

# Mansfield Post Construction Water Quality Requirements

Howard Redfearn  
Environmental Manager  
City of Mansfield

# Agenda

- Why
- Who
- What
- Where
- When
- How
- Examples
- Tracking

# Attendee Make Up

Please complete the following statement.

I am a:

Municipal Civil Engineer

Municipal Stormwater Professional

Other

Development Civil Engineer

Private Stormwater Professional

# Community Size

< 20,000

20,000-50,000

50,000 – 100,000

+100,000

# Why??????

## 4. Post-Construction Stormwater Management in New Development and Redevelopment

### A. Post –Construction Storm Management Program

1. All permittees shall develop, implement, and enforce a program, to the extent allowable under state, federal and local law, to control stormwater discharges that disturb one acre or more, including projects that disturb less than one acre that are part of a larger common plan of development or sale. The program must be established for private and public development sites. The program may utilize an offsite mitigation and payment in lieu of components to address this requirement.

Existing permittees shall assess program elements that were described in the previous permit and modify as necessary to continue reducing the discharge of pollutants from the MS4 to the MEP. New elements must be fully implemented by the end of this permit term and newly regulated permittees shall have the program fully implemented by the end of the permit term.

2. All permittees shall use, to the extent allowable under state, federal, and local development standards, an ordinance or other regulatory mechanism to address post-construction runoff from new development and redevelopment projects. **The permittees shall establish, implement, and enforce a requirement, that owners or operators of new development and redeveloped sites design, install, implement, and maintain a combination of *structural and non-structural BMPS* appropriate for the community and that protects water quality.** If the construction of permanent structure is not feasible due to space limitations, health and safety concerns, cost effectiveness or highway construction codes, the permittee may propose an alternative approach to TCEQ. Newly regulated permittees shall have the program element fully implemented by the end of the permit term.

### B. Requirements for all Permittees

*All permittees shall include the requirements described below in Parts III.B.4 (b) (1)-(3)*

1. All permittees shall review and update as necessary, the SWMP and MCM

implementation procedures required by Part III.A.2..Any changes must be included in the annual report. Such written procedures must be maintained either on site or in the SWMP and made available for inspection by TCEQ.

2. All permittees shall document and maintain records of enforcement actions and make them available for review by the TCEQ.

3. Long-Term Maintenance of Post-Construction Stormwater Control Measures

All permittees shall, to the extent allowable under state, federal, and local law ensure the long-term operation and maintenance of structural stormwater control measures installed through one or both of the following approaches:

- a) Maintenance performed by the permittee. (See Part III.B.5)
- b) Maintenance performed by the owner or operator of a new development or redeveloped site under a maintenance plan. The maintenance plan must be filed in the real property records of the county in which the property is located. The permittee shall require the owner or operator of any new development or redeveloped site to develop and implement a maintenance plan addressing maintenance requirements for any structural control measures installed onsite. The permittee shall require operation and maintenance performed is documented and retained on site, such as at the offices of the owner or operator and made available for review by the small MS4.

# Who?

- New developments/redevelopments without a plat prior to 2015

# What is a Post Construction Water Quality Control Measure?

- Device or structure that is designed in a way that treats a volume of water from a site prior to being discharged into a natural waterway or underground system
- Unless a site can be designed with 10% or less impervious area site design considerations only reduce the amount of treatment needed by a device or structure

# What is NOT a structural control measure

- Detention pond designed for flood control only
  - Mandated landscape buffers
  - Tree mitigation alone
- ❖ Floodplain preservation and other development limiting measures do have a positive impact, but measuring/determining how much is difficult





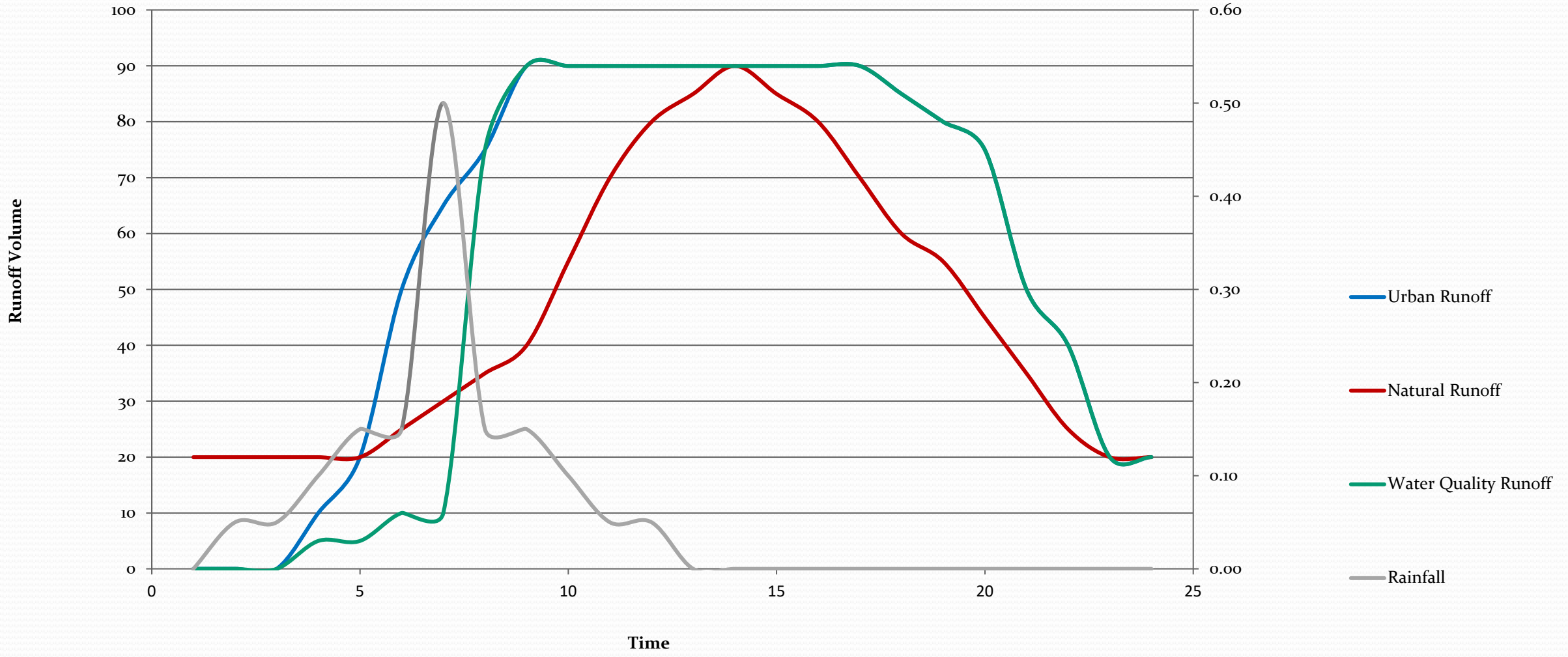
- **Water Quality Volume**

- The volume of water from impervious areas that will need to be treated from the 85 percentile storm
- Generally represented in units of cubic feet or acre feet
- For many proprietary structures this has to be converted to a flow rate (equation is in iSWM manual)

- **Multi-stage outfall**

- Considered multi-stage because the discharge flow is limited depending on storm (WQv, 25 yr, 100 yr) and purpose (water quality treatment, stream bank protection, flood control)

# Runoff Comparison - Detention



# Does your community require detention?

Yes

No

Depends

# Where?

- Location within a given site depends on site conditions
  - When located online significant challenges emerge

# When?

- Initial design of control measures should be incorporated before/during initial site layout
- Delaying until permit submission can result in a need to redesign the site

# How?

- Calculate WQv (1.5” \* impervious acres of drainage area)
- Select treatment method/device
  - iSWM has large collection
  - Can propose measure not in iSWM
- Place treatment method/device in system
  - Evaluate for impacts to storm drain system

# Does your community require post construction water quality measures?

Yes

No

Not sure

Depends

Does your community HAVE any post construction water quality measures?

Yes

No

Maybe

Not sure



Ponds

The Good













3" Water Quality Opening











The Bad



# The Ugly





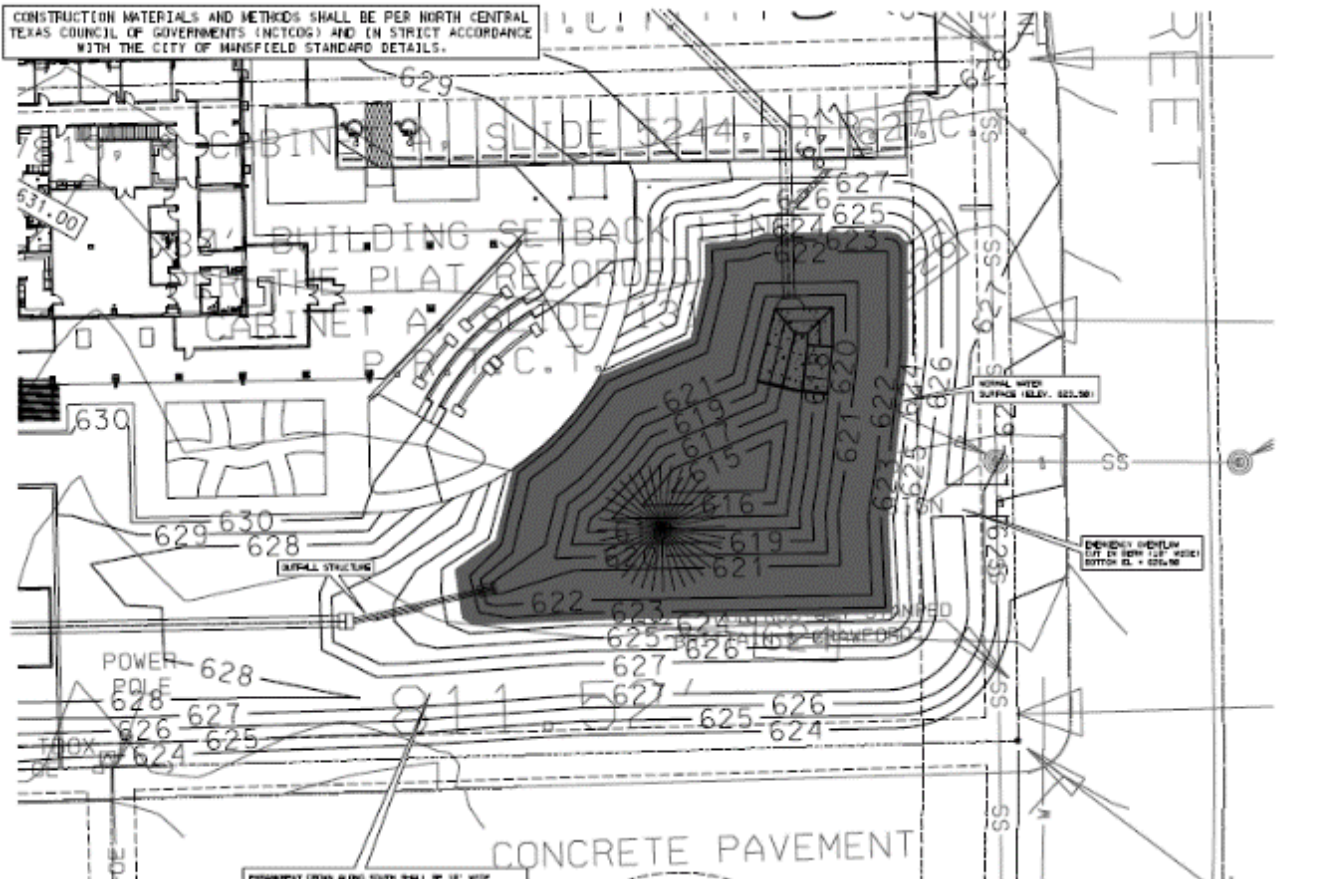




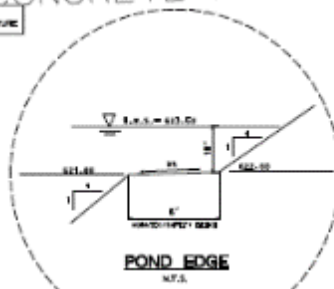




CONSTRUCTION MATERIALS AND METHODS SHALL BE PER NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS (NCTCG) AND IN STRICT ACCORDANCE WITH THE CITY OF WAXSHELL STANDARD DETAILS.



CONCRETE CURB ALONG EVERY SHALL BE 24" HIGH FOR MAINTENANCE VEHICLES TO GET TO OUTFALL STRUCTURE



POND OUTFALL DESIGN

**ORIFICE CALCULATIONS**

NOTE: STARTING WATER SURFACE FOR POND IS 62.00 FEET (SEE ELEV. COLUMN)

OUTFALL STRUCTURE IS AN 18" DIA. ORIFICE

ORIFICE CLEAR WIDTH:

W = 18" DIA.  
 H = 1.5' DIA.  
 L = 1.5' DIA.  
 Y = 1.5' DIA.  
 Q = 48.0 CFS

**INLET CAPACITY CALCULATIONS**

CURB/DROP OPENING INLET IN SUMP:  $Q/L = 3.0Y^{1.49}$

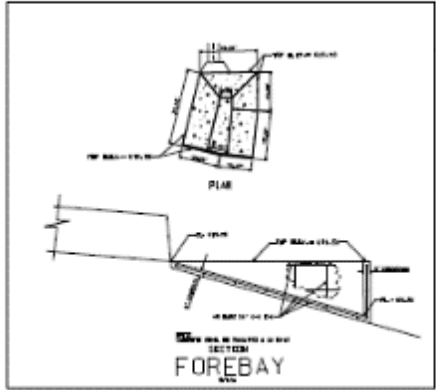
Where:  
 Q = Storm Drainage Discharge (cfs)  
 L = Length of Inlet Opening (ft)  
 Y = Depth of flow at Opening (ft)

For 4" Drop Inlet:  
 12" Depth:  $Qcap = 48.0 cfs$

Q100 = 12.8 \* 48.0 = 60.8 CFS (61.1 CFS REQUIRED FROM DRAINAGE AREA MAP)

**PILE VOLUME CALCULATIONS:**

- 1) PILE VOLUME =  $0.785 \times D^2 \times L \times N$  (CIRCULAR PILE)  
 2) NORMAL PILE VOLUME = 31-127 CIRC PILE  
 3) PILE VOLUME WITH CONCRETE TIP = 31-127 CIRC PILE  
 4) PILE VOLUME WITH CONCRETE TIP = 31-127 CIRC PILE



PILE SURFACE PREPARATION SHALL BE AS FOLLOWS:

THE SURFACE OF THE PILE SHALL BE CLEANED AND FREE OF ALL OIL, GREASE, AND OTHER CONTAMINANTS. THE SURFACE SHALL BE SMOOTHED TO REMOVE ALL PROTRUSIONS AND A LAYER OF 1/4" OF PORTLAND CEMENT SHALL BE APPLIED TO THE SURFACE OF THE PILE TO PROVIDE A BONDING SURFACE FOR THE CONCRETE.

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AFTER COMPLETION OF THE SURFACE PREPARATION, THE PILE SHALL BE IMMEDIATELY COVERED WITH A LAYER OF 1/4" OF PORTLAND CEMENT TO PROTECT THE SURFACE FROM WEATHERING AND THE MIXTURE OF THE MATERIAL SHALL BE 0-3% MOISTURE.

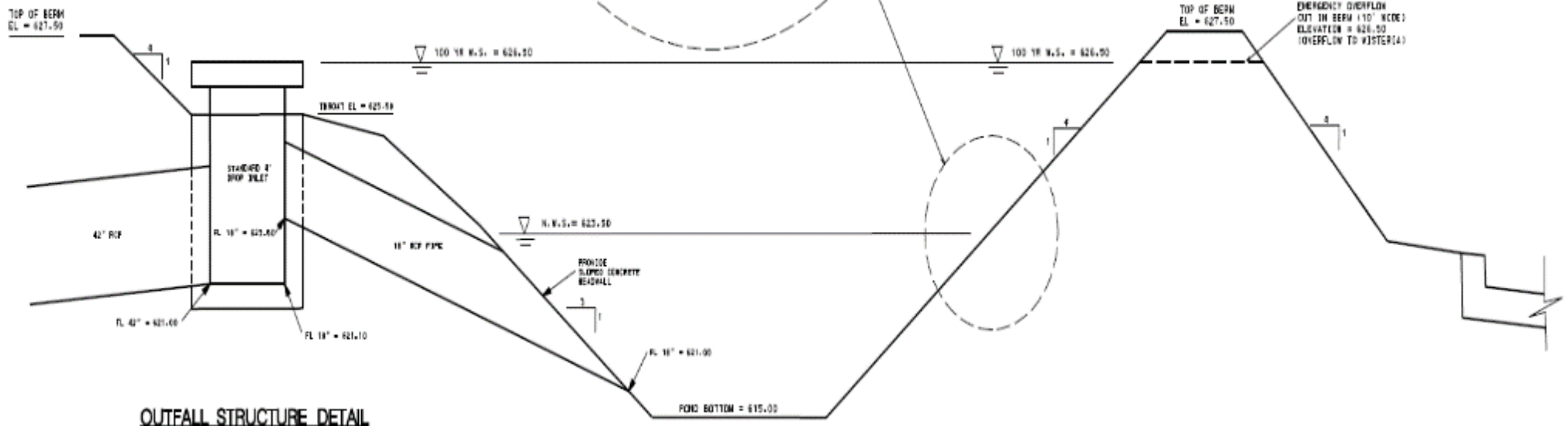
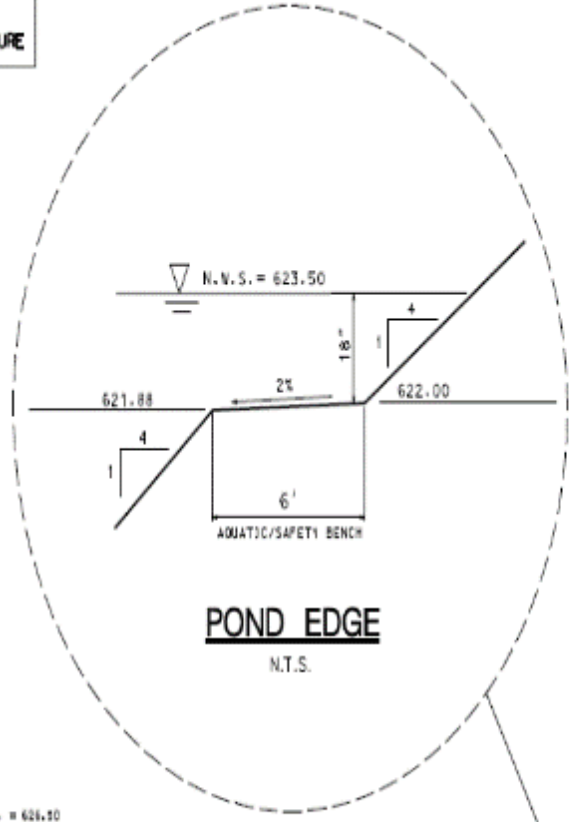
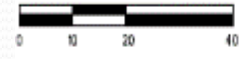
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EMBANKMENT CROWN ALONG SOUTH SHALL BE 10' WIDE FOR MAINTENANCE VEHICLES TO GET TO OUTFALL STRUCTURE

CONCRETE PAVEMENT



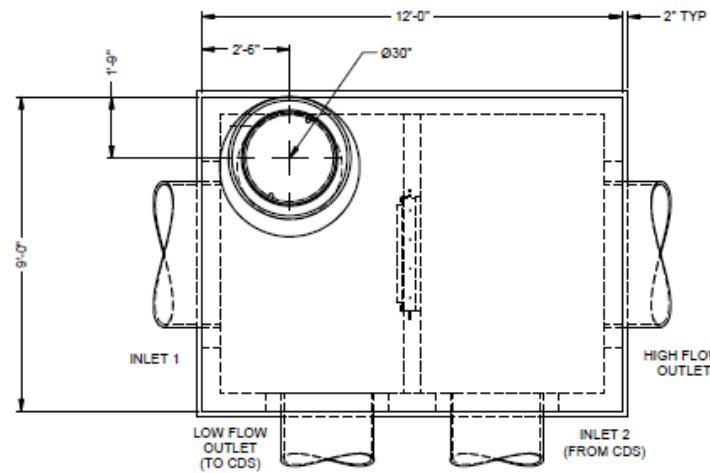
SCALE 1" = 20'



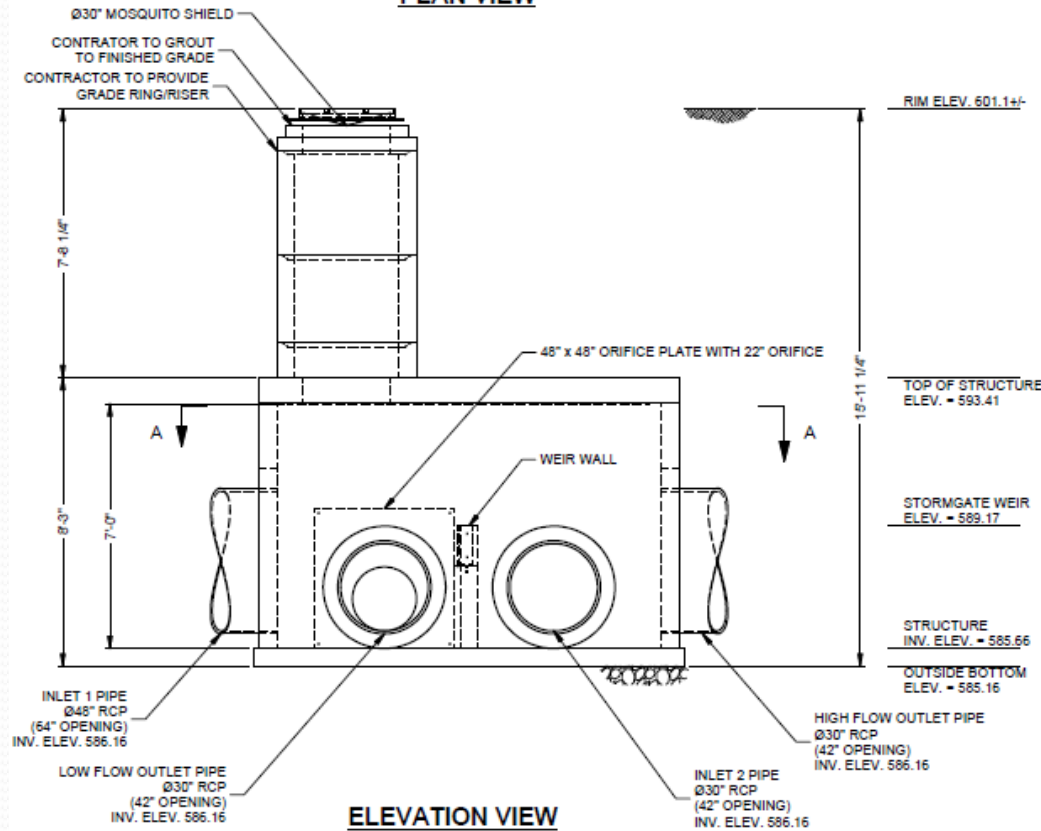
OUTFALL STRUCTURE DETAIL  
N.T.S.

# Proprietary structures





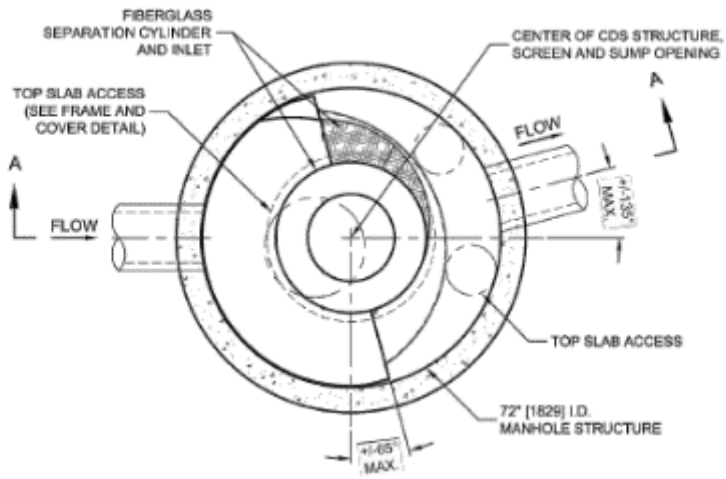
**PLAN VIEW**



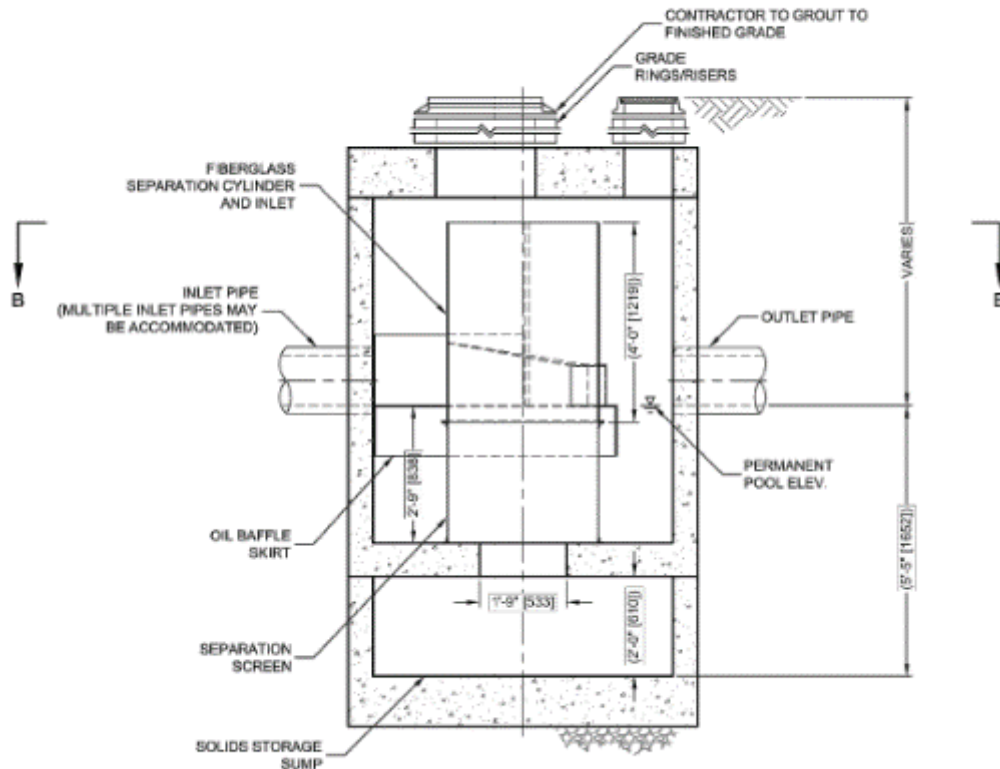
**ELEVATION VIEW**







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



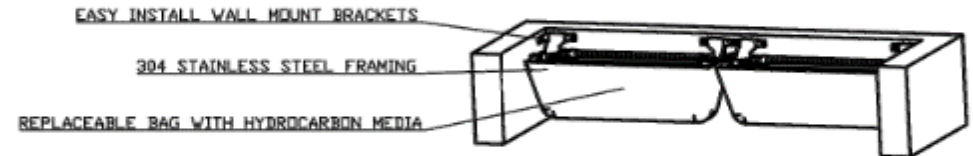
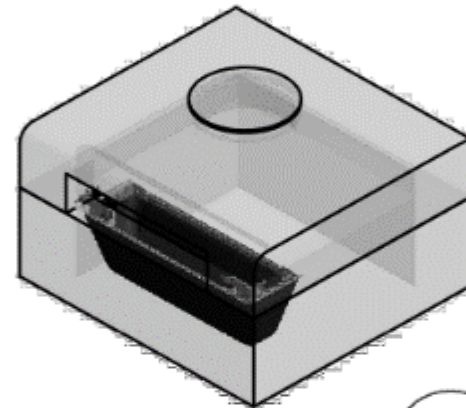
**ELEVATION A-A**  
N.T.S.



# Other

## Curb Inlet Insert

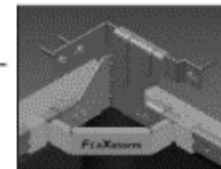
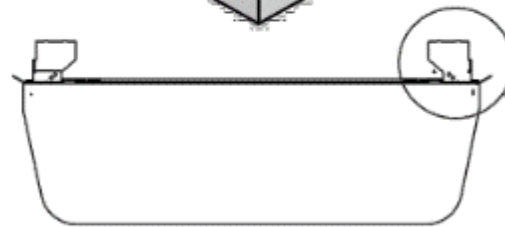
Product selection for FLEXSTORM PURE Filters (Permanent Inlet Protection)												
Standard	Inlet Type	Kristar Equivalent	Grate Size	Clear Opening Size	Bag Cap. (ft <sup>2</sup> )	Flow Ratings (CFB)			PRICE			
						FX/FX+	PC/PC+	Bypass	FX	FX+	PC	PC+
36" Open Throat Inlet	Open Throat (WM)	FGP-36CI	N/A	36	2.5	1.9	1.4	N/A	62HDWM36FX	62HDWM36FXP	62HDWM36PC	62HDWM36PCP
42" Open Throat Inlet	Open Throat (WM)	FGP-42CI	N/A	42	3.0	2.5	1.7	N/A	62HDWM41FX	62HDWM41FXP	62HDWM41PC	62HDWM41PCP
48" Open Throat Inlet	Open Throat (WM)	FGP-48CI	N/A	48	3.3	2.8	2.2	N/A	62HDWM48FX	62HDWM48FXP	62HDWM48PC	62HDWM48PCP
60" Open Throat Inlet (2 piece)	Open Throat (WM)	FGP-60CI	N/A	60	4.2	3.6	2.6	N/A	62HDWM60FX	62HDWM60FXP	62HDWM60PC	62HDWM60PCP
64" Open Throat Inlet (2 piece)	Open Throat (WM)	FGP-64CI	N/A	64	5.8	5.0	3.4	N/A	62HDWM64FX	62HDWM64FXP	62HDWM64PC	62HDWM64PCP
96" Open Throat Inlet (2 piece)	Open Throat (WM)	FGP-48CI	N/A	96	6.6	5.6	4.4	N/A	62HDWM66FX	62HDWM66FXP	62HDWM66PC	62HDWM66PCP
48" Open Throat with Side Wings	Open Throat (WM)	N/A	N/A	48 Winged	5.1	2.7	1.7	N/A	62HDWM4818FX	62HDWM4818FXP	62HDWM4818PC	62HDWM4818PCP



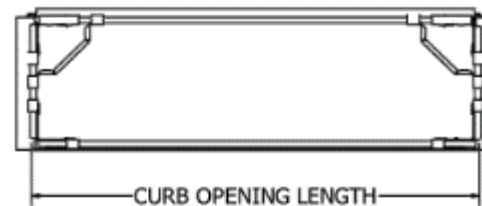
FLEXSTORM HDWM WALL MOUNT INLET FILTERS FOR OPEN THROAT GUTTERS (2 piece set for 6', 7', 8')

### INSTALLATION AND MAINTENANCE INSTRUCTIONS

1. ENTER MANHOLE OPENING WITH INLET FILTER AND MOUNTING HARDWARE
2. ALIGN FILTER FRAME WITH CURB OPENING AND MARK CENTERLINE OF EACH FRAME HANGER BRACKET
3. USING SUPPLIED WALL MOUNT BRACKETS, MARK LOCATION OF BRACKET SCREW HOLES SPACED 1" DOWN FROM TOP LEDGE OF CONCRETE.
4. USING HAMMER DRILL, DRILL HOLE TO RECOMMENDED DEPTH OF SPECIFIED FASTENER.
5. SECURE THE WALL MOUNT BRACKETS USING CONCRETE FASTENERS AND HANG THE FLEXSTORM INLET ASSEMBLY.
6. FOR MAINTENANCE LIFT THE FILTER FRAME OFF MOUNTING BRACKETS AND CARRY UP THROUGH MANHOLE OPENING. ALTERNATIVELY SERVICE WITH TRUCK MOUNTED VACUUM.



INSTALLATION DETAIL







# Tracking

## POST CONSTRUCTION UNITS: PERMITTED, INSTALLED AND OPERATING PER FISCAL YEAR

ID Num	UNIT	COMMON NAME	PLAT NAME	ATEGOR	WATER QUALITY DEVICE	Area Treated (acre)	ADDRESS	FINAL INSPECTION APPROVAL (CO)	Last Inspection Date	Next Maintenance Date
<b>EXISTENT BEFORE 2017</b>										
WQ11-01	1	Crescent Apart (360 Hwy)	Crescent Apartments	Commercial	Hydrodynamic Separator	10.5	360 Hwy	In place before 2017		
WQ15-01	2	Mansfield Service Center	Heritage Bus. Park	Commercial	Vortsentry HS Unit (Areas A4 & A5)	1.75	620 S. WISTERIA ST.	In place before 2017	8/7/2017; 9/5/2017; 1/5/2018	
WQ15-02	3				W/Q Pond	8.81		In place before 2017		
WQ15-03	4				Inlet Baskets (2) - Area B6	0.49		In place before 2017		
WQ15-04	5				Inlet Basket (1) - Area B3 (Treating approx 1/5 of Total drainage Area)	0.29		In place before 2017		
WQ15-05	6				Extended Release Det. Ponds - North Pond	2.83		In place before 2017		
WQ16-01	7	Coll Buildings	McQueen Add.	Commercial	Extended Release Det. Ponds - South Pond	17.29	1401 HERITAGE PKWY. (1351 & 1441)	7/1/2016	4/23/2018	
WQ16-02	8								4/23/2018	
<b>INSTALLED FISCAL YEAR 2017</b>										
WQ17-01	9	Dollar General	R&C Business Center	Commercial	Extended Release Det. Pond	1.43	2851 N MAIN	4/17/2017	7/16/2019	
WQ17-02	11	Somerset Addn. Phase I	Somerset Addn. Phase I	Residential	W/Q Pond - 4	75.4	Hwy 360	Operating		
WQ17-03	12				W/Q Pond - 5	31.5				
WQ17-04	13				W/Q Pond - 6	15.5				
WQ17-05	14				W/Q Pond - 6-A	26.8				
WQ17-06	15				W/Q Pond - 7	49.7				
WQ17-07	16	Manchester Heights Ph 1	Manchester Heights Ph 1	Residential	Contech CDS 3020-6-C (Lateral A-1)	1.83	715 W Kimball St	Operating	8/7/2017	
WQ17-08	17				Contech CDS 3030-6-C (Lateral A-2)	2.33				
WQ17-09	18	Fieldhouse USA	Shops at Broad	Commercial	Hydrodynamic Separator - Line E	2.58	605 N. US 287	3/3/2017	10/4/2017; 1/5/2018	
WQ17-10	19				Hydrodynamic Separator - Line I	1.96				
WQ17-11	20				Hydrodynamic Separator - Line D	0.34				
WQ17-12	21				Hydrodynamic Separator - Line G	0.96				
WQ17-13	22				Hydrodynamic Separator - Line H	1.12				
WQ17-14	23	Midwest Fasteners	Mansfield Industrial Park Ammendment: Midwest Fasteners	Commercial	Dry Detention	3.8	601 South 5th Ave	8/10/2017		
WQ17-15	24	Storage Facility	Mansfield Public Storage	Commercial	Enhanced Channel	4.42	2430 US 287	9/14/2017	4/23/2018	
WQ17-16	25	Texas Health Resources Rehabilitation Hospital	Texas Health Resource Rehabilitation Hospital	Commercial	Line B, Contech YSHS96	7.38	240 N Miller Rd	Operating. Env Depart was never called back to sign off CO.		
WQ17-17	26				Line C, Contech YSHS84	7.87				
WQ17-18	27	Laderas Ph I	Laderas Ph I	Residential	W/Q Retention Pond Ph I - Trash Rack/Reverse Drain	17.61	1900 Debbie Ln	Installed and under operation.		
WQ17-19	28	Laderas Ph II	Laderas Ph II		W/Q Retention Pond Ph II - Trash Rack/Reverse Drain			Installed and under operation.		
WQ17-21	29	Restaurants	Jacob Back Addition	Commercial	Inlet Baskets		3540-3600 E. BROAD	CO Approved, but still waiting for the filter baskets.		
<b>INSTALLED FISCAL YEAR 2018</b>										
WQ18-01	30	Methodist POB2	Methodist Hospital of Dallas Addn.	Commercial	Contech CDS 5653-10-C (Line A)	7.42	252 N. MATLOCK RD.	1/12/2018	1/12/2018	
WQ18-02	31				Contech CDS 3030-6-C (Line B,C,D)	1.45				
WQ18-03A	32	Main St. Lofts Apartments	Main St. Lofts	Commercial	DS-Stormwater Qty. Unit - Two parallel lines connected to a single inlet and outlet	7.72	751 N. MAIN ST.	4/2/2018	4/2/2018	
WQ18-03B	33									
WQ18-04	34	Assured 360 Partners Addition	Assured Self Storage - 360 Hwy	Commercial	Enhance Swale	3.77	264 N SH 360	6/27/2018	6/27/2018	
WQ18-05	35	Wendy's	Wendy's - Jacob's addition	Commercial	DA-1: Filter baskets - Flexstorm 10' curb inlet - P/N 62HDW/M3	0.57	3750 E Broad St	7/10/2018	7/10/2018	
WQ18-06	36				DA-2: Filter baskets - Flexstorm 10' curb inlet - P/N 62HDW/M3	0.52				
WQ18-07	37	AMC Warehouse	AM-C Warehouse Add	Commercial	Dry Detention	5.13	1212 ANTLER DR	7/31/2018	7/31/2018	
WQ18-08	38				DA-A: Filter Baskets: Flexstorm 6' curb inlet - P/N 62HDW/M2	0.41				
WQ18-09	39	Denny's Restaurant	Lots 1,2 & 3, Block 1 & Lots 1 & 2, Block 2 Jacob Back Addition	Commercial	DA-D: Filter Baskets: Flexstorm 6' curb inlet - P/N 62HDW/M2	0.09	3720 E Broad St	8/13/2018	8/13/2018	
WQ18-10	40				DA-E: Filter Baskets: Flexstorm 6' curb inlet - P/N 62HDW/M2	0.17				
WQ18-11	41	Legend Assisted Living & Memory Care	Legend Mansfield Add	Commercial	Hydroworks Storm Separator, Model HG8 (Line B)	5.32	601 E Debbie Ln.	CO NOT Approved yet		
WQ18-12	42	The Julian at South Pointe	The Julian at South Pointe	Commercial	Baysaver Bayseptors 10 K Left hand Unit (2 manholes in line: 10 ft diameter)	8.36	1300 Lowe St	CO NOT Approved yet	2/14/2019	2/14/2019
WQ18-13	43	Broad St Marketplace	Broad St Marketplace	Commercial	Dry Detention	10.56	3171 & 3141 E Broad St	CO NOT Approved yet		
WQ18-14	44				Contech HS60 Vortsentry - Line B	1.08				
WQ18-15	45				Contech HS96 Vortsentry - Line C	3.41				
WQ18-16	46				Filter Basket	No installed yet				
WQ18-17	47				Filter Basket	No installed yet				
WQ18-18	48	Mill Valley	Mill Valley	Residential	Dry Detention Ponds - BioBasin A&B	18.21	Matlock Dr	03/26/2018: Ponds are in place. Project still in the process of installing the infrastructure. 11/07/2018: Subdivision not accepted yet.		
WQ18-19	49				Dry Detention Ponds - BioBasin C	1.51				
WQ18-20	50				Dry Detention Ponds - BioBasin E	7.61				
WQ18-21	51				Dry Detention Ponds - BioBasin F&G	14.44				
WQ18-22	52	Shops at Broad	Shops at Broad	Commercial	Contech CDS Unit - Line K CDS5668 (11 FT & 11 INCHES)	10.82	1711 E Broad St.	NOTE: Contech CDS Units (9) - 2 Fieldhouse Infrastructure (LINE K, LINE R) / 7 at Shops at Broad Infrastructure (LINE A, LINE B, LINE C, LINE D, LINE H, LINE I, LINE J)		
WQ18-23	53				Contech CDS Unit - Line R CDS4040 (9.5 FT DIA)	2.99				
WQ18-24	54				Contech CDS Unit - Line A (LAT A-2) CDS4040 (9.5 FT DIA)	3.26				
WQ18-25	55				Contech CDS Unit - Line B CDS9280 (13 FT & 11 1/4 INCHES)	15.58				
WQ18-26	56				Contech CDS Unit - Line C CDS3020 (10 FT & 3 3/4 INCHES)	1.00				
WQ18-27	57				Contech CDS Unit - Line D CDS5678 (11 FT & 11 INCHES)	11.43				
WQ18-28	58				Contech CDS Unit - Line H CDS3035 (8 FT & 4 INCHES)	2.17				
WQ18-29	59				Contech CDS Unit - Line I CDS5653 (11 FT & 11 INCHES)	5.00				
WQ18-30	60				Contech CDS Unit - Line J CDS4045 (9.5 FT DIA)	4.17				
WQ18-31	61									
WQ18-32	62				Inlet Basket 1	0.8		3/7/2019	3/7/2019	3/7/2019
WQ18-33	63				Inlet Basket 2	1.16		3/7/2019	3/7/2019	3/7/2019
WQ18-34	64				Inlet Basket 3	1.1		3/7/2019	3/7/2019	3/7/2019
					Inlet Basket 4	1.06		3/7/2019	3/7/2019	3/7/2019

**POST CONSTRUCTION UNITS: PERMITTED, INSTALLED AND OPERATING PER FISCAL YEAR**

ID Num.	UNIT	COMMON NAME	PLAT NAME	CATEGORY
<b>INSTALLED FISCAL YEAR 2017</b>				
WQ17-01	9	Dollar General	R&C Business Center	Commercial
WQ17-02	11	Somerset Addn. Phase I	Somerset Addn. Phase I	Residential
WQ17-03	12			
WQ17-04	13			
WQ17-05	14			
WQ17-06	15			
WQ17-07	16	Manchester Heights Ph 1	Manchester Heights Ph 1	Residential
WQ17-08	17			
WQ17-09	18	Fieldhouse USA	Shops at Broad	Commercial
WQ17-10	19			
WQ17-11	20			
WQ17-12	21			
WQ17-13	22			
WQ17-14	23	Midwest Fasteners	Mansfield Industrial Park Ammendment: Midwest Fasteners	Commercial
WQ17-15	24	Storage Facility	Mansfield Public Storage	Commercial
WQ17-16	25	Texas Health Resources Rehabilitation Hospital	Texas Health Resource Rehabilitation Hospital	Commercial
WQ17-17	26			
WQ17-18	27	Laderas Ph I	Laderas Ph I	Residential
WQ17-19	28	Laderas Ph II	Laderas Ph II	
WQ17-21	29	Restaurants	Jacob Back Addition	Commercial

**INSTALLED FISCAL YEAR 2018**

WATER QUALITY DEVICE	Area Treated (acre)	ADDRESS
Extended Release Det. Pond	1.43	2851 N MAIN
WQ Pond - 4	75.4	Hwy 360
WQ Pond - 5	31.5	
WQ Pond - 6	15.5	
WQ Pond- 6-A	26.8	
WQ Pond - 7	49.7	
Contech CDS 3020-6-C (Lateral A-1)	1.83	
Contech CDS 3030-6-C (Lateral A-2)	2.33	
Hydrodynamic Separator - Line E	2.58	605 N. US 287
Hydrodynamic Separator - Line I	1.96	
Hydrodynamic Separator - Line D	0.34	
Hydrodynamic Separator - Line G	0.96	
Hydrodynamic Separator - Line H	1.12	
Dry Detention	3.8	601 South 5th Ave
Enhanced Channel	4.42	2430 US 287
Line B, Contech VSHS96	7.38	240 N Miller Rd
Line C, Contech VSHS84	7.87	
WQ Retention Pond Ph I - Trash Rack/Reverse Drain	17.61	1900 Debbie Ln
WQ Retention Pond Ph II - Trash Rack/Reverse Drain		
Inlet Baskets		3540-3600 E. BROAD

FINAL INSPECTION APPROVAL (CO)	Last Inspection Date	Last Maintenance Date
4/17/2017		
4/17/2017	7/16/2019	
Operating		
Operating	8/7/2017	
3/3/2017	10/4/2017; 1/5/2018	
8/10/2017		
9/14/2017	4/23/2018	
Operating. Env Depart was never called back to sign off CO.		
Installed and under operation.		
Installed and under operation.		
CO Approved, but still waiting for the filter baskets.		



ID	Shape *	ID	DESCRIPT	SIZE	TYPE	NOTES	ELEVATION	UNQ_ID	X_NAD83	Y_NAD83	UPDATED	ID_XY	YR_INST	FISCAL_YR	SOURCE	HOTLINK
6986	Point	WQ18-40	FILTER BASKET	18	BC-CURB-FC		0	17334	2395750.952803	6887493.06712	9/27/2018	2395750.95280337_6887493.06712043	2018	18-19	Steadfast	K:\Environm
6987	Point	WQ18-39	SEPARATOR	72	VSHS72	CONTECH VO	0	17335	2395559.012699	6887373.503318	9/27/2018	2395559.0126992_6887373.50331837	2018	18-19	Steadfast	K:\Environm
6968	Point	WQ18-30	SEPARATOR	9.5	CDS4045	LINE J	0	17316	2395001.178284	6893924.744544	12:00:00 A	2395001.17828429_6893924.74454385	0			
6967	Point	WQ18-29	SEPARATOR	11.11	CDS5653	LINE I	0	17315	2395106.907451	6893852.348711	12:00:00 A	2395106.90745095_6893852.34871052	0			K:\Environm
6966	Point	WQ18-28	SEPARATOR	8.4	CDS3035	LINE H	0	17314	2394948.487312	6893074.136905	12:00:00 A	2394948.48731206_6893074.13690496	0			K:\Environm
6965	Point	WQ18-27	SEPARATOR	11.11	CDS5678	LINE D	0	17313	2395481.37215	6893345.823826	12:00:00 A	2395481.37215003_6893345.82382625	0			K:\Environm
6964	Point	WQ18-26	SEPARATOR	10.4	CDS3020	LINE C	0	17312	2394570.43465	6894200.25091	12:00:00 A	2394570.43465002_6894200.25090958	0			K:\Environm
6963	Point	WQ18-25	SEPARATOR	13.11	CDS9280	LINE B	0	17311	2394345.993099	6894122.805886	12:00:00 A	2394345.9930991_6894122.80588643	0			K:\Environm
6962	Point	WQ18-24	SEPARATOR	9.5	CDS4040	LINE A	0	17310	2394404.557914	6894035.942461	12:00:00 A	2394404.55791391_6894035.94246051	0			K:\Environm
6961	Point	WQ18-23	SEPARATOR	9.5	CDS4040	LINE R	0	17309	2395026.353342	6894089.537657	12:00:00 A	2395026.35334216_6894089.53765727	0			K:\Environm
6960	Point	WQ18-22	SEPARATOR	11.11	CDS5668	LINE K	0	17308	2394532.138932	6894343.48731	12:00:00 A	2394532.13893243_6894343.48731005	0			K:\Environm
6959	Point	WQ18-21	POND	43250	DRY POND	BASIN F&G	0	17307	2404951.59893	6881287.729931	12:00:00 A	2404951.59893022_6881287.72993096	0			K:\Environm
6958	Point	WQ18-20	POND	22809	DRY POND	BASIN E	0	17306	2404345.001708	6881050.577153	12:00:00 A	2404345.00170797_6881050.57715317	0			K:\Environm
6957	Point	WQ18-19	POND	4582	DRY POND	BASIN C	0	17305	2404310.97393	6881205.438264	12:00:00 A	2404310.97393019_6881205.43826429	0			K:\Environm
6956	Point	WQ18-18	POND	54593	DRY POND	BASIN A&B	0	17304	2404745.999972	6881371.236875	12:00:00 A	2404745.99997188_6881371.23687541	0			K:\Environm
5928	Point	WQ18-15	SEPARATOR	9.5	CONTECH HS96	LINE C	0	16243	2403928.09951	6895244.357993	7/16/2014	2403928.09950989_6895244.35799298	0			
5921	Point	WQ18-14	SEPARATOR	6	CONTECH HS60	LINE B	0	16236	2403703.968723	6895639.98325	7/16/2014	2403703.96872288_6895639.9832502	0			
6955	Point	WQ18-13	POND	45302.4	DRY POND		0	17303	2403050.605007	6895506.268705	12:00:00 A	2403050.60500666_6895506.2687047	0			K:\Environm
6954	Point	WQ18-12	SEPARATOR	10	BAYSEPARATOR	BAYSAVER	0	17302	2404114.390452	6883326.429294	12:00:00 A	2404114.39045233_6883326.42929432	0			K:\Environm
6953	Point	WQ18-11	SEPARATOR	8	HYDROWORKS H	LINE B	0	17301	2389780.280603	6904015.049821	12:00:00 A	2389780.28060348_6904015.04982058	0			K:\Environm
6951	Point	WQ18-10	FILTER BASKET	6	NOT INSTALLED		0	17299	2407036.50187	6896426.94902	12:00:00 A	2407036.50186972_6896426.94901975	0			K:\Environm
6950	Point	WQ18-09	FILTER BASKET	6	NOT INSTALLED		0	17298	2406979.227564	6896541.462909	12:00:00 A	2406979.22756416_6896541.46290863	0			K:\Environm
6949	Point	WQ18-08	FILTER BASKET	6	NOT INSTALLED		0	17297	2406840.812489	6896465.553259	12:00:00 A	2406840.81248893_6896465.55325874	0			K:\Environm
6952	Point	WQ18-07	POND	10890	DRY POND		0	17300	2389194.272574	6883790.057959	12:00:00 A	2389194.27257401_6883790.05795852	0			K:\Environm
6947	Point	WQ18-06	FILTER BASKET	10	FLEXSTORM 62H	DA-2	0	17295	2407048.084624	6896571.093985	12:00:00 A	2407048.08462435_6896571.09398498	0			K:\Environm
6948	Point	WQ18-05	FILTER BASKET	10	FLEXSTORM 62H	DA-1	0	17296	2407062.407541	6896518.35961	12:00:00 A	2407062.40754102_6896518.35960998	0			K:\Environm
6907	Point	WQ18-04	SWALE	15987	ENHANCE		0	17255	2405477.076271	6890340.281958	12:00:00 A	2405477.07627096_6890340.28195759	0			K:\Environm
6906	Point	WQ18-03B	ADS WQ UNIT	5	CORRUGATED PIP	MODEL 6040	0	17254	2385855.281852	6893533.633962	12:00:00 A	2385855.28185181_6893533.63396209	2018	17-18		X:\Construct
6905	Point	WQ18-03A	ADS WQ UNIT	5	CORRUGATED PIP	MODEL 6040	0	17253	2385867.11389	6893540.369122	12:00:00 A	2385867.11388965_6893540.3691221	0			X:\Construct
6812	Point	WQ18-02	SEPARATOR	6	CONTECH CDS30		0	17159	2401452.993148	6892026.033345	1/16/2018	2401452.99314779_6892026.03334488	2018	17-18	Methodist	K:\Environm
6806	Point	WQ18-01	SEPARATOR	10	CONTECH CDS56		0	17153	2401298.197141	6891552.844687	1/16/2018	2401298.19714085_6891552.84468745	2018	17-18	Methodist	K:\Environm
6904	Point	WQ17-21	POND	55060	RETENTION POND		0	17252	2398957.798289	6906586.732646	12:00:00 A	2398957.79828914_6906586.73264552	2018	17-18	18-003	K:\Environm
6903	Point	WQ17-20	POND	41817	RETENTION POND		0	17251	2396954.553497	6907026.885919	12:00:00 A	2396954.55349747_6907026.88591933	2018	17-18	18-003	K:\Environm
6793	Point	WQ17-17	SWALE	7452	ENHANCED DRY	WQV-3	0	17138	2383178.819159	6906996.83307	12:00:00 A	2383178.81915905_6906996.8330705	2016	15-16		K:\Environm
6946	Point	WQ17-17	SEPARATOR	10	CONTECH VSHS8	(LINE C)	0	17294	2403645.17927	6891277.412732	12:00:00 A	2403645.17927027_6891277.41273188	0			K:\Environm
6792	Point	WQ17-16	SWALE	7110	ENHANCED DRY	WQV-2	0	17137	2383072.916381	6906989.541404	12:00:00 A	2383072.91638127_6906989.54140383	2016	15-16		K:\Environm
6945	Point	WQ17-16	SEPARATOR	10	CONTECH VSHS9	(LINE B)	0	17293	2404350.734826	6891700.806829	12:00:00 A	2404350.73482583_6891700.8068291	0			K:\Environm
6791	Point	WQ17-15	SWALE	4086	ENHANCED DRY	WQV-1	0	17136	2382988.194159	6906989.194182	12:00:00 A	2382988.19415904_6906989.19418161	2016	15-16		K:\Environm
6790	Point	WQ17-14	POND	15475		WQ VOL CUB	0	17135	2384279.834061	6886880.616346	12:00:00 A	2384279.83406067_6886880.61634599	2017	17-18		K:\Environm
6786	Point	WQ17-13	SEPARATOR	6	RINKER STC900 L		0	17130	2394054.577748	6894307.403424	12:00:00 A	2394054.57774817_6894307.40342441	2017	16-17		K:\Environm
6785	Point	WQ17-12	SEPARATOR	6	RINKER STC900 L		0	17129	2393990.775665	6894409.096133	12:00:00 A	2393990.77566484_6894409.09613274	2017	16-17		K:\Environm
6784	Point	WQ17-11	SEPARATOR	6	RINKER STC900 L		0	17128	2393934.265248	6894502.715924	12:00:00 A	2393934.26524817_6894502.71592441	2017	16-17		K:\Environm
6788	Point	WQ17-10	SEPARATOR	10	RINKER STC4800		0	17132	2394218.343663	6894304.514246	12:00:00 A	2394218.34366252_6894304.51424618	2017	16-17		K:\Environm
6787	Point	WQ17-09	SEPARATOR	10	RINKER STC4800		0	17131	2394030.214322	6894609.301573	12:00:00 A	2394030.21432224_6894609.30157256	2017	16-17		K:\Environm
6795	Point	WQ17-08	SEPARATOR	6	CONTECH CDS30		0	17140	2384717.867183	6889326.024415	12:00:00 A	2384717.86718262_6889326.02441271	0			K:\Environm
6794	Point	WQ17-07	SEPARATOR	6	CONTECH CDS30		0	17139	2384721.799474	6889302.847331	12:00:00 A	2384721.79947429_6889302.84733138	0			K:\Environm
6800	Point	WQ17-06	POND	509814	POND 7	WQ VOL CUB	0	17145	2404768.645539	6873825.674299	12:00:00 A	2404768.64553922_6873825.67429886	0			K:\Environm
6798	Point	WQ17-05	POND	508115	POND 6A	WQ VOL CUB	0	17143	2404824.201095	6875003.452077	12:00:00 A	2404824.20109478_6875003.45207665	0			K:\Environm

FID	Shape *	ID	DESCRIPT	SIZE	TYPE	NOTES	ELEVATION	UNQ_ID
6986	Point	WQ18-40	FILTER BASKET	18	BC-CURB-FC		0	17334
6987	Point	WQ18-39	SEPARATOR	72	VSHS72	CONTECH VO	0	17335
6968	Point	WQ18-30	SEPARATOR	9.5	CDS4045	LINE J	0	17316
6967	Point	WQ18-29	SEPARATOR	11.11	CDS5653	LINE I	0	17315
6966	Point	WQ18-28	SEPARATOR	8.4	CDS3035	LINE H	0	17314
6965	Point	WQ18-27	SEPARATOR	11.11	CDS5678	LINE D	0	17313

X_NAD83	Y_NAD83	UPDATED	ID_XY	YR_INST	FISCAL_YR	SOURCE	HOTLINK
2395750.952803	6887493.06712	9/27/2018	2395750.95280337_6887493.06712043	2018	18-19	Steadfast	K:\Environm
2395559.012699	6887373.503318	9/27/2018	2395559.0126992_6887373.50331837	2018	18-19	Steadfast	K:\Environm
2395001.178284	6893924.744544	12:00:00 A	2395001.17828429_6893924.74454385	0			
2395106.907451	6893852.348711	12:00:00 A	2395106.90745095_6893852.34871052	0			K:\Environm
2394948.487312	6893074.136905	12:00:00 A	2394948.48731206_6893074.13690496	0			K:\Environm
2395481.37215	6893345.823826	12:00:00 A	2395481.37215003_6893345.82382625	0			K:\Environm



After review, does your community have any post construction water quality measures?

Yes

No, for sure



# Conclusion

- Objective and equitable
  - All sites are treated equally
- Flexible
  - Developers are able to propose anything they feel may work
- Does not address existing development
- Outcomes unknown
  - Maintenance will be mostly performed by private companies therefore we will not have data on amount of material removed

# This presentation was:

Educational

Informative

Unhelpful

Too detailed

Not detailed enough

Helpful



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