



# **DRAINAGE ANALYSIS**

**Town Center  
Improvements**

**Town of Winthrop,  
Massachusetts**

## TABLE OF CONTENTS

SECTION	PAGE NO.
1. INTRODUCTION.....	1
2. EXISTING CONDITIONS.....	1
3. METHODOLOGY.....	1
4. CONCLUSIONS.....	2

## LIST OF TABLES

TABLE	PAGE NO.
Table 1: Existing Pipe Network.....	3
Table 2: Proposed Pipe Network.....	4

## APPENDICES

Appendix A: Town Center Improvements Conceptual Layout

Appendix B: Overview Site Design Plan

Appendix C: Hydrologic Soil Group Map

Appendix D: Contech CDS 2025-5-C Inline CDS Standard Detail

Appendix F: Contech Filterra Internal Bypass Curb Inlet and Chamber Details

Appendix E: "Town of Winthrop, 1 Metcalf Square, Winthrop, Massachusetts, Town Center Site Improvements, Project No. 230079, March 2017." Site Plans Sheets 1-19.

---

## 1. INTRODUCTION

Woodard & Curran has completed a drainage study of the storm drain infrastructure located in downtown Winthrop at Harold E. French Square and the surrounding streets Woodside Avenue, Somerset Avenue, Bartlett Road, Pauline Street, Hagman Road, and Jefferson Street. Storm water in downtown Winthrop discharges to the ocean near Simon J. Donovan Beach, which experiences the most closures of Winthrop's public beaches due to elevated bacteria levels. The proposed design will treat storm water under current conditions and increase the town's resiliency to climate change impacts predicted for coastal communities particularly increased flooding from storms by increasing the size of existing pipes and structures as well as utilizing stormwater best management practices (BMPs).

The Town Center Improvements Project includes water, sewer and drain infrastructure improvements to address both the Town's short term infrastructure needs and prepare for future redevelopment of the Centre Business District. The project also includes improvements to establish a revitalized and vibrant Town Center, geared toward making the Center more attractive and inviting. This area is to be developed to attract tourism by enhancing the commercial district, promoting environmental resources such as Donovan's beach and to engage Harold E. French Square as a green space focal point.

To assess the stormwater issues, Woodard & Curran developed a model of the stormwater system using Autodesk Storm and Sanitary Analysis software to analyze the existing hydrology of the surrounding watershed area.'

## 2. EXISTING CONDITIONS

Based upon our review of the Town's GIS mapping, drainage As-built plans and ground survey, the storm drain system in this area provides conveyance for a watershed of approximately 80 acres. The downtown area contains commercial/residential developments and roadways. Runoff in the area is collected by various inlets into a pipe network that leads through a 24" pipe that runs through Brook Field to the ocean near Simon J. Donovan Beach. In order to determine where there may be capacity issues within the existing pipe network, each segment of this pipe network was modeled using Autodesk Storm and Sanitary Analysis. Information obtained from an existing conditions survey provided by Coughlin Environmental Services, LLC, November 2016, was used for the modeling of the pipe network.

## 3. METHODOLOGY

The hydrologic model was performed using precipitation and rainfall intensity parameters recommended by the U.S. Army Corps of Engineers (ACOE). A 25-year, 24-hour precipitation depth of 6.2 inches was derived from the *Northeast Regional Climate Center, Atlas of Precipitation Extremes for the Northeastern United States and Southeastern Canada* (Cornell Atlas), by Cornell University for Quincy, MA. The analysis used the NRCS Type III rainfall distribution pattern, as recommended by TR-20 for the project location. Tables 1 and 2 show the pipes conditions after this storm.

In Table 1 "Existing Pipe Network" a majority of the pipes are surcharged because they are undersized. In Table 2 "Proposed Pipe Network" a significant amount of pipe is no longer surcharged. The pipe diameter column shows that every single pipe has been increased in size, this will reduce flooding. In addition to upsizing the pipes, the proposed design reconfigures the runoff path from one path to two. Separating the runoff paths makes the drainage design able to increase the pipe size efficiently and allowing enough distance for the proposed sewer line to be under the proposed drainage line. See Site plans "Town Center Improvements, Project No. 230079, March 2017."

---

## 4. CONCLUSIONS

Increasing pipe size is not enough to reduce pollutants discharged to Donovan's beach and prevent beach closures. Woodard and Curran has complete research on which stormwater Best Management Practices (BMPs) would be best suited to remove bacteria on urban sites. Woodard and Currans suggest two BMPs for the Town Center, the Continuous Deflective Separator (CDS) Stormwater treatment Device and media filters.

The Continuous Deflective Separator (CDS) Stormwater treatment Device by Contech Engineered Solutions LLC is a swirl concentrator hybrid technology that uses continuous deflective separations, a combinations and indirect screening to screen, separate and trap debris, sediment and hydrocarbons from stormwater runoff. The indirect screening capability of the system allows for 100% removal of floatables and neutrally buoyant material debris. Adding two small CDS units to the pipe network will remove trash, debris, and sediment to Donovan's beach and lower bacteria levels. Maintenance is every six months using a vacuum truck, with no requirements to enter the unit. (See Appendix D.)

Another type of BMP that is effective in reducing bacteria are sand and organic media filters. Subsurface Sand filters retain, filter and slowly release stormwater runoff. They reduce peak stormwater flows and remove many common stormwater pollutants. An advantage of this system is that it requires little space and is well suited for urban areas. (See Appendix E.)

As well as stormwater improvements the proposed design of the Town Center also increases approximately 5,250 square feet in green space area. Adding green space improves the environment by filtering pollutants and dust from the air, providing shade and lower temperatures in urban areas and rainfall retention. Harold E. French Square will become the downtown focal point containing, green space, bench areas and a fountain. Hagman Road will also be transferred into a pedestrian-only environment which will reduce the pedestrian hazard of shopping in the central business district.

## TABLES

SN	Element	From (Inlet)	To (Outlet)	Length	Inlet	Outlet	Average	Pipe	Peak	Design	Max	Reported
	ID	Node	Node		Invert	Invert	Slope	Diameter	Flow	Flow	Flow	Condition
					Elevation	Elevation		or Height		Capacity	Depth	
				(ft)	(ft)	(ft)	(%)	(inches)	(cfs)	(cfs)	(ft)	
1	PIPE-326	CB-406	DMH-316	197.86	11.04	4.60	3.2500	10.000	4.52	4.28	0.83	SURCHARGED
2	PIPE-327	DMH-312	DMH-313	62.30	3.07	0.46	4.1900	21.000	13.41	35.14	0.75	Calculated
3	PIPE-329	DMH-316	DMH-307	62.18	4.60	4.60	0.0000	21.000	8.25	7.68	1.75	SURCHARGED
4	PIPE-330	DMH-307	DMH-309	49.19	4.55	4.30	0.5100	21.000	10.55	12.24	1.25	Calculated
5	PIPE-331	DMH-309	DMH-311	267.94	4.40	3.14	0.4700	21.000	12.68	11.77	1.75	SURCHARGED
6	PIPE-332	DMH-311	DMH-312	148.69	3.11	3.07	0.0300	21.000	8.24	7.68	1.75	SURCHARGED
7	PIPE-335	DMH-317	DMH-456	100.57	5.65	5.51	0.1400	18.000	4.29	5.09	1.05	Calculated
8	PIPE-340	CB-322	DMH-309	61.05	5.83	5.10	1.2000	12.000	4.47	4.22	1.00	SURCHARGED
9	PIPE-341	DMH-314	DMH-307	269.04	13.46	4.60	3.2900	8.000	2.54	2.38	0.67	SURCHARGED
10	PIPE-469	DMH-442	DMH-317	13.07	8.15	8.10	0.3800	10.000	1.58	1.47	0.83	SURCHARGED
11	PIPE-480	DMH-429	DMH-442	243.76	8.80	8.15	0.2700	10.000	1.32	1.23	0.83	SURCHARGED
12	PIPE-483	CB-444	CB-322	63.21	8.79	5.99	4.4300	12.000	6.08	8.12	0.63	Calculated
13	PIPE-485	DMH-443	CB-444	91.51	9.02	8.79	0.2500	12.000	2.08	1.93	1.00	SURCHARGED
14	PIPE-487	CB-438	DMH-443	69.21	9.06	9.02	0.0600	10.000	1.14	1.06	0.83	SURCHARGED
15	PIPE-511	DMH-456	DMH-316	134.95	5.48	4.60	0.6500	18.000	9.74	9.19	1.50	SURCHARGED
16	PIPE-513	DMH-457	DMH-313	164.08	7.68	4.46	1.9600	10.000	3.57	3.33	0.83	SURCHARGED

**Table 1. Existing Pipe Network**  
From Autodesk Storm and Sanitary

SN	Element	From (Inlet)	To (Outlet)	Length	Inlet	Outlet	Average	Pipe	Peak	Design	Max	Reported
	ID	Node	Node		Invert	Invert	Slope	Diameter	Flow	Flow	Flow	Condition
					Elevation	Elevation		or Height		Capacity	Depth	
				(ft)	(ft)	(ft)	(%)	(inches)	(cfs)	(cfs)	(ft)	
96	PIPE-326	DMH-316	DMH-307	42.94	6.01	5.50	1.1800	24.000	10.64	16.73	1.16	Calculated
97	PIPE-327	DMH-312	DMH-313	34.84	0.65	0.21	1.2600	36.000	43.94	63.92	1.83	Calculated
98	PIPE-329	DMH-308	DMH-309	34.78	5.13	4.78	1.0000	28.000	0.00	36.98	0.00	Calculated
99	PIPE-330	DMH-309	DMH-310	45.59	4.68	4.22	1.0000	28.000	13.79	36.97	0.99	Calculated
100	PIPE-331	DMH-310	DMH-311	128.08	4.14	2.85	1.0000	28.000	13.78	18.73	1.49	Calculated
101	PIPE-332	DMH-311	DMH-312	233.39	2.77	0.75	0.8600	36.000	31.48	29.83	2.76	> CAPACITY
102	PIPE-335	DMH-456	DMH-317	137.64	5.03	4.65	0.2800	24.000	16.08	22.85	1.24	Calculated
103	PIPE-340	CB-322	DMH-309	63.04	5.98	5.74	0.3800	18.000	11.58	17.20	0.89	Calculated
104	PIPE-341	DMH-314	DMH-307	88.70	6.41	5.40	1.1300	18.000	5.78	22.02	0.51	Calculated
106	PIPE-460	CB-406	DMH-316	44.13	8.39	8.22	0.3800	24.000	4.98	15.12	0.77	Calculated
107	PIPE-466	DMH-448	DMH-318	21.78	5.60	5.54	0.2800	24.000	5.65	11.74	0.97	Calculated
109	PIPE-469	DMH-317	DMH-442	84.81	4.54	4.35	0.2300	28.000	27.02	28.38	1.82	Calculated
110	PIPE-470	DMH-318	DMH-317	31.05	5.22	5.03	0.6200	24.000	11.74	10.96	2.00	SURCHARGED
113	PIPE-476	DMH-429	DMH-426	179.87	3.84	3.08	0.4200	36.000	27.00	35.17	1.97	Calculated
115	PIPE-480	DMH-442	DMH-429	78.76	4.25	3.94	0.3900	28.000	27.03	29.45	1.76	Calculated
118	PIPE-483	CB-444	CB-322	57.85	6.42	5.98	0.7600	18.000	11.72	11.10	1.50	SURCHARGED
119	PIPE-485	DMH-443	CB-444	72.82	7.73	6.52	1.6600	18.000	5.44	5.09	1.50	SURCHARGED
120	PIPE-487	CB-438	DMH-443	56.56	7.58	7.13	0.8000	18.000	10.90	10.15	1.50	SURCHARGED
121	PIPE-498	DMH-447	DMH-448	20.51	5.67	5.60	0.3400	18.000	5.65	6.65	1.05	Calculated
122	PIPE-511	DMH-307	DMH-456	21.01	5.30	5.30	0.0000	24.000	16.10	29.77	1.05	Calculated
123	PIPE-512	DMH-426	DMH-457	190.78	2.98	2.34	0.3400	36.000	27.22	25.85	2.76	> CAPACITY
124	PIPE-513	DMH-457	DMH-313	114.56	0.71	0.22	0.4300	36.000	39.50	38.19	2.73	> CAPACITY

**Table 2. Proposed Pipe Network**  
From Autodesk Storm and Sanitary Analysis

\*The pipes still experiencing surcharged conditions are connected to drainage pipes that are outside the project limits. The downtown drainage pipe network is very large and this project is only upgrading a portion of this network. Fixing that issue would require expanding the project limits.

## **APPENDIX A: WOODARD & CURRAN “OVERALL SITE DESIGN PLAN”**



980 Washington Street, Suite 325  
 Dedham, Massachusetts 02026  
 800.446.5516 | www.woodardcurran.com

**WOODARD & CURRAN**

COMMITMENT & INTEGRITY DRIVE RESULTS

THE PRESENCE OF OUR LOGO DOES NOT WARRANT THAT THE CLIENT'S REPRODUCTION OF MODIFICATIONS WITHOUT WRITTEN PERMISSION IS PROHIBITED.

REV	DESCRIPTION	DATE

DESIGNED BY ADL/MCH/CTK CHECKED BY ADL/MCH  
 DRAWN BY: CTK  
 230079 - PRJ.DWG

## OVERVIEW SITE DESIGN PLAN

TOWN OF WINTHROP  
 1 METCALF SQUARE  
 WINTHROP, MASSACHUSETTS

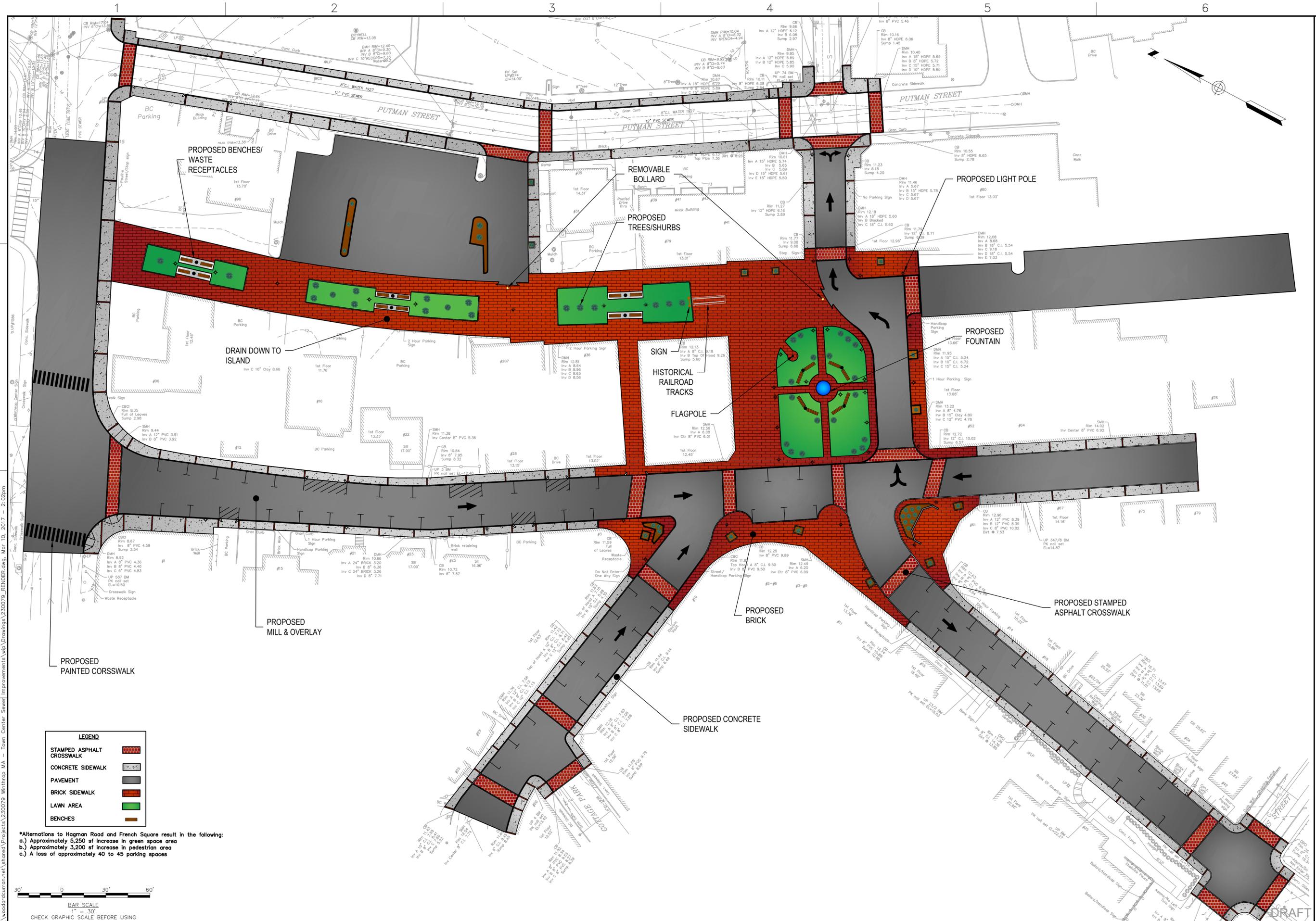
TOWN CENTER  
 DRAINAGE AND SEWER  
 IMPROVEMENTS

JOB NO.: 230079  
 DATE: 03/09/17  
 SCALE: 1"=30'

SHEET: 1 OF 1

**FIG. 1**

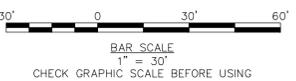
## **APPENDIX B: WOODARD & CURRAN “TOWN CENTER IMPROVEMENTS CONCEPTUAL PLAN”**



**LEGEND**

STAMPED ASPHALT CROSSWALK	[Red brick pattern]
CONCRETE SIDEWALK	[Grey pattern]
PAVEMENT	[Dark grey pattern]
BRICK SIDEWALK	[Red brick pattern]
LAWN AREA	[Green pattern]
BENCHES	[Orange pattern]

\*Alternations to Hagman Road and French Square result in the following:  
 a.) Approximately 5,250 sf increase in green space area  
 b.) Approximately 3,200 sf increase in pedestrian area  
 c.) A loss of approximately 40 to 45 parking spaces



980 Washington Street, Suite 325  
 Dedham, Massachusetts 02026  
 800.446.5518 | www.woodardcurran.com

**WOODARD & CURRAN**

THIS DOCUMENT IS THE PROPERTY OF WOODARD & CURRAN, INC. AND ITS CLIENTS. REPRODUCTION OR MODIFICATION WITHOUT WRITTEN PERMISSION IS PROHIBITED.

REV	DESCRIPTION	DATE

CHECKED BY: ADL  
 2/20/17  
 DESIGNED BY: CTK  
 DRAWN BY: CTK

**TOWN CENTER IMPROVEMENTS**  
**CONCEPTUAL LAYOUT**

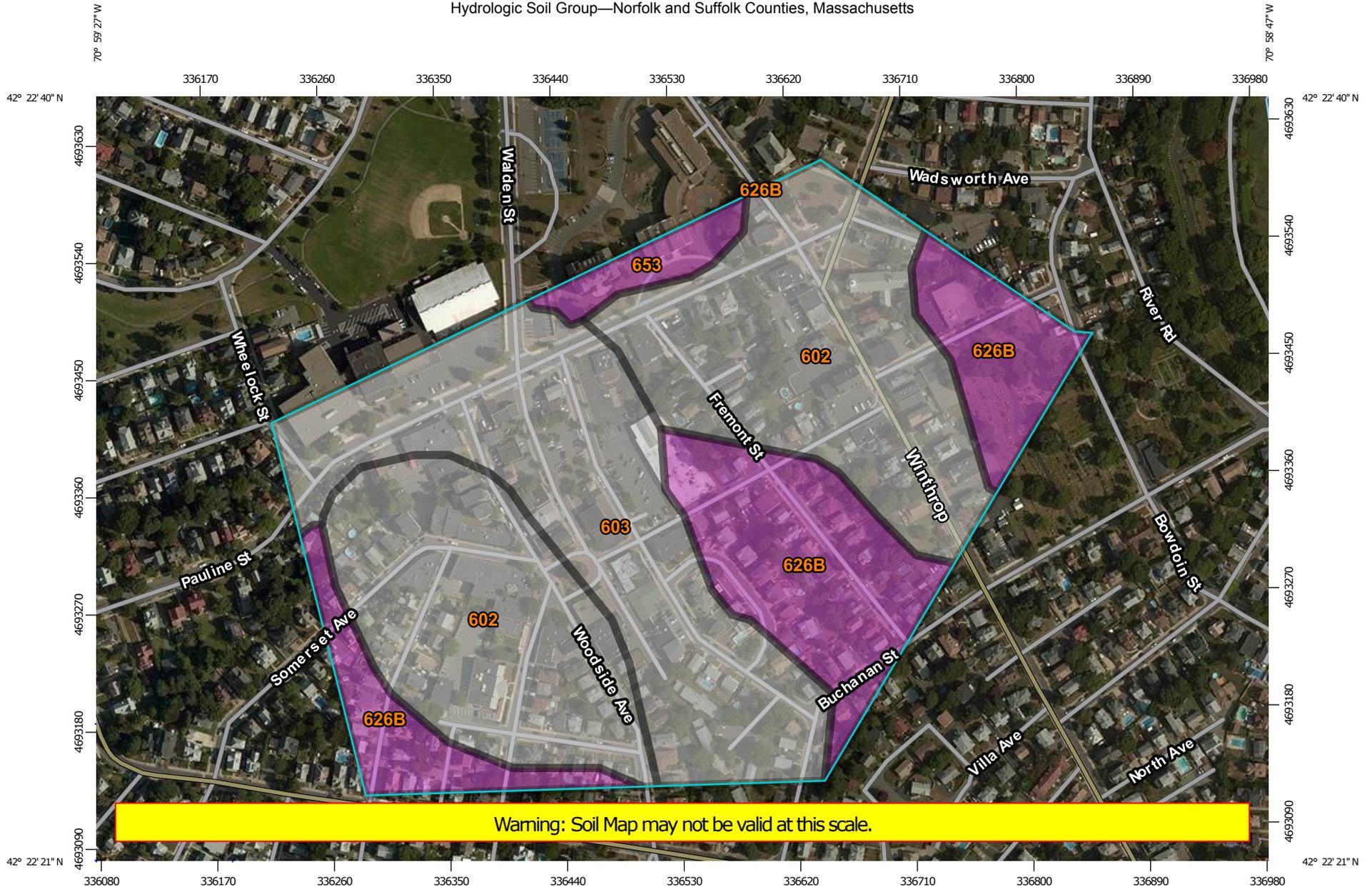
TOWN OF WINTHROP  
 METCAL SQUARE  
 WINTHROP, MASSACHUSETTS

TOWN CENTER  
 DRAINAGE AND SEWER  
 IMPROVEMENTS

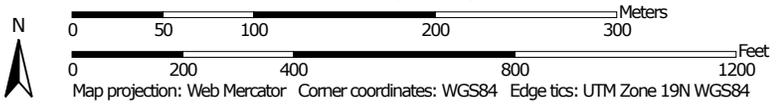
JOB NO.: 230079  
 DATE: MARCH 2017  
 SCALE: AS NOTED  
 SHEET: 1 OF 1

## APPENDIX C: HYDROLOGIC SOIL GROUP MAP

Hydrologic Soil Group—Norfolk and Suffolk Counties, Massachusetts



Map Scale: 1:4,140 if printed on A landscape (11" x 8.5") sheet.



## MAP LEGEND

### Area of Interest (AOI)

 Area of Interest (AOI)

### Soils

#### Soil Rating Polygons

 A  
 A/D  
 B  
 B/D  
 C  
 C/D  
 D  
 Not rated or not available

#### Soil Rating Lines

 A  
 A/D  
 B  
 B/D  
 C  
 C/D  
 D  
 Not rated or not available

#### Soil Rating Points

 A  
 A/D  
 B  
 B/D

 C  
 C/D  
 D  
 Not rated or not available

### Water Features

 Streams and Canals

### Transportation

 Rails  
 Interstate Highways  
 US Routes  
 Major Roads  
 Local Roads

### Background

 Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:25,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service  
 Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>  
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Norfolk and Suffolk Counties, Massachusetts  
 Survey Area Data: Version 11, Sep 28, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 10, 2014—Aug 25, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

## Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Norfolk and Suffolk Counties, Massachusetts (MA616)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
602	Urban land, 0 to 15 percent slopes		22.2	44.5%
603	Urban land, wet substratum, 0 to 3 percent slopes		14.1	28.2%
626B	Merrimac-Urban land complex, 0 to 8 percent slopes	A	12.4	24.8%
653	Udorthents, sandy	A	1.3	2.6%
<b>Totals for Area of Interest</b>			<b>50.0</b>	<b>100.0%</b>

## Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

## Rating Options

*Aggregation Method:* Dominant Condition

*Component Percent Cutoff:* None Specified

*Tie-break Rule:* Higher

## APPENDIX D: CONTECH CDS 2025-5-C STAND DETAIL

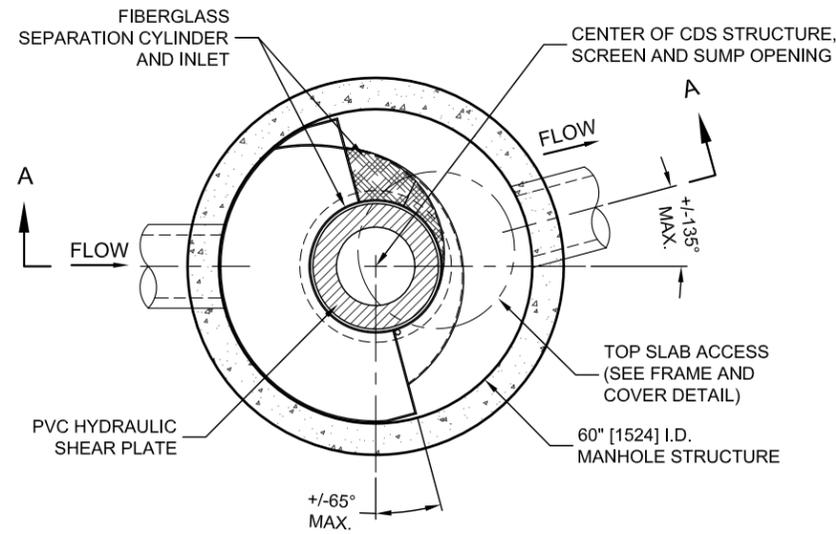
## CDS2025-5-C DESIGN NOTES

CDS2025-5-C RATED TREATMENT CAPACITY IS 1.6 CFS [45.3 L/s], OR PER LOCAL REGULATIONS. MAXIMUM HYDRAULIC INTERNAL BYPASS CAPACITY IS 14.0 CFS [396 L/s]. IF THE SITE CONDITIONS EXCEED 14.0 CFS [396 L/s], AN UPSTREAM BYPASS STRUCTURE IS REQUIRED.

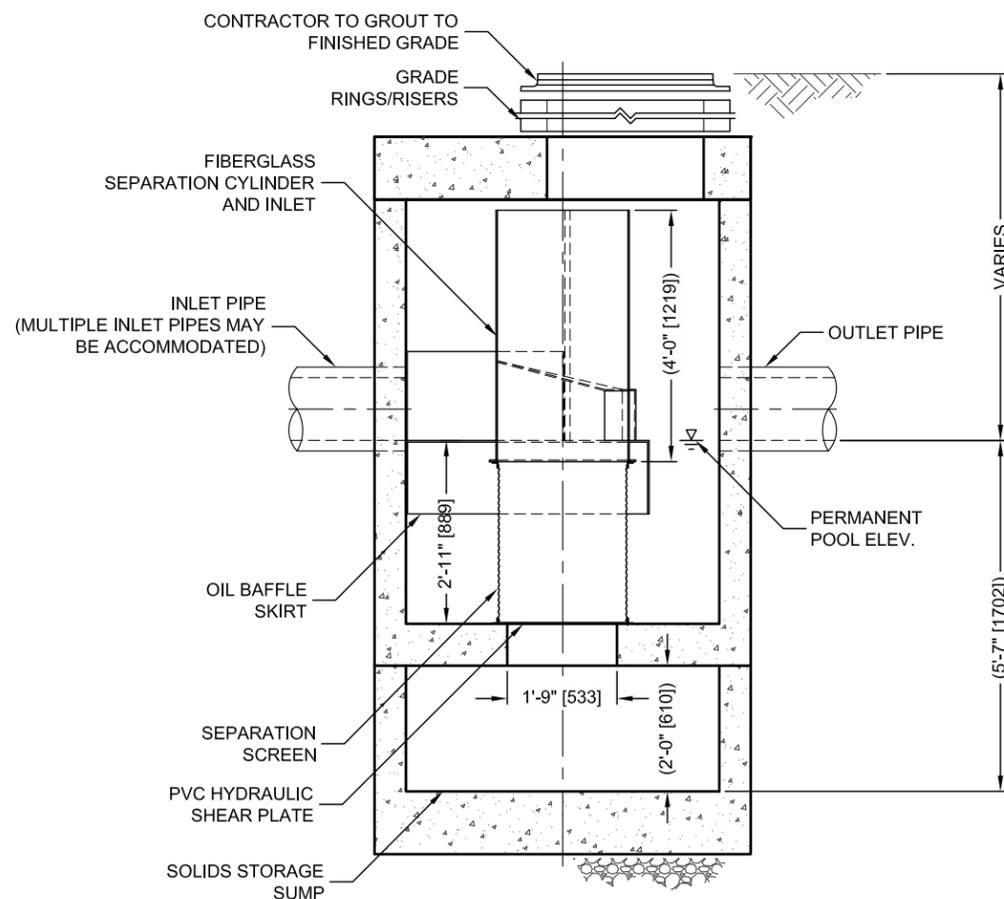
THE STANDARD CDS2025-5-C CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE AVAILABLE AND ARE LISTED BELOW. SOME CONFIGURATIONS MAY BE COMBINED TO SUIT SITE REQUIREMENTS.

### CONFIGURATION DESCRIPTION

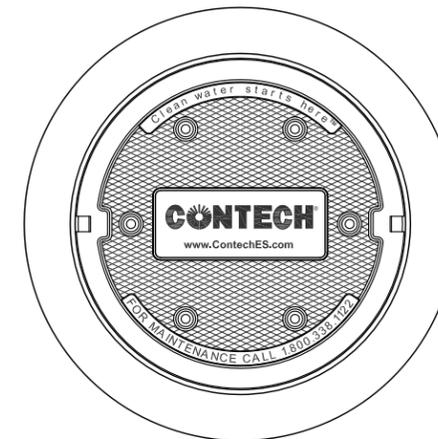
- GRATED INLET ONLY (NO INLET PIPE)
- GRATED INLET WITH INLET PIPE OR PIPES
- CURB INLET ONLY (NO INLET PIPE)
- CURB INLET WITH INLET PIPE OR PIPES
- SEPARATE OIL BAFFLE (SINGLE INLET PIPE REQUIRED FOR THIS CONFIGURATION)
- SEDIMENT WEIR FOR NJDEP / NJCAT CONFORMING UNITS



**PLAN VIEW B-B**  
N.T.S.



**ELEVATION A-A**  
N.T.S.



**FRAME AND COVER**  
(DIAMETER VARIES)  
N.T.S.

### SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID				
WATER QUALITY FLOW RATE (CFS OR L/s)				*
PEAK FLOW RATE (CFS OR L/s)				*
RETURN PERIOD OF PEAK FLOW (YRS)				*
SCREEN APERTURE (2400 OR 4700)				*
PIPE DATA:	I.E.	MATERIAL	DIAMETER	
INLET PIPE 1	*	*	*	
INLET PIPE 2	*	*	*	
OUTLET PIPE	*	*	*	
RIM ELEVATION				*
ANTI-FLOTATION BALLAST	WIDTH	HEIGHT		
	*	*		
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 WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. [www.ContechES.com](http://www.ContechES.com)
4. CDS 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 HS20 (AASHTO M 306) LOAD RATING, ASSUMING GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION.
6. PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.

#### 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 CDS MANHOLE STRUCTURE (LIFTING CLUTCHES PROVIDED).
- C. CONTRACTOR TO ADD 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.

**CONTECH**  
ENGINEERED SOLUTIONS LLC

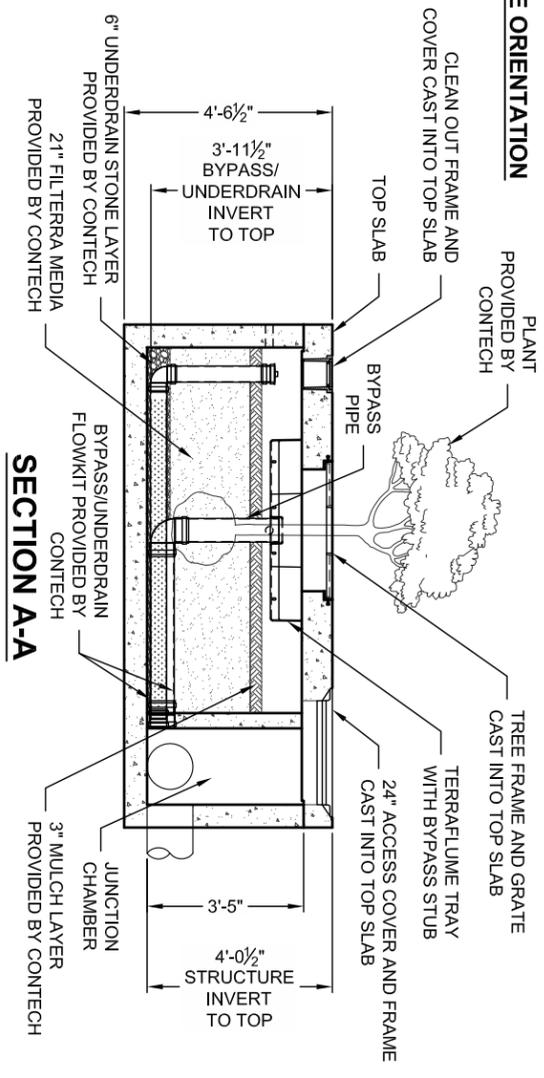
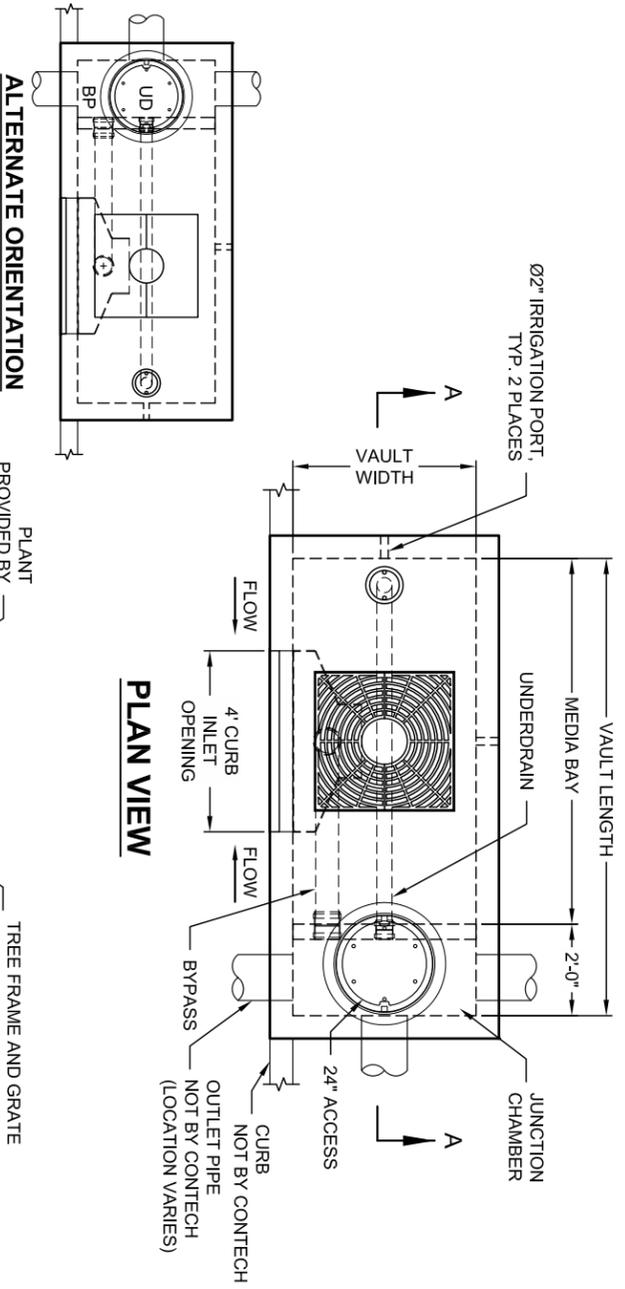
[www.ContechES.com](http://www.ContechES.com)  
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069  
800-338-1122    513-645-7000    513-645-7993 FAX

CDS2025-5-C  
INLINE CDS  
STANDARD DETAIL



THIS PRODUCT MAY BE PROTECTED BY ONE OR MORE OF THE FOLLOWING U.S. PATENTS: 6,788,848; 6,841,722; 6,911,565; 6,961,762. RELATED FOREIGN PATENTS, OR OTHER PATENTS PENDING.

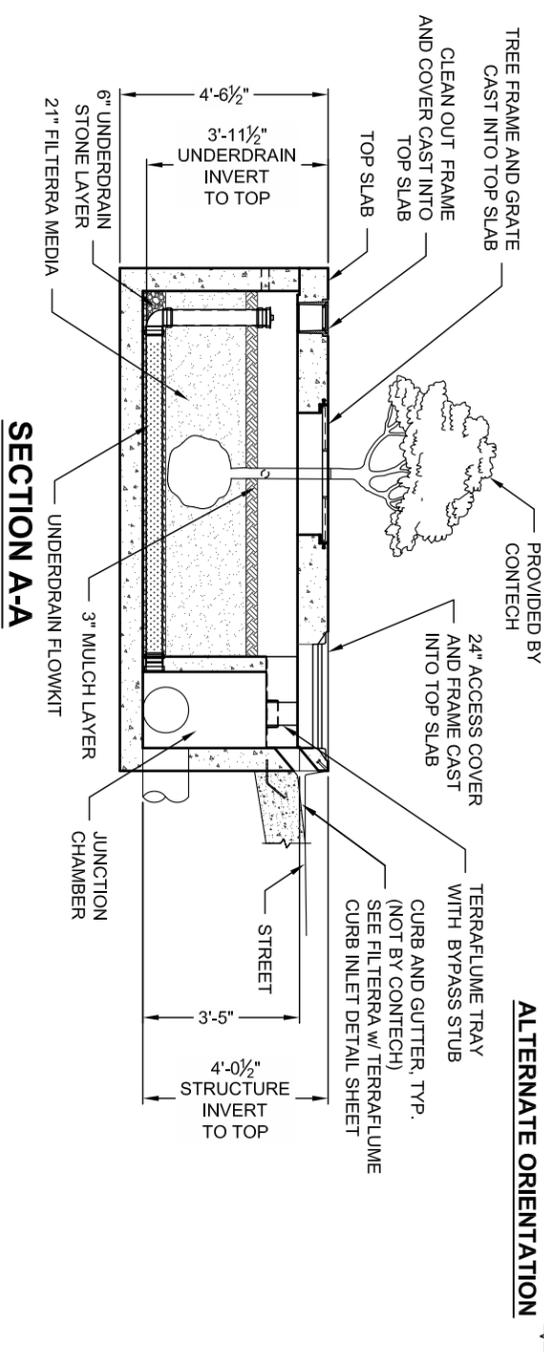
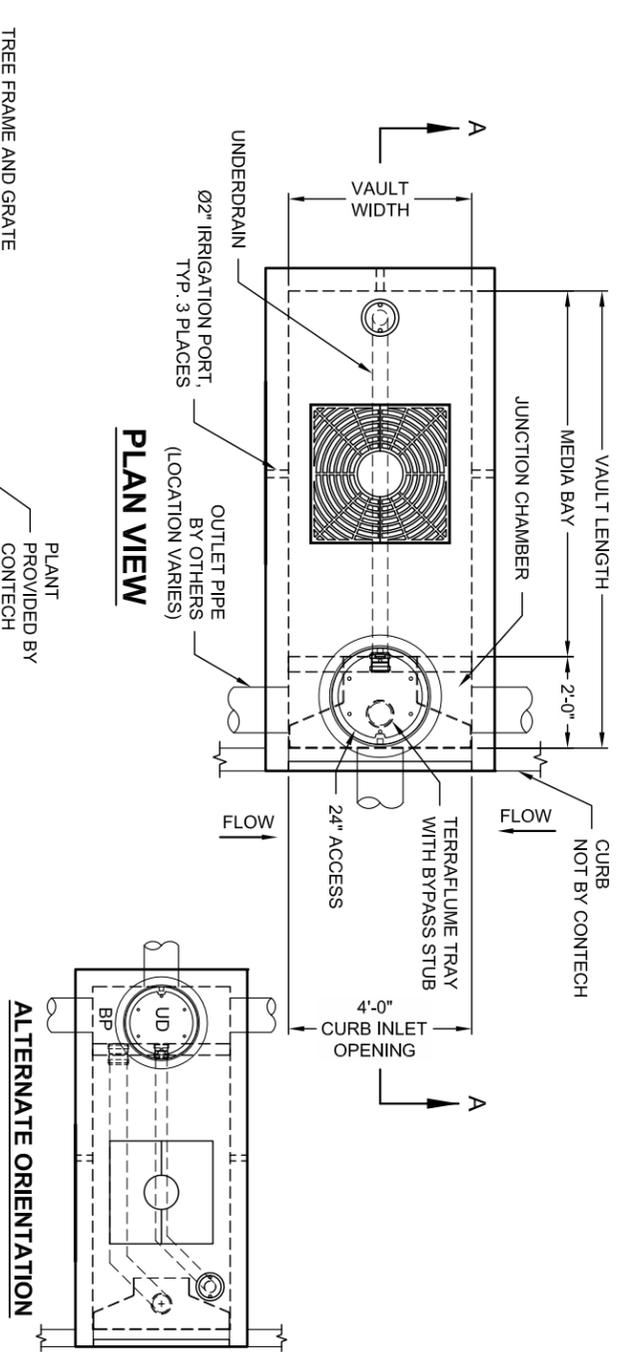
## **APPENDIX E: CONTECH FILTERRA INTERNAL BYPASS CURB INLET AND CHAMBER DETIAL**



### FTIBC-C LONG SIDE CURB INLET

DESIGNATION (LONG SIDE)	SIZE (MEDIA BAY)	VAULT LENGTH	VAULT WIDTH	MAX. BYPASS PIPE SIZE	MAX. BYPASS FLOW (CFS)	UNDERDRAIN PIPE DIA. (PERF.)	TREE GRATE QTY. & SIZE
FTIBC-C0404 LS	4' x 4'	6'-0"	4'-0"	6" SDR 35	1.42	4" SDR 35	(1) 3' x 3'
FTIBC-C0604	6' x 4'	8'-0"	4'-0"	8" SDR 35	1.89	4" SDR 35	(1) 3' x 3'
FTIBC-C0606 LS	6' x 6'	8'-0"	6'-0"	10" SDR 35	2.37	4" SDR 35	(1) 3' x 3'
FTIBC-C0804	8' x 4'	10'-0"	4'-0"	8" SDR 35	1.89	4" SDR 35	(1) 3' x 3'
FTIBC-C0806	8' x 6'	10'-0"	6'-0"	10" SDR 35	2.37	4" SDR 35	(1) 4' x 4'
FTIBC-C1006	10' x 6'	12'-0"	6'-0"	10" SDR 35	2.37	6" SDR 35	(1) 4' x 4'
FTIBC-C1204	12' x 4'	14'-0"	4'-0"	8" SDR 35	1.89	4" SDR 35	(2) 3' x 3'
FTIBC-C1206	12' x 6'	14'-0"	6'-0"	10" SDR 35	2.37	6" SDR 35	(2) 4' x 4'
FTIBC-C1307	13' x 7'	15'-0"	7'-0"	10" SDR 35	2.37	6" SDR 35	(2) 4' x 4'

INTERNAL PIPE CONFIGURATION MAY VARY DEPENDING ON VAULT SIZE



### FTIBC-C SHORT SIDE CURB INLET

DESIGNATION (SHORT SIDE)	SIZE (MEDIA BAY)	VAULT LENGTH	VAULT WIDTH	MAX. BYPASS PIPE SIZE	MAX. BYPASS FLOW (CFS)	UNDERDRAIN PIPE DIA. (PERF.)	TREE GRATE QTY. & SIZE
FTIBC-C0404 SS	4' x 4'	6'-0"	4'-0"	6" SDR 35	1.42	4" SDR 35	(1) 3' x 3'
FTIBC-C0406	4' x 6'	8'-0"	4'-0"	8" SDR 35	1.89	4" SDR 35	(1) 3' x 3'
FTIBC-C0408	4' x 8'	10'-0"	4'-0"	8" SDR 35	1.89	4" SDR 35	(1) 3' x 3'
FTIBC-C0412	4' x 12'	14'-0"	4'-0"	8" SDR 35	1.89	4" SDR 35	(2) 3' x 3'
FTIBC-C0606 SS	6' x 6'	8'-0"	6'-0"	10" SDR 35	2.37	4" SDR 35	(1) 3' x 3'
FTIBC-C0608	6' x 8'	10'-0"	6'-0"	10" SDR 35	2.37	4" SDR 35	(1) 4' x 4'
FTIBC-C0610	6' x 10'	12'-0"	6'-0"	10" SDR 35	2.37	6" SDR 35	(1) 4' x 4'
FTIBC-C0612	6' x 12'	14'-0"	6'-0"	10" SDR 35	2.37	6" SDR 35	(2) 4' x 4'
FTIBC-C0713	7' x 13'	15'-0"	7'-0"	10" SDR 35	2.37	6" SDR 35	(2) 4' x 4'

INTERNAL PIPE CONFIGURATION MAY VARY DEPENDING ON VAULT SIZE

\* DIMENSIONS MAY VARY ± 1/8" DEPENDING ON PRECASTER BUILD CONFIGURATION.



**CONTECH**  
ENGINEERED SOLUTIONS LLC  
www.conteches.com

**FILTERRA**  
INTERNAL BYPASS CURB WITH CHAMBER (FTIBC-C)  
CONFIGURATION DETAILS

The design and information shown on this drawing is provided as a service to the product owner, engineer and contractor by Contech Engineered Solutions LLC or one of its affiliated companies ("Contech"). Neither this drawing, nor any part thereof, may be used, reproduced or modified in any manner without the prior written consent of Contech. Failure to comply is done at the user's own risk and Contech expressly disclaims any liability or responsibility for such use. If discrepancies between the supplied information upon which the drawing is based and actual field conditions are encountered as site work progresses, these discrepancies must be reported to Contech immediately for re-evaluation of the design. Contech accepts no liability for designs based on missing, incomplete or inaccurate information supplied by others.

9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069  
800-338-1122 513-645-7000 513-645-7993 FAX

**APPENDIX F: “TOWN OF WINTHROP, 1 METCALF SQUARE,  
WINTHROP, MASSACHUSETTS, TOWN CENTER  
SITE IMPROVEMENTS, PROJECT NO. 230079,  
MARCH 2017” SITE PLANS, SHEETS 1-19  
(ATTACHED SEPARATELY)**