


MUNICIPAL BMP “SHOW & TELL”

MAY 11, 2021

MICROSOFT TEAMS

AGENDA

- Welcome & Housekeeping
- Poll Questions
- Speakers
  - Perry Harts, City of Frisco
  - Echo Rexroad, City of Plano
  - Cody Cash, City of Irving
  - Howard Redfearn, City of Mansfield
  - Amesha Morris, City of McKinney
- Q&A Roundtable
- NCTCOG Resources
- Thank You & Conclusion

WELCOME & HOUSEKEEPING

- Please keep your line on mute until the end of all the presentations.

- We will have an open Q&A session at the end of the presentations. Please type your question in the chat box or type in your request to speak.

- The webinar slides and recording will be posted on NCTCOG's website under green banner called "Webinars" at the link below. Follow-up emails to come.

- https://www.nctcog.org/envir/natural-resources/water-resources

****Information provided in this webinar and presentation regarding any specific commercial product by trade name, manufacture or otherwise does not constitute or imply its endorsement, recommendation or approval by the Regional Stormwater Management Coordinating Council (RSWMCC) or NCTCOG.****

North Central Texas Council of Governments

SPEAKERS

Perry Harts

Echo Rexroad

Cody Cash

Howard Redfearn

Amesha Morris

PERRY HARTS, P.E., CPMSM

City of Frisco

Perry L. Harts, P.E has 34 years of experience in municipal government in the north central Texas area. He has been with the City of Frisco since 1999. In 2010 he helped create the stormwater division which includes environmental compliance and infrastructure. He is currently division manager. He is a Professional Engineer and Certified Professional in Stormwater Management (CPMSM).

North Central Texas Council of Governments

Best Management Practices (BMPs)

Show and Tell

5/11/21

Frisco's Show & Tell

4 BMPs

4 BMPs


FRISCO
PROGRESS IN MOTION
46029
COMDEX
TYMCO
WACO
TEXAS
REGENERATIVE AIR SYSTEMS
TYMCO
WACO, TEXAS
600
AIR SWEEPER

Street Sweeping

FRISCO

Street Sweeping

3 Types of Sweeping

- Contract Sweeping (Regenerative)
  - 2 times per month thoroughfares
  - 1 per month collectors
  - Sand removal
- In House Sweeping (1 Regenerative)
  - City yards
  - Residential as needed
  - Sand removal
- Broom
  - Emergency Cleanups
  - Pool broom for crews to cleanup messes

FRISCO


SWEEPMASTER 300™
ASEC
1-800-687-0008
WARNING
STAND CLEAR OF BROOM. MINIMUM DISTANCE 50 FT., WHEN MACHINE IS IN OPERATION OR ENGINE IS RUNNING
DANGER
NO RIDERS
LAYMOR

Street Sweeping

- 30 minutes training needed to operate.
- Airconditioned cab
- Crew cleanup after themselves
- Paid by stormwater.

Street Sweeping

- Waste management
  - Central location for dumping
  - The waste then hauled to landfill by stormwater crews
  - It is weighed and tickets archieved
  - Sweeping after snow event- 254 tons
  - Reported on the annual report
    - 2020 523 tons
    - 2019 804 tons

5. Pollution Prevention and Good Housekeeping for Municipal Operations	27. Disposal of Collected	Removal and disposal of debris from MS4	804 Tons	Yes. Pollutants are physically removed.

Street Sweeping

Lessons Learned

- Central location for dumping debris
- Do an RFP for contract sweeping not straight bid
- Record weight and report on annual report
- Make it easy to clean up messes
- For more info on street sweeping contact plharts@friscotexas.gov


600
TYMCO
REGENERATIVE AIR SYSTEMS
WACO, TEXAS
FRISCO
TYMCO
WACO, TEXAS
U.S.A.


FRISCO
Adopt a Street
Titan
Theatre

Adopt-A-Street

- Trash is largest pollutant by volume.
- It is in the MS4.
- It is a force multiplier.

Adopt-A-Street

- Approach
- Documentation to include CY
  - 2020- 49 CY
  - 2019- 413 CY

MCM(s)	BMP	Information Used	Quantity	Units	Does BMP Demostrate a Direct Reduction in Pollutants?
1. Public Education, Outreach, and Involvement	7. Waste Cleanup	Waste collected at Environmental Collection Center.	4,070	Tons	Partial. This ensures potential pollutants are properly disposed and eliminates the potential of becoming an illicit discharge.
1. Public Education, Outreach, and Involvement 2. Illicit Discharge Detection and Elimination (IDDE)	8. Adopt-a-Street	Pick up and disposal of debris along streets.	413	Cubic Yards	Yes. Pollutants are physically removed.

Adopt-A-Street

Lessons Learned

- Documentation
  - Spatial like Cityworks
  - Include measurements for reporting

- Contact Julianah Marie at JMarie@friscotexas.gov for more info.

And Beyond

Adopt-A-Street

Types of Construction

Civil Construction

- Infrastructure such as mass grading, roads, bridges, water and sewer systems.

Building Construction

- Structures especially single family.

Building Sites

Differences between Builders and Civil Contractors

- Some are mom-and-pop builders
- Most work performed by subs
- Higher turnover of management
- Management has fewer controls on trade people on the job site.
- Trash
- Concrete waste
- Track out
- Trash

Inspection for Single Family Construction

Builder's Audit

- **Narrative, Project Description – Potential pollutants, schedule of sequence of activities, total acreage,**
- Amendments – Notice of change (NOC), Log of Amendments
- **Certification Page**
- **Delegation Letters**
- **Notice of Intent (NOI)**
- **TCEQ Certificate**
- **BMP Specs and Details** – including Track-out control, dust control
- Plans - Erosion and Sediment Control Plan, Drainage Plans, Grading Plans, Soil Testing Data
- Spill Prevention Control and Countermeasures (SPCC)
- **Weekly Inspection Form**
- **Qualified Inspector Form**
- **Posted Site Notice –** Primary Operator (Posted), Secondary Operator (for large constructions sites)
- **Site Map - With Legend, Concrete Washout Station**
- **Site Map – Marked BMPs, Silt Fence, Curlex, Inlets Location**
- Endangered Species
- Historical Preservation
- **Construction General Permit**
- **Notice of Termination –** Inform builder to: Submit to TCEQ within 30 days of final stabilization of all portions of site. Submit to City of Frisco at ms4@friscotexas.gov

Inspection for Single Family Construction

Concrete Washout

Inspection for Single Family Construction

Masonry Cleanup Discharge

Masonry Cleanup Discharge

Downstream
kids are playing in it.

Trash Bin

Inspection for Single Family Construction

Ordinance Change in 2016

- Additional requirements when right of way disturbed.
- Required the clean up of pollutants in street at end of workday
- Additional controls on stockpiles in ROW
- Prohibited inlet protection

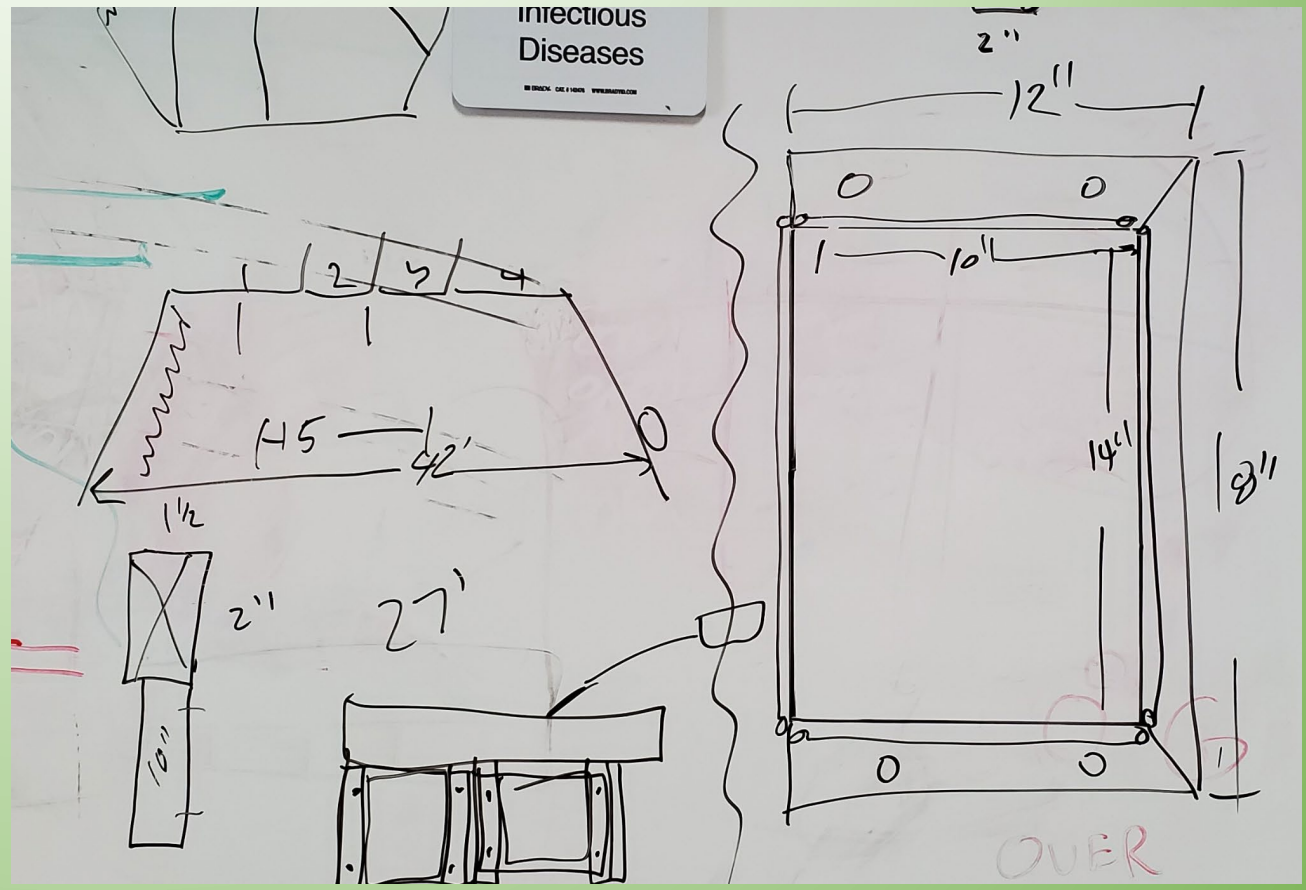
Sand Containment

Inspection for Single Family Construction

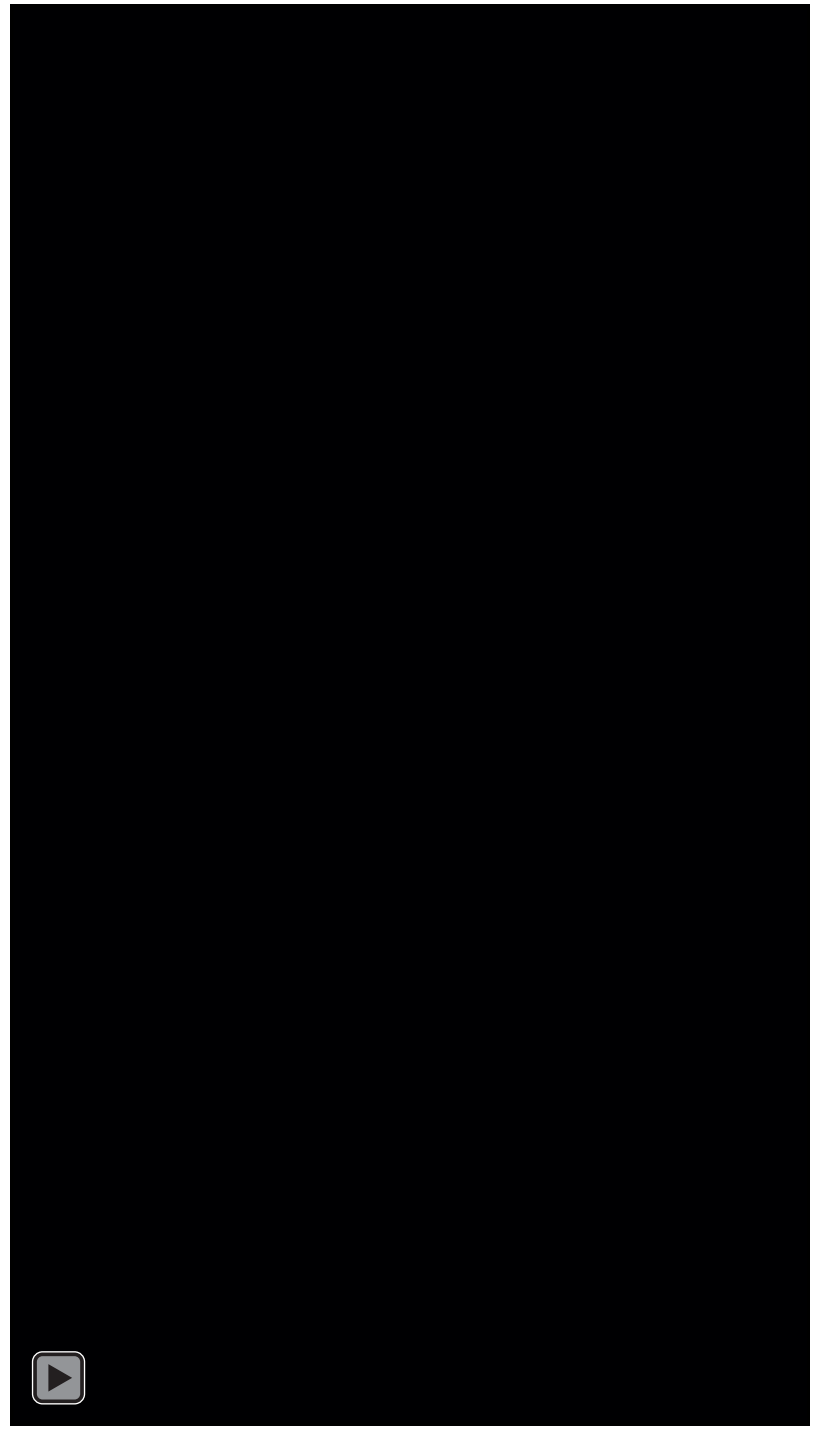
- Lessons Learned
  - Different strategy than civil
  - Zero tolerance on concrete spills
  - Tame the wild west (as much as possible)
  - Audit processes don’t do their inspections
  - Additional requirements in ROW.
  - For more info contact Chris Collis at Ccollis@friscotexas.gov

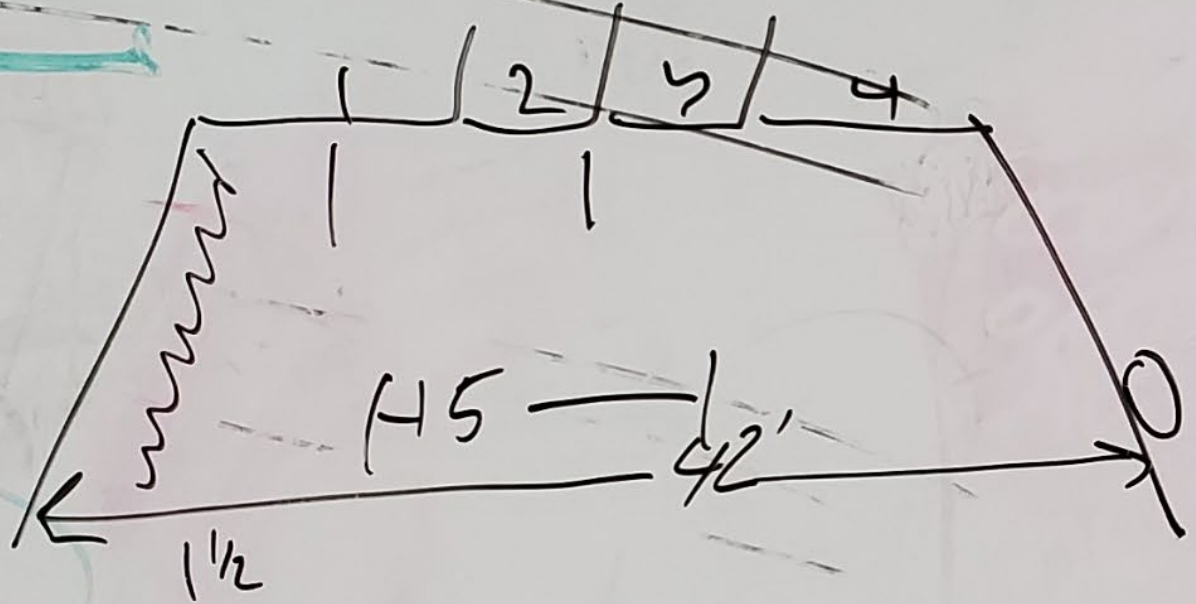
Prototype Trash Rack

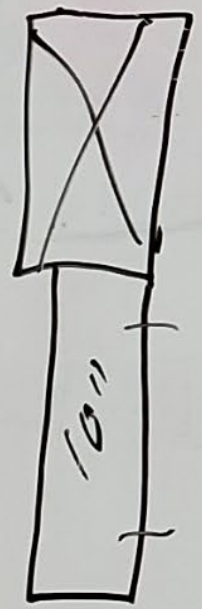
- MS4 Phase 2 Tier 4.
- Sketch on the board
- Break away approach
  - Ensure does not back up flood waters
  - Possibly forgo a flood study
  - Simplifies the design.
- Fabricated in house



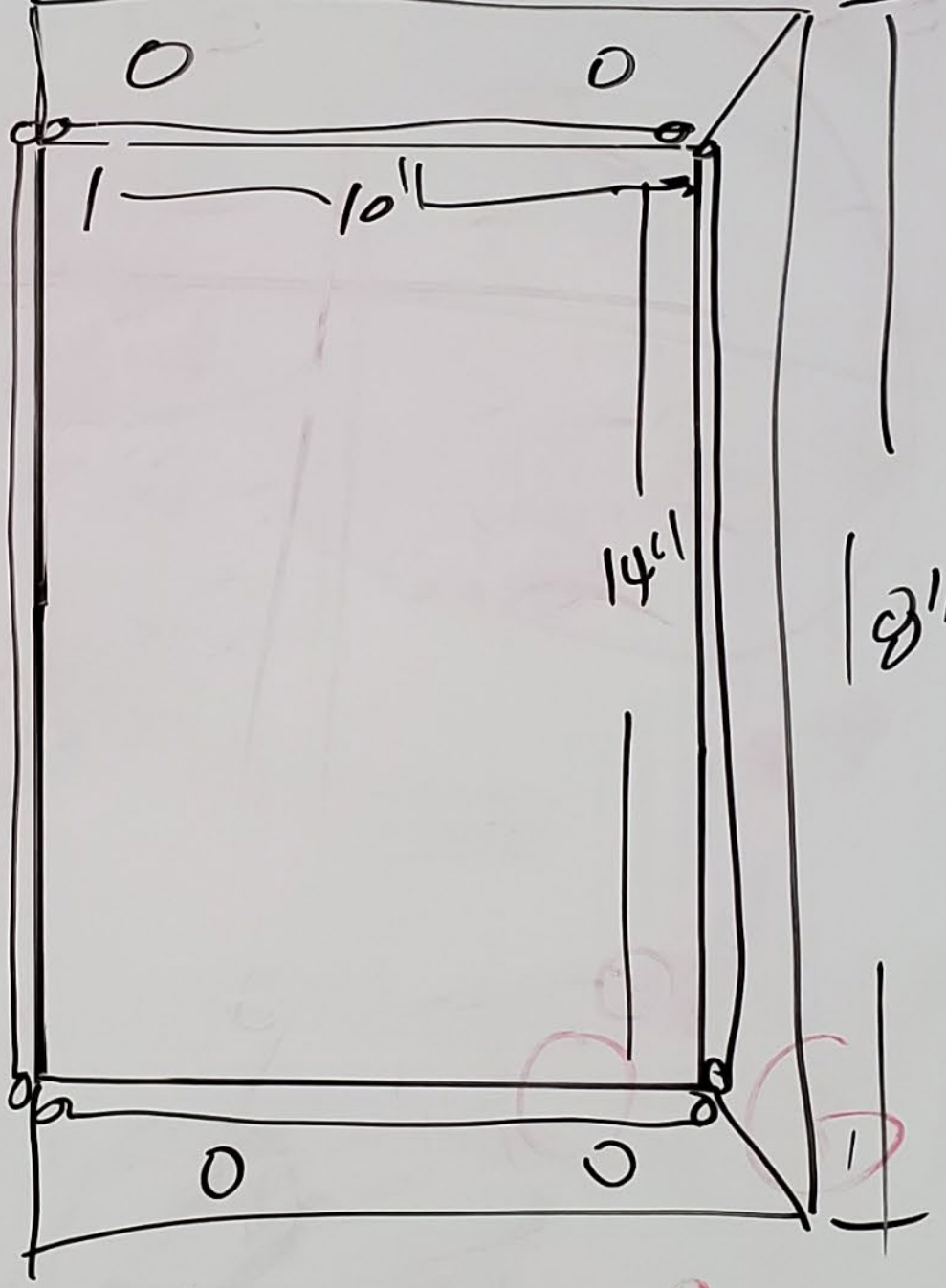
Prototype Trash Rack

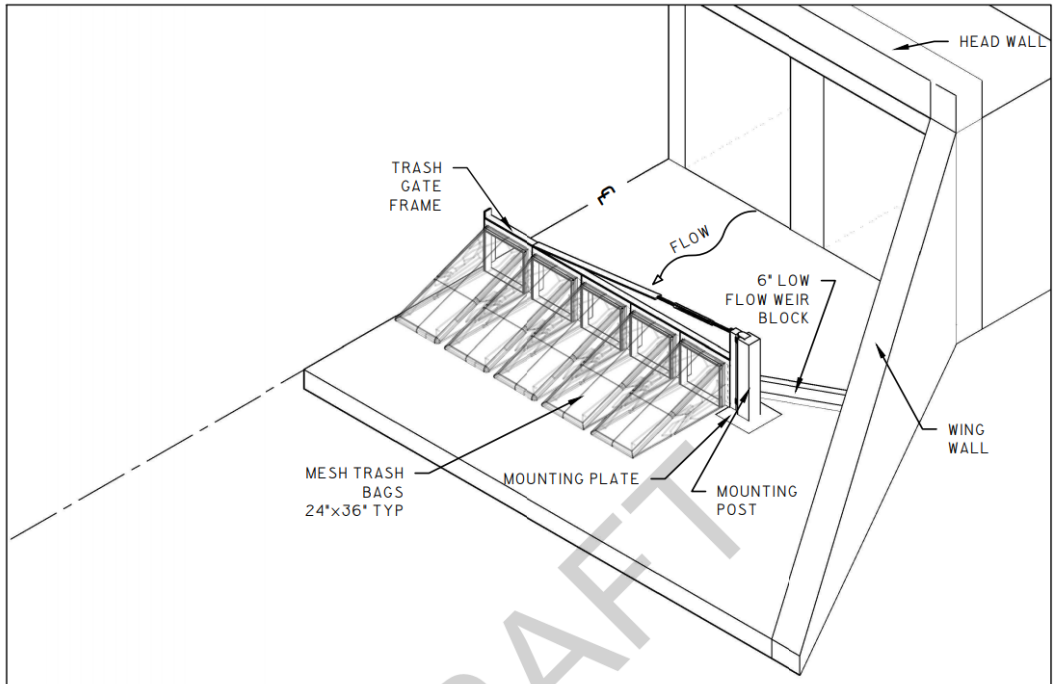




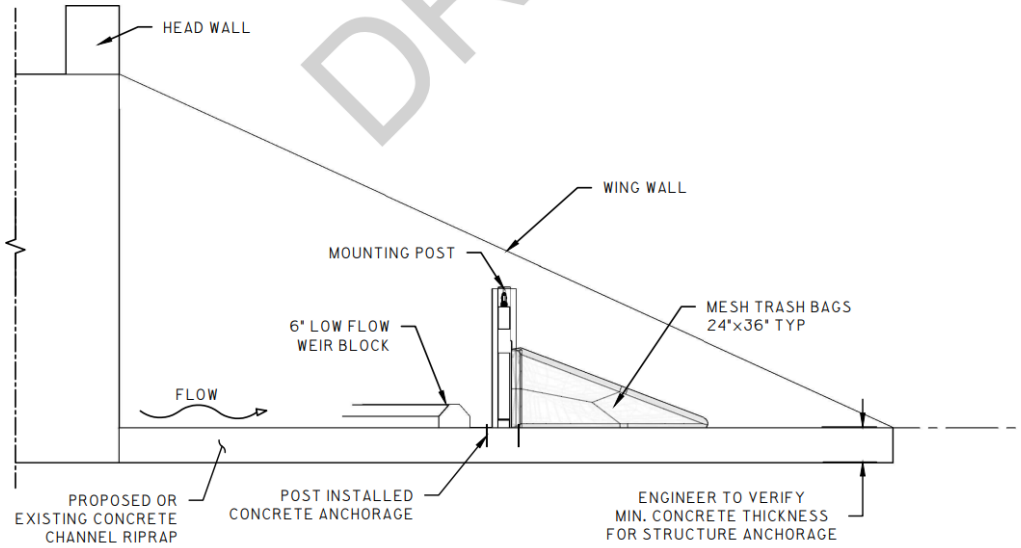


27"



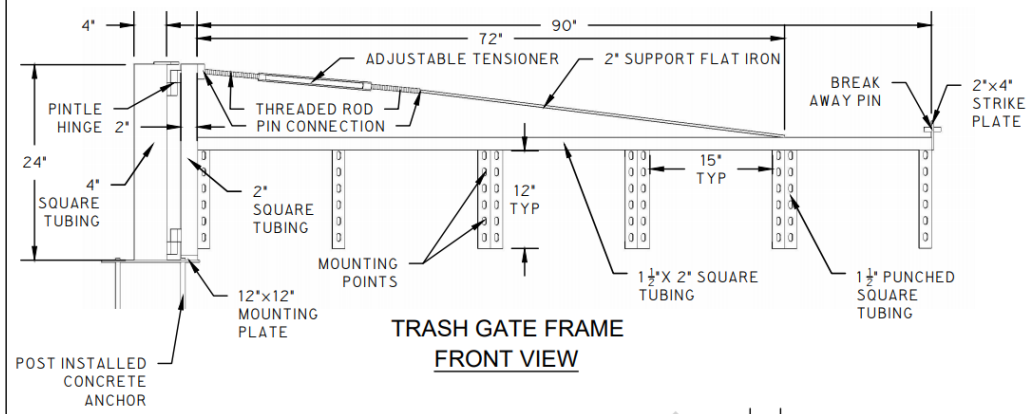


HALF ISOMETRIC VIEW

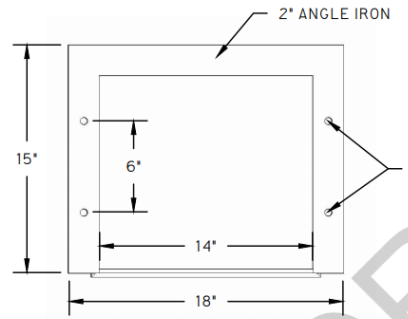


SIDE VIEW WITH HEADWALL

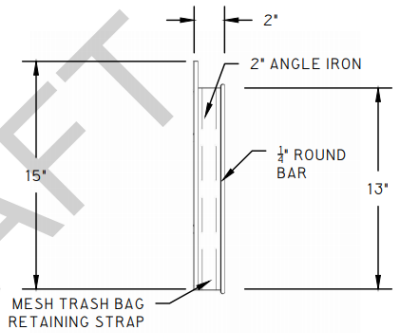
FIGURE X.XX TRASH GATE ISOMETRIC



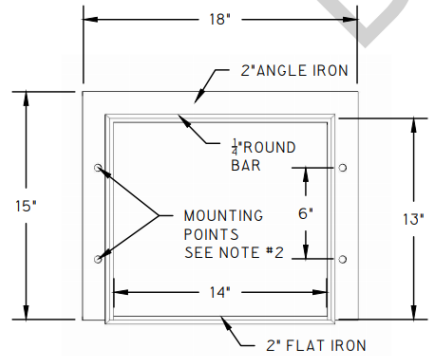
TRASH GATE FRAME
FRONT VIEW



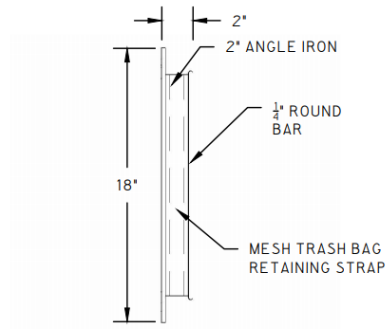
TRASH BAG BRACKET
FRONT VIEW



TRASH BAG BRACKET
SIDE VIEW



TRASH BAG BRACKET
BACK VIEW



TRASH BAG BRACKET
TOP VIEW

NOTES:
1. ALL MATERIAL UNLESS OTHERWISE NOTED IS NUMBER 3 GAUGE PAINTED STEEL WELDED CONNECTIONS.
2. ATTACH USING ½" ×2" THREADED BOLTS WITH ½" WASHERS AND NUTS.

FIGURE X.XX TRASH GATE PLAN

Prototype Trash Rack

- Installed in Nov 2020
- Debris collected in Nov and Dec 2020 was 342 pounds.

2. Illicit Discharge Detection and Elimination (IDDE)	9. Floatables	Floatable debris collected.	342 Pounds	Yes. Pollutants are physically removed.

Prototype Trash Rack

Lessons learned

- We may have more trash in the creek than imagined.
- Use hinges with steal ball bearings
- Use break away pins
- For more info contact Brandon Smith at Bsmith1@friscotexas.gov or plharts@friscotexas.gov.

City of Frisco

Stormwater Management Program

Plano
City of Excellence

Echo is the Environmental Quality Manager for the City of Plano, Texas where she oversees the City's Municipal Separate Storm Sewer System permit with the Texas Commission on Environmental Quality. In addition, Ms. Rexroad manages programs for stormwater, vector, pretreatment, noise, light and liquid waste management and currently serves as Vice Chair for the North Central Texas Council of Governments' Regional Stormwater Management Coordinating Council. Ms. Rexroad is a Registered Environmental Manager and received her Bachelor of Science degree from Texas A&M University and her Master of Science degree from Utah State University.

ECHO REXROAD

City of Plano

North Central Texas Council of Governments

Plano
City of Excellence

BMP Show and Tell

Echo Rexroad, Environmental Quality Manager
erexroad@plano.gov

Overview

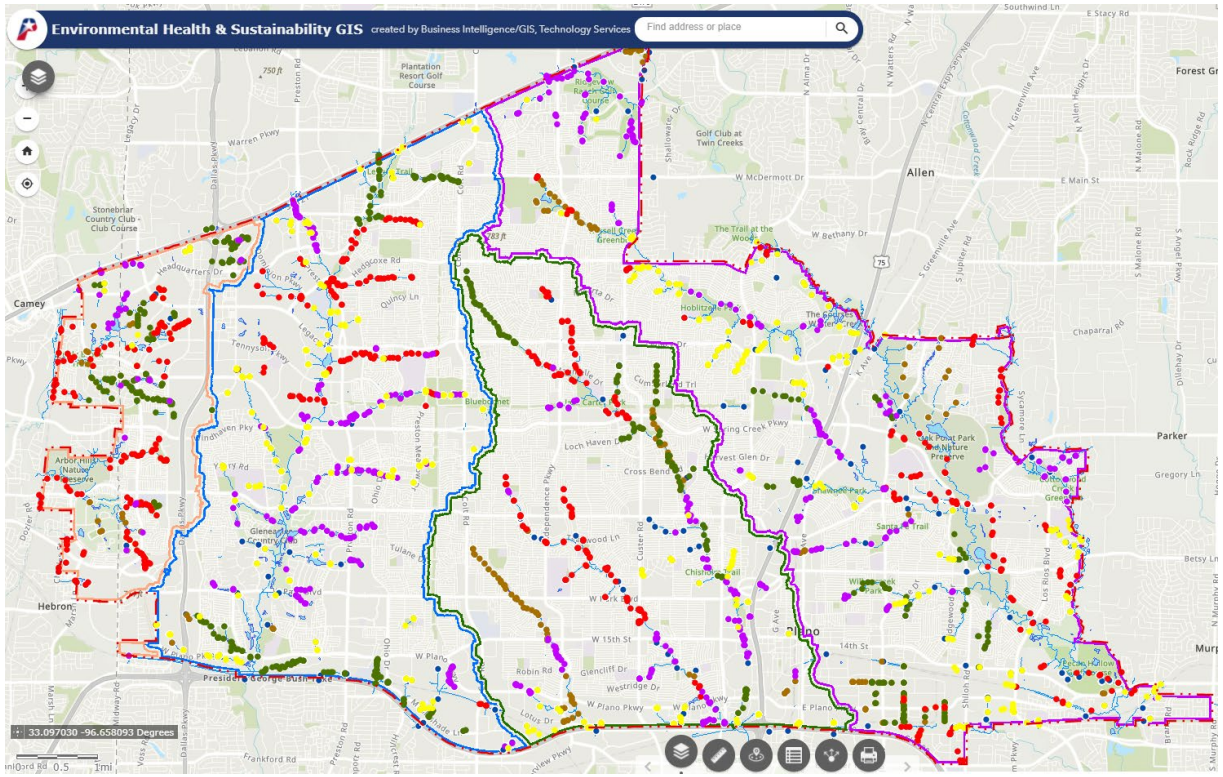
- Dry Weather Screening Program (IDDE)
- Auto Related Business Inspection Program
- Household Hazardous Waste Collection
- Floatables Removal

ILLICIT DISCHARGE DETECTION and ELIMINATION (IDDE)




IDDE

- 3,000 major outfalls
- Inspect 20% per year for 5 year permit term; 600/year
- 4 Environmental Quality Specialists; 150/year/Specialist
- Sample during dry weather, <0.1 inch in last 72 hours
- Palin test kit (iron, copper, nitrate, phosphate), NH_3, pH, DO, chlorine, and conductivity meters



AUTO RELATED BUSINESS INSPECTION

- 300 facilities inspected per year by 4 Environmental Quality Specialists
- Inspect for:
  - Chemical spills
  - Proper storage and disposal of chemicals, tires and equipment
  - Standing water issues (vector)
  - Sand/grit traps and floor drains
- Ordinances and enforcement

Household Hazardous Waste Curbside Collection

- Call or submit online requests to schedule free collection at least 24 hours prior to scheduled day
- Collect by zip code once per week
- No drop off service available
- 15-gallon limit for each collection event
- Commercial waste not accepted

HHW Contract

- $94K annual contract with “Clean Earth” (formerly Stericycle)
- Items that cannot be placed in the residents reuse center are packed in drums after collection for proper shipping

Reuse Center

- Properly labeled items collected through residential chemical collections
- Free for residents to take and use
- Usually open Wednesdays, 11 a.m. - 1 p.m. and Saturdays, 9 a.m. - 11 a.m.
- Chemical drop-off not accepted at the Reuse Center

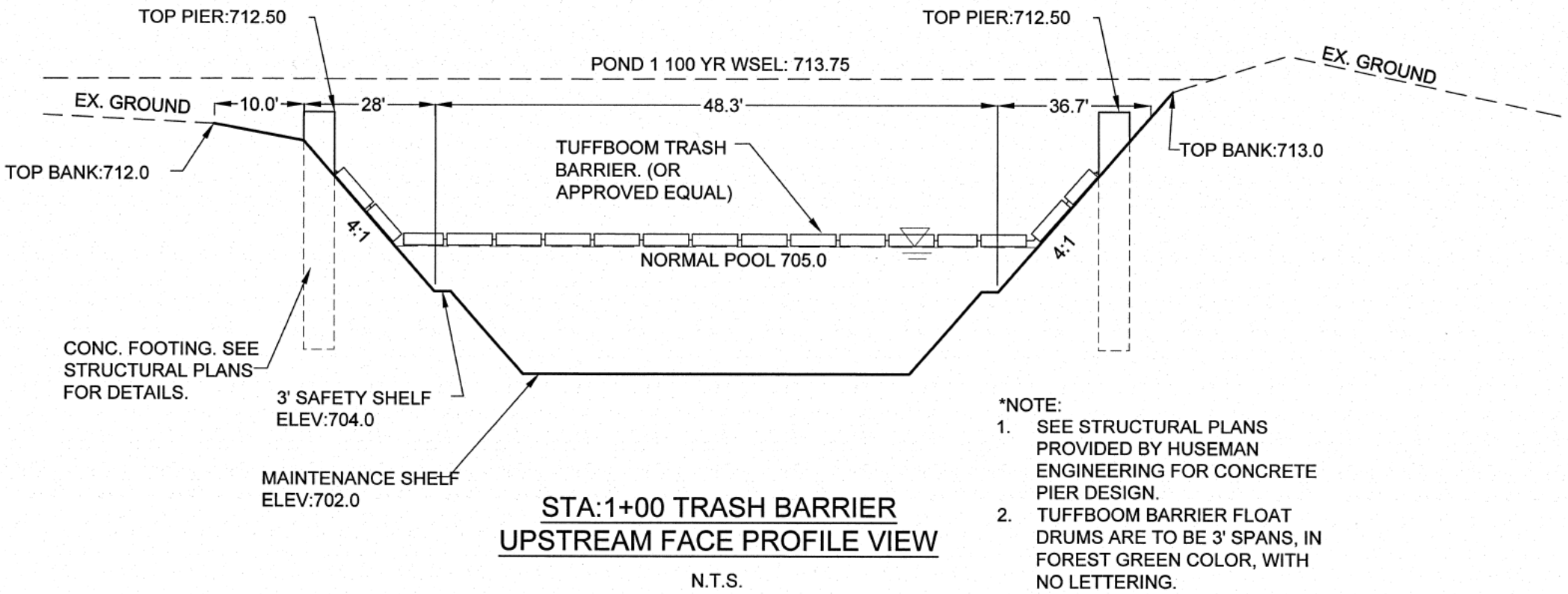
Hoblitzelle Park Floatables Removal

- Type: Trash rack at riser
- Year installed: NA
- Cost to install: $1,000
- Cost to maintain: $480
- Removal frequency per year: 6
- Approximate amount removed per year: 20 cubic yards

Carpenter Park Floatables Removal

- Type: Floating trash boom
- Year installed: 2017
- Cost to install: $18,000
- Cost to maintain: $14,260/year*
- Removal frequency per year: 10
- Approximate amount removed per year: 2.25 55-gallon bags

Carpenter Floatable Boom



Russell Creek Park Floatables Removal

- Type: Trash rack at spillway
- Year installed: 2018
- Cost to install: ~$1,750
- Cost to maintain: Removal not required during 2019-2020
- Removal frequency per year: NA
- Approximate amount removed per year: NA

Shawnee Park Floatables Removal

- Type: Trash rack at riser
- Year installed: 2018
- Cost to install: $6,500
- Cost to maintain: $240
- Removal frequency per year: 3
- Approximate amount removed per year: 3 cubic yards

White Rock Trail Park Floatables Removal

- Type: Trash rack at spillway
- Year installed: 2018
- Cost to install: ~$1,750
- Cost to maintain: $80
- Removal frequency per year: 1
- Approximate amount removed per year: 1 cubic yard

Bob Woodruff Park Floatables Removal

- Type: Concrete spillway
- Year installed: 1987
- Cost to install: Unknown
- Cost to maintain: $1,920
- Removal frequency per year: 12
- Approximate amount removed per year: 12 cubic yards

Plano
City of Excellence

Thank you

Echo Rexroad
Environmental Quality Manager
erexroad@plano.gov

IRVING
TEXAS

Cody is the Drainage Programs Specialist, with the City of Irving for a over a year. He has a Bachelor of Science in Geology from UT Arlington. As a Texas native who loves nature, and he’s genuinely distraught with the state of the urban natural world. Fortunately, he is in a role where he can make (somewhat limited) changes and his main objective is to try and clean up Irving's creeks and streams.

CODY CASH

City of Irving

North Central Texas Council of Governments

Outfall Based Trash and Debris Nets

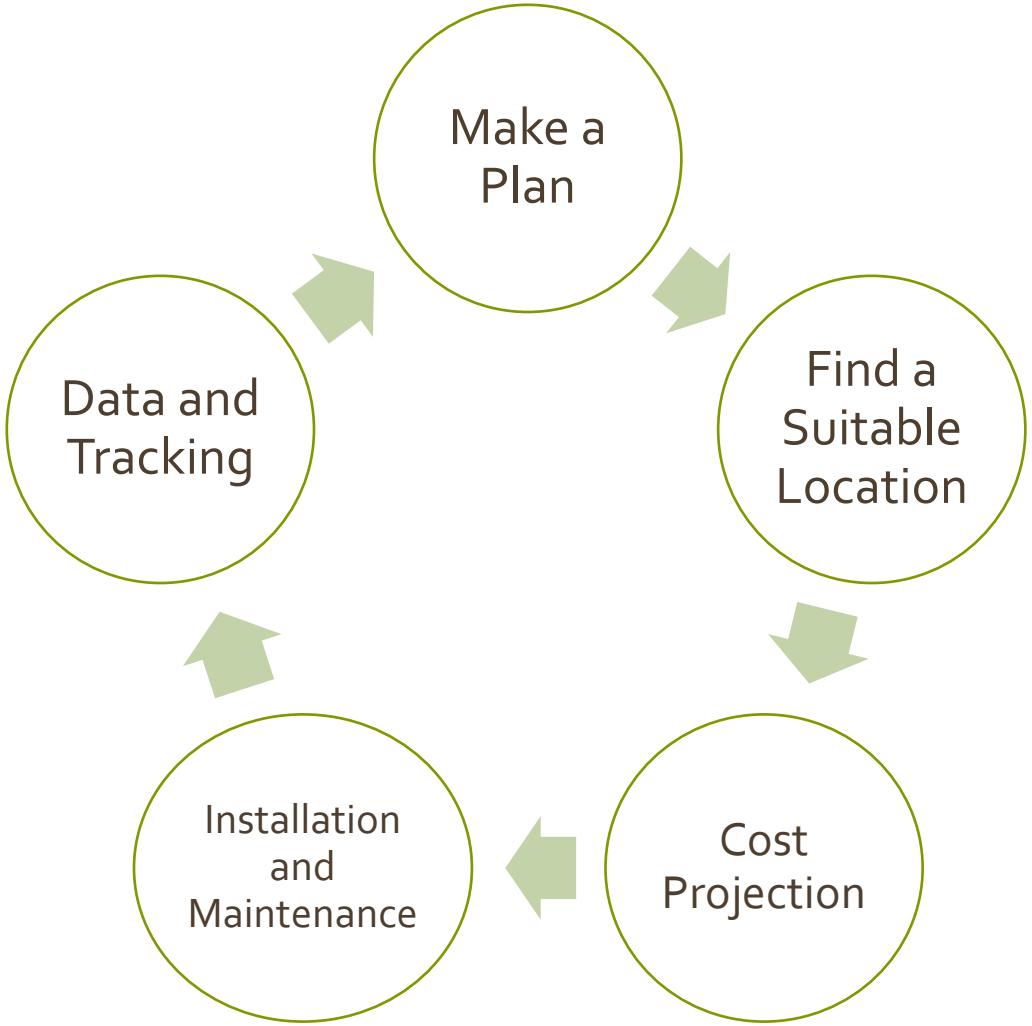
A point source solution to a non-point source problem

City of Irving
Cody Cash

IRVING
TEXAS

During /After Rain Events

Implementation Strategy

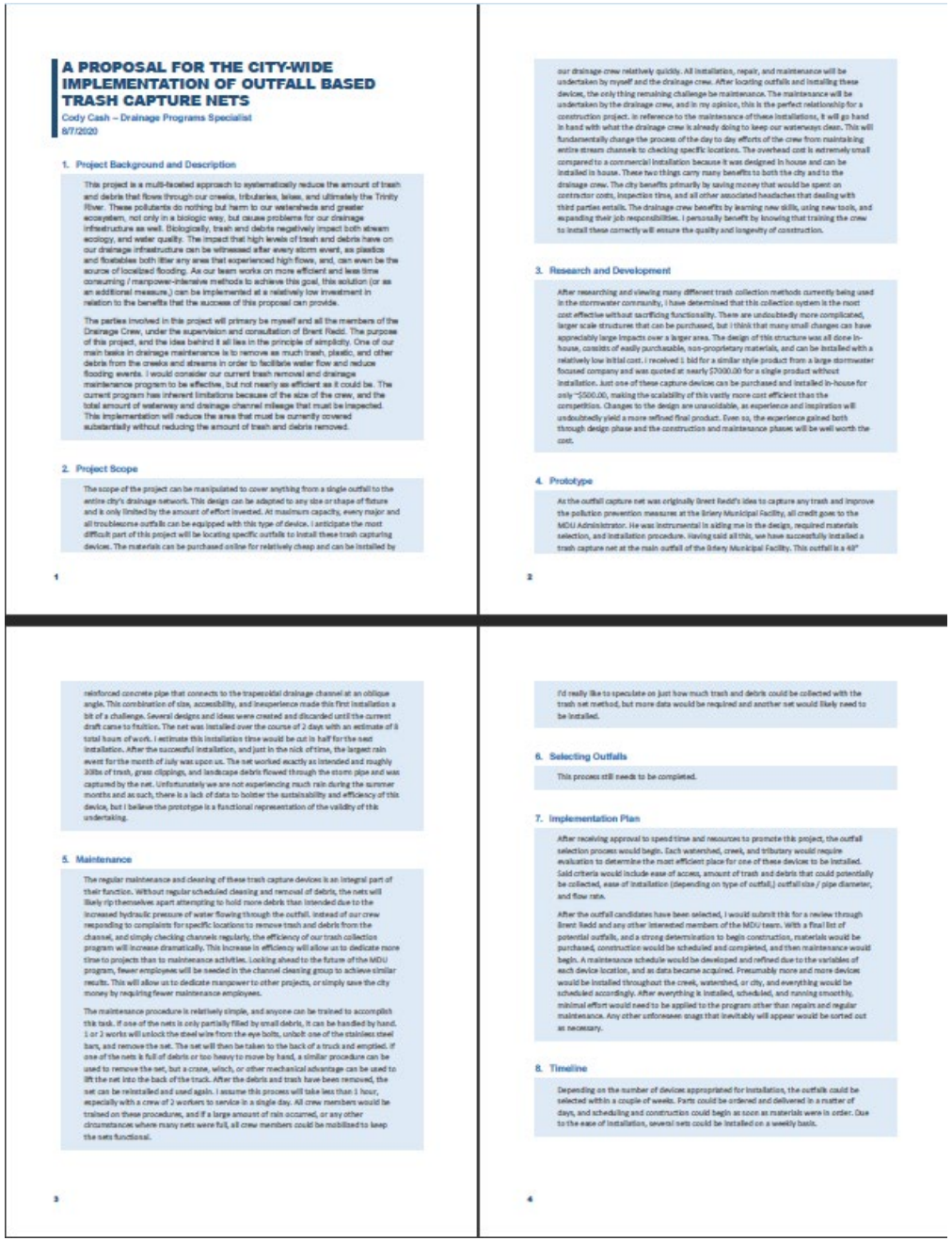


Make a Plan

- Who - Myself and Drainage Crew
- What - ~~A trash net~~ **A debris collector**
- When - ASAP
- Where - Good question!
- Why - Floatables and debris, water quality, future TMDL requirements, ecological impacts, etc.

Make a Plan

The impetus of this project began with the update of the Pollution Prevention and Good Housekeeping Plan for one of our larger municipal facilities. This facility houses our fleet maintenance area, traffic and transportation, and various other entities and storage. **All of the underground storm drainage leads to one large outfall** which was perfect for a pilot project.



A PROPOSAL FOR THE CITY-WIDE IMPLEMENTATION OF OUTFALL BASED TRASH CAPTURE NETS

Cody Cash – Drainage Programs Specialist

6/7/2020

1. Project Background and Description

This project is a multi-faceted approach to systematically reduce the amount of trash and debris that flows through our creeks, tributaries, lakes, and ultimately the Trinity River. These pollutants do nothing but harm to our watersheds and greater ecosystem, not only in a biologic way, but cause problems for our drainage infrastructure as well. Biologically, trash and debris negatively impact both stream ecology, and water quality. The impact that high levels of trash and debris have on our drainage infrastructure can be witnessed after every storm event, as plastics and floatables both litter any area that experienced high flows, and, can even be the source of localized flooding. As our team works on more efficient and less time consuming / manpower-intensive methods to achieve this goal, this solution (or as an additional measure,) can be implemented at a relatively low investment in relation to the benefits that the success of this proposal can provide.

The parties involved in this project will primary be myself and all the members of the Drainage Crew, under the supervision and consultation of Brent Redd. The purpose of this project, and the idea behind it all lies in the principle of simplicity. One of our main tasks in drainage maintenance is to remove as much trash, plastic, and other debris from the creeks and streams in order to facilitate water flow and reduce flooding events. I would consider our current trash removal and drainage maintenance program to be effective, but not nearly as efficient as it could be. The current program has inherent limitations because of the size of the crew, and the total amount of waterway and drainage channel mileage that must be inspected. This implementation will reduce the area that must be currently covered substantially without reducing the amount of trash and debris removed.

2. Project Scope

The scope of the project can be manipulated to cover anything from a single outfall to the entire city's drainage network. This design can be adapted to any size or shape of fixture and is only limited by the amount of effort invested. At maximum capacity, every major and all troublesome outfalls can be equipped with this type of device. I anticipate the most difficult part of this project will be locating specific outfalls to install these trash capturing devices. The materials can be purchased online for relatively cheap and can be installed by

1

our drainage crew relatively quickly. All installation, repair, and maintenance will be undertaken by myself and the drainage crew. After locating outfalls and installing these devices, the only thing remaining challenge be maintenance. The maintenance will be undertaken by the drainage crew, and in my opinion, this is the perfect relationship for a construction project. In reference to the maintenance of these installations, it will go hand in hand with what the drainage crew is already doing to keep our waterways clean. This will fundamentally change the process of the day to day efforts of the crew from maintaining entire stream channels to checking specific locations. The overhead cost is extremely small compared to a commercial installation because it was designed in house and can be installed in house. These two things carry many benefits to both the city and to the drainage crew. The city benefits primarily by saving money that would be spent on contractor costs, inspection time, and all other associated headaches that dealing with third parties entails. The drainage crew benefits by learning new skills, using new tools, and expanding their job responsibilities. I personally benefit by knowing that training the crew to install these correctly will ensure the quality and longevity of construction.

3. Research and Development

After researching and viewing many different trash collection methods currently being used in the stormwater community, I have determined that this collection system is the most cost effective without sacrificing functionality. There are undoubtedly more complicated, larger scale structures that can be purchased, but I think that many small changes can have appreciably large impacts over a larger area. The design of this structure was all done in-house, consists of easily purchasable, non-proprietary materials, and can be installed with a relatively low initial cost. I received 1 bid for a similar style product from a large stormwater focused company and was quoted at nearly $7000.00 for a single product without installation. Just one of these capture devices can be purchased and installed in-house for only ~$500.00, making the scalability of this vastly more cost efficient than the competition. Changes to the design are unavoidable, as experience and inspiration will undoubtedly yield a more refined final product. Even so, the experience gained both through design phase and the construction and maintenance phases will be well worth the cost.

4. Prototype

As the outfall capture net was originally Brent Redd's idea to capture any trash and improve the pollution prevention measures at the Briery Municipal Facility, all credit goes to the MDU Administrator. He was instrumental in aiding me in the design, required materials selection, and installation procedure. Having said all this, we have successfully installed a trash capture net at the main outfall of the Briery Municipal Facility. This outfall is a 48"

2

reinforced concrete pipe that connects to the trapezoidal drainage channel at an oblique angle. This combination of size, accessibility, and inexperience made this first installation a bit of a challenge. Several designs and ideas were created and discarded until the current draft came to fruition. The net was installed over the course of 2 days with an estimate of 8 total hours of work. I estimate this installation time would be cut in half for the next installation. After the successful installation, and just in the nick of time, the largest rain event for the month of July was upon us. The net worked exactly as intended and roughly 30lbs of trash, grass clippings, and landscape debris flowed through the storm pipe and was captured by the net. Unfortunately we are not experiencing much rain during the summer months and as such, there is a lack of data to bolster the sustainability and efficiency of this device, but I believe the prototype is a functional representation of the validity of this undertaking.

5. Maintenance

The regular maintenance and cleaning of these trash capture devices is an integral part of their function. Without regular scheduled cleaning and removal of debris, the nets will likely rip themselves apart attempting to hold more debris than intended due to the increased hydraulic pressure of water flowing through the outfall. Instead of our crew responding to complaints for specific locations to remove trash and debris from the channel, and simply checking channels regularly, the efficiency of our trash collection program will increase dramatically. This increase in efficiency will allow us to dedicate more time to projects than to maintenance activities. Looking ahead to the future of the MDU program, fewer employees will be needed in the channel cleaning group to achieve similar results. This will allow us to dedicate manpower to other projects, or simply save the city money by requiring fewer maintenance employees.

The maintenance procedure is relatively simple, and anyone can be trained to accomplish this task. If one of the nets is only partially filled by small debris, it can be handled by hand. 1 or 2 workers will unlock the steel wire from the eye bolts, unbolt one of the stainless steel bars, and remove the net. The net will then be taken to the back of a truck and emptied. If one of the nets is full of debris or too heavy to move by hand, a similar procedure can be used to remove the net, but a crane, winch, or other mechanical advantage can be used to lift the net into the back of the truck. After the debris and trash have been removed, the net can be reinstalled and used again. I assume this process will take less than 1 hour, especially with a crew of 2 workers to service in a single day. All crew members would be trained on these procedures, and if a large amount of rain occurred, or any other circumstances where many nets were full, all crew members could be mobilized to keep the nets functional.

3

I'd really like to speculate on just how much trash and debris could be collected with the trash net method, but more data would be required and another net would likely need to be installed.

6. Selecting Outfalls

This process still needs to be completed.

7. Implementation Plan

After receiving approval to spend time and resources to promote this project, the outfall selection process would begin. Each watershed, creek, and tributary would require evaluation to determine the most efficient place for one of these devices to be installed. Said criteria would include ease of access, amount of trash and debris that could potentially be collected, ease of installation (depending on type of outfall,) outfall size / pipe diameter, and flow rate.

After the outfall candidates have been selected, I would submit this for a review through Brent Redd and any other interested members of the MDU team. With a final list of potential outfalls, and a strong determination to begin construction, materials would be purchased, construction would be scheduled and completed, and then maintenance would begin. A maintenance schedule would be developed and refined due to the variables of each device location, and as data became acquired. Presumably more and more devices would be installed throughout the creek, watershed, or city, and everything would be scheduled accordingly. After everything is installed, scheduled, and running smoothly, minimal effort would need to be applied to the program other than repairs and regular maintenance. Any other unforeseen snags that inevitably will appear would be sorted out as necessary.

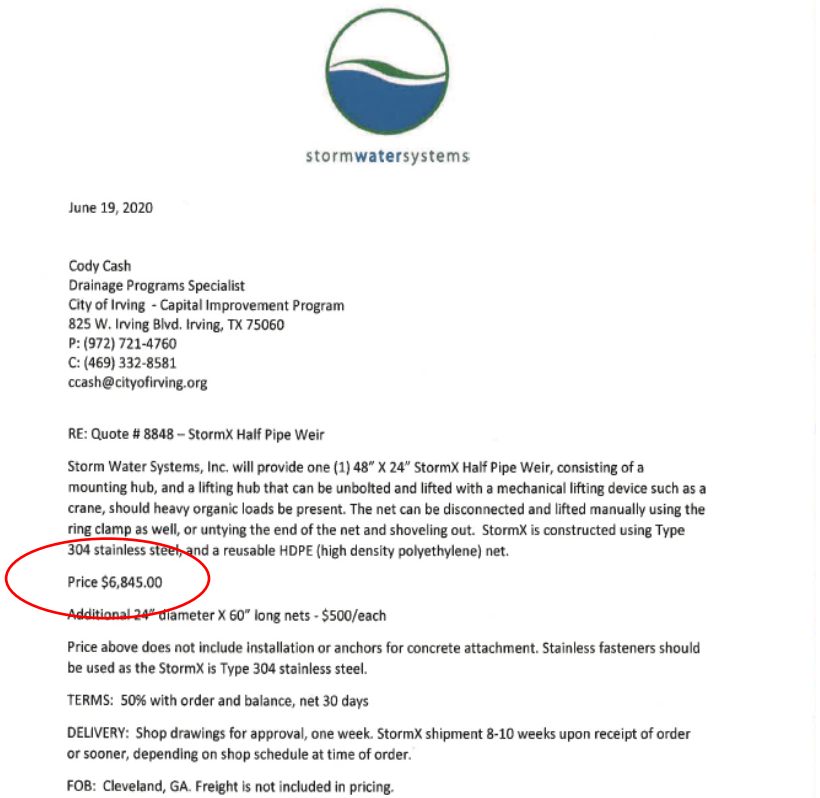
8. Timeline

Depending on the number of devices appropriated for installation, the outfalls could be selected within a couple of weeks. Parts could be ordered and delivered in a matter of days, and scheduling and construction could begin as soon as materials were in order. Due to the ease of installation, several nets could be installed on a weekly basis.

4

Find a Suitable Location

Cost Projection



stormwatersystems

June 19, 2020

Cody Cash
Drainage Programs Specialist
City of Irving - Capital Improvement Program
825 W. Irving Blvd. Irving, TX 75060
P: (972) 721-4760
C: (469) 332-8581
ccash@cityofirving.org

RE: Quote # 8848 – StormX Half Pipe Weir

Storm Water Systems, Inc. will provide one (1) 48" X 24" StormX Half Pipe Weir, consisting of a mounting hub, and a lifting hub that can be unbolted and lifted with a mechanical lifting device such as a crane, should heavy organic loads be present. The net can be disconnected and lifted manually using the ring clamp as well, or untying the end of the net and shoveling out. StormX is constructed using Type 304 stainless steel, and a reusable HDPE (high density polyethylene) net.

Price $6,845.00

Additional 24" diameter X 60" long nets - $500/each

Price above does not include installation or anchors for concrete attachment. Stainless fasteners should be used as the StormX is Type 304 stainless steel.

TERMS: 50% with order and balance, net 30 days

DELIVERY: Shop drawings for approval, one week. StormX shipment 8-10 weeks upon receipt of order or sooner, depending on shop schedule at time of order.

FOB: Cleveland, GA. Freight is not included in pricing.

$6,845 (not including shipping, fasteners or install)

Tool and Item List

Name	# of Items	Use	Price
Hammer Drill + Battery + Charger	1	Drilling holes for anchoring bolts	$538.00
Metal Drill Bit (3/4")	1	Drilling holes through the metal clamping sheets	$19.97
Masonry Drill Bit (3/4")	1	Drilling holes through concrete	$39.75
Stainless Steel Sheet 2" x 36" x 1/8"	2	These 2 pieces will make the lower clamping point to hold the net	$24.75
Eye Bolts (1/2")	3	Used as a connection point between the top of the net and the concrete above the outfall	$6.10
Threaded Rod (3/4") Comes in a 10-pack	5	Anchoring the lower clamp jaws	$27.50
Threaded Nuts (3/4") Comes in a 10-pack	5		$5.65
Epoxy	1	Anchoring all bolts into the concrete in and around the pipe	$23.47
Netting (going to keep looking for a better/cheaper net)	1	Collect trash from the outfall	$295.00
3/8" utility rope	1	tying the net to the anchor and general net shaping	$31.50
Carabiners (pack of 10)	1	connecting net to eye bolts	$20.99
3/16" x 50' steel cable (nylon rope replacement)[IMPROVEMENTS]	1	connecting net to eye bolts	$20.98
3/16 cable clamps [CARABINER / NYLON ROPE IMPROVEMENTS]	2	connecting net to eye bolts	$2.98
3-pack Masterlock [CARABINER IMPROVEMENTS]	1	connecting cable to eye bolts	$20.00
Tool and Materials Cost			**$1,116.57**
Total cost for additional trash capture devices			$426.73

Installation and Maintenance

Installation and Maintenance

Installation and Maintenance

Data and Tracking

Debris Net #1

Trash Net Debris Collection Data BRIERY

Date	Weight	Notes
9/3/2020	100lb est.	Oily residue present, some sediment
10/14/2020	100lb est.	Oily residue
11/24/2020	100lb est.	Oily residue
12/21/2020	80lb	Some sediment removed
2/23/2021	20lb	Not much
3/30/2021	200lb est.	10 bags

Total Debris Captured 7-3-20 to 3-30-21

~600lb

Debris Net #2

Trash Net Debris Collection Data WIDENER

Date	Weight	Notes
1/25/2021	50lb	
2/23/2021	20lb (one bag)	
3/3/2021	175lb (9 bags)	75% leaf debris, 25% trash / floatables
3/23/2021	~800lb (40 bags)	no photos :(

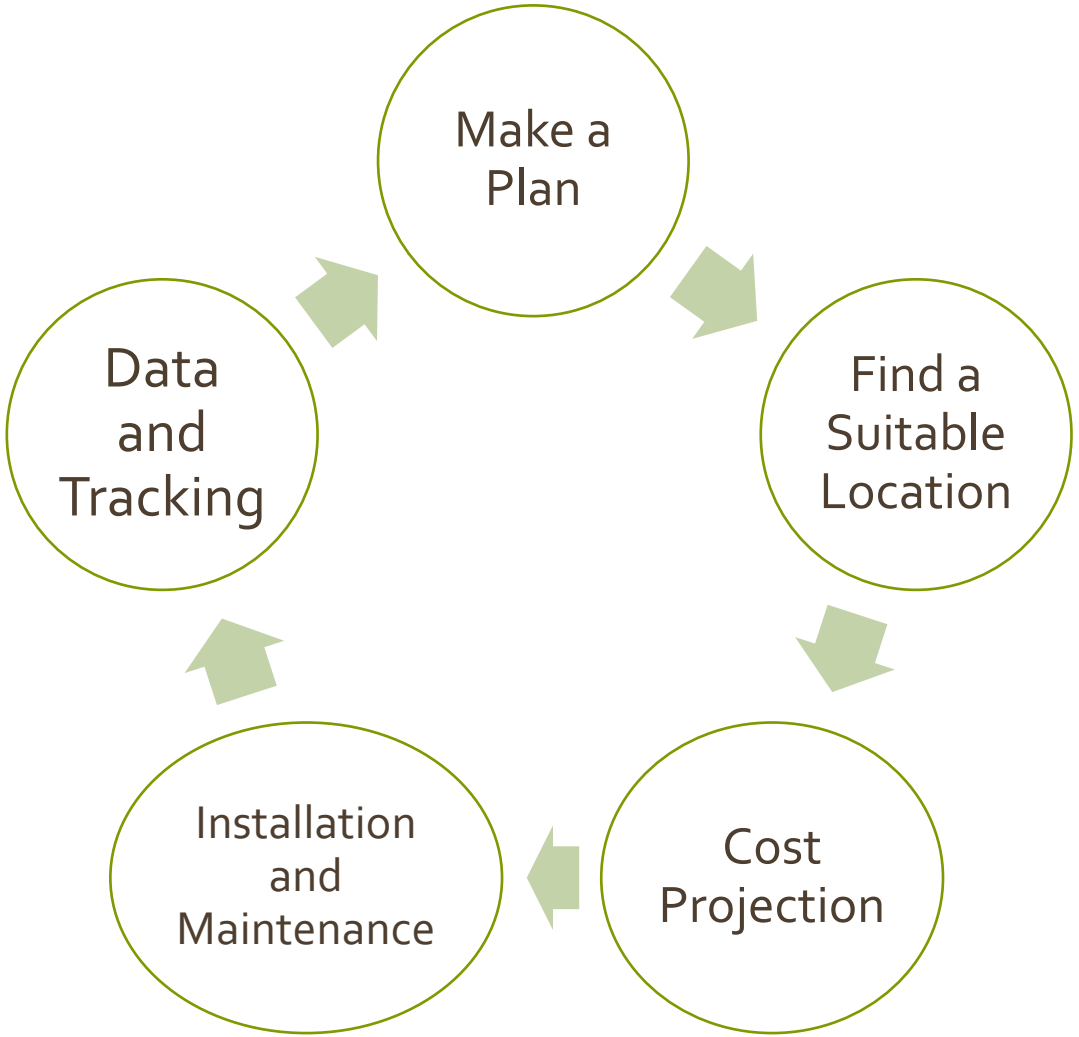
Total Debris Captured 1-18-21 to 3-23-21

~1,045lb

Total Debris Captured

~1645lb

Debris Net #2


Make a Plan
Find a Suitable Location
Cost Projection
Installation and Maintenance
Data and Tracking

Make a Plan

Find a Suitable Location

Cost Projection

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Carabiner	3	connecting cable to eye bolts	$4.00
Fence posts for gate support	2	attaching and securing the gate	$15.73
4' length of chain / bailing wire	1	attaching gate to posts	$21.96
12' fence gate	1	Opening and closing for accessing the net through the fence.	$134.99
Materials Cost			$379.99

Hours Involved [ESTIMATE] Project Phase	man hours	cost @ 20/hr	
Installing posts and swinging access gate	8	$160.00	
Vegetation Clearing for outfall access	24	$480.00	
Drilling Holes in Concrete and Metal and epoxy anchoring all bolts into place	3	$60.00	4
Net and steel cable fabrication/adjustments	1	$20.00	3
installation of steel sheet, net, and cables	3	$60.00	3
Total	39	$780.00	
Total Project Cost (Materials and Labor) [ESTIMATE]		**$1,147.00**	
ACTUAL TOTAL (MATERIALS AND LABOR)		**$1,219.99**	

Compared to the debris net #1 which required $1116.57 in tools and materials.

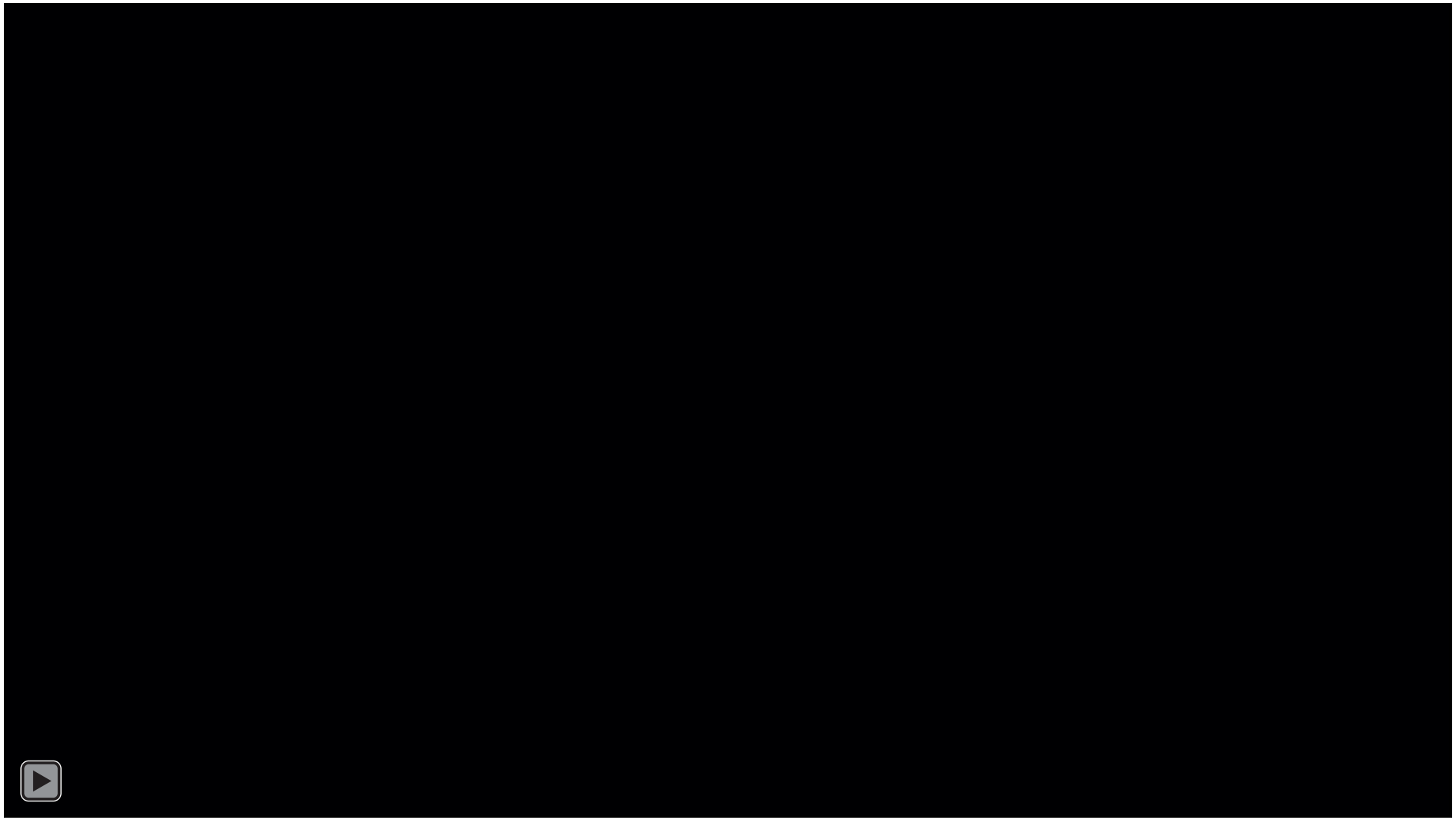
Debris Net #2 – Pre-Construction

Installation and Maintenance


01/18/2021 13:48


01/18/2021 14:18


03/15/2021 09:50



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Why Debris Nets?

- Why is my conviction so high?
- The cost of these installations is incredibly inexpensive (looking at you stormwatersolutions.)
- Ease of customization, this system can be made to fit any outfall. Net #1 vs Net#2 differences. **Incord.com** plug
- This operation can be scaled almost indefinitely large as long as they are maintained.
- Installation (and maintenance) are very simple operations that don't require much specialized equipment.
- Net and hardware can be easily moved if the initial location is not giving bountiful harvest
- They simply work!
- Future permit regulations

Why Not?

- Possible negative environmental impacts, fish and animals could become trapped. ☹
- It is literally just one more thing to maintain.
- Flooding, siltation, general safety and hazard implications. What "could" happen.

Moving Forward / What Next?!

- Approval for 2 new sites in 2021
- Currently looking for suitable locations.
- Small modification needed on the debris net #2 due to low-flow floatable bypass.
- Working on a less labor-intensive method for net cleaning.
- More data collection and analysis.

Thanks!

IRVING
TEXAS

Please contact me if you want plans, materials lists and prices, or contacts. The purpose of this presentation is to inform everyone of a relatively inexpensive solution to areas that are prone to trash and debris/trash accumulation.

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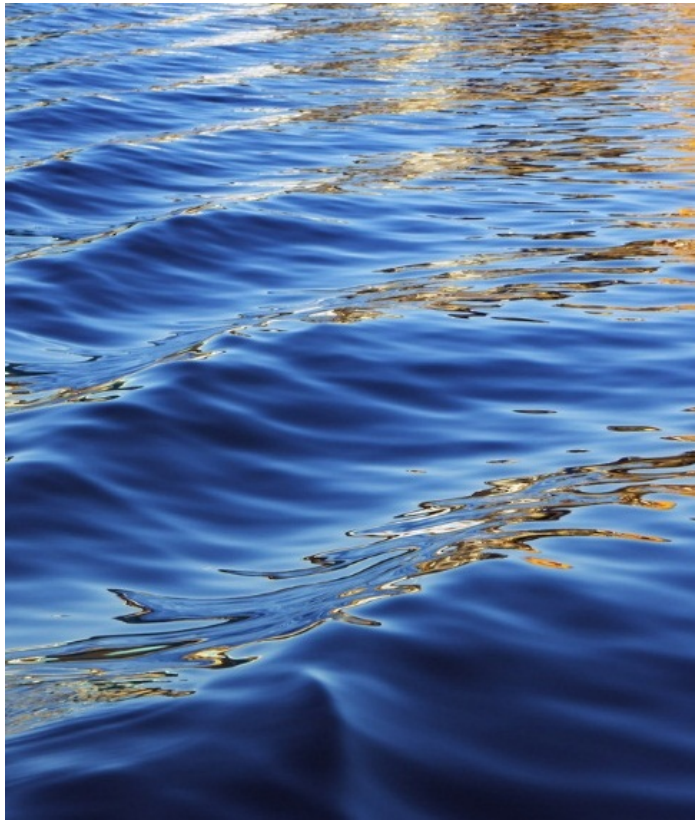


HOWARD REDFEARN

City of Mansfield

Howard is the Environmental Manager with the City of Mansfield and has been with the City since November 2005. He oversees the City's stormwater management plan, floodplain development, mosquito control program, and drainage capital program. In addition, he oversees and coordinates the City's household hazardous waste, and solid waste and recycling collection programs. He is active in the local stormwater community through the Regional Stormwater Management Coordinating Council at the North Central Texas Council of Governments. He graduated with a Bachelor of Science in Kinesiology from the University of North Texas in 2001 and received his Master of Science in Environmental Science from UNT in 2005.

Mansfield BMP Show & Tell

Howard Redfearn

Environmental Manager

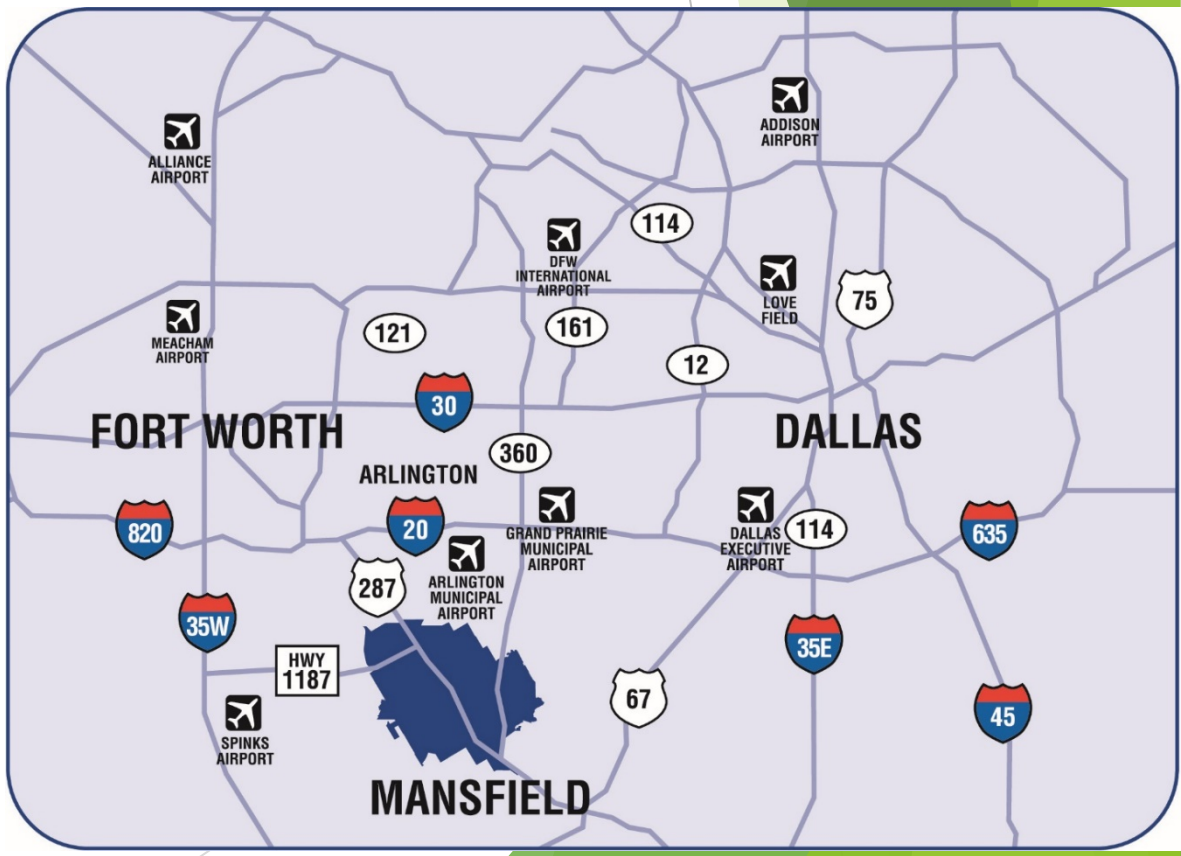
City of Mansfield

MANSFIELD

ENVIRONMENTAL SERVICES

About Mansfield

- Roughly located roughly the same distance from downtown Fort Worth and Dallas
- About 37 square miles covering 3 counties
- Population roughly 76,000
  - Right at 40,000 when I started in 2005
- Level III Phase 2 Community
  - No dry weather program
  - No industrial inspection program
  - No floatables controls
  - Do utilize MCM 7 for construction projects
  - Do conduct inspections on post construction measures
  - Rush Creek TMDL – 300 acres
  - Joe Pool Lake Watershed Protection Plan participant



Mansfield HHW Collection Program

Year	Total	Mobile	Take to FW per month	% At Mobile
2002	52	52		
2003	112	77(1)	2.92	68.75%
2004	152	64(1)	7.33	42.11%
2005	189	40(1)	12.42	21.16%
2006	169	58(1)	9.25	34.32%
2007	281	125(1)	13.00	44.48%
2008	468	266(2)	16.83	56.84%
2009	350	139(2)	17.58	39.71%
2010	452	250(3)	16.83	55.31%
2011	500	251(2)	20.75	50.20%
2012	575	301(3)	22.83	52.35%
2013	661	375(3)	19.50	56.73%
2014	653	283(3)	30.83	43.34%
2015	426	112(1)	26.17	26.29%

- Table shows historical use of mobile vs. Fort Worth dropoff
- Used to justify need to construct a permanent dropoff facility

https://www.mansfieldtexas.gov/201/Collection-Center

Mansfield Environmental Collection Center

- Permanent facility significantly increased participation
- Started just 2nd Saturday 10-3
- 2018 Added Thursday & Friday before 2nd Saturday 3-7
- One full time HHW Coordinator
- Helpers are overtime from other depts.
- Accepted Cedar Hill in 2020

Year	Participants	Weight Disposed	Weight Recycled
2016	1,393	24,590	57,276
2017	1,924	51,045	61,528
2018	2,091	40,441	120,816
2019	2,369	77,520	149,560
2020*	2,729	34,840	172,020

- How much does it cost???
- $ Construction, ops, maintenance paid through drainage utility fees
- $ Construction over $800,000
- $ Tracked ops cost as separate since 2018

2018	$56,780.00
2019	$66,693.00
2020	$61,855.00

Mansfield Street Sweeping

- Street sweeping originally through staff in house and rent equipment
- In 2009 was moved to contractor

Year	ResMiles	ComMiles	Results	Results/mi	
2009	36.6	151.2	150	0.80	tons
2010	99.35	148.63	UA		
2011	99.35	295.29	UA		
2012	311	656	UA		
2013	325.29	598.6	UA		
2014	644.37	1263.5	503	0.26	cy
2015	624	1317	276	0.14	cy
2016	627.9	1643	244	0.11	cy
2017	634	1456	320.5	0.15	cy
2018	648	1674	406.5	0.18	cy
2019	663	1721	1036.5	0.43	cy
2020	694.79	1602.79			

New Sweeping Program

- For most of the bids – only one bidder submitted
- Purchased street sweeper - $240,000
- Hired 2 person crew
  - Taking over mowing of drainage areas
  - Assist in HHW consolidation
  - Minor drainage maintenance and preventive maintenance inspection of drainage infrastructure
- Do not have results yet
- Better ability to respond on the fly

Challenges and other considerations:

- Where/how to dump
- Testing for disposal
  - Going with our contract waste disposal company
  - Annual testing
  - Waste has to be manifested
- Narrow streets and on street parking
  - Once program becomes establish expect to be able to schedule and advertise when/where sweeper will be in areas
- Better delivery of service before/after special events

Mansfield Drainage Maintenance

- Huge challenge of managing expectations
  - What a resident thinks is excessive erosion or unacceptable ponding level
- Trash can lids
  - Inspections of limited residential areas identified up to 40% of inlets have some sort of potential blockage in them
- Mosquitoes
  - I hate mosquitoes
- Historically completed between a mix of other department staff and contractors
- No preventative maintenance/inspection program

Work Orders

- Use MyGov to track work order status
- Inventory

114 acres of land to mow/maintain	131 miles storm drain pipe
13.67 miles of box culvert	3,609 inlets 893 headwalls
195 miles of open channel	

- 51 WO Completions FY2019

1 bridge/culvert clearing	2 outfalls
150’ channel regrading	19 misc repairs
7 inlets	61 days average

Contracts

Costs and number of projects bid vary year to year

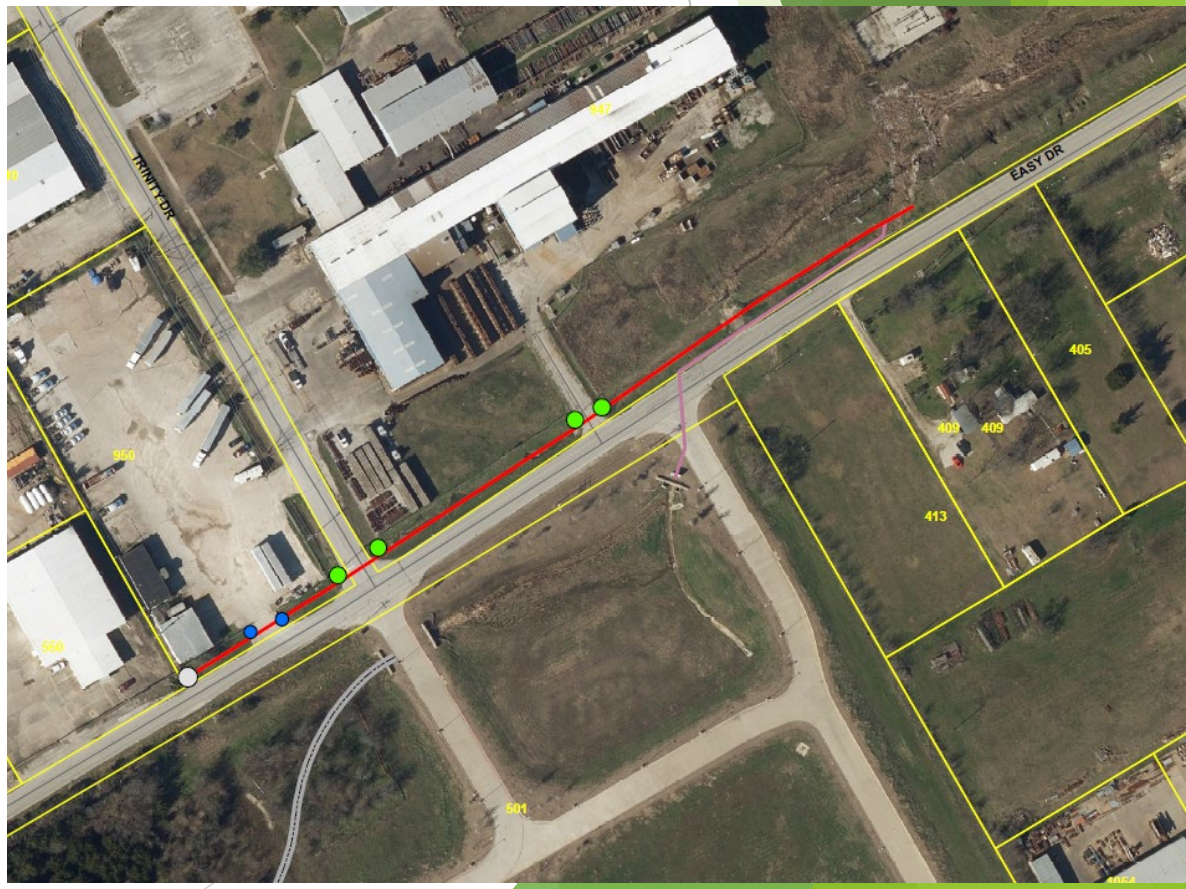
2021 - $75,350 paid to contractors

2020 - $52,500

2019 - $46,300

2018 - $91,390

- Solicit bids from variety of utility contractors
- Scope and scale makes it difficult to find vendors
- Try to bundle several projects together
- Larger scale projects become part of Drainage CIP
- Delays impact home owner opinion



Mansfield Post Construction Water Quality Requirements

- Adopted in 2015 to comply with TXR400000
- Included in Drainage Criteria Manual
  - Adopted by P&Z, not Council
- Based on iSWM Water Quality Volume calculations
  - Recommend treatment measures from iSWM but open to other submissions
  - Separators and other devices need to convert volume to flow rate
- Typical residential measures are ponds with multi-stage outfall
  - Several recent subdivisions have proposed inlet screens
- Commercial/Industrial develop mostly using separators

Post Construction Water Quality Measures

Year	Devices	Treated Area
Pre-2017	8	41.96
2017	21	252.53
2018	42	134.14
2019	11	67.95
2020	23	358.87
2021	52	256.66
Totals	157	1,112.11

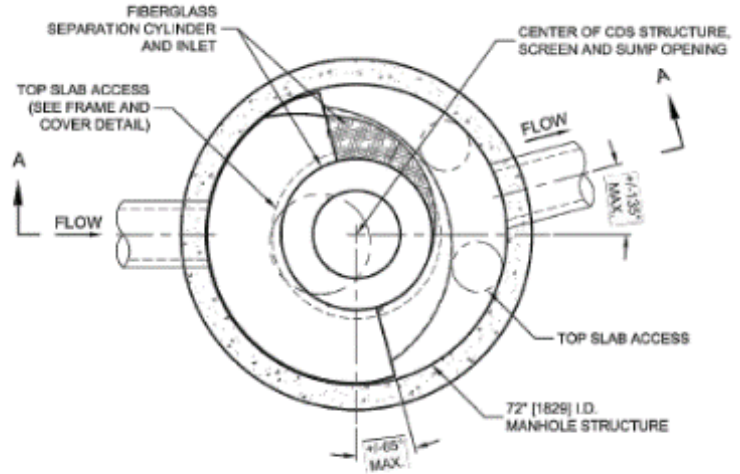
Have not used projected removal and life of device to estimate amount of material collected

Inlet Screens

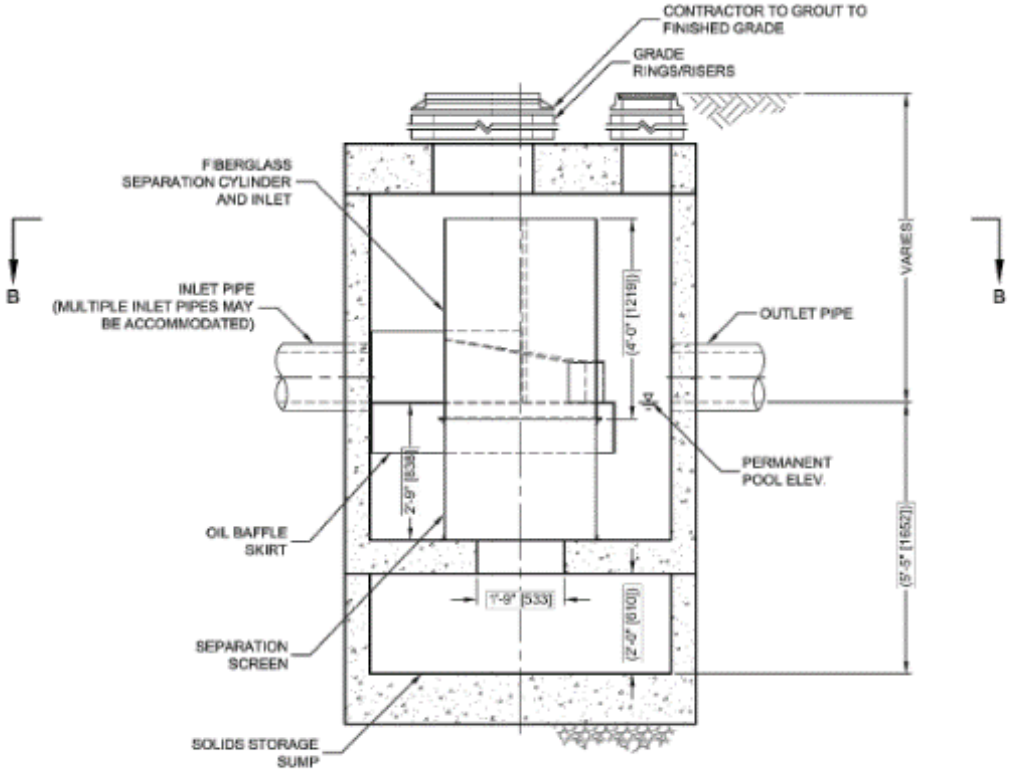
Water Quality Pond


Detention Pond
3” Water Quality Opening

Separators



PLAN VIEW B-B
N.T.S.



ELEVATION A-A
N.T.S.

Post Construction Notes

- There is a steep learning curve
  - In house staff, developer groups, development design staff
- Build in flexibility, especially in the beginning
- Apply equitably
  - Municipal facility construction also has complied
  - Industrial/commercial create more runoff per acre, so they will need to treat more
- Create tracking system early
  - Spreadsheet that is editable by Environmental staff, linked to GIS shapefile that is locked
- Maintenance enforcement??

Howard Redfearn

Environmental Manager

Howard.Redfearn@mansfieldtexas.gov

817-276-4240

MANSFIELD

ENVIRONMENTAL SERVICES

Amesha is currently the Stormwater Administrator for the City of McKinney. She started with the City of McKinney in 2019 and is currently serving as the chairperson for the Regional Stormwater Management Coordinating Council. Amesha began as an intern with the City of Denton, and a Stormwater Inspector for the City of Lewisville before joining McKinney.

AMESHA MORRIS, M.S., CFM

City of McKinney

North Central Texas Council of Governments

City of McKinney Floatable BMPs

Amesha Morris M.S.

Stormwater Administrator

Band-a Long Litter Trap:

- Municipalities can add educational outreach signage
- Trash is contained between the floatable berms, lack of netting allows for wildlife to move freely
- Rises and falls with water levels,
- Requires manual or truck crane maintenance

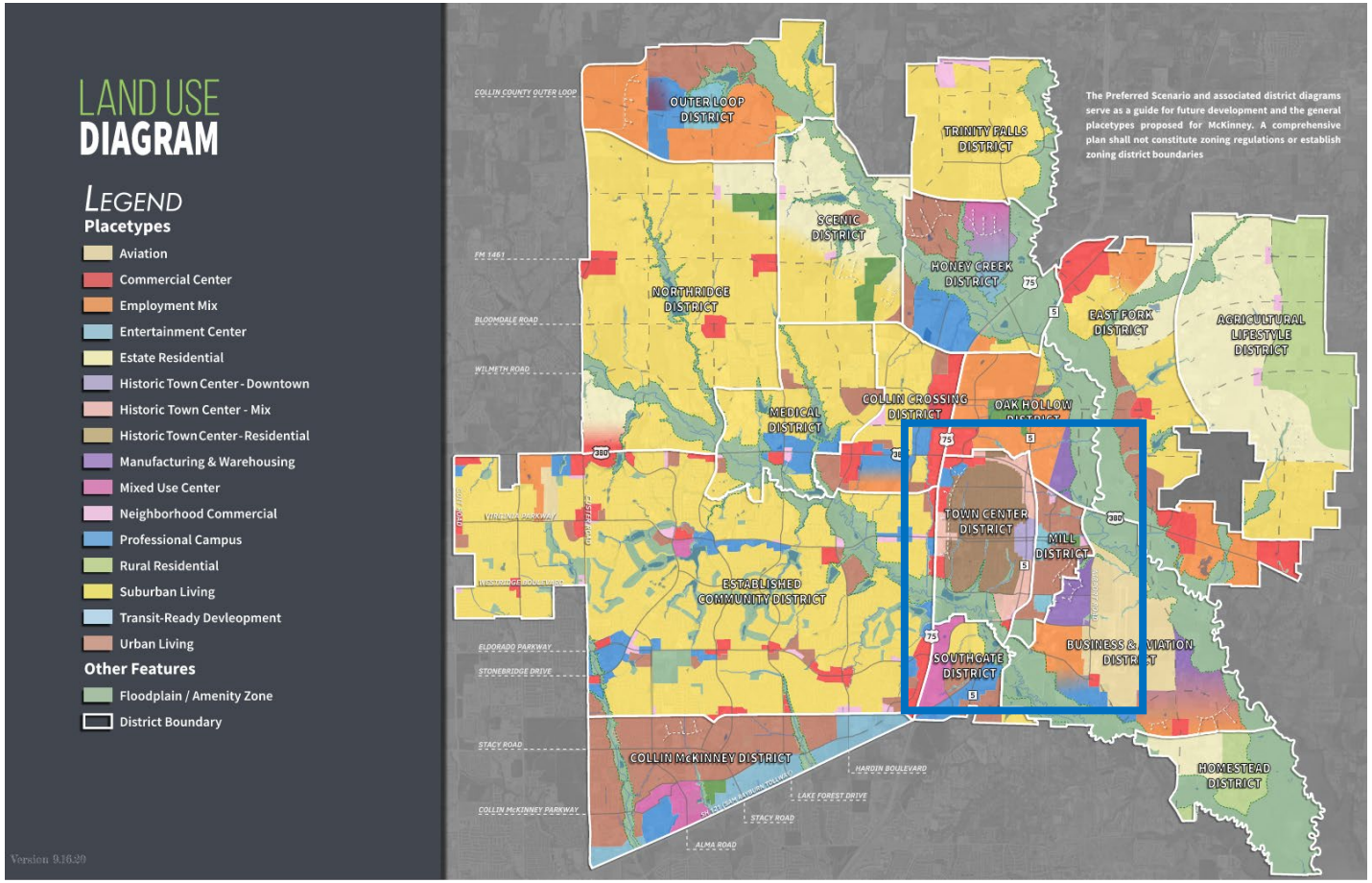
Netting Trash Trap:

- Requires a weir configuration
- At least two men or truck crane required for maintenance
- Captures material as small as 5mm, good for nutrient reduction
- Various sizes available

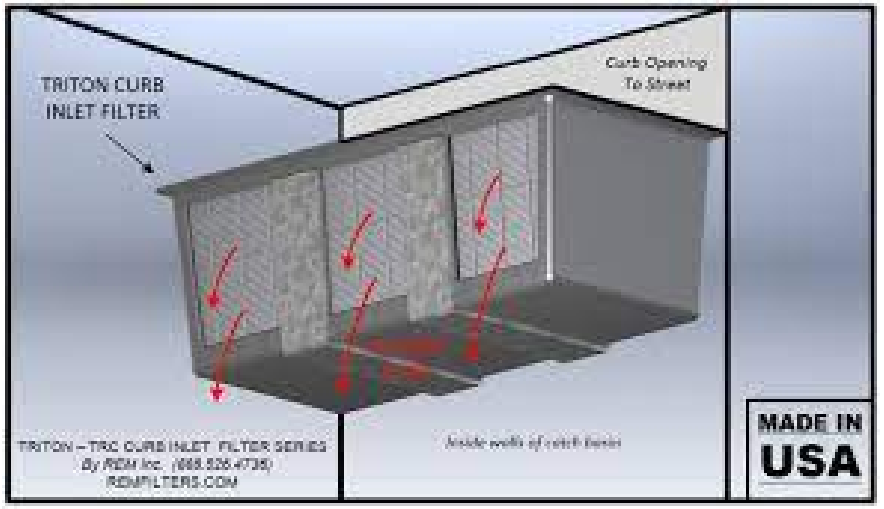
Curb Inlet Filtration Inlets:

- Monthly maintenance
- Replace entire unit after the each rain season and autumn leave-fall
- Vac-truck or manual maintenance
- Biodegradable

Downtown McKinney



Honestly We Got Lucky



Curb Inlet Basket

- Baskets are removeable, so we can have a smaller number in stock and move them to impacted areas as necessary.
- Requires minimal hardware
- Allows us to use existing infrastructure
- Contractor will handle routine monthly maintenance at a low cost
- Contractor will weigh trash removed and supply monthly reports
- Easily replicable in other impacted areas.

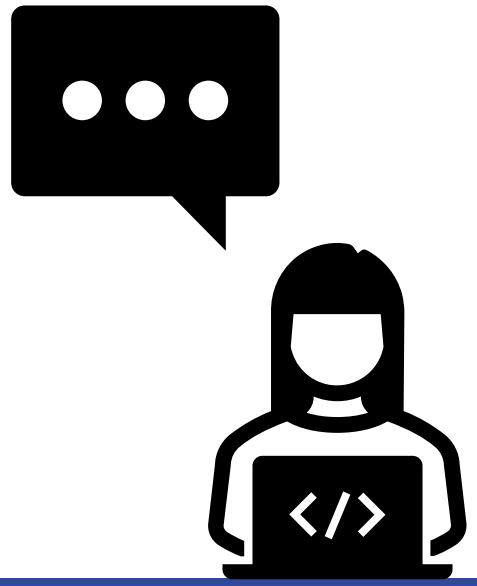
Inspector Committee

Combined Issues:

- Many issues cross departmental lines
- Address issues that are becoming more prevalent - homeless
- Clear understanding of what each department can and can’t enforce
- Central touch point and leadership where leadership is need

Q&A ROUNDTABLE

- Have a question? Please unmute your line or place your question in the chat.



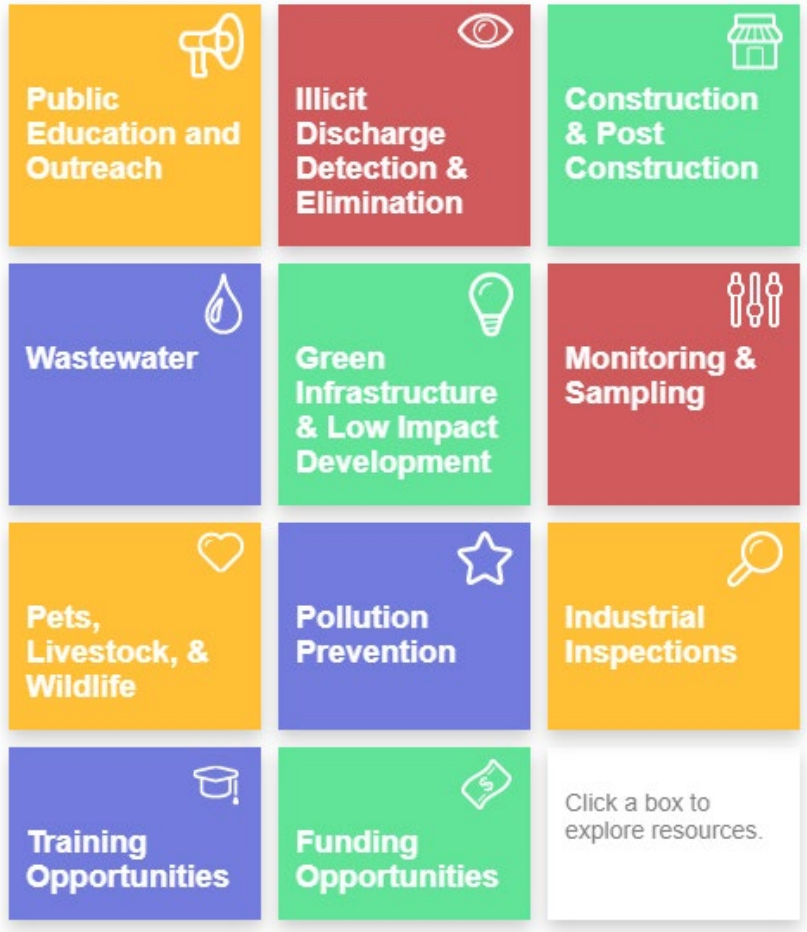
North Central Texas Council of Governments

NCTCOG RESOURCES

NCTCOG RESOURCES

Stormwater BMP Library

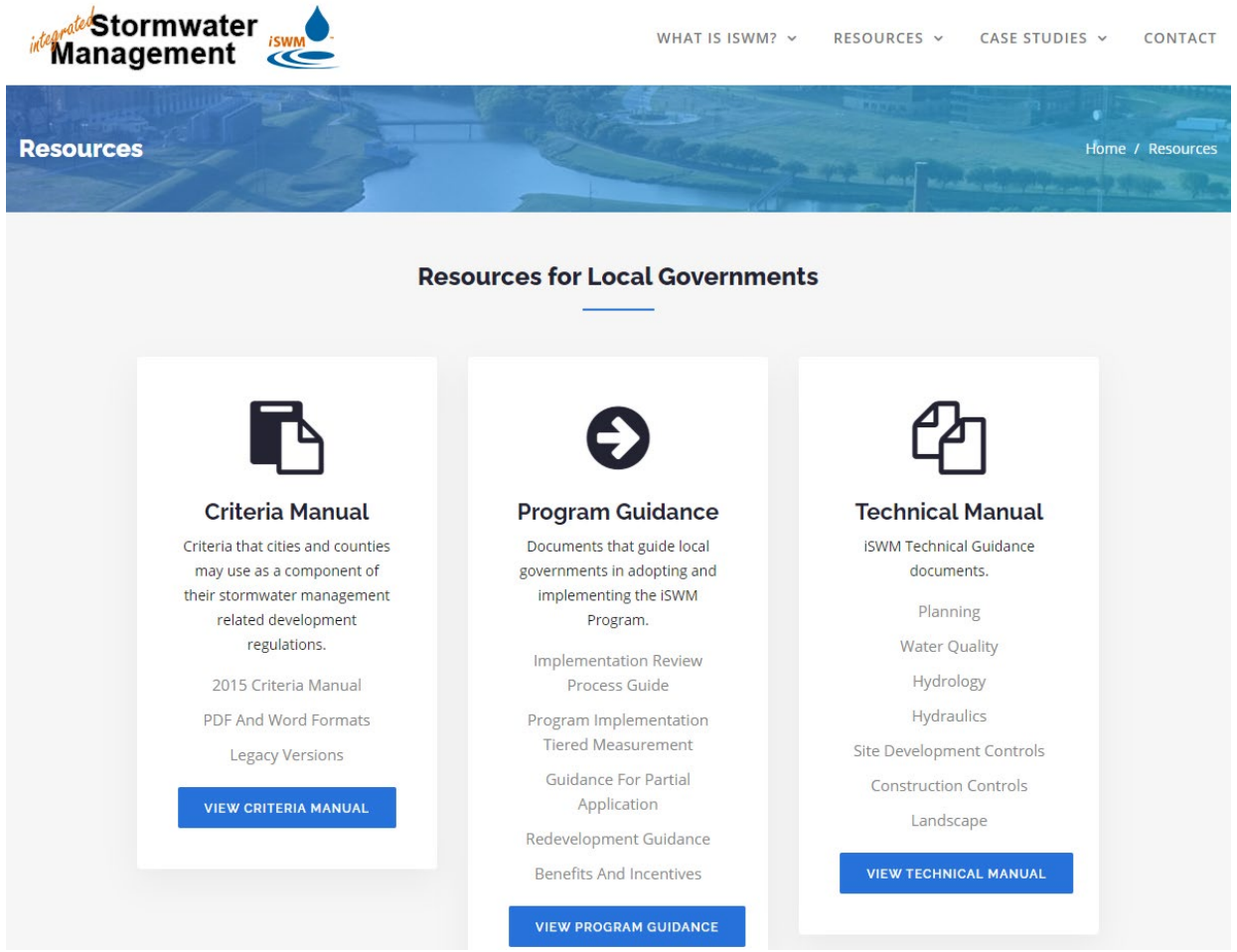
- Organized by general topics
- Easy to search for specific items for your individual situation



North Central Texas Council of Governments

NCTCOG RESOURCES

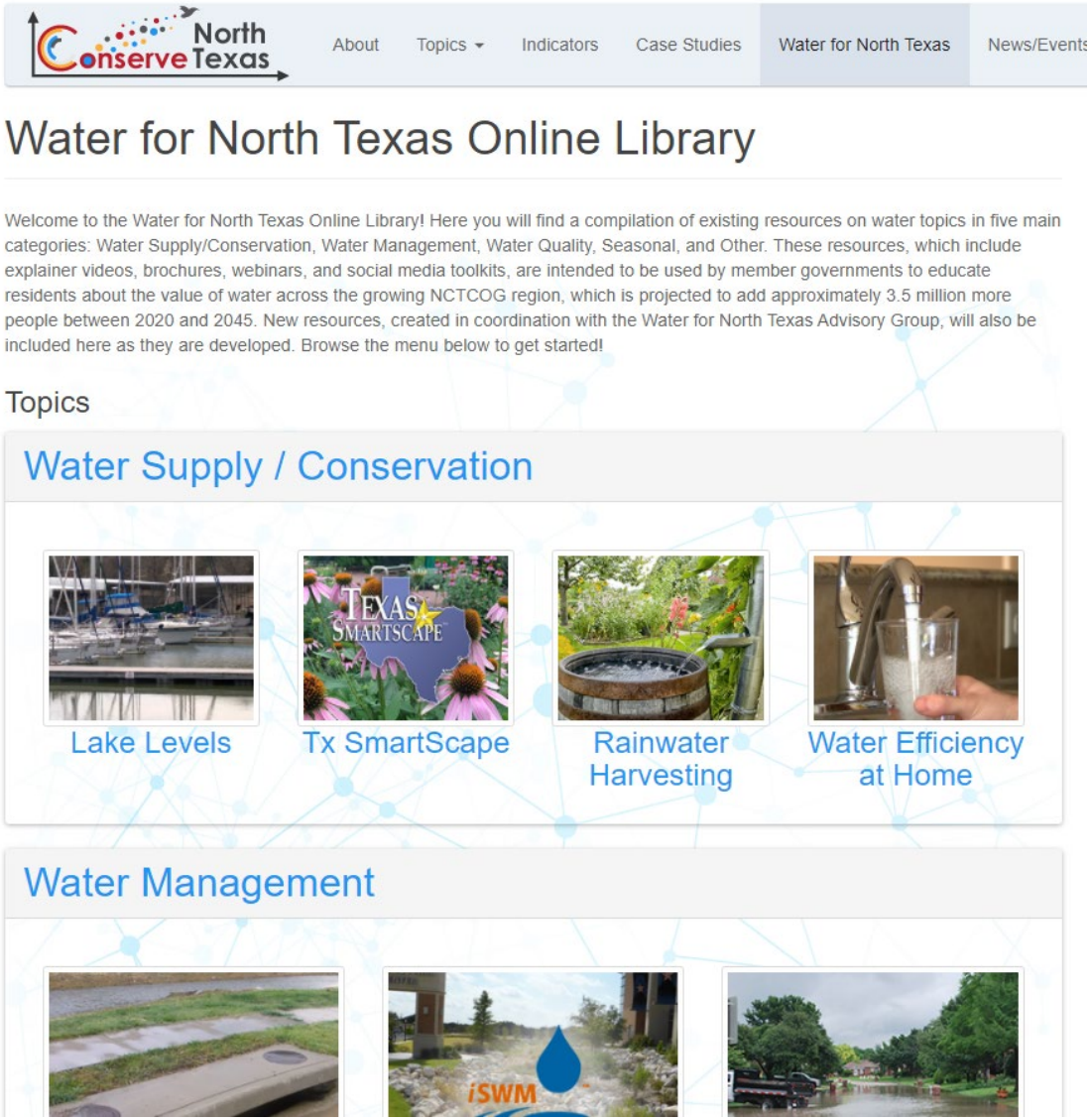
Integrated Stormwater Management (iSWM) Resources



NCTCOG RESOURCES

Go to Water for North Texas Online Library

- Contains resources on water topics on the regional, state, and national level.
  - Social media toolkits
  - Case studies from NCTCOG region
  - Educational pamphlets, videos, etc. to share



NCTCOG RESOURCES

- Public Works Construction Standards North Central Texas, Fifth Edition (2017)
  - Available for purchase here:
    - https://www.nctcog.org/envir/public-works/construction-standards

- Sustainable Public Rights of Way Subcommittee (SPROW)
  - SPROW Best Management Practices Guidebook, under development!

For more information, please contact Olivia Kale at okale@nctcog.org

WEBINAR RECORDING AND PRESENTATION SLIDES

- Presentation Slides and Recording will be posted on NCTCOG's website here:

  https://www.nctcog.org/envir/natural-resources/water-resources

- Follow-up emails to come to all registrants.
  - Email Elena Berg, eberg@nctcog.org if you did not register, but would like to be added to follow-up emails.

Contact

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THANK YOU!

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North Central Texas Council of Governments