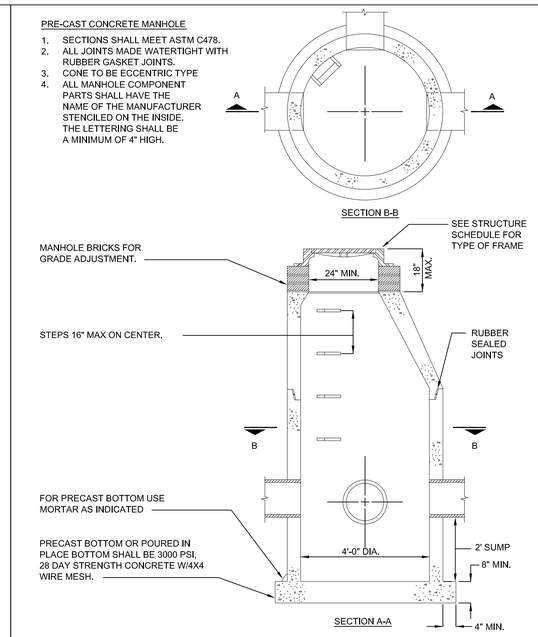
3.05 ANIMAL GRATES

A. Animal grates shall be required on all endsections greater than 12-inch diameter.

PCT February 2008



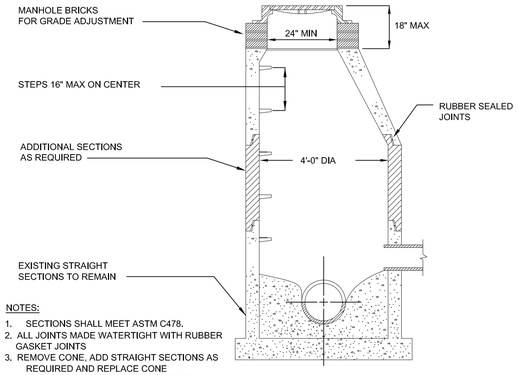
2' DIAMETER INLET



4' DIAMETER CATCH BASIN

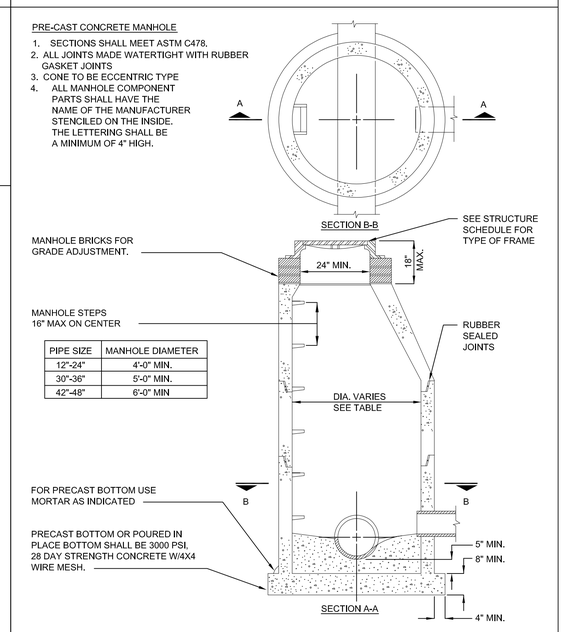
AFFIX TO SURFACE ON OR NEAR ALL DRAINAGE COVERS.

STORM DRAIN MARKER



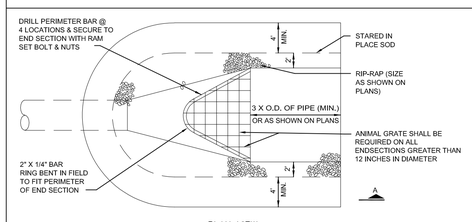
NOTES:
1. SECTIONS SHALL MEET ASTM C478.
2. ALL JOINTS MADE WATERTIGHT WITH RUBBER GASKET JOINTS
3. REMOVE CONE, ADD STRAIGHT SECTIONS AS REQUIRED AND REPLACE CONE
4. ADD MANHOLE STEPS AS NECESSARY
5. ADD ADJUSTMENT RINGS FOR RIM GRADE ADJUSTMENT

MANHOLE & CATCH BASIN RECONSTRUCTION DETAIL



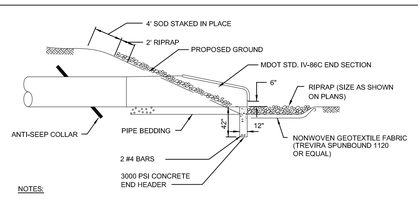
PIPE SIZE	MANHOLE DIAMETER
12"-24"	4'-0" MIN.
30"-36"	5'-0" MIN.
42"-48"	6'-0" MIN

STORM SEWER MANHOLE



PLAN VIEW

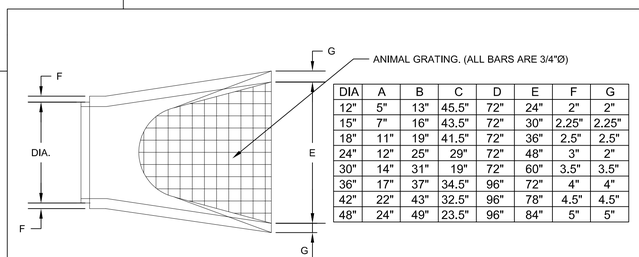
1. RIPRAP THICKNESS AS SHOWN ON PLANS.



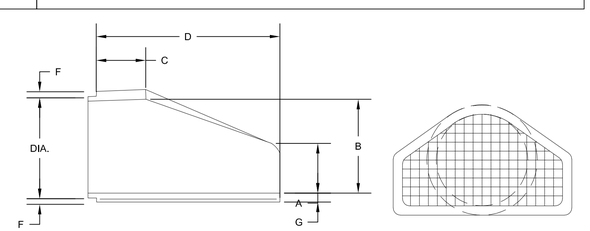
NOTES:
EXTENT OF RIPRAP SHALL BE AS SHOWN HERE OR AS SHOWN ON PLANS, WHICHEVER IS GREATEST.

SECTION A–A

END SECTION AND RIPRAP DETAIL



DIA	A	B	C	D	E	F	G
12"	5"	13"	45.5"	72"	24"	2"	2"
15"	7"	16"	43.5"	72"	30"	2.25"	2.25"
18"	11"	19"	41.5"	72"	36"	2.5"	2.5"
24"	12"	25"	29"	72"	48"	3"	2"
30"	14"	31"	19"	72"	60"	3.5"	3.5"
36"	17"	37"	34.5"	96"	72"	4"	4"
42"	22"	43"	32.5"	96"	78"	4.5"	4.5"
48"	24"	49"	23.5"	96"	84"	5"	5"



NOTE:
FLARED END SECTIONS SHALL BE MANUFACTURED TO THE CLASS SPECIFICATIONS AS THE PIPE ITSELF.

STANDARD END SECTIONS FOR PRECAST CONCRETE

Pittsfield Charter Township
6201 W. Michigan Ave.
Ann Arbor, MI 48108–9721
48108–9721
Tel. 734.822.3101
www.pittsfield-mi.gov

Revision	By	Appd.	YY.MM.DD
UPDATES	MRH	DRW	14.01.24
TWP REV	BWA	DRW	12.08.09
TWP REV	BWA	DRW	11.04.27
UPDATES	BWA	DRW	10.10.25
UPDATES	TTN	DRW	10.01.20

Issued	By	Appd.	YY.MM.DD
File Name: ST–01	TTN	DRW	07.10.01
	Dwn.	Chkd.	Dsgn. YY.MM.DD

Permit-Seal

Client/Project
PITTSFIELD TOWNSHIP

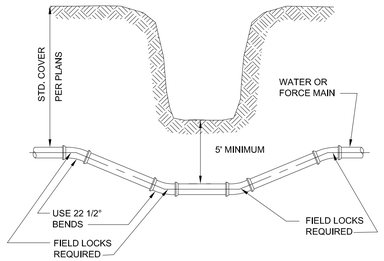
Pittsfield Township, Michigan

Title
STORM SEWER DETAILS AND SPECIFICATIONS

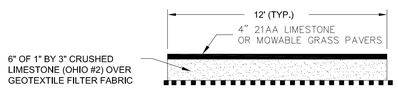
Project No.
2075001300

Scale
NOT TO SCALE

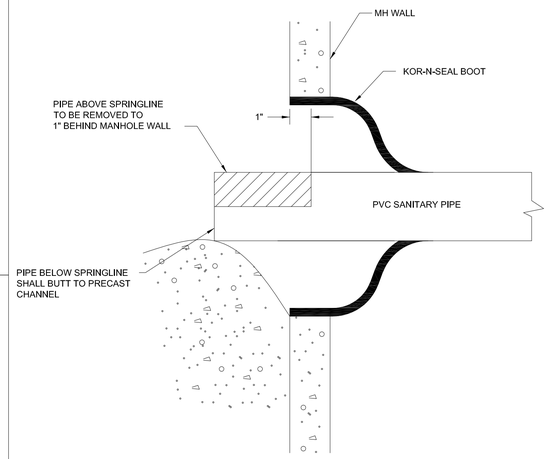
Revision



DITCH & STREAM CROSSING



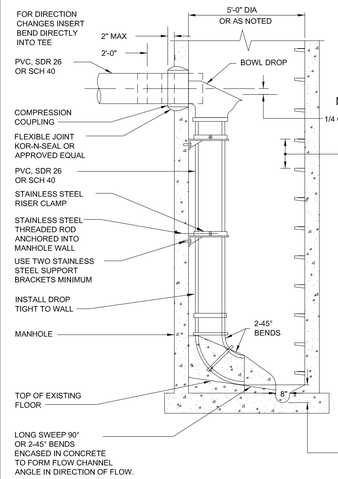
SANITARY SEWER ACCESS PATH

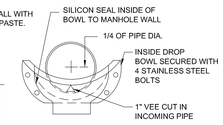


SANITARY PIPE PENETRATION

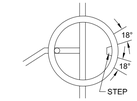
NOTES:

1. SECURE DROP PIPE TO MANHOLE WALL WITH RELINER-DURAN, INC STAINLESS STEEL ADJUSTABLE CLAMPING BRACKETS OR EQUAL.
2. ATTACH THE DROP BOWL & EACH CLAMPING BRACKET TO THE MANHOLE WALL WITH 3/8" x 3 3/4" RAMSET/RED HEAD BOLTS HELD INPLACE WITH 2 STAGE EPOXY PASTE.





DROP BOWL
MOUNTING POSITION



DROP SHALL
BE NO CLOSER
THAN 18" FROM
STEP

SIZE

LINE	LINE
4"	4"
6"	6"
8"	8"
10"	8"

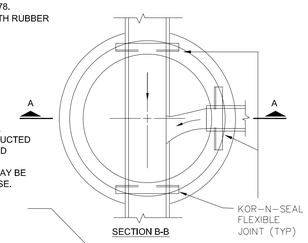
MH DIA.	MAX. DROPS
4'	2-6"
5'	4-6"
5'	2-8"
6'	3-8"

NO UTILITY STRUCTURES (ie. MANHOLES, CURB BOXES etc.) SHALL BE PLACED IN ANY DRIVEWAY OR SIDEWALK

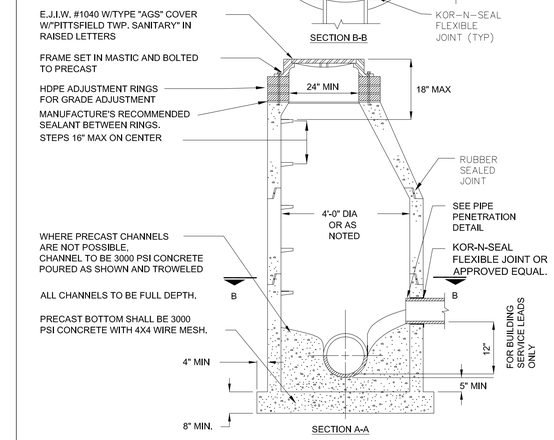
INTERIOR DROP SANITARY MANHOLE

PRE-CAST CONCRETE MANHOLE

1. SECTIONS SHALL MEET ASTM C478.
2. ALL JOINTS MADE WATERTIGHT WITH RUBBER GASKET JOINTS
3. CONE TO BE ECCENTRIC TYPE
4. ALL MANHOLE COMPONENT PARTS SHALL HAVE THE NAME OF THE MANUFACTURER STENCILED ON THE INSIDE. THE LETTERING SHALL BE A MINIMUM OF 4" HIGH.
5. PROVIDE INTEGRAL BASE WITH PRECAST CONCRETE CHANNELS.
6. WHERE MANHOLES ARE CONSTRUCTED OVER EXISTING SEWERS, POURED IN PLACE OR PRECAST COOKIE AND DOGHOUSE STRUCTURES MAY BE USED IN PLACE OF INTEGRAL BASE.



SECTION B-B



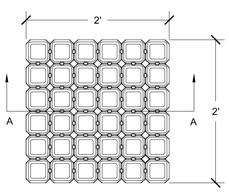
SECTION A-A

NO UTILITY STRUCTURES (ie. MANHOLES, CURB BOXES etc.) SHALL BE PLACED IN ANY DRIVEWAY OR SIDEWALK

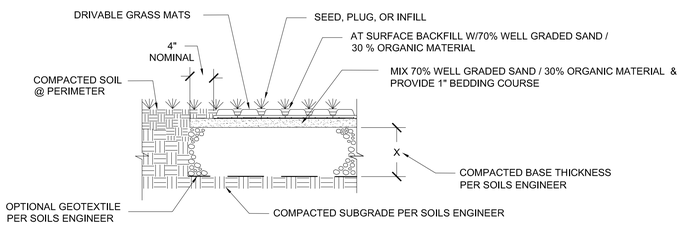
SANITARY MANHOLE

NOTE:

FOR STORMWATER MANAGEMENT APPLICATIONS INCLUDING STORAGE AND INFILTRATION, ALTERNATE INFILLS, BASE MATERIAL, AND DRAINAGE MAY BE REQUIRED

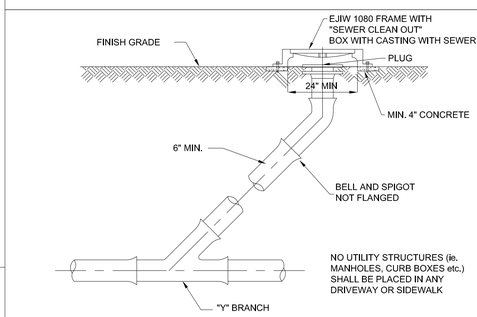


PLAN VIEW

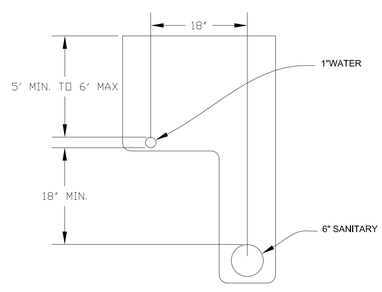


SECTION A-A

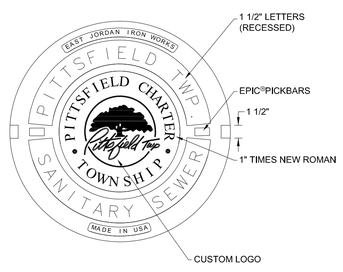
TYPICAL HEAVY TRAFFIC DRIVABLE GRASS DETAIL



SANITARY SEWER CLEANOUT

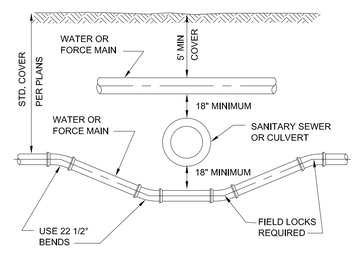


TYPICAL L TRENCH DETAIL HOUSE LEADS

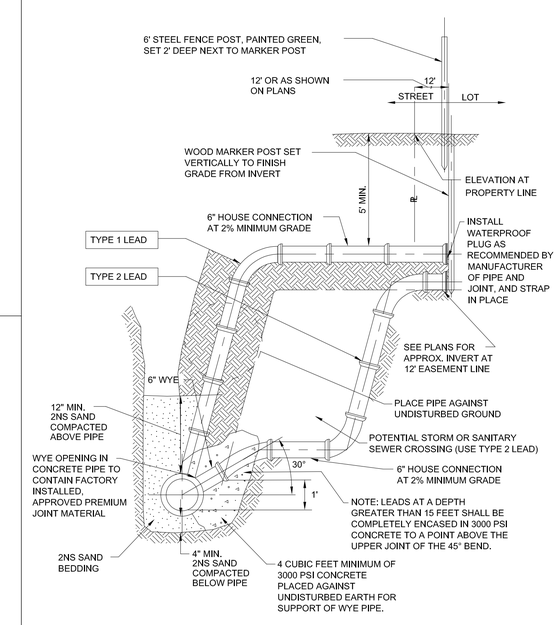


EAST JORDAN IRON WORKS 1040 Z BOLT DOWN FRAME
EAST JORDAN IRON WORKS 1040 AGS COVER

COVER DETAIL



SEWER OR CULVERT CROSSING



SANITARY SEWER SERVICE & RISER CONNECTION DETAIL

Pittsfield Charter Township
6201 W. Michigan Ave.
Ann Arbor, MI 48108-9721
48108-9721
Tel. 734.822.3101
www.pittsfield-mi.gov

Revision	By	Appd.	YY.MM.DD
COVER DETAIL UPDATE	MRH	DRW	14.01.24
TWP REV	BWA	DRW	11.04.27
MANHOLE UPDATES	BWA	DRW	10.10.25
UPDATES	TTN	DRW	10.01.20

Issued	By	Appd.	YY.MM.DD
File Name: SS-01	BWA	DRW	07.10.01
	Dwn.	Chkd.	Dsgn. YY.MM.DD

Permit-Seal

Client/Project
PITTSFIELD TOWNSHIP

Pittsfield Township, Michigan

Title
SANITARY SEWER DETAILS

Project No.
2075001300

Scale
NOT TO SCALE

Revision

SANITARY SEWER AND MANHOLES

1.00 GENERAL

1.01 DESCRIPTION

A. The CONTRACTOR shall furnish all labor, tools, equipment and materials to construct all sanitary sewers, manholes and necessary appurtenant work as herein specified. No sewers shall be accepted until the sewer system has passed the system acceptance tests.

1.02 TESTING

A. General

1. The CONTRACTOR shall furnish all equip\-ment and personnel to conduct system acceptance tests as specified herein on all completed sewers. All tests shall be conducted under the supervision of the ENGINEER. No acceptance tests shall be conducted until the entire sewer system is constructed and has been installed for not less than 30 days.

2. The CONTRACTOR may desire to make an air test prior to backfill for his own purposes but the line acceptance tests shall be conducted after backfilling or extensions.

3. All sewer lines shall be televised while running enough water through the line to be visible at the next downstream manhole.

4. All sewer lines shall be checked for alignment.

5. All manholes shall be tested for leakage. All PVC lines shall be tested for deflection.

6. Sewer pipe 30 inches and smaller shall be air tested. Sewer pipe larger than 30 inches shall be tested by either infiltration or exfiltration and shall be tested in lengths of 1600 feet or less.

7. Should the results of any test fail to meet the criteria established in this Specification, the CONTRACTOR shall, at his own expense, locate and repair rejected section and retest until it is within specified allowance.

B. Test for Leakage - Air Test

1. Section 33-95 (pg 30-6) 2004-Ten State Standards.

2. After a manhole-to-manhole section of line has been backfilled and cleaned, it shall be plugged at each manhole with pneumatic plugs inflated to 35 psig internal pressure. The design of the pneumatic plugs shall be such that they will hold against the line test pressure without requiring external blocking or bracing.

3. There shall be three (3) hose connections to the pneumatic plug. One hose shall be used only for inflation of the pneumatic plug. The second hose shall be used for continuously reading the air pressure rise in the sealed line. The third hose shall be used only for introducing low pressure air into the sealed line.

4. There shall be a 0-30 psig gauge for reading the internal pressure of the line being tested. Calibrations from the 1-10 psig range shall be in tenths of lbs (not ounces) and this 0-10 portion shall cover 90% of the complete dial range.

5. Low pressure air shall be introduced into the sealed line until the internal air pressure reaches 4.0 psig greater than the average back pressure of any ground water pressure that may be over the pipe. At least two (2) minutes shall be allowed for the air pressure to stabilize. After the stabilization period, the third hose shall be disconnected.

6. The portion of line being tested shall be accepted if the portion under test meets the following conditions.

a. DI, and RCP Pipes

(1) The time requirement for the pressure to decrease from 3.5 to 2.5 psig (greater than the average back pressure of any ground water that may be over the pipe) shall not be less than the time given in the following table:

Pipe	Min. Holding Time Seconds/100 ft. Pipe
4-inch	18
6-inch	42
8-inch	72
10-inch	90
12-inch	108
15-inch	126
18-inch	144
21-inch	180
24-inch	216
27-inch	252
30-inch	288

(2) In areas where ground water is known to exist, the CONTRACTOR shall install a 1/2-inch diameter capped pipe nipple, approximately 10 inches long, through the manhole wall on top of one of the sewer lines entering the manhole. This shall be done at the time the sewer line is installed. Immediately prior to the performance of the line acceptance test, the ground water level shall be determined by removing the pipe cap, blowing air through the pipe nipple into the ground so as to clear it, and then connecting a clear plastic tube to the pipe nipple. The hose shall be held vertically and a measurement of the height in feet of water shall be taken after the water stops rising in this plastic tube. The height in feet shall be divided by 2.3 to establish the lbs of pressure that will be added to all readings. For example, if the height of water is 11-1/2 ft, then the added pressure will be 5 psig. This makes the 3.5 psig to be 8.5 psig, and the 2.5 psig to be 7.5 psig. The 1 lb allowable drop and the timing remains the same.

a. PVC Pipe

(1) The time requirement for the pressure to decrease from 3.5 to 3.O psig (greater than the average back pressure of any ground water that may be over the pipe) shall not be less than that shown in the following table:

(inches) Pipe Size	Holding Time (seconds)	Minimum Holding Time (seconds)
4-inch	0.190xL	113
6-inch	0.427xL	170
8-inch	0.760xL	227
10-inch	1.187xL	283
12-inch	1.709xL	340
15-inch	2.671xL	425
18-inch	3.846xL	512

(2) If any section of the sewer fails to meet this requirement, the CONTRACTOR shall perform a television inspection of the faulty section and repair or replace at his own expense all defective materials and/or workmanship to the satisfaction of the ENGINEER. The test procedure shall be repeated until the results are acceptable.

C. Test for Infiltration

1. Sewer pipe over 18 inches shall be tested to measure the infiltration of ground water. If the measured leakage exceeds 100 gallons per inch diameter per mile of pipe per 24 hr period, the CONTRACTOR shall locate the points of excessive leakage and make the necessary repairs at his own expense.

2. In the event the line does not pass the infiltration test as stated above, the test shall be repeated after suitable repairs have been completed.

D. Test for Exfiltration

1. Where the ground water provides less than a 2 ft head on the sewer, an exfiltration test shall be conducted by filling the sewer with water to a 4 ft head or 4 ft above the ground water level, whichever is greater. The allowable water loss shall be 100 gal/in./mi/day as calculated above for infiltration.

2. After the sewer has been filled with water, 4 hrs time shall be allowed for water absorption by the pipe before exfiltration tests are initiated.

3. For the purpose of establishing the 4 ft test head, the head shall be measured from the center of the sewer pipe at the midpoint of the test section length. This procedure shall be used for both infiltration and exfiltration tests.

E. Test for Manhole Leakage

1. All manholes shall be tested for leakage by using plugs on inleting-outleting sewers, and filling the manholes with water to the top of the man\-hole. Four hours shall be allowed for water absorption by the manhole before testing is initiated. Allowable exfiltration for 48-inch diameter manholes shall be 2 gallons per foot of depth per day.

F. Test for Alignment

1. All sewers shall be laid accurately to the line and grade designed by the ENGINEER. The sewers will be tested for alignment by shining a light through the pipe at a manhole and viewing the light from an adjacent manhole. Any section of sewer in which a light cannot be seen from one manhole to the next shall be corrected to the satisfaction of the ENGINEER to pass this test.

G. Test for Deflection of PVC Pipe

1. PVC pipe sewers shall be installed in such a manner that the initial deflection of the conduit shall conform to the latest revision of ASTM D-3034.

2. Deflection of PVC pipe shall be tested by pulling a rigid pig or equivalent through the pipe. The pig shall be constructed in accordance with the following table of maximum outside diameters and shall be submitted to the ENGINEER for review before testing is initiated.

Pipe I.D.	Pig O.D.
6 inches	5.33 inches
8 inches	7.11 inches
10 inches	8.87 inches
12 inches	10.55 inches
15 inches	12.90 inches
18 inches	15.74 inches

3. The pig shall be drawn by hand through the pipe from manhole to manhole. Any portion of pipe through which the pig passes freely shall be deemed to have passed the deflection test. Sections of pipe through which the pig does not pass shall be located, un\-covered and the pipe zone bedding improved and backfilled by the CONTRACTOR at his own expense. The pipe shall then be retested before acceptance is granted.

H. Material Tests

1. The CONTRACTOR shall have tests of pipe and strength made by an independent testing laboratory. Tests of up to 4 lengths of sewer pipe per hundred lengths may be required to show compliance with the Specifications. All pipe delivered to the job site shall be accompanied with a manufacturer's certificate of compliance to the Specifications.

1.03 SUBMITTALS

A. The CONTRACTOR shall submit shop drawings or data sheets for all pipe, manholes, manhole castings, pipe to manhole connections, and valves. The Contractor shall submit certification letter for all pipe proposed on the project. The letters shall contain the following: Contractor name, project name, township name, current date, certification of pipe provided and letterhead of the certifying company.

2.00 PRODUCTS

2.01 SEWER PIPE

A. Pipe for sewer 24-inch diameter and smaller shall be polyvinyl chloride (PVC). Pipe for 30-inch diameter and larger shall be PVC truss pipe. Ductile iron pipe and reinforced concrete pipe shall be used as specified by the ENGINEER.

B. Pipe for service leads 4 though 8 inches in diameter shall be polyvinyl chloride (PVC).

C. Reinforced concrete pipe shall be no less than the latest revision of ASTM C76, with the class designation as shown on the Plans or in the Pro\-posal.

D. PVC pipe 4 inches through 15 inches in diameter shall meet or exceed all of the requirements of the current ASTM D-3034 SDR-26 polyvinyl chloride sewer pipe and fittings. 18-inch diameter PVC pipe shall meet or exceed all the requirements of the current ASTM F-794 SDR 26 polyvinyl chloride sewer pipe and fittings. Samples of pipe and physical and chemical data sheets shall be submitted to the ENGINEER for review. Approval shall be obtained before pipe is purchased.

E. If the sewer pipe is greater than 15 feet deep PVC pipe shall be SDR 21.

F. Truss pipe shall meet or exceed all of the requirements of the current ASTM D2680.

G. Ductile iron pipe shall meet or exceed all the requirements of ANSI A21.50 with a cement lining.

2.02 SEWER PIPE FITTINGS

A. Fittings shall be of the same material as the pipe, and in no case shall the walls be thinner than that of the pipe furnished.

B. Wye and tee fittings for PVC pipe shall be reviewed by the ENGINEER before purchasing.

C. The dry fit of all fittings must be snug. If the fit is such that it is loose, the pipe or fitting will be rejected as faulty and of improper size.

2.03 SEWER PIPE JOINTS

A. Concrete pipe joints shall be made of a resilient material conforming to the latest revision of ASTM Designation C443. Proper lubricant shall be furnished by the joint manufacturer.

B. Concrete pipe for use with rubber joints shall be smooth and precisely formed to provide a uniform annular space for joint materials.

C. PVC pipe shall be jointed with ring gusseted bell ends. (ASTM-D3212) Jointing materials shall be applied to the bell end of the pipe at the point of manufacture in such a manner that a tight uniform joint will be achieved and such that when the joint is made up in the field, the joint material will not roll or tear from the pipe. A proper joint lubricant shall be furnished by the pipe manufacturer.

2.04 REINFORCED CONCRETE MANHOLES

A. Manholes shall conform to the current ASTM specifications for precast reinforced concrete manhole sections, serial designation C478. Manhole section joints shall conform to ASTM C990-96. Cone sections shall be straight side type, with an offset step configuration.

B. All manhole component parts shall have the name of the manufacturer stenciled on the inside. The lettering or logo shall be a minimum of 4-inches high.

C. Manholes constructed over an existing sewer line shall have a doghouse mudded to an 8-inch thick cookie. The bottom of the existing pipe shall be the channel. All other manholes shall have precast integral base sections with pre-formed concrete channels.

D. All channels shall be constructed to the full flow depth of the pipe.

2.05 MORTAR FOR MANHOLES

A. Mortar for plastering manholes shall be made of one part Portland cement and two parts fine aggregate.

2.06 MANHOLE FRAMES AND COVERS

A. Manhole frames and covers shall weigh not less than 350 lbs. Each frame and cover shall have machined bearing surfaces and shall be suitably notched for convenient removal of the cover. Each cover shall be marked with the Pittsfield Township logo and the letters, PITTSFIELD TWP SANITARY SEWER integrally cast into the cover.

B. Covers shall be of the "self-sealing" design having a continuous gasket glued in a machined groove and a concealed pickhole. Frames and covers shall be East Jordan 1040Z, with Type AGS cover.

C. All manhole frames and covers shall be coated by the manufacturer with coal tar pitch varnish or other asphaltum coating reviewed by the ENGINEER.

2.07 MANHOLE STEPS

A. Steps shall be plastic coated steel. They shall be M.A. Industries PS1-PF or PS1-B, or approved equal.

2.08 MANHOLE CONNECTIONS

A. Sewer pipe (6-inch to 24-inch) to manhole connections shall be through: 1) a flexible rubber boot which shall be securely clamped into a core-drilled pipe port. Pipe ports shall be core-drilled at the point of manhole manufacturer and shall be accurately located within 1/2-inch of proposed sewer centerline (Kor-N-Seal); or, 2) a self-adjusting mechanical pipe to manhole seal which provides a resilient flexible and infiltration-proof joint (Res-seal); or, 3) a flexible rubber wedge firmly rammed into a rubber gasket which is cast into the manhole (Press Wedge II), or equal. All flexible pipe to manhole connections shall be installed per the manufacturers specifications.

B. Neoprene rubber for the manhole boot shall meet ASTM Specification C443 and shall have a minimum thickness of 3/8-inch. Pipe clamp bands shall be of corrosion-resistant steel.

C. Sewer pipe over 24 inches to manhole connections shall be in accordance with details shown on the Plan.

2.09 SANITARY MANHOLE ADJUSTMENTS

A. All final grade adjustment of manhole covers and frame assemblies shall be completed utilizing injection molded High Density Polyethylene (HDPE) adjustment rings as manufactured by LADTECH, INC. or approved equal. The adjustment rings shall be manufactured from polyethylene plastic as identified in ASTM Designation D 1248.

B. All adjustment for matching road grade shall be made utilizing a molded indexed slope ring.

C. Each adjustment ring shall be sealed with a 3/16 to ¼ inch bead of butyl rubber sealant per the manufacturer's instructions. Sealant shall meet ASTM specification C-990.

D. All castings and adjustment rings shall be securely fastened to the cone of the structure with four 3/8-inch threaded rods. The rods shall be galvanized or stainless steel anchored to the structure with Redhead concrete anchors or equal. Stainless steel or galvanized nuts and washers shall be used to attach the casting.

2.10 MANHOLE DROPS

A. Manhole drop connections shall be interior drops using the drop bowl as produced by Reliner-Duran Inc. or approved equal.

B. Drop bowl model A-4" shall be used for all lines up through full 6-inch inlets. Drop bowl model A-6" shall be used for all 8-inch inlets. Drop bowl model B-8" shall be used for all 10-inch inlets. Lines larger than 10 inches shall be as directed by the ENGINEER.

C. The force line hood shall be attached on models A-4" and A-6" when the incoming line is from a force main or the slope is 3 percent or greater.

D. The drop pipe shall be secured to the manhole wall with Reliner-Duran, Inc. stainless steel adjustable clamping brackets or approved equal.

E. The drop bowl and each clamping bracket shall be attached to the manhole wall with 3/8-inch x 3 3/4-inch bolts.

F. The incoming pipe shall be trimmed such that it protrudes 2 inches into the manhole .

G. A 1-inch V shaped notch shall be cut into the bottom edge of the incoming pipe.

3.00 EXECUTION

3.01 EXCAVATION AND BACKFILL

A. All excavation and backfill above a line 12 inches above the crown of the pipe shall conform to Section 2.04, Earthwork, of these Specifications.

3.02 BEDDING

A. Reference Section 33.83a of 10 State Standards.

B. Reference Section 33.83b of 10 State Standards.

C. Ductile iron, and concrete pipes shall be laid on a compacted granular material placed on the bottom of the trench to a depth of not less than 3 inches for 24-inch and smaller pipe and not less than 4 inches for pipe larger than 24-inch conforming to Class B bedding as shown on the Plans. Where shown on the Plans or required by the ENGINEER, concrete encasement or concrete cradle shall be used.

D. PVC pipe shall be laid on a compacted granular material placed on the bottom of the trench to a depth of not less than 4 inches conforming to Class B bedding as shown on the Plans. Where shown on the Plans, or where the pipe passes under a road with less than 4 ft of cover, the pipes shall be encased.

E. For all pipes, compacted granular material shall be placed at the sides of the pipe and cover not less than 12 inches above the crown of the pipe.

F. "Granular Material" shall be class 2NS sand, pea gravel or crushed stone conforming to ASTM C33 Size No. 67 placed in not more than 6-inch layers and com\-pacted to not less than 95% standard density for PVC and 90% standard density for reinforced concrete.

G. Pea gravel or crushed stone used for bedding shall be separated from the sand backfill with a non-woven geotextile fabric. The fabric shall be Amoco 4551, or approved equal.

3.03 PIPE INSTALLATION

A. Installation of PVC pipe shall be in confor\-mance with ASTM D2321-89.

B. All pipe shall be laid true to the required lines and grades. All trenches when pipe laying is in progress shall be kept dry; and all pipes and fittings shall be uniformly supported on a properly trimmed bedding with holes at each joint to receive bells. All pipe shall be laid with bells uphill.

C. All joints shall be made up in accordance with the manufacturer's instructions using materials and equipment especially prepared for the type of joint to be used.

D. The grade as shown on the profiles is that of the pipe invert and that to which the work must conform. The grade shall be kept by levels, laser or other tools which shall be furnished by the CONTRACTOR at his expense. Each pipe shall be laid accurately to the line and grade as shown on the Plans and in such manner as to form a close concentric joint with the adjoining pipe and prevent sudden offsets of the invert. The interior of sewers shall, as the work progresses, be cleaned of all dirt, cement, debris and other superfluous materials of every description. Bulkheads shall be used to keep foreign materials out of the open end of the sewer when work is not in progress.

E. The location of the piping as shown on the Plans has been determined to avoid, insofar as possible, interference with trees or structures or fixtures above ground and other underground mains, services, utilities, or structures. Any change in location or alignment of piping which may be found more feasible or practicable as the work progresses shall be made by the CONTRACTOR, as the ENGINEER may direct.

F. All pipe and fittings shall be carefully lowered and moved into position in trench or vault in a controlled manner such as will prevent damage to the pipe and any coatings or lining. An excessive amount of scratching on the surface of the PVC pipe will be considered cause for rejection.

G. The trench shall be backfilled closely behind the pipe laying. Unless otherwise directed or permitted by the ENGINEER, the backfilling shall follow and be completed to the top of the trench within two pipe lengths behind pipe laying.

H. All cutting of the pipe shall be done in a neat workmanlike manner with the least amount of waste and without damage to existing or new lines. A fine tooth saw, tubing cutter or similar tool may be used to cut PVC pipe. Cuts must be square. Ragged edges shall be removed with a cutting tool or file.

I. After cutting bell and spigot or socket pipe, a stop mark shall be made with a pencil or crayon using dimensions as shown by the manufacturer's instructions or by using another pipe in the field as a guide.

J. Breaks in pipe or joints shall be repaired to the satisfaction of the ENGINEER and at the expense of the CONTRACTOR.

3.04 CONNECTIONS TO EXISTING MANHOLES AND OTHER RIGID STRUCTURES

A. When a sewer is connected to an existing manhole, a hole adequate to receive the new pipe shall be cut into the manhole.

B. If the existing manhole is of brick construction, a single rowlock of brick shall be turned over the new pipe and the existing manhole brick work shall be cleaned, pointed and given a 1/2-inch mortar coat on the outside surface.

C. For connections to existing precast reinforced concrete manholes, a hole shall be cored into the concrete manhole wall to receive the pipe. A Kor-N-Seal boot or engineer approved equal shall be clamped into the cored hole and used to make the connection.

D. For connections to existing fiberglass manholes, a hole shall be cored into the manhole wall to receive the pipe. A Kor-N-Seal boot or engineer approved equal shall be installed using fiberglass reinforced pipe stubout for Kor-N-Seal boot sealing surface.

3.05 STREAM AND RIVER CROSSING

A. Whenever a pipe is required to cross a stream or river, all work shall be in accordance with the provisions of Act 346, the Inland Lakes and Streams Act of 1962, and the rules and regulations promulgated thereunder. Stream crossings and all restoration required shall be completed within five days of the construction.

B. The CONTRACTOR shall utilize such con\-struction methods as are feasible and practicable to divert or stop stream flow to lay the pipe in the dry. Pipe shall be ductile iron, mechanical joint, or compression gasket joint pipe with joints at transition to other types of sewer pipe encased with no less than 1 cu yd of concrete, placed at a minimum of 6 inches thickness around the pipe. After the sewer is properly laid, jointed and encased, the stream-channel shall be cleaned of dirt and debris resulting from the CONTRACTOR's operations.

C. After the crossing is made, heavy riprap and sodding shall be placed to protect the banks from corrosion as shown on the Plans.

PCT July 2008

Pittsfield Charter Township
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48108-9721
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TWP REV	BWA	DRW	11.04.27
UPDATES	BWA	DRW	10.10.25
UPDATES	TTN	DRW	10.01.20
Revision	By	Appd.	YY.MM.DD

Issued	By	Appd.	YY.MM.DD

File Name: SS-02	BWA	DRW	DRW	07.10.01
	Dwn.	Chkd.	Dsgn.	YY.MM.DD

Permit-Seal

Client/Project
PITTSFIELD TOWNSHIP

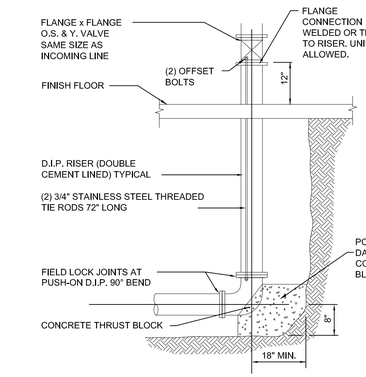
Pittsfield Township, Michigan

Title
SANITARY SEWER SPECIFICATIONS

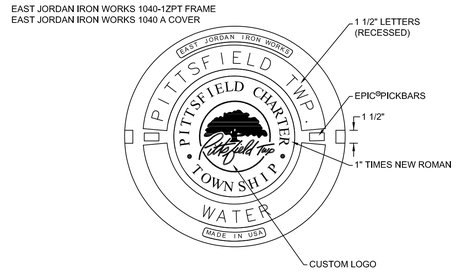
Project No.
2075001300

Scale
NOT TO SCALE

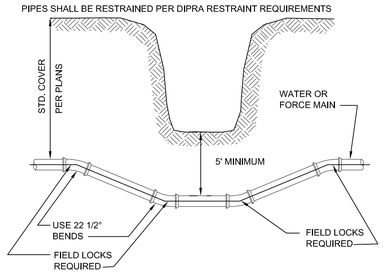
Revision
1



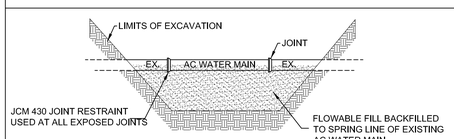
FIRE PROTECTION RISER DETAIL



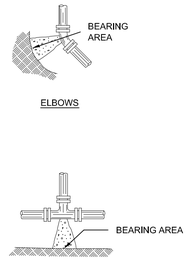
COVER DETAIL



DITCH & STREAM CROSSING



ASBESTOS CEMENT (AC) WATER MAIN



ELBOWS					
PIPE DIA. INCHES		BEARING AREA SQUARE FEET			
		90°	45°	22 1/2°	11 1/4°
4		2.1	1.1	0.6	0.3
6		4.1	2.2	1.1	0.6
8		6.8	3.7	1.9	0.9
10		10.1	5.5	2.8	1.4
12		14.1	7.6	3.9	2.0
16		24.2	13.0	6.7	3.3
18		30.0	16.3	8.3	4.2
20		36.8	19.9	10.1	5.1

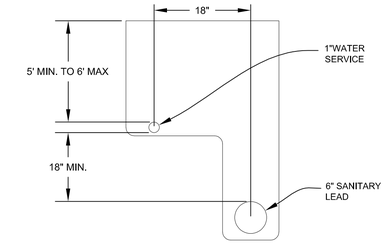
TEES, CROSSES & HYDRANTS		
PIPE DIA. INCHES		BEARING AREA SQUARE FEET
4		1.5
6		2.9
8		4.8
10		7.1
12		10.0
16		17.1
18		21.0
20		26.0

NOTES:
1. CONCRETE FOR ALL THRUST BLOCKS SHALL BE 3000 PSI, 28 DAY STRENGTH MIN.
2. ALL THRUST BLOCKS SHALL BE POURED AGAINST UNDISTURBED EARTH
3. BOLTS, FITTINGS & JOINTS SHALL BE KEPT CLEAR OF CONCRETE
4. A BEARING CAPACITY OF 2000# PER FOOT WAS USED IN DETERMINING THE MINIMUM "BEARING AREAS" IN THE ABOVE TABLE
5. THE CROSS SECTION OF THE THRUST BLOCKS SHALL BE SQUARE
6. IN ADDITION TO THRUST BLOCKS, ALL PIPE JOINTS SHALL BE RESTRAINED WITH LOCKING GASKETS PER DIPRA'S STANDARDS.

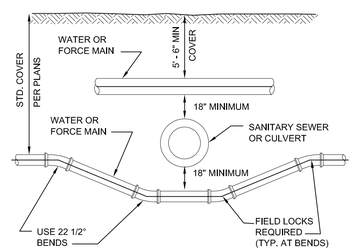
SOIL CHARACTERISTICS	FACTOR
(A) LOOSE COARSE OR MEDIUM SAND; COMPACT FINE SAND; COMPACT SAND-CLAY SOILS; STIFF CLAY	0.33
(B) FIRM FINE SAND; COMPACT INORGANIC SILT; FIRM SAND-CLAY SOILS; MEDIUM CLAY	0.50
(C) LOOSE FINE SAND; FIRM INORGANIC SILT	0.67
(D) LOOSE SAND-CLAY SOILS; LOOSE INORGANIC SILT SOFT CLAY	1.00

"BEARING AREA" x FACTOR = ACTUAL BEARING AREA
2.1 x .5 = 1.05 SQ. FT.
BASED UPON 150# TEST PRESSURE

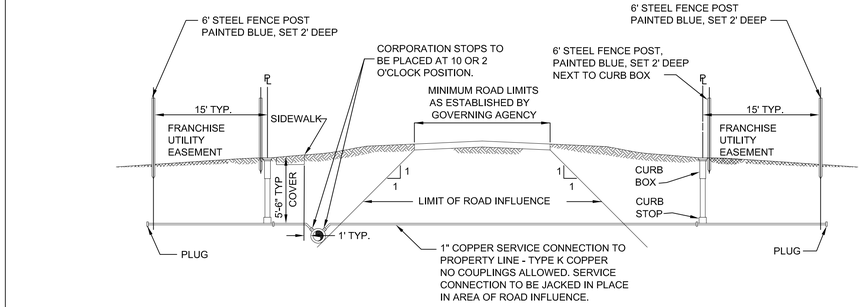
THRUST BLOCK



TYPICAL L TRENCH DETAIL HOUSE LEADS

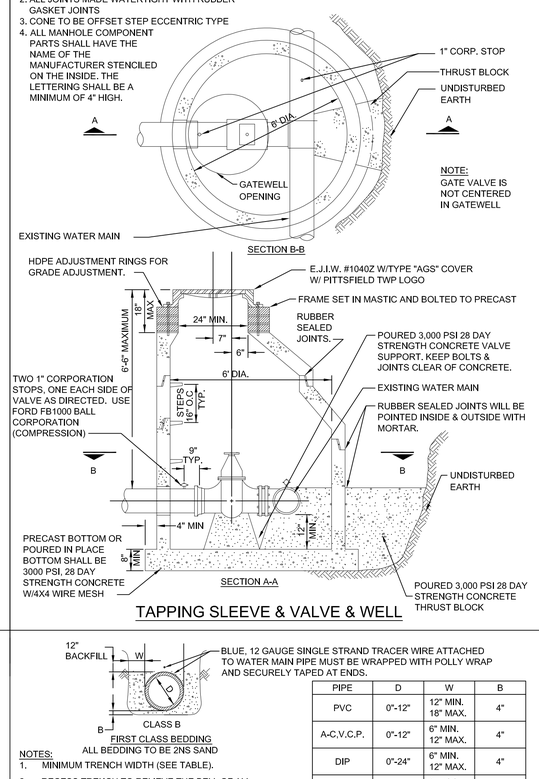


SEWER OR CULVERT CROSSING



WATER MAIN CONNECTION

PRE-CAST CONCRETE MANHOLE
1. SECTIONS SHALL MEET ASTM C478.
2. ALL JOINTS MADE WATERTIGHT WITH RUBBER GASKET JOINTS
3. CONE TO BE OFFSET STEP ECCENTRIC TYPE
4. ALL MANHOLE COMPONENT PARTS SHALL HAVE THE NAME OF THE MANUFACTURER STENCILED ON THE INSIDE. THE LETTERING SHALL BE A MINIMUM OF 4" HIGH.



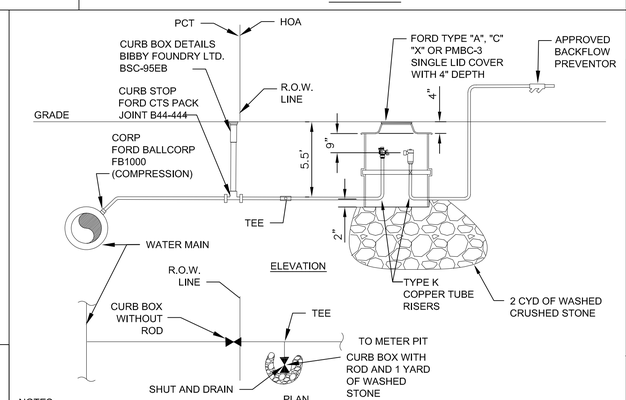
TAPPING SLEEVE & VALVE & WELL

ALL BEDDING TO BE 2NS SAND

NOTES:
1. MINIMUM TRENCH WIDTH (SEE TABLE).
2. RECESS TRENCH TO RELIEVE THE BELL OF ALL LOAD. PIPE HAUNCHES SHALL BE COMPACTED.
3. 2NS BACKFILL TO DEPTH OF ONE FOOT ABOVE PIPE. TAMPED LAYERS NOT TO EXCEED 6" IN DEPTH. PLATE COMPACT ABOVE PIPE (ON 1st LIFT)
4. ALL PIPE TO BE PLACED AND JOINTED IN A DRY TRENCH AND LAID ACCURATELY TO LINE AND GRADE WITH BELLS UPHILL.
5. ALL CONCRETE ENCASEMENT AND CRADLING TO BE CLASS "A" CONCRETE.

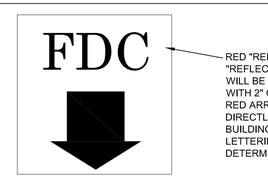
PIPE	D	W	B
PVC	0"-12"	12" MIN. 18" MAX.	4"
A-C,V.C.P.	0"-12"	6" MIN. 12" MAX.	4"
DIP	0"-24"	6" MIN. 12" MAX.	4"
A-C,CONC.	0"-24"	6" MIN. 12" MAX.	4"
CONC. DIP	24" +	6" MIN. 12" MAX.	4"

BEDDING



NOTES:
1. SADDLE MAY BE REQUIRED ON MAIN BASED ON LEAD SIZE, MAIN SIZE, AND MAIN PRESSURE
2. ALL WATER MAIN TAPS AND COMPONENT PARTS SHALL BE APPROVED BY THE PITTSFIELD TOWNSHIP UTILITIES DEPARTMENT PRIOR TO INSTALLATION.
3. INSTALLATION SHALL BE INSPECTED AND APPROVED BY THE PITTSFIELD TOWNSHIP UTILITIES DEPARTMENT.

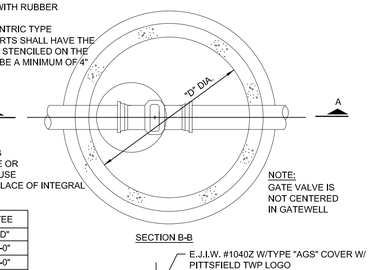
IRRIGATION METER PIT DETAIL



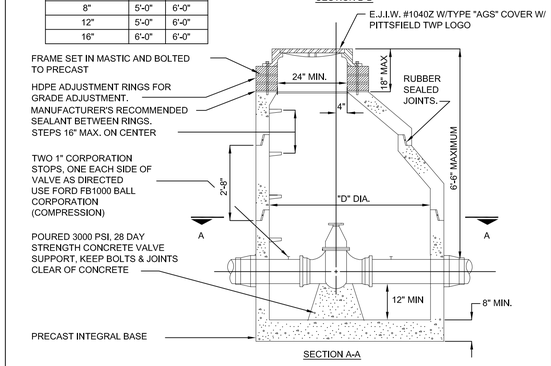
RED "REFLECTIVE" LETTERS WITH WHITE "REFLECTIVE" BACKGROUND. LETTERS WILL BE A MINIMUM OF 8" TALL BY 4" WIDE WITH 2" GIRTH, WITH AN 8" TALL 4" WIDE RED ARROW UNDER LETTERS POINTING DIRECTLY AT THE CONNECTION. TALLER BUILDINGS MAY REQUIRE LARGER LETTERING. SIGN SIZE AND LOCATION DETERMINED BY FIRE MARSHALL

FIRE DEPARTMENT CONNECTION LABEL DETAIL

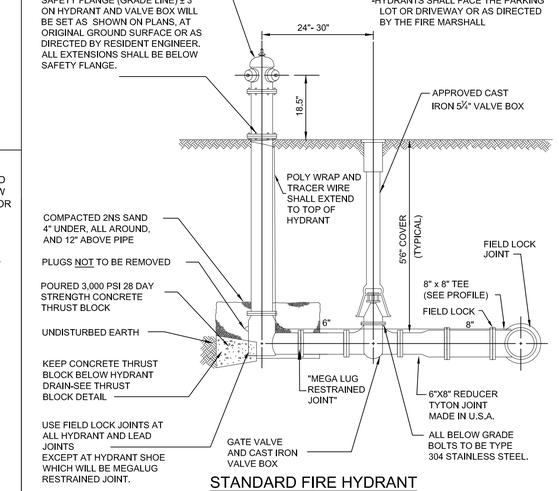
PRE-CAST CONCRETE MANHOLE
1. SECTIONS SHALL MEET ASTM C478.
2. ALL JOINTS MADE WATERTIGHT WITH RUBBER GASKET JOINTS
3. CONE TO BE OFFSET STEP ECCENTRIC TYPE
4. ALL MANHOLE COMPONENT PARTS SHALL HAVE THE NAME OF THE MANUFACTURER STENCILED ON THE INSIDE. THE LETTERING SHALL BE A MINIMUM OF 4" HIGH.
5. PROVIDE INTEGRAL BASE.
6. KOR-N-SEAL BOOTS OR APPROVED EQUAL TO BE INSTALLED AT PIPE PENETRATIONS.
7. WHERE GATE WELLS ARE CONSTRUCTED OVER EXISTING WATERMAIN, POURED IN PLACE OR PRECAST COOKIE AND DOGHOUSE STRUCTURES MY BE USED IN PLACE OF INTEGRAL BASE.



STRAIGHT THRU		TEE
VALVE SIZE	"D"	"D"
8"	5'-0"	6'-0"
12"	5'-0"	6'-0"
16"	6'-0"	6'-0"

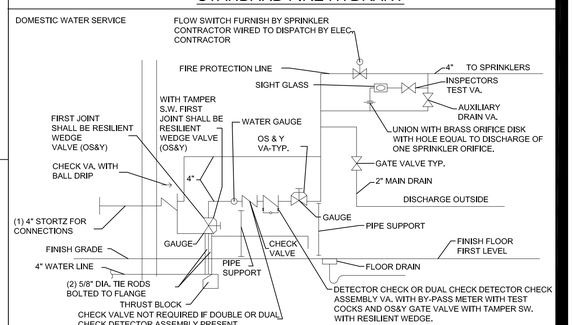


STANDARD GATE VALVE & WELL



NOTES:
-PROVIDE ONE 4-INCH STORZ CONNECTION ON EACH HYDRANT ON THE LEFT NOZZLE WHEN FACING THE HYDRANT
-HYDRANTS SHALL FACE THE PARKING LOT OR DRIVEWAY OR AS DIRECTED BY THE FIRE MARSHALL

STANDARD FIRE HYDRANT



METER ROOM DETAIL

Pittsfield Charter Township
6201 W. Michigan Ave.
Ann Arbor, MI 48108-9721
48108-9721
Tel. 734.822.3101
www.pittsfield-mi.gov

Revision	By	Appd.	YY.MM.DD
UPDATES	MRH	DRW	14.01.24
FDC UPDATE	BWA	DRW	11.09.13
TWP REV	BWA	DRW	11.04.27
HYDRANT, MANHOLE UPDATE	BWA	DRW	10.10.25
UPDATES	TTN	DRW	10.01.20

Issued	By	Appd.	YY.MM.DD
File Name: W-01	BWA	DRW	07.10.01
Permit-Seal	Dwn.	Chkd.	Dsgn. YY.MM.DD

Client/Project
PITTSFIELD TOWNSHIP

Pittsfield Township, Michigan

Title
WATER MAIN DETAILS

Project No. 2075001300

Scale NOT TO SCALE

Revision

1.00 GENERAL

1.01 DESCRIPTION

A. The CONTRACTOR shall furnish all labor, materials, and equipment required to construct a water main and necessary appurtenant work as herein specified. The water main shall be installed in the locations as shown on the Plans and shall meet all acceptance tests.

1.02 NOTIFICATION

A. CONTRACTOR shall notify the ENGINEER and the Pittsfield Township Utilities Department at (734) 882-2110, 24 hours prior to flushing or chlorination of the water main.

B. CONTRACTOR shall schedule bacteriological testing with the ENGINEER 48 hours prior.

C. CONTRACTOR shall notify the ENGINEER and the Pittsfield Township Utilities Department 48 hours prior to connecting to an existing water main.

1.03 SUBMITTALS

A. The CONTRACTOR shall submit shop drawings or data sheets for all pipe, manholes, manhole castings, pipe to manhole connections, valves, hydrants and the B-1 Poly Pig. The Contractor shall submit a certification letter for all pipe proposed on the project. The letters shall contain the following: Contractor name, project name, Township name, current date, certification of pipe provided and letterhead of the certifying company.

1.04 TESTING

A. General

1. CONTRACTOR shall furnish all equipment and personnel to conduct system acceptance tests as specified herein. All tests shall be conducted under the supervision of the ENGINEER. All water mains, branches and valves shall be subject to cleaning with a poly-pig, hydrostatic pressure testing, disinfection and bacteriological testing. No acceptance tests shall be conducted until the water main has been installed and backfilled for not less than 30 days. A copy of all test results shall be furnished to the ENGINEER.

2. Hydrostatic pressure testing must be performed in accordance with ANSI/AWWA C600, Disinfection and bacteriological testing must be performed in accordance with ANSI/AWWA C651.

3. CONTRACTOR shall furnish all material and labor to provide for an acceptable full size blow-off to flush the poly-pigs out of the main at the far end of the project not connected to the existing system.

4. Should the results of any test fail to meet the criteria established in this Specification, the CONTRACTOR shall, at his own expense, locate and repair the rejected section and retest until it is within the specified allowance.

5. Only Pittsfield Township personnel or the CONTRACTOR under direct supervision of Pittsfield Township personnel may fill or flush lines.

B. Preparation

1. After the pipe has been laid and backfilled as specified, the CONTRACTOR shall fill the line, or a valve section thereof, to be tested with water in such a manner as to expel all air from the pipe. This may be done through fire hydrants at the high points; or, if no hydrant is available at such point, the CONTRACTOR shall make the taps necessary to accomplish the expulsion of all air. At the close of the test, all taps shall be satisfactorily plugged with brass plugs.

C. Sequence

1. All water mains connected to an existing water system shall be flushed, swabbed, chlorinated and bacteriological tested prior to pressure testing. The sequence for acceptance testing shall be:

   a. Flushing with approved B-1 Poly-Pig
   b. Chlorination
   c. Flushing
   d. Bacteriological Testing
   e. Pressure Testing

2. Where mains can be totally isolated from the existing water system with airgaps, pressure testing shall precede chlorination and bacteriological testing. The sequence for acceptance testing shall be:

   a. Pressure Testing
   b. Connect to System
   c. Flushing with approved B-1 Poly Pig
   d. Chlorination
   e. Flushing
   f. Bacteriological Testing

3. If a hydrostatic pressure test fails, the chlorination and flushing process must be repeated after repairs to the system are completed.

D. Flushing

1. All flushing will be conducted by the TOWNSHIP with clean potable water until the water runs clear.

E. Chlorination

1. All new mains and pipe or any existing mains contaminated by the CONTRACTOR shall be chlorinated to a minimum residual chlorine concentration of fifty (50) parts per million with commercial liquid chlorine solution or approved equal. The chlorinated water shall be allowed to stand in the mains for 24 hours. The end of the 24-hour period the chlorinated water at all parts of the mains shall show a free available chlorine residual of not less than twenty-five (25) parts per million. If less than twenty-five (25) parts per million residual is shown at the end of the first 24 hours period, additional chlorine shall be added until a residual of not less than twenty-five (25) parts per million at all parts of the system is shown after a subsequent 24 hour period. The chlorinated water shall then be removed from the mains and the mains flushed with potable water for bacteriological testing. No flushing shall take place between the two required bacteriological testing.

F. Bacteriological Testing

1. The Pittsfield Township Utilities Department will take bacteriological samples of the water in the mains for analysis at two different times. The first samples will be taken 24 hours after the mains have been satisfactorily chlorinated, flushed and filled with potable water. The second sample will be taken 24 hours later. Each sample will be incubated for 48 hours. No flushing shall be done during or between tests, unless supervised and approved by ENGINEER. Two sets of safe consecutive bacteriological samples, collected at least 24 hours apart, must be obtained before placing the water main in service.

2. The CONTRACTOR shall provide a sufficient number of corporation cocks and copper tubing for taking samples. Samples shall not be collected from hoses or fire hydrants.

3. Bacteriological testing must begin on Mondays to allow Pittsfield Township personnel and the testing laboratory a full work week to conduct the testing.

G. Hydrostatic Pressure Testing

1. The CONTRACTOR shall pressure test sections of water main as sections of 2,000 feet or less unless otherwise authorized by the ENGINEER. When permitted to test lengths in excess of 2,000 feet, only the allowable leakage for 2,000 feet will be permitted.

2. All water mains shall be subjected to a hydrostatic pressure of 150 psi based on the elevation of the lowest point in the system. The main shall be maintained under the test pressure for a minimum continuous period of two (2) hours by pumping potable water into the line at frequent intervals. The volume of water so added shall be measured and considered to represent the leakage from the main. No pipeline installed will be accepted until the leakage measured is less than 0.092 gallons per inch diameter of the pipe per 1 hour per 1,000 feet.

3. In the event that the leakage exceeds the specified amount, the main shall be carefully inspected for leaks and repaired as necessary. Any cracked or defective pipe, fittings, valves or hydrants discovered shall be removed and replaced with sound material and the test repeated to the satisfaction of the ENGINEER.

4. If the CONTRACTOR chooses to pressure test against an existing valve he assumes the responsibility of meeting the leakage requirements. The CONTRACTOR may at his discretion provide a physical break and cutting in sleeve for pressure testing.

5. Temporary connections (jumpers) between existing water mains and the newly constructed system for testing purposes, shall include a reduced zone backflow preventer to prevent backflow and possible contamination of the public water.

H. Material Tests

1. The CONTRACTOR shall have test of pipe and strength made by an independent testing laboratory. Tests of up to 4 lengths of water main per hundred lengths may be required to show compliance with the Specifications. All pipe delivered to the job site shall be accompanied with a manufacturers certificate of compliance to the specifications.

2.00 PRODUCTS

A. All products shall be consistent with the current component part submittal sheet posted on the Township website.

2.01 PIPE AND FITTINGS

A. Ductile-iron pipe water main shall meet all the requirements of the latest revision of ANSI/AWWA C151/A21.51. Pipe shall be furnished in eighteen-foot or twenty-foot lengths, unless otherwise required. All joints, to include joints for fittings, valves and hydrants, must be of the push on joint type and compatible tyton joint gaskets. Ductile iron pipe must be designed in accordance with the latest revision of ANSI/AWWA C150/A21.50 to meet requirements for Pressure Class 350.

B. Ductile iron pipe and fittings shall be double-cement lined with an approved bituminous seal coat in accordance with ANSI/AWWA C104/A21.4.

C. Ductile iron fittings shall meet all the requirements of the latest revision of ANSI/AWWA C110/A21.10 for full body fittings and ANSI/AWWA C153/A21.53 for compact fittings for a minimum working pressure of 250 psi and be of the push-on joint type. Plugs, where shown on the plans, shall be solid mechanical joint plug type.

D. Restrained mechanical joints of the wedge action type shall use a follower gland and shall include a restraining mechanism which, when activated, impart multiple wedging action against the pipe, increasing its resistance as the pressure increases. Twist off nuts shall be used to insure proper actuating of the restraining device. Restrained mechanical joints for ductile iron pipe shall be Megalug, Series 1100, or approved equal. Mechanical joints shall be in conformity with the requirements of the latest revision of the ANSI AWWA C111/A21.11. Bolts and nuts must be type 304 stainless steel.

E. Push-on joints shall meet all requirements of ANSI/AWWA C111/A21.11. Push-on joints shall consist of a ductile-iron bell provided with a recess to receive a circular molder rubber gasket to effect the joint seal. A rubber gasket and sufficient lubricant to assemble the joint shall be furnished with each joint. The lubricant shall have no deleterious effect upon the color, taste or odor of potable water and shall not be corrosive to either the pipe or gasket. Pipe furnished with push-on type joints shall be equal in strength and leak tightness to pipe furnished with mechanical joints as specified when installed under identical conditions, and shall meet all other requirements of these specifications. In addition to the above requirements, the gasket and lubricant shall conform to the latest revision of ANSI/AWWA C111/A21.11. When it is necessary to utilize a locking mechanism for a push-on joint upstream or downstream of a restrained mechanical joint, field-lok gaskets or equal shall be utilized and shall be used in conformance with DIPRA Standards for restraint distance from a restrained mechanical joint fitting.

F. All pipe and fittings shall be manufactured in the United States of America.

G. The ENGINEER shall witness the delivery and unloading of all pipe and collect the appropriate manufacturer's certificate of compliance per Section 1.04 of this Specification.

2.02 VALVES

A. All valves installed under this Specification shall conform to the applicable requirements of ANSI/AWWA C500, C504 and C509 standards governing construction materials and workmanship. Each valve shall carry the name or trademark of the manufacturer. All valves shall have operating nuts that turn to the right (clockwise) to open.

B. Resilient-Seated Gate Valves

1. Resilient seated gate valves shall conform to the applicable requirements of ANSI/AWWA C515. Valves shall have a minimum working pressure of 250 psi. The gate shall be ductile iron encased in a bonded synthetic rubber to form resilient seating surfaces. Stem shall be bronze with a non-rising design and double o-ring packing. Joints shall be push-on type.

2. Resilient Seated Gate Valves shall be manufactured by American Flow Control or Clow.

C. Tapping Sleeves and Valves

1. Tapping sleeves shall be full length of heavy-duty stainless steel construction designed for use with the type of pipe to be tapped. Tapping sleeve flange and body shall be type 304 stainless steel. Bolts and nuts shall be 304 stainless steel. Gasket shall be full circumferential SBR compounded for water service. Tapping sleeve shall contain a test plug to assure seal prior to tapping. Tapping sleeve shall be JCM Industries 432; Romac Industries SST; Ford FAST, Powerseal 3490AS; Dresser 630 or equal.

2. Tapping valves shall meet the specifications for gate valves except that the valve shall have a flange compatible with the tapping sleeve.

3. The tapping sleeves and valves shall be subjected to a hydrostatic pressure of 200 psi. The sleeves and valves shall be maintained under pressure for a minimum continuous period of 5 minutes by pumping potable water into the sleeve. Upon any visual leakage observed by the ENGINEER, the tapping sleeve and valve shall be removed and replaced, and the test repeated at the CONTRACTOR's expense to the satisfaction of the ENGINEER.

D. Corporation Stops

1. Corporation stops used for insertion into mains shall be ball valve type. All stops shall have no lead brass bodies, keys, stem washers and nuts. Inlet threads shall conform to the latest revision of AWWA C800. The outlet connection shall be of the compression type to receive copper service pipe.

E. Valve Boxes

1. Valves boxes shall be 5-1/4-inch and be of cast-iron construction. They shall be of three-piece, screw-type adjustment design. All valve boxes shall be installed flush with the top of the proposed site grade. Cover shall be designed to be removed easily to provide access to the valve. The base shall not rest upon the valve assembly. Valve boxes shall be Tyler 6860 Item DD with number 6 base, or equal.

F. Valve Extensions

1. All gate valves with operating nuts at a distance greater than 6.5 feet below ground surface shall be provided with an extension stem. The length of the extension stem shall reach within 6.5 feet of the ground surface. Details of the extension system and method of installation shall be approved by the ENGINEER prior to installation.

G. Post Indicators and Valves

1. Post indicators, when specified, shall be American Flow Control series A240 or Clow series 2945A with aluminum plates indicating OPEN and SHUT. Post indicators shall open left.

2. Post indicator valves shall be American Flow Control Model 2500 or Clow model F-6120. All valves shall open left.

3. Post indicators and their corresponding valves must be made by the same manufacturer.

4. Bollards must be placed to protect post indicators, except as specified by the ENGINEER.

5. Bollards shall be 4-inch diameter galvanized schedule 40 steel posts 36 to 48 inches high with minimum depth of 24 inches. The posts shall be set in and filled with 3000 psi concrete. Bollards protecting hydrants and PIVs shall be painted red.

2.03 GATEWELLS

A. Gatewells shall conform to the latest revision of ASTM C478 for Precast Reinforced Concrete Manhole Sections. Section joints shall be rubber gasketed and shall conform to ASTM C990. Cone sections shall be eccentric, with an offset step configuration.

B. All gatewell components shall have the name of the manufacturer stenciled on the inside. The lettering shall be a minimum of 4-inches high.

C. Gatewells constructed over an existing water main shall have a doghouse mudded to an 8-inch thick cookie. All other gatewells shall have precast integral base sections.

D. Mortar for masonry or plastering outside of gatewells shall be made of one part of Portland Cement to two parts fine aggregate. Mortar materials and mixing shall correspond, in general, to those for concrete. All openings in gate wells shall be closed with brick and mortar in a manner that will make them watertight.

E. Gatewell steps shall be reinforced polypropylene coated steel. They shall be M.A. Industries models PS1-PF or PS1-B, or approved equal.

2.04 GATEWELL FRAMES AND COVERS

A. Gatewell frames and covers shall weigh not less than 350 lbs. Each frame and cover shall have machined bearing surfaces and shall be suitable notched for convenient removal of the cover.

B. Frames and covers shall be East Jordan Iron Works Model 1040Z frame with 1040 A cover. Each cover shall have the Pittsfield Township logo and the letters "PITTSFIELD TWP WATER" cast integrally into the cover.

C. All frames and covers shall be coated at the place of manufacturer with coal tar pitch varnish or other asphaltum coating approved by the ENGINEER.

2.05 GATEWELL CONNECTIONS

A. Water pipe to gate well connections shall be through a watertight flexible pipe-to-manhole connector, which shall be securely clamped into a core-drilled port. Pipe ports shall be core-drilled at the point of manufacturer and shall be accurately located within 1/2-inch of the proposed water main centerline. Flexible pipe-to-manhole connectors shall meet the requirements of ASTM C923 and shall be NPC, Kor-N-Seal, or equal.

B. All non-rubber components including wedges, bands and pipe clamps shall be stainless steel.

2.06 GATEWELL ADJUSTMENTS

A. All final grade adjustment of gatewell cover and frame assemblies shall be completed utilizing injection molded High Density Polyethylene (HDPE) adjustment rings as manufactured by Ladtech, Inc., or approved equal. The adjustment rings shall be manufactured from polyethylene plastic meeting the requirements of ASTM D4976. Brick adjustments are not acceptable.

B. All adjustment for matching road grade shall be made utilizing a molded indexed slope ring.

C. Each adjustment ring shall be sealed with a 3/16 to 1/4-inch bead of butyl rubber sealant per the manufacturer's instructions. Sealant shall meet the requirements of ASTM C990.

D. All castings and adjustment rings shall be securely fastened to the cone of the structure with four 3/8-inch threaded rods. The rods shall be galvanized or stainless steel anchored to the structure with Redhead Trubolt concrete anchors, or equal. Stainless steel or galvanized nuts and washers shall be used to attach the casting.

E. When the depth of the gate well requires an adjustment greater than the maximum allowed, the CONTRACTOR shall provide additional pre-cast gate well barrel sections required to maintain acceptable chimney heights.

2.07 HYDRANTS

A. Fire hydrants shall comply with the latest revision of ANSI/AWWA C502. Hydrants shall be compression type to open with the pressure. They shall have a 5-1/4" valve opening and 6" mechanical joint inlet. Hydrants shall have two 3-1/2" (4.05" O.D.) pumper connections with National Standard 7-1/2 threads per inch. All hydrants shall have City of Ann Arbor standard thread pattern.

B. Fire hydrants shall have an inside barrel dimension of not less than 7.375" I.D. from top to bottom. The 1-1/8" pentagon operating nut shall open left (counter clockwise).

C. All nozzles shall be on a removable head with a flange so that they may be rotated by changing the position of the flange.

D. Hydrant shall be fully bronze mounted, including top of the operating stem where it passes through the double o-ring seal in the bronze packing gland. The forged operating stem in the base and the valve seat shall also be of bronze. The molded valve shall be of compositive rubber and the cast iron valve clamps shall be packed with o-ring seals and held tight to the stem by a threaded bronze hex retainer ring and threaded bronze locknut, anchored with set screws.

E. Hydrant shall be designed for 150 psi working pressure and tested to 300 psi. Those portions of the hydrant above grade shall have two coats of red enamel. All unpainted surfaces shall have two coats of coal tar pitch varnish.

F. The hydrants shall be EJIW WaterMaster 5BR-250 with mechanical joint connections and break flange barrel with standard head.

G. Hydrant bolts located below grade shall be type 304 stainless steel

H. All hydrants shall have a 4" Harrington Integral Hydra-Storz (HIHS) adaptor. The HIHS shall meet the requirements of AWWA C502 regarding material and pressure testing. Stortz nozzle shall have a brass metal face and hard anodized ramps and lugs. The aluminum finish shall be hardcoat anodized to MIl-A-8625f, type 3 dark gray. The adapter shall be made from forged or extruded 6061-T6 aluminum.

I. The blind cap shall have hard anodized aluminum Storz ramps and lugs, made of forged or extruded 6061-T6 aluminum, the cap shall be equipped with suction seal. The cap shall be connected to the adapter or the hydrant with 0.125 vinyl coated aircraft cable.

J. Fire hydrant extensions shall be manufactured by the hydrant manufacturer for use with the model hydrant being installed.

K. Hydrants adjacent to truck routes on commercial developments shall be protected by bollards.

2.08 SERVICE LEADS

A. Pipe for service leads 1-inch to 2-inch shall be soft annealed Type K copper. Service leads 4-inch to 8-inch shall be Pressure Class 350 Ductile Iron, Double cement lined.

B. Curb Stops

1. Curb stops used for service connections shall be ball valve type. All parts shall be no lead brass. Both the inlet and outlet connections shall be of the compression type to receive copper service pipe. Curb stops shall be consistent with the most current shop drawing checklist posted on the Township website.

C. Curb Boxes

1. Curb boxes shall be the Bibby Screw Style V010 with S169 top, V201 bottom, V223 extention, and V240 water cover . All curb boxes shall be coated inside and out with a tar base enamel. The minimum bury shall be 5'-0" (60") and the maximum 6' (72"). Curb boxes shall be consistent with the most current shop drawing checklist posted on the Township website.

D. Couplings

1. Couplings used for service connections shall be located outside the pavement and more than 10 feet from any building wherever possible. They shall have a three part union, and both connections shall be of the compression type to receive copper service pipe. All parts shall be no lead brass..

2. All service connections between two copper service pipes (two-inch or less in diameter) located under the pavement or within 10 feet of a building shall be connected using wrought copper, solder-sweat type couplings conforming to ASME B16.18 or ASME B16.22. Fittings shall bear made in USA labels. Joining of copper piping shall be a solder-sweat connection using lead free Silfos. The use of 95-5, Tin-Antimony or equivalent solders will not be allowed.

2.09 TRACER WIRE

A. Tracer wire to be used on open cut pipe shall be AWG #12 single strand copper with blue 30 mil HDPE insulation. Connections shall be made using 3M DBR-6 wire connectors, or equal.

2.10 POLYETHYLENE ENCASEMENT

A. All ductile iron pipe and fittings must be polyethylene encased. In addition, the initial 24-inches of copper service lead must be encased from the corporation stop. Polyethylene encasement must be manufactured in accordance with the requirements of the latest revision of ANSI/AWWA C105/A21.5.

B. Polyethylene Encasement shall be black linear low-density polyethylene with a minimum thickness of 8 mils.

C. The wrap shall overlap the joint by 12 inches to either side and be secured to the pipe with polyethylene adhesive tape.

3.00 EXECUTION

3.01 EXCAVATION AND BACKFILL

A. All excavation and backfill shall conform to the Earthwork specification.

3.02 PIPE INSTALLATION

A. The installation of ductile iron water main must conform to the requirements of ANSI/AWWA C600.

B. Any pipe damaged in transport or handling shall be rejected and removed from the site of the work.

C. Before lowering in the trench, and while suspended, each pipe and fitting shall be inspected for defects. Defective, damaged or unsound pipe shall immediately be removed from the construction site. The interior of each pipe shall be inspected for cleanness and cleared of all dirt and foreign matter before being lowered into the trench.

D. In handling and placing ductile iron pipe and fittings, no metal shall be used in contact with the inside of the pipe to fit or support the pipe. The pipe shall be moved only through the use of belt slings or automatic release type pipe tongs. Care shall be taken not to injure the pipe or pipe coating, and no damaged or imperfect pipe shall be used in the work except that minor damage to pipe coating may be repaired subject to the review of the ENGINEER.

E. Unless otherwise directed, pipe shall be laid with bell ends facing in the direction of laying. After a length of pipe is placed in the trench, the spigot shall be centered in the bell of the adjacent pipe; the pipe shoved into position and brought to a true alignment. It will then be secured with sand backfill tamped under and on each side of the pipe, except at bell holes. No earth or other foreign matter shall be allowed to enter the joint space.

F. All excavation and backfill above the pipe shall conform to specifications under Earthwork and as shown on the Drawings.

G. A minimum of 18-inches vertical clearance shall be provided between the water main and any existing underground facility, unless otherwise approved by the ENGINEER. Whenever a main is installed under any existing utility line such as gas, buried electric power, telephone line, sewer or water, provisions shall be made to properly support or distribute any concentrated load to avoid settlement and possible failure of either main. Such provisions shall consist of concrete bedding of the main, complete concrete encasement, or some other method as shown on the plans. Water mains passing under sewers, in addition, shall be protected by providing:

1. A vertical separation of at least 18-inches between the bottom of the sewer and the top of the water main.

2. Adequate structural support for the sewer to prevent excessive deflection of joints and settlement of the sewer about the water main; i.e., a concrete saddle under the pipe with a span length extending to undistributed earth bearing.

H. Water mains shall be installed at least 10 feet horizontally from any existing or proposed gravity sanitary or storm sewer, septic tank, or subsoil treatment system. The distance shall be measured edge to edge.

I. In assembly of push-on or shove type joints, the bell socket recess and the gasket shall be wiped clean and the gasket placed properly in position. A thin film of lubricant shall then be applied to the surface of the gasket to come into contact with the entering pipe. The plain end of the entering pipe shall be cleaned and then entered and forced home to the base of the socket.

J. Where necessary to cut pipe, cutting shall be done with approved tools and cut ends of pipe shall be square and regular. Cutting shall be done in a manner to avoid damage to lining and coating. Minor damage may be repaired subject to review of the ENGINEER.

K. To prevent trench water from entering the pipe, joints, which for any reason may not be completed as the pipe is laid, shall be thoroughly packed with approved material, in a manner to make them watertight. Open ends of fittings shall be tightly closed with approved plugs and well packed, as shall the end of the last pipe laid whenever work is not in progress.

L. Each pipe shall be laid accurately to the line and grade shown on the Plans. Wherever deflections at joints are required by changes in grade or alignment or to plumb valve stems, the deflection at any bell and spigot joint shall not exceed that which will cause the spigot end of pipe to be away from home in the bell of the adjacent pipe a distance of 1/4 inch at the point of greatest opening.

M. The deflection at any mechanical joint shall not exceed three-quarters of the maximum deflection recommended by the manufacturer or 3 degrees, whichever is more conservative of the joint used.

N. The CONTRACTOR shall not be entitled to any additional compensation because depth is more than specified at certain locations or due to clearances at manholes, or due to unforeseen obstacles, or occasioned in order to avoid undue changes in grade.

O. Pipe shall be laid at depths to provide minimum cover of 5' - 6" over the top of the pipe unless otherwise noted on the Drawings or elsewhere in these specifications.

3.03 GATE VALVES AND WELLS

A. All pre-cast section joints and lift holes shall be pointed and plugged, inside and outside, with mortar.

B. Gate valves shall be of the size and installed at the location as shown on the plans. They shall be set square with the line of the main, and unless otherwise directed by the Township ENGINEER, all gate valves shall be set with stems plumb. At each side of gate valve, the CONTRACTOR shall furnish and install a 1-inch corporation stop on the main as shown on the Standard Details.

C. All gate valves with operating nuts at a distance greater than 6.5 feet below ground surface shall be provided with an extension stem.

3.04 HYDRANTS

A. Fire hydrants shall be constructed in accordance with the details shown on the plans. Finish grade level to center of nozzle caps shall measure between 24 and 30 inches. A maximum of one hydrant barrel extension and one operating stem extension may be used to accommodate changes in grade. Under no conditions shall extended hydrant have more than one coupling in the operating stem. Pumper connections shall point toward the street.

B. Fire hydrants shall be installed with barrel vertical and properly based. Concrete thrust blocks shall be placed behind the hydrant, tee, and every bend. Care should be taken to insure the drain holes on the hydrant are not plugged by the thrust blocks. Hydrant shall be set in 1 yard of coarse gravel for drainage purposes. If ground water is encountered, the drain hole shall be plugged as directed by the manufacturer. The backfill shall be sand thoroughly tamped around the hydrant and valve box in 1 ft layers.

C. Fire hydrant and gate valve shall be set apart 24 inches. Gate valves and valve box shall be as specified under the valve paragraphs of this section.

D. Hydrant leads shall have a minimum of 5.5 feet of cover in all areas, including crossings through ditch sections.

E. Hydrants shall be carefully plumbed, braced and backfilled so they remain plumb.

F. All grade, facing, and vertical alignment adjustment of hydrants shall be completed prior to pressure testing and charging of the hydrants.

G. All hydrants shall be cleaned and painted with a rust inhibitive, oil base paint such as "rustoleum" or approved equal to the Township's color code prior to acceptance.

H. The lubricant reservoirs in all hydrants having such construction shall be filled with a lubricant acceptable to the Michigan Department of Environmental Quality and recommended by the hydrant manufacturer.

I. Backfilling around fire hydrants shall be carefully tamped sand in 12-inch layers from the centerline of the lead main to a height of 1-foot below finished grade.

J. CONTRACTOR shall place burlap sack or equivalent material over the hydrant nozzles after installation.

K. Fire hydrant nozzles shall be aligned as required by the Township Fire Marshal.

L. Fire hydrant extensions shall be provided as necessary so that the safety flange is located at or above surface grade.

3.05 TRACER WIRE

A. Tracer wire shall be installed along the top of all water mains. For directional drilling, the tracer wire shall be installed at the same time as the pipe. For open cut construction, the tracer wire shall be installed at a height of not more than 6 inches above the main line pipe or service leads. Wire shall be extended to all hydrants, blow-offs, dead ends, service leads and post indicator valves. Tracer wire shall be brought to grade, leaving enough excess material to avoid loss or damage to the wire during construction and subsequent activities. Wire shall be trimmed to finish grade following completion of the landscaping.

B. When tracer wire is to be run along short offsets (less than 20 feet), a loop of wire shall be utilized to loop to the end of the offset, bring the loop to grade and terminate it in an approved manner. For service leads and offsets of more than 20 feet in length, or installed by directional drilling method, a splice may be utilized to make the connection at the main. The tracer wire shall then be installed and terminated in an approved manner.

C. Tracer wire terminations shall be made by one of the following methods:

1. Tracer wire shall be terminated at hydrants by tying off the wire at the head flange, leaving excess material for future trimming following landscape activities.

2. Terminations at valve/curb boxes, post indicators, valves and blow-offs shall be made with 2 wraps of wire at grade around the box or pipe, leaving excess material for future trimming following landscaping.

3. Gatewell terminations shall be made by running the tracer wire through the pipe opening in the wall, down to and across the floor to the steps, up the wall and secure to the top step leaving the stub accessible at the casting. Wire shall be run through the gatewell such that it does not create a hazard.

4. Terminations at existing water mains without tracer wire shall be made at the nearest hydrant or gate well as outlined above. If no hydrant or gatewell is available, an upper section of valve box shall be installed with the tracer wire stubbed up inside

D. When connections are made to existing water mains which do not have tracer wire, the following method most applicable to field conditions shall be used.

1. When connection is made at/near a valve or hydrant, the connection shall be made in the same manner as the termination at said structures in Item C(2) above.

2. When connection takes place in a gatewell, the same procedure shall be used as in termination at a gatewell (see Item C(3) above).

3. If no valve or hydrant is available, the upper section only of a valve box shall be set with the tracer wire stubbed up inside.

3.06 POLYETHYLENE ENCASEMENT

A. The polyethylene encasement must be installed in accordance with the specifications and requirements of ANSI/AWWA C105/A21.5. For open cut applications a single wrap is required, and for directional drill applications a double wrap is required.

B. The polyethylene encasement must be taped and overlapped at pipe joints and must be taped in a spiral configuration along the length of the pipe.

3.07 CONNECTION TO EXISTING MAINS

A. All connections to existing water mains shall be made at the locations as shown on the plans.

B. All valves shall be operated by the Pittsfield Township Utilities Department.

C. Prior to beginning construction of the final connections, the CONTRACTOR shall provide sequence of all final connections to the existing system and coordinate a meeting between the ENGINEER, OWNER and CONTRACTOR in the field to review the procedure.

D. When making a dry connection to an existing main, the existing main to which a connection is to be made shall be isolated by the closing of the necessary existing valves, and the water from the existing main shall then be pumped out or removed by other means so the connection may be made in the dry. After the connection has been acceptably made, the portion of the new line to the nearest valve shall be satisfactorily tested and disinfected, along with the drained portion of the existing water main, before the isolated existing main is placed back in service, except as the ENGINEER may otherwise direct. In as much as residents served by this isolated main will be temporarily out of water during this period, the work shall be executed as rapidly as possible, and the time of, and the procedure in, making such connections shall be subject to the review of the ENGINEER. Such work may be required to be done at night in order to minimize inconvenience of water users. The CONTRACTOR shall not be entitled to any additional compensation because of night work or other special requirements in work under this section.

E. The CONTRACTOR shall make particular effort, prior to bidding, to ascertain whether or not valves in the existing mains to be connected to the new mains are so located as to provide isolation. If valves are not found to be adequate, then the CONTRACTOR shall utilize other means to make the connections with a minimum of interruption to service.

F. When making a wet tap connection to an existing main, a tapping sleeve designed for the type of pipe being tapped shall be utilized and the tap shall be made in accordance with the manufacturer of the tapping equipment.

G. Wherever adapters are required to properly connect the pipe with existing pipe or other material or manufacturer, the nominal I.D. of adapters shall be the same size as the nominal diameter of pipe connected thereto. Adapters shall also be furnished and used as required by the manufacturer for connection to fittings.

3.08 BEDDING

A. Ductile iron pipes shall be fully enclosed in polywrap and laid on a compacted sand cushion, 4 inches thick. Sand shall conform to fine aggregate 2NS as defined in 2003 MDOT, Section 902.

B. 2NS sand bedding material shall be placed around and above the main to a height of 12 inches above the main.

C. Sand shall be compacted on top of the 12-inches of sand above the pipe to not less than 95 percent of the maximum unit density as determined at optimum moisture content.

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Permit-Seal

Client/Project
PITTSFIELD TOWNSHIP

Pittsfield Township, Michigan

Title
WATER MAIN SPECIFICATIONS

Project No.
2075001300

Scale

Revision

Earthwork

1.00 GENERAL

1.01 DESCRIPTION

A. The CONTRACTOR shall perform all excavation and backfilling necessary to complete the work. This shall include the excavation of earth and rock, the removal and disposal of unsuitable material, dewatering, placement of suitable fill and backfill material, pipe boring and jacking, all quality assurance testing, and the restoration and final grading for all earth surfaces.

1.02 WORK WITHIN RIGHTS-OF-WAY

A. Where the governmental bodies having jurisdiction of the streets or rights-of-way have specific specifications relating to the requirements for work within their jurisdiction, such requirements must be met as a minimum requirement, and if these Specifications impose further limitation on the work, they shall also be met as the required work standard.

B. During all operations of the CONTRACTOR in the streets and roadways, the CONTRACTOR shall maintain barricades, lights, and warning signs as required by the agency having jurisdiction.

1.03 WORK WITHIN EASEMENTS

A. During construction within any easements, the CONTRACTOR shall confine himself to the limits shown on the Plans. He shall notify property owners in advance of moving equipment on easements and use of the access routes which will be designated by the OWNER. The OWNER will cooperate in working out the details of access. The topsoil over the trench shall be removed and carefully replaced upon completion of the work. The backfill of the trench in the easement may be left slightly high to provide for any slight residual settlement. Any trees, shrubs, or bushes removed shall be replaced to the satisfaction of the property owner.

1.04 SOIL BORINGS

A. Soil boring results, if taken on a site, are appended to these Specifications with locations noted. Boring logs are shown to be generally representative of the site and to assist in the design and construction of the work.

2.00 PRODUCTS

2.01 BACKFILL MATERIAL

A. For areas not requiring "granular backfill" material, backfill shall be of the excavated material, with the exception that materials such as soft clay, topsoil, muck, cinders, vegetable matter, refuse, boulders and other objectionable and non-packing earth shall be excluded from the backfill and removed from the site. Stone larger than 3 inches in any dimension shall be excluded from the backfill and removed from the site by the CONTRACTOR.

B. Where "granular material" backfill is required as specified herein, backfill material shall be defined as a material meeting granular material Class II as defined in 2003 MDOT 902.08.

C. All utilities within road right-of-way corridor (existing or proposed) shall be backfilled with MDOT CL II granular material compacted to 95% maximum unit weight.

D. All utilities shall be installed with 2 NS sand bedding or better.

2.02 ENCASING PIPE

A. Steel encasing pipe for boring and jacking shall conform to the requirements of either, ASTM A53, Type E or S, Grade B or ASTM A139, Grade B.

B. Steel encasing pipe used under channels and highways shall meet the requirements of the governmental agency having jurisdiction and the following minimum requirements;

Nominal Diameter (Inches)	Maximum Wall Thickness
Under 13	0.188 inches
13-24	0.250 inches
25-36	0.312 inches
42	0.438 inches
48	0.500 inches
54	0.563 inches

C. Steel encasing pipe used under railroads shall meet the requirements of the railroad and the following minimum requirements:

	Minimum Wall Thickness (inches)	
Nominal Diameter (Inches)	Coated or Cathodically Protected	Uncoated & Unprotected
Under 14	0.180	0.251
14-16	0.219	0.282
18	0.250	0.313
20	0.281	0.344
22	0.312	0.375
24	0.344	0.407
26	0.375	0.438
28-30	0.406	0.469
32	0.438	0.501
34-36	0.469	0.532
38-42	0.500	0.563
48	0.563	0.626

D. Casing pipe joints shall be welded to form a leak-proof continuous casing.

E. The inside diameter of casing pipe shall be at least 2 inches greater than the largest outside diameter of the carrier pipe joints or couplings for carrier pipe less than 6 inches in diameter, and at least 4 inches greater than the largest outside diameter of the carrier pipe joints for carrier pipe 6 inches and over in diameter, unless otherwise shown on the Plans.

F. The steel casing pipe shall be of smooth interior and shall be placed accurately to line and grade, allowing for the encased pipe thickness and supports under each length of encased pipe.

3.00 EXECUTION

3.01 GENERAL EXCAVATION

A. Excavation shall be performed by any practicable method consistent with the integrity and protection of the work and neighboring structures, workmen, and the public. Topsoil shall be separately removed and stockpiled for reuse.

B. All excavation, except where necessary to tunnel, bore or jack under roads, railroads, tree roots and other obstructions within the limits indicated on the Plans, may be open cut from the surface. Tunneling or boring under trees shall be considered as incidental to construction and will not be considered as cause for request for additional payment.

C. Foreign material or unsuitable foundation material encountered such as wood, boulders, etc., which obstruct the excavation, shall be removed. Such materials found at the bottom of the excavation shall be removed and the foundation restored with approved materials.

D. If excess excavation is made or the material becomes disturbed so as to require removal beyond the prescribed limits, the resulting space shall be filled with selected material solidly tamped into place, in not more than 6-inch layers to the satisfaction of the ENGINEER, before the construction work proceeds. At the direction of the ENGINEER, the excess excavation may be filled with 2000 psi concrete at the CONTRACTOR's expense.

E. The excavation shall be kept dry during the work. Where water is encountered in the excavation, it shall be removed by pumping or well points. All necessary precautions shall be taken to prevent damage to existing wells and to completed or partially completed structures. The CONTRACTOR shall be responsible for all damages caused by him due to inadequate or improper protection.

F. The CONTRACTOR shall take ample precautions to protect all trees and ornamental shrubbery not within the limits of the construction areas, or within the construction areas shown on the Plans to be retained from injury by workmen, equipment, or any other agencies connected with the work, including subcontractors. Such protection shall be provided during the progress of the excavation, grading, or other phases of the work as necessary. Such trees or shrubbery shall be surrounded by protective posts or fencing before construction begins, when in judgment of the ENGINEER, such precautionary measures are necessary. If, as a result of any phase of the work, trees are damaged or it is necessary to remove limbs in the way of construction, the repair of the damage and such limb removal shall be done by the CONTRACTOR as directed by the ENGINEER. All costs for the protective work shall be borne by the CONTRACTOR as incidental to the Contract work.

G. Any excavation not backfilled at the end of each day must be clearly marked and surrounded by appropriate safety fencing as directed by the ENGINEER. If directed by the ENGINEER, the CONTRACTOR shall cover the open excavation with a steel plate and light the excavated area.

3.02 EXCAVATION FOR SEWERS AND WATER MAINS

A. Trenches shall be excavated to the depth required with allowance for bedding the pipe. The trench shall be cut wider and deeper at each pipe joint location to provide for properly completing the pipe joint and to relieve the joint of all loadings.

B. The width of the trench at the top of a rigid pipe shall be sufficient to allow the pipe to be laid and jointed properly and shall provide for a minimum net clearance of 6 inches and a maximum net clearance of 12 inches on each side of the barrel of the pipe and to allow the backfill to be placed and properly compacted.

C. The width of trench at the top of a flexible pipe backfill when using concrete bedding shall be sufficient to allow the pipe to be laid and jointed properly with the minimum net clearance of 12 inches and a maximum net clearance of 18 inches on each side of the barrel of the pipe.

D. Where the conditions of the ground require or where the work is in close proximity of existing structures, the sides of excavation shall be securely held by bracing and/or sheeting which may be removed in units when the level of the backfill has reached a point where it is safe to pull the sheeting without disturbing the protected feature. No sheeting, bracing, or other timber shall be left in the excavation upon the completion of the main or other structures, except with the specific review and direction of the ENGINEER.

E. Other underground mains, sewers or structures encountered in the excavation shall be adequately supported during the CONTRACTOR's operations, and before backfilling, shall be given permanent support as directed by the ENGINEER to meet the standards or requirements of the owning utility or agency.

F. Water, sewer, gas and other utility services disturbed by the CONTRACTOR in his operations shall be repaired or replaced in a manner equal to the original condition by the CONTRACTOR at his own expense. Where these services are encountered and are undamaged, they shall be supported and/or protected by the CONTRACTOR at his expense against later settlement and/or damage after backfill. The CONTRACTOR shall consult the agency or the utility firm having jurisdiction over any duct line, gas main, etc., which may cross the excavation to determine method of supporting such duct or pipe.

G. All excavated material shall be piled in a manner that will not endanger the work and that will avoid obstructing sidewalks and driveways. Hydrants under pressure, valve manhole covers, valve boxes, curb stop boxes, fire and police call boxes, or other utility controls shall be left unobstructed and accessible until the work is completed. Gutters shall be kept clean, or other satisfactory provisions made for street drainage, and natural water courses shall not be obstructed except as otherwise provided for herein on a temporary basis.

3.03 EXCAVATION FOR STRUCTURES

A. Excavation for structures shall be extended sufficiently beyond the limits of the structure to provide ample room for form construction and for practicable construction methods to be followed.

B. Requirements for excavation of sewers and water mains shall also apply to this Section.

3.04 EXCAVATION FOR PAVED SURFACES

A. In excavating around manholes and catch basins or inlets, care shall be exercised to avoid removing the casings and pushing dirt into the structures. Dirt pushed into manholes, catch basins or inlets by the CONTRACTOR's operations shall be immediately removed so that the dirt will not be carried into the sewer by the flow of sewage or storm water.

B. The CONTRACTOR shall take ample precautions to protect all trees and ornamental shrubbery not within the limits of the construction area, or within the construction areas shown on the Plans to be retained from injury by workmen, equipment, or any other agencies connected with the work, including subcontractors. Such protection shall be provided during the progress of the excavation, grading, or other phases of the work as necessary. Such trees or shrubbery shall be surrounded by protective posts or fencing before construction begins, when in the judgment of the ENGINEER, such precautionary measures are necessary. If, as a result of any phase of the work, trees are damaged or it is necessary to remove limbs in the way of construction, the repair of the damage and such limb removal shall be done by the CONTRACTOR as directed by the ENGINEER. All costs for the protective work shall be borne by the CONTRACTOR as incidental to the Contract work.

3.05 ROCK EXCAVATION

A. Rock excavation shall consist of excavating igneous, metamorphic and sedimentary rock which cannot be excavated without continuous drilling and blasting or drilling and splitting to fracture the rock. Blasting shall be permitted only after it has been shown that other methods of excavation are impractical. All rock excavation shall be carried to a minimum depth of 8 inches below the pipe or manhole bottom and to the bottom of all footings. The width of the rock excavation shall not exceed the diameter of the pipe plus 12 inches on either side or the edge of the foundation footing.

B. When the use of explosives is necessary for the progression of the work, the CONTRACTOR shall comply with all laws, ordinances and applicable safety code requirements and regulations relative to the handling, storage and use of explosives and protection of life and property. A person competent and experienced in the use of explosives shall be employed to supervise the work. The CONTRACTOR shall schedule all blasting for a definite hour of the day and shall so notify all residents and businesses in the area as to the scheduled day and hour for such blasting operations. Explosive materials shall not be stockpiled and stored in residential areas. Explosives and initiating devices shall not be carried in the same vehicle.

C. Suitable weighted plank coverings or timber mats shall be provided to confine all materials lifted by blasting within the limits of the excavation of trench. Excessive blasting or overshooting shall not be permitted. Any material outside of the authorized excavation cross section which may be shattered or loosened shall be removed at the CONTRACTOR's expense. The CONTRACTOR shall be responsible for all damage resulting from the use of explosives.

3.06 PIPE BORING AND JACKING

A. The CONTRACTOR shall obtain all necessary permits for jacking the encasing pipe under channels, highways and/or railroads and shall notify the governmental agency and/or company having jurisdiction 48 hrs before work at any crossing is started. The CONTRACTOR shall pay all costs for an inspector and/or flagmen required by a railroad or governmental agency.

B. A suitable approach trench shall be opened, adjacent to the toe of the slope of the embankment. The approach trench shall be long enough to accommodate the length of pipe units to be placed, and wide enough to provide sufficient working room. Guide timbers or rails for keeping the pipe on-line and grade shall be installed in the bottom of the trench and heavy timber backstop supports installed at the rear of the trench to take the thrust of the jacks. A timber bearing a "pushing frame" shall be built and furnished to fit or match the end of the pipe to be jacked, so that the pressure of the jacks will be evenly distributed over the end of the pipe. Two (2) hydraulic jacks of sufficient power shall be used to apply pushing or jacking pressure. For firm ground, excavation shall be carried on from inside the pipe, not to exceed twelve (12) inches ahead of the lead pipe. For unstable ground, the lead pipe shall precede the auger. Excavation at the top and sides shall be accurately cut to line and grade. Adjoining sections of steel pipe shall be welded. Pipe shall be jacked on successive shifts until completed to guard against the "freezing of the line" due to settlement and compaction of surrounding soil.

C. The sheeting of pits along any road will be required if the leading edge of all work pits will be closer to the pavement edge than the shoulder point or ten (10) ft, which ever distance is greater, or on curb and gutter sections, at least five (5) ft from back of curb.

D. Upon completion of the installation of the steel pipe encasement, the contractor shall furnish and install a bolted style casing spacer as described below on the carrier pipe. Casing spacers shall be placed a maximum of seven (7) feet apart along the length of the carrier pipe with one casing spacer within 2-1/2 feet of each side of a pipe joint and the rest evenly spaced. Wood skids are not an acceptable method of supporting the carrier pipe.

1. Casing spacers for carrier pipes from 4" - 24" shall be made of a molded, segmented high density polyethylene plastic with 304 stainless steel connecting nuts and bolts. Minimum spacer width shall be 5.2" for carrier pipes from 4" - 12" and 7.0" for carrier pipes 14" - 24". Each casing spacer shall have at least six (6) integrally molded skids extending 1" beyond the bell or mechanical joint of the carrier pipe. The casing spacers shall be equal to the PSI Ranger as manufactured by Pipeline Seal and Insulator, Inc., Houston, TX.

2. Casing spacers for carrier pipes larger than 24" shall be a PVC fusion bonded coated (10-16 mils) steel shell (minimum 14 gauge steel) with a 90 mil PVC inner liner and 2" wide 30% glass reinforced polyester runners (minimum compressive strength = 18,000 psi) (polyethylene is not an acceptable runner material) attached by 3/8" coated steel studs welded to the steel shell. All bolts and nuts used to fasten the shell to the carrier pipe shall be cadmium plated steel. Where riser are required under the runners they shall be a minimum 10 gauge steel welded to the shell and coated as specified for the shell (epoxy is not an acceptable coating for the shell riser). The casing spacers shall be equal to the PSI Model C as manufactured by Pipeline Seal and Insulator, Inc., Houston, Texas.

E. Boring shall be performed by accepted and recognized methods which will provide adequate safety and protection at all times to workmen employed in the work and to inspectors and others involved in the construction.

F. If voids should develop around the outside of the encasing pipe, grouting or other methods approved by the ENGINEER shall be employed to fill such voids.

G. After the pipes are tested satisfactorily, the remaining space between the carrier pipe and the encasing pipe shall be pressure grouted or otherwise filled with concrete. The carrier pipe shall be adequately braced to prevent floating or movement of the pipe.

3.07 SHORING, SHEETING AND BRACING

A. Where sheet piling, shoring, sheeting, bracing, or other supports are necessary, they shall be furnished, placed, maintained, and except as shown or specified otherwise, removed by the CONTRACTOR.

B. All sheet piling, shoring, sheeting and bracing shall be designed by a professional engineer engaged by the CONTRACTOR with demonstrated competence and experience in such work. The sheeting system shall be designed to prevent bottom failure and hydrostatic uplift within the excavation. Provision shall also be made in the design for lateral pressures due to side slope and construction equipment or other surcharge loads, as applicable.

C. The CONTRACTOR shall provide to the ENGINEER for his review, design calculation and arrangement drawings of the sheeting system prior to ordering any materials for bracing, sheeting, etc., and prior to the commencement of the excavation.

D. All materials, except as otherwise specified, used for sheeting and sheet piling, lagging, braces, shores, and stringers, or waling strips shall be of approved quality and dimensions throughout.

E. Materials for sheeting systems shall be furnished and driven or set in place by the CONTRACTOR, where necessary or wherever ordered by the ENGINEER, whether the same is or is not considered necessary by the CONTRACTOR. If, in the opinion of the ENGINEER, the materials furnished by the CONTRACTOR are not of proper quality or sufficient size or not properly placed to ensure the safety of the work or of adjacent structures and property, the CONTRACTOR shall, upon notice from the ENGINEER to that effect, forthwith procure, furnish and set in place or drive other and satisfactory materials, or place the material in a satisfactory manner; and if he shall fail or neglect to do so, the ENGINEER may order all or any part of the work to be stopped until such materials so used are furnished and placed; and the CONTRACTOR shall not be entitled to claim, demand, or receive any compensation for larger size or better quality or different disposal of materials ordered by the ENGINEER, nor any compensation for allowance of any kind whatsoever for or on account of any damage or delay resulting from such stoppage of work.

F. Steel sheet piling may be either new or used. It shall be of adequate strength, straight and properly braced. Steel sheet piling shall be of the interlocking type. Friction in the interlocks shall not be assumed to contribute to the strength of the sheet piling.

G. The design, planning, installation and removal, if required, of all sheet piling, shoring, sheeting, and bracing shall be accomplished in such a manner as to maintain the required excavation or trench section and to maintain the undisturbed state of the soils below and adjacent to the excavation.

H. Steel sheet piling for the excavation shall be driven straight and in-line. The piling shall be supported above ground, before driving, by a guide frame at least 20 ft high which will keep the piling accurately in the required position and vertical. Each piece of piling shall be driven only a few feet at a time and driving shall proceed continuously around the perimeter so that the piles shall reach their full penetration together.

I. Walers and bracing shall be supplied and installed as required to complete the sheeting system. Walers and braces shall be of adequate strength for the load imposed. Splices in walers shall develop the full strength of the member in bending, shear, and axial compression.

J. If bracing members are to be removed during construction, the timing and procedure for removal shall not induce excessive stresses in the permanent structures or in steel sheet piling and bracing members.

K. If the construction sequence of structures requires the transfer of bracing to the completed portions of any structure, the CONTRACTOR shall secure written acceptance of the ENGINEER prior to the installation of such bracing.

L. In trenching operations the use of horizontal strutting below the barrel of pipe or the use of the pipe as support for trench racing will not be permitted. The use of a travelling shield for sewer construction shall require that the device be approved for use by a professional engineer. Sheet piling and timbers in trench excavations shall be withdrawn in a manner so as to prevent subsequent settlement of the pipe or additional backfill loadings which might overload the pipe.

M. The neglect, failure, or refusal of the ENGINEER to order the use of sheeting, or sheet piling or steel, or to order the same to be left in place, or the giving or failure to give of any order or directions as to the manner or methods of driving or placing sheeting, sheet piling, bracing, shores, etc., shall not in any way relieve the CONTRACTOR of any or all obligations under this Contract. Sheeting left in place shall be cut off one (1) ft below existing grade.

N. The rules of the OSHA and the State Department of Labor with respect to excavation and construction shall at all times be strictly observed.

3.08 GENERAL BACKFILLING

A. For all areas, unless otherwise noted, backfilling shall consist of placing excavated material as defined in Paragraph 2.01.A. of this Section, in 12-inch lifts to finish grade. Compaction of backfill shall be such as to obtain 90% of the maximum density.

B. Under pavements, curb, paved driveways, and sidewalks, and where pipe is within a one on one influence of pavement, compaction testing shall be performed by an independent testing laboratory. Testing shall be performed at intervals of one test per lift per 50 feet of trench or as determined necessary by the ENGINEER.

C. In residential developments, all backfill within the road corridor shall be granular material compacted in layers not to exceed 12 inches loose thickness with backfilling carried up to subgrade. Compaction of backfill shall be as such to obtain 95% of the maximum unit density as determined at the optimum moisture content. For purposes of this section, the road corridor is defined as front of house to front of house, including right-of-way and adjacent easements and setbacks.

3.09 BACKFILLING FOR SEWERS AND WATER MAINS

A. Backfilling shall consist of placement of the prescribed materials from a level 12 inches above the crown of the pipe. Placement shall be as follows:

1. Under gravel driveways, gravel roads and shoulders, the backfill shall be granular material which shall be solidly compacted by mechanical tamps in layers of not more than 12 inches loose thickness with backfilling carried up to within 12 inches of finished grade. Compaction of backfill shall be such as to obtain 95% of the maximum unit density as determined at the optimum moisture content.

2. Under pavements, curb, paved driveways, and sidewalks, the backfill shall be granular material compacted in layers not to exceed 12 inches loose thickness with backfilling carried up to subgrade. Compaction of backfill shall be such as to obtain 95% of the maximum unit density as determined at the optimum moisture content. After a period of about 60 days or less, if the backfill compaction is satisfactory to the ENGINEER, to provide for any slight settlement, the CONTRACTOR shall retrim neatly any broken edges of pavement and replace the top surface of the backfill within the pavement area with pavement surface equal to that surface which was removed. The pavement shall be replaced in accordance with the standard specifications of the agency having jurisdiction.

3. Backfill around lift stations, or buried underground structures shall be granular material compacted in 12-inch lifts. Compaction of backfill shall be such as to obtain 95% of the maximum unit density as determined at the optimum moisture content.

4. For all other areas, backfilling shall consist of placing excavated material as defined in Paragraph 2.01.A. of this Section, in 12-inch lifts to finish grade. Compaction of backfill shall be such as to obtain 90% of the maximum unit density as determined at the optimum moisture content.

3.10 FILLING AND BACKFILLING FOR STRUCTURES

A. Embankments underlying structural footings, streets and drives, sidewalks and around structures shall be granular material meeting the requirements of the Michigan Department of Transportation for granular material compacted to 95% density.

B. In all other areas, material required for embankments and backfilling shall be soil or soil-rock mixture free of organic and other deleterious matter and shall contain no more than 15% rocks or lumps larger than 2-1/2 inches in the greatest dimension, compacted to 90% density.

C. Under all interior and exterior floor slabs, an 8-inch thick granular cushion shall be placed. This material shall be clean mineral aggregate meeting the following gradation requirements:

Passing the No. 4 Sieve	100%
Passing the No. 200 Sieve	0-3%

D. Where embankment material is placed to achieve a new surface elevation, the top 4 inches shall be approved topsoil either salvaged from the site or hauled in by the CONTRACTOR.

3.11 FILLING AND BACKFILLING FOR PAVED SURFACES

A. Embankments, including sand cushions and granular fills, shall be placed in successive layers not more than 6 inches in depth the full width of the cross section, each layer to be thoroughly compacted by means of vibratory compactors or by an approved pneumatic-tired roller or combination thereof, as required by the ENGINEER. Each layer shall be compacted to not less than 95% of the maximum unit density as determined at the optimum moisture content. All parts of the embankment shall be uniformly compacted and the CONTRACTOR shall so direct all earthmoving equipment used in the work so that the same shall be attained. Embankment or fill outside the limits of the subgrade where sand or gravel is not required shall be made with suitable material which is free from perishable organic matter, rubbish, stones, broken concrete, roots, or other foreign materials, at no additional compensation. Before any embankments are begin, the base shall be made firm and cleared of topsoil, sod or other perishable material. The sides of the embankment shall be neatly and evenly dressed to the slope shown on the Plans, or such other slope as the ENGINEER may direct.

B. Upon completion of the placing of the curbs, and after the concrete has cured sufficiently, forms shall be removed and the excavated space behind the curb shall be backfilled with a good quality of surface soil, free of rubbish, stone, broken concrete, roots or other foreign material. Where adequate acceptable material for backfill behind the curb is not available, granular fill conforming to 2003 MDOT 8.02.06, Class II, shall be used. Where the area behind the curb is in cut, it shall be trimmed from the top of the curb on the slope shown on the Plans. If the area is in embankment or fill, an earth berm shall be placed immediately adjacent to the top of the curb and then the embankment of fill shall be finished to the slope shown on the Plans. All trimming and finishing shall be done in a neat, workmanlike manner. All excess concrete and debris shall be removed from the excavation behind the curb line before backfilling begins.

C. In construction of non-rigid pavements, backfilling back of curb and gutter shall be completed before placement and compaction of the base course of the roadway.

3.12 PREPARATION OF SUBGRADE FOR ROADWAY SURFACES

A. The bottom of the excavation for the pavement or top of the fill shall be known as the pavement subgrade and shall be smoothed, trimmed and compacted to the required line, grade and cross section to receive the road metal. It shall be thoroughly compacted by rolling with a roller of approved type weighing not less than 8 tons. The subgrade shall be compacted to at least 95% of the maximum density as designated by the test method AASHTO T-180. Inaccessible areas, where rolling is not practical, shall be thoroughly compacted by mechanical tampers capable of striking a blow equivalent to at least 250 foot-pounds per square foot. The subgrade thus formed shall be maintained in a smooth and compacted condition until the pavement has been placed. No base course, surfacing, curb, or curb and gutter, shall be placed until the subgrade has been reviewed by the ENGINEER. The subgrade shall be finished in an acceptable condition at least one day in advance of the pavement construction at all times. Six inches of compacted depth of granular material shall be used where uncompactable soil is encountered. The granular fill shall conform to the 2003 MDOT 9.02.08., Class II, compacted to 95% of its density.

B. Immediately prior to placing the pavement, the subgrade shall be tested for conformity with the cross section shown on the Plans by means of an approved template riding on the curb and gutter sections or on side forms. If necessary, materials shall be removed or added, as required, to bring all portions of the subgrade to the correct elevation. Corrected portions shall then be thoroughly compacted and again tested with the template. Pavement material shall not be placed at any portion of the subgrade which has not been tested for correct elevation.

C. The finished subgrade shall be maintained in a smooth and compacted condition until the pavement is placed. No storage piles of fine or coarse aggregate shall be placed directly upon the finished subgrade. Should the subgrade become rutted or disturbed in any manner, it shall be reshaped and recompacted.

3.13 GRADING

A. The CONTRACTOR shall grade the site to achieve the elevations as shown on the Plans. All disturbed areas beyond the grading limits shall be restored to prior condition.

B. Surplus excavated material not needed for embankment shall be disposed of by the CONTRACTOR. Headwalls, culverts, drains, sewers and appurtenances filled or damaged by the CONTRACTOR during the course of his operations shall be cleaned, repaired, or replaced at his expense.

C. All temporary earth changes shall be in conformance with the Soil and Erosion Control Act.

3.14 RESTORATION

A. Headwalls, culverts, and drainage systems filled or damaged by the CONTRACTOR during the course of his operations shall be cleaned, relaid or rebuilt with new materials to a condition equal to the original state, and of thickness equal to the original structure and to the original line and grade at the CONTRACTOR's expense.

B. Where the excavation is located beside a ditch and/or where an existing ditch is filled or disturbed in the CONTRACTOR's operations, the CONTRACTOR shall clean, repair, or replace the ditch with properly pitched bottom and side slopes and of section and capacity not less than the original section.

C. Where excavation has been through lawn areas, the CONTRACTOR shall restore the disturbed area by placing topsoil and seeding or sodding over the final backfill material.

D. The CONTRACTOR shall remove excess dirt and other construction material from the site of the work and leave the site in a condition equal to its original state.

E. The final condition of the streets and roadways shall be subject to the approval of the governmental body having jurisdiction thereof, as well as review by the ENGINEER.

Pittsfield Charter Township
6201 W. Michigan Ave.
Ann Arbor, MI 48108-9721
48108-9721
Tel. 734.822.3101
www.pittsfield-mi.gov

TWP REV		BWA	DRW	11.04.27
UPDATES		TTN	DRW	10.01.20
Revision		By	Appd.	YY.MM.DD
Issued		By	Appd.	YY.MM.DD
File Name: SE-02	TTN	DRW	DRW	07.10.01
	Dwn.	Chkd.	Dsgn.	YY.MM.DD

Permit-Seal

Client/Project
PITTSFIELD TOWNSHIP

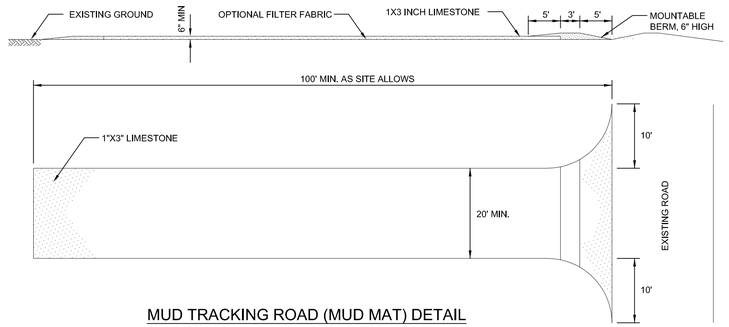
Pittsfield Township, Michigan

Title
EARTHWORK SPECIFICATIONS

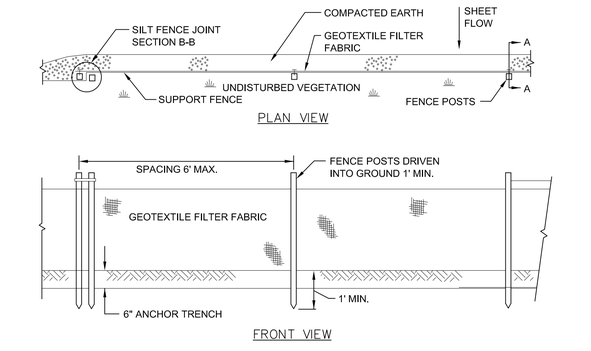
Project No.
2075001300

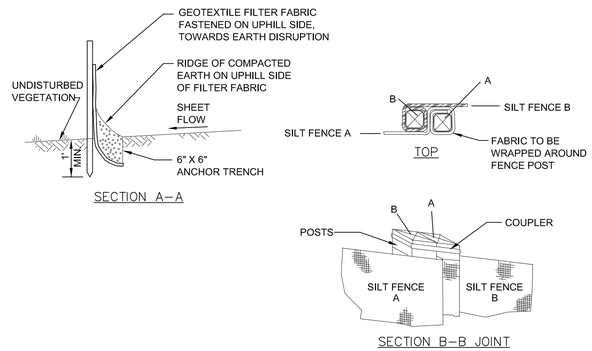
Scale
NOT TO SCALE

Revision
1



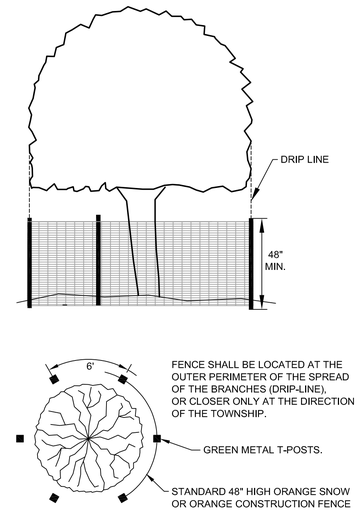
MUD TRACKING ROAD (MUD MAT) DETAIL





SILT FENCE

NOT TO SCALE



NOTES:
1. ALL TREES TO BE REMOVED WILL BE IDENTIFIED BY RED FLAGGING.
2. TREE PROTECTION FENCING IS TO BE ERECTED PRIOR TO ANY EARTHWORK OR CONSTRUCTION AND IS TO REMAIN IN PLACE UNTIL CONSTRUCTION AND GRADING IS COMPLETE.
3. ALL DEBRIS, FILL, EQUIPMENT OR MATERIAL IS TO BE KEPT CLEAR OF AREA WITHIN PROTECTIVE FENCE. NO CLEANING OF EQUIPMENT OR MATERIAL OR STORAGE OR DISPOSAL OF ANY MATERIAL WITHIN THE DRIP LINE OF ANY TREES TO BE SAVED.

TREE PROTECTION FENCE DETAIL

NOT TO SCALE

PITTSFIELD CHARTER TOWNSHIP
SOIL EROSION AND SEDIMENTATION CONTROL NOTES
GENERAL

1. The contractor shall implement and maintain the soil erosion control measures as shown on the plans at all times during construction on this project. Any modifications or additions to the soil erosion control measures due to construction or changed conditions, shall be complied with as required or directed by the owner, project engineer or Pittsfield Township.
2. All soil erosion and sedimentation control work shall conform to the permit requirements of Pittsfield Township and the laws of the State of Michigan.
3. A NPDES construction activity permit is required for all sites greater than 5 acres.
4. Daily inspections shall be made by the contractor. Periodic inspections may be made by the owner/project engineer/Township to determine the effectiveness of erosion and sedimentation control measures. Any necessary corrections shall be made without delay.
5. Erosion and sedimentation from work on the site shall be contained on the site and not be allowed to collect on any off-site areas or in waterways.
6. All mud/dirt tracked onto roads from the site due to construction, shall be promptly removed by the contractor.
7. Restoration of all disturbed areas, including placement of topsoil, seed, fertilizer and mulch and/or sod shall be done within 5 days of the completion of final grade.
8. Construction operations shall be scheduled and performed so that preventative soil erosion control measures are in place prior to excavation in critical areas and temporary stabilization measures are in place immediately following backfilling operations.
9. Special precautions will be taken in the use of construction equipment to prevent situations that promote erosion.
10. Proper dust control shall be maintained during construction by use of water trucks and/or chloride as required.
11. The contractor shall be responsible for maintaining all temporary soil erosion control measures and removal of some upon authorized completion of project. Completion of project will not be authorized until all site work, home building, road work and utility construction is complete and all soils are stabilized.
12. The contractor shall not grade in existing wetland or conservation areas to be protected. Silt fence shall be installed and maintained adjacent to existing wetland and conservation areas to prevent grading, erosion and sedimentation into them.
13. Tree protection fencing must remain intact until restoration of the site is complete.

SEQUENCE OF CONSTRUCTION

1. Install sediment fence and tree protection fencing prior to any grading operation.
2. Install mud-tracking pad.
3. Construct temporary sediment/detention basin.
4. Place topsoil, fertilizer, seed and mulch over the entire detention basin area.
5. Rough grade site, stockpile topsoil and begin building construction.
6. Install storm drainage system including riprap and parking lot inlet filters and detention basin standpipe.
7. Maintain erosion and sedimentation control measures, as required.
8. Install sanitary sewer and water systems.
9. Bring pavement areas to sub-base grade, place sub-base and bituminous pavement.
10. Install franchised utilities.
11. Finish grade, redistribute topsoil, seed and mulch all disturbed areas.
12. Remove any accumulated sediment within the detention basin and replace clean washed stone around standpipe.
13. Complete construction of site.
14. Insure all soil is stabilized. Remove all temporary soil erosion control measures.

SEEDING/SOD

1. Seed or sod in accordance with project specifications.
2. All areas of disturbed earth that are not to be paved or sodded shall have 4 inches of topsoil, seed, fertilizer and mulch.
3. Immediately after seeding, mulch all seeded areas with unweathered small grain straw (preferably wheat) or hay spread. Spread uniformly at the rate of 1 ½ to 2 tons or 100 pounds (2 to 3 bales) per 1,000 square foot. This mulch should be anchored with a disc-type mulch-anchoring tool.
4. Any disturbed area not paved, seeded or mulched, sodded or built upon by November 15, is to be mulched in the manner as specified above, in order to provide soil erosion protection during the winter and early spring.
5. All erosion and sedimentation control prevention procedures and structures are to comply with the Standards and Specifications for soil erosion and sediment control of the Washtenaw County Soil Conservation District.
6. Drainage ditches and slopes steeper than 1:4 (25%) shall be stabilized with erosion control blankets.
7. Steep slopes that do not take upon initial seeding must be re-seeded and stabilized with erosion control blankets.
8. Where excavation has been through lawn areas, the CONTRACTOR shall restore the disturbed area by placing topsoil and seeding or sodding over the final backfill material.

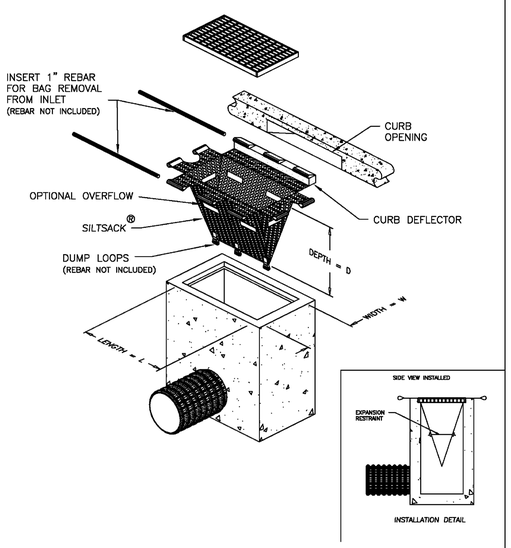
CATCH BASIN/MANHOLE PROTECTION

1. Protect storm sewer catch basins with Siltsack. or approved equivalent as follows:

ROADS

1. During construction, all roads shall be protected from unvegetated areas washing onto road surfaces by placement of silt fence behind curb or a 10 foot wide straw mulch bank behind the curb or other approved method and/or as shown on the plans.
2. During construction of any portion of the project, roads shall be maintained free of dirt, silt and construction debris.

Pittsfield SEC 9/22/2009



DETAIL OF INLET SEDIMENT CONTROL DEVICE
TYPE B – WITH CURB DEFLECTOR

ACF Environmental
Your Complete Source for Geosynthetic Solutions

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Richmond, Virginia 23234
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SILTSACK®
SPECIFICATIONS

NOTE: THE SILTSACK® WILL BE MANUFACTURED FROM A WOVEN POLYPROPYLENE FABRIC THAT MEETS OR EXCEEDS THE FOLLOWING SPECIFICATIONS.

REGULAR FLOW SILTSACK®
(FOR AREAS OF LOW TO MODERATE PRECIPITATION AND RUN-OFF)

PROPERTIES	TEST METHOD	UNITS
GRAB TENSILE STRENGTH	ASTM D-4632	300 LBS
GRAB TENSILE ELONGATION	ASTM D-4632	20 %
PUNCTURE	ASTM D-4833	120 LBS
MULLEN BURST	ASTM D-3786	800 PSI
TRAPEZOID TEAR	ASTM D-4533	120 LBS
UV RESISTANCE	ASTM D-4355	80 %
APPARENT OPENING SIZE	ASTM D-4751	40 US SIEVE
FLOW RATE	ASTM D-4491	40 GAL/MIN/SQ FT
PERMITTIVITY	ASTM D-4491	0.55 SEC -1

* HI-FLOW SILTSACK®
(FOR AREAS OF MODERATE TO HEAVY PRECIPITATION AND RUN-OFF)

PROPERTIES	TEST METHOD	UNITS
GRAB TENSILE STRENGTH	ASTM D-4632	265 LBS
GRAB TENSILE ELONGATION	ASTM D-4632	20 %
PUNCTURE	ASTM D-4833	135 LBS
MULLEN BURST	ASTM D-3786	420 PSI
TRAPEZOID TEAR	ASTM D-4533	45 LBS
UV RESISTANCE	ASTM D-4355	90 %
APPARENT OPENING SIZE	ASTM D-4751	20 US SIEVE
FLOW RATE	ASTM D-4491	200 GAL/MIN/SQ FT
PERMITTIVITY	ASTM D-4491	1.5 SEC -1

OIL-ABSORBANT SILTSACK®
(FOR AREAS WHERE THERE IS A CONCERN FOR OIL RUN-OFF OR SPILLS)

DEPENDING ON YOUR PARTICULAR APPLICATION, THE SILTSACK® CAN BE MADE FROM EITHER ONE OF THE ABOVE FABRICS WITH AN OIL-ABSORBANT PILLOW INSERT OR, MADE COMPLETELY FROM AN OIL-ABSORBANT SILTSACK® WITH A WOVEN PILLOW INSERT.

SILTSACK DISTRIBUTORS:
PRICE & COMPANY
(www.priceandcompany.com)

METRO GRAND RAPIDS, MI
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WYOMING, MI 49548-2108
1-800-248-8230

METRO DETROIT, MI
29165 WALL STREET
WIXOM, MI 48393-3525
1-866-960-4300

(* HI-FLOW SILT SACK SHALL BE USED FOR ALL APPLICATIONS WITHIN PITTSFIELD TOWNSHIP)

SILTSACK

NOT TO SCALE

Pittsfield Charter Township
6201 W. Michigan Ave.
Ann Arbor, MI 48108–9721
48108–9721
Tel. 734.822.3101
www.pittsfield-mi.gov

SILTSACK	BWA	DRW	12.01.03
TWP REV	BWA	DRW	11.04.27
UPDATES	TTN	DRW	10.01.20
Revision	By	Appd.	YY.MM.DD

Issued	By	Appd.	YY.MM.DD
File Name: SE–01	TTN	DRW	07.10.01
	Dwn.	Chkd.	Dsgn. YY.MM.DD

Permit-Seal

Client/Project
PITTSFIELD TOWNSHIP

Pittsfield Township, Michigan

Title
SOIL EROSION DETAILS AND NOTES

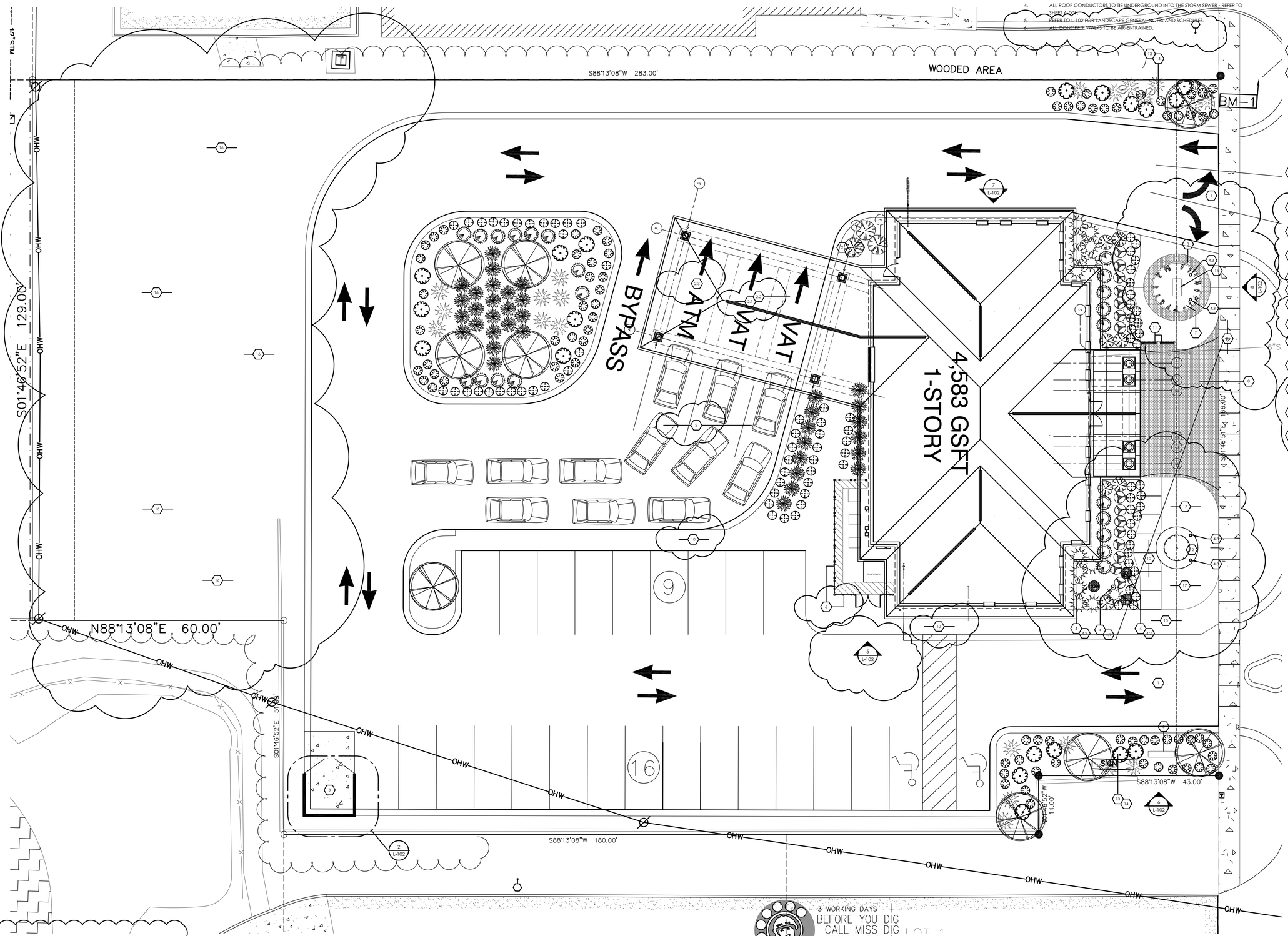
Project No. 2075001300
Scale NOT TO SCALE
Revision

GENERAL NOTES:

1. REFER TO CIVIL ENGINEERING DRAWINGS AS PART OF THIS PACKAGE FOR ALL RELATED SITE ENGINEERING.
2. REFER TO CIVIL ENGINEERING DRAWINGS AS PART OF THIS PACKAGE FOR ADDITIONAL RELATED LANDSCAPE REQUIREMENTS.
3. ALL WORK TO CONFORM TO THE CURRENT PITTSFIELD TOWNSHIP STANDARDS AND SPECIFICATIONS.
4. ALL ROOF CONDUCTORS TO TIE UNDERGROUND INTO THE STORM SEWER - REFER TO SHEET A-001.
5. REFER TO L-102 FOR LANDSCAPE GENERAL NOTES AND SCHEDULES.
6. ALL CONCRETE WALKS TO BE AIR-ENTRAINED.

SITE PLAN KEY NOTES:

1. ENTRY | EGRESS DRIVES
2. DRIVE THRU CANOPY TO INCLUDE TWO (2) DRIVE-THROUGH (VAT) LANES AND ONE (1) ATM; WITH ONE (1) BY-PASS LANE AT ONE SIDE. PROVIDE CONCRETE UNDER DRIVE THRU CANOPY LANES AND AT APPROACH.
   - 2.1 UNDERSIDE OF DRIVE-THROUGH CANOPY TO INCLUDE FULLY RECESSED LIGHTING FIXTURES AS REQUIRED (REFER TO SHEET A-001 FOR ADDITIONAL INFORMATION
   - 2.2 SPEAKERS AT DRIVE-THROUGH SHALL NOT CAUSE NOISE THAT IS AUDIBLE FROM ADJACENT SITES.
   - 2.3 DRIVE THRU ATM UNIT AND LANE
3. NEW CMU | BRICK DUMPSTER SCREEN WALL. REFER TO L-102 FOR PLANS | DETAILS | ELEVATIONS. ADDITION OF BOLLARDS FOR VEHICLE PROTECTION OR LANDSCAPING IF DEEMED ABLE TO DURING CONSTRUCTION.
4. NEW FLAG POLE AND GROUND LIGHTING. REFER TO CIVIL ENGINEERING PACKAGE FOR ELECTRICAL CONDUIT REQUIREMENTS.
   - 4.1 FLAG POLE AT FRONT ENTRY; ROCKET ENTERPRISE, INC / STYLE - HEAVY DUTY COMMERCIAL / COLOR - DARK BRONZE ANODIZED / 30' HEIGHT / SINGLE FLAG MODEL # RH30 OR APPROVED EQUAL.
   - 4.2 GROUND LIGHTS THREE (3) FOR FLAG POLE AT FRONT ENTRY: HYDRELL MODULAR IN-GRADE LUMINAIRE, SINGLE LENS, 19W MODEL M9710 A 18LED WHT41K 120 FL FLC 34B IHL LP BL, STANDARD LED DRIVER 0-10V. PROVIDE 3/4" CONDUITS / POWER TO THIS LOCATION FROM BUILDING PANEL FOR GROUND LIGHTS.
   - 4.3 FLUSH ADA COMPLIANT GROUND LIGHTS - TWO (2) FOR TREE AND ARTWORK AT FRONT ENTRY: HYDRELL MODULAR IN-GRADE LUMINAIRE, SINGLE LENS, 19W MODEL TO MATCH ABOVE. PROVIDE TWO (2) 3/4" CONDUIT STUBBED TO THIS LOCATION FROM BUILDING PANEL FOR GROUND LIGHTS.
5. NEW MONUMENT GROUND SIGN WITH "DFCU ANN ARBOR " LOGO. REFER TO 6 / L-102 FOR ELEVATIONS AND DETAILS AS PROVIDED BY OWNER CONTRACTOR. CONTRACTOR TO UTILIZE EXISTING FOUNDATION AND PROVIDE NEW SIGN UNIT AS SHOWN. NEW CONDUITS AND ELECTRICAL SERVICE PROVIDED BY BASE BUILDING GENERAL CONTRACTOR FROM PANEL. ACTUAL SIGNAGE COMPONENTS BY SIGN CONTRACTOR.
6. NEW CONTINUOUS 5'-0" HIGH WOOD SCREEN FENCE WITH (2) - 3'-0" X 5'-0" DOORS. PROVIDE 24" CONTINUOUS CLEAR SPACE (MIN.) AROUND ALL CONDENSER UNITS. REFER TO DETAIL FOR ADDITIONAL INFORMATION.
7. NEW CONCRETE WALK - DECORATIVE BROOM FINISH WITH PATTERNED CONTROL JOINTS PER CIVIL PLANS. DECORATIVE IMAGES INSET INTO CONCRETE TO BE PROVIDED BY TENANT (DFCU FINANCIAL) FOR INSTALL BY OWNER.
8. NEW STAMPED CONCRETE WALK - COBBLESTONE PATTERN WITH CONTROL JOINTS PER CIVIL PLANS. STAMPING MUST COMPLY WITH ALL CODES AND ACCESSIBILITY REQUIREMENTS.
9. NOT USED.
10. NEW CONCRETE WALK - BROOM FINISH WITH PATTERNED CONTROL JOINTS PER CIVIL PLANS.
11. (2) - GALVANIZED STEEL BIKE RACKS (5 - BIKE CAPACITY EACH) AS SPECIFIED / SUPPLIED / INSTALLED BY OWNER.
12. NEW 6" HIGH RAISED PLANTING BED. COVER WITH MULCH AND PROVIDE CONTINUOUS EDGING (PROVIDED AND INSTALLED BY OWNER'S CONTRACT).
13. OWNER'S LANDSCAPE CONTRACTOR TO REVIEW EXISTING PLANTING BED LANDSCAPE ELEMENTS WHERE NOTED; REMOVE AND REPLACE ANY DAMAGE STOCK TO MATCH PREVIOUS SPECIFICATION.
14. OWNER'S LANDSCAPE CONTRACTOR TO REVIEW EXISTING PLANTING MULCH WHERE NOTED: CLEAN AND REPLACE AS NEEDED TO FORM CONTIGUOUS APPEARANCE THROUGHOUT.
15. CUSTOM 'BENCH' ARTWORK COMPONENT PROVIDED AND INSTALLED BY TENANT (DFCU FINANCIAL) CONTRACT. PROVIDE TWO (2) 3/4" CONDUIT STUBBED TO THIS LOCATION FROM BUILDING PANEL FOR GROUND LIGHTS AS SHOWN.
16. PROVIDE / PLANT VARIOUS WILDFLOWERS INDIGENOUS TO MICHIGAN IN AREAS DESIGNATED. SPECIES TO INCLUDE BUT NOT LIMITED TO: COMMON MILKWEED, WHITE SNAKEROOT, BLACK-EYED SUSAN, CUP PLANT, STIFF GOLDENROD, BLUE VERVAIN.
17. PROVIDE AND PLANT GRASS PRODUCT IN AREA DESIGNATED AS APPROVED BY THE TOWNSHIP.



DATE	ISSUED FOR	BY
2015 05-19	PER REVIEW COMMENTS	VTD
2015 03-19	TOWNSHIP COMMENTS	SAP
2014 10-23	SPA REVISIONS	MMG
2014 09-04	SPA	VTD

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CONSULTANT:

PROJECT:

DFCU - PLYMOUTH TWP.
NEW BRANCH FACILITY
"CORE & SHELL PACKAGE"
2910 CARPENTER RD
PITTSFIELD TWP., MI 48108
LANDSCAPE SITE PLAN

PROJECT # DFC14-021.02

SEAL:

NORTH

SHEET:

L-101

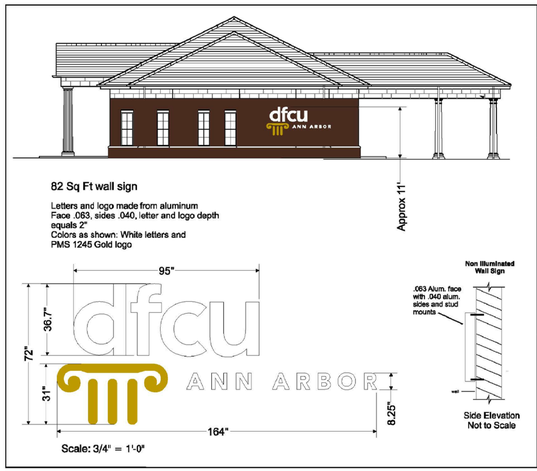
2 / L-101 NOT USED
SCALE : NTS

3 WORKING DAYS
BEFORE YOU DIG
CALL MISS DIG
1-800-482-7171
FOR THE LOCATION OF UNDERGROUND FACILITIES

1 / L-101 LANDSCAPE SITE PLAN
SCALE : 3/32" = 1'-0"

CIVIL ENGINEERS BACKGROUND USED FOR REFERENCE PURPOSES ONLY AS IT PERTAINS TO ARCHITECTURAL LANDSCAPING PLAN HEREIN.

8 / L-102 ARTWORK SCULPTURE
SCALE: N.T.S.



82 Sq Ft wall sign

Letters and logo made from aluminum
Face .063, sides .040, letter and logo depth equals 2"
Colors as shown: White letters and PMS 1245 Gold logo

Scale: 3/4" = 1'-0"

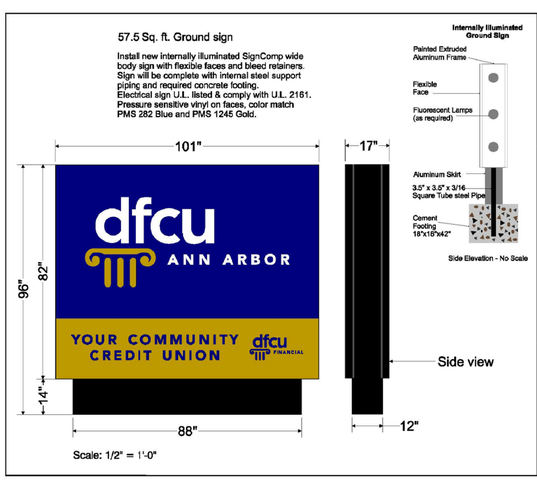
LAYOUT BY: RJO
LAYOUT DATE: 10-23-14
REVISION #
REVISION DATE
DATE:
APPROVED BY:

TYPE OF SIGN: Wall
ELEVATION: North
SQ. FT.: 82
SIZE: 164" x 72"
NAME: DFCU Ann Arbor
STREET: 2910 Carpenter Rd.
CITY: Pittsfield Twp.
STATE: MI

CHAPS SIGNS
16801 E. Nine Mile Rd. Eastpointe, MI 48021
586-776-5000 • Fax: 586-776-8880
email: jim@chapssignsgroup.com

7 / L-102 BUILDING SIGN DETAIL
SCALE: N.T.S.

SIGNAGE PACKAGE SHOWN FOR REFERENCE HEREIN. UNDER CONTRACT WITH OWNER.



LAYOUT BY: RJO
LAYOUT DATE: 10-3-14
REVISION #
REVISION DATE:
DATE:
APPROVED BY:

TYPE OF SIGN: Ground Sign
ELEVATION: TBD
SQ. FT.: 57.5
SIZE: 101" x 82"
NAME: DFCU Ann Arbor
STREET:
CITY: Pittsfield
STATE: MI

CHAPS SIGNS
16801 E. Nine Mile Rd. Eastpointe, MI 48021
586-776-5000 • Fax: 586-776-8880
email: jim@chapssignsgroup.com

6 / L-102 MONUMENT SIGN DETAIL
SCALE: N.T.S.

SIGNAGE PACKAGE SHOWN FOR REFERENCE HEREIN. UNDER CONTRACT WITH OWNER.

BUILDING FOUNDATION LANDSCAPING SCHEDULE

SYMB.	QUAN.	COMMON NAME	BOTANICAL NAME	SIZE	ROOT	COMMENTS	
	15	GROW-LOW FRAGRANT SUMAC	RHUS AROMATICA	15" HT.	CONT.	EVEN HABIT: 3' O.C.	
	11	DWARF BURNING BUSH	EUONYMUS ALATA 'COMPACTA'	36" HT.	B & B	EVEN HABIT: 5' O.C.	
	22	HICKS YEW	TAXUS x MEDIA 'HICKSII'	30" HT.	5 GAL.	EVEN HABIT: 3' O.C.	
	36	KARL FORESTER FEATHER REED GRASS	CALAMAGROSTIS X ACUTIFLORA 'K.F.'	-	3 GAL.	FULL HABIT: 3' O.C.	
	14	DWARF FOUNTAIN GRASS	PENNISETUM ALOPECUROIDES 'HAMELN'	-	3 GAL.	EVEN HABIT: 3' O.C.	
	86	HAPPY RETURNS DAYLILY	HEMEROCALLIS 'HAPPY RETURNS'	-	1 GAL.	FULL, WELL ROOTED: 2' O.C.	

STREET SCAPE LANDSCAPING SCHEDULE

SYMB.	QUAN.	COMMON NAME	BOTANICAL NAME	SIZE	ROOT	COMMENTS	
	10	FLOWERING PEAR	Pyrus calleryana 'Bradford'	30' HT. MAX.	28.6 GAL.	EVEN HABIT: 20' O.C.-MIN	
	19	BARBERRY	BERBERIS THUNBERGII 'ATROPURPUREA NANA'	36" HT.	3 GAL.	EVEN HABIT: 3' O.C.	
	21	BLUE SEDGE GRASS	HELICTOTRICHON SEMPERVIRENS	36" HT.	2.25 GAL.	FULL HABIT: 2' O.C.	
	66	BROADMOOR JUNIPER	JUNIPERUS SABINA 'BROADMOOR'	24" HT.	2.5 QUART.	FULL HABIT: 2' O.C.	
	2	SAUCER MAGNOLIA	MAGNOLIA SOULANGEANA	20'-30' HT. MAX.	28.6 GAL.	EVEN HABIT: 20' O.C.-MIN	PLAZA TREE AT GRATE

LANDSCAPE NOTES

1. PLAN MATERIAL TO BE NO. 1 GRADE, NORTHERN GROWN NURSERY STOCK AND SHALL BE GUARANTEED FOR A PERIOD OF 2 YEARS. LANDSCAPING SHALL BE INSTALLED IN A WORKMAN LIKE ORDER TO THE STANDARDS SET FORTH BY PITTSFIELD TOWNSHIP, AND IN A TIMELY MANNER.
2. LANDSCAPE IS TO BE INSTALLED IN ACCORDANCE WITH THE PITTSFIELD TOWNSHIP LANDSCAPE ORDINANCE. DURING THE SPECIFIED PERIOD OF ESTABLISHMENT, THE OWNER SHALL ASSUME RESPONSIBILITY FOR MAINTAINING THE PLANTS IN A HEALTHY, NEAT AND ORDERLY APPEARANCE WHICH SHALL INCLUDE WATERING, CULTIVATION, AND WEED CONTROL.
3. ALL PLANTING BEDS TO BE DRESSED WITH 4" DEPTH OF SHREDDED HARDWOOD BARK MULCH.
4. LANDSCAPING TO BE IRRIGATED WITH AN AUTOMATIC IRRIGATION SYSTEM. LAWNS AND SHRUB AREAS SHALL BE WATERED BY SEPARATE ZONES TO MINIMIZE OVER WATERING.
5. PRUNING OF LANDSCAPE MATERIALS SHALL BE KEPT TO A MINIMUM ORDER TO ACHIEVE PROPER MATURATION OF PLANTINGS.

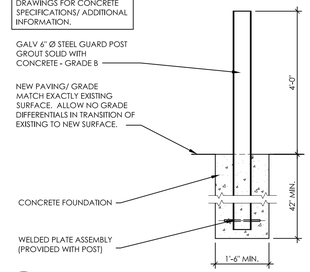
IRRIGATION SPECIFICATIONS

1. ALL WORK IS TO BE IN COMPLIANCE WITH ALL LOCAL, STATE, AND FEDERAL CODES AND ORDINANCES.
2. ALL UNDERGROUND ELECTRICAL CONNECTIONS ARE TO BE MADE WITH 3-M WIRE CONNECTORS, DBY.
3. AUTO CONTROL VALVES ARE TO BE INSTALLED IN NDS VALVE BOXES OF APPROPRIATE SIZE.
4. ALL CONTROL WIRING DOWNSTREAM OF THE CONTROLLER IS TO BE 14 AWG, UL APPROVED FOR DIRECT BURY.
5. ALL ROTORS AND SPRAY POP-UPS SHALL BE INSTALLED ON SWING PIPE.
6. ALL QCV SHALL BE INSTALLED ON 3-ELBOW PVC SWING JOINTS.
7. SYSTEM DESIGN BASED UPON 22 GPM @ 60 PSI.
8. ANY CHANGES IN AVAILABILITY OF SUPPLY SHOULD BE NOTED AND MODIFICATIONS TO THE DESIGN SHOULD BE MADE.
9. CONTRACTOR TO VERIFY WATER PRESSURE AND AVAILABILITY PRIOR TO INSTALLATION.
10. 120V. TO CONTROLLER AND COPPER STUB, BY OTHER THAN IRRIGATION CONTRACTOR.
11. THERE WILL BE NO SUBSTITUTIONS OR CHANGES TO THE IRRIGATION DESIGN ALLOWED WITHOUT DIRECT, WRITTEN APPROVAL FROM THE IRRIGATION CONSULTANT.

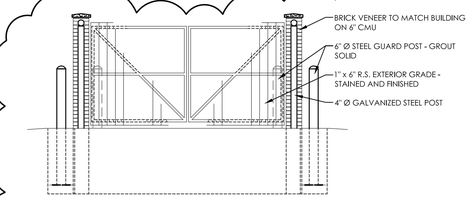
CITY LANDSCAPING REQUIREMENTS:

REQUIREMENT	REQUIRED	PROVIDED	COMPLIANCE
PARKING LOT PERIMETER	1 TREE EVERY 40'	EXISTING VEGETATION	
INTERIOR PARKING AREAS	1 TREE EVERY 8 SPACES.	YES	
INTERIOR PARKING AREAS	MIN. OF 5% PAVED SURFACE TO BE LANSCAPED	YES	2700 SF LANDSCAPE AREA OUT OF 9000 SF PARKING AREA = 30%
SITE LANDSCAPE	MIN. OF 20% OF SITE TO BE OF LANDSCAPED MATERIAL	YES	14,730 SF LANDSCAPE AREA OUT OF 46,300 SF TOTAL AREA = 31%
SCREENING BETWEEN LAND USE	NORTH AND WEST ELEV. REQUIRE SCREENING BETWEEN DISIMILAR USE.	EXISTING VEGETATION	WE FEEL THE REQUIREMENT HAS BEEN MET WITH EXISTING VEGETATION TO THE NORTH AND WEST.
FRONT GREENBELT	1 TREE EVERY 30'	YES	1 TREE IS PROVIDED AT ALL POSSIBLE LOCATIONS. PLANTING LOCATION IS LIMITED DUE TO DRIVEWAY/ ENTRY.

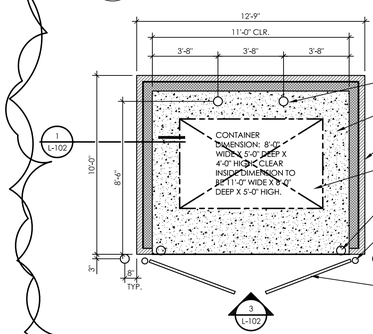
REFER TO STRUCTURAL DRAWINGS FOR CONCRETE SPECIFICATIONS/ ADDITIONAL INFORMATION.



4 / L-102 POST DETAIL
SCALE: 1/2" = 1'-0"

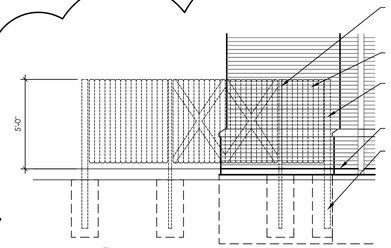


3 / L-102 RECEPTACLE ELEVATION DETAIL
SCALE: 1/4" = 1'-0"



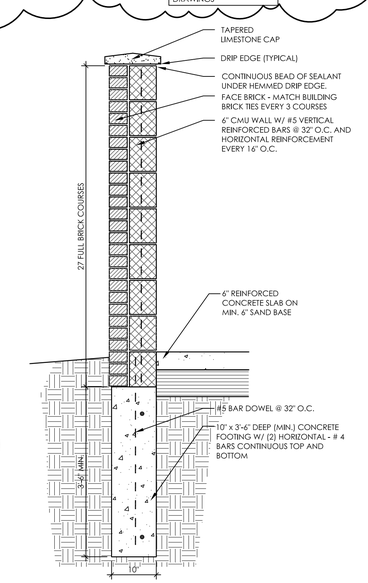
2 / L-102 RECEPTACLE PLAN
SCALE: 1/4" = 1'-0"

LOCATION OF RECEPTACLE SCREEN WALL ON CIVIL DRAWINGS



5 / L-102 ELEVATION @ TRANSFORMER SCREEN
SCALE: 1/4" = 1'-0"

CONFIRM ALL DIMENSIONS WITH SIDING MANUF.



1 / L-102 RECEPTACLE SCREEN WALL DETAIL
SCALE: 3/4" = 1'-0"

GENERAL NOTES:

1. ALL CONSTRUCTION TO CONFORM TO APPLICABLE MICHIGAN BARRIER FREE AND ADA REQUIREMENTS.
2. ALL LIGHTING SHALL BE SHIELDED AND DIRECTED DOWNWARD.
3. CIVIL ENGINEER TO PROVIDE ADJACENT SITE CONDITIONS AS REQUIRED FOR DRAINAGE / RUN OFF DUE TO PROPOSED SITE GRADING.
4. UTILITIES AS SHOWN ARE FROM OFFICE RECORDS; NO GUARANTEE IS GIVEN AS TO ACCURACY OR COMPLETENESS THEREOF: CONTACT MISSDIG (1-800-482-7171) SEVENTY TWO HOURS PRIOR TO ANY PROPOSED CONSTRUCTION SO THAT CONFLICTS WITH UTILITIES MAY BE RESOLVED.
5. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE TOWNSHIP'S CURRENT STANDARDS AND SPECIFICATIONS.
6. CONTRACTOR SHALL NOTIFY THE CITY ENGINEER AND / OR THE AUTHORITY HAVING JURISDICTION, 48 HOURS PRIOR TO THE BEGINNING OF CONSTRUCTION.

STRUCTURAL GENERAL NOTES:

1. 28 DAY CONCRETE COMPRESSIVE STRENGTH, fc' = 4,500 PSI OR GREATER
2. THE CONCRETE MIX DESIGN SHALL CONFORM TO ACI 318-08 CHAPTER 4 REQUIREMENTS FOR EXPOSURE CLASS F3.
3. CONCRETE SHALL HAVE AN AIR CONTENT OR 5.5% BY VOLUME, PLUS OR MINUS 1.5%.
4. CALCIUM CHLORIDE SHALL NOT BE ADDED TO THE CONCRETE MIX DESIGN
5. COMPRESSIVE STRENGTH OF MASONRY, fm' = 1,500 PSI OR GREATER
6. MORTAR FOR MASONRY SHALL BE TYPE "N"
7. NET AREA COMPRESSIVE STRENGTH OF MASONRY UNITS SHALL BE 2,150 PSI OR GREATER
8. GROUT FOR MASONRY SHALL HAVE A 28 DAY COMPRESSIVE STRENGTH OF 2,000 PSI OR GREATER
9. WELDED WIRE MESH REINFORCING SHALL CONFORM TO ASTM A185, WITH A MINIMUM YIELD STRENGTH, fy = 60,000 PSI
10. ALL OTHER STEEL REINFORCING FOR CONCRETE OR MASONRY SHALL BE DEFORMED BARS, CONFORMING TO ASTM A615
11. STEEL PLATES, CHANNELS, AND ANGLES SHALL BE OF ASTM A36 MATERIAL
12. STEEL W-SHAPES SHALL BE OF ASTM A992 MATERIAL
13. ALL WELDING SHALL BE DONE IN ACCORDANCE WITH THE 2006 AMERICAN WELDING SOCIETY STRUCTURAL WELDING CODE, AWS D1.1
14. HOT DIPPED GALVANIZED STEEL SHALL CONFORM TO ASTM A123
15. THE OWNER SHALL ENGAGE AND RETAIN A QUALIFIED SPECIAL INSPECTION AGENCY FOR THE SPECIAL INSPECTION AND TESTING OF STEEL, CONCRETE, AND MASONRY AS REQUIRED BY THE 2009 MICHIGAN BUILDING CODE. TABLES 1704.3 (STEEL), 1704.4 (CONCRETE), AND 1704.5.1 (MASONRY)
16. GROUND PAD PER N.E.C. 250-91

3 WORKING DAYS
BEFORE YOU DIG
CALL MISS DIG
1-800-482-7171
FOR THE LOCATION OF UNDERGROUND FACILITIES

ARCHITECT NOT RESPONSIBLE FOR CONFIRMATION OR CLARIFICATION OF ANY EXISTING CONDITIONS. ALL CONDITIONS PROVIDED ASSUMED TO BE ACCURATE. CONTRACTOR TO CONFIRM ALL CONDITIONS PRIOR TO CONSTRUCTION AND NOTIFY OWNER IF DISCREPANCIES EXIST.

DATE	ISSUED FOR	BY
2015 05-19	PER REVIEW COMMENTS	VTD
2014 10-27	SPA REVISIONS	MMG
2014 09-04	SPA	VTD

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Livonia, MI 48152
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CONSULTANT:

PROJECT:

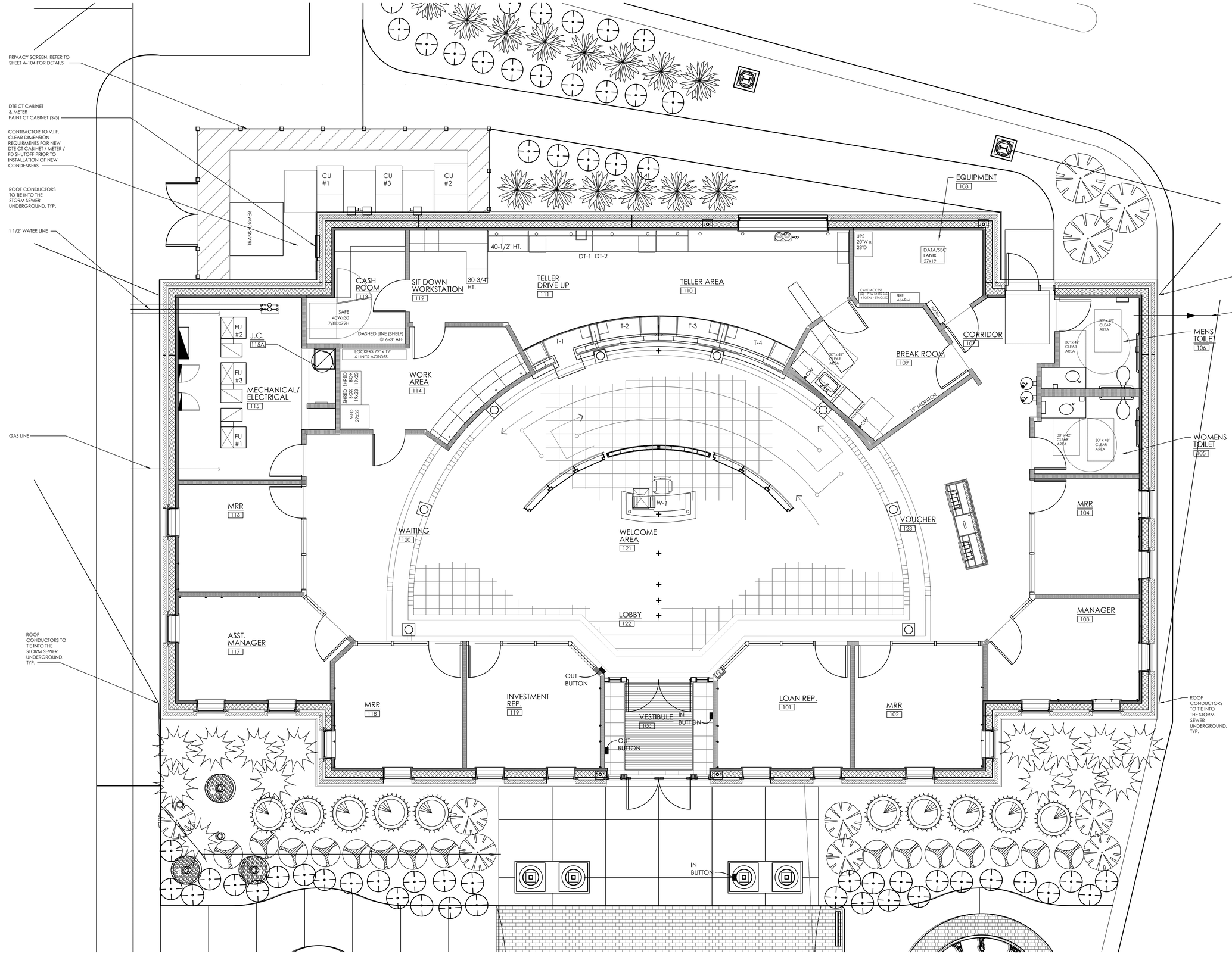
DFCU - PLYMOUTH TWP.
NEW BRANCH FACILITY
"CORE & SHELL PACKAGE"
2910 CARPENTER RD
PITTSFIELD TWP., MI 48108

ARCHITECTURAL SITE DETAILS / SCHEDULES
PROJECT # DFC14-021.02

SEAL:

NORTH

SHEET:
L-102



DATE	ISSUED FOR	BY
2014 07-01	SPA REVISIONS	VTD
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CONSULTANT:

PROJECT:

DFCU - PITTSFIELD TWP.
NEW BRANCH FACILITY
"CORE & SHELL PACKAGE"
2910 CARPENTER RD
PITTSFIELD TWP., MI 48108

ENLARGED BUILDING FLOOR PLAN

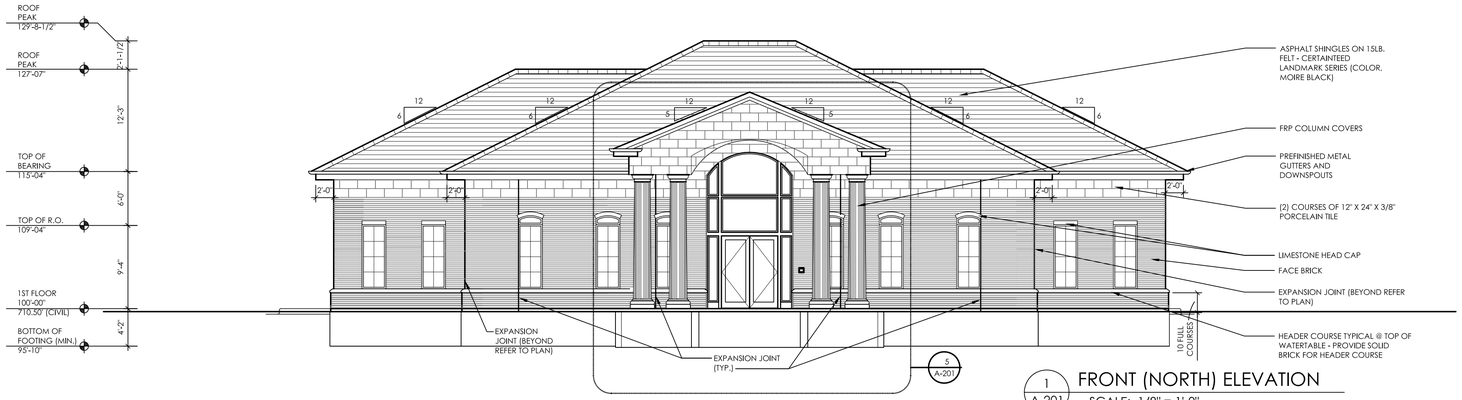
PROJECT # DFC14-021.02

SEAL:

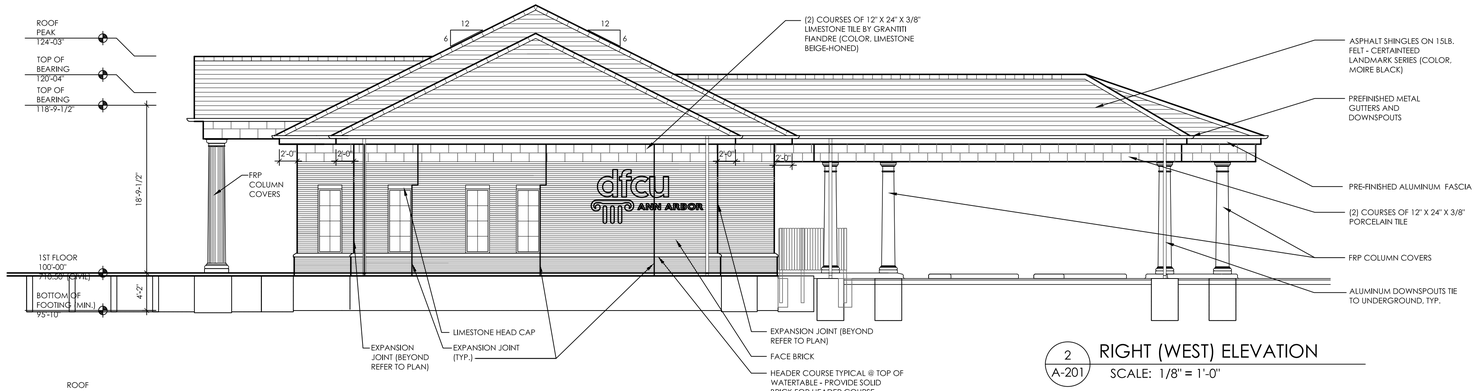
NORTH

SHEET:

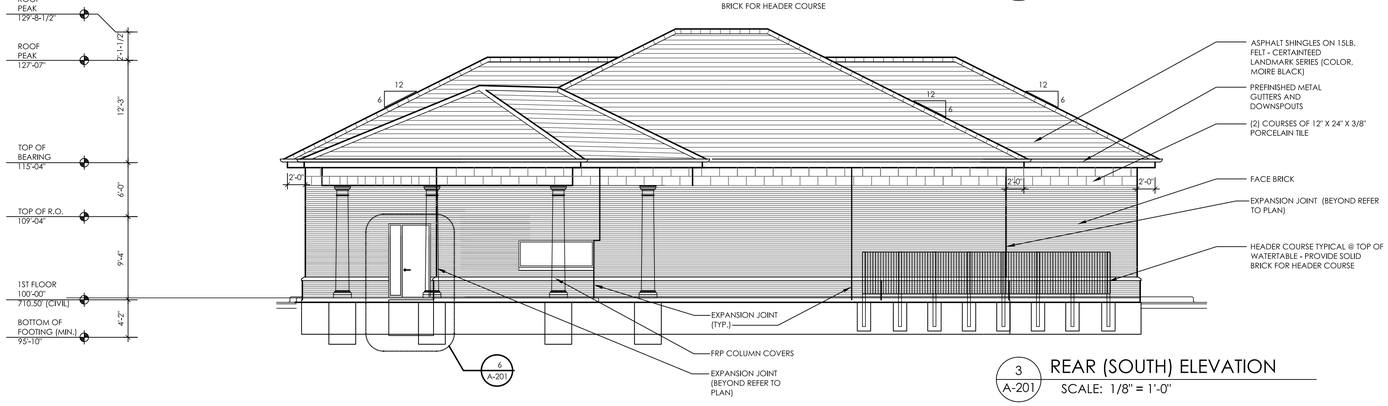
A-102



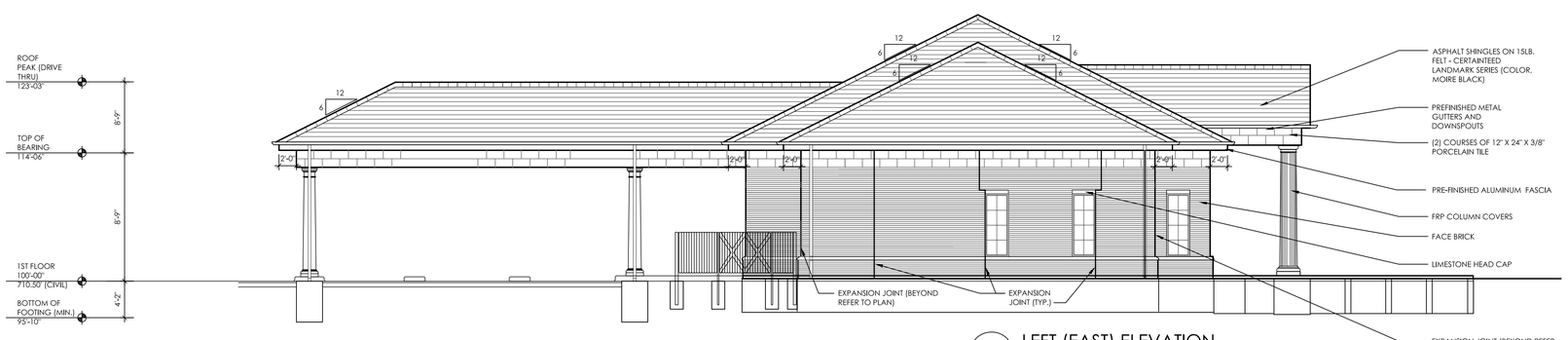
1 A-201 FRONT (NORTH) ELEVATION
SCALE: 1/8" = 1'-0"



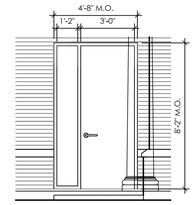
2 A-201 RIGHT (WEST) ELEVATION
SCALE: 1/8" = 1'-0"



3 A-201 REAR (SOUTH) ELEVATION
SCALE: 1/8" = 1'-0"

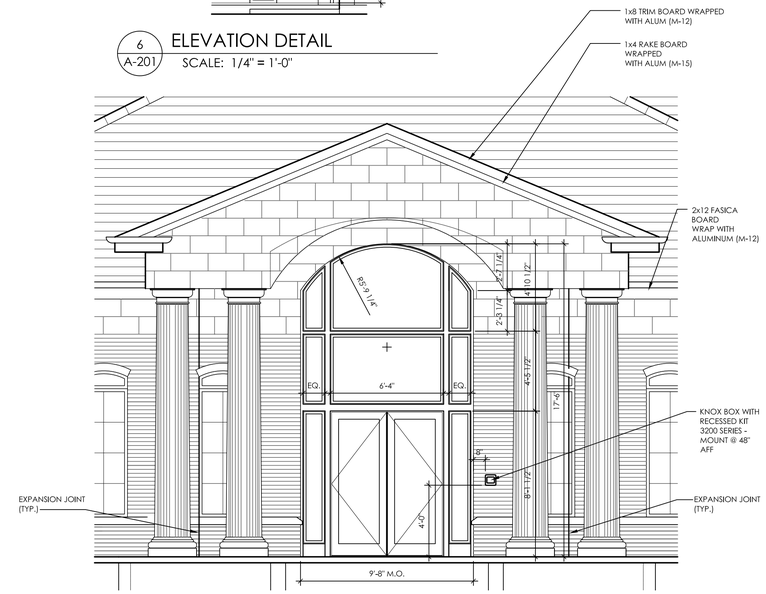


4 A-201 LEFT (EAST) ELEVATION
SCALE: 1/8" = 1'-0"



CONTRACTOR TO CONFIRM TOP OF FOOTING DIMENSION WITH ARCHITECT / CIVIL ENGINEER PRIOR TO CONSTRUCTION

6 A-201 ELEVATION DETAIL
SCALE: 1/4" = 1'-0"



5 A-201 ELEVATION DETAIL
SCALE: 1/4" = 1'-0"

COORDINATE DOWNSPOUT TIE INS WITH CIVIL ENGINEERING DRAWINGS - PROVIDE (4) FOUR LEADS AT CORNERS OF BUILDING AS SHOWN ON ELEVATIONS

BUILDING FACADE % CALCULATIONS:

NORTH ELEVATION:
BRICK: 28%
PORCELAIN TILE: 9%
ASPHALT SHINGLES: 48%
OPEN AREA: 30%

SOUTH ELEVATION:
BRICK: 28%
PORCELAIN TILE: 9%
ASPHALT SHINGLES: 48%
OPEN AREA: 30%

WEST ELEVATION:
BRICK: 53%
PORCELAIN TILE: 9%
ASPHALT SHINGLES: 38%

EAST ELEVATION:
BRICK: 53%
PORCELAIN TILE: 15%
ASPHALT SHINGLES: 32%

DATE	ISSUED FOR	BY
2015 07-01	SPA REVISIONS	VTD
2014 10-23	SPA REVISIONS	MMG
2014 09-04	SPA	VTD

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NEW BRANCH FACILITY
"CORE & SHELL PACKAGE"
2910 CARPENTER RD
PITTSFIELD TWP., MI 48108
EXTERIOR BUILDING ELEVATIONS

PROJECT # DFC14-021.02

SEAL:

NORTH

SHEET:
A-201