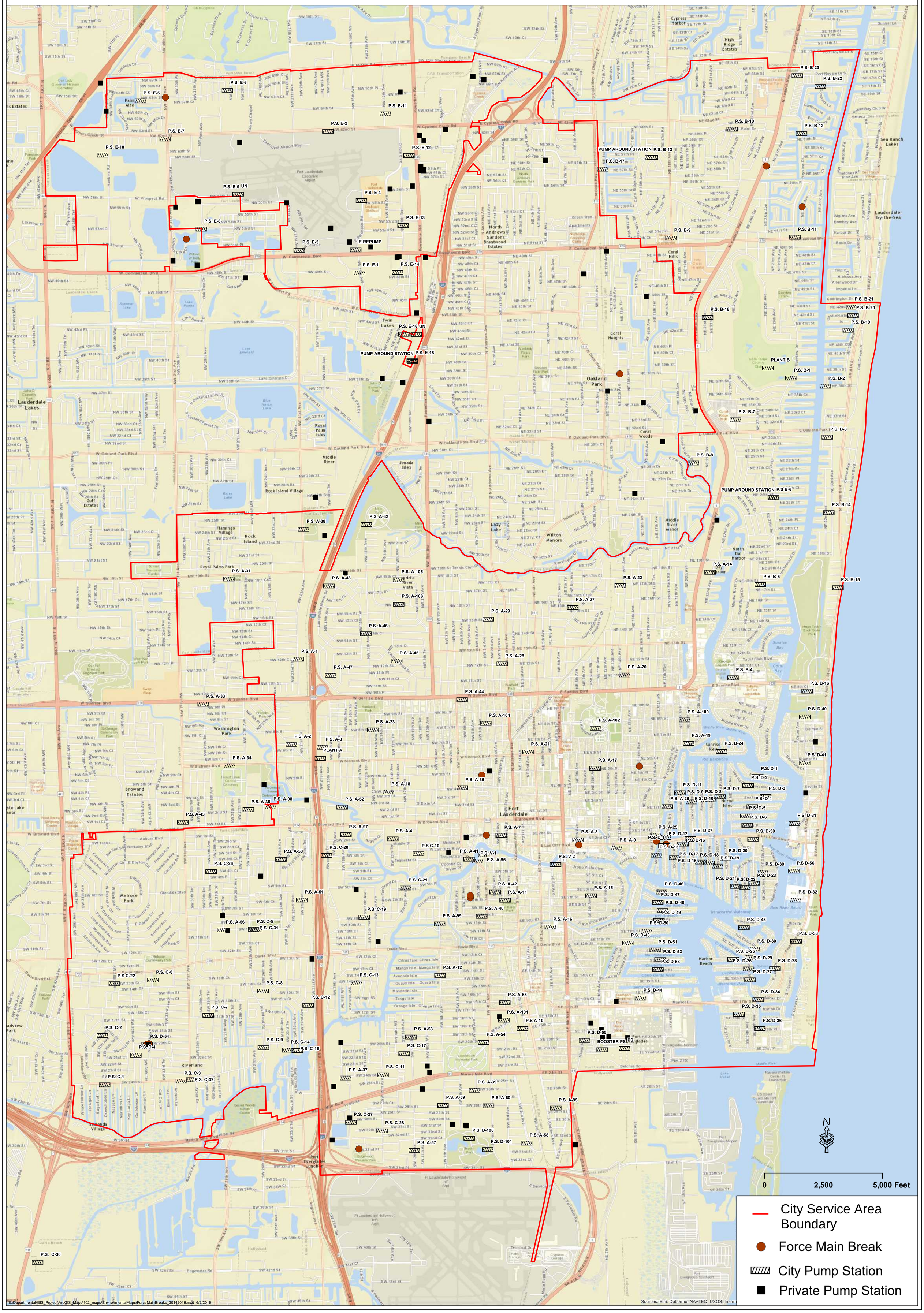
Appendix F-5: Location Map of Force Main Breaks from October 2013 to May 2016

LOCATION MAP OF FORCE MAIN BREAKS FROM OCTOBER 2013 TO MAY 2016


P.S. E-6
P.S. E-5
P.S. E-11
P.S. E-2
P.S. E-7
P.S. E-10
P.S. E-12
P.S. E-9 UN
P.S. E-4
P.S. E-8
P.S. E-13
P.S. E-3
E REPUMP
P.S. E-1
P.S. E-14
P.S. E-16 UN
PUMP AROUND STATION P.S. E-15
PUMP AROUND STATION P.S. B-13
P.S. B-17
P.S. B-23
P.S. B-22
P.S. B-10
P.S. B-12
P.S. B-9
P.S. B-11
P.S. B-21
P.S. B-20
P.S. B-18
P.S. B-19
PLANT B
P.S. B-1
P.S. B-2
P.S. B-7
P.S. B-3
P.S. B-8
PUMP AROUND STATION P.S B-6
P.S. B-14
P.S. B-5
P.S. B-15
P.S. A-38
P.S. A-32
P.S. A-31
P.S. A-48
P.S. A-105
P.S. A-106
P.S. A-46
P.S. A-29
P.S. A-1
P.S. A-45
P.S. A-47
P.S. A-28
P.S. A-20
P.S. A-33
P.S. A-44
P.S. A-104
P.S. A-102
P.S. A-100
P.S. A-23
P.S. A-2
P.S. A-3
PLANT A
P.S. A-19
P.S. A-21
P.S. A-34
P.S. A-17
P.S. A-36
P.S. A-18
P.S. A-35
P.S. A-98
P.S. A-52
P.S. A-43
P.S. A-97
P.S. A-4
P.S. A-7
P.S. A-8
P.S. A-9
P.S. A-25
P.S. A-50
P.S. C-20
P.S. C-10
P.S. A-41
P.S. V-1
P.S. A-96
P.S. V-2
P.S. C-26
P.S. C-21
P.S. A-42
P.S. A-11
P.S. A-15
P.S. A-51
P.S. C-19
P.S. A-40
P.S. A-99
P.S. A-16
P.S. A-56
P.S. C-5
P.S. C-31
P.S. C-6
P.S. C-22
P.S. C-8
P.S. C-12
P.S. A-12
P.S. C-13
P.S. C-7
P.S. C-2
P.S. D-54
P.S. C-4
P.S. C-9
P.S. C-14
P.S. C-15
P.S. A-53
P.S. C-17
P.S. A-54
P.S. A-55
P.S. A-101
P.S A-10
P.S. D-55
BOOSTER PS
P.S. C-3
P.S. C-32
P.S. C-1
P.S. A-37
P.S. C-11
P.S. A-39
P.S. A-59
P.S. A-60
P.S. A-95
P.S. C-27
P.S. C-28
P.S. D-100
P.S. A-58
P.S. A-57
P.S. D-101
P.S. C-30
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P.S. D-2
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P.S. D-8
P.S. D-7
P.S. D-3
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P.S. D-4
P.S. D-5
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P.S. A-14
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P.S. D-30
P.S. D-25
P.S. D-26
P.S. D-29
P.S. D-28
P.S. D-27
P.S. D-44
P.S. D-34
P.S. D-35
P.S. D-36
P.S. B-4
P.S. B-16
Port Everglades Junction
Oakland Park
Pompano Beach
Fort Lauderdale
Lauderdale Lakes
Lauderdale-by-the-Sea
Sea Ranch Lakes
Cypress Harbor
High Ridge Estates
Coral Heights
Coral Hills
Oakland Park
Coral Woods
Lazy Lake
Wilton Manors
Middle River Manor
North Bal Harbor
Harbor Beach
Sunrise Key
Rio Barcelona
Nurmi Isles
Fort Lauderdale
Broward Estates
Melrose Park
Riverland
Rovenda Village
Golf Estates
Flamingo Village
Rock Island
Royal Palms Park
Rock Island Village
Middle River
Jenada Isles
Royal Palm Isles
Twin Lakes
Lake Emerald
Blue Heron Lake
Summer Lake
Lake Pointe
Bates Lake
Lakeside Dr
Golfview
Lake Dr
Lake Emerald Dr
W Oakland Forest Dr
S Oakland Forest Dr
Executive Airport Way
Fort Lauderdale Executive Airport
Powerline Rd
Perimeter Rd
Hawkins Rd
Calvary Chapel
Our Lady Queen of Heaven Cemetery
Florida's Turnpike
SR-7 S
SR-7 N
SR-9
SR-A1A
SR-A1A S
W Cypress Creek Rd
E Cypress Creek Rd
W Commercial Blvd
E Commercial Blvd
W Prospect Rd
E Prospect Rd
W Oakland Park Blvd
E Oakland Park Blvd
W Sunrise Blvd
E Sunrise Blvd
W Broward Blvd
E Broward Blvd
W Sistrunk Blvd
E Las Olas Blvd
Marina Mile Blvd
W SR-84
N Federal Hwy
N Andrews Ave
N Andrews Gardens
Green Tree Apartments
Northridge Shopping Center
Holy Cross Hospital
Wimberly Fields Park
Stevens Field Park
Wilton Manors
Lloyd Dr
Corporate Park Dr
Cypress Creek
CSX Transportation
Tamarac
Lauderdale Lakes
Pompano Park
Our Lady Queen of Heaven Cemetery
Fort Lauderdale Executive Airport
Lockhart Stadium
Mills Pond Park
Sunset Memorial Garden
Central Broward Regional Park
West Ken Lee Park
Swap Shop
Franklin Park
Sunland Park
St George Community Park
Forest Lawn Central Cemetery
Broward General Medical Center
Plaza Shopping Center
West Broward Shopping Center
Plantation Village
Sunview Park
Melrose Community Park
Edgewater Rd
Davie Blvd
Davie Blvd Ext
Citrus Isle
Mango Isle
Avocado Isle
Guava Isle
Mandarin Isle
Tango Isle
Orange Isle
Secret Woods Nature Center
Edgewood Passive Park
Snyder Park
Ft Lauderdale Hollywood Int'l Arpt
Terminal Dr
Palm Garage
Hibiscus Garage
Cypress Garage
Port Everglades Northport
Port Everglades Midport
Port Everglades Southport
Port Everglades
Cruise Terminal
Fort Lauderdale
Hollywood
Dania Beach
Hugh Taylor Birch State Park
Intracoastal Waterway
New River Sound
Middle River
Bayview Park
Coral Ridge Country Club
Coral Ridge Mall
Holiday Park
Lauderdale Memorial Park
Evergreen Cemetery
Southpoint Shopping Center
Harbor Beach
Bay Harbor
Isla Bahia Dr
Isla Dorada Blvd
Coronado Isle
Compass Is
Seneca
Winnetonka Rd
Pine Ave
Saranac Rd
Cayuga Rd
Algiers Ave
Bombay Ave
Harbor Dr
Basin Dr
Port Royale Dr N
Port Royale Dr S
Ocean Bay Club Dr
Bay Colony Dr
Sunset Ln
Palm Cir
Codrington Dr
Castle Harbor Is
Tropic Isle
Hibiscus Ave
Allenwood Dr
Imperial Ln
Seville St
Belmar St
Terramar St
Cotton Ave
Center Ave
N Atlantic Blvd
Ocean Dr
Galt Ocean Dr
Bayview Dr
Bayview Park
Hugh Taylor Birch State Park
Sunrise Bay
Coral Bay
Yacht Club Blvd
George English Park
Isle of Palm Dr
Isle of Venice Rd
Venice of Fort Lauderdale
Las Olas Isles
Las Olas Blvd
Las Olas Circle
Las Olas Intracoastal
Riomar
Rio Vista
Rio Vista Blvd
Ponce de Leon Dr
Coconut Dr
Tarpon River
Bryan Pl
Coontie Ct
Tequesta St
Argyle Dr
Middle St
Auburn Blvd
Berkeley Blvd
Kentucky Ave
Kansas Ave
Utah Ave
Georgia Ave
Florida Ave
Delaware Ave
Carolina Ave
Glendale Blvd
E Dayton Cir
W Dayton Cir
E Melrose Cir
W Melrose Cir
E Evanston Cir
W Evanston Cir
Carolina Ave
Arizona Ave
Alabama Ave
Iroquis Ave
Park Dr
Pennsylvania Ave
Wyoming Ave
Tennessee Ave
Long Island Ave
Indiana Ave
Atkinson Ave
Whale Harbor Ln
Tortugas Ln
Sugarloaf Ln
Okeechobee Ln
Nassau Ln
Marathon Ln
Key Largo Ln
Gulfstream Ln
Flamingo Ln
Bimini Ln
Caribbean Ln
Arabian Ln
Admiral Rd
Whitehall Rd
Sunset Ln
Somerset Dr
Oak Tree Dr
Cypress Grove Dr
Cypress Bend Dr
Cypress Club Dr
Cypress Blvd
W Cypress Dr
E Cypress Dr
N Cypress Dr
Gardens Dr
Palm Aire
Pompano Park
Lakeside Dr
Lauderdale Lakes
Lauderdale-by-the-Sea
Sea Ranch Lakes
Lauderdale Isles
Lauderdale Lakes
Lauderdale-by-the-Sea
Lauderdale Isles
Lauderdale Lakes
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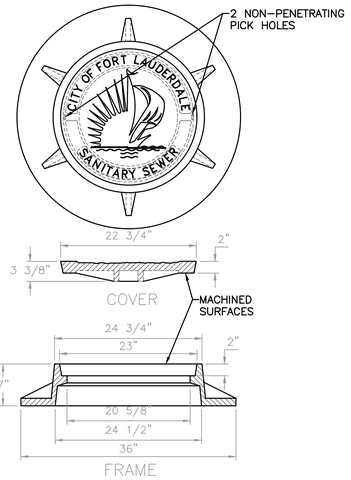
Lauderdale Lakes
Lauderdale Isles
Lauderdale Lakes

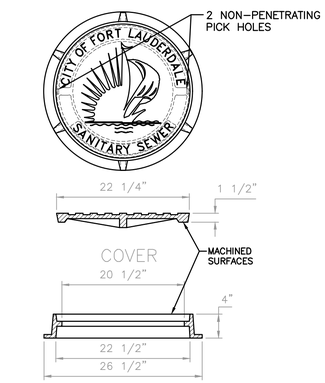
Appendix AB
Standard Details



NOTES:

1. MATERIAL: FRAME AND COVER AS SPECIFIED.
2. ADDITIONAL GRADE RINGS MAY BE USED TO ELEVATE EXISTING MANHOLE FRAMES TO RESURFACED GRADE (MAX. 4" HEIGHT).
3. ALL DIMENSIONS ARE NOMINAL.
4. OPTIONAL: HINGED FRAME AND COVER AS SPECIFIED.

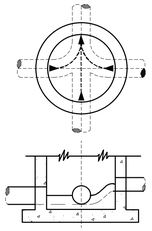
200 MANHOLE FRAME & COVER PAVED AREAS
N.T.S



NOTES:

1. MATERIAL: FRAME AND COVER AS SPECIFIED.
2. ADDITIONAL GRADE RINGS MAY BE USED TO ELEVATE EXISTING MANHOLE FRAMES TO RESURFACED GRADE (MAX. 4" HEIGHT).
3. ALL DIMENSIONS ARE NOMINAL.
4. OPTIONAL: HINGED FRAME AND COVER AS SPECIFIED.

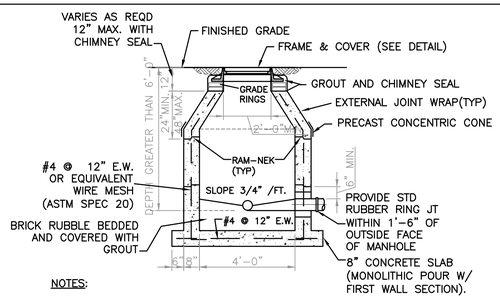
201 MANHOLE FRAME & COVER UNPAVED AREAS
N.T.S.



NOTE:

1. ALL INVERT CHANNELS ARE TO BE CONSTRUCTED FOR SMOOTH FLOW WITHOUT OBSTRUCTION.
2. PROPERLY SHAPED SPILLWAYS SHALL BE CONSTRUCTED BETWEEN PIPES WITH DIFFERENT INVERT ELEVATIONS TO PROVIDE FOR SMOOTH FLOWS.
3. SERVICE LATERALS SHALL NOT ENTER MANHOLES UNLESS SPECIFIED ON PLANS AND THEN MUST BE TREATED AS MAINS. (ELEVATIONS SHOWN, PRECAST HOLE, FLOW CHANNEL)
4. BRICK RUBBLE PERMITTED AS FLOW CHANNEL BUILDUP.
5. SIDEWALLS OF FLOW CHANNEL SHALL BE AT LEAST HALF OF PIPE HEIGHT AT ALL POINTS.
6. NO INSIDE DROP LARGER THAN 6" SHALL BE ALLOWED WITH 3 OR 4 INVERTS AND MANHOLES WITH A CHANGE OF DIRECTION OF FLOW OF MORE THAN 45 DEGREES.

202 INVERT FLOW CHANNELS
N.T.S.



NOTES:

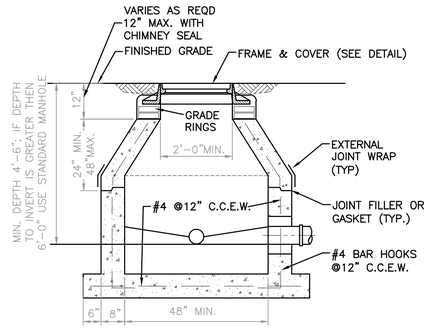
1. PRECAST CONCRETE TYPE II 4000 P.S.I.
2. "RAM-NEK" OR EQUAL AT ALL RISER JOINTS (1/2" THICK WITH THE WIDTH AT LEAST 1/2 THE WALL THICKNESS).
3. ALL OPENINGS SHALL BE SEALED WITH A WATERPROOF NON-SHRINKING GROUT.
4. FLOW CHANNELS SHALL BE CONSTRUCTED TO DIRECT INFLUENT INTO FLOW STREAM. (SEE DETAIL)
5. LIFT HOLES ARE PERMITTED.
6. ALL PIPE HOLES SHALL BE PRECAST OR CORE DRILLED.

   A. FOR PVC PIPE ENTERING MANHOLE WITH PRECAST HOLES USE THE APPROVED NON-ASBESTOS PVC-MANHOLE ADAPTER OR PRECAST FLEXIBLE MANHOLE SLEEVE FOR THE APPROPRIATE PIPE DIAMETER AND DIMENSION RATIO. THE ADAPTER SHALL NOT EXTEND MORE THAN 1" INTO THE MANHOLE. DOUBLE BANDING IS REQUIRED FOR FLEXIBLE MANHOLE SLEEVE.

   B. CONNECTION TO A MANHOLE WITH A CORE DRILLED HOLE SHALL BE MADE USING A 5' MIN. DUCTILE IRON PIPE SECTION (EPOXY LINED) OR THE APPROVED PVC-MANHOLE ADAPTER.

7. INSIDE DROPS SHALL NOT BE DESIGNED TO EXCEED 1.80 FEET AND NOT CONSTRUCTED TO EXCEED 2.0 FEET. MAX. 6" INSIDE DROP IS PERMITTED FOR MANHOLES WITH 3 OR MORE INVERTS AND MANHOLES WITH A CHANGE IN FLOW DIRECTION OF MORE THAN 45 DEGREES.
8. MANHOLE FABRICATION SHALL BE IN ACCORDANCE WITH ASTM C-478, LATEST STANDARD.
9. MINIMUM 5 FEET IS REQUIRED BETWEEN OUTSIDE OF MANHOLE AND SERVICE WYE.
10. MANHOLES TO BE PAINTED INSIDE AND OUTSIDE WITH 2 COATS OF AN APPROVED PROTECTIVE COATING. (ONE COAT RED, ONE COAT BLACK) MIN. 8-10 MILS D.F.T. PER COAT.
11. MANHOLE SHALL BE SET PLUMB TO LINE AND GRADE.

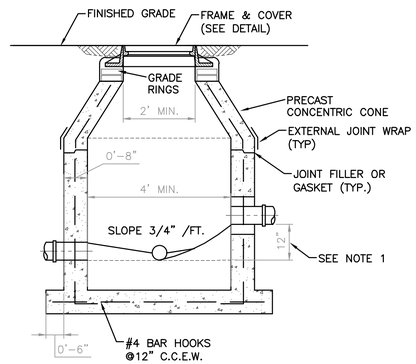
203 STANDARD MANHOLE
N.T.S.



NOTE:

ALL STANDARD MANHOLE NOTES AND DETAILS ARE APPLICABLE

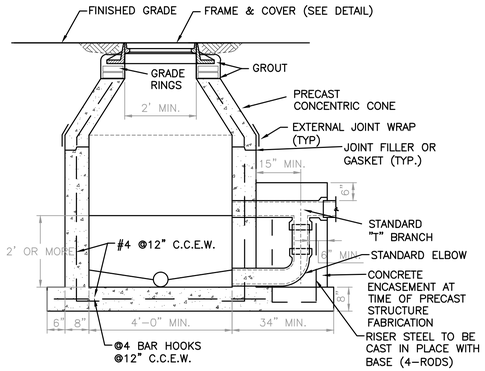
204 SHALLOW MANHOLE
N.T.S.



NOTES:

1. INSIDE DROP TO BE USED WHEN DROP IS GREATER THAN 6 INCHES AND LESS THAN 24 INCHES AND/OR FOR LATERAL CONNECTIONS.
2. A FLOW CHANNEL SHALL BE CONSTRUCTED INSIDE MANHOLE TO DIRECT INFLUENT INTO FLOW STREAM.
3. CONSTRUCTION OF DROP SHALL PROVIDE AN OVERSIZED SLAB TO EXTEND UNDER THE DROP CONNECTION.
4. MINIMUM PIPE SIZE FOR DROP IS 8".
5. SEE "STANDARD MANHOLE" DETAIL FOR ADDITIONAL REQUIREMENTS.

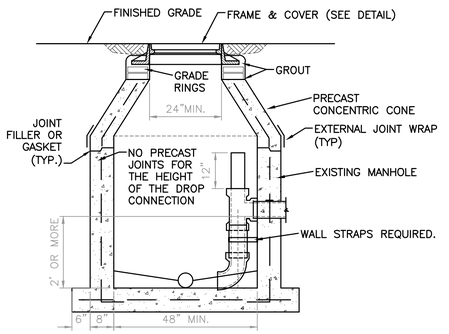
205 DROP CONNECTION PRECAST MANHOLE - TYPE A
N.T.S.



NOTES:

1. ALL DETAILS AND SPECIFICATIONS FOR STANDARD MANHOLES ARE APPLICABLE EXCEPT FOR REFERENCES TO DROP ASSEMBLY.
2. DROP CONNECTIONS SHALL BE REQUIRED WHENEVER AN INFLUENT INVERT IS LOCATED 2.0 FEET OR MORE ABOVE THE MAIN INVERT CHANNEL. DROP CONNECTIONS SHOULD NOT BE DESIGNED FOR LESS THAN A 2.0 FOOT DROP.
3. SOLVENT TYPE JOINT PVC FITTINGS TO BE UTILIZED IN THE DROP ASSEMBLY ONLY.
4. THE PRECAST BASE SHALL EXTEND FULLY UNDER THE DROP ASSEMBLY AND BE CONSTRUCTED MONOLITHICALLY WITH THE BASE SECTION.
5. BRICK AND CONCRETE RUBBLE ARE PERMITTED AS FILLER IN DROP ENCASEMENT.

206 OUTSIDE DROP CONNECTION PRECAST MANHOLE - TYPE B
N.T.S.



NOTES:

1. ALL DETAILS AND SPECIFICATIONS FOR STANDARD MANHOLES ARE APPLICABLE EXCEPT FOR REFERENCES TO DROP ASSEMBLY.
2. INSIDE DROP CONNECTION TO BE USED ONLY FOR A SINGLE DROP CONNECTION TO AN EXISTING MANHOLE.
3. DROP CONNECTIONS SHALL BE REQUIRED WHENEVER AN INFLUENT INVERT IS LOCATED 2.0 FEET OR MORE ABOVE THE MAIN INVERT CHANNEL. DROP CONNECTIONS SHOULD NOT BE DESIGNED FOR LESS THAN A 2.4 FOOT DROP.
4. SOLVENT TYPE JOINT PVC FITTINGS TO BE UTILIZED IN THE DROP ASSEMBLY ONLY.

207 INSIDE DROP CONNECTION EXISTING MANHOLE - TYPE C
N.T.S.

NOT FOR CONSTRUCTION OR BID

PROJECT # P0000
PROJECT NAME
DESCRIPTION
SHEET
PLACE PROJECT ADDRESS

SHEET NO.
SSWR01
TOTAL: 0
CAD FILE: FTLAUD-SSWR01
DRAWING FILE NO. 4-XXX-XX

REVISIONS

NO.	DATE	BY	CHK'D	DESCRIPTION

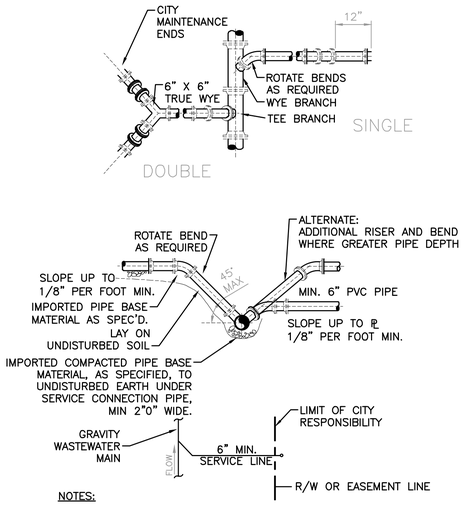
Page 1 of 88

ENGINEER: #Name
REG. No: #NO.
DATE: #DATE
TEL: #Tel
FAX: #Fax

DRAWN BY: CMB
DESIGNED BY:
CHECKED BY:
DATE: 09/17/2018
SCALE:
FIELD BOOK:

CITY OF FORT LAUDERDALE
PUBLIC WORKS DEPARTMENT
ENGINEERING & ARCHITECTURE
100 North Andrews Avenue, Fort Lauderdale, Florida 33301

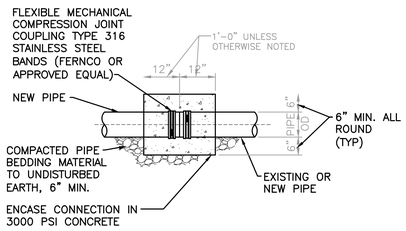
R:\STD TEMPLATES\STANDARD DETAIL TEMPLATES\SANITARY\FTLAUD-SSWR01.DWT



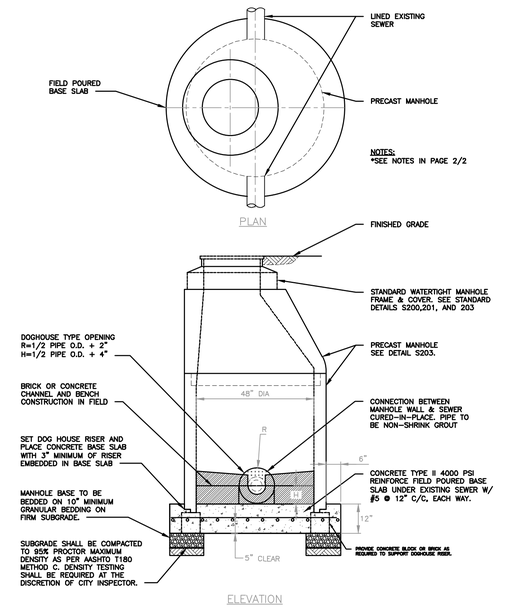
NOTES:

1. WASTEWATER MAIN WYE BRANCH TO MATCH MAIN PIPE MATERIAL.
2. NO 90° BENDS SHALL BE USED FOR WASTEWATER SERVICE AND CLEANOUT INSTALLATIONS.
3. SERVICE LATERALS SHALL TERMINATE AT 12" INSIDE THE PROPERTY LINE AT A DEPTH OF 3 FEET EXCEPT WHERE A DEEPER INVERT IS REQUIRED BY EXISTING BUILDING CONDITIONS.

208 TYPICAL WASTEWATER SERVICE CONNECTION
N.T.S.



211 JOINT FOR DISSIMILAR GRAVITY SEWER PIPE
N.T.S.



NOTES: ABANDONMENT OF EXISTING WASTEWATER SERVICE CONNECTIONS.

1. EXISTING SEWER LATERAL CONNECTIONS TO BE ABANDONED AS PART OF NEW CONSTRUCTION AND TO BE REPLACED WITH NEW CONNECTIONS MUST BE SEALED OFF USING SECTIONAL CURED-IN PLACE (CIP) LINERS.
2. CIP LINER CONTRACTOR MUST BE DULY LICENSED BY BROWARD COUNTY, FLORIDA AND CERTIFIED BY THE EQUIPMENT MANUFACTURER AND/OR ITS AUTHORIZED REPRESENTATIVE TO PERFORM SUCH INSTALLATIONS.

NOTES: INSTALLATION OF NEW WASTEWATER SERVICE CONNECTIONS

3. NEW WASTEWATER SERVICE CONNECTIONS SHALL BE CONSTRUCTED BY INSTALLING A LMT(TM) (LINED MAIN TAP) SADDLE INSTALLATION SYSTEM ENGINEERED TO CONNECT A LATERAL SERVICE PIPE TO A LINER INSIDE A REHABILITATED MAINLINE (LMK TECHNOLOGIES OR APPROVED EQUAL). TO BE INSTALLED PER MANUFACTURER INSTRUCTIONS.
4. CLEANOUT MUST BE PROVIDED PER STANDARD DETAIL S209.
5. CONTRACTOR SHALL PERFORM POST CCTV INSPECTION FOR NEW WASTEWATER SERVICE CONNECTION. SUBMIT COPY OF CCTV FILE TO CITY'S DSD AND PW ENGINEERING STAFF FOR INSPECTION OF DEFECTS OR DISTORTION TO MAINLINER.

NOTES: INSTALLATION OF NEW PRECAST CONCRETE MANHOLE(S) BUILT OVER EXISTING CIP LINER.

6. ALL NEW MANHOLES MUST BE CONSTRUCTED PER STANDARD DETAIL S212 (P.1 of 2) BY EXCAVATING TO HOST PIPE ELEVATION.
7. REMOVE HOST PIPE MATERIAL (E.G. VCP) FROM AREA OF NEW DOG HOUSE MANHOLE INSTALLATION.
8. CONTRACTOR SHALL NOT COMPROMISE STRUCTURAL INTEGRITY OF THE CIP LINER
9. CONTRACTOR SHALL PROPERLY SEAL CONNECTIONS BETWEEN DOG HOUSE MANHOLE AND CIP LINER TO AVOID INFILTRATION AND INFLOW CONTRIBUTION TO THE CITY'S COLLECTION SYSTEM PER STANDARD DETAIL S212 (P.1 of 2).
10. MANHOLE BENCH SHALL BE CONSTRUCTED TO INCORPORATE THE BOTTOM HALF OF THE CIP LINER AS PART OF THE MANHOLE TROUGH.
11. UPON FINAL CONSTRUCTION AND CURING OF THE MANHOLE BENCH THE INSIDE OF THE MANHOLE SHALL BE LINED UTILIZING SPRAY APPLIED POLYMERIC (EPOXY AND URETHANE) RESINS. RAVEN LINING SYSTEMS, IET COATING (PAINTS AND COATINGS, INC.) OR APPROVED EQUAL MUST BE UTILIZED.
12. ALL NEW DOGHOUSE MANHOLE INSTALLATIONS MUST BE INSPECTED BY CITY INSPECTORS WHO SHALL WITNESS ALL PHASES OF CONSTRUCTION.
13. CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE POST CCTV INSPECTION OF MAINLINE/ MANHOLE INTERCONNECTIONS.
14. QUALITY OF CCTV INSPECTION FILES MUST CLEARLY SHOW SUCH INTERCONNECTION IN ORDER TO EVALUATE AND APPROVE. CONTRACTOR SHALL SUBMIT A COPY OF CCTV FILE TO DSD AND PW ENGINEERING STAFF FOR REVIEW AND APPROVAL.

DSD = DEPARTMENT OF SUSTAINABLE DEVELOPMENT

PW = PUBLIC WORKS

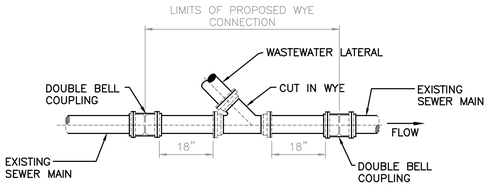
212 PRECAST CONCRETE MANHOLE BUILT OVER EXISTING CURED IN PLACE LINED SEWER PIPE
N.T.S.

NOT FOR CONSTRUCTION OR BID

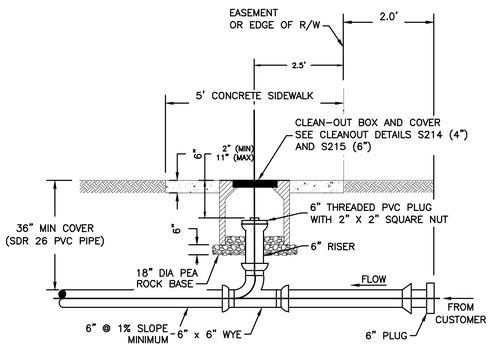
ENGINEER: #Name
REG. No: #NO.
DATE: #DATE
TEL: #Tel
FAX: #Fax

DRAWN BY: | DATE: MM/DD/YY
DESIGNED BY: | SCALE:
CHECKED BY: | FIELD BOOK:

CITY OF FORT LAUDERDALE
PUBLIC WORKS DEPARTMENT
ENGINEERING & ARCHITECTURE
100 North Andrews Avenue, Fort Lauderdale, Florida 33301

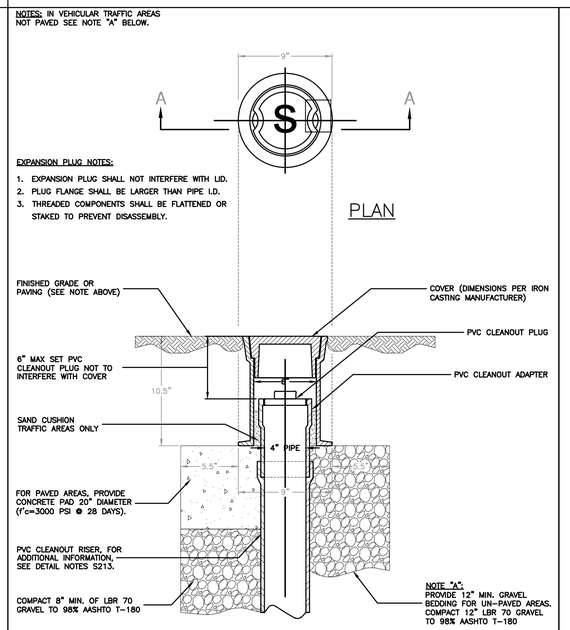


210 NEW LATERAL ON EXISTING GRAVITY WASTEWATER MAIN
N.T.S.

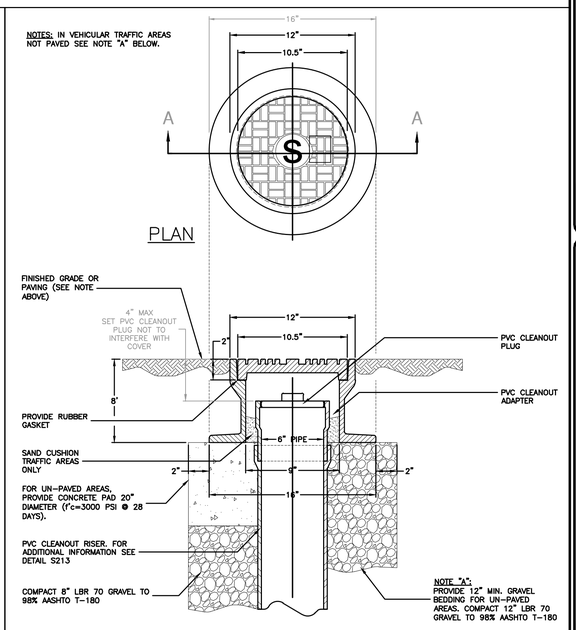


1. THE CLEAN OUT SHALL BE INSTALLED IN THE MIDDLE OF THE SIDEWALK. THIS DIMENSION WILL VARY DEPENDING UPON THE WIDTH OF THE SIDEWALK. 2.5' APPLIES TO 5' SIDEWALK WIDTH. IF SIDEWALKS DO NOT EXIST, THE CLEAN OUT SHALL BE INSTALLED 2.5' FROM THE RIGHT OF WAY LINE.
2. A NEW SECTION OF SIDEWALK SHALL BE POURED AROUND THE CLEAN-OUT BOX WHEN WORKING IN AN AREA WITH EXISTING SIDEWALKS.
3. IN GRASS AREA USE 24"x24" OR 24" DIAMETER CONCRETE COLLAR. SEE DETAILS S214 AND S215 FOR 4 AND 6 INCH CLEAN-OUT.

213 SANITARY SERVICE CONNECTION AT PROPERTY LINE OR EASEMENT LINE (PROFILE)
N.T.S.



214 CLEAN-OUT COVER ASSEMBLY FOR 4-INCH CLEANOUTS
N.T.S.



215 CLEAN-OUT COVER ASSEMBLY FOR 6-INCH CLEANOUTS
N.T.S.

NO.	DATE	BY	CHK'D	DESCRIPTION

REVISIONS

Page 2 of 68

PROJECT # P0000
PROJECT NAME
DESCRIPTION
SHEET
PLACE PROJECT ADDRESS

SHEET NO.
SSWR02

TOTAL: 0

CAD FILE: FTLAUD-SSWR02

DRAWING FILE NO. 4-XXX-XX

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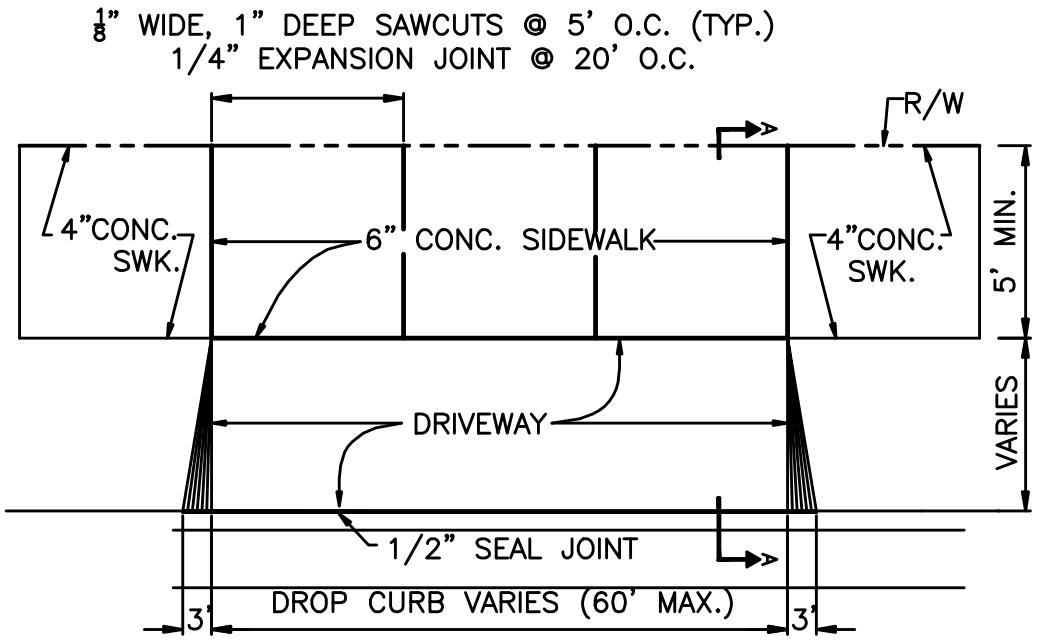
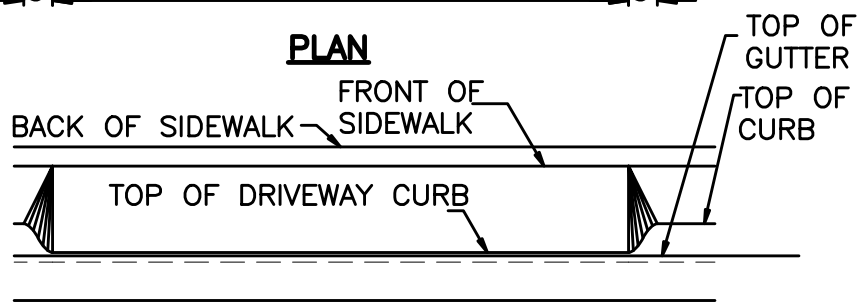
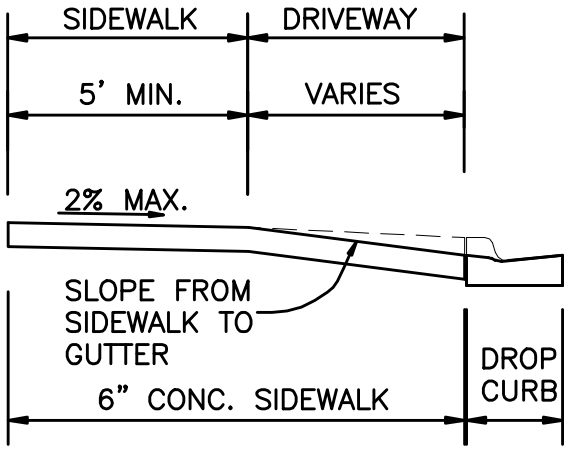


PLAN



ELEVATION



SECTION A–A

DATE: JAN.'82	SCALE: N.T.S.	**DRIVEWAY WITH CURB**	**C**
REVISED: MARCH '09	DRAWN BY:		**1.3** 1 OF 2

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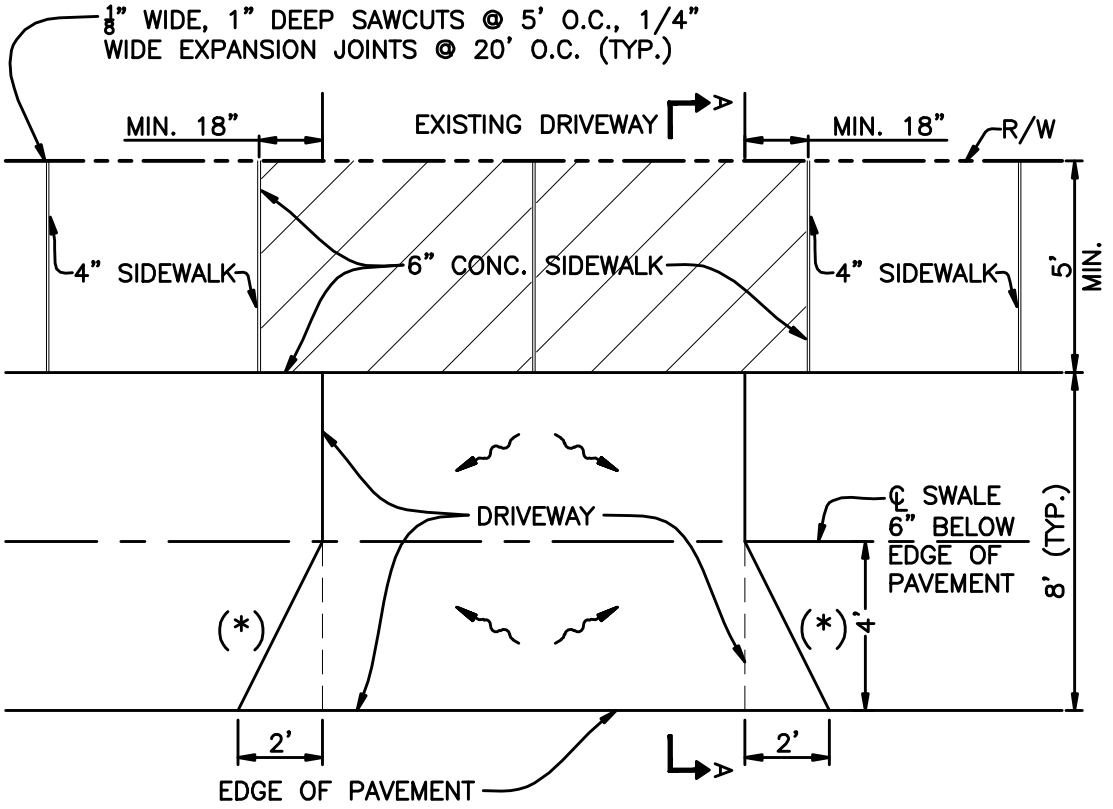
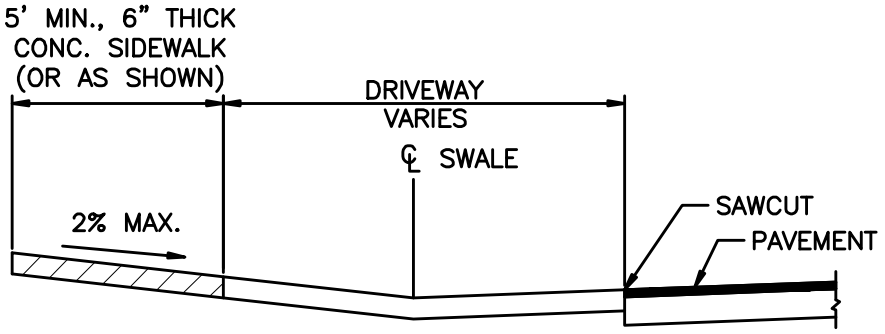


PLAN VIEW

NOTE:

*4' FLARED RADIUS OPTIONAL



SECTION A–A

DATE: JAN.'82	SCALE: N.T.S.	DRIVEWAY WITH CURB	C 1.3 2 OF 2
REVISED: MARCH '09	DRAWN BY:		

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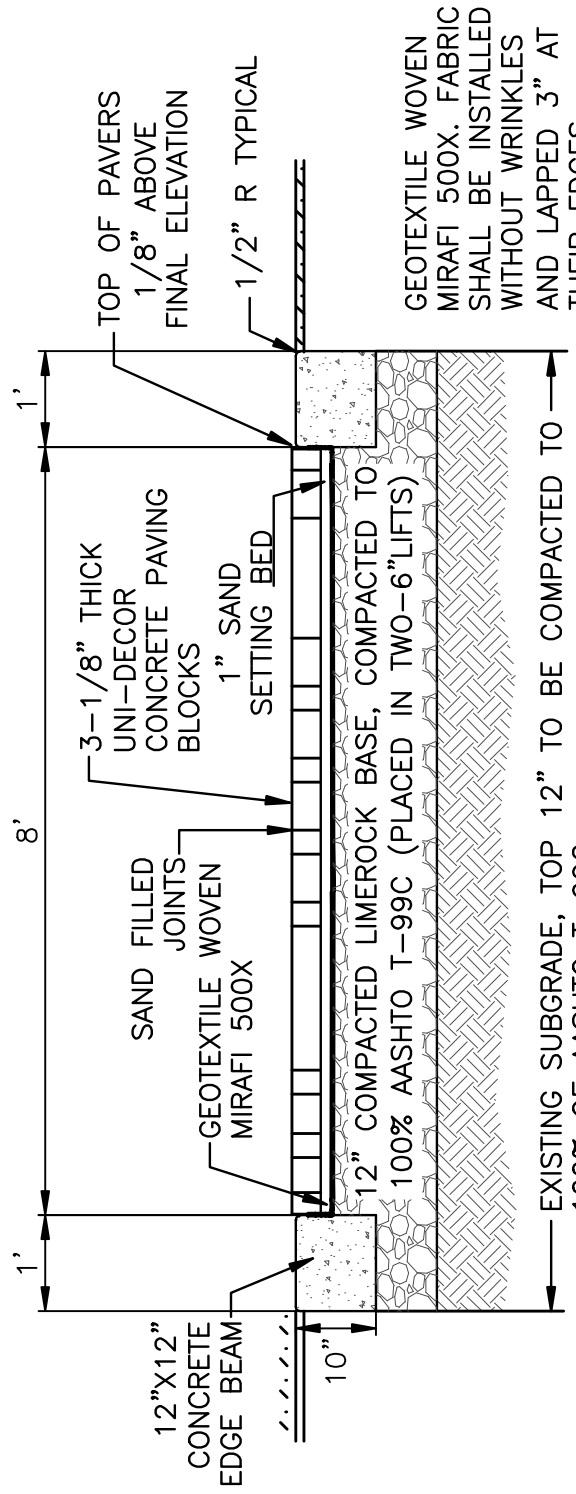

DATE: JAN.'09	SCALE: N.T.S.	**PAVERS WITH LIMESTONE BASE**	**C**
REVISED: MARCH '09	DRAWN BY: R.C.	**CROSS SECTION**	**1.4** 1 OF 3

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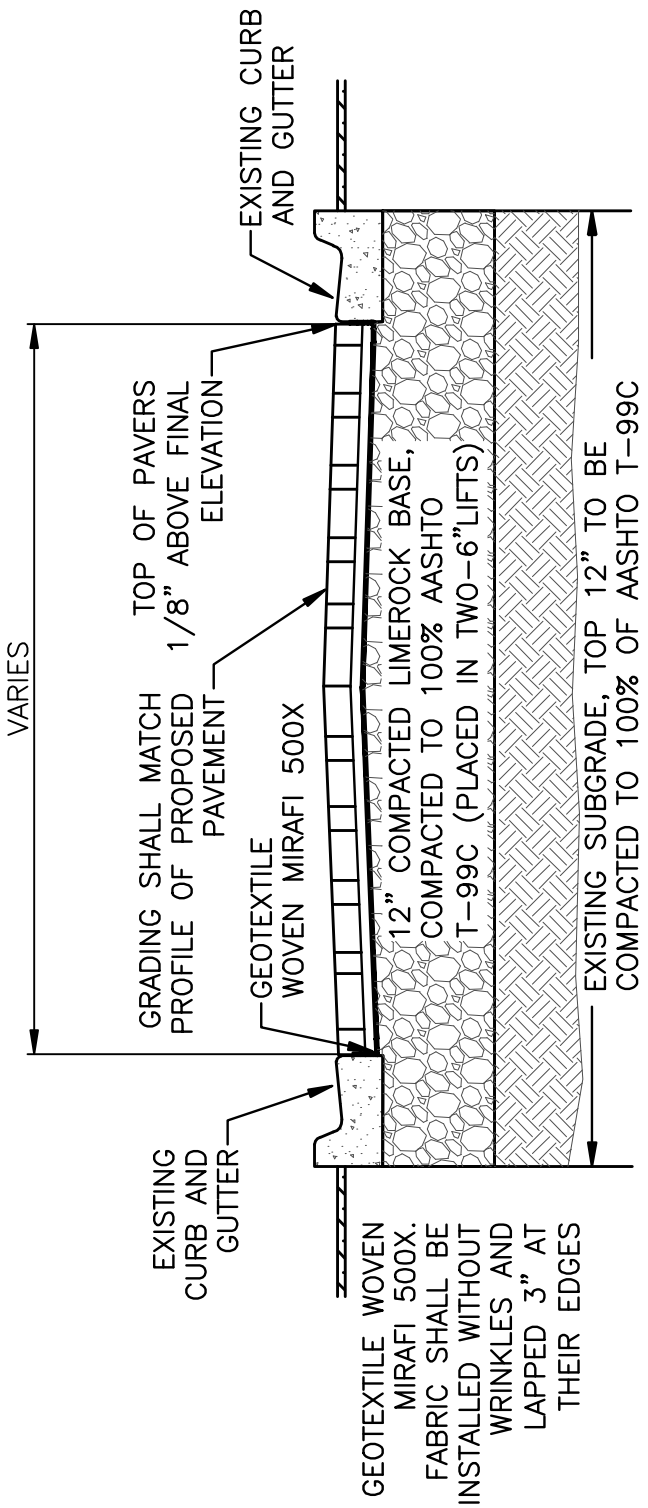

DATE: JAN.'09	SCALE: N.T.S.	PAVERS WITH LIMESTONE BASE	C
REVISED: MARCH '09	DRAWN BY: R.C.	LONGITUDINAL SECTION	1.4
			2 OF 3

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1) CONTRACTOR SHALL GIVE SPECIAL ATTENTION TO ACHIEVE COMPACTION REQUIREMENTS AT AREAS ADJACENT TO EDGE RESTRAINTS, CATCH BASINS, AND UTILITY STRUCTURES.

2) CONTRACTOR SHALL FORM THE INTENDED SURFACE PROFILE OF THE BASE SO THAT THE PAVERS CAN BE PLACED ON A UNIFORM THICKNESS OF BEDDING SAND.

3) SURFACE OF COMPACTED BASE SHALL BE SMOOTH WITH A SURFACE SMOOTHNESS MAXIMUM TOLERANCE OF +/− 3/8" OVER A 10' STRAIGHTEDGE. UNEVEN AREAS OF THE LIMEROCK BASE SURFACE MUST BE MADE LEVEL PRIOR TO PLACING THE BEDDING SAND. BEDDING SAND SHALL NOT BE USED TO COMPENSATE FOR AN UNEVEN BASE.

4) CONTRACTOR SHALL ENSURE THAT ALL SURROUNDINGS CONTAINING EDGES, AND COMPACTED BASE ARE COMPLETED PRIOR TO INITIATING PAVER INSTALLATION.

5) BEDDING SAND SHALL CONFORM TO ASTMC33 (CONCRETE SAND) WITH 0% PASSING NO.200 SIEVE. SPREAD BEDDING SAND AT OPTIMUM MOISTURE CONTENT EVENLY OVER BASE AND SCREED SAND TO AN EVEN THICKNESS OF 1" (+/− 3/16in.). THE SCREEDED SAND SHOULD NOT BE DISTURBED.

6) LAY PAVERS IN THE PATTERN INDICATED. MAINTAIN STRAIGHT JOINT LINES. JOINTS BETWEEN PAVERS SHALL BE CONSISTENT AND BETWEEN 1/16 TO 1/8 INCH WIDE.

7) AFTER AN AREA OF PAVERS ARE PLACED, IT SHALL BE COMPACTED WITH A VIBRATING PLATE COMPACTOR, EXERTING 5000 LBS. OF CENTRIFUGAL COMPACTION FORCE, WITH SURFACE CLEAN AND JOINTS UNSANDED. A MINIMUM OF THREE PASSES SHALL BE MADE. PLATE VIBRATOR SHALL HAVE A RUBBER MAT OR ROLLER FEET TO AVOID CHIPPING THE PAVERS.

8) JOINT SAND SHALL BE FINER THAN THE BEDDING SAND TO FACILITATE FILLING OF THE JOINTS. THIS CAN OBTAINED BY PASSING THE BEDDING SAND THROUGH A No. 8 SIEVE. AFTER THE FIRST PASS OF THE PLATE COMPACTOR, DRY JOINT SAND SHALL BE SWEPT INTO THE JOINTS AND THE PAVERS COMPACTED, REPEAT THE PROCESS UNTIL THE JOINTS ARE FILLED WITH SAND. WET SAND SHALL NOT BE INSTALLED.

9) CONTRACTOR SHALL LEAVE TOP OF PAVERS 3/16" ABOVE FINAL ELEVATION TO COMPENSATE FOR POSSIBLE MINOR SETTLING.

10) ALL CUTS TO BE VERTICAL AND TRUE, NO EDGE PIECE TO BE SMALLER THAN 1/3 FULL PAVER SIZE.

DATE: JAN.'09	SCALE: N.T.S.	**PAVERS WITH LIMESTONE BASE**	**C**
REVISED: MARCH '09	DRAWN BY: R.C.	**CONSTRUCTION NOTES**	**1.4** 3 OF 3

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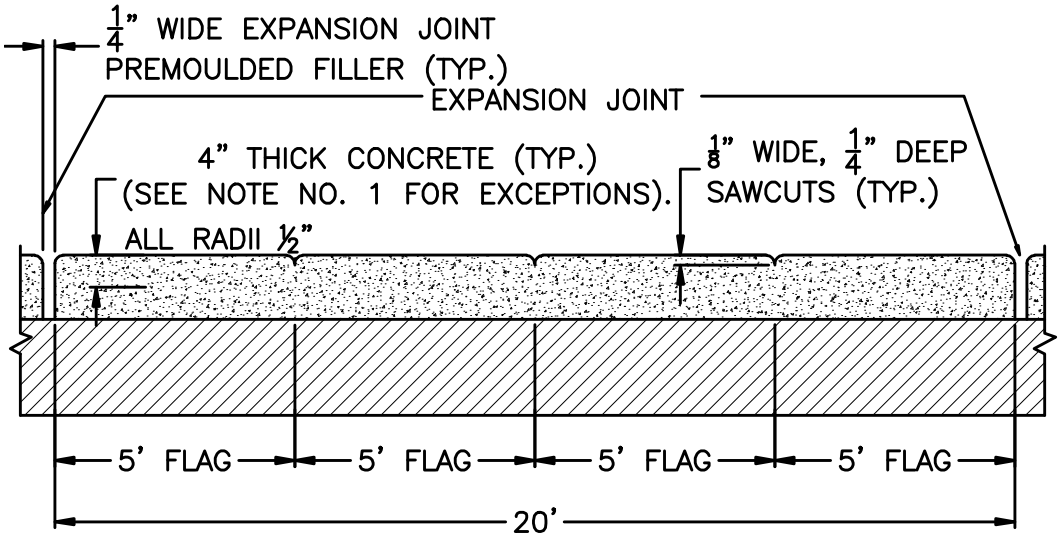

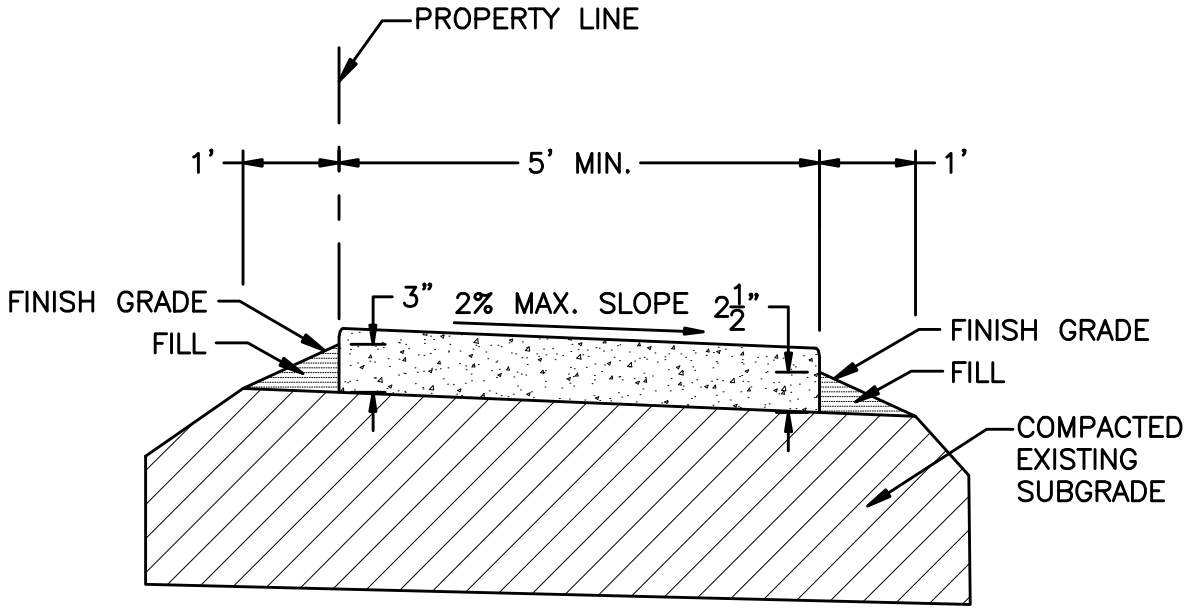

NOTES:

1. A MINIMUM OF 6" THICK SIDEWALK IS REQUIRED AT SIDEWALKS THROUGH DRIVEWAYS AND ON ALL COMMERCIAL SIDEWALK APPLICATIONS.
2. CONCRETE STRENGTH SHALL BE 3000 P.S.I.
3. THE USE OF REINFORCEMENT WILL NOT BE PERMITTED.
4. SIDEWALK SLOPES SHALL MEET THE REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT (ADA).

DATE: JAN.'82	SCALE: N.T.S.	SIDEWALK CONSTRUCTION	C
REVISED: MARCH '09	DRAWN BY:		2.1

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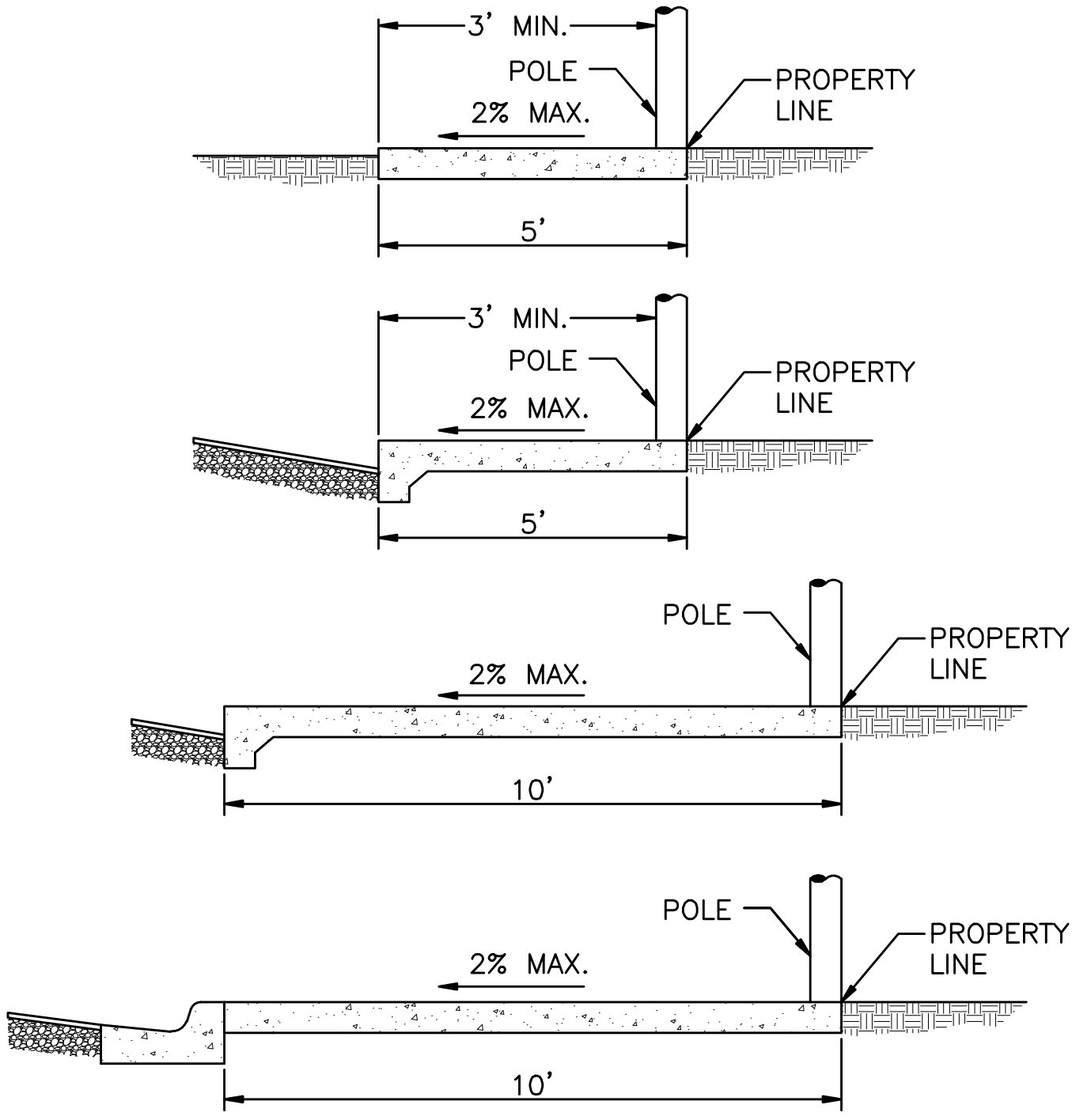

DATE: JAN.'82	SCALE: N.T.S.	POLE IN SIDEWALK	C 2.2
REVISED: MARCH '09	DRAWN BY:		

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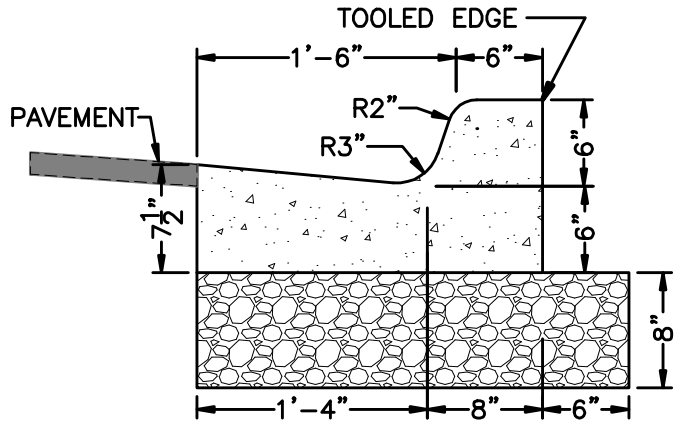
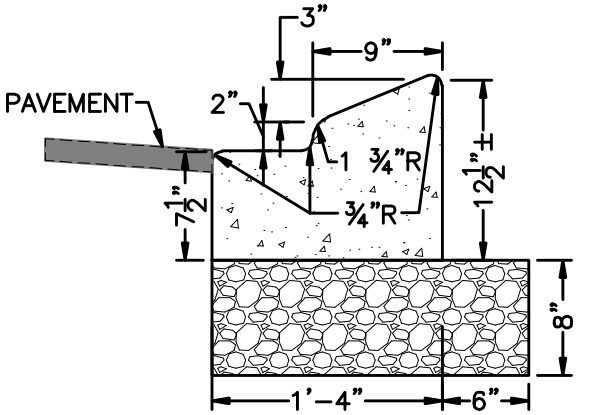
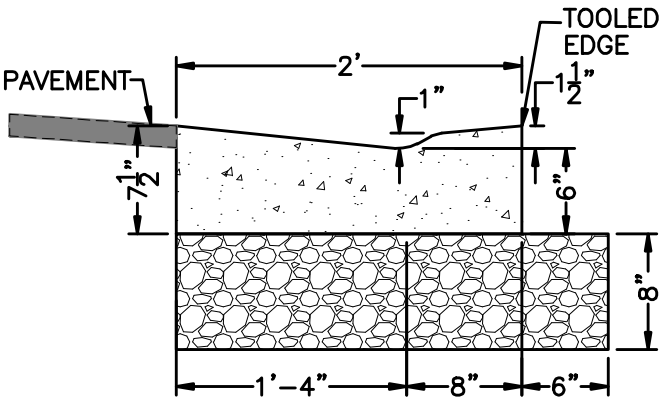


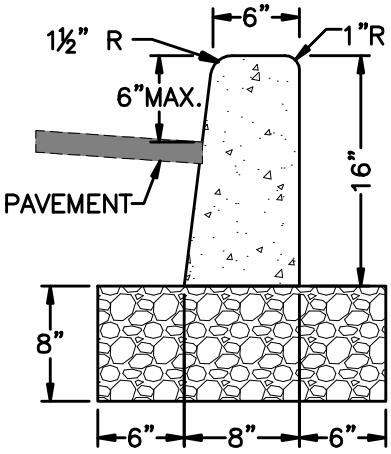
TYPE 'F' CURB & GUTTER



TYPE 'A' MEDIAN CURB



DROP CURB



TYPE 'D'

NOTE:

1. ALL CURBS MUST HAVE AN 8" THICK MINIMUM STABILIZED LIMEROCK BASE, COMPACTED TO 98% MAX. DENSITY PER AASHTO T-180.
2. ALL CONCRETE STRENGTH TO BE 3000 P.S.I.

DATE: JAN.'82	SCALE: N.T.S.	STANDARD CURB DETAILS	C
REVISED: MARCH '09	DRAWN BY:		3.1
			1 OF 2

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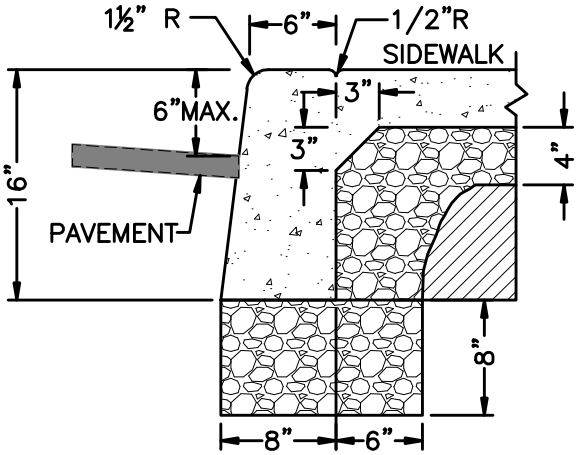
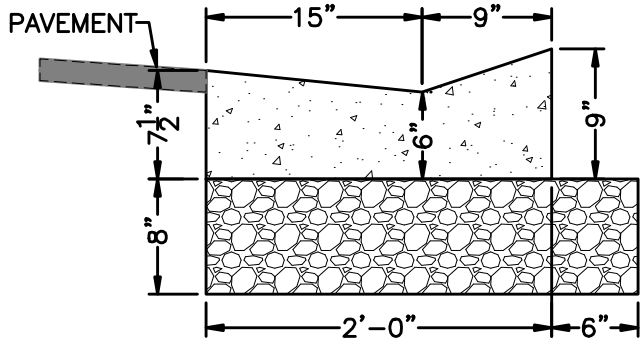


16" CURB WITH SIDEWALK



V-GUTTER

NOTE:

1. ALL CURBS MUST HAVE AN 8" THICK MINIMUM STABILIZED LIMEROCK BASE, COMPACTED TO 98% MAX. DENSITY PER AASHTO T-180.
2. ALL CONCRETE STRENGTH TO BE 3000 P.S.I.

DATE: JAN.'82	SCALE: N.T.S.	STANDARD CURB DETAILS	C 3.1 2 OF 2
REVISED: MARCH '09	DRAWN BY:		

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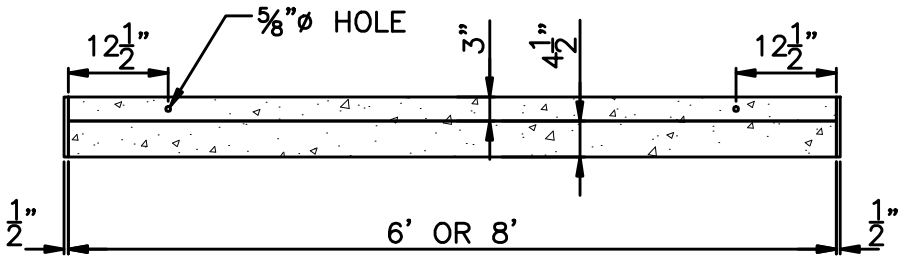
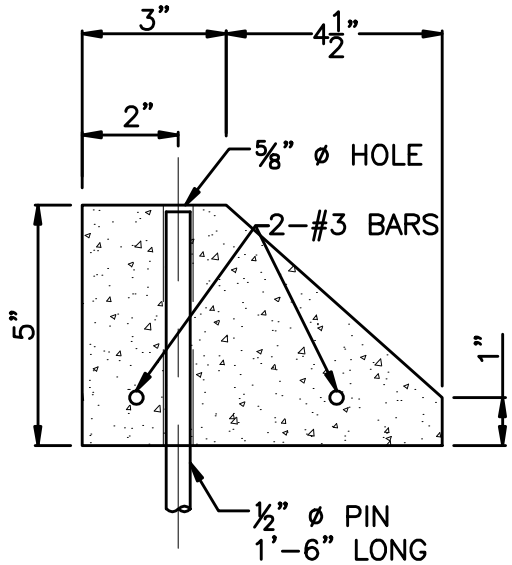


PLAN

ELEVATION



SECTION A–A

DATE: JAN.'82	SCALE: N.T.S.	STANDARD WHEEL STOP	C 3.2
REVISED: MARCH '09	DRAWN BY:		

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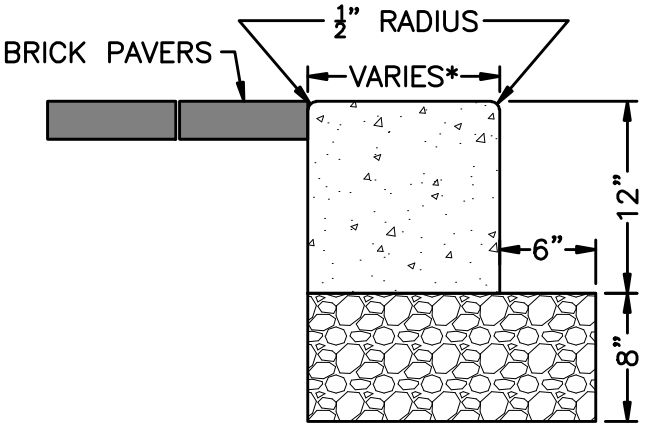

HEADER CURB

*** 18" X 12" FOR ROADWAY**
12" X 12" FOR WALKWAY & PARKING APPLICATIONS

DATE: JAN.'82	SCALE: N.T.S.	**HEADER CURB**	**C**
REVISED: MARCH '09	DRAWN BY:		**3.3**

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ADA CURB RAMPS GENERAL NOTES*:

1. PUBLIC SIDEWALK CURB RAMPS SHALL BE CONSTRUCTED IN THE PUBLIC RIGHT OF WAY AT LOCATIONS THAT WILL PROVIDE CONTINUOUS UNOBSTRUCTED PEDESTRIAN CIRCULATION PATHS TO PEDESTRIAN AREAS, ELEMENTS, AND FACILITIES IN THE PUBLIC RIGHT OF WAY AND TO ACCESSIBLE PEDESTRIAN ROUTES ON ADJACENT SITES. CURBED FACILITIES WITH SIDEWALKS AND THOSE WITHOUT SIDEWALKS ARE TO HAVE CURB RAMPS CONSTRUCTED AT ALL STREET INTERSECTIONS AND AT TURNOUTS THAT HAVE CURBED RETURNS. RAMPS CONSTRUCTED AT LOCATIONS WITHOUT SIDEWALKS SHALL HAVE A LANDING CONSTRUCTED AT THE TOP OF EACH RAMP.

2. THE LOCATION AND ORIENTATION OF CURB RAMPS SHALL BE AS SHOWN IN THE PLANS.

3. CURB RAMP RUNNING SLOPES AT UNRESTRAINED SITES SHALL NOT BE STEEPER THAN 1:12 AND CROSS SLOPE SHALL BE 0.02 OR FLATTER. TRANSITION SLOPES SHALL NOT BE STEEPER THAN 1:12.

WHEN ALTERING PEDESTRIAN FACILITIES WHERE EXISTING SITE DEVELOPMENT PRECLUDES THE ACCOMMODATION OF A RAMP SLOPE OF 1:12, A RUNNING SLOPE BETWEEN 1:12 AND 1:10 IS PERMITTED FOR A RISE OF 6" MAXIMUM AND A RUNNING SLOPE OF BETWEEN 1:10 AND 1:8 IS PERMITTED FOR A RISE OF 3" MAXIMUM. WHERE COMPLIANCE WITH THE REQUIREMENTS FOR A CROSS SLOPE CANNOT BE FULLY MET, THE MINIMUM FEASIBLE CROSS SLOPE SHALL BE PROVIDED.

RAMP RUNNING SLOPE IS NOT REQUIRED TO EXCEED 8' IN LENGTH, EXCEPT AT SITES WHERE THE PLANS SPECIFY A GREATER LENGTH.

4. IF A CURB RAMP IS LOCATED WHERE PEDESTRIANS MUST WALK ACROSS THE RAMP, THEN THE WALK SHALL HAVE TRANSITION SLOPES TO THE RAMP; THE MAXIMUM SLOPE OF THE TRANSITIONS SHALL BE 1:12. RAMPS WITH CURB RETURNS MAY BE USED AT LOCATIONS WHERE OTHER IMPROVEMENTS PROVIDE GUIDANCE AWAY FROM THAT PORTION OF THE CURB PERPENDICULAR TO THE SIDEWALK; IMPROVEMENTS FOR GUIDANCE ARE NOT REQUIRED AT CURB RAMPS FOR LINEAR PEDESTRIAN TRAFFIC.

* AMENDED FROM FDOT INDEX 304

DATE: JAN.'82	SCALE: N.T.S.	ADA CURB RAMPS (FOR DETAILS C4.2 - C4.9)	C 4.1 1 OF 2
REVISED: MARCH '09	DRAWN BY:		

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ADA CURB RAMPS GENERAL NOTES *: (CONT'D)

5. CURB RAMP DETECTABLE WARNING SURFACE SHALL EXTEND THE FULL WIDTH OF THE RAMP AND IN THE DIRECTION OF TRAVEL 24" FROM THE BACK OF THE CURB. DETECTABLE WARNING SURFACES SHALL BE VANGUARD, ARMOR TILE, OR APPROVED EQUAL.

6. WHERE A RAMP IS CONSTRUCTED WITHIN EXISTING EXISTING CURB, CURB AND GUTTER, AND/OR SIDEWALK, THE EXISTING CURB OR CURB AND GUTTER SHALL BE REMOVED TO THE NEAREST JOINT BEYOND THE CURB TRANSITIONS OR TO THE EXTENT THAT NO REMAINING SECTION OF CURB OR CURB AND GUTTER IS LESS THAN 5' LONG. THE EXISTING SIDEWALK SHALL BE REMOVED TO THE NEAREST JOINT BEYOND THE TRANSITION SLOPE OR WALK AROUND OR TO THE EXTENT THAT NO REMAINING SECTION OF SIDEWALK IS LESS THAN 5' LONG.

7. DETECTABLE WARNING SURFACE COLOR SHALL CONTRAST WITH SURROUNDING SURFACE AS DIRECTED BY CITY ENGINEER (DEFAULT COLOR IS YELLOW).

* AMENDED FROM FDOT INDEX 304

DATE: JAN.'82	SCALE: N.T.S.	**ADA CURB RAMPS**	**C**
REVISED: MARCH '09	DRAWN BY:	**(FOR DETAILS C4.2 - C4.9)**	**4.1** 2 OF 2

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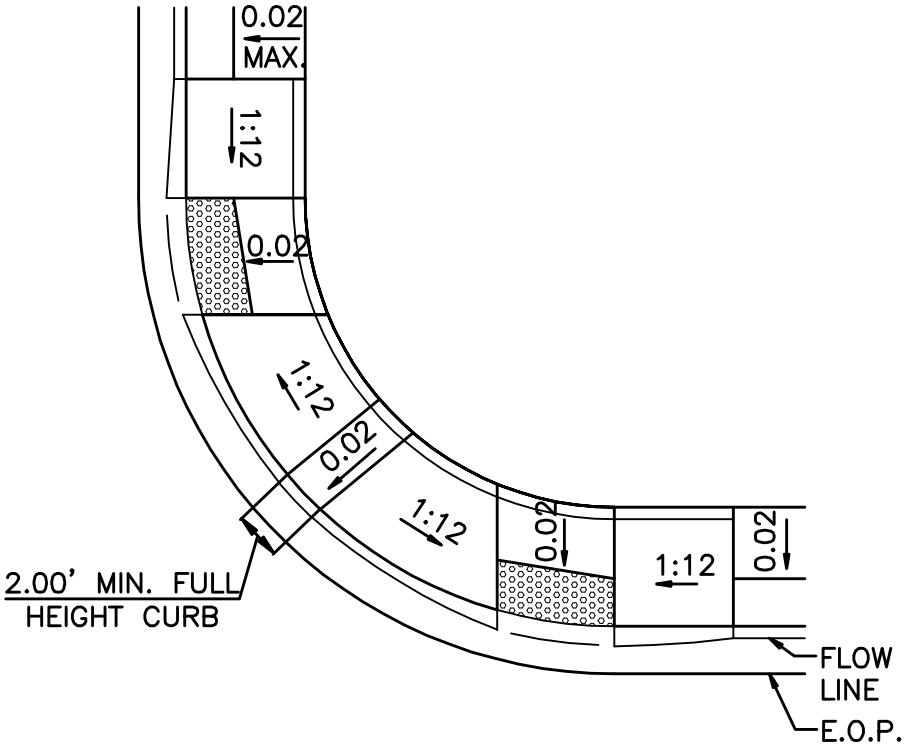

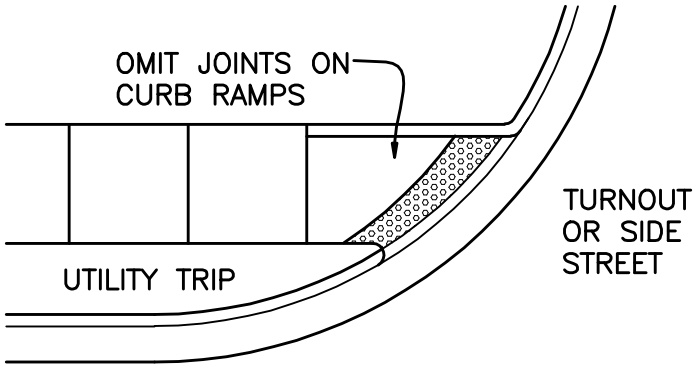

LINEAR SIDEWALK RAMPS *

* AMENDED FROM FDOT INDEX 304

DATE: JAN.'82	SCALE: N.T.S.	TYPICAL PLACEMENT OF PUBLIC SIDEWALK	C
REVISED: MARCH '09	DRAWN BY:	CURB RAMPS AT CURBED RETURNS	4.2
			1 OF 2

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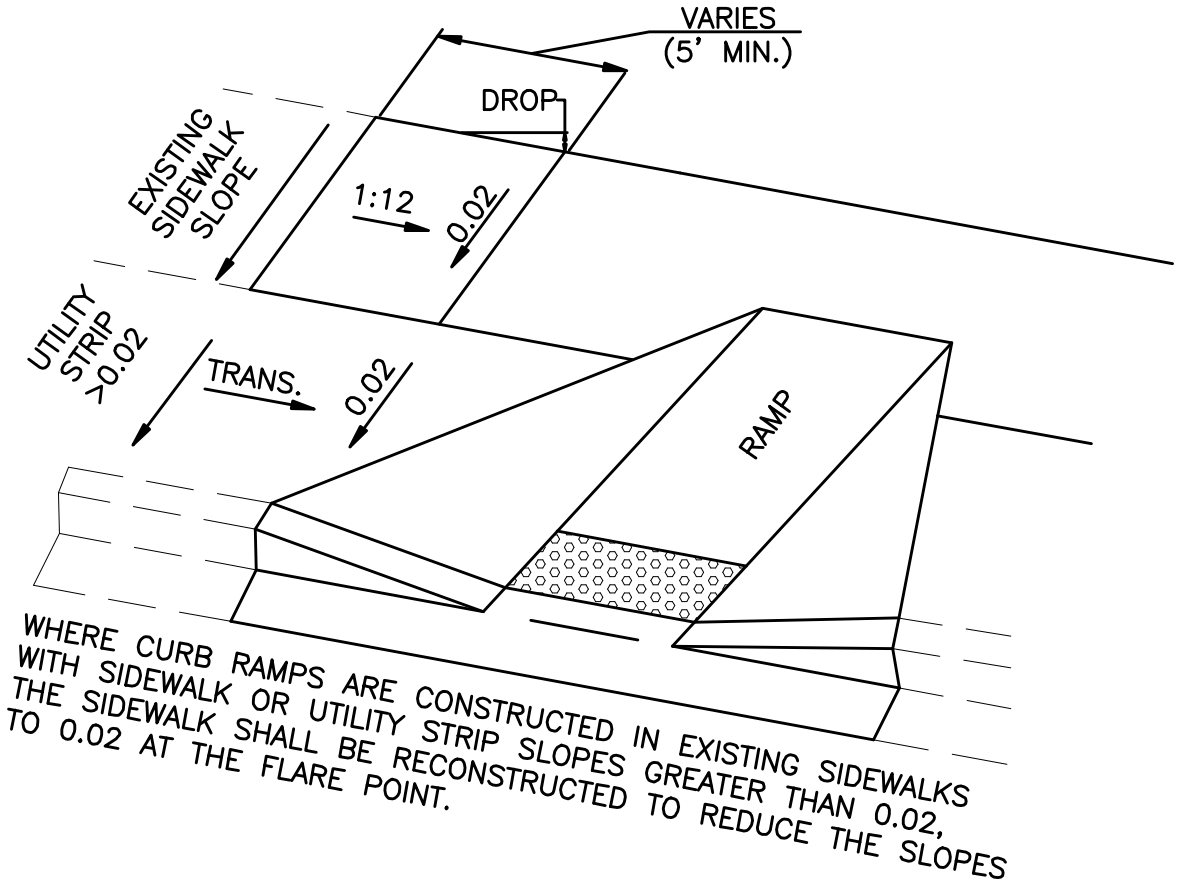

SIDEWALK / UTILITY STRIP * TRANSITION

* AMENDED FROM FDOT INDEX 304

DATE: JAN.'82	SCALE: N.T.S.	TYPICAL PLACEMENT OF PUBLIC SIDEWALK	C
REVISED: MARCH '09	DRAWN BY:	CURB RAMPS AT CURBED RETURNS	4.2 2 OF 2

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CITY OF FORT LAUDERDALE

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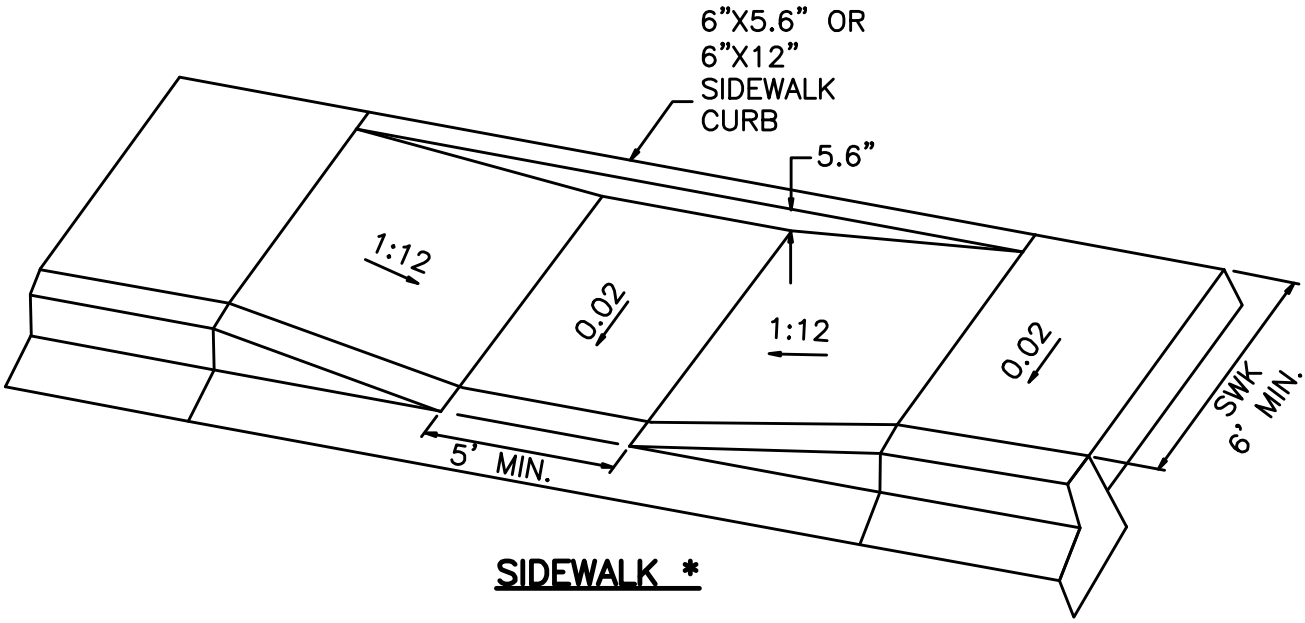
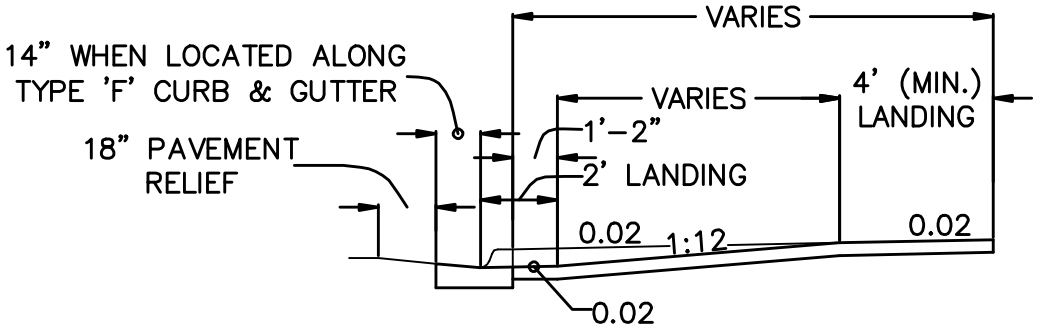


SIDEWALK *



SECTION THROUGH RAMP RUN AND LANDINGS WITH *
UPPER LANDING AT NORMAL SIDEWALK ELEVATION

* AMENDED FROM FDOT INDEX 304

DATE: JAN.'81	SCALE: N.T.S.	**DIMENSIONAL FEATURES FOR PUBLIC SIDEWALK RAMPS WHERE RAMP AND LANDING DEPTH ARE NOT RESTRICTED BY R/W**	**C 4.3**
REVISED: MARCH '09	DRAWN BY:		

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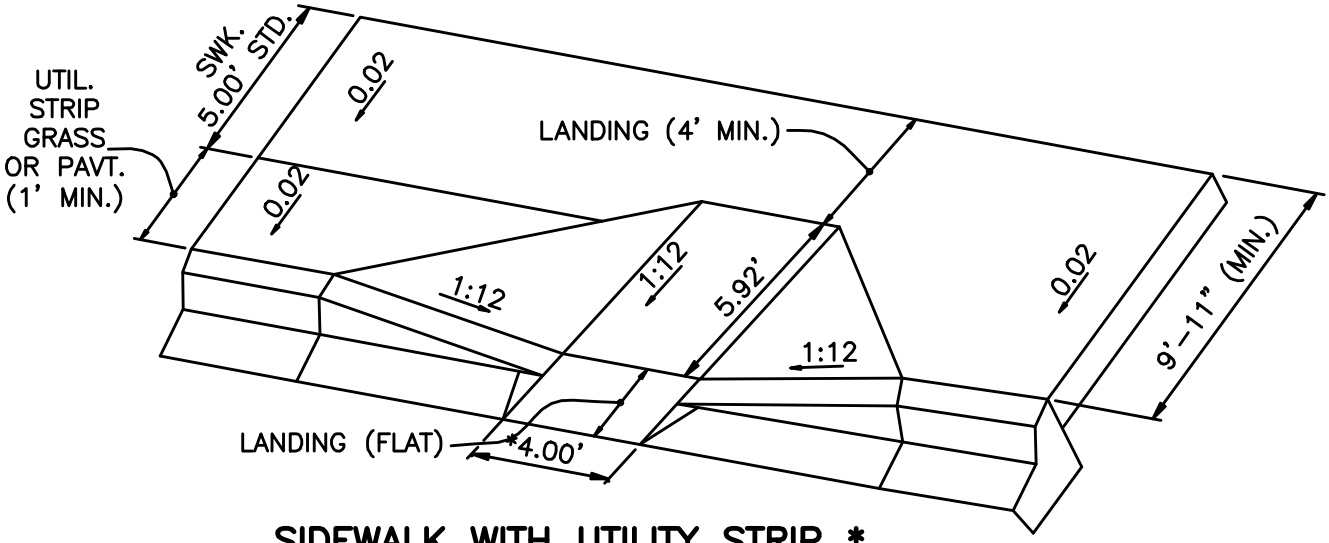
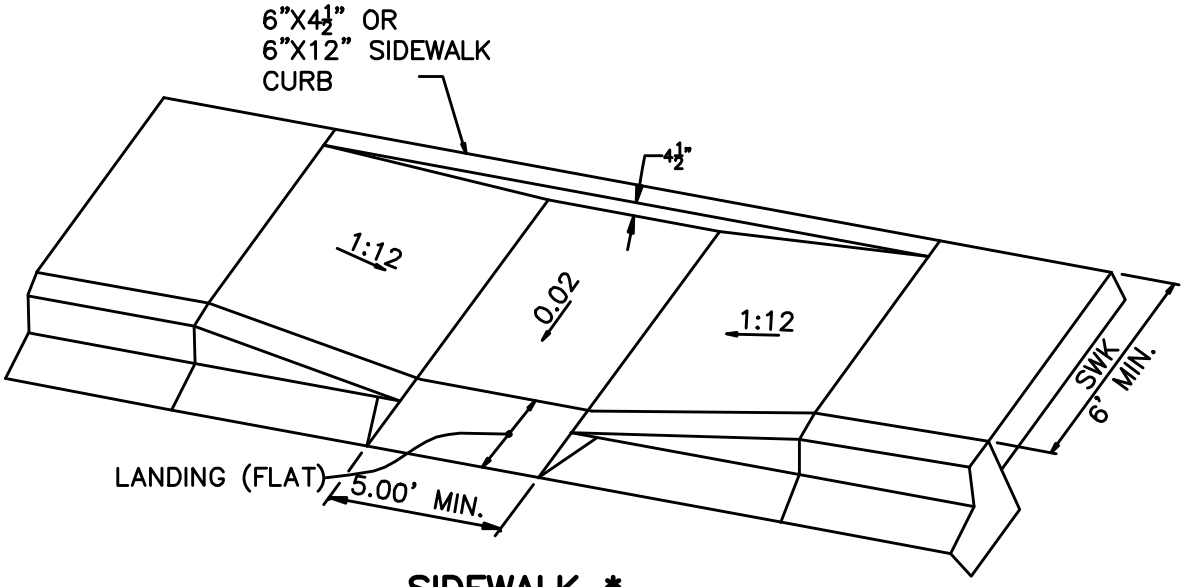


SIDEWALK WITH UTILITY STRIP *

*MAY BE REDUCED TO 3' IN RESTRICTED CONDITIONS



SIDEWALK *

* AMENDED FROM FDOT INDEX 304

DATE: JAN.'82	SCALE: N.T.S.	**DIMENSIONAL FEATURES FOR PUBLIC SIDEWALK CURB RAMPS WHERE RAMP AND LANDING DEPTH ARE RESTRICTED BY R/W**	**C 4.4**
REVISED: MARCH '09	DRAWN BY:		

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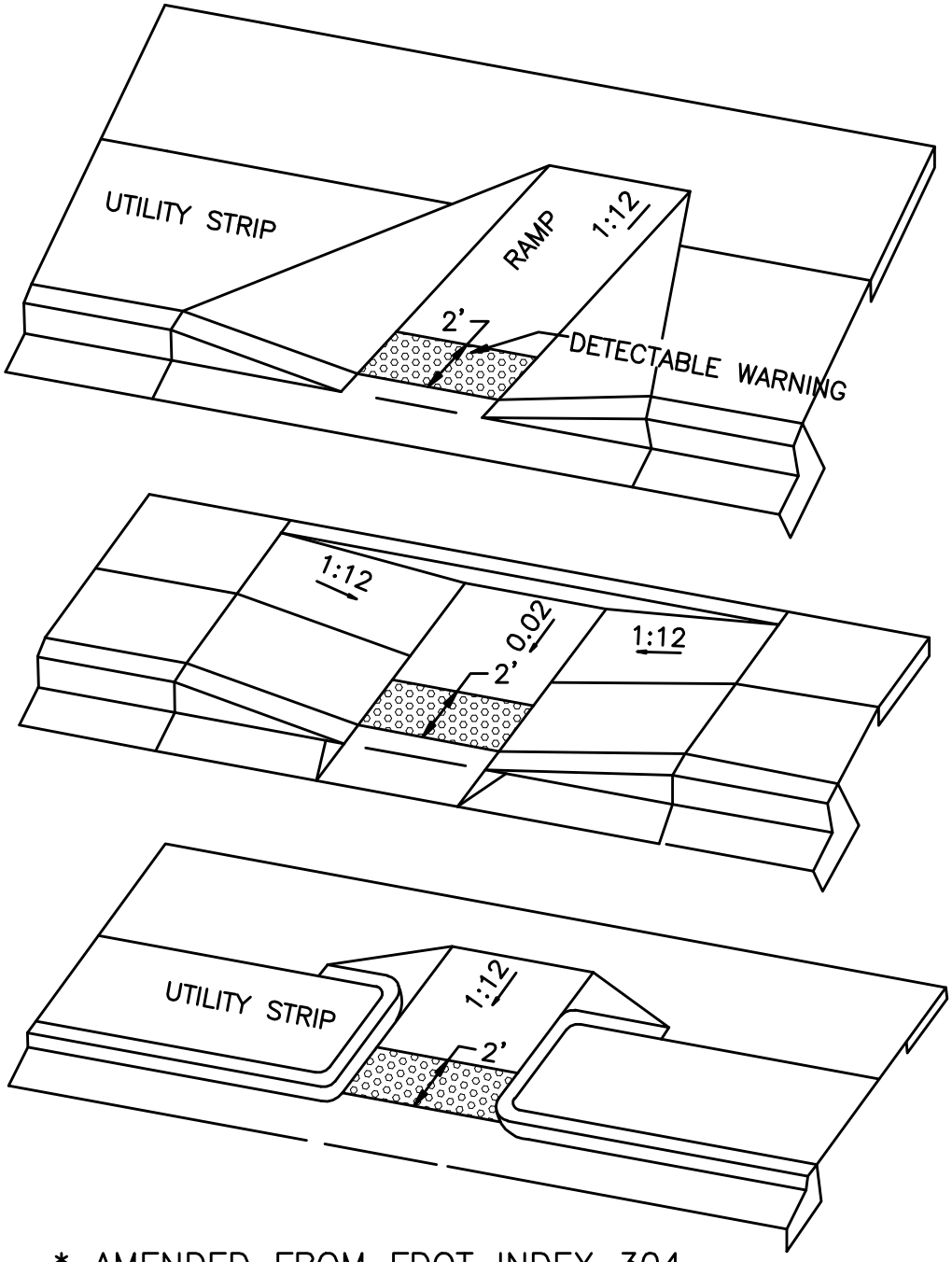

* AMENDED FROM FDOT INDEX 304

DATE: OCT.'08	SCALE: N.T.S.	TYPICAL PLACEMENT OF DETECTABLE WARNING ON CURB RAMPS	C 4.5 1 OF 2
REVISED: MARCH '09	DRAWN BY: W.D.		

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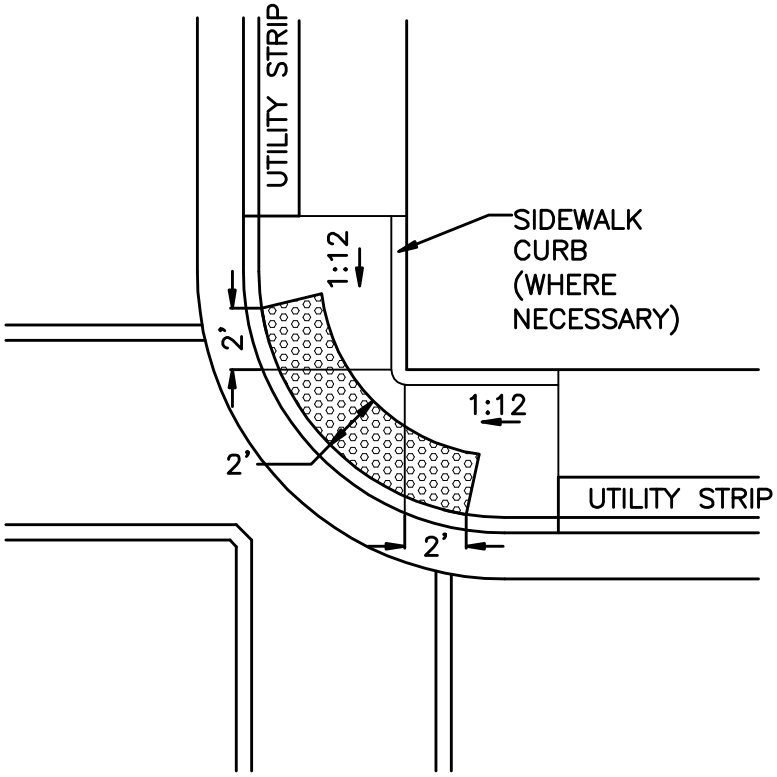

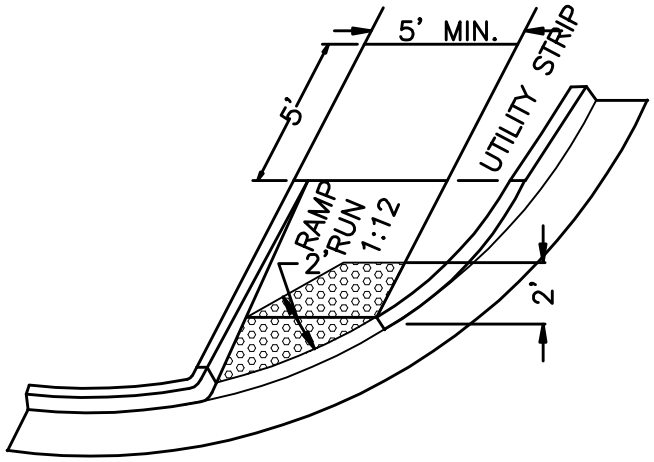

* AMENDED FROM FDOT INDEX 304

DATE: OCT.'08	SCALE: N.T.S.	TYPICAL PLACEMENT OF DETECTABLE WARNING ON CURB RAMPS	C 4.5 2 OF 2
REVISED: MARCH '09	DRAWN BY: W.D.		

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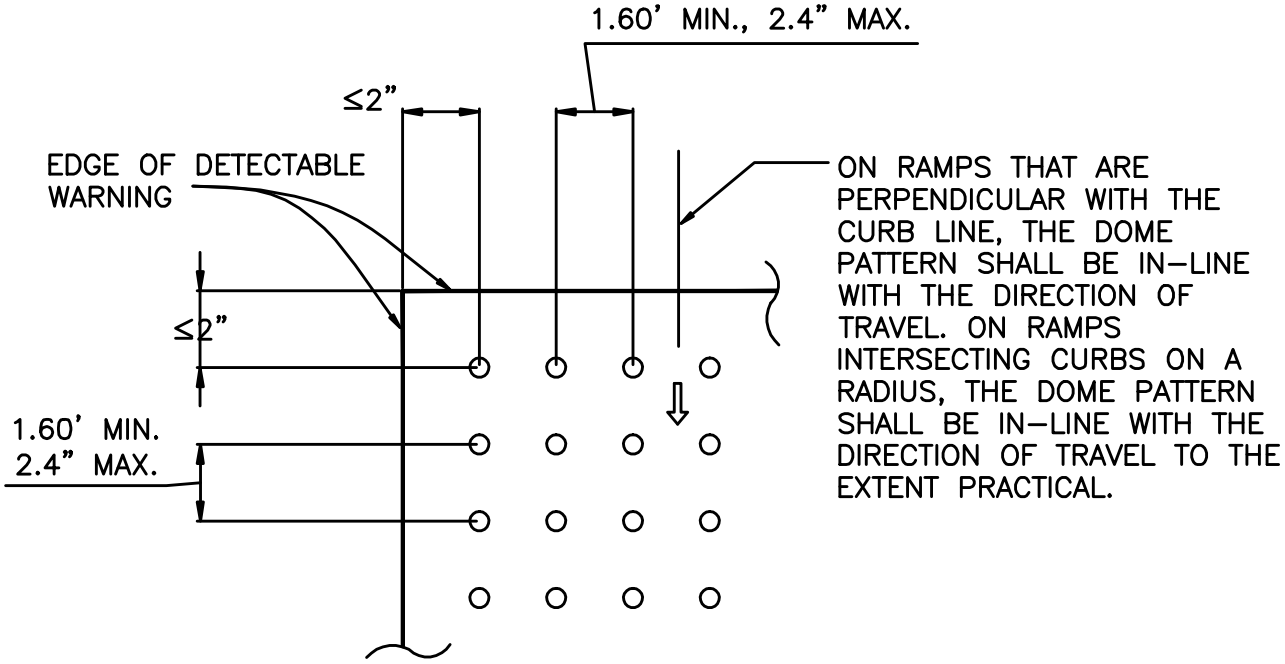
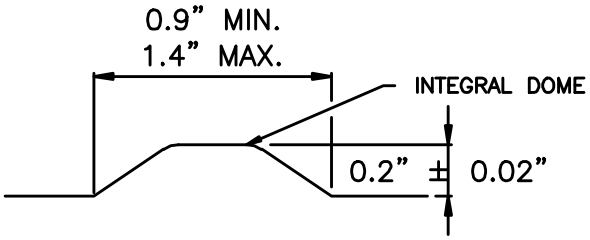


BASE-TO-BASE SPACING SHALL BE 0.65" MINIMUM BETWEEN DOMES.

PLAN VIEW *



THE TOP WIDTH OF THE DOME SHALL BE A MINIMUM OF 50% AND A MAXIMUM OF 65% OF THE BASE DIAMETER.

TRUNCATED DOME *

NOTE:

ALL SIDEWALK CURB RAMPS SHALL HAVE DETECTABLE WARNING SURFACE THAT EXTEND THE FULL WIDTH OF RAMP AND IN THE DIRECTION OF TRAVEL 24 INCHES FROM THE BACK OF THE CURB.

* AMENDED FROM FDOT INDEX 304

DATE: OCT.'08	SCALE: N.T.S.	CURB RAMP DETECTABLE WARNING DETAIL	C 4.6
REVISED: MARCH '09	DRAWN BY: W.D.		

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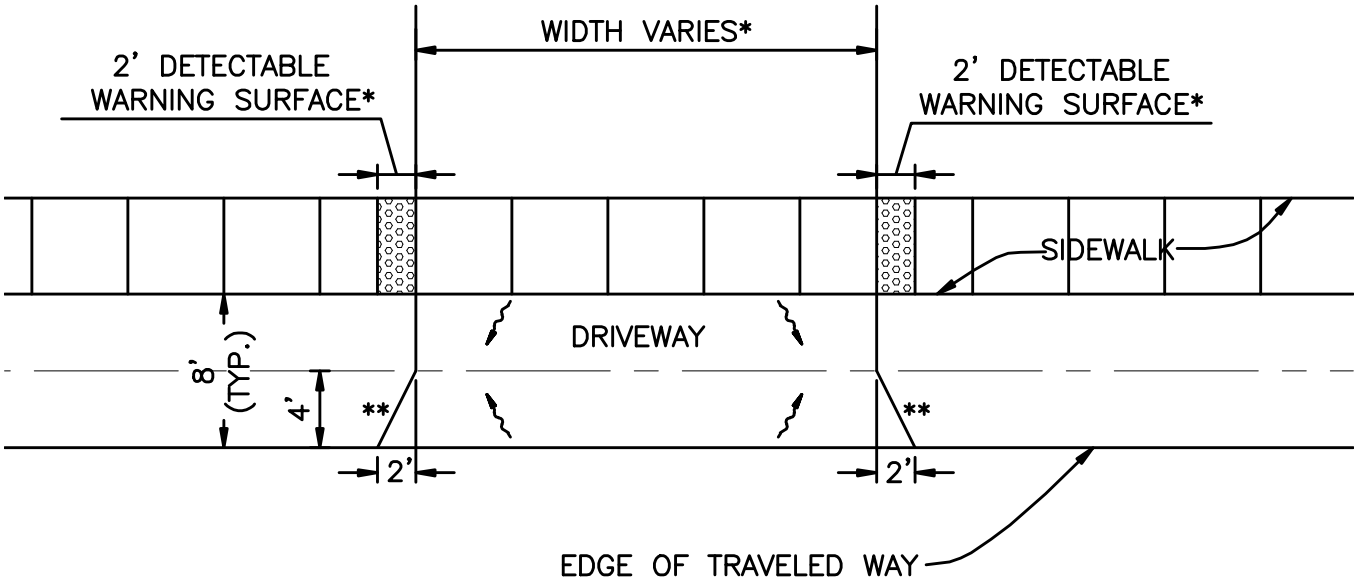

NOTES:

* USE DETECTABLE WARNING SURFACES ONLY FOR DRIVEWAYS 24' OR WIDER.
** 4' FLARED RADIUS OPTIONAL

1. SIDEWALKS SHALL BE CONSTRUCTED IN ACCORDANCE WITH CITY OF FORT LAUDERDALE STANDARDS AND SPECIFICATIONS (SEE DETAIL C1.3).
2. SIDEWALKS ADJOINING 24' DRIVES, ALLEYWAYS, OR STREETS SHALL HAVE A DETECTABLE WARNING SURFACE THAT EXTENDS THE FULL WIDTH OF THE SIDEWALK IN THE DIRECTION OF TRAVEL. THE MINIMUM LENGTH OF THE DETECTABLE WARNING SURFACE SHALL BE 24" FROM THE EDGE OF DRIVEWAYS, EDGE OF SIDE ROADS, OR STREETS.
3. SIDEWALKS SHALL BE CONTINUOUS THROUGH ALL DRIVEWAYS REGARDLESS OF DRIVEWAY WIDTH.

* AMENDED FROM FDOT INDEX 310

DATE: OCT.'08	SCALE: N.T.S.	ADA SIDEWALK DETAIL AT DRIVEWAYS	C 4.7
REVISED: MARCH '09	DRAWN BY: W.D.		

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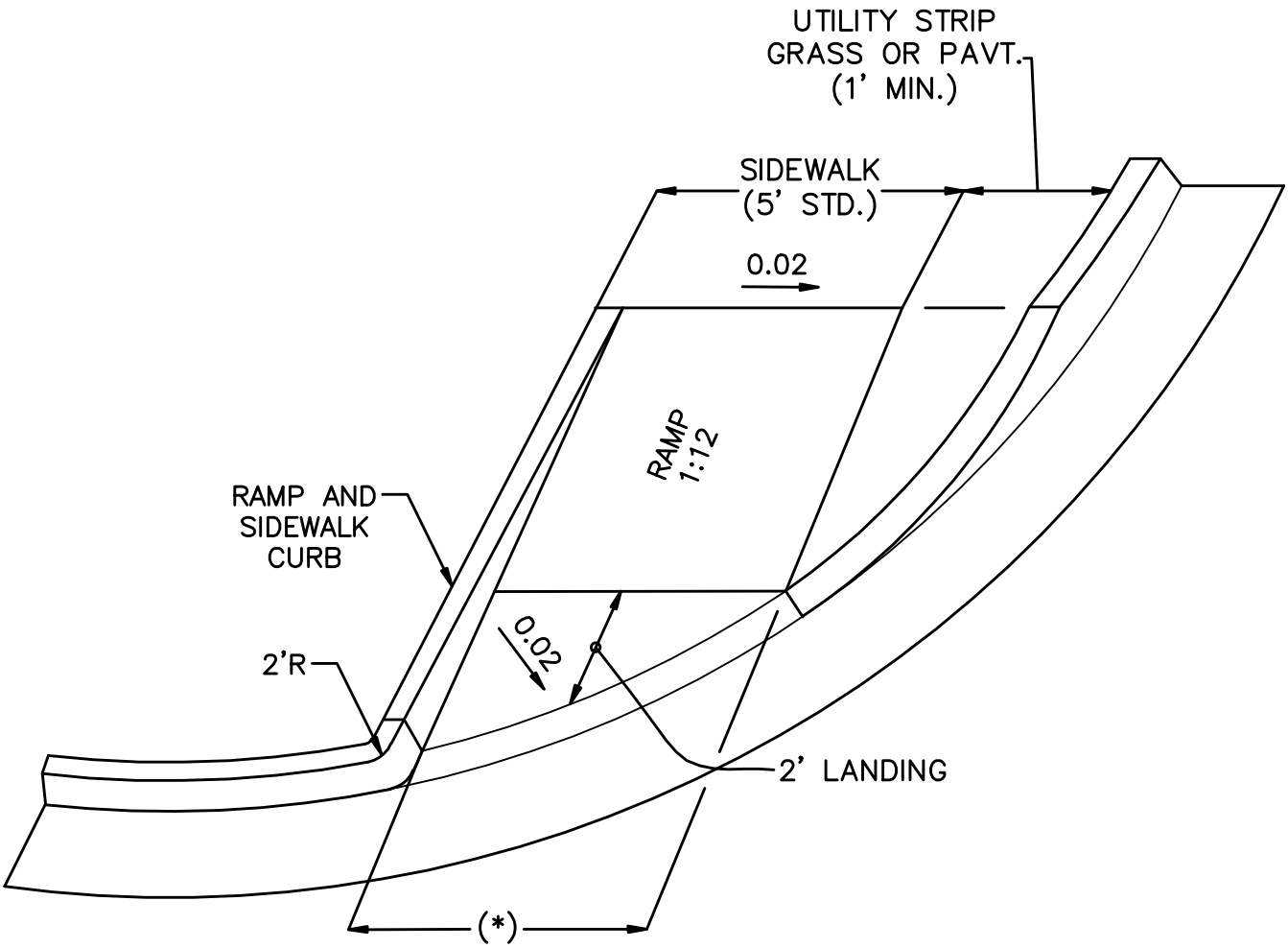

* MAY BE REDUCED TO 3' IN RESTRICTED CONDITIONS

* AMENDED FROM FDOT INDEX 304

DATE: OCT.'08	SCALE: N.T.S.	DIMENSIONAL FEATURES FOR PUBLIC SIDEWALK	C
REVISED: MARCH '09	DRAWN BY: W.D.	CURB RAMPS FOR LINEAR PEDESTRIAN TRAFFIC	4.8

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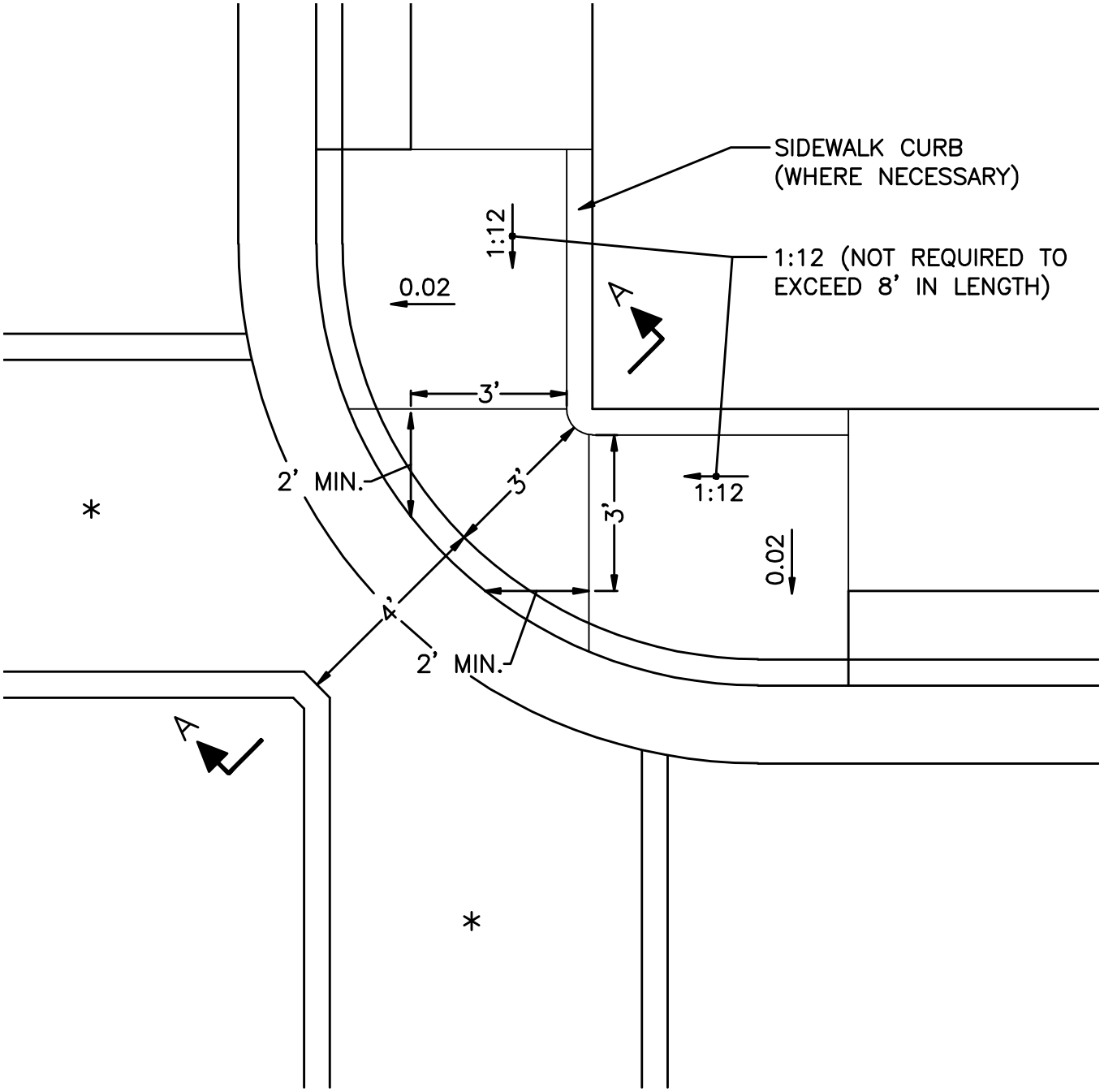

*CROSSWALK WIDTH AND CONFIGURATION VARIES

* AMENDED FROM FDOT INDEX 304

DATE: OCT.' 8 REVISED: MARCH '09	SCALE: N.T.S. DRAWN BY: W.D.	**DIMENSIONAL FEATURES FOR PUBLIC SIDEWALK COMBINED CORNER RAMPS UNDER CONDITIONS OF INFEASIBILITY**	**C** **4.9**

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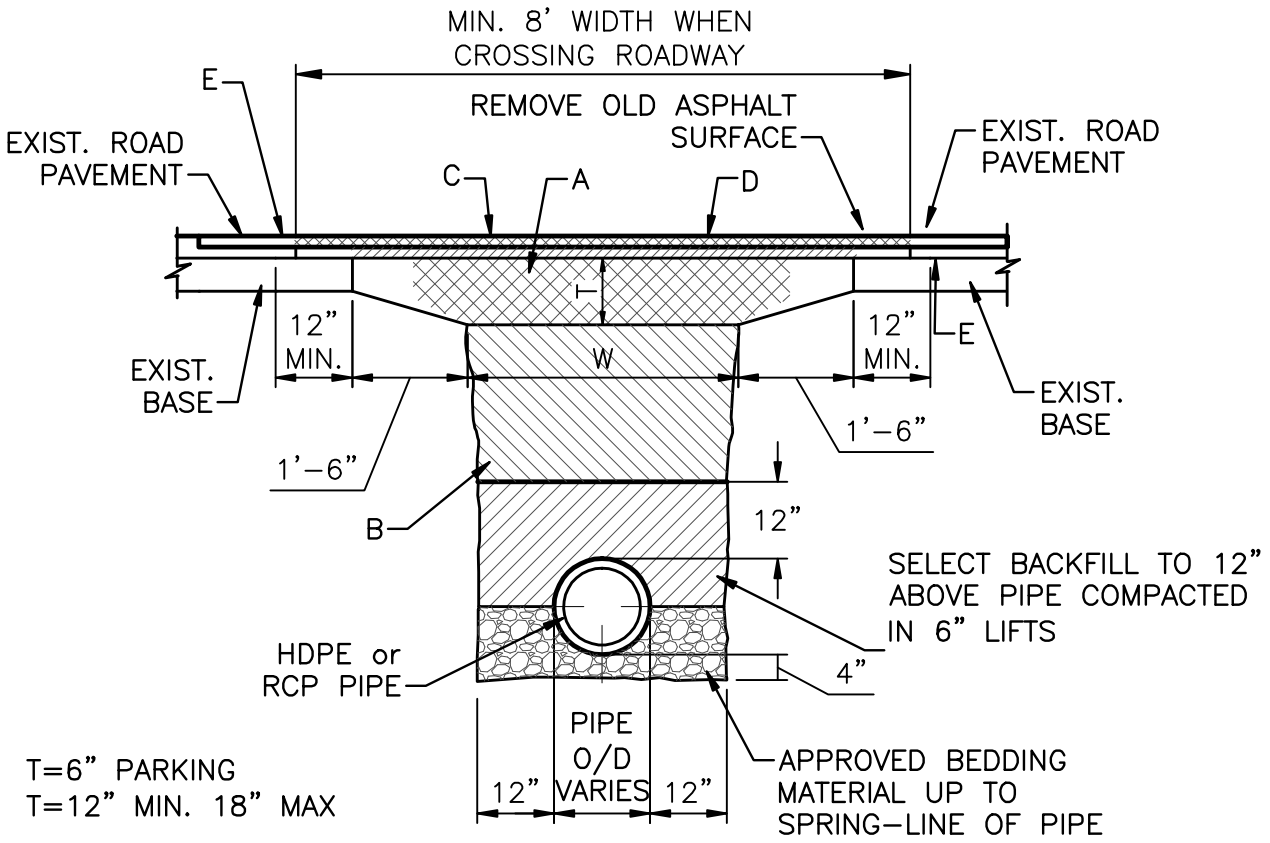

RIGHT OF WAY
TRENCH REPAIR, MILLING, AND OVERLAY

A. RESTORE ROAD BED TWO TIMES ORIGINAL THICKNESS 18" MAX. AND 12" MIN. PLACED IN 6" LAYERS AND COMPACTED TO 98% OF MAXIMUM DENSITY PER AASHTO T-180

B. TRENCH BACKFILLED IN 6" COMPACTED LIFTS TO 98% OF MAXIMUM DENSITY PER AASHTO T-180

C. ASPHALTIC CONCRETE AS REQUIRED BY SPECIFICATIONS THICKNESS TO MATCH EXISTING. (TYPICAL 1-1/2")

D. MILLING, ASPHALTIC CONCRETE RESURFACING AS REQUIRED BY SPECIFICATIONS.

E. SAW CUT & APPLY TACK COAT TO ALL SURFACES AND EDGES

DATE: FEB.'06	SCALE: N.T.S.	TYPICAL TRENCH AND PAVEMENT RESTORATION FOR TRANSVERSE CROSSING	D 1.1 1 OF 2
REVISED: MARCH '09	DRAWN BY: A.C.		

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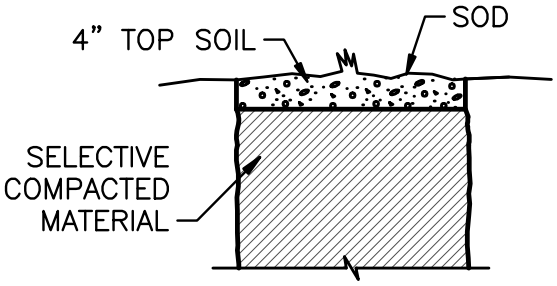

SURFACE RESTORATION
IN R/W ABOVE THE PIPE ZONE

NOTES:

1. UNLESS OTHERWISE SPECIFIED SELECTED MATERIAL SHALL BE FREE OF STONES LARGER THAN 3/8" DIA.

2. REPLACE ALL EXISTING LANE MARKINGS AND REFLECTIVE MARKERS DAMAGED BY CONSTRUCTION ACTIVITIES.

DATE: FEB.'06	SCALE: N.T.S.	**TYPICAL TRENCH AND PAVEMENT RESTORATION FOR TRANSVERSE CROSSING**	**D** 1.1 2 OF 2
REVISED: MARCH '09	DRAWN BY: A.C.		

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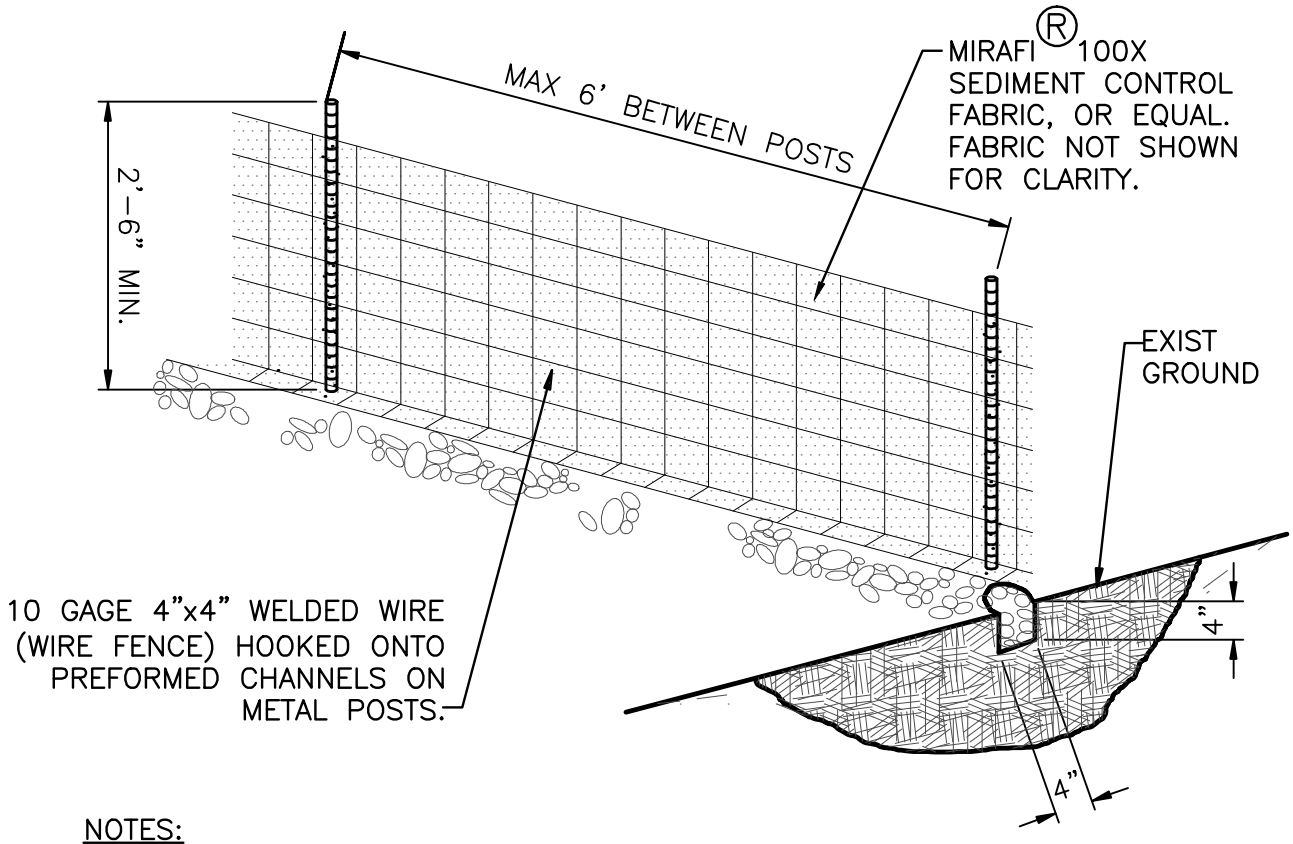

NOTES:

1. DRIVE WOOD POSTS (1.3 LBS/FT MIN) 18" MIN INTO GROUND AND EXCAVATE A 4"X4" TRENCH UPHILL 5' LONG (MIN) ALONG LINE OF POSTS. WOOD.
2. POSTS 4" IN DIAMETER OR 2"X4" MAY BE USED. ATTACH WIRE FENCE TO POSTS AND EXTEND THE BOTTOM OF THE FENCE 8" INTO THE EXCAVATED TRENCH. ALTERNATE : USE SEDIMENT CONTROL FABRIC WITH PRE-SEWN POCKETS FOR POSTS SO THAT WIRE FENCE IS NOT REQ'D.
3. ATTACH THE SEDIMENT CONTROL FABRIC (36" WIDE) TO THE WIRE FENCE W/METAL CLIPS OR WIRE AND EXTEND THE BOTTOM OF THE FABRIC 6" INTO THE TRENCH.
4. BOTTOM OF SEDIMENT CONTROL FABRIC MUST BE PLACED IN TRENCH AND SECURED WITH GRANULAR FILL TO A HEIGHT OF 6" ABOVE GROUND LEVEL, SO THAT RUNOFF IS FORCED TO GO THROUGH THE FENCE AND CANNOT GO UNDER IT.
5. SILT FENCE SHALL BE MAINTAINED AND TRAPPED SEDIMENTS SHALL BE REMOVED BY THE CONTRACTOR PERIODICALLY AS DETERMINED BY THE ENGINEER OR AS NECESSARY (MAX. 6 MONTHS).
6. THE CONTRACTOR IS REQUIRED TO REMOVE ALL SILT FENCES AND AREA TO BE RESTORED TO THE ORIGINAL CONDITION UPON COMPLETION OF CONSTRUCTION.

DATE: FEB.'06	SCALE: N.T.S.	**SILT FENCE DETAIL**	**D**
REVISED: MARCH '09	DRAWN BY: A.C.		**2.1**

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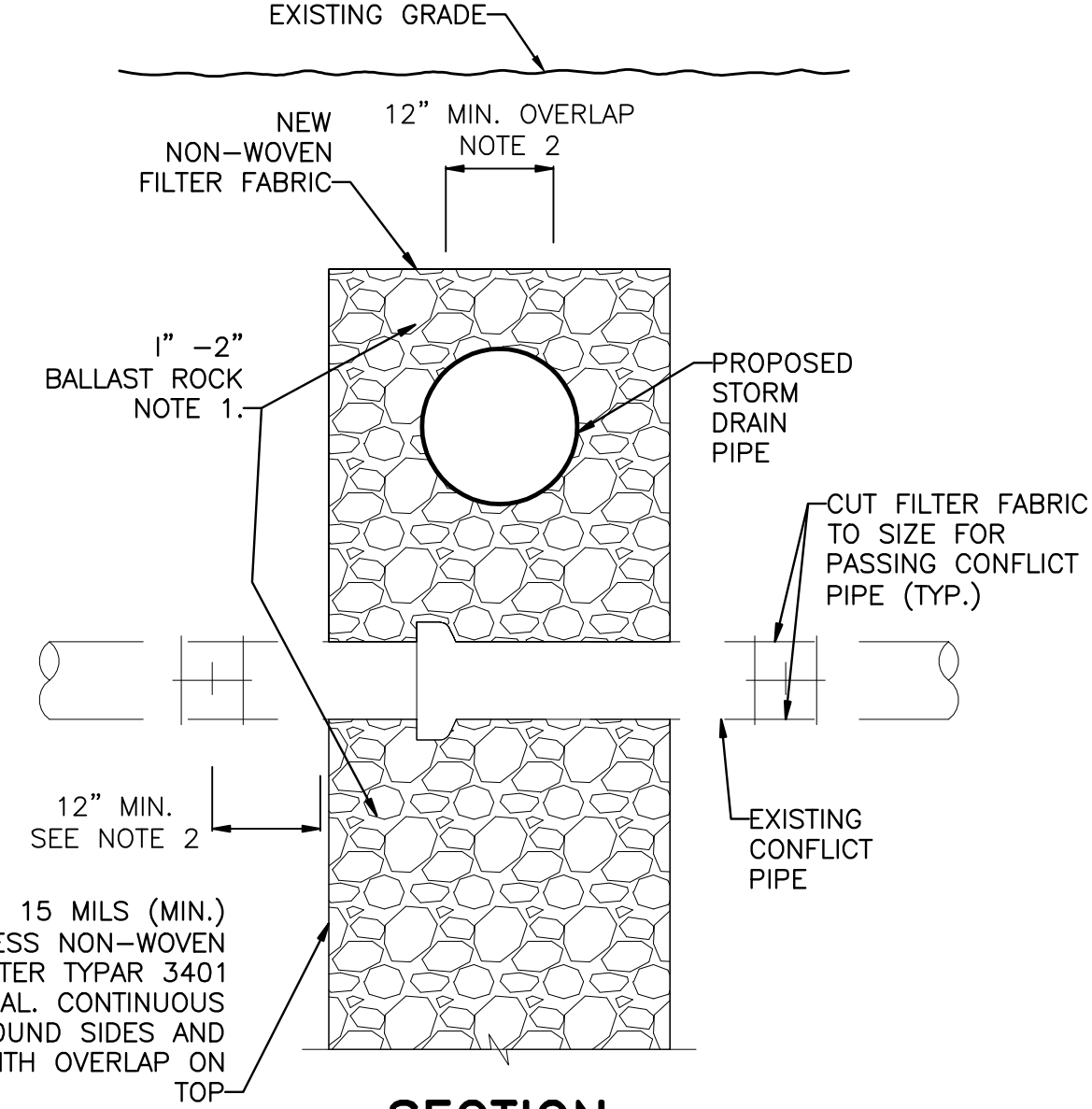

SECTION

NOTES:

1. EQUIVALENT STONE TO REPLACE DISTURBED ROCK (1" TO 2" BALLAST ROCK).
2. THE RESTORATION OF THE EXISTING TRENCH SHALL OVERLAP THE CUT WITH NEW NON-WOVEN FILTER FABRIC AND EXTENDED BEYOND THE CUT BY 1-FT. BOTTOM OF CUT SHALL ALSO BE REPAIRED WITH OVERLAPPING FABRIC.
3. AVOID INTRODUCING SAND AND SOIL INTO THE EXPOSED FRENCH DRAIN ROCK.
4. COMPACT SOIL SURROUNDING THE TRENCH IN 6" LIFTS OR PER TRENCH RESTORATION DETAIL.

DATE: FEB.'06	SCALE: N.T.S.	**EXFILTRATION TRENCH AND CONFLICT PIPE DETAIL**	**D**
REVISED: MARCH '09	DRAWN BY: A.C.		**3.1** 1 OF 2

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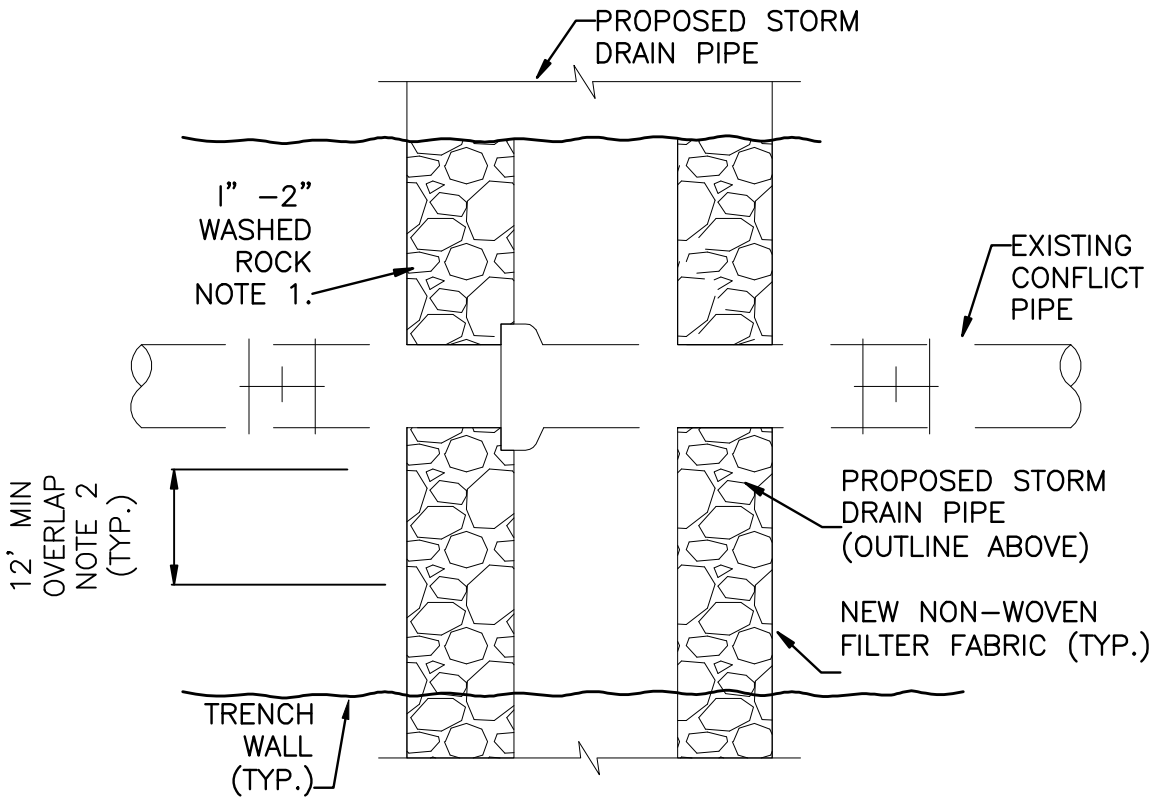

PLAN

DATE: FEB.'06	SCALE: N.T.S.	**EXFILTRATION TRENCH AND CONFLICT PIPE DETAIL**	**D** **3.1** 2 OF 2
REVISED: MARCH '09	DRAWN BY: A.C.		

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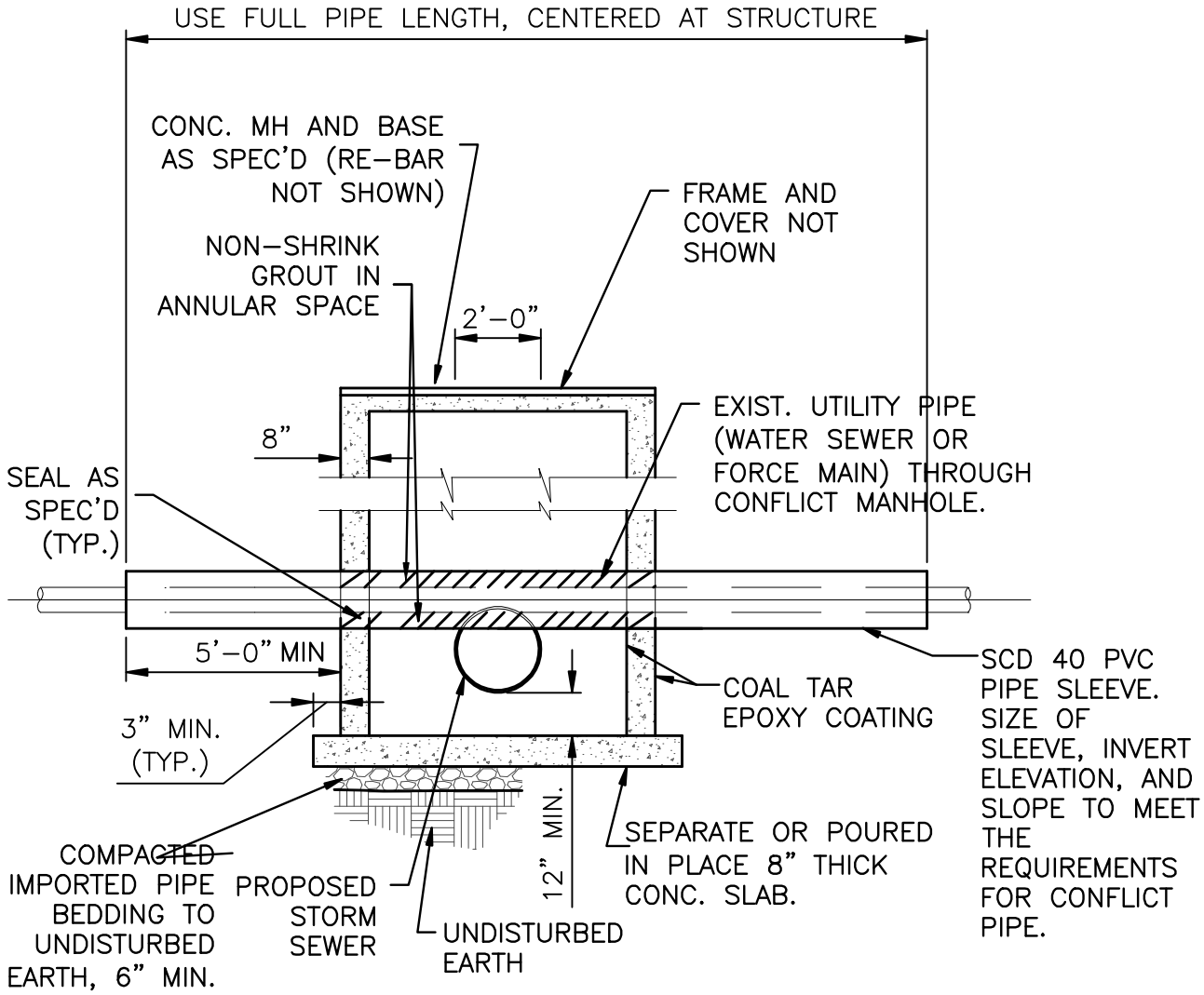

SECTION

NOTES:
1. CONTRACTOR SHALL DETERMINE PIPE SIZES, PIPE INVERT ELEVATIONS AND ANGLES OF PIPE ENTRY AND EXIT.
2. ALL CONFLICT MANHOLES SHALL CONFORM TO THE REQUIREMENTS SHOWN ON THE CITY OF FORT LAUDERDALE ENGINEERING PLAN AND SPECS.

DATE: FEB.'06	SCALE: N.T.S.	CONFLICT MANHOLE FOR NEW STORM SEWERS	D 3.2 1 OF 2
REVISED: MARCH '09	DRAWN BY: A.C.		

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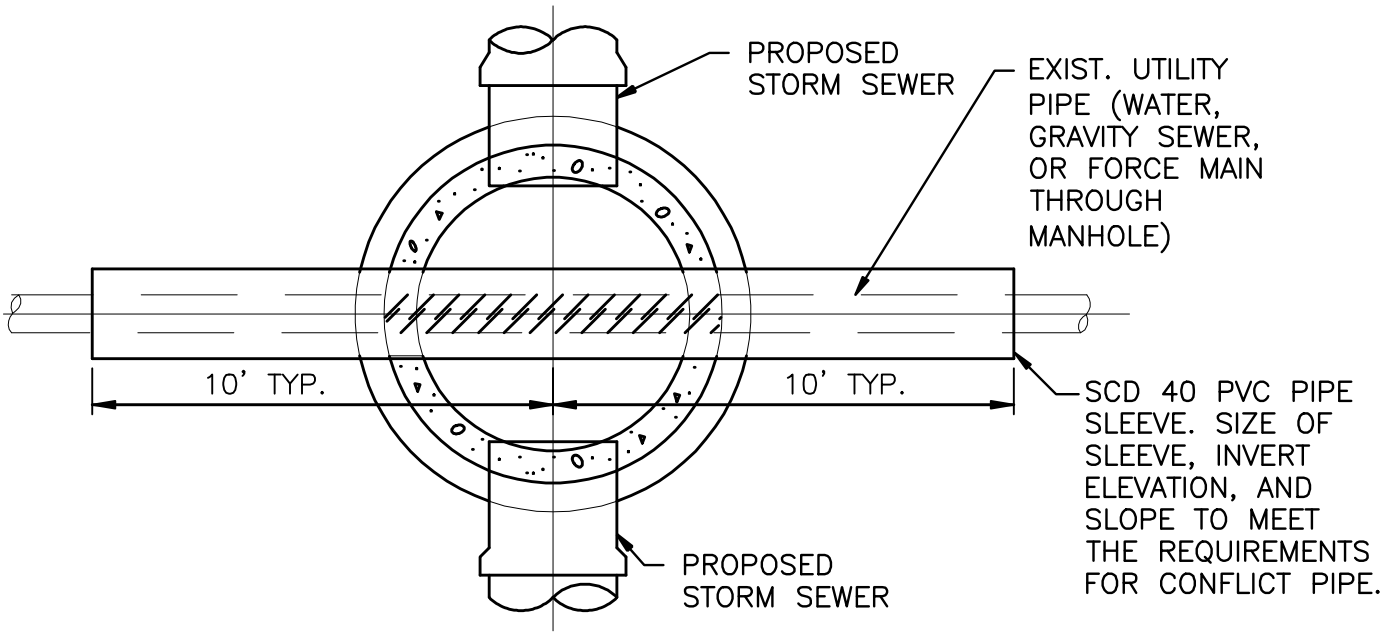

PLAN

DATE: FEB.'06	SCALE: N.T.S.	**CONFLICT MANHOLE FOR NEW STORM SEWERS**	**D**
REVISED: MARCH '09	DRAWN BY: A.C.		**3.2** 2 OF 2

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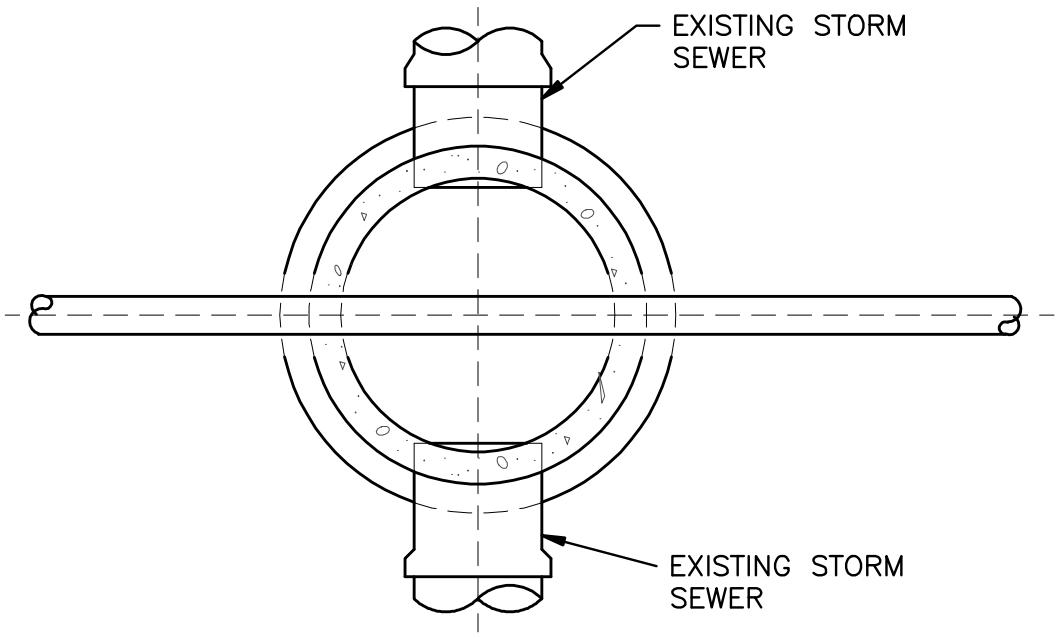
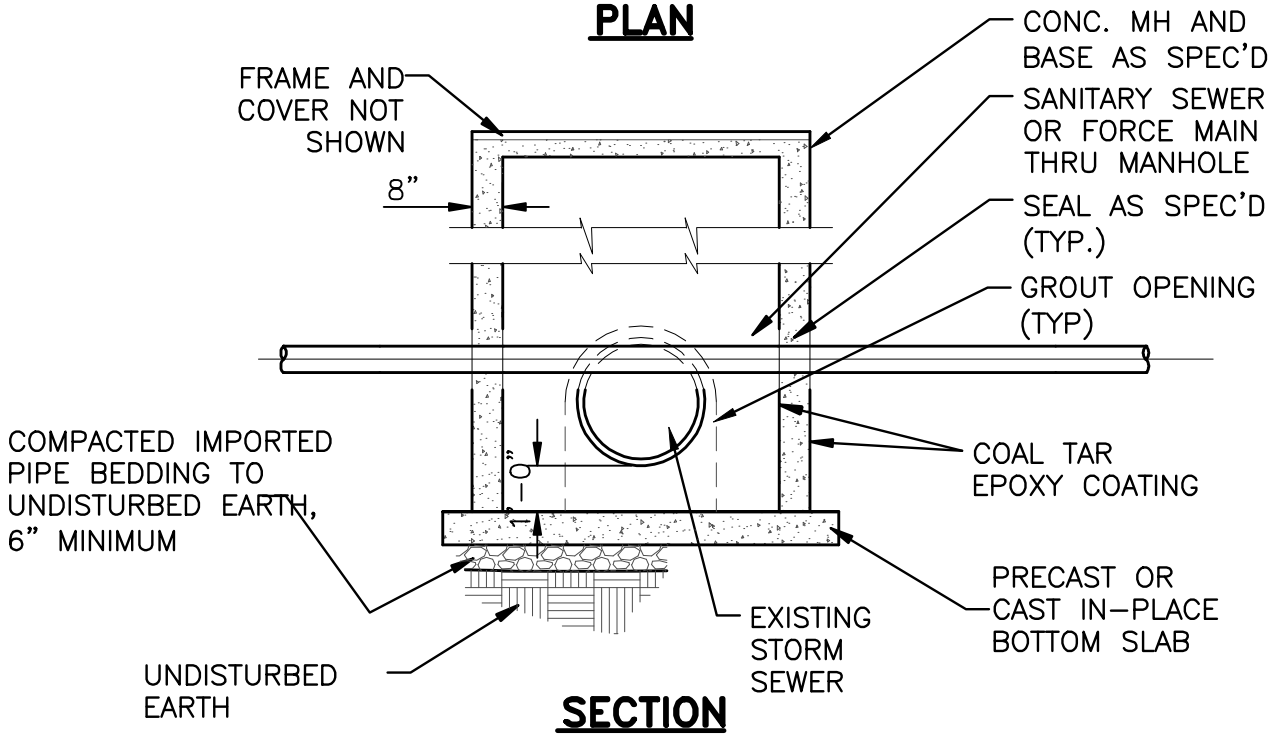


PLAN



SECTION

NOTE: CONTRACTOR SHALL DETERMINE PIPE SIZES, PIPE INVERT ELEVATIONS AND ANGLES OF PIPE ENTRY AND EXIT.

DATE: FEB'06	SCALE: N.T.S.	**CONFLICT MANHOLE FOR SANITARY SEWER THROUGH EXISTING STORM SEWER (IN ACCORDANCE W/FDOT #301)**	**D 3.3**
REVISED: MARCH '09	DRAWN BY: R.C.		

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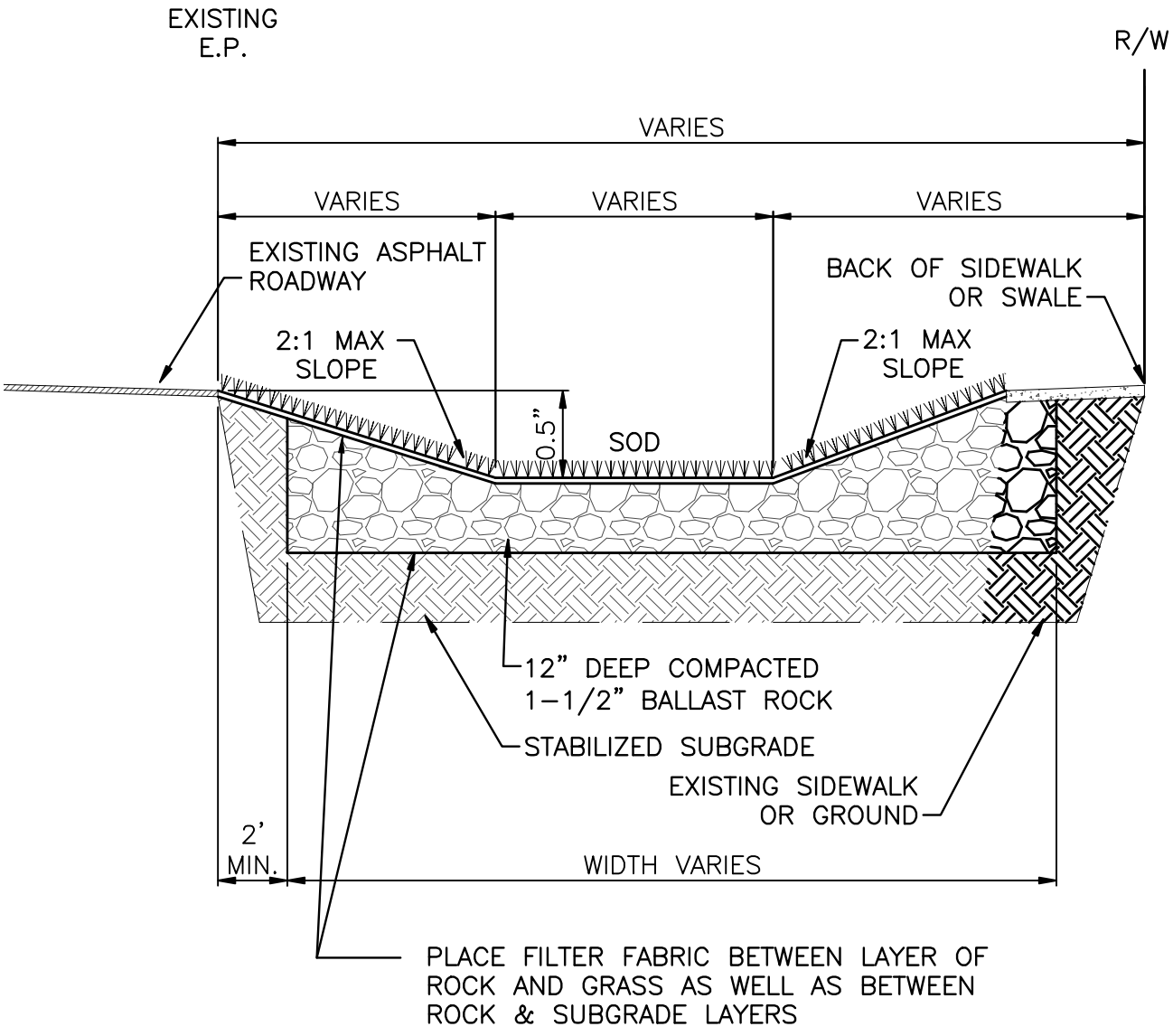

DATE: FEB.'06	SCALE: N.T.S.	**BALLAST ROCK SWALE PROFILE**	**D 4.1**
REVISED: MARCH '09	DRAWN BY: A.C.		

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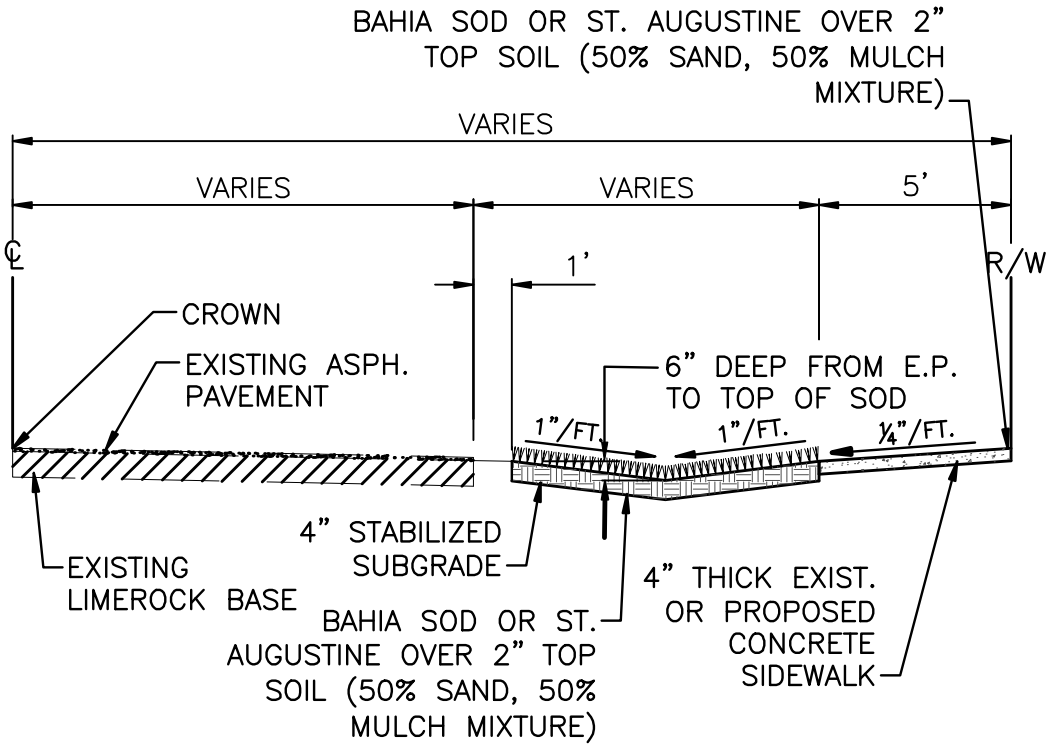

NOTE:
CONTRACTOR SHALL CENTER BOTTOM OF SWALE BETWEEN EDGE OF PAVEMENT AND R/W LINE IF NO SIDEWALK EXISTS.

DATE: FEB.'06	SCALE: N.T.S.	**6" SWALE PROFILE**	**D 4.2**
REVISED: MARCH '09	DRAWN BY: A.C.		

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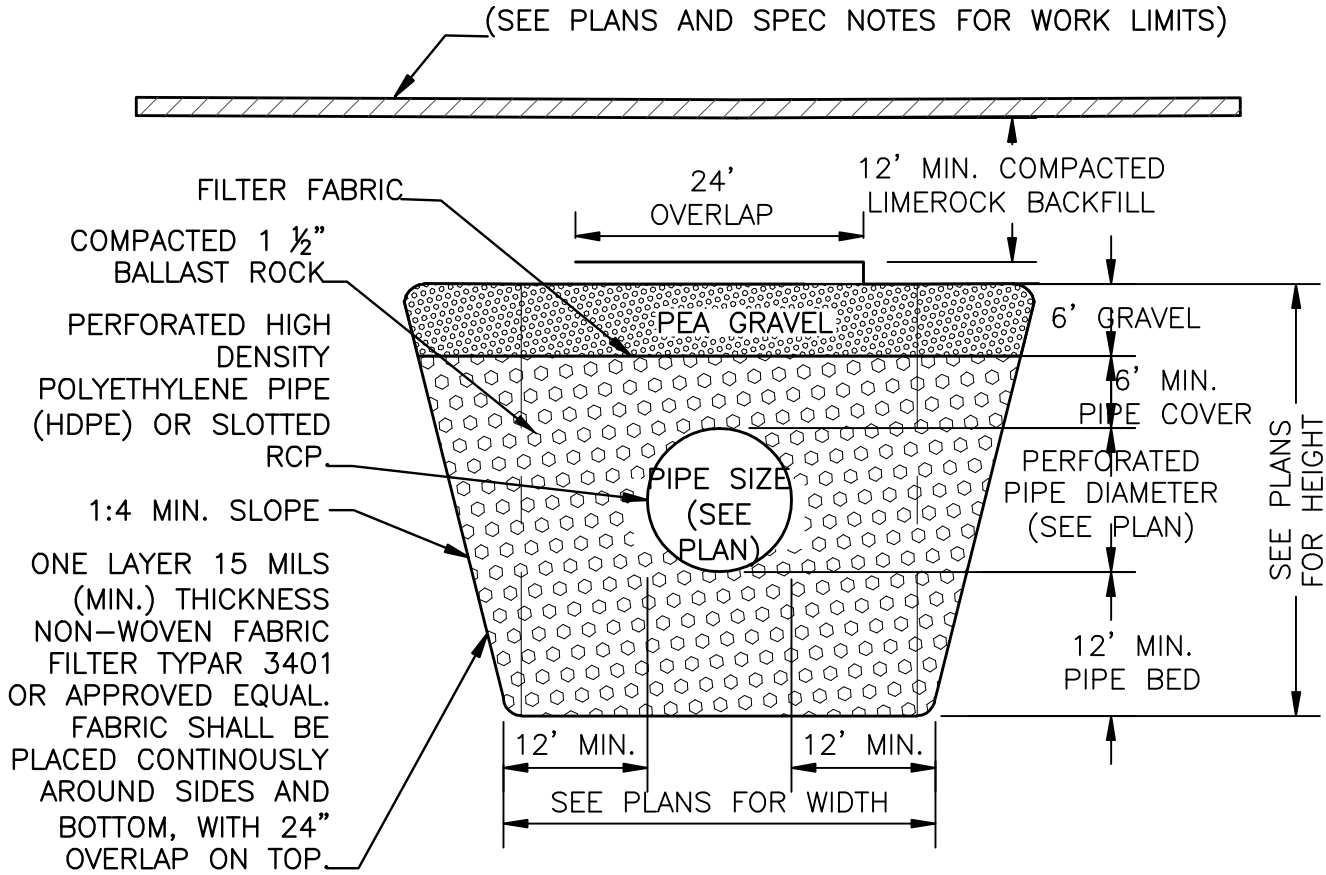

TRANSVERSE CROSS SECTION

NOTES:

1. CONTRACTOR MUST READ AND ABIDE THE CITY'S GENERAL CONSTRUCTION NOTES AND DRAINAGE DESIGN NOTES PRIOR TO STARTING CONSTRUCTION.

2. THE STANDARD CROSS SECTION SHALL BE CONSTRUCTED UNLESS OTHER SECTIONS ARE DESCRIBED OR DETAILED ON PLANS.

3. THE CONTRACTOR SHALL TAKE THE NECESSARY PRECAUTIONS TO PREVENT CONTAMINATION OF THE TRENCH WITH SAND, SILT AND FOREIGN MATERIALS.

4. THE 12" WEEP HOLE SHALL NOT BE USED IF THE BOTTOM OF THE INLET OR MANHOLE IS BELLOW THE NORMAL WATER TABLE, UNLESS OTHERWISE SHOWN ON PLANS.

5. FRENCH DRAINS MUST BE INSPECTED BY THE ENGINEERING INSPECTOR PRIOR TO CONTRACTOR BACKFILLING.

DATE: FEB.'06	SCALE: N.T.S.	EXFILTRATION TRENCH SYSTEM	D 5.1 1 OF 2
REVISED: MARCH '09	DRAWN BY: A.C.		

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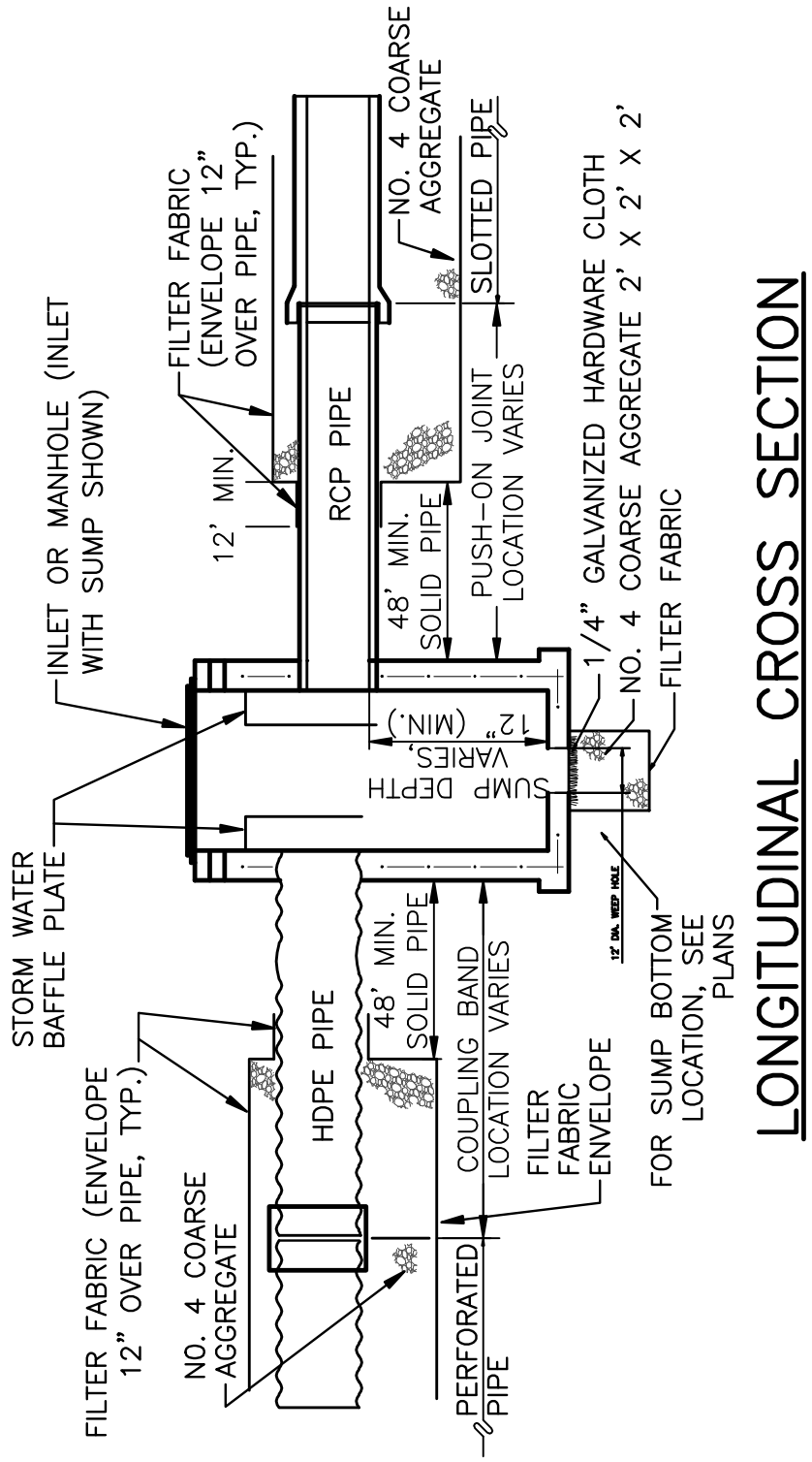

DATE: FEB.'06	SCALE: N.T.S.	**EXFILTRATION TRENCH SYSTEM**	**D** 5.1 2 OF 2
REVISED: MARCH '09	DRAWN BY: A.C.		

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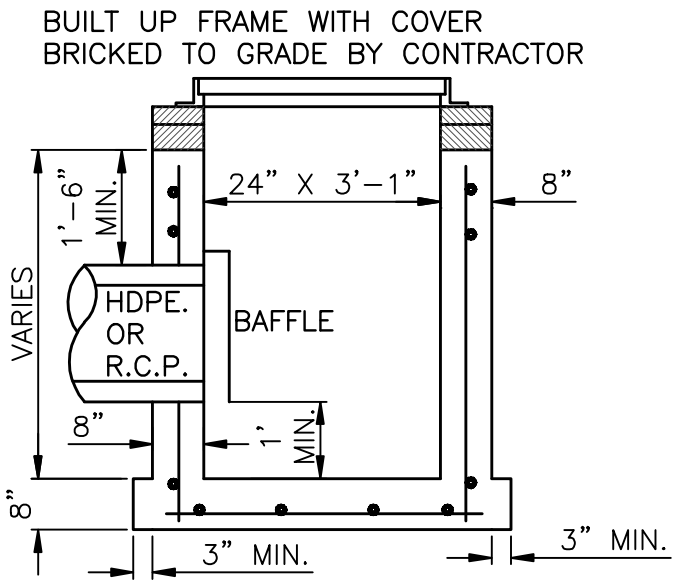

TYPE "C" CATCH BASIN (USP 3-3.0)

NOTES

1) MINIMAL CONC. STRENGTH FOR ALL CATCH BASINS AND MANHOLE STRUCTURES SHALL BE 4000 PSI.

2) CONTRACTOR IS RESPONSIBLE FOR FINAL ELEVATION AND LOCATION ADJUSTMENTS OF CATCH BASINS, GRATES, MANHOLES DUE TO FIELD CONSTRAINTS.

3) THE 12" WEEP HOLE SHALL NOT BE USED IF THE BOTTOM OF THE INLET OR MANHOLE IS BELLOW THE NORMAL WATER TABLE, UNLESS OTHERWISE SHOWN ON PLANS.

DATE: FEB.'06	SCALE: N.T.S.	**POLLUTION RETARDANT BASIN & BAFFLE DETAIL FOR NEW STORM SEWERS**	**D** **6.1** 1 OF 2
REVISED: MARCH '09	DRAWN BY: A.C.		

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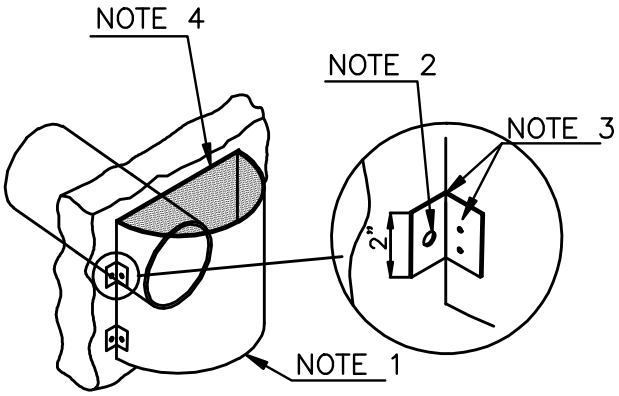

BAFFLE DETAIL BRACKET DETAIL

NOTES

1) BAFFLE SHALL BE C.M.P. OR C.A.P. SECTION (OUTFALL DIAMETER PLUS 6").

2) 1/2" GALV. WEDGE ANCHORS (ULT. PULLOU 6000, ULT. SHEAR 5900.)

3) WELD OR 2–3/8" THRU BOLTS

4) BOLTED TO WALL WITH TOP CAPPED. (WATER TIGHT)

DATE: FEB.'06	SCALE: N.T.S.	**POLLUTION RETARDANT BASIN & BAFFLE DETAIL FOR NEW STORM SEWERS**	**D** **6.1** 2 OF 2
REVISED: MARCH '09	DRAWN BY: A.C.		

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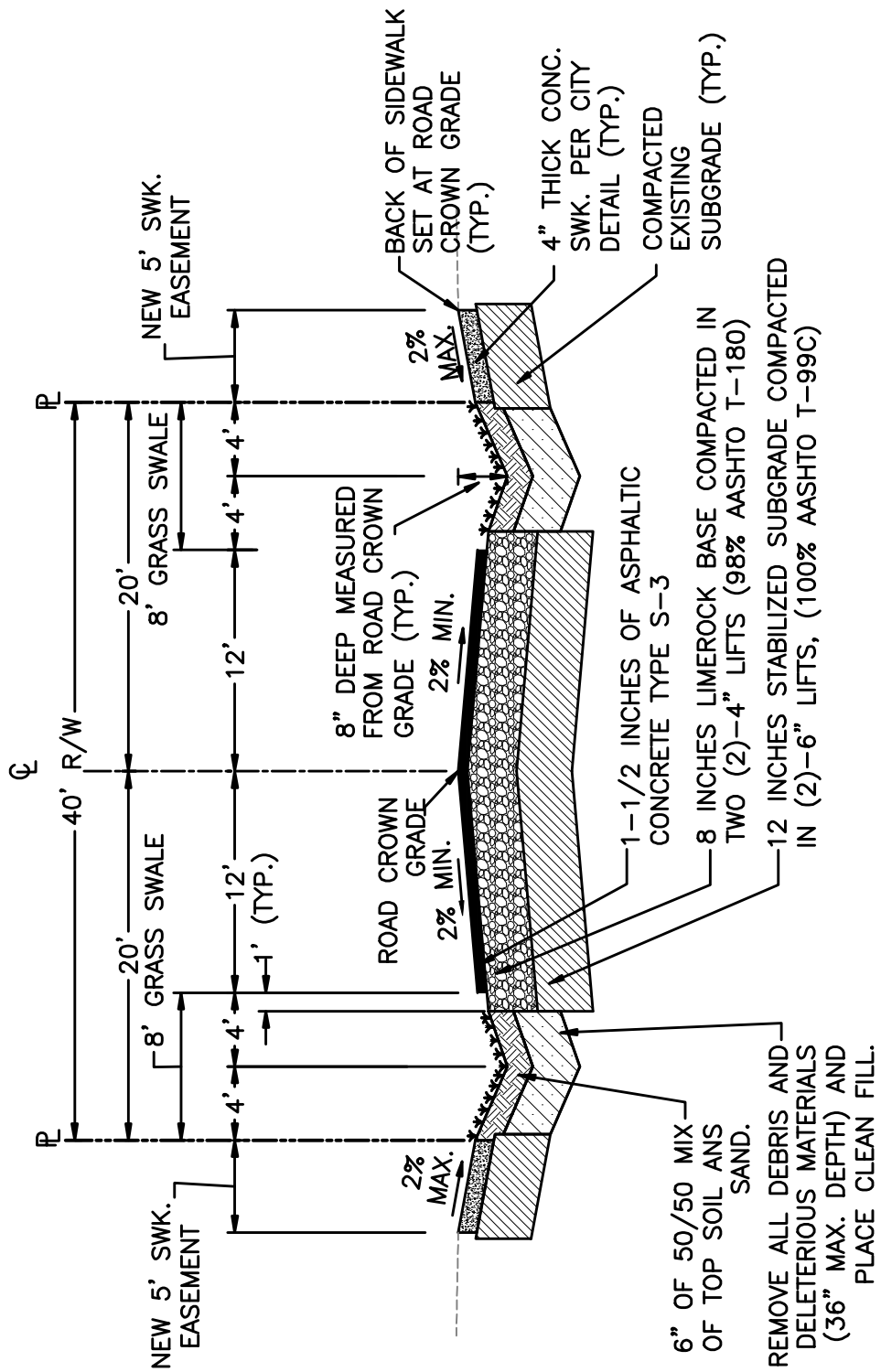

DATE: JAN. '82	SCALE: N.T.S.	TYPICAL ROAD	P
REVISED: MARCH '09	DRAWN BY:	40' RIGHT-OF-WAY	1.1

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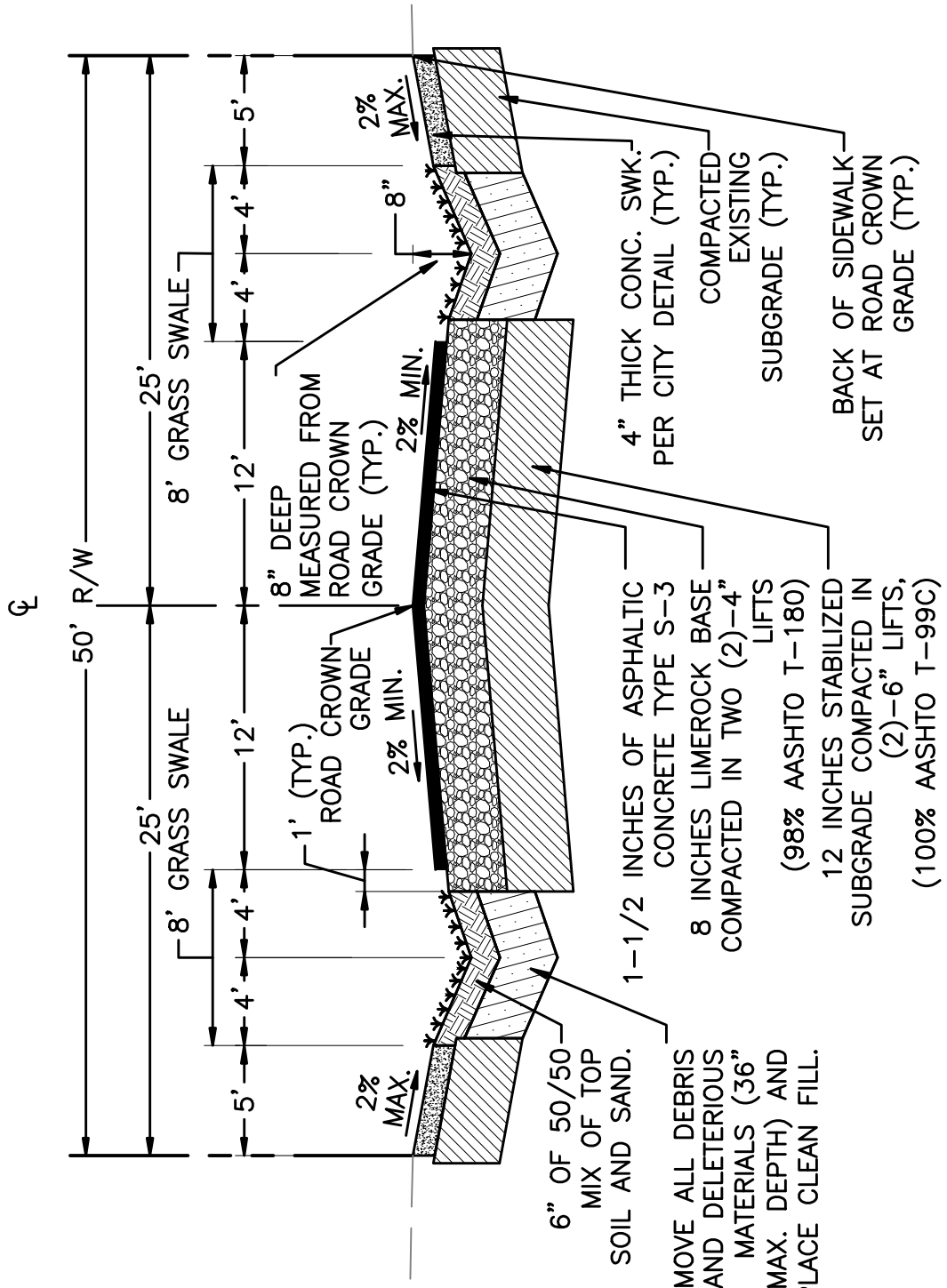

DATE: JAN.'82	SCALE: N.T.S.	TYPICAL ROAD	P
REVISED: MARCH '09	DRAWN BY:	50' RIGHT-OF-WAY	2.1

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CITY OF FORT LAUDERDALE

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DATE: APRIL '04

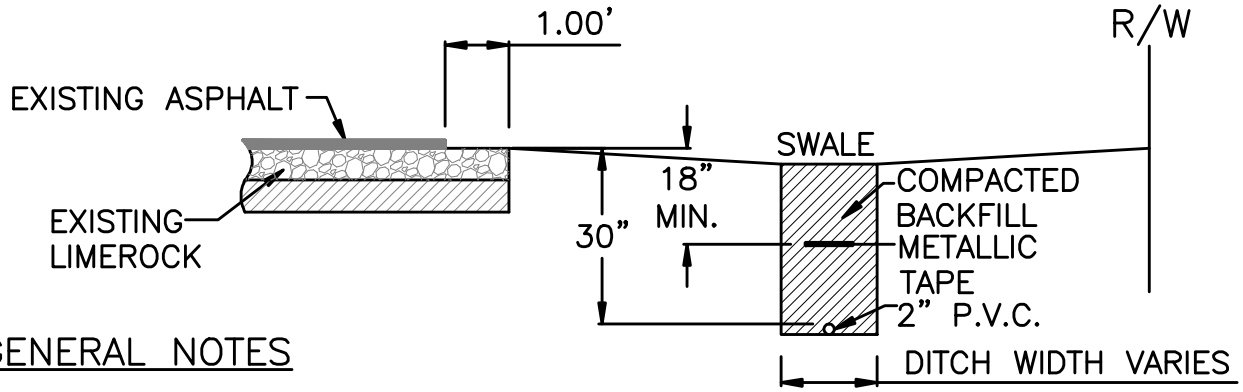
REVISED: MARCH '09

SCALE: N.T.S.

DRAWN BY:

RESTORATION OF PAVEMENT - FIBER OPTIC CABLE INSTALLATION PARALLEL

P 4.10



GENERAL NOTES

1. BACKFILL SHALL BE COMPACTED TO 98% OF MAXIMUM DRY DENSITY PER AASHTO T-99-C AND SHALL BE PLACED IN LIFTS NOT TO EXCEED 12" MAXIMUM, LOOSE MEASUREMENT.
2. FIBER OPTIC CABLE SHALL BE INSTALLED IN MINIMUM 2" SCHEDULE 40 P.V.C. CONDUIT.
3. LOCATION OF CONDUIT WITH RESPECT TO CENTERLINE OF STREETS, RIGHT-OF-WAY LINES OR OTHER BASE LINES WILL BE SUBJECT TO APPROVAL OF PUBLIC WORKS DEPARTMENT.
4. 0.005" X 3" WIDE (MINIMUM) METALLIC TAPE COLOR CODED U.L.C.C. ORANGE TO RUN CONTINUOUSLY WITH TRENCH. TAPE IDENTIFYING FIBER OPTIC CABLE WILL HAVE THE WORDS "CAUTION FIBER OPTIC" FOLLOWED BY OWNERS NAME AND TELEPHONE NUMBER.
5. U.L.C.C.=UTILITY LOCATION CO-ORDINATION COUNCIL
6. THE PROVISIONS IN THIS DETAIL SUPERSEDES ALL OTHER RELATED PROVISIONS MENTIONED IN CITY OF FORT LAUDERDALE CONSTRUCTION STANDARDS AND SPECIFICATIONS.

CITY OF FORT LAUDERDALE

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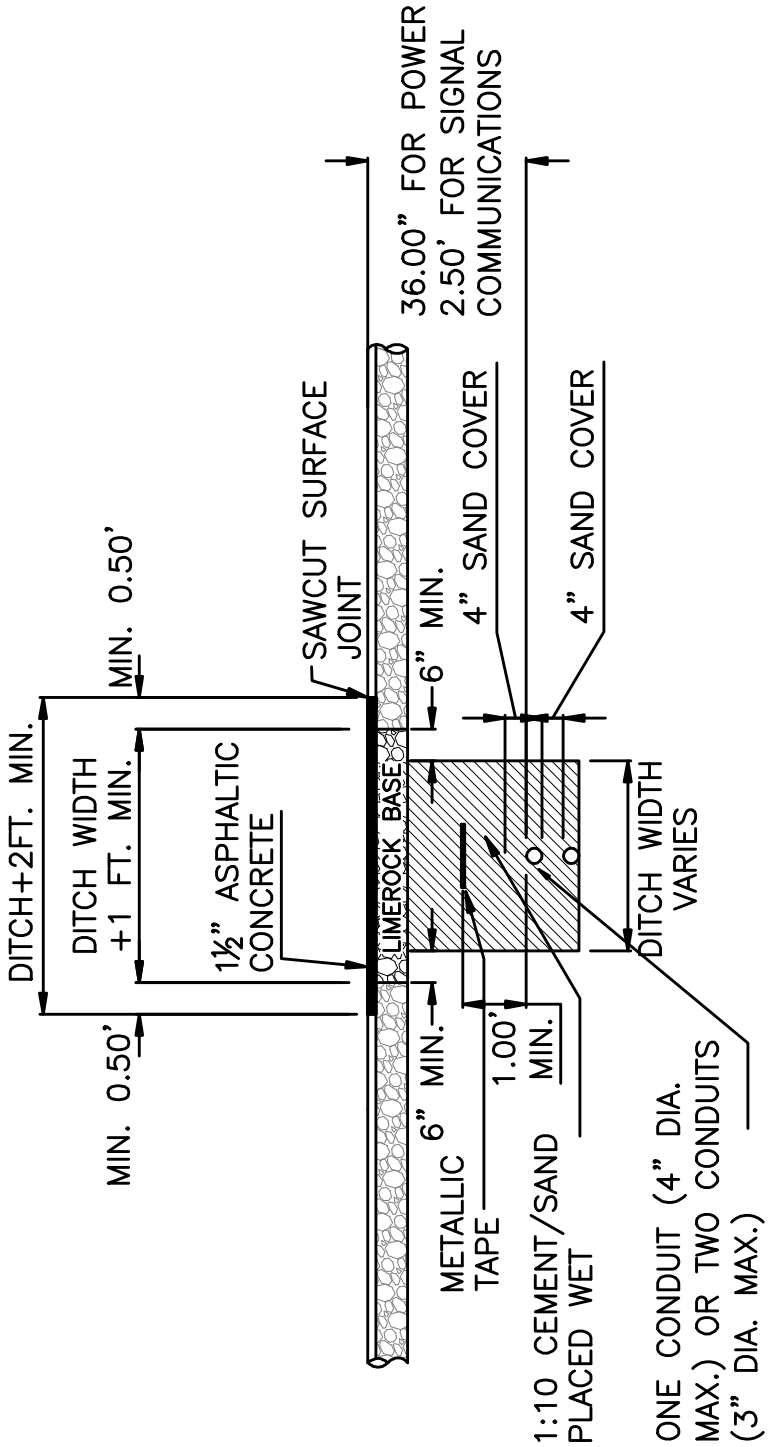

DATE: APRIL'04	SCALE: N.T.S.	RESTORATION OF PAVEMENT	P
REVISED: MARCH '09	DRAWN BY:	UTILITIES INSTALLATION CROSSING	4.11
			1 OF 2

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CITY OF FORT LAUDERDALE

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GENERAL NOTES

1. BASE MATERIAL SHALL BE PLACED IN LAYERS NOT THICKER THAN 6" COMPACTED THICKNESS AND EACH LAYER THOROUGHLY ROLLED OR TAMPED TO 98% OF MAXIMUM DENSITY, PER AASHTO T-180.

2. ASPHALT PAVEMENT JOINTS (ASPHALTIC CONCRETE) SHALL BE MECHANICALLY SAWED.

3. NEW SURFACE MATERIAL WILL BE D.O.T. TYPE III ASPHALTIC CONCRETE.

4. BASE MATERIAL SHALL HAVE A MINIMUM LBR OF 100 & MINIMUM CARBONATE CONTENT OF 70% FOR MAJOR STREETS AND 60% FOR RESIDENTIAL STREETS.

5. IF THE DITCH IS FILLED TEMPORARILY, IT SHALL BE COVERED WITH A 2" ASPHALTIC CONCRETE PATCH ON MAJOR STREET AND 1-1/2" ASPHALTIC CONCRETE PATCH ON RESIDENTIAL STREET AND PARKING LOT TO KEEP THE FILL MATERIAL FROM RAVELING UNTIL PLACED WITH A PERMANENT PATCH.

6. GAS MAINS 4" OR SMALLER IN SIZE SHALL BE CONSTRUCTED AS SHOWN IN THIS DETAIL WITH THE PROVISION OF 3" MINIMUM WIDTH CONTINUOUS METALLIC TAPE OR #12 WIRE WRAPPED AROUND THE CONDUITS.

7. THE PROVISIONS IN THIS DETAIL SUPERSEDES ALL OTHER RELATED PROVISIONS MENTIONED IN CITY OF FORT LAUDERDALE CONSTRUCTION STANDARDS AND SPECIFICATIONS.

8. THIS DETAIL APPLIES FOR ROAD CROSSINGS ONLY. FOR PARALLEL INSTALLATIONS WITHIN THE ROADWAY, EITHER HALF A LANE OR A FULL RESTORATION SHALL BE CONSTRUCTED IN CONFORMANCE WITH APPLICABLE DETAILS.

DATE: APRIL'04	SCALE: N.T.S.	RESTORATION OF PAVEMENT	P
REVISED: MARCH '09	DRAWN BY:	UTILITIES INSTALLATION CROSSING	4.11 2 OF 2

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CITY OF FORT LAUDERDALE

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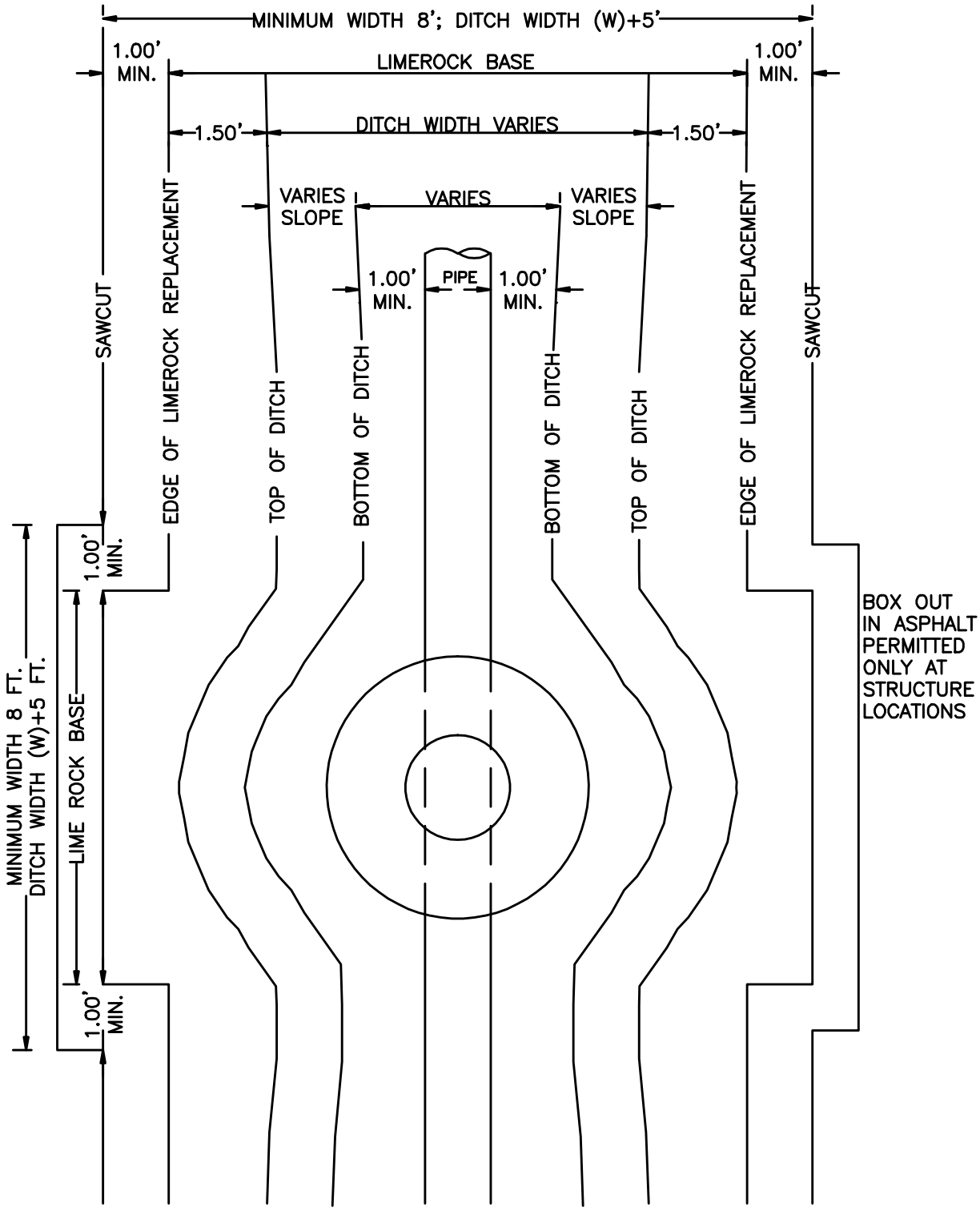

DATE: APRIL'04	SCALE: N.T.S.	RESTORATION OF PAVEMENT	P
REVISED: MARCH '09	DRAWN BY:	UTILITIES INSTALLATION PARALLEL	4.12

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CITY OF FORT LAUDERDALE

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THE PROCEDURE FOR BACKFILL AND PAVEMENT RESTORATION SHALL BE AS FOLLOWS: "DENSITY TESTS OF COMPACTED FILL, BACKFILL SHALL BE TAKEN AT EACH 12" PRIOR TO PLACEMENT OF THE SUCCEEDING LIFT OF MATERIAL ACCORDING TO THE FOLLOWING SCHEDULE".

1. FOR ANY ROAD CROSSING IN WHICH THE ROAD IS CUT AND RESTORED ONE LANE AT A TIME, ONE DENSITY TEST SHALL BE TAKEN IN EACH LANE.

2. FOR ANY ROAD CROSSING IN WHICH THE ROAD IS CUT AND RESTORED THREE LANES AT A TIME, DENSITIES SHALL BE TESTED IN TWO LOCATIONS STAGGERED WITH EACH SUCCESSIVE LIFT.

3. FOR ANY ROAD CROSSING IN WHICH THE ROAD IS CUT AND RESTORED TWO LANES AT A TIME, DENSITIES SHALL BE TESTED IN ONE LANE PER LIFT, ALTERNATING LANES WITH EACH LIFT.

4. CUTS ACROSS ROADS SHALL NOT BE LEFT OPENED OVER NIGHT UNLESS ABSOLUTELY NECESSARY. TRENCHES SHALL BE BACKFILLED AND A TEMPORARY ASPHALT APPLIED TO MAKE A SMOOTH LEVEL PATCH. THE TRENCHES SHALL THEN BE EXCAVATED THE NEXT DAY AND PERMANENT BACKFILL AND PAVEMENT INSTALLED IN ACCORDANCE WITH THESE STANDARDS. THE ONLY EXCEPTIONS WILL BE IN CASES WHERE THE FACILITY INSTALLED MUST BE TESTED BEFORE THE ROADS ARE RESTORED. IN THESE CASES, THE PERMANENT RESTORATION MUST BE PERFORMED ON THE DAY OF TESTING OR THE NEXT DAY.

5. IN CASES WHERE THE INSTALLATION PARALLELS THE ROADWAY AND DAMAGES THE PAVEMENT, THE DENSITY TESTS SHALL BE MADE EVERY 100 L.F. WITH TEST LOCATIONS STAGGERED 25' EACH LIFT.

6. SHOULDER AREAS AND SWALE AREAS BEYOND SHOULDERS SHALL BE COMPACTED TO A MINIMUM OF 98% OF MAXIMUM DRY DENSITY, ALL AS DETERMINED BY AASHTO T-99-C STANDARD PROCTOR TEST.

7. RESTORATION OF STRIPING, SIGNING, AND SIGNALIZATION DEVICES SHALL BE ACCOMPLISHED IMMEDIATELY AFTER PAVEMENT RESTORATION IS COMPLETED.

A COPY OF ALL PROCTOR AND FIELD DENSITY TESTS SHALL BE FURNISHED TO THE ENGINEERING DIVISION.

DATE: APRIL'04	SCALE: N.T.S.	**PROCEDURE FOR RESTORATION**	**P**
REVISED: MARCH '09	DRAWN BY:	**OF FLEXIBLE PAVEMENT**	**4.13**

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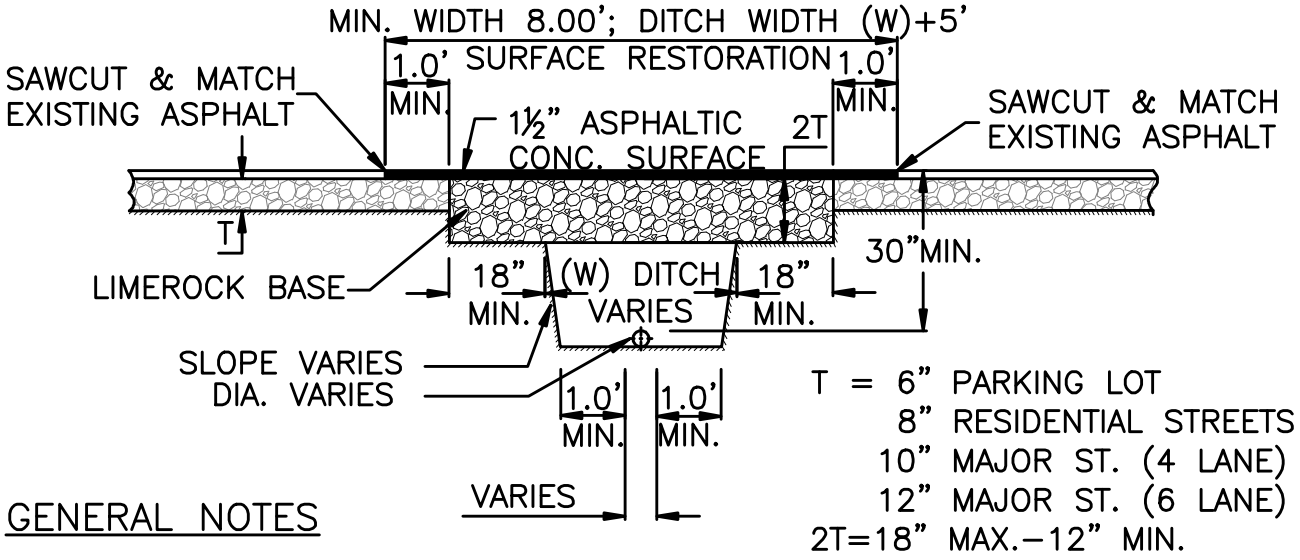

T = 6" PARKING LOT
8" RESIDENTIAL STREETS
10" MAJOR ST. (4 LANE)
12" MAJOR ST. (6 LANE)
2T=18" MAX.–12" MIN.

GENERAL NOTES

1. REPLACED BASE MATERIAL OVER DITCH SHALL BE TWICE THE THICKNESS OF THE ORIGINAL BASE. MINIMUM 12", MAXIMUM 18".
2. BASE MATERIAL SHALL BE PLACED IN LAYERS NOT THICKER THAN 6" COMPACTED THICKNESS AND EACH LAYER THOROUGHLY ROLLED OR TAMPED TO 98% OF MAXIMUM DENSITY, PER AASHTO T–180.
3. ASPHALT PAVEMENT JOINTS (ASPHALTIC CONCRETE) SHALL BE MECHANICALLY SAWED.
4. NEW SURFACE MATERIAL WILL BE D.O.T. TYPE III ASPHALTIC CONCRETE.
5. BASE MATERIAL SHALL HAVE A MINIMUM LBR OF 100 & MINIMUM CARBONATE CONTENT OF 70% FOR MAJOR STREETS AND 60% FOR RESIDENTIAL STREETS.
6. IF THE DITCH IS FILLED TEMPORARILY, IT SHALL BE COVERED WITH A 2" ASPHALTIC CONCRETE PATCH ON MAJOR STREET AND 1–1/2" ASPHALTIC CONCRETE PATCH ON RESIDENTIAL STREET AND PARKING LOT TO KEEP THE FILL MATERIAL FROM RAVELING UNTIL PLACED WITH A PERMANENT PATCH.
7. SUBGRADE SHALL BE COMPACTED TO 100% OF DRY DENSITY PER AASHTO T–99 AND SHALL BE PLACED IN LIFTS NOT TO EXCEED 12" MAXIMUM, LOOSE MEASUREMENT.
8. PAVEMENT RESTORATION DUE TO PLACEMENT OF 4" GAS MAINS OR LARGER SHALL BE AS SHOWN ON THIS DETAIL WITH A 3" MINIMUM WIDTH AND PLACEMENT OF CONTINUOUS METALLIC TAPE OR #12 WIRE WRAPPED AROUND THE PIPE(S).
9. THE PROVISIONS IN THIS DETAIL SUPERSEDES ALL OTHER RELATED PROVISIONS MENTIONED IN CITY OF FORT LAUDERDALE CONSTRUCTION STANDARDS AND SPECIFICATIONS.

DATE: APRIL'04	SCALE: N.T.S.	RESTORATION OF PAVEMENT	P
REVISED: MARCH '09	DRAWN BY:	UTILITY CROSSING	4.1

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CITY OF FORT LAUDERDALE

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T= 6" PARKING LOT
8" RESIDENTIAL STREETS
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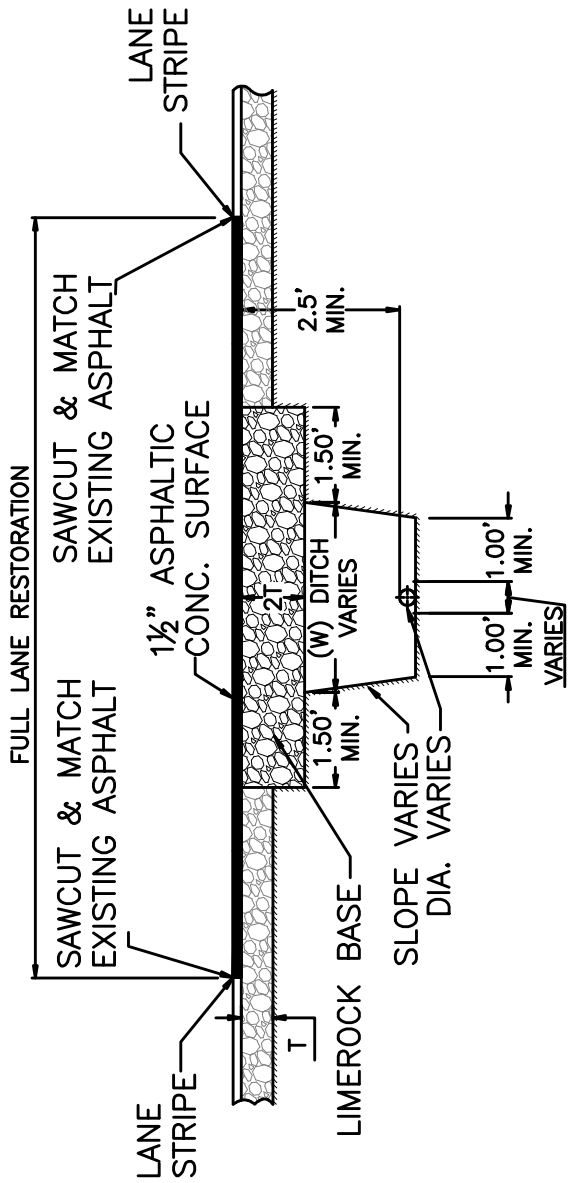
2T=18" MAX.–12" MIN.



DATE: APRIL '04	SCALE: N.T.S.	FULL LANE RESTORATION OF PAVEMENT	P
REVISED: MARCH '09	DRAWN BY:	PARALLEL UTILITY INSTALLATION	4.2
			1 of 2

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GENERAL NOTES

1. REPLACED BASE MATERIAL OVER DITCH SHALL BE TWICE THE THICKNESS OF THE ORIGINAL BASE. MINIMUM 12", MAXIMUM 18".

2. BASE MATERIAL SHALL BE PLACED IN LAYERS NOT THICKER THAN 6" COMPACTED THICKNESS AND EACH LAYER THOROUGHLY ROLLED OR TAMPED TO 98% OF MAXIMUM DENSITY, PER AASHTO T-180.

3. ASPHALT PAVEMENT JOINTS (ASPHALTIC CONCRETE) SHALL BE MECHANICALLY SAWED.

4. NEW SURFACE MATERIAL WILL BE D.O.T. TYPE III ASPHALTIC CONCRETE.

5. BASE MATERIAL SHALL HAVE A MINIMUM LBR OF 100 & MINIMUM CARBONATE CONTENT OF 70% FOR MAJOR STREETS AND 60% FOR RESIDENTIAL STREETS.

6. IF THE DITCH IS FILLED TEMPORARILY, IT SHALL BE COVERED WITH A 2" ASPHALTIC CONCRETE PATCH ON MAJOR STREET AND 1-1/2" ASPHALTIC CONCRETE PATCH ON RESIDENTIAL STREET AND PARKING LOT TO KEEP THE FILL MATERIAL FROM RAVELING UNTIL PLACED WITH A PERMANENT PATCH.

7. SUBGRADE SHALL BE COMPACTED TO 100% OF DRY DENSITY PER AASHTO T-99 AND SHALL BE PLACED IN LIFTS NOT TO EXCEED 12" MAXIMUM, LOOSE MEASUREMENT.

8. PAVEMENT RESTORATION DUE TO PLACEMENT OF 4" GAS MAINS OR LARGER SHALL BE AS SHOWN ON THIS DETAIL WITH A 3" MINIMUM WIDTH AND PLACEMENT OF CONTINUOUS METALLIC TAPE OR #12 WIRE WRAPPED AROUND THE PIPE(S).

9. THE PROVISIONS IN THIS DETAIL SUPERSEDES ALL OTHER RELATED PROVISIONS MENTIONED IN CITY OF FORT LAUDERDALE CONSTRUCTION STANDARDS AND SPECIFICATIONS.

DATE: APRIL '04 REVISED: MARCH '09	SCALE: N.T.S. DRAWN BY:	**FULL LANE RESTORATION OF PAVEMENT** **PARALLEL UTILITY INSTALLATION**	**P** **4.2** 2 of 2

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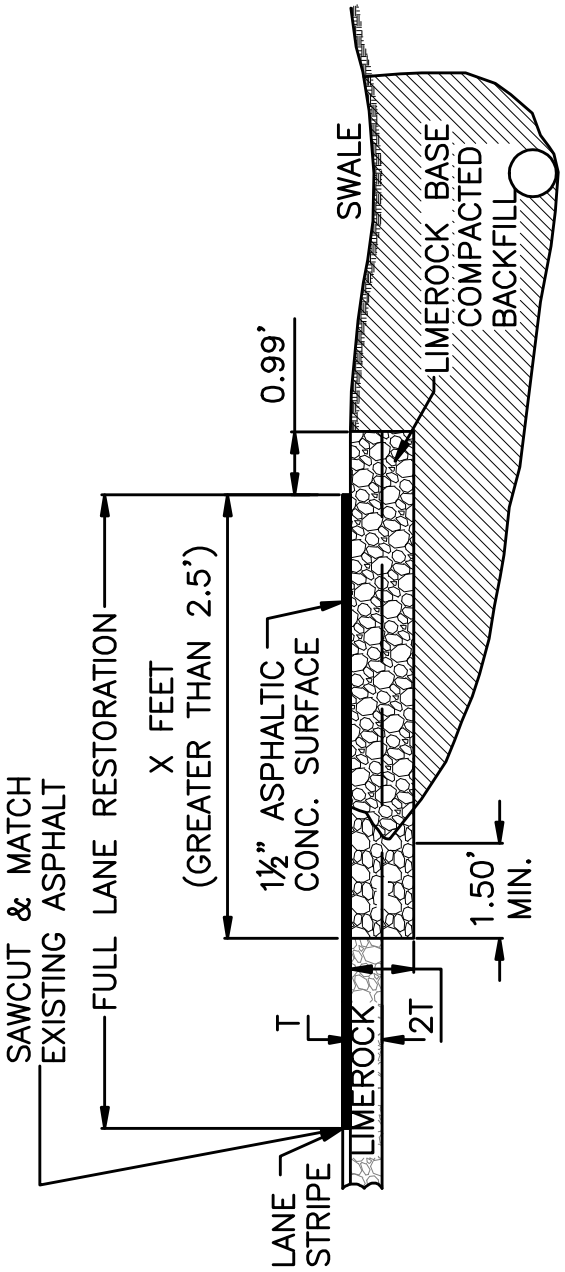
T= 6" PARKING LOT
8" RESIDENTIAL STREETS
10" MAJOR ST. (4 LANE)
12" MAJOR ST. (6 LANE)
2T=18" MAX.–12" MIN.



DATE: APRIL'04	SCALE: N.T.S.	FULL LANE RESTORATION OF PAVEMENT	P
REVISED: MARCH '09	DRAWN BY:	PARALLEL UTILITY INSTALLATION	4.3
			1 OF 2

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GENERAL NOTES

1. REPLACED BASE MATERIAL OVER DITCH SHALL BE TWICE THE THICKNESS OF THE ORIGINAL BASE. MINIMUM 12", MAXIMUM 18".

2. BASE MATERIAL SHALL BE PLACED IN LAYERS NOT THICKER THAN 6" COMPACTED THICKNESS ND EACH LAYER THOROUGHLY ROLLED OR TAMPED TO 98% OF MAXIMUM DENSITY, PER AASHTO T-180.

3. ASPHALT PAVEMENT JOINTS (ASPHALTIC CONCRETE) SHALL BE MECHANICALLY SAWED.

4. NEW SURFACE MATERIAL WILL BE D.O.T. TYPE III ASPHALTIC CONCRETE.

5. BASE MATERIAL SHALL HAVE A MINIMUM LBR OF 100 & MINIMUM CARBONATE CONTENT OF 70% FOR MAJOR STREETS AND 60% FOR RESIDENTIAL STREETS.

6. IF THE DITCH IS FILLED TEMPORARILY, IT SHALL BE COVERED WITH A 2" ASPHALTIC CONCRETE PATCH ON MAJOR STREET AND 1-1/2" ASPHALTIC CONCRETE PATCH ON RESIDENTIAL STREET AND PARKING LOT TO KEEP THE FILL MATERIAL FROM RAVELING UNTIL PLACED WITH A PERMANENT PATCH.

7. SUBGRADE SHALL BE COMPACTED TO 100% OF DRY DENSITY PER AASHTO T-99 AND SHALL BE PLACED IN LIFTS NOT TO EXCEED 12" MAXIMUM, LOOSE MEASUREMENT.

8. PAVEMENT RESTORATION DUE TO PLACEMENT OF 4" GAS MAINS OR LARGER SHALL BE AS SHOWN ON THIS DETAIL WITH A 3" MINIMUM WIDTH AND PLACEMENT OF CONTINUOUS METALLIC TAPE OR #12 WIRE WRAPPED AROUND THE PIPE(S).

9. THE DIMENSION 'X' FEET IS ANY WIDTH GREATER THAN 2.5'.

10. THE PROVISIONS IN THIS DETAIL SUPERSEDES ALL OTHER RELATED PROVISIONS MENTIONED IN CITY OF FORT LAUDERDALE CONSTRUCTION STANDARDS AND SPECIFICATIONS.

DATE: APRIL'04	SCALE: N.T.S.	FULL LANE RESTORATION OF PAVEMENT	P
REVISED: MARCH '09	DRAWN BY:	PARALLEL UTILITY INSTALLATION	4.3
			2 OF 2

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CITY OF FORT LAUDERDALE

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8" RESIDENTIAL STREETS
10" MAJOR ST. (4 LANE)
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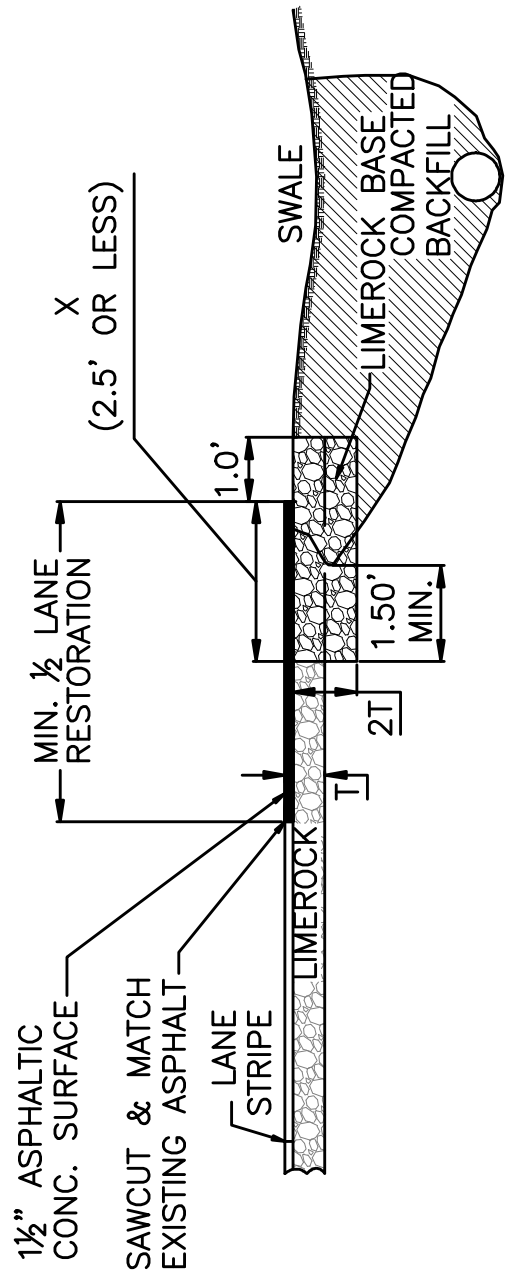

DATE: JAN.'82	SCALE:	**RESTORATION OF PAVEMENT**	**P**
REVISED: MARCH '09	DRAWN BY:	**PARALLEL UTILITY INSTALLATION**	**4.4** 1 OF 2

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CITY OF FORT LAUDERDALE

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GENERAL NOTES

1. REPLACED BASE MATERIAL OVER DITCH SHALL BE TWICE THE THICKNESS OF THE ORIGINAL BASE. MINIMUM 12", MAXIMUM 18".

2. BASE MATERIAL SHALL BE PLACED IN LAYERS NOT THICKER THAN 6" COMPACTED THICKNESS AND EACH LAYER THOROUGHLY ROLLED OR TAMPED TO 98% OF MAXIMUM DENSITY, PER AASHTO T-180.

3. ASPHALT PAVEMENT JOINTS (ASPHALTIC CONCRETE) SHALL BE MECHANICALLY SAWED.

4. NEW SURFACE MATERIAL WILL BE D.O.T. TYPE III ASPHALTIC CONCRETE.

5. BASE MATERIAL SHALL HAVE A MINIMUM LBR OF 100 & MINIMUM CARBONATE CONTENT OF 70% FOR MAJOR STREETS AND 60% FOR RESIDENTIAL STREETS.

6. IF THE DITCH IS FILLED TEMPORARILY, IT SHALL BE COVERED WITH A 2" ASPHALTIC CONCRETE PATCH ON MAJOR STREET AND 1-1/2" ASPHALTIC CONCRETE PATCH ON RESIDENTIAL STREET AND PARKING LOT TO KEEP THE FILL MATERIAL FROM RAVELING UNTIL PLACED WITH A PERMANENT PATCH.

7. SUBGRADE SHALL BE COMPACTED TO 100% OF DRY DENSITY PER AASHTO T-99 AND SHALL BE PLACED IN LIFTS NOT TO EXCEED 12" MAXIMUM, LOOSE MEASUREMENT.

8. PAVEMENT RESTORATION DUE TO PLACEMENT OF 4" GAS MAINS OR LARGER SHALL BE AS SHOWN ON THIS DETAIL WITH A 3" MINIMUM WIDTH AND PLACEMENT OF CONTINUOUS METALLIC TAPE OR #12 WIRE WRAPPED AROUND THE PIPE(S).

9. THE DIMENSION 'X' FEET IS ANY WIDTH LESS THAN OR EQUAL TO 2.5'.

10. THE PROVISIONS IN THIS DETAIL SUPERSEDES ALL OTHER RELATED PROVISIONS MENTIONED IN CITY OF FORT LAUDERDALE CONSTRUCTION STANDARDS AND SPECIFICATIONS.

DATE: JAN.'82	SCALE:	**RESTORATION OF PAVEMENT**	**P**
REVISED: MARCH '09	DRAWN BY:	**PARALLEL UTILITY INSTALLATION**	**4.4** 2 OF 2

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CITY OF FORT LAUDERDALE

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T= 6" PARKING LOT
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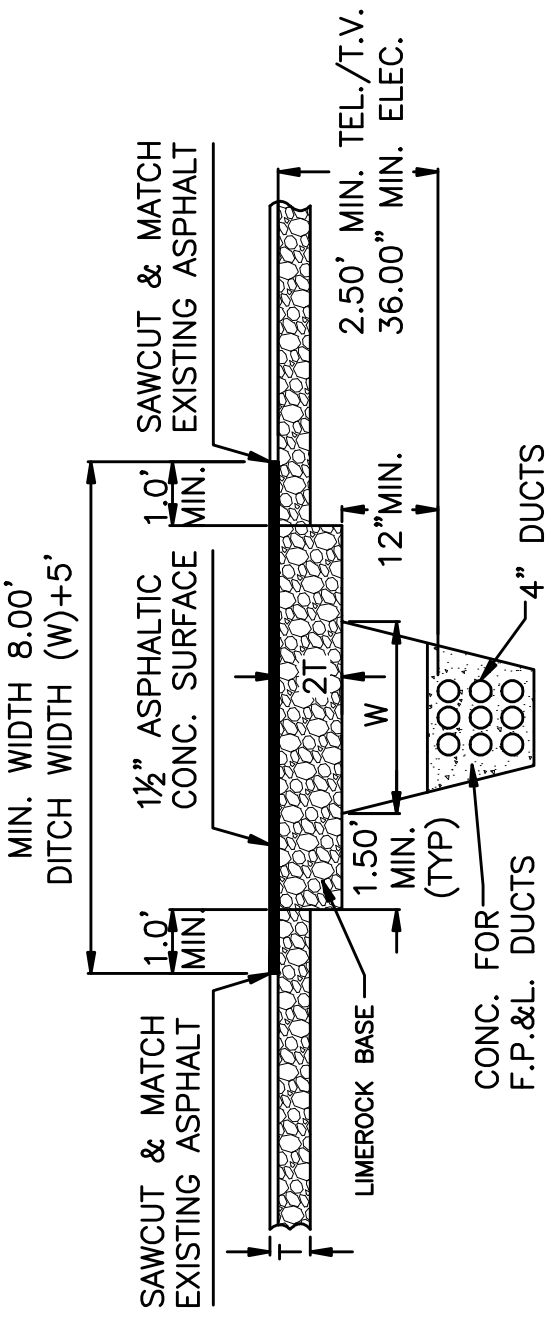
12" MAJOR ST. (6 LANE)
2T=18" MAX.–12" MIN.



DATE: APRIL'04	SCALE: N.T.S.	RESTORATION OF PAVEMENT	P
REVISED: MARCH '09	DRAWN BY:	UTILITIES CROSSING	4.5 1 OF 2

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CITY OF FORT LAUDERDALE

OFFICE OF THE CITY ENGINEER

GENERAL NOTES

1. REPLACED BASE MATERIAL OVER DITCH SHALL BE TWICE THE THICKNESS OF THE ORIGINAL BASE. MINIMUM 12", MAXIMUM 18".

2. BASE MATERIAL SHALL BE PLACED IN LAYERS NOT THICKER THAN 6" COMPACTED THICKNESS AND EACH LAYER THOROUGHLY ROLLED OR TAMPED TO 98% OF MAXIMUM DENSITY, PER AASHTO T-180.
3. ASPHALT PAVEMENT JOINTS (ASPHALTIC CONCRETE) SHALL BE MECHANICALLY SAWED.

4. NEW SURFACE MATERIAL WILL BE D.O.T. TYPE III ASPHALTIC CONCRETE.

5. BASE MATERIAL SHALL HAVE A MINIMUM LBR OF 100 & MINIMUM CARBONATE CONTENT OF 70% FOR MAJOR STREETS AND 60% FOR RESIDENTIAL STREETS.

6. IF THE DITCH IS FILLED TEMPORARILY, IT SHALL BE COVERED WITH A 2" ASPHALTIC CONCRETE PATCH ON MAJOR STREET AND 1-1/2" ASPHALTIC CONCRETE PATCH ON RESIDENTIAL STREET AND PARKING LOT TO KEEP THE FILL MATERIAL FROM RAVELING UNTIL PLACED WITH A PERMANENT PATCH.

7. SUBGRADE SHALL BE COMPACTED TO 100% OF DRY DENSITY PER AASHTO T-99 AND SHALL BE PLACED IN LIFTS NOT TO EXCEED 12" MAXIMUM, LOOSE MEASUREMENT.

8. PAVEMENT RESTORATION DUE TO PLACEMENT OF 4" GAS MAINS OR LARGER SHALL BE AS SHOWN ON THIS DETAIL WITH A 3" MINIMUM WIDTH AND PLACEMENT OF CONTINUOUS METALLIC TAPE OR #12 WIRE WRAPPED AROUND THE PIPE(S).

9. THE DIMENSION 'W' FEET IS ANY WIDTH EXCEEDING 2.5'.

10. THE PROVISIONS IN THIS DETAIL SUPERSEDES ALL OTHER RELATED PROVISIONS MENTIONED IN CITY OF FORT LAUDERDALE CONSTRUCTION STANDARDS AND SPECIFICATIONS.

DATE: APRIL'04	SCALE: N.T.S.	**RESTORATION OF PAVEMENT**	**P**
REVISED: MARCH '09	DRAWN BY:	**UTILITIES CROSSING**	**4.5** 2 OF 2

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CITY OF FORT LAUDERDALE

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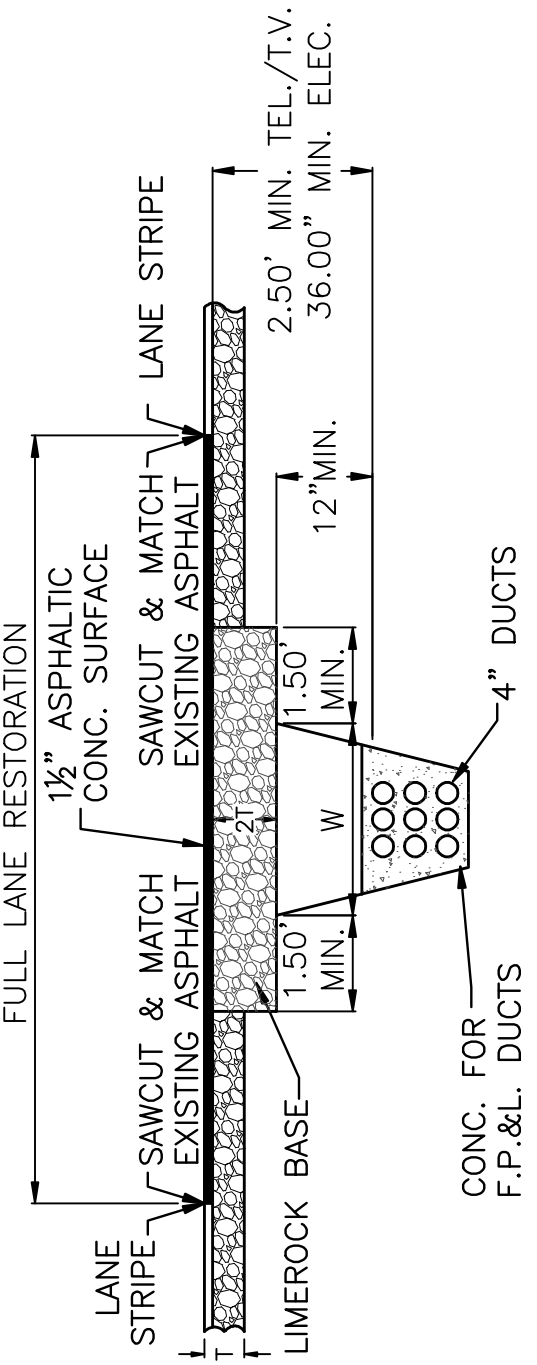
T= 6" PARKING LOT
8" RESIDENTIAL STREETS
10" MAJOR ST. (4 LANE)
12" MAJOR ST. (6 LANE)
2T=18" MAX.–12" MIN.



DATE: APRIL'04	SCALE: N.T.S.	RESTORATION OF PAVEMENT	P
REVISED: MARCH '09	DRAWN BY:	PARALLEL UTILITIES INSTALLATION	4.6
			1 OF 2

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CITY OF FORT LAUDERDALE

OFFICE OF THE CITY ENGINEER

GENERAL NOTES

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2. BASE MATERIAL SHALL BE PLACED IN LAYERS NOT THICKER THAN 6" COMPACTED THICKNESS AND EACH LAYER THOROUGHLY ROLLED OR TAMPED TO 98% OF MAXIMUM DENSITY, PER AASHTO T-180.
3. ASPHALT PAVEMENT JOINTS (ASPHALTIC CONCRETE) SHALL BE MECHANICALLY SAWED.
4. NEW SURFACE MATERIAL WILL BE D.O.T. TYPE III ASPHALTIC CONCRETE.
5. BASE MATERIAL SHALL HAVE A MINIMUM LBR OF 100 & MINIMUM CARBONATE CONTENT OF 70% FOR MAJOR STREETS AND 60% FOR RESIDENTIAL STREETS.
6. IF THE DITCH IS FILLED TEMPORARILY, IT SHALL BE COVERED WITH A 2" ASPHALTIC CONCRETE PATCH ON MAJOR STREET AND 1-1/2" ASPHALTIC CONCRETE PATCH ON RESIDENTIAL STREET AND PARKING LOT TO KEEP THE FILL MATERIAL FROM RAVELING UNTIL PLACED WITH A PERMANENT PATCH.
7. SUBGRADE SHALL BE COMPACTED TO 100% OF DRY DENSITY PER AASHTO T-99 AND SHALL BE PLACED IN LIFTS NOT TO EXCEED 12" MAXIMUM, LOOSE MEASUREMENT.
8. PAVEMENT RESTORATION DUE TO PLACEMENT OF 4" GAS MAINS OR LARGER SHALL BE AS SHOWN ON THIS DETAIL WITH A 3" MINIMUM WIDTH AND PLACEMENT OF CONTINUOUS METALLIC TAPE OR #12 WIRE WRAPPED AROUND THE PIPE(S).
9. THE DIMENSION 'W' FEET IS ANY WIDTH GREATER THAN OR EQUAL TO 2.5'.
10. THE PROVISIONS IN THIS DETAIL SUPERSEDES ALL OTHER RELATED PROVISIONS MENTIONED IN CITY OF FORT LAUDERDALE CONSTRUCTION STANDARDS AND SPECIFICATIONS.

DATE: APRIL'04	SCALE: N.T.S.	**RESTORATION OF PAVEMENT**	**P**
REVISED: MARCH '09	DRAWN BY:	**PARALLEL UTILITIES INSTALLATION**	**4.6** 2 OF 2

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CITY OF FORT LAUDERDALE

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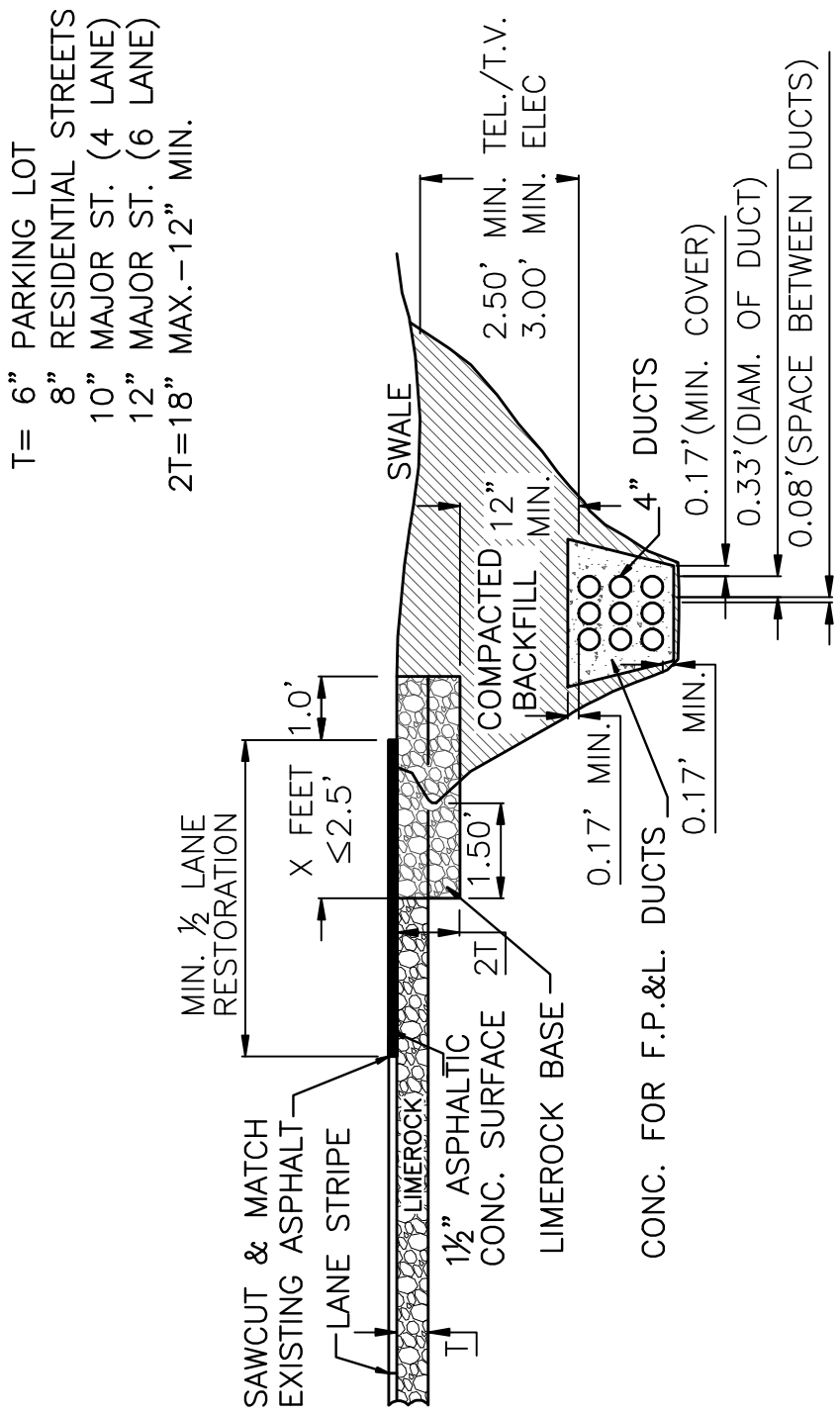

DATE: APRIL'04	SCALE: N.T.S.	RESTORATION OF PAVEMENT	P
REVISED: MARCH '09	DRAWN BY:	PARALLEL UTILITIES INSTALLATION	4.7
			1 OF 2

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CITY OF FORT LAUDERDALE

OFFICE OF THE CITY ENGINEER

GENERAL NOTES

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2. BASE MATERIAL SHALL BE PLACED IN LAYERS NOT THICKER THAN 6" COMPACTED THICKNESS AND EACH LAYER THOROUGHLY ROLLED OR TAMPED TO 98% OF MAXIMUM DENSITY, PER AASHTO T-180.

3. ASPHALT PAVEMENT JOINTS (ASPHALTIC CONCRETE) SHALL BE MECHANICALLY SAWED.

4. NEW SURFACE MATERIAL WILL BE D.O.T. TYPE III ASPHALTIC CONCRETE.

5. BASE MATERIAL SHALL HAVE A MINIMUM LBR OF 100 & MINIMUM CARBONATE CONTENT OF 70% FOR MAJOR STREETS AND 60% FOR RESIDENTIAL STREETS.

6. IF THE DITCH IS FILLED TEMPORARILY, IT SHALL BE COVERED WITH A 2" ASPHALTIC CONCRETE PATCH ON MAJOR STREET AND 1-1/2" ASPHALTIC CONCRETE PATCH ON RESIDENTIAL STREET AND PARKING LOT TO KEEP THE FILL MATERIAL FROM RAVELING UNTIL PLACED WITH A PERMANENT PATCH.

7. FP&L SHALL ENCASE THE DUCTS IN CONCRETE UNLESS OTHERWISE APPROVED.

8. TELEPHONE COMPANY SHALL SECURE THE DUCTS WITH SUITABLE STRAPS, AND SPACERS AT INTERVALS AS NECESSARY TO MAINTAIN LINE AND GRADE UNLESS OTHERWISE APPROVED.

9. SUBGRADE SHALL BE COMPACTED TO 100% OF DRY DENSITY PER AASHTO T-99 AND SHALL BE PLACED IN LIFTS NOT TO EXCEED 12" MAXIMUM, LOOSE MEASUREMENT.

10. THE DIMENSION 'X' FEET IS ANY WIDTH LESS THAN OR EQUAL TO 2.5'.

11. THE PROVISIONS IN THIS DETAIL SUPERSEDES ALL OTHER RELATED PROVISIONS MENTIONED IN CITY OF FORT LAUDERDALE CONSTRUCTION STANDARDS AND SPECIFICATIONS.

DATE: APRIL'04	SCALE: N.T.S.	RESTORATION OF PAVEMENT	P
REVISED: MARCH '09	DRAWN BY:	PARALLEL UTILITIES INSTALLATION	4.7 2 OF 2

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CITY OF FORT LAUDERDALE

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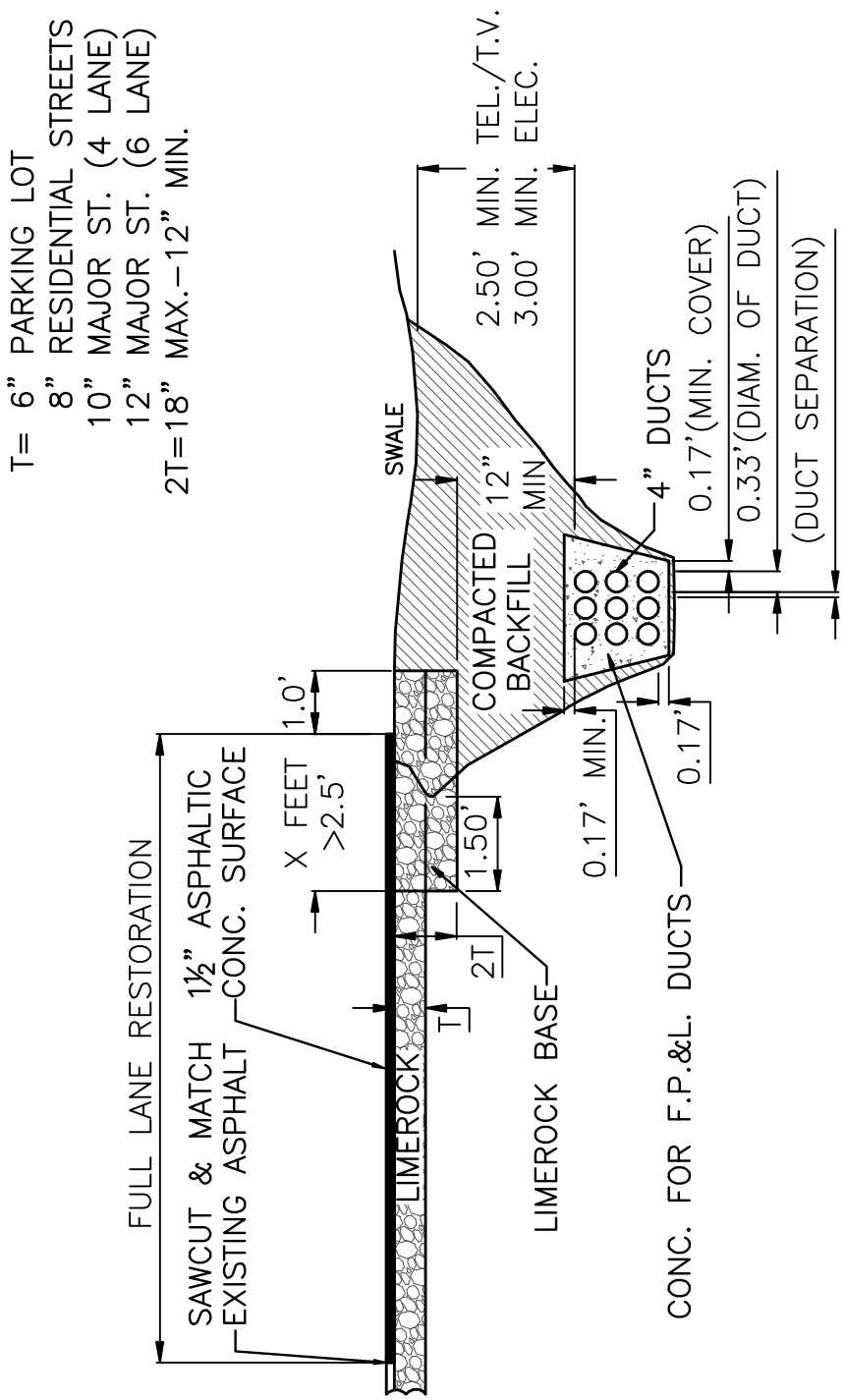

DATE: APRIL'08	SCALE: N.T.S.	FULL LANE RESTORATION OF PAVEMENT	P
REVISED: MARCH '09	DRAWN BY:	PARALLEL UTILITIES INSTALLATION	4.8
			1 OF 2

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CITY OF FORT LAUDERDALE

OFFICE OF THE CITY ENGINEER

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2. BASE MATERIAL SHALL BE PLACED IN LAYERS NOT THICKER THAN 6" COMPACTED THICKNESS AND EACH LAYER THOROUGHLY ROLLED OR TAMPED TO 98% OF MAXIMUM DENSITY, PER AASHTO T-180.

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7. FP&L SHALL ENCASE THE DUCTS IN CONCRETE UNLESS OTHERWISE APPROVED.

8. TELEPHONE COMPANY SHALL SECURE THE DUCTS WITH SUITABLE STRAPS, AND SPACERS AT INTERVALS AS NECESSARY TO MAINTAIN LINE AND GRADE UNLESS OTHERWISE APPROVED.

9. SUBGRADE SHALL BE COMPACTED TO 100% OF DRY DENSITY PER AASHTO T-99 AND SHALL BE PLACED IN LIFTS NOT TO EXCEED 12" MAXIMUM, LOOSE MEASUREMENT.

10. THE DIMENSION 'X' FEET IS ANY WIDTH GREATER THAN 2.5'.

11. THE PROVISIONS IN THIS DETAIL SUPERSEDES ALL OTHER RELATED PROVISIONS MENTIONED IN CITY OF FORT LAUDERDALE CONSTRUCTION STANDARDS AND SPECIFICATIONS.

DATE: APRIL'08	SCALE: N.T.S.	FULL LANE RESTORATION OF PAVEMENT	P
REVISED: MARCH '09	DRAWN BY:	PARALLEL UTILITIES INSTALLATION	4.8 2 OF 2

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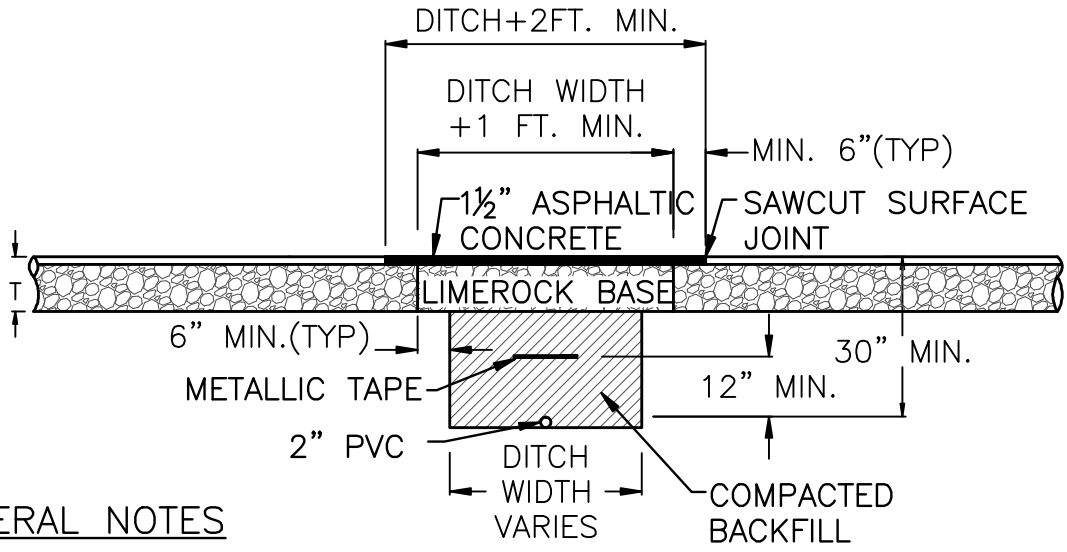
CITY OF FORT LAUDERDALE

OFFICE OF THE CITY ENGINEER



GENERAL NOTES

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6. SUBGRADE SHALL BE COMPACTED TO 100% OF DRY DENSITY PER AASHTO T-99 AND SHALL BE PLACED IN LIFTS NOT TO EXCEED 12" MAXIMUM, LOOSE MEASUREMENT.
7. FIBER OPTIC CABLE SHALL BE INSTALLED IN MINIMUM 2" SCHEDULE 40 P.V.C. CONDUIT.
8. LOCATION OF CONDUIT WITH RESPECT TO CENTERLINE OF STREETS, RIGHT-OF-WAY LINES OR OTHER BASE LINES WILL BE SUBJECT TO APPROVAL OF PUBLIC WORKS DEPARTMENT.
9. 0.005" X 3" WIDE MINIMUM METALLIC TAPE COLOR CODED U.L.C.C. ORANGE TO RUN CONTINUOUSLY WITH TRENCH. TAPE IDENTIFYING FIBER OPTIC CABLE WILL HAVE THE WORDS "CAUTION FIBER OPTIC" FOLLOWED BY OWNERS NAME AND TELEPHONE NUMBER.
10. U.L.C.C.=UTILITY LOCATION COORDINATION COUNCIL

DATE: APRIL'04	SCALE: N.T.S.	RESTORATION OF PAVEMENT - FIBER OPTIC CABLE INSTALLATION CROSSING	P 4.9
REVISED: MARCH '09	DRAWN BY:		

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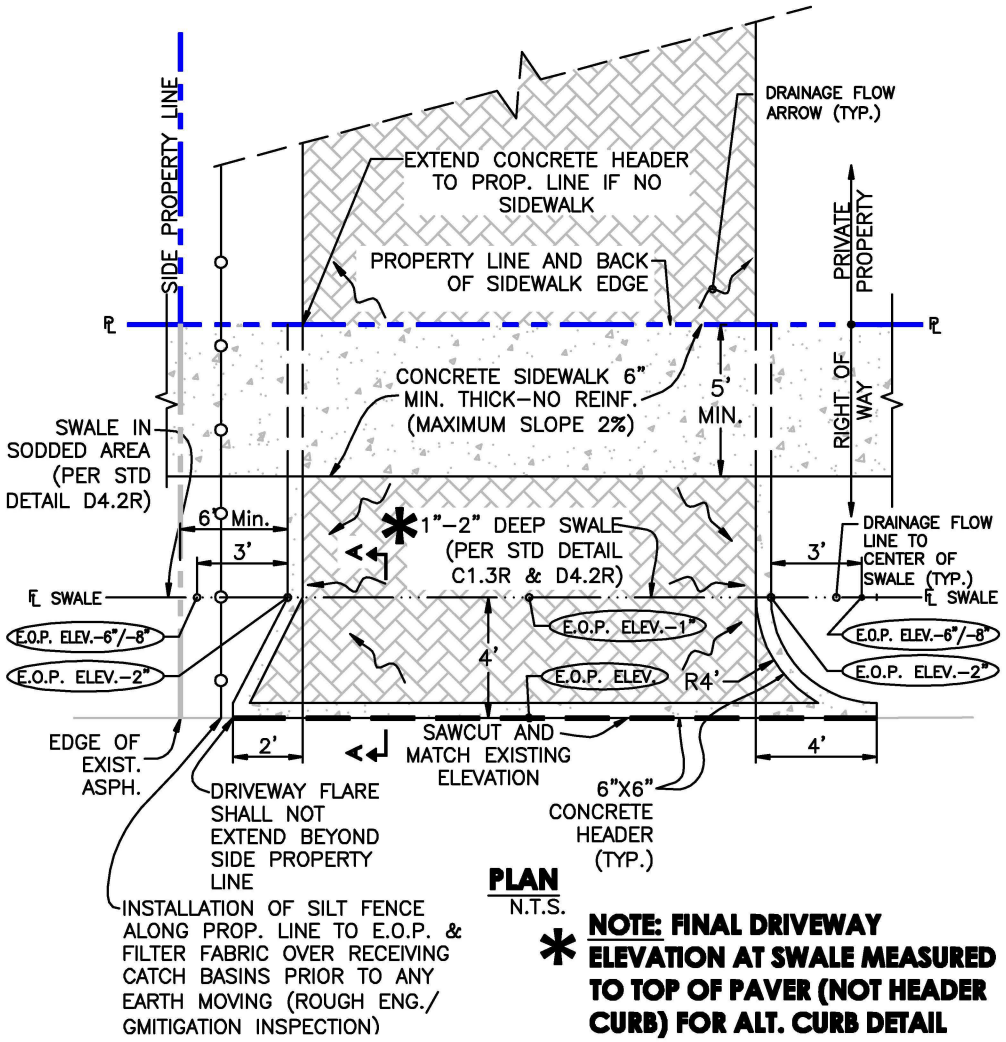
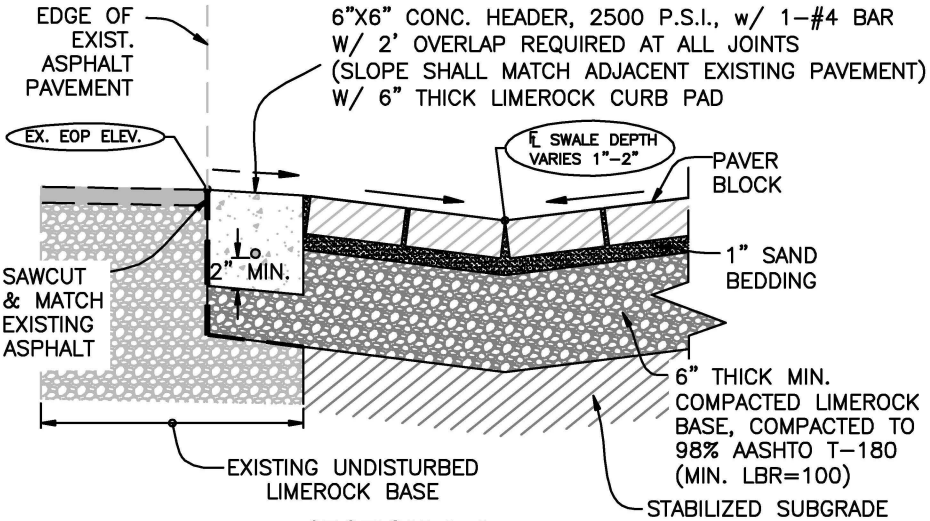
CONSTRUCTION NOTES:

1. SWALE SHALL EXTEND ENTIRE LENGTH OF PROPERTY FROM PROPERTY LINE TO PROPERTY LINE.
2. ALL MATERIALS, WORKMANSHIP, AND RESTORATION OF FEATURES IN THE RIGHT-OF-WAY SHALL BE TO THE SATISFACTION OF THE CITY ENGINEER. MATERIAL CERTIFICATIONS, SAMPLES, SHOP DRAWINGS, DENSITY TESTS MAY BE REQUIRED BY THE CITY INSPECTOR FOR VERIFICATION & APPROVAL.
3. ENGINEERING GROUGH SWALE INSPECTION SHALL BE CALLED, INSPECTED AND PASSED PRIOR TO PLACEMENT OF CONCRETE OR ANY LANDSCAPING OR TREE INSTALLATION.
4. FINAL SWALE DEPTHS SHALL MEET THE FOLLOWING AFTER INSTALLATION OF ANY SOD OR PAVERS (INCLUDING HEADER CURBS IF APPLICABLE)
   DEPTHS ARE MEASURED FROM EXISTING EDGE OF PAVEMENT (E.O.P.):
   A. 40' ROW SECTION – 6" MINIMUM DEPTH IN NON PAVED & LANDSCAPED OR SODDED AREAS
   B. 50' ROW SECTION – 8" MINIMUM DEPTH IN
5. MINIMUM CLEAR ZONE SHALL BE PROVIDED FROM EDGE OF PAVEMENT.
   A. 4' MINIMUM CLEAR ZONE FOR PLANTINGS OR SMALL GROUNDCOVER (SHALL NOT EXCEED 30" IN FULL GROWN HEIGHT)
   B. 6' MINIMUM CLEAR ZONE FOR TREES (SIGHT TRIANGLE REQUIRED ON PLANS)
6. CENTER BOTTOM OF SWALE BETWEEN EDGE OF PAVEMENT AND NEW RIGHT OF WAY LINE IF NO SIDEWALK EXISTS (SPECIAL S/W WAIVER REQUIRED BY CITY ENGINEER).
7. SIDEWALKS SHALL BE CONCRETE, CONFORM TO CITY ENGINEERING STD DETAIL C1.3R, AND RUN CONTINUOUSLY THROUGH ALL DRIVEWAYS.
8. SITE PREPARATION AND EROSION CONTROL MEASURES SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION. ADDITIONAL EROSION CONTROL MEASURES AFTER INITIAL GROUGH INSPECTION MAY BE REQUIRED

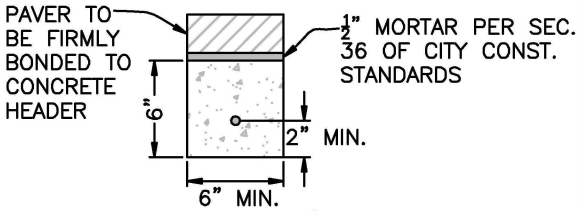


PLAN
N.T.S.

*** NOTE: FINAL DRIVEWAY ELEVATION AT SWALE MEASURED TO TOP OF PAVER (NOT HEADER CURB) FOR ALT. CURB DETAIL**



SECTION A-A
N.T.S.



ALTERNATE HEADER CURB DETAIL
N.T.S.

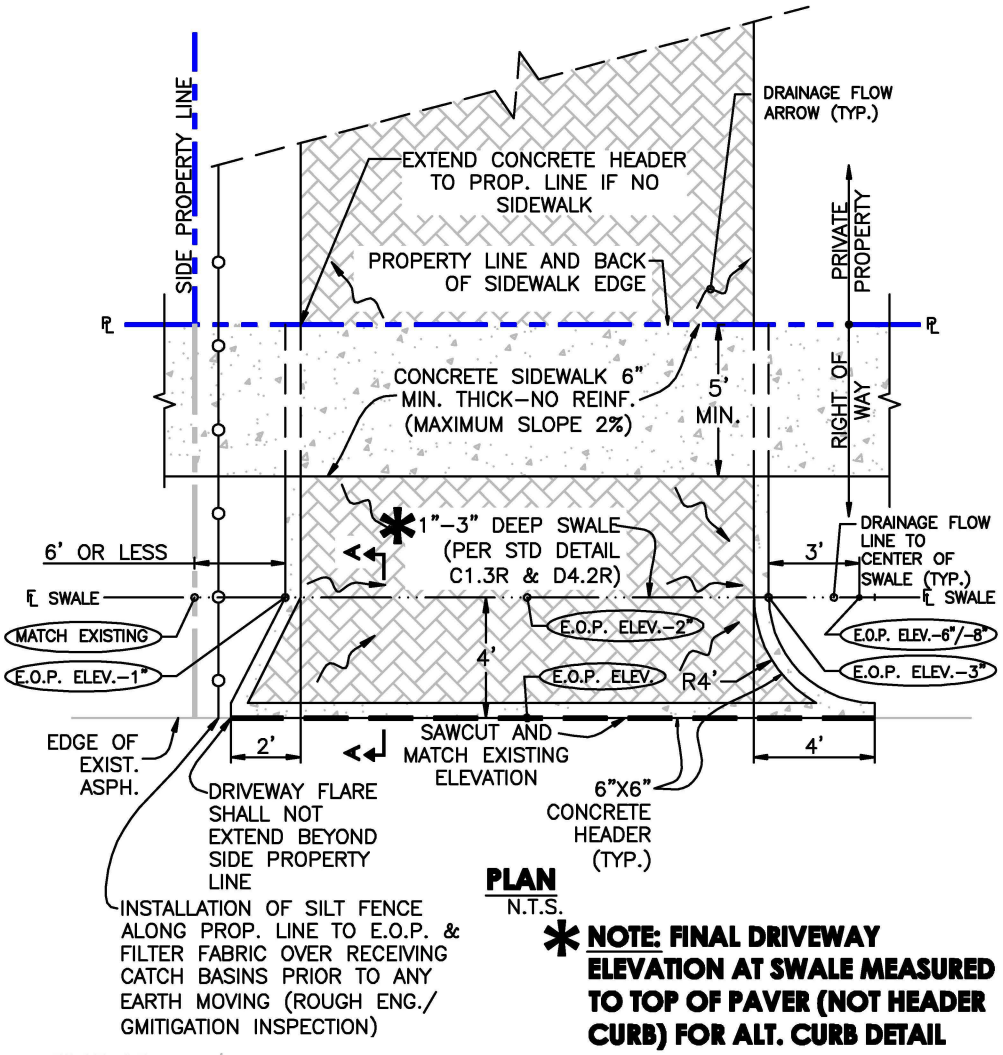
GENERAL NOTES:

1. 2' WIDE FLARE OR OPTIONAL 4' RADIUS
2. UTILITY LOCATES SHALL BE CALLED AND DOCUMENTED PRIOR TO FIRST INSPECTION.
3. IF NEW DRIVEWAY LIMITS COVER EXISTING SEWER LATERAL:
   A. NEW CLEANOUT SHALL BE INSTALLED AT THE PROPERTY LINE WITH NEW TRAFFIC RATED BOX OR
   B. EXISTING SEWER LATERAL SHALL BE RELOCATED WITH NEW CLEAN OUT INSTALLED AT PROPERTY LINE
4. SIDEWALKS SHALL BE CONCRETE, CONFORM TO CITY RIGHT OF WAY CONSTRUCTION & ENGINEERING STD DETAIL C2.1, AND RUN CONTINUOUSLY THROUGH DECORATIVE DRIVEWAYS.
5. CONCRETE PAVERS SHALL CONFORM TO ASTM C–936. CLAY PAVERS SHALL BE HARD–BURNED AND SHALL CONFORM TO ASTM C–902. THE MINIMUM PAVER THICKNESS SHALL BE 3 1/8". DEVIATION FROM STANDARD THICKNESS REQUIRES SHOP DRAWING APPROVAL & ADDITIONAL 6" THICK CONCRETE BASE (MIN. 3000 P.S.I.) REQUIRED.
6. BEDDING SAND SHALL BE GRANULAR AND FINELY GRADED. LIMEROCK BASE SHALL BE BROUGHT UP TO GRADE BEFORE BEDDING SAND IS INSTALLED. BEDDING SAND SHALL NOT BE USED TO COMPENSATE FOR AN UNEVEN LIMEROCK BASE. PAVER GRADES SHALL BE SLOPED TO ENSURE PROPER DRAINAGE TO SWALE IN CONFORMANCE WITH STD DETAIL C1.3R & D4.2R.
7. PAVER JOINTS SHALL BE 1/8" WIDE, WITH A 1/16" TOLERANCE. ALL JOINTS SHALL BE SWEPT WITH DRY SAND UP TO THE PAVER SURFACE AND COMPACTED WITH A VIBRATORY PLATE COMPACTOR.
8. ALL MATERIALS, WORKMANSHIP, AND RESTORATION OF FEATURES IN THE RIGHT–OF–WAY SHALL BE TO THE SATISFACTION OF THE CITY ENGINEER OR INSPECTOR. MATERIAL CERTIFICATIONS, SAMPLES, SHOP DRAWINGS, & DENSITY TESTS MAY BE REQUIRED BY THE CITY INSPECTOR FOR VERIFICATION.
9. FOR DRIVEWAYS CONSTRUCTED WITHIN 6' OF PROPERTY LINE, CONSTRUCTION SHALL BE IN ACCORDANCE WITH DETAIL DW–P–1ALT AND DRIVEWAY SHALL SLOPE AWAY FROM PROPERTY LINE.

R1-2/2016

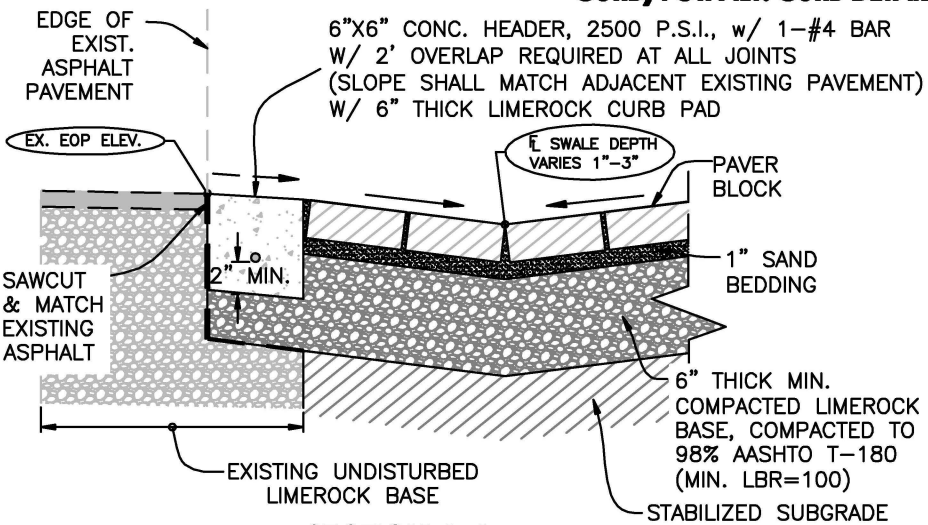
CITY OF FORT LAUDERDALE

CITY OF FORT LAUDERDALE DEPT. OF SUSTAINABLE DEVELOPMENT	PAVER DRIVEWAY DETAIL	ISSUED: 1/2016
RIGHT OF WAY ENGINEERING & CONSTRUCTION	CONSTRUCTION IN CITY ROW	DETAIL TITLE: DW-P-1



PLAN
N.T.S.

*** NOTE: FINAL DRIVEWAY ELEVATION AT SWALE MEASURED TO TOP OF PAVER (NOT HEADER CURB) FOR ALT. CURB DETAIL**



SECTION A-A
N.T.S.

GENERAL NOTES:

1. 2' WIDE FLARE OR OPTIONAL 4' RADIUS
2. UTILITY LOCATES SHALL BE CALLED AND DOCUMENTED PRIOR TO FIRST INSPECTION.
3. IF NEW DRIVEWAY LIMITS COVER EXISTING SEWER LATERAL:
   A. NEW CLEANOUT SHALL BE INSTALLED AT THE PROPERTY LINE WITH NEW TRAFFIC RATED BOX
   OR
   B. EXISTING SEWER LATERAL SHALL BE RELOCATED WITH NEW CLEAN OUT INSTALLED AT PROPERTY LINE
4. SIDEWALKS SHALL BE CONCRETE, CONFORM TO CITY RIGHT OF WAY CONSTRUCTION & ENGINEERING STD DETAIL C2.1, AND RUN CONTINUOUSLY THROUGH DECORATIVE DRIVEWAYS.
5. CONCRETE PAVERS SHALL CONFORM TO ASTM C–936. CLAY PAVERS SHALL BE HARD–BURNED AND SHALL CONFORM TO ASTM C–902. THE MINIMUM PAVER THICKNESS SHALL BE 3 1/8". DEVIATION FROM STANDARD THICKNESS REQUIRES SHOP DRAWING APPROVAL & ADDITIONAL 6" THICK CONCRETE BASE (MIN. 3000 P.S.I.) REQUIRED.
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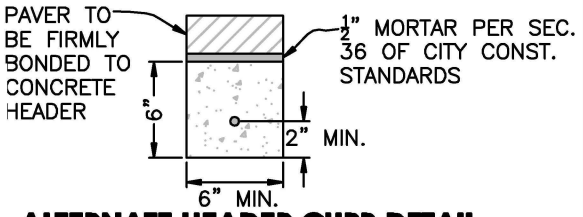
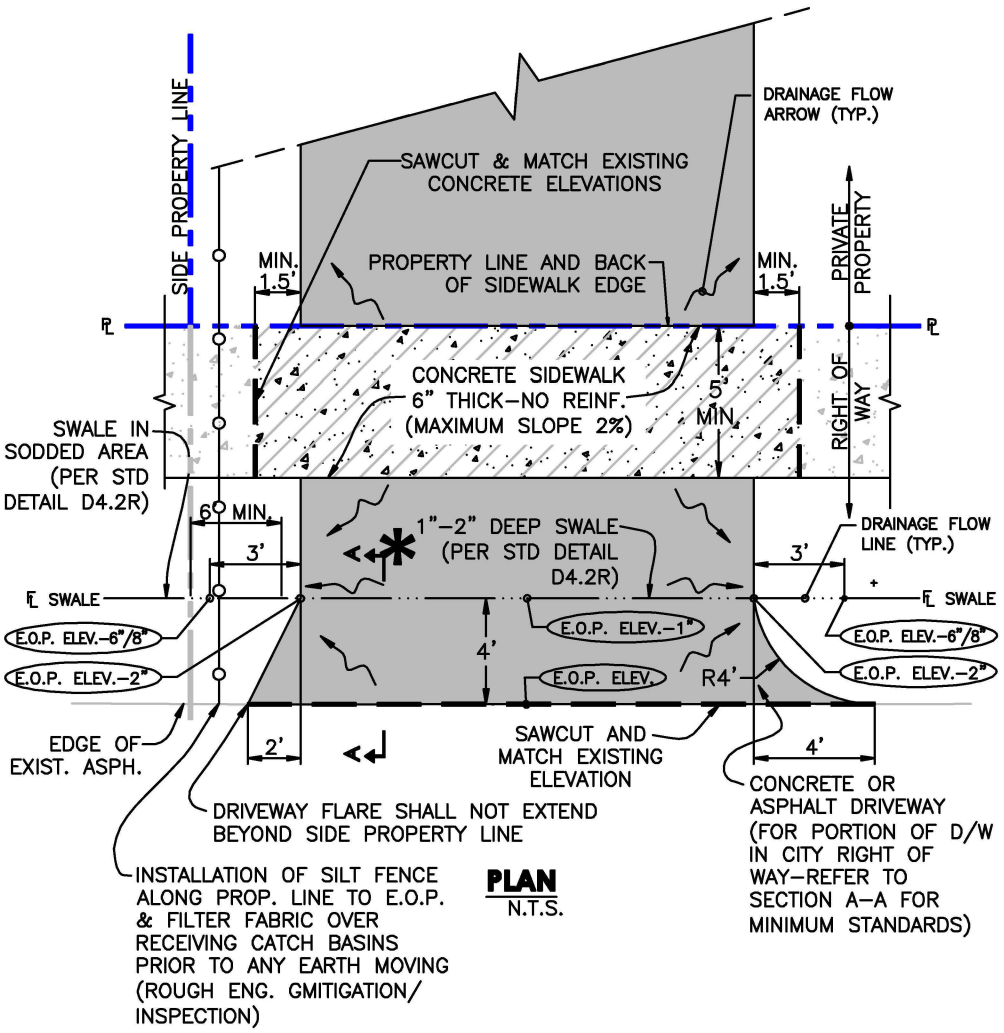
7. PAVER JOINTS SHALL BE 1/8" WIDE, WITH A 1/16" TOLERANCE. ALL JOINTS SHALL BE SWEPT WITH DRY SAND UP TO THE PAVER SURFACE AND COMPACTED WITH A VIBRATORY PLATE COMPACTOR.
8. ALL MATERIALS, WORKMANSHIP, AND RESTORATION OF FEATURES IN THE RIGHT–OF–WAY SHALL BE TO THE SATISFACTION OF THE CITY ENGINEER OR INSPECTOR. MATERIAL CERTIFICATIONS, SAMPLES, SHOP DRAWINGS, & DENSITY TESTS MAY BE REQUIRED BY THE CITY INSPECTOR FOR VERIFICATION.
9. FOR DRIVEWAYS CONSTRUCTED THAT PROVIDE MORE THAN 6' FROM PROPERTY LINE, CONSTRUCTION SHALL BE IN ACCORDANCE WITH STANDARD DRIVEWAY PAVER DETAIL DW–P–1.



ALTERNATE HEADER CURB DETAIL
N.T.S.

R1-2/2016

CITY OF FORT LAUDERDALE	CITY OF FORT LAUDERDALE DEPT. OF SUSTAINABLE DEVELOPMENT	ALTERNATE PAVER DRIVEWAY DETAIL	ISSUED: 1/2016
	RIGHT OF WAY ENGINEERING & CONSTRUCTION	CONSTRUCTION IN CITY ROW	DETAIL TITLE: DW-P-1ALT

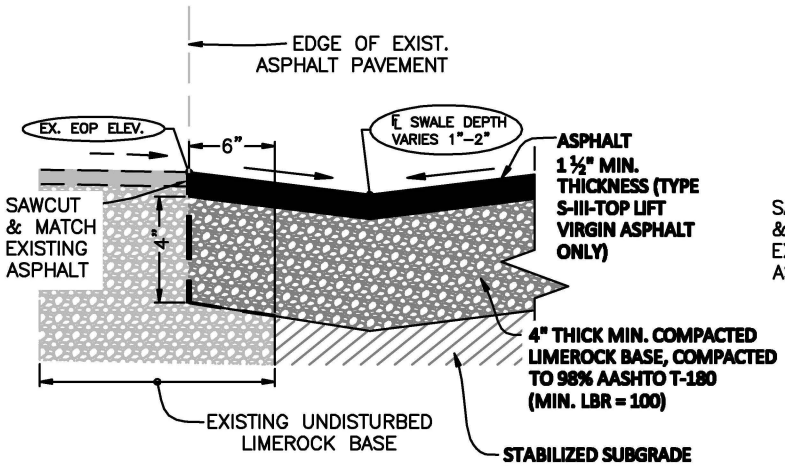


PLAN
N.T.S.

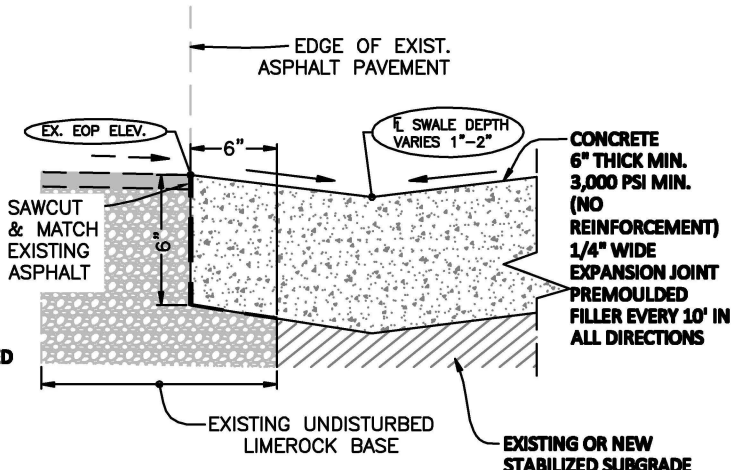
GENERAL NOTES:

1. 2' WIDE FLARE OR OPTIONAL 4' RADIUS
2. UTILITY LOCATES SHALL BE CALLED AND DOCUMENTED PRIOR TO FIRST INSPECTION.
3. IF NEW DRIVEWAY LIMITS COVER EXISTING SEWER LATERAL:
   A. NEW CLEANOUT SHALL BE INSTALLED AT THE PROPERTY LINE WITH NEW TRAFFIC RATED BOX OR
   B. EXISTING SEWER LATERAL SHALL BE RELOCATED WITH NEW CLEAN OUT INSTALLED AT PROPERTY LINE
4. SIDEWALKS SHALL BE CONCRETE, CONFORM TO CITY RIGHT OF WAY CONSTRUCTION & ENGINEERING STD DETAIL C2.1, AND RUN CONTINUOUSLY THROUGH ALL DRIVEWAYS.
5. PAVEMENT GRADES SHALL BE SLOPED TO ENSURE PROPER DRAINAGE TO SWALE IN CONFORMANCE WITH STD DETAIL D4.2R.
6. ALL MATERIALS, WORKMANSHIP, AND RESTORATION OF FEATURES IN THE RIGHT–OF–WAY SHALL BE TO THE SATISFACTION OF THE CITY ENGINEER OR INSPECTOR. MATERIAL CERTIFICATIONS, SAMPLES, SHOP DRAWINGS, & DENSITY TESTS MAY BE REQUIRED BY THE CITY INSPECTOR FOR VERIFICATION.
7. FOR DRIVEWAYS CONSTRUCTED WITHIN 6' OF PROPERTY LINE, CONSTRUCTION SHALL BE IN ACCORDANCE WITH DETAIL C1.3R–ALT AND DRIVEWAY SHALL SLOPE AWAY FROM PROPERTY LINE.

✱ **NOTE: FINAL DRIVEWAY ELEVATION AT SWALE MEASURED TO TOP OF PAVER (NOT HEADER CURB) FOR ALT. CURB DETAIL.**



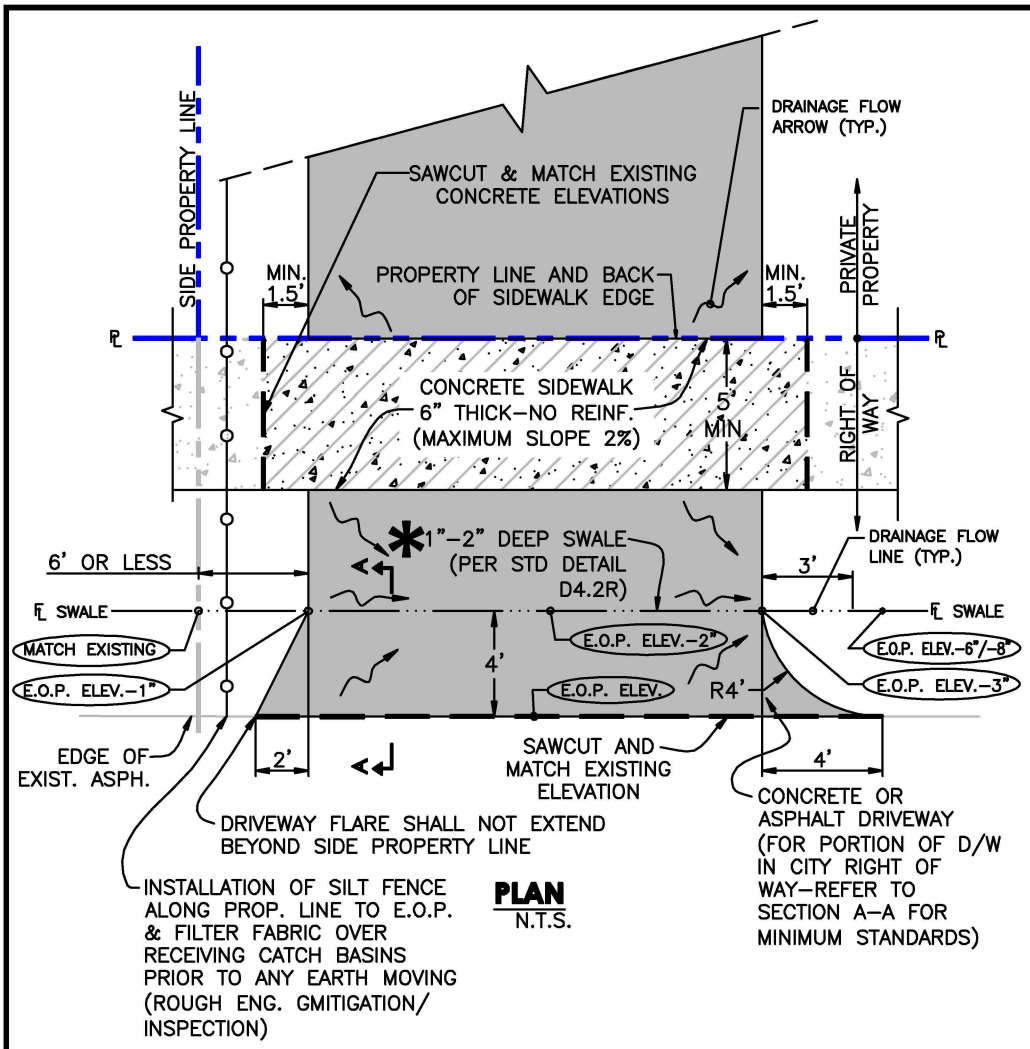
SECTION A-A
ASPHALT SECTION
N.T.S.



SECTION A-A
CONCRETE
N.T.S.

R1-2/2016

CITY OF FORT LAUDERDALE	CITY OF FORT LAUDERDALE DEPT. OF SUSTAINABLE DEVELOPMENT	DRIVEWAY WITHOUT CURB	ISSUED: 1/2016
	RIGHT OF WAY ENGINEERING & CONSTRUCTION	CONSTRUCTION IN CITY ROW	DETAIL TITLE: C1.3R

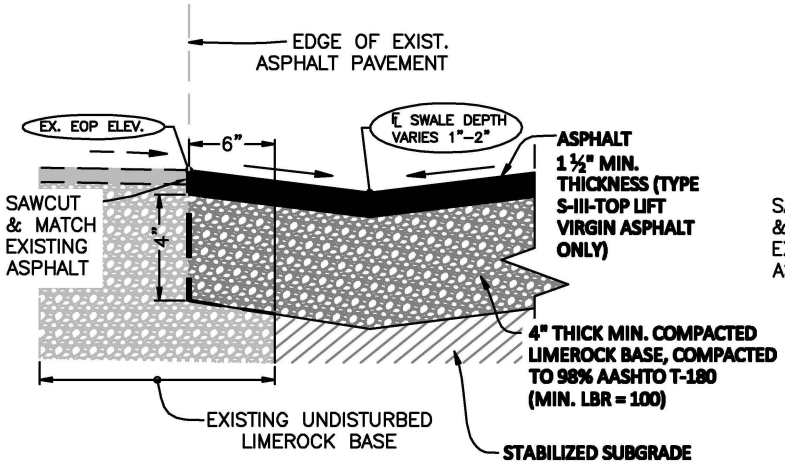


PLAN
N.T.S.

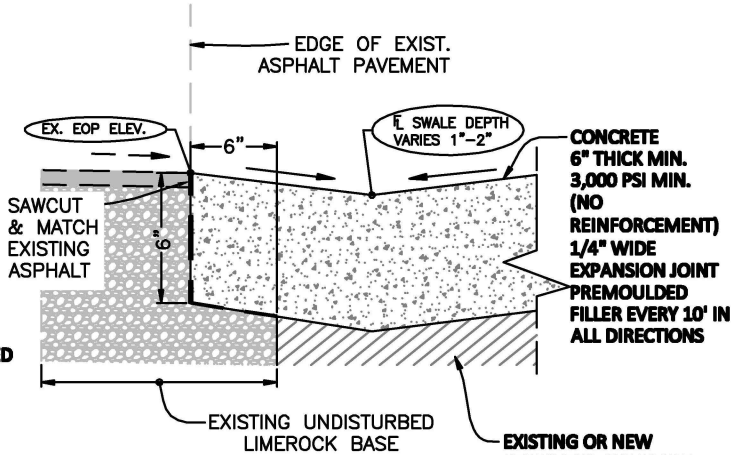
GENERAL NOTES:

1. 2' WIDE FLARE OR OPTIONAL 4' RADIUS
2. UTILITY LOCATES SHALL BE CALLED AND DOCUMENTED PRIOR TO FIRST INSPECTION.
3. IF NEW DRIVEWAY LIMITS COVER EXISTING SEWER LATERAL:
   A. NEW CLEANOUT SHALL BE INSTALLED AT THE PROPERTY LINE WITH NEW TRAFFIC RATED BOX OR
   B. EXISTING SEWER LATERAL SHALL BE RELOCATED WITH NEW CLEAN OUT INSTALLED AT PROPERTY LINE
4. SIDEWALKS SHALL BE CONCRETE, CONFORM TO CITY RIGHT OF WAY CONSTRUCTION & ENGINEERING STD DETAIL C2.1, AND RUN CONTINUOUSLY THROUGH ALL DRIVEWAYS.
5. PAVEMENT GRADES SHALL BE SLOPED TO ENSURE PROPER DRAINAGE TO SWALE IN CONFORMANCE WITH STD DETAIL D4.2R.
6. ALL MATERIALS, WORKMANSHIP, AND RESTORATION OF FEATURES IN THE RIGHT—OF—WAY SHALL BE TO THE SATISFACTION OF THE CITY ENGINEER OR INSPECTOR. MATERIAL CERTIFICATIONS, SAMPLES, SHOP DRAWINGS, & DENSITY TESTS MAY BE REQUIRED BY THE CITY INSPECTOR FOR VERIFICATION.
7. FOR DRIVEWAYS CONSTRUCTED THAT PROVIDE MORE THAN 6' FROM PROPERTY LINE, CONSTRUCTION SHALL BE IN ACCORDANCE WITH STANDARD DRIVEWAY PAVER DETAIL C1.3R.

✱ **NOTE: FINAL DRIVEWAY ELEVATION AT SWALE MEASURED TO TOP OF PAVER (NOT HEADER CURB) FOR ALT. CURB DETAIL.**



SECTION A-A
ASPHALT SECTION
N.T.S.

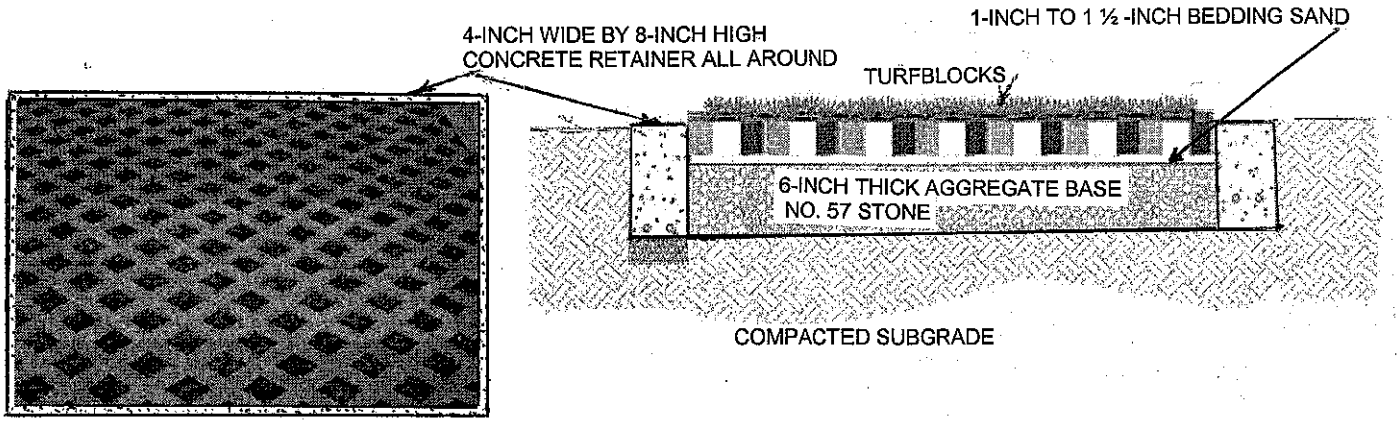


SECTION A-A
CONCRETE
N.T.S.

R1-2/2016

CITY OF FORT LAUDERDALE	CITY OF FORT LAUDERDALE DEPT. OF SUSTAINABLE DEVELOPMENT	ALTERNATE DRIVEWAY W/OUT CURB	ISSUED: 1/2016
	RIGHT OF WAY ENGINEERING & CONSTRUCTION	CONSTRUCTION IN CITY ROW	DETAIL TITLE: C1.3R-ALT

TYPICAL TURFBLOCK INSTALLATION REQUIREMENTS IN THE CITY'S RIGHT-OF-WAY



A typical Turfblock installation in City's swales consists of a soil subgrade, a gravel base, a layer of bedding sand and the turf block. Topsoil and grass, or stone aggregate is placed in the openings.

1. **Soil Subgrade:** The soil subgrade should be uniformly compacted to 95% of its optimum density prior to placing the gravel, sand and the grids.

2. **Aggregate Base:** Aggregate, 6-inch thick layer of FDOT No. 57 Stone shall be provided beneath turf blocks.

3. **Bedding Sand:** Bedding sand, between 1 and 11/2 inch thick layer shall be provided over the aggregate base. The sand should have uniform moisture content (not saturated) prior to placing the turf block. To maintain a level bedding surface, the sand should not be disturbed.

4. **Edge Restraints:** Concrete edge restraints or turf block retainers are necessary for turf block installation in the City's swale. The retainers shall have an area of 4-inch wide by 8-inch high, with compressive strength of 3000 psi @ 28 days, and reinforced with a #4 bar.

Please be advised that the homeowner is responsible for maintaining the turf blocks at all times.

Provide a Temporary Structure Affidavit.

Affidavit shall be properly executed and recorded in Broward County Records prior to permit issuance.

Appendix AC
Standard Operating Procedures

Appendix D Table of Contents		
Name of SOP	**Subsection**	**Page**
PW-UTL-DC-AA-3-Purpose, Objectives, & Organization of the Public Services Policy & Standards Manual	General	Page 7
PW-UTL-DC-AA-4-Record of Training Form	General	Pages 8-10
PW-UTL-DC-AA-5-Annual Certification of SOPs	General	Pages 11-17
PW-UTL-DC-AA-6-State Distribution System Licensing Requirement Form	General	Pages 18-19
PW-UTL-DC-AA-7-Acknowledgement Form	General	Page 20
PW-UTL-DC-COL-HM-1-Wastewater Force Main Break Maintenance Procedures	O&M Procedures	Page 22
PW-UTL-DC-COL-HM-2-Wastewater Gravity Main Break Maintenance	O&M Procedures	Page 23
PW-UTL-DC-COL-OVP-1- Pump Down	O&M Procedures	Page 24
PW-UTL-DC-COL-PC-1-Pump Station Upgrade to SCADA	O&M Procedures	Pages 25-28
PW-UTL-DC-COL-PM-1-Wastewater Pump Station Maintenance Procedures	O&M Procedures	Pages 29-30
PW-UTL-DC-COL-PM-2-Valve Exercising Procedures for Valves 10” and Larger	O&M Procedures	Page 31
PW-UTL-DC-COL-PM-3-Wastewater Pump station Maintenance Procedures	O&M Procedures	Pages 32-35
PW-UTL-DC-COL-SLC-1-Jet Cleaning Crew Daily Operations	O&M Procedures	Page 36
PW-UTL-DC-COL-SLC-2-Routine Sewer Line Jet Cleaning and Jet Cleaning for TV Survey	O&M Procedures	Pages 37-38
PW-UTL-DC-COL-TV-1-TV Survey Crew Daily Operations	O&M Procedures	Page 39
PW-UTL-DC-COL-TV-2-Routine TV Survey	O&M Procedures	Pages 40-41
PW-UTL-DC-COL-WS-1-Wet Well Crew Daily Operations	O&M Procedures	Page 42
PW-UTL-DC-COL-WS-2- Wet Well Cleaning	O&M Procedures	Pages 43-46
PW-UTL-DC-COL-WS-3-Plugging a Pipe	O&M Procedures	Pages 47-48
PW-UTL-DC-GEN-DTY-1- Chief Field Work	Chief Field Work, Duty Lists, and Overtime	Page 50
PW-UTL-DC-GEN-DTY-2-Heavy Equipment Call Out List	Chief Field Work, Duty Lists, and Overtime	Pages 51-52

Appendix D Table of Contents		
Name of SOP	**Subsection**	**Page**
PW-UTL-DC-GEN-DTY-3-Duty Mechanic Call Out List	Chief Field Work, Duty Lists, and Overtime	Pages 53-54
PW-UTL-DC-GEN-DTY-4-Management D&C Duty Foreman List	Chief Field Work, Duty Lists, and Overtime	Page 55
PW-UTL-DC-GEN-DTY-5-Pump Station Call Out List	Chief Field Work, Duty Lists, and Overtime	Pages 56-57
PW-UTL-DC-GEN-DTY-6-Service Worker Voluntary Call Out List	Chief Field Work, Duty Lists, and Overtime	Pages 58-59
PW-UTL-DC-GEN-DTY-7-Vacuum Truck Operator Call Out List	Chief Field Work, Duty Lists, and Overtime	Pages 60-61
PW-UTL-DC-GEN-DTY-8- Electrician Duty List	Chief Field Work, Duty Lists, and Overtime	Pages 62-63
PW-UTL-DC-GEN-DTY-9- Scheduled Overtime	Chief Field Work, Duty Lists, and Overtime	Page 64
PW-UTL-DC-GEN-DTY-10- Emergency Overtime	Chief Field Work, Duty Lists, and Overtime	Page 65
PW-UTL-DC-GEN-DTY-11-Utility Field Rep Call Out List	Chief Field Work, Duty Lists, and Overtime	Pages 66-67
PW-UTL-DC-GEN-DTY-12-Operational Emergency Staffing	Chief Field Work, Duty Lists, and Overtime	Pages 68-69
PW-UTL-DC-GEN-CPL-1- Cell Phone Policy	Communications, Purchasing, Licensing	Page 71
PW-UTL-DC-GEN-CPL-2- Email Response Procedure	Communications, Purchasing, Licensing	Page 72
PW-UTL-DC-GEN-CPL-3- Requisition Authorization (RA) for Contracted Services	Communications, Purchasing, Licensing	Page 73
PW-UTL-DC-GEN-CPL-4- Requisitions	Communications, Purchasing, Licensing	Page 74
PW-UTL-DC-GEN-CPL-5- Department Licensing	Communications, Purchasing, Licensing	Page 75
PW-UTL-DC-GEN-CPL-6-Safety Shoes Procedures	Communications, Purchasing, Licensing	Pages 76-77
PW-UTL-DC-GEN-CT-1- Pipe Crew Restoration	Construction	Pages 79-80
PW-UTL-DC-GEN-CT-2- Staging Area	Construction	Page 81

Appendix D Table of Contents		
Name of SOP	**Subsection**	**Page**
PW-UTL-DC-GEN-CT-3- Roadway Closures and Maintenance Practices to Reduce Pollutants	Construction	Pages 82-83
PW-UTL-DC-GEN-CT-4- Laying Asphalt	Construction	Pages 84-85
PW-UTL-DC-GEN-CT-5-Letters to Neighbors Affected by D&C Construction	Construction	Page 86
PW-UTL-DC-GEN-CT-6- Excavation or Pavement Cuts in City Street of Right of Way	Construction	Page 87
PW-UTL-DC-GEN-CT-6-Trenching and Excavating	Construction	Page 88
PW-UTL-DC-GEN-CT-8-Flasher Coordination Responsibility	Construction	Pages 89-90
PW-UTL-DC-GEN-CT-9-Concrete Restoration Procedure	Construction	Pages 91-92
PW-UTL-DC-GEN-CON-1-Valve Exercising Contractor Customer Field Operations	Contractors	Pages 94-95
PW-UTL-DC-GEN-CON-2-Inspections of Contractor Exercising Valves	Contractors	Pages 96-97
PW-UTL-DC-GEN-CON-3-Atlas Sections Provided to Contractor	Contractors	Page 98
PW-UTL-DC-GEN-CON-4- Tracking Completed Tasks by Contractors	Contractors	Page 99
PW-UTL-DC-GEN-EQ-1- Equipment Policy	Equipment	Page 101
PW-UTL-DC-GEN-EQ-2- Daily Vehicle Maintenance	Equipment	Page 102
PW-UTL-DC-GEN-EQ-3- Jet Truck Daily Vehicle Maintenance	Equipment	Page 103
PW-UTL-DC-GEN-EQ-4- TV Survey Crew Daily Vehicle Maintenance	Equipment	Page 104
PW-UTL-DC-GEN-EQ-5- Wet Well Crew Daily Vehicle Maintenance	Equipment	Page 105
PW-UTL-DC-GEN-EQ-6- Equipment Hauling and Towing	Equipment	Pages 106-107
PW-UTL-DC-GEN-EQ-7-Air Masks	Equipment	Pages 108-109
PW-UTL-DC-GEN-EQ-8-Purchase Procedure- Tools and Equipment and Request Form	Equipment	Pages 110-113
PW-UTL-DC-GEN-EQ-9-Tools and Equipment Request Form	Equipment	Page 114

Appendix D Table of Contents		
Name of SOP	**Subsection**	**Page**
PW-UTL-DC-GEN-EQ-10-Preventative Maintenance for Vehicles	Equipment	Pages 115-116
PW-UTL-DC-GEN-EQ-11-Vehicle Tools and Repair Parts Inventory	Equipment	Pages 117-121
PW-UTL-DC-GEN-EQ-12-Vehicle Tools Inventory Log	Equipment	Pages 122-123
PW-UTL-DC-GEN-EQ-13- Shop Inventory	Equipment	Pages 124-127
PW-UTL-DC-GEN-EQ-14- Shop Tools Inventory Log	Equipment	Pages 128-129
PW-UTL-DC-GEN-EQ-15- Missing Damaged, Vandalize, and Stolen Property Procedure	Equipment	Pages 130-132
PW-UTL-DC-GEN-EQ-17-Vehicle Inspection Form Procedure	Equipment	Page 133
PW-UTL-DC-GEN-EQ-18 CDL Inspection Form	Equipment	Page 134
PW-UTL-DC-GEN-EQ-19-Vehicle Equipment & Tools Security	Equipment	Page 135
PW-UTL-DC-GEN-EVT-1- Determining an Affected Area During an Event	Events	Page 137
PW-UTL-DC-GEN-EVT-2- Sanitary Sewer Overflow (SSO) Procedure	Events	Pages 138-151
PW-UTL-DC-GEN-EVT-3- Discharge and Overflows	Events	Pages 152-153
PW-UTL-DC-GEN-EVT-4- Rain Event Policy	Events	Page 154
PW-UTL-DC-GEN-EVT-5- Sewer Overflow Response Plan	Events	Appendix B
PW-UTL-DC-GEN-EVT-6-Hurricane Procedures	Event	Pages 155-161
PW-UTL-DC-GEN-LOC-1- Locating and Marking Existing Services	Locating	Page 163
PW-UTL-DC-GEN-LOC-2- Locating Paint on Decorative Surfaces	Locating	Page 164
PW-UTL-DC-GEN-NSF-6-NSF NSF Certification Quiz	NSF	Pages 166-172
PW-UTL-DC-GEN-RP-1- Distribution & Collection SRS Reporting Policy	Reporting	Pages 174-175

Appendix D Table of Contents		
Name of SOP	**Subsection**	**Page**
PW-UTL-DC-GEN-SFT-1-Pipe Saws and Cutting Equipment Safety	Safety	Page 177
PW-UTL-DC-GEN-SFT-2- Safety Meeting Policy	Safety	Page 178
PW-UTL-DC-GEN-SFT-3- Safety Vest Policy	Safety	Page 179
PW-UTL-DC-GEN-SFT-4- Working on Private Property	Safety	Page 180
PW-UTL-DC-GEN-SFT-5- Respiratory Protection Program	Safety	Pages 181-185
PW-UTL-DC-GEN-SFT-6-Lock-Out/ Tag-Out	Safety	Pages 186-187
PW-UTL-DC-GEN-SFT-7- Hot Work Safety Policy	Safety	Pages 188-193
PW-UTL-DC-GEN-SFT-8-Hearing Conservation Program	Safety	Pages 194-199
PW-UTL-DC-GEN-SFT-9-Working on Meters and Service Lines	Safety	Pages 200-201

General

Purpose:

1. To establish a system of written policy guidelines and procedural directives to be used in the normal conduct of business with the Public Services Department. The Public Services Policy and Standards Manual shall be applicable to the Public Services Department internal policies and procedures.

Purpose:

2. The Public Services Policy and Standard Manual provides a common system of written directive for the Public Services Department. The objectives of the Public Services Policy and Standards Manual are:

    a. To improve communication effectiveness among the Public Service employees, strengthen administrative operations and insure a consistent approach to problems common to the Public Services Department.

    b. To provide intradepartmental and interdepartmental guidelines.

    c. To establish uniform standards for the distribution of policy guidelines.

    d. To be used as a training document for new employees.

3. The Public Services Policy and Standards Manual is organized into several sections and subsections. For the Table of Contents, please see SOP PW-UTL-DC-GEN-AA-2-Table of Contents.

Record of Training Form

Instructor (print): _____

Training Date: _____

Training Topic: _____

Recommendations / Comments / Observations: _____

_____

_____

Means used to verify employee understood the training: *(circle all that apply)*

Written Exam / Oral Exam / Observation / Instructor Certification

Note: Attach written exam(s) if applicable. If oral exam or observation was used, list observations / comments above.

Instructor Certification: I certify that the following employees have received and understood the above-referenced training.

Signature: _____ **Date**: _____

Signature: _____ **Date**: _____

Name:	**Title:**	**Employee Number**:

Name:

Title:

Employee Number:

_____	_____
_____	_____

A. PURPOSE

1. All the SOPs need to be read and signed off by all Distribution and Collections personnel once a year for the areas that are pertinent to their job. This procedure is to accomplish that and to create the necessary sign off sheets

B. PREPARATION.

1. None

C. PRECAUTIONS AND WARNINGS

1. WARNING STATEMENTS

i. None

D. OPERATING LIMITS

Name of SOP	Subsection	Reviewed
PW-UTL-DC-GEN-AA-1-SOP Header Numbering Key	Contents and Standards	R.J. 9/4/2015
PW-UTL-DC-GEN-AA-2-Table of Contents	Contents and Standards	R.J. 9/4/2015
PW-UTL-DC-GEN-AA-3-Purpose, Objectives, & Organization of the Public Services Policy & Standards Manual	Contents and Standards	R.J. 9/4/2015
PW-UTL-DC-GEN-AA-4-Record of Training Form	Contents and Standards	
PW-UTL-DC-GEN-AA-5-Annual Certification of SOPs	Contents and Standards	
PW-UTL-DC-COL-HM-1-Wastewater Force Main Break Maintenance Procedures	Heavy Maintenance	R.J. 9/4/2015
PW-UTL-DC-COL-HM-2-Wastewater Gravity Main Break Maintenance	Heavy Maintenance	R.J. 9/4/2015
PW-UTL-DC-COL-OVP-1- Pump Down	Overlapping	R.J. 9/4/2015
PW-UTL-DC-COL-PM-1-Wastewater Pump station Maintenance Procedures	Pump Maintenance	R.J. 9/4/2015
PW-UTL-DC-COL-PM-2-Valve Exercising Procedures for Valves 10" and Larger	Pump Maintenance	R.J. 9/4/2015
PW-UTL-DC-COL-SLC-1-Jet Cleaning Crew Daily Operations	Sewer Line Cleaning	R.J. 9/4/2015
PW-UTL-DC-COL-SLC-2-Routine Sewer Line Jet Cleaning and Jet Cleaning for TV Survey	Sewer Line Cleaning	R.J. 9/4/2015
PW-UTL-DC-COL-TV-1-TV Survey Crew Daily Operations	TV Inspections	R.J. 9/4/2015
PW-UTL-DC-COL-TV-2-Routine TV Survey	TV Inspections	R.J. 9/4/2015
PW-UTL-DC-COL-WS-1-Wet Well Crew Daily Operations	Wet Well Services	R.J. 9/4/2015
PW-UTL-DC-COL-WS-2- Wet Well Cleaning	Wet Well Services	R.J. 9/4/2015
PW-UTL-DC-COL-WS-3-Plugging a Pipe	Wet Well Services	R.J. 9/4/2015
PW-UTL-DC-DIS-CHL-1- Free Chlorination (FC)	Chlorine	R.J. 9/4/2015
PW-UTL-DC-DIS-CHL-2- Chlorine Procedures for Sections of Pipe with Diameters of 4" or Larger	Chlorine	R.J. 9/4/2015

PW-UTL-DC-DIS-CT-1- Small Water Main Construction Project	Distribution Construction	R.J. 9/4/2015
Name of SOP	Subsection	Reviewed
PW-UTL-DC-DIS-CT-2-New Water Main Tie-Ins	Distribution Construction	R.J. 9/4/2015
PW-UTL-DC-DIS-CT-3- Changing Over a Service Line	Distribution Construction	R.J. 9/4/2015
PW-UTL-DC-DIS-CT-4- Installing New Water Pipe	Distribution Construction	R.J. 9/4/2015
PW-UTL-DC-DIS-CT-5- Leak Repair- Disinfection of Pipes and Appurtenances	Construction	R.J. 9/4/2015
PW-UTL-DC-DIS-FAC-1-Prospect Wellfield	Facilities	R.J. 9/4/2015
PW-UTL-DC-DIS-FAC-2-Well Seal Testing	Facilities	R.J. 5/24/2016
PW-UTL-DC-DIS-FSH-1- Flushing Procedures	Flushing	R.J. 9/4/2015
PW-UTL-DC-DIS-HV-1- Hydrant Functionality Testing	Hydrants & Valves	R.J. 9/4/2015
PW-UTL-DC-DIS-HV-2- Hydrant Preventive Maintenance Program	Hydrants & Valves	R.J. 9/4/2015
PW-UTL-DC-DIS-HV-3- Valve Exercising Procedures for Valves	Hydrants & Valves	R.J. 9/4/2015
PW-UTL-DC-DIS-HV-4- Relocating a Hydrant	Hydrants & Valves	R.J. 9/4/2015
PW-UTL-DC-DIS-HV-5-Color Coding	Hydrants & Valves	R.J. 9/4/2015
PW-UTL-DC-DIS-MR-1-Bermex Meter Reading Procedure- Versaterms	Meter Reading	
PW-UTL-DC-DIS-MR-2-Hydrant Meter Procedures	Meter Reading	R.J. 1/6/2016
PW-UTL-DC-DIS-MR-3-Illegal Hook-Ups	Meter Reading	
PW-UTL-DC-DIS-MR-4- Turn Off's for Non-Payment	Meter Reading	
PW-UTL-DC-DIS-MR-5- urn-On Service Type Process	Meter Reading	
PW-UTL-DC-DIS-MR-6- Creating Work Orders	Meter Reading	

PW-UTL-DC-DIS-WM-1-Removing and Replacing a Meter Box and/or Cover	Water Meter Installation & Maintenance	R.J. 9/4/2015
Name of SOP	Subsection	Reviewed
PW-UTL-DC-DIS-WM-2- Broken Glass on Water Meter	Water Meter Installation & Maintenance	R.J. 9/4/2015
PW-UTL-DC-DIS-WM-3- Meter Set Service Request	Water Meter Installation & Maintenance	R.J. 9/4/2015
PW-UTL-DC-GEN-CON-1-Valve Exercising Contractor Customer Field Operations	Contractors	R.J. 9/4/2015
PW-UTL-DC-GEN-CON-2-Inspections of Contractor Exercising Valves	Contractors	R.J. 9/4/2015
PW-UTL-DC-GEN-CON-3-Atlas Sections Provided to Contractor	Contractors	R.J. 9/4/2015
PW-UTL-DC-GEN-CON-4- Tracking Completed Tasks by Contractors	Contractors	R.J. 9/4/2015
PW-UTL-DC-GEN-CPL-1- Cell Phone Policy	Communications, Purchasing, Licensing	R.J. 9/4/2015
PW-UTL-DC-GEN-CPL-2- Email Response Procedure	Communications, Purchasing, Licensing	R.J. 9/4/2015
PW-UTL-DC-GEN-CPL-3- Requisition Authorization (RA) for Contracted Services	Communications, Purchasing, Licensing	R.J. 9/4/2015
PW-UTL-DC-GEN-CPL-4- Requisitions	Communications, Purchasing, Licensing	R.J. 9/4/2015
PW-UTL-DC-GEN-CPL-5- Department Licensing	Communications, Purchasing, Licensing	R.J. 9/4/2015
PW-UTL-DC-GEN-CPL-6-Safety Shoes Procedures	Communications, Purchasing, Licensing	R.J. 9/4/2015
PW-UTL-DC-GEN-CT-1- Pipe Crew Restoration	Construction	R.J. 9/4/2015
PW-UTL-DC-GEN-CT-2- Staging Area	Construction	R.J. 9/4/2015
PW-UTL-DC-GEN-CT-3- Roadway Closures and Maintenance Practices to Reduce Pollutants	Construction	R.J. 9/4/2015
PW-UTL-DC-GEN-CT-4- Laying Asphalt	Construction	R.J. 9/4/2015
PW-UTL-DC-GEN-CT-6- Excavation or Pavement Cuts in City Street of Right of Way	Construction	R.J. 9/4/2015

PW-UTL-DC-GEN-CT-8-Flasher Coordination Responsibility	Construction	R.J. 9/4/2015
PW-UTL-DC-GEN-DTY-1- Chief Field Work	Chief Field Work, Duty Lists, and Overtime	R.J. 9/4/2015
Name of SOP	Subsection	Reviewed
PW-UTL-DC-GEN-DTY-10-Utility Field Rep Call Out List	Chief Field Work, Duty Lists, and Overtime	R.J. 9/4/2015
PW-UTL-DC-GEN-DTY-2-Heavy Equipment Call Out List	Chief Field Work, Duty Lists, and Overtime	R.J. 9/4/2015
PW-UTL-DC-GEN-DTY-3-Duty Mechanic Call Out List	Chief Field Work, Duty Lists, and Overtime	R.J. 9/4/2015
PW-UTL-DC-GEN-DTY-4-Management D&C Duty Foreman List	Chief Field Work, Duty Lists, and Overtime	R.J. 9/4/2015
PW-UTL-DC-GEN-DTY-5-Pump Station Call Out List	Chief Field Work, Duty Lists, and Overtime	R.J. 9/4/2015
PW-UTL-DC-GEN-DTY-6-Service Worker Voluntary Call Out List	Chief Field Work, Duty Lists, and Overtime	R.J. 9/4/2015
PW-UTL-DC-GEN-DTY-7-Vacuum Truck Operator Call Out List	Chief Field Work, Duty Lists, and Overtime	R.J. 9/4/2015
PW-UTL-DC-GEN-DTY-8- Electrician Duty List	Chief Field Work, Duty Lists, and Overtime	R.J. 9/4/2015
PW-UTL-DC-GEN-DTY-9- Emergency Overtime	Chief Field Work, Duty Lists, and Overtime	R.J. 9/4/2015
PW-UTL-DC-GEN-DTY-9- Scheduled Overtime	Chief Field Work, Duty Lists, and Overtime	R.J. 9/4/2015
PW-UTL-DC-GEN-EQ-1- Equipment Policy	Equipment	R.J. 9/4/2015
PW-UTL-DC-GEN-EQ-2- Daily Vehicle Maintenance	Equipment	R.J. 9/4/2015
PW-UTL-DC-GEN-EQ-3- Jet Truck Daily Vehicle Maintenance	Equipment	R.J. 9/4/2015
PW-UTL-DC-GEN-EQ-4- TV Survey Crew Daily Vehicle Maintenance	Equipment	R.J. 9/4/2015
PW-UTL-DC-GEN-EQ-5- Wet Well Crew Daily Vehicle Maintenance	Equipment	R.J. 9/4/2015
PW-UTL-DC-GEN-EQ-6- Equipment Hauling and Towing	Equipment	R.J. 9/4/2015

PW-UTL-DC-GEN-EQ-7-Air Masks	Equipment	R.J. 9/4/2015
PW-UTL-DC-GEN-EQ-8-Purchase Procedure-Consumable Tools	Equipment	R.J. 9/4/2015
Name of SOP	Subsection	Reviewed
PW-UTL-DC-GEN-EVT-1- Determining an Affected Area During an Event	Events	R.J. 9/4/2015
PW-UTL-DC-GEN-EVT-2- Sanitary Sewer Overflow (SSO) Procedure	Events	R.J. 9/4/2015
PW-UTL-DC-GEN-EVT-3- Discharge and Overflows	Events	R.J. 9/4/2015
PW-UTL-DC-GEN-EVT-4- Rain Event Policy	Events	R.J. 9/4/2015
PW-UTL-DC-GEN-EVT-5-Hurricane Procedure - IN PROGRESS	Event	
PW-UTL-DC-GEN-LOC-1- Locating and Marking Existing Services	Locating	R.J. 9/4/2015
PW-UTL-DC-GEN-LOC-2- Locating Paint on Decorative Surfaces	Locating	R.J. 9/4/2015
PW-UTL-DC-GEN-RP-1- Distribution & Collection SRS Reporting Policy	Reporting	R.J. 9/4/2015
PW-UTL-DC-GEN-SFT-1-Pipe Saws and Cutting Equipment Safety	Safety	R.J. 9/4/2015
PW-UTL-DC-GEN-SFT-2- Safety Meeting Policy	Safety	R.J. 9/4/2015
PW-UTL-DC-GEN-SFT-3- Safety Vest Policy	Safety	R.J. 9/4/2015
PW-UTL-DC-GEN-SFT-4- Working on Private Property	Safety	R.J. 9/4/2015
PW-UTL-DC-GEN-SFT-5- Respiratory Protection Program	Safety	R.J. 9/4/2015
PW-UTL-DC-GEN-SFT-6-Lock-Out/ Tag-Out	Safety	R.J. 9/4/2015
PW-UTL-DC-GEN-SFT-7- Hot Work Safety Policy	Safety	R.J. 9/4/2015
PW-UTL-DC-GEN-SFT-8-Hearing Conservation Program	Safety	R.J. 9/4/2015

PW-UTL-DC-GEN-SFT-9-Working on Meters and Service Lines	Safety	R.J. 9/4/2015

Employee Name: _____

Employee Signature_____

By signing below, I affirm that I have read and understand the memo on the State licensing requirements for Utilities Serviceworker III's, Utility Serviceworker IV's, and Utility Field Representatives.

Date:

State Distribution System Licensing Requirements

Name: **Title:**

Employee Number:

By signing below, I affirm that I have read and understand the attached.

Date:

Subject: _____

Name: **Title:**

Employee Number:

O&M Procedures

HEAVY MAINTENANCE- WASTEWATER FORCE MAIN BREAK MAINTENANCE PROCEDURES

Rev: 0 | **Revision Date:** 6/22/2015 | **Print Date:** 8/10/2018
I.D. Number: PW-UTL-DC-COL-HM-1-Wastewater Force Main Break Maintenance Procedures

This is a procedure to handle a Wastewater Force Main break.

- Report all spills in accordance to the SSO Procedures (CH/SEC/SUBJ/PAGE).
- Redirect flow to an alternate force main, if available.
- In the event there is no alternate force main available, implement tankering or bypass pumping will be implemented.
- Turn off pumping stations on the damaged force main.
- Isolate the damaged force main.
- Notify all pertinent Public Works Environmental and Supervisory personnel.
- Repair and test the force main.
- Place the force main back in service.
- Sanitize and deodorize the area.

Approved by: Rick Johnson, Distribution & Collections Systems Manager
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HEAVY MAINTENANCE- WASTEWATER GRAVITY MAIN BREAK MAINTENANCE PROCEDURES

Rev: 1 | **Revision Date:** 6/22/2015 | **Print Date:** 8/10/2018
I.D. Number: PW-UTL-DC-COL-HM-2-Wastewater Gravity Main Break Maintenance

This is a procedure to handle a Wastewater Gravity Main break or stoppage.

- Report all spills in accordance to the SSO Procedures.
- Determine the location of the stoppage or damaged gravity main.
- If an SSO is occurring, bypass pump or tanker the system until the overflow condition ceases or the main is repaired.
- If the gravity main is stopped, use the equipment available (rodding machine, snake, vacuum truck, etc.) to break the stoppage.
- If the main is broken, determine the depth:

  1. If it is able to be repaired by in-house crews, make the repair.
  2. If it is not able to be repaired by in-house crews, refer it to the annual emergency repair contractor.

- Sanitize and deodorize the area.

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OVERLAPPING- PUMP DOWN

Rev: 0 | **Revision Date:** 6/22/2015 | **Print Date:** 8/10/2018
I.D. Number: PW-UTL-DC-COL-OVP-1- Pump Down

This document contains guidelines for reacting to the loss of a pump.

Wet Well Crew

- In the event of a pump being down all necessary service workers will drive any vehicle capable of transporting sewage over to the event location.
- Tanker Driver must have a Class B license with tanker endorsement.
- Super Tanker driver must have Class A license with tanker endorsement.
- Each available vehicle will be filled with sewage from the affected pump station and then transport the sewage to nearest operational pump station as many times as necessary until pump service is restored.

Approved by: Rick Johnson, Distribution & Collections Systems Manager
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Purpose:

This document provides an outline of the process followed for upgrades and repairs to pump stations.

For a lift station retrofit, the system is updated to current industry standards with complete design and engineering. This scenario includes construction, installation, and integration of the electrical control cabinet.

The pump station that is being retrofitted is on an electro-mechanical platform with an analog modem connection that will be upgraded to a processor based platform with digital communications. Then it will be placed on the Supervisory Control and Data Acquisition (***SCADA***) network for monitoring.

Planning:

1. Determine what the requirements for building the electrical panel are:

A. Complete the "Citect-Field Information Form" of which there is an example at the end of this document.
B. Acquire a set of the existing drawings for that station.
C. Check and verify the 'as-built' plans at the physical location of that station.
D. Obtain the set of drawings for the planned retrofit.

2. Conduct field inspection to check and/or verify the following:

A. Determine the depth and other dimensions of the wet well.
B. Define the specifications, per the manufacturer's nameplate of the pumps that are currently in service and/or to be installed.
C. Obtain the specific utility voltage available at that location.
D. Perform load calculations to determine the total amperage requirements for that station.
E. Inspect the complete pump station to evaluate which components can be retained throughout the retrofit.
F. Outline Interconnectivity of existing and new equip./controls.
G. Delineate Replacement of any equipment as needed.
H. Take measurements at and around the panel to ensure you have adequate room for new controls, devices, and gear.

I. Survey the electrical system of the entire station in order to ensure that it will be in compliance with the National Electrical Codes (NEC).

Pre-Construction:

1. Site Planning

A. Reconcile physical layout of existing station with the planned layout of the retrofit
B. Assess the job for all general and specific safety risks or hazards.
C. Request and schedule any assistance from other individuals, crews, departments, utilities, etc., where needed.
D. CALL 811 in order to have underground utilities located.
E. Plan for the site-preparation work.

2. Equipment, Parts, and Materials:

A. Prepare materials list per established drawings and any specific equipment requirements of that particular stations retrofit.
B. Verify inventory of parts, materials, and equipment in stock.
C. Order, purchase, and/or fabricate all necessary components, parts, etc.

3. Purchasing:

A. Determine purchasing requirements (e.g., proprietary, informal quotes, or Formal Intent to Bid (ITB):

1. If *less than $5,000* utilize the City P-Card

2. If *informal purchase* ($5,000 and above but less than $50,000), obtain three quotes and prepare an informal quote form; or, do a quick-bid in Bidsync request.

3. If the cost is *$50,000 and above*, prepare bid specs and enter in Bidsync for processing by Procurement.

4. Also, if this is a *proprietary purchase*, follow the established guidelines:
   a. Complete Form 20, and
   b. Attach proprietary form and letters, or
   c. Attach informal-quote form and quotes

Construction Phase:

A. Build Control-Cabinet backboard.
B. Install a temporary panel to run the pump station during construction.
C. Remove superfluous controls, electronics, and electrical gear.
D. Install the new SCADA cabinet and associated raceways.
E. Install the new SCADA controls used. Usually a single backboard built with all the specific components for that stations demand, including the programmable logic controller (PLC), Motor Starters, etc.
F. Install Human Machine Interface (HMI), and other associated devices to the dead-front.

Post-Construction:

A. Assign I.P. Address'.
B. Install physical communication, radio and/or phone.
C. Install appropriate software for PLC, HMI, VFD, soft starters, etc.
D. Commission the radio.
E. Perform loop-check for Quality Assurance/Quality Control.
F. Notification to staff that station is on Citect.

EXAMPLE: Copy of form to add station to system, "Citect – Field Information"

Add Station to Citect - Field Information Required				
Pump Station Number:				
Pump Station Address:				
Street Level:				
Discharge to (circle one):	A-REPUMP	B-REPUMP	E-REPUMP	
	D-37	GTL	OTHER:_____	
Number of Pumps	DUPLEX	TRIPLEX	QUADPLEX	
Type of Drive (circle one):	PF40 VFD	PF70 VFD	PF400 VFD	PF700 VFD
	ACL	SMC	SMC 3	OTHER:_____
Modbus or DO Start Command	MOD	DO		
Dry Pit or Wet Pit (circle one):	DRY	WET		
Rain Gauge (circle one):	YES	NO		
Force Main Pressure (circle one):	YES	NO		
Water Distribution Pressure (circle one):	YES	NO		
Station High Temp Alarm	YES	NO		
Exhaust/Supply Fan Alarm	YES	NO		
Radio IP address				
PLC File Name				
Panel View Plus File Name				

End of Document

This document instructs how to maintain clean and functioning Pump Stations.

Preventative Maintenance Schedule

- The most critical pump stations are visited as often as necessary. Visits could be as frequent as daily. The maintenance checklists are filled out during each visit.
- The less critical pump stations are visited biweekly. The maintenance checklists are filled out during each visit.

Pump Station Alarms

- All stations have a form of one way communication.
- All stations have a type of alarm system.
- Alarms encompass everything from unauthorized entry to a system failure.
- Alarms are evaluated and responded to 24 hours a day 7 days a week.

Pump Station Checklist includes:

- Blower
- Lights
- Clock
- Waste Water Level
- Electric Controls
- Motors
- Pumps
- Compressors
- Water Seal Unit
- Check and Isolation Valves
- Bubbler System
- Sump Pump
- Paint Condition
- Housekeeping
- Landscaping
- Graffiti

Critical Pump Stations can be defined in many ways:

- A recent maintenance history.
- Small wet wells or holding time.
- Recent power failures.
- A history of graffiti problems.
- The re-pump stations.
- The 5 largest stations.

Emergency Procedures in the event of a Pump Station Failure

- If the Pump Station loses its power from supplier (FPL) or due to a catastrophic electrical failure which cannot be repaired, a portable generator of sufficient size to operate the entire station will be used until repairs have been made.
- If there is a catastrophic failure of mechanical equipment rendering the station inoperable, a portable bypass pump of sufficient size to maintain normal service will be used.
- If either of the first two methods are not possible then and only then, will tanker trucks be used to maintain the gravity system until repairs have been made.
- The above instructions are intended for immediate implementation for Critical Pump Stations and non-critical pump stations in excess of eight (8) hours or when deemed necessary.
- When all operations are complete sanitize and deodorize the area.

PUMP MAINTENANCE- VALVE EXERCISING PROCEDURES FOR VALVES 10" AND LARGER

Rev: 0 | **Revision Date:** 6/22/2015 | **Print Date:** 8/10/2018
I.D. Number: PW-UTL-DC-COL-PM-2- Valve Exercising Procedures for Valves 10" and Larger

This procedure sets guidelines for identifying valves, which are inoperative and restoring their usefulness to the Distribution and Collection Systems, to verify the accuracy of the atlas information versus the actual field conditions, verify a count of the number of turns it would take to operate a particular valve, and identify the valve by address and by Global Positioning Systems coordinates.

- Valves are not to be operated by anyone other than City of Fort Lauderdale Public Services Crews without written permission from the D&C Manager.
- When operating a valve the crew will follow all guidelines to ensure their safety.
- The employee should verify the exercising of the valve would not inconvenience or endanger any customer.
- The valve will be verified by address, GPS, and location on the atlas.
- The valve will be closed no more than ten turns, then reopened counting turns in each direction to verify the correct operation of the valve.
- In case of emergency where the valve needs to be fully closed, a record of the number of turns will be kept in both directions.
- If the valve is not operating as it should a Q-Alert number will be created and issued to a crew to make the repair.
- All records will be gathered and kept at a central location.
- Pumping station isolation valves which are not buried and are located in a valve box or inside a drywell are operated and serviced by the station mechanics.
- Critical pump station isolation valves which are buried are exercised annually and non-critical are exercised on an as needed basis or a minimum of every five years.

The City is very conservative when it comes to operating in-line valves, 10 year or older valves, and valves 10" and greater. Due to the age, size and location of these valves, the potential for an SSO is exponentially increased.

Approved by: Rick Johnson, Distribution & Collections Systems Manager
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PURPOSE:

This document indicates the process to maintain the electrical system for the Lift Stations/Pump Stations.

POLICY:

To safely, effectively and efficiently maintain the system that collects and delivers the wastewater to the treatment facility.
The elimination of sewage spills, improved sewer maintenance, inspection of facilities and equipment and implementing long-term Capital Improvement programs to renew aging infrastructure. The Preventive Maintenance program is a time based strategy conducted at a set interval or predetermined time when a piece of equipment is routinely inspected and/or taken offline for schedule service or repairs.

COST BENEFIT:

The beneficial result of planned Preventative Maintenance (PM) and scheduled repairs rather than Run-to-Failure or reactive-maintenance is significant to the maintenance repair budget. Emergency repairs typically take labor, time and equipment. Overtime costs are often involved. Routine inspections, scheduled maintenance and accurate recordkeeping can help reduce costs and increase equipment reliability and lifespan.

Standard Operating Procedures (SOP)

DOCUMENTATION:

A. Records of these PMs must be maintained through the use of written notes, logs, notebooks, journals, and /or computer format.
B. These are to be referred to management; who, in turn, disseminates relevant data to operations, and maintenance crews, to ensure established procedures are being followed and to make sure the continued functionality and maximum lifespan of all facilities and equipment.
C. Documentation requirements of the City may also be required by outside regulatory agencies, insurance companies, warrantee holders or certifying entities in the event of an injury, spill, equipment failure, or property loss.

INSPECTION FORMS/CHECKLISTS/DOCUMENTATION:

The following is an outline of the minimum inspections that should to be performed and documented.

Lift/Pump Station Preventative Maintenance Schedule

Continuously

A. Inspection of the alarm systems are performed continuously. All of the alarm functions are inspected concurrently while the alarms are being monitored and any issue is addressed directly.
B. A logbook of motor hours and maintenance completion dates is kept.
C. All lift/pump stations are monitored 24 hours a day using remote notification systems; such as modem dialer, telemetry or Supervisory Control and Data Acquisition (SCADA) system. These systems provide 24 hour notification to dispatchers, and remote monitoring and control of pumps and alarms, e.g., wet well level and power status. This system is accessible to assigned employees on duty after-hours.

Weekly

A. Visually inspect the station for vandalism and graffiti.
B. Clean up any trash or debris material.
C. Run each pump by hand / manual control and watch level control go up and down to ensure pumps are operating properly.
D. Place pump controls back in auto position prior to leaving station.
E. Test all panel lights and change as needed to ensure proper operation.
F. Lock up station, including exterior power panels if required, prior to leaving. Complete all required paper work.
G. During routine inspections, if the station is so equipped, the emergency backup generator transfer switch needs be tested to ensure proper operation. For stations with an Automatic Transfer Switch this test is to be conducted by tripping power to the station and observing a successful transfer to generator power for at least 15 minutes.

Monthly

A. Check wet well floats for rag build up, clean as needed.
B. Wires are checked visually for defects and damage.
C. Amperage should be taken at least once a month on each motor in the on-site lift station. If the readings do not meet the manufacturer's

specifications, it is an indication that mechanical pump issues may exist and needs to be conveyed to appropriate personnel.

Quarterly

A. Generator is to be operated, under load, for 15 minutes. This test is to be conducted by tripping power to the station and observing a successful transfer to generator power. Emergency generators are to be operated per manufacturer's requirements and in compliance with any City, County, or State agency operating permit.
B. Cleaning and inspections of floats should be performed four times a year to assure proper performance. The buildup of grease prevents floats from working properly.

Annually

A. An annual inspection of all electrical motor control equipment should be performed to find poor connections and worn parts. This inspection should include infrared testing and panel maintenance.
B. Thermal readings

Other Duties

A. Assist maintenance staff as needed for repair work requirements.
B. Respond to all lift station alarms.
C. Refer all non-electrical problems found at the lift station to the Mechanical Maintenance Chief.
D. Record problems or observations at the lift station in the lift station journal.
E. Perform all necessary repairs on-site immediately, if possible. Otherwise schedule those repairs for the next available opportunity and/or make provisions to operate the station with alternate methods.

Emergencies

In the event of a sanitary sewer overflow (SSO), all emergency protocols must be taken to ensure the life and safety of the employees working at the site as well as the general public.

The Sewer Overflow Response Plan (SORP) plan shall be followed to eliminate, reduce, prevent, or otherwise control sanitary sewer overflows (SSOs).

The response is intended to ensure responsible, overall management of a serious incident and to accomplish the repair promptly. Other functions include logistics support, site safety, agency liaison, and information systems.

Related Standard Operating Procedures:

- PW-UTL-DC-GEN-EVT-5- Sewer Overflow Response Plan

End of Document

SEWER LINE CLEANING- JET CLEANING CREW DAILY OPERATIONS

Rev: 0 | **Revision Date:** 6/22/2015 | **Print Date:** 8/10/2018
I.D. Number: PW-UTL-DC-COL-SLC-1-Jet Cleaning Crew Daily Operations

This document contains guidelines for Daily Operations of the Jet Cleaning Crew.

- Prior to leaving the yard, the Service Worker responsible for each vehicle will ensure daily vehicle maintenance procedures (CH/SEC/SUBJ/PAGE) are followed.
- The Lead Service Worker will determine if there are any customer complaints or emergency jobs that should take precedence, prior to following the area map for routine surveys and discuss plans with the assigned TV Survey Crew.
- As necessary, Service Workers will fill the water tank at the most convenient hydrant, making sure to properly flush the hydrant before hooking up the hose.
- The crew will follow procedures for Routine Jet Cleaning (CH/SEC/SUBJ/PAGE) working with the TV Survey Crew to ensure the survey is effective.
- Once all lines to be surveyed are cleaned and the TV Survey Crew verifies they are able to complete all scheduled surveys, Service Workers will follow the area map distributed by the Crew Chief for routine jet cleanings.
- If the crew is alerted to any customer complaints or emergency jobs, they will stop scheduled routine cleanings until the complaint or emergency is resolved.
- As needed, Service Workers will dump the debris tank at a designated dumping site.
- The Service Worker responsible for the work will document all activities for the day and submit them to the Crew Chief along with any completed area maps upon return to CMS.

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SEWER LINE CLEANING- ROUTINE SEWER LINE JET CLEANING AND JET CLEANING FOR TV SURVEY

Rev: 0 | **Revision Date:** 6/22/2015 | **Print Date:** 8/10/2018
I.D. Number: PW-UTL-DC-COL-SLC-2-Routine Sewer Line Jet Cleaning and Jet Cleaning for TV Survey

This document contains steps to be followed when jet cleaning a sewer line.

- Pre-determine a parking spot for the vacuum truck so the boom hose can be placed safely in the manhole.
- Once parked, turn on hazard signals for all vehicles on site, and set up the Maintenance of Traffic (MOT) which may include safety cones, arrow boards, and/or signs.
- Open the manhole to perform a preliminary visual inspection.
- A Service Worker will line up the jet hose and reel with the manhole to ensure the easiest possible access.
- Whenever possible, cleaning should be done in a manner that allows debris to be pulled downstream.
- One Service Worker will use the control box to unspool enough of the jet hose into the manhole and ensure it lines up with the pipe to be cleaned.
- Using the control box a Service Worker will turn on the hose, watching to ensure pressure does not get too high, and begin unwinding the hose at a pace that allows it to propel forward and remain tight.
- The jet hose must remain under control at all times.
- A Service Worker will stand at the necessary upstream manhole to let the Service Worker operating the jet hose know when to stop.
- Service Workers will ensure that the hose boot remains between the hose and manhole or the hose and pipe (depending on what will cause the most damage) to avoid tearing in the hose.
- If cleaning more than one line or cleaning while a TV Crew surveys a connected line, a Service Worker will stand at a manhole further down the line to watch for the hose and let the Service Worker operating the controls know when to stop.
- Once the hose reaches the end of the line, the Service Worker operating the controls will begin pulling the hose back ensuring it coils smoothly, while leaving the jet on to clean the sewer line.

- One Service Worker will line up and lower the boom hose and turn on the vacuum, while the other manually controls the pipes to ensure debris is removed.
- While hose is being pulled back, the vacuum should remain on to remove any debris.
- Service Workers will close the manhole and re-secure all hoses, pipes, equipment, and safety cones leaving the site as it was found or better.

TV INSPECTIONS- TV SURVEY CREW DAILY OPERATIONS

Rev: 0 | **Revision Date:** 6/22/2015 | **Print Date:** 8/14/2018
I.D. Number: PW-UTL-DC-COL-TV-1-TV Survey Crew Daily Operations

This document contains guidelines for Daily Operations of the TV Survey Crew.

- Prior to leaving the yard, the Service Worker responsible for each vehicle will ensure daily vehicle maintenance procedures are followed.
- The Lead Service Worker will determine if there are any customer complaints or emergency jobs that should take precedence, prior to following the area map distributed by the Crew Chief for Routine Surveys and then discuss plans with their assigned Jet Crew.
- The crew will follow procedures for Routine TV Survey working with the Jet Crew to ensure the survey is effective.
- If the crew is alerted to any customer complaints or emergency jobs, they will stop scheduled routine surveys until the complaint or emergency is resolved.
- Upon completion of any customer complaint, a Service Worker will radio the Crew Chief to inform them of any findings and/or results.
- Service Workers will deliver any survey DVDs or survey reports to all necessary parties.
- If the hard drive storing survey information is nearly full, a Service Worker will save the data to the office computer at CMS and return the empty hard drive to the truck.
- The Service Worker responsible for the work will document all activities for the day and submit them to the Crew Chief along with any completed area maps upon return to CMS.

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TV INSPECTIONS- ROUTINE TV SURVEY

Rev: 0 | **Revision Date:** 6/22/2015 | **Print Date:** 8/14/2018
I.D. Number: PW-UTL-DC-COL-TV-2-Routine TV Survey

This document contains steps to be followed when completing Routine TV Surveys of sewer or storm lines.

- The Lead Service Worker is responsible for ensuring that all work is completed accurately and safely. To accomplish this directive the Lead Service Worker may need to assign task to other Service Workers, this does not absolve the Lead Service Worker of his responsibilities.
- Upon arriving on site turn on hazard signals, put on safety vest, and set up the Maintenance of Traffic (MOT) which may include safety cones, arrow boards, and/or signs.
- To begin system setup one Service Worker will be responsible for operating the computer system, while a second Service Worker is responsible for handling the equipment.
- The Service Worker operating the computer system will verify camera control settings and set up the computer system, while the Service Worker handling the equipment will clean the camera, verify cable connection, and change wheels on the tractor if necessary.
- Visually inspect the land above the sewer or storm line for any sinks or patches indicating possible infiltrations.
- Remove the manhole cover and visually inspect the pipes to determine the water level, flow, and pipe size.
- If water level is too high, contact the Station Mechanic to request a pump down.
- If the water flow is too strong, verify there are no upstream pump stations and plug the pipe to stop the flow (sewer only).
- If there is an upstream pump station, call the Station Mechanic and request the pump be turned off before plugging the pipe.
- Once setup is complete and verification is received that the line has been cleaned, the Service Worker handling the equipment will attach rope to the tractor and lower it into the manhole while giving slack on the cable.
- The Service Worker operating the computer system will set the counter at 6ft for the first line or 0ft if continuing down additional lines.

- The Service Worker handling the equipment will pull the cable tight, while the other Service Worker moves the tractor forward, while checking the rear camera to verify the cable has no slack.
- If the pipe has a repair liner move the tractor on cruise control (unless a sink or patch is noticed during the visual inspection); if the pipe does not have a repair liner, manually use the controls to move the tractor forward.
- The Service Worker operating the computer system will switch to the front camera and record all laterals, infiltrations, anomalies, and defects using the Flexidata system by notating the counter distance, type, code, and location.
- Upon reaching the next manhole, the survey is complete for that line.
- Verify footage is correct as per map, if not make a note and inform the Geographic Information System Specialist.
- If continuing on to next line, save data for the first line and set counter to 0ft. If not, remove tractor ensuring that it does not run over the cable by using the rear camera.
- The Service Worker handling the equipment will remove the tractor from the manhole and rinse all necessary equipment.
- The Service Worker operating the computer system will enter all pertinent information, save data, and print any necessary reports.
- The Service Workers will determine if a repair is necessary and pass all pertinent information on to the Chief responsible for the work.
- Equipment will be loaded back onto the truck leaving the site as found or better.
- The Service Worker responsible for the work will document all activities for the day and submit to the Crew Chief upon return to CMS.

This document contains guidelines for daily operations of the Wet Well Crew.

- Prior to leaving the yard, the Service Worker responsible for each vehicle will ensure daily vehicle maintenance procedures (CH/SEC/SUBJ/PAGE) are followed.
- The Lead Service Worker will determine if there are any emergency jobs that should take precedence and then discuss daily plans with the crew.
- If there are no pending emergency jobs, Service Workers will follow the Pump Station Checklist distributed by the Crew Chief for routine cleanings.
- If proper vehicles are unavailable, Service Workers will inspect and prepare stations for upcoming jobs.
- The Crew will follow procedures for Wet Well Cleaning (CH/SEC/SUBJ/PAGE) and/or Plugging a Pipe (CH/SEC/SUBJ/PAGE) depending on the circumstances.
- Any pump malfunctions, leaks, or issues will be called or radioed in to the necessary chief immediately and documented on daily reports.
- If the crew is alerted to any emergency jobs, they will stop scheduled routine cleanings until the complaint or emergency is resolved.
- The Service Worker responsible for the work may leave the job site to set up overtime jobs and deliver notification of overtime jobs to residents in area if necessary, but the remainder of crew will continue as scheduled.
- The Service Worker responsible for the work will document all activities for the day and submit to the Crew Chief along with any completed area maps upon return to CMS.

This procedure contains guidelines for wet well cleaning by the Wet Well Crew.

- The Lead Service Worker is responsible for ensuring that all work is completed accurately and safely. To accomplish this directive the Lead Service Worker may need to assign task to other Service Workers, this does not absolve the Lead Service Worker of his responsibilities.

- Before starting the job determine if a confined space entry is needed, will the wet well need to be cleaned from within, the number of Service Workers needed, and the number and types of vehicles necessary to complete the cleaning.

- Coordinate with the Pump Station Chief to ensure a Station Mechanic is available for pump down if necessary.

- Pre-determine a parking spot for the vacuum truck so the boom hose can be placed safely in the wet well.

- Once parked, turn on hazard signals for all vehicles on site, put on safety vests, and set up the Maintenance of Traffic (MOT) which may include safety cones, arrow boards, and/or signs.

- Visually inspect the wet well to determine if a "Plug off" of the gravity well is required.

- A "Plug Off" is required if: debris in the wet well is too large for the pipe and unable to be roped out, one or more pumps are down, or an object capable of damaging the pump is identified.

- If a "Plug Off" is required or the wet well needs to be cleaned from within:
  1. Service Workers on site will be on standby to complete a station pump down if necessary.
  2. All Service Workers entering the well must be Confined Space Certified, fill out a Confined Space Entry Permit each time they enter and exit the wet well, and submit it to the Service Worker responsible for documentation.
  3. Secure the area around the wet well and/or manholes to be opened using the proper safety equipment.
  4. Open the wet well and/or manholes using the appropriate tools (crowbars, manhole pullers, rope, etc.).

5. Set up and check equipment including but not limited to the tripod, ladder, rope, air blower, air gauges, hoses, lights, plugs, pipes, gaskets, gas detectors, masks, protective suits, boots, trucks, and radio system if necessary.
6. Set up and turn on the blower which will remain on until the cleaning is complete and all Service Workers are out of the wet well.
7. Follow steps for plugging a pipe (CH/SEC/SUBJ/PAGE) and once the plug is secured have the Mechanic pump down the station.
8. A Service Worker will be assigned to watch and listen to the pressure gauge at all times to ensure the plug does not lose pressure and allow flow.
9. All Service Workers entering the wet well must wear a gas mask (self-contained breathing apparatus or particulate respirator) with new filters, hip waders, protective suit, and a harness.
10. A Service Worker will hold the ladder steady while Service Workers entering the wet well climb down the ladder one at a time.
11. A Service Worker, qualifying as a competent person, will monitor the Service Workers in the wet well at all times from the surface.
12. One Service Worker will manually operate the pipe from below, while a second Service Worker operates the boom hose and vacuum controls.
13. Service Workers in the wet well will use the necessary equipment to pick up and break up debris when needed.
14. Empty water from the sewer tank on the vacuum truck into city manholes as necessary.
15. Once the wet well is clean and debris has been removed, Service Workers in the wet well will climb the ladder while a Service Worker above keeps the ladder steady.
16. Upon exiting the wet well, Service Workers will begin the decontamination process by removing all contaminated clothing and equipment and disposing of any disposable clothing or equipment.
17. Once all Service Workers are clear of the wet well, remove the pipes using rope for the bottom section when necessary.

18. Remove the air blower and release the pressure to remove the plug.
19. After unplugging the wet well, have the Mechanic turn on the pump to listen and inspect for any issues or malfunctions (leaks, grinding noises, etc.), pump down the station, and certify the station is functional.
20. Close up the wet well, turn the pump station back on auto, make sure any spills have been cleaned and no debris is left on the ground, and ensure things are left as they were found upon arrival.
21. Clean up and rinse off any equipment necessary and make sure all tools are put back on the vehicle they came from.
22. Inspect vehicles to verify pipes, hose, and all other equipment has been secured to the trucks.
23. The Service Worker responsible for the work will document all activities for the day and submit to the Crew Chief upon return to CMS.

- If the well can be cleaned externally (without entry):
  1. Set up and check all appropriate equipment.
  2. One Service Worker will manually operate the pipe and water nozzle, while a second service worker operates the boom hose and vacuum controls.
  3. Lower the boom hose into the wet well and begin to vacuum any debris. When necessary, use the water nozzle to move or displace debris behind the pump and unable to be reached.
  4. Empty water in the sewer tank on the Vacuum Truck into city manholes as necessary.
  5. Turn on the pump to listen and inspect for any issues or malfunctions (leaks, grinding noises, etc.).
  6. If issues are found document on daily report and call or radio necessary Chief to notify of situation. Issues on daily report will be submitted to the Crew Chief then to Data Control, who will submit issues to the Mechanic Chief for further inspection and corrective action.
  7. Once the wet well is clean and debris has been removed, remove the pipes using rope for the bottom section when necessary.
  8. Close up the well, turn the pump station back on auto, and ensure things are left as they were upon arrival.

9. Inspect vehicle to verify pipes, hose, and all other equipment has been secured to trucks.
10. Service Worker responsible for the work will document all activities for the day and submit to the Crew Chief upon return to CMS.

WET WELL SERVICES- PLUGGING A PIPE

Rev: 0 | **Revision Date:** 6/22/2015 | **Print Date:** 8/14/2018
I.D. Number: PW-UTL-DC-COL-WS-3-Plugging a Pipe

This document contains guidelines to be used by all crews when plugging a pipe to stop water flow.

- At times, it will be necessary for a crew to plug a pipe in order to slow or stop the water flow into the pipe or vessel being worked on.
- Remove the manhole cover or open the wet well and visually inspect to determine the size of plug needed and if the plug needs to be manually installed, requiring a confined space entry into the sewer system, or if it can be installed using rope and a remote plug insertion tool from above.
- If the pipe can be plugged from above:

  1. Lower the plug and line it up with the pipe using rope and hose.
  2. Use the remote plug insertion tool to maneuver the plug into the pipe.
  3. Inflate the plug using the air hose and pressure gauge to test the air pressure and ensure the plug does not rupture.
  4. If moving to the next manhole or wet well, close up the manhole or wet well and leave the pressure gauge and air hose with Maintenance of Traffic (MOT).

- If the plug must be manually inserted:

  1. Set up the air blower and begin to ventilate the system of gas (blower will remain on the entire time Service Workers are below ground and the system must be ventilated for at least thirty minutes prior to confined space entry).
  2. If the connecting wet well is not open while ventilating the manhole, the next upstream manhole should be opened for ventilation and MOT set up around it.
  3. Test the system periodically with a gas detector to determine when it is safe to enter.
  4. Any Service Worker entering the well must be Confined Space Certified, fill out a Confined Space Entry Permit each time they enter and exit the wet well, and submit it to the Service Worker responsible for documentation.
  5. Once the system is cleared of gas, set up a ladder if necessary and one Service Worker will climb down the ladder while a second Service Worker

holds the ladder steady.

6. Any Service Worker entering a confined space must wear the appropriate PPE.

7. A Service Worker above will be designated to monitor the Service Worker below at all times.

8. Once the Service Worker in the system reaches the bottom, Service Workers above will lower the plug using rope and hose until the Service Worker below can manually insert the plug into the pipe. A Service Worker above will fill the plug using the air hose and a pressure gauge to ensure the plug does not rupture, while the Service Worker below verifies the flow has stopped.

A Service Worker above will hold the ladder steady while the Service Worker below climbs back up.

Chief Field Work, Duty Lists, and Overtime

This policy contains guidelines to improve on the lines of communication between Supervisors, Chiefs and Field Crews. To keep Supervisors and Chiefs current on daily workloads and common practices occurring in the field. To better define the expectations Supervisors and Chiefs have of the Field Crews.

Starting April 1st 2013 D&C Chiefs will spend a minimum of two shifts in the field with each day shift and one shift in the field with each off-hours shift per quarter. Employees who are working because they are on a Duty Roster rotation are not considered a shift. Chiefs should rotate through the crews until they have spent one shift with each crew. It is understood that some Chiefs have multiple one person crews; your Supervisor may allow you to combine two such crews in one day. Once all of the Chiefs have spent a shift with each of their crews the policy will be revisited. Chiefs will inform their Supervisors that they will be in the field at least one week in advance. Chiefs will keep a written record of their experience and email a copy of it to their Supervisor.

Chiefs should focus on:

- Helping crew leaders plan work
- Helping crew leaders be more prepared
- Safety
- Coaching staff (help staff become more knowledgeable and efficient)
- Helping the entire crew understand how the work they are doing fits into the bigger picture
- Cross training opportunities

Learning from staff (how do the crews differ, what innovative practices or techniques does the crew use, how do we eliminate the bad, and how do we repeat the good)

GENERAL- CHIEF FIELD WORK, DUTY LISTS, AND OVERTIME- HEAVY EQUIPMENT OPERATOR CALL OUT LIST

Rev: 0 | **Revision Date:** 6/26/2015 | **Print Date:** 8/14/2018
I.D. Number: PW-UTL-DC-GEN-DTY-2-Heavy Equipment Call Out List

To provide appropriate staffing levels for after-hours events.

Beginning February 3, 2006 all Service Worker IV's and Heavy Equipment Operators, who are required to operate heavy equipment as a part of their job duties, will be required to be a part of the heavy equipment operator call out list.

- The employee will be paid stand-by pay according to the contract in place for the time the employee is on duty.
- If the employee is called in to work the employee will be compensated according to the contract in place for the time the employee worked.
- If the employee is on duty and fails to report to work when called in the employee will be considered to have failed to follow a management directive and will be subject to progressive discipline for each event.
- The employee has up to 20 minutes to respond to the call and up to 1 hour to report if needed.
- In the event an employee has a personal conflict within his/her scheduled time it is the employees' responsibility to find his/her own replacement and complete a form letter.
- A form letter will be distributed to all of the chiefs.
- This form letter will be completed by anyone seeking to be replaced on the duty roster.
- Each time frame where an employee is seeking to be replaced will require a form letter.
- The completed form letter must contain the date of the duty being transferred, the employees name relinquishing the duty, the employees name accepting the duty, both of the employees' signatures, and a chief's signature as a witness.
- The letter must be completed a minimum of two weeks prior to the assigned duty.

- Upon completion of the letter an email containing the necessary information should be sent to the Customer Service Office Supervisor, Distribution and Collection Manager, his secretary, and both Distribution and Collection Supervisors by the witnessing Chief.
- Bona fide emergencies will be handled on a case-by-case basis.
- Acceptable replacements are limited to Service Worker IV's, Heavy Equipment Operators, and Service Worker III's capable of operating heavy equipment (the chief will have the final say if a Service Worker III is qualified).
- The list will be constructed in the following order volunteers will be placed at the top of the list, followed by all Service Worker IV's and Heavy Equipment Operators ranked by City seniority from lowest to highest.
- The list will be established and renewed in one-year intervals.

Each Service Worker IV and Heavy Equipment Operator on the list must perform a minimum of one duty per year.

GENERAL- CHIEF FIELD WORK, DUTY LISTS, AND OVERTIME- DUTY MECHANIC CALL OUT LIST

Rev: 0 | **Revision Date:** 6/26/2015 | **Print Date:** 8/14/2018
I.D. Number: PW-UTL-DC-GEN-DTY-3-Duty Mechanic Call Out List

This Procedure sets appropriate Duty Mechanic staffing levels for after-hours events.

Beginning January 7, 2011 all Public Works D&C Mechanic II's and Mechanic I's, who are currently working in index code PBS 660602 will be required to be a part of the duty mechanic call out list.

- The employee will be paid stand-by pay according to the contract in place for the time the employee is on duty.
- If the employee is called in to work the employee will be compensated according to the contract in place for the time the employee worked.
- If the employee is on duty and fails to report to work when called in, the employee will be considered to have failed to follow a management directive and will be subject to progressive discipline for each event.
- The employee has up to 20 minutes to respond to the call and up to 1 hour to report if needed.
- In the event an employee has a personal conflict within their scheduled time it is the employees' responsibility to find their own replacement and complete a form letter.
- A form letter will be distributed to all of the chiefs.
- This form letter will be completed by anyone seeking to be replaced on the duty roster.
- Each time frame where an employee is seeking to be replaced will require a form letter.
- The completed form letter must contain the date of the duty being transferred, the employees name relinquishing the duty, the employees name accepting the duty, both of the employees' signatures, and a chiefs' signature as a witness.
- The letter must be completed a minimum of two weeks prior to the assigned duty.

Approved by: Rick Johnson, Distribution & Collections Systems Manager
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- Upon completion of the letter an email containing the necessary information should be sent to the Customer Service Office Supervisor, Distribution and Collection Manager, Distribution and Collection Managers' Aid, and both Distribution and Collection Supervisors by the witnessing Chief.
- Bona fide emergencies will be handled on a case-by-case basis.
- Acceptable replacements are limited to D&C Pump Station Mechanic IIs and D&C Pump Station Mechanic Is capable of operating and maintaining sewer pumping stations (the chief will have the final say if a Mechanic is qualified).
- The list will be constructed in the following order: volunteers will be placed at the top of the list, followed by all Mechanic Is and then Mechanic IIs ranked by City seniority from lowest to highest. The list will be established and renewed in one-year intervals.
- All employees are required to complete at least one full duty shift per year.

GENERAL- CHIEF FIELD WORK, DUTY LISTS, AND OVERTIME- MANAGEMENT D&C DUTY FOREMAN LIST

Rev: 0 | **Revision Date:** 6/26/2015 | **Print Date:** 8/14/2018
I.D. Number: PW-UTL-DC-GEN-DTY-4-Management D&C Duty Foreman List

This document contains guidelines for providing appropriate staffing levels for after-hours events.

It is appropriate and necessary to have a Management representative available during the off-hours to approve overtime, provide guidance, and make decisions.

- The Manager should respond within 20 minutes of receiving the call and has 1 hour to report if needed.
- In the event a Manager has a personal conflict within his/her scheduled time it is the employees' responsibility to find his/her own replacement.
- If a change is made, an email containing the necessary information should be sent to the Customer Service Manager, D&C Manager, his Administrative Aide, both D&C Supervisors and the Customer Service Office Supervisor.
- Bona fide emergencies will be handled on a case-by-case basis.
- The list will be established and renewed in one-year intervals.

Approved by: Rick Johnson, Distribution & Collections Systems Manager
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GENERAL- CHIEF FIELD WORK, DUTY LISTS, AND OVERTIME- PUMP STATION CALL OUT LIST

Rev: 0 | **Revision Date:** 6/26/2015 | **Print Date:** 8/14/2018
I.D. Number: PW-UTL-DC-GEN-DTY-5-Pump Station Call Out List

This document sets appropriate Duty Mechanic staffing levels for after-hours events.

It is appropriate and necessary to have a Pump Station Mechanic available during the off-hours to respond to Pump Station Alarms and related emergencies.

The following procedures are not meant to be all inclusive nor supersede any agreements, City policies or laws. Management approval shall be considered the normal chain of command or the Duty Chief when necessary.

- The Duty Mechanic should respond within 20 minutes of receiving the call and should arrive on site within 1 hour.
- In the event a Duty Mechanic has a personal conflict within his/her scheduled time it is the assigned Duty Mechanics responsibility to find his/her replacement.
- If a change is made, an e-mail containing the necessary information should be sent to the Customer Service Office Manager and the D&C Supervisor.
- The Duty Mechanic rotation shall begin at the end of the normal work day Friday afternoon. It shall last nominally one week and end at the beginning of the normal work day of the following Friday.
- The Duty Mechanic will be assigned a pager for duty and it must be on at all times. The Duty Mechanic is responsible to keep the batteries at peak charge at all times. Batteries can be obtained from his/her Chief or the Public Works Dispatcher. The Duty Mechanic will also have a City issued portable radio turned on and with him/her at all times. He/she will bring with him/her a sufficient number of radio batteries to sustain him/her through the call-out periods.
- The Duty Mechanic must take home a city truck equipped to handle emergencies in the field. ABSOLUTELY NO PERSONAL VEHICLES WILL BE USED FOR DUTY CALL OUT. Vehicles will be inventoried each day before it is taken home to ensure the Duty Mechanic has the necessary inventory on the truck to respond appropriately to emergency Pump Station call-outs.

- The Duty Truck must contain the following:
  1. Sump Pump
  2. Motor Control Compressor (Silent Giant)
  3. Amp Probe
  4. Manhole Puller
  5. Appropriate Hand Tools
  6. Flashlight
  7. Lock-out Tag-out Kit complete with locks
  8. HTH Sanitizing Crystals
  9. Deodorizing Crystals
  10. SSO Report Forms

  2) The Duty Mechanic must adhere to lock-out tag-out procedures and have been trained in stormwater/sewer overflow containment and reporting procedures.
  3) The Duty Mechanic is only authorized to call the Duty Electrician if needed. Any additional personnel require authorization and approval by the Pump Station Chief Mechanic, Supervisor, or Duty Chief. The use of portable equipment (i.e.: pumps, generators, and compressors) also require prior approval before the equipment may be deployed.
  4) The Duty Mechanic shall not make any confined space entries without prior approval from the Pump Station Chief, Supervisor, or Duty Chief.
  5) Failure to adhere to the policy/procedure may result in disciplinary action. If the failure to adhere to the policy/procedure is the result of a bona fide emergency, each bona fide emergency will be reviewed on case by case basis.

The Duty Mechanic Call-Out list will be established and renewed in one-year intervals.

GENERAL- CHIEF FIELD WORK, DUTY LISTS, AND OVERTIME- SERVICE WORKER VOLUNTARY CALL OUT LIST

Rev: 0 | **Revision Date:** 6/26/2015 | **Print Date:** 8/14/2018
I.D. Number: PW-UTL-DC-GEN-DTY-6-Service Worker Voluntary Call Out List

This policy sets appropriate Service Worker staffing levels for after-hours events.

Service Worker Volunteers are solicited and lists are created to staff after-hours. If an insufficient number of volunteers are available a mandatory list will be created at the direction of the D&C Manager.

- The employee will be paid stand-by pay according to the contract in place for the time the employee is on duty.
- If the employee is called in to work the employee will be compensated according to the contract in place for the time the employee worked.
- If the employee is on duty and fails to report to work when called in the employee will be considered to have failed to follow a management directive and will be subject to progressive discipline for each event.
- The employee has up to 20 minutes to respond to the call and up to 1 hour to report if needed.
- In the event an employee has a personal conflict within their scheduled time it is the employee's responsibility to find their own replacement and complete a form letter.
- A form letter will be distributed to all of the Chiefs.
- This form letter will be completed by anyone seeking to be replaced on the duty roster.
- Each time frame where an employee is seeking to be replaced will require a form letter.
- The completed form letter must contain the date of the duty being transferred, the employees name relinquishing the duty, the employees name accepting the duty, both of the employees' signatures, and a chief's signature as a witness.
- The letter must be completed a minimum of two weeks prior to the assigned duty.

Approved by: Rick Johnson, Distribution & Collections Systems Manager
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- Upon completion of the letter an email containing the necessary information should be sent to the Customer Service Office Supervisor, D&C Manager, D&C Administrative Aide, and both D&C Supervisors by the witnessing Chief.
- Bona fide emergencies will be handled on a case-by-case basis.
- The list will be constructed in the order of volunteers ranked by City seniority from highest to lowest.
- The list will be established and renewed in one-year intervals. All volunteers are responsible for completing their commitment.

GENERAL- CHIEF FIELD WORK, DUTY LISTS, AND OVERTIME- VACUUM TRUCK OPERATOR CALL OUT LIST

Rev: 0 | **Revision Date:** 6/29/2015 | **Print Date:** 8/14/2018
I.D. Number: PW-UTL-DC-GEN-DTY-7-Vacuum Truck Operator Call Out List

This procedure sets appropriate Vacuum Truck Operator staffing levels for after-hours events.

Beginning February 3, 2006 all designated Vacuum Truck Operators, who are required to operate Vacuum Trucks as a part of their job duties, will be required to be a part of the Vacuum Truck Operator call out list.

- The employee will be paid stand-by pay according to the contract in place for the time the employee is on duty.
- Upon approval from the Duty Chief the dispatcher will call in the designated Duty Vacuum Truck Operator.
- If the employee is called in to work the employee will be compensated according to the contract in place for the time the employee worked.
- Should the Duty Vacuum Truck Operator require assistance he/she must get the request approved by the Duty foreman and must use service workers on duty.
- Upon approval from the Duty Chief the dispatcher will call in the designated Service Worker from the Duty List.
- No other Vacuum Truck Operator should be called into work on same truck except in the case of an emergency and with the Duty Chief's approval.
- If an additional truck is needed, the Vacuum Truck Duty Operator must contact dispatch to call Duty Chief for approval.
- If the employee is on duty and fails to report to work when called in the employee will be considered to have failed to follow a management directive and will be subject to progressive discipline for each event.
- The employee has up to 20 minutes to respond to the call and up to 1 hour to report if needed.
- In the event an employee has a personal conflict within his/her scheduled time it is the employees' responsibility to find his/her own replacement and complete a form letter.

- A form letter will be distributed to all of the chiefs.
- This form letter will be completed by anyone seeking to be replaced on the duty roster.
- Each time frame where an employee is seeking to be replaced will require a form letter.
- The completed form letter must contain the date of the duty being transferred, the employees name relinquishing the duty, the employees name accepting the duty, both of the employees' signatures, and a chief's signature as a witness.
- The letter must be completed a minimum of two weeks prior to the assigned duty.
- Upon completion of the letter an email containing the necessary information should be sent to the Customer Service Office Supervisor, Distribution and Collection Manager, his secretary, and both Distribution and Collection Supervisors by the witnessing Chief.
- Emergencies will be handled on a case-by-case basis.
- The list will renew in one-year intervals.

To provide appropriate staffing levels for after-hours events.

Beginning January 7, 2011 all Public Services CMS Industrial Electricians, who are currently working in the I&R Department operating and maintaining sewer pumping stations and wellfields as a part of their job duties, will be required to be a part of the duty electrician call out list.

- The employee will be paid stand-by pay according to the contract in place for the time the employee is on duty.
- If the employee is called in to work the employee will be compensated according to the contract in place for the time the employee worked.
- If the employee is on duty and fails to report to work when called in the employee will be considered to have failed to follow a management directive and will be subject to progressive discipline for each event.
- The employee has up to 20 minutes to respond to the call and up to 1 hour to report if needed.
- In the event an employee has a personal conflict within his/her scheduled time it is the employees' responsibility to find his/her own replacement and complete a form letter.
- A form letter will be distributed to all of the chiefs.
- This form letter will be completed by anyone seeking to be replaced on the duty roster.
- Each time frame where an employee is seeking to be replaced will require a form letter.
- The completed form letter must contain the date of the duty being transferred, the employees name relinquishing the duty, the employees name accepting the duty, both of the employees' signatures, and a chief's signature as a witness.
- The letter must be completed a minimum of two weeks prior to the assigned duty.

- Upon completion of the letter an email containing the necessary information should be sent to the Customer Service Office Supervisor, Distribution and Collection Manager, his secretary, and both Distribution and Collection Supervisors by the witnessing Chief.

- Bona fide emergencies will be handled on a case-by-case basis.

- Acceptable replacements are limited to CMS electricians capable of operating and maintaining sewer pumping stations and wellfields. (The chief will have the final say if Electrician is qualified).

- The list will be constructed in the following order; volunteers will be placed at the top of the list, ranked by City seniority from lowest to highest.

- The list will be established and renewed in one-year intervals.
- All employees are required to complete at least one full duty shift per year.

This procedure contains a description of the communication needed in scheduling, approving, and completing overtime work.

This procedure is for all crews who work 8 hour shifts Monday through Friday and 10 hour shifts Monday through Thursday.

All work scheduled after normal working hours, requires an e-mail. The email will include:

- Location
- Work situation (example: water leak)
- Crews (example: small leaks (3); locator (1) and asphalt (3)) Total of 7
- Crew Leader with contact information (cell phone and radio call number)
- Time reporting back to work
- Estimated time needed to complete work

The email will be initiated by the Distribution and Collection Chief or his designee. It will be sent to:

- The Distribution and Collection Manager
- The Customer Operations Manager
- Both Distribution and Collection Supervisors
- The Customer Service Office Supervisor
- The Duty Foreman.

If those listed above are unavailable then forward the email to their designee.

All e-mails of scheduled work should be sent out **no later than three hours** prior to the end of their shift.

Recipients of the email are encouraged to respond, acknowledging receipt of the email.

In addition to an email, the Distribution and Collection Chief or his designee will contact his Supervisor by phone (cell or office).

This procedure contains a description of the communication needed when scheduling, approving, and completing emergency overtime.

This procedure is for all crews who work 8 hour shifts Monday through Friday and 10 hour shifts Monday through Thursday.

All work requiring crews to remain at work past their normal working hours, requires an e-mail and telephone notifications. The Notification will include:

- Location
- Work situation (example: water leak)
- Crews (example: small leaks (3); locator (1) and asphalt (3)) Total of 7
- Crew Leader with contact information (cell phone and radio call number)
- Estimated time of completion

The email will be initiated by the Distribution and Collection Chief or his designee. It will be sent to:

- The Distribution and Collection Manager
- The Customer Operations Manager
- Both Distribution and Collection Supervisors
- The Customer Service Office Supervisor
- The Duty Foreman

If those listed above are unavailable then forward the email to their designee.

Recipients of the email are encouraged to respond, acknowledging receipt of the email.

The phone call should be made to:

- Customer Service Office Supervisor, if unavailable contact the Public Works Dispatcher
- The Duty Foreman

All e-mails and phone calls should be completed as soon as possible, upon knowing your crews are working past their normal shift.

GENERAL- CHIEF FIELD WORK, DUTY LISTS, AND OVERTIME- UTILITY FIELD REP CALL OUT LIST

Rev: 0 | **Revision Date:** 4/18/2017 | **Print Date:** 8/14/2018
I.D. Number: PW-UTL-DC-GEN-DTY-11-Utility Field Rep Call Out List

This policy sets appropriate Utility Field Rep staffing levels for after-hours events.

Beginning July 1, 2014 all Utility Field Reps who are deemed first responders are required to be a part of the Utility Field Rep call out list.

- The employee will be paid stand-by pay according to the contract in place for the time the employee is on duty.
- If the employee is called in to work the employee will be compensated according to the contract in place for the time the employee worked.
- If the employee is on duty and fails to report to work when called in the employee will be considered to have failed to follow a management directive and will be subject to progressive discipline for each event.
- The employee has up to 20 minutes to respond to the call and up to 1 hour to report if needed.
- In the event an employee has a personal conflict within his/her scheduled time it is the employees' responsibility to find his/her own replacement and complete a form letter.
- A form letter will be distributed to all of the chiefs.
- This form letter will be completed by anyone seeking to be replaced on the duty roster.
- Each time frame where an employee is seeking to be replaced will require a form letter.
- The completed form letter must contain the date of the duty being transferred, the employees name relinquishing the duty, the employees name accepting the duty, both of the employees' signatures, and a chief's signature as a witness.
- The letter must be completed a minimum of two weeks prior to the assigned duty.

- Upon completion of the letter an email containing the necessary information should be sent to the Customer Service Office Supervisor, Distribution and Collection Manager, his secretary, and both Distribution and Collection Supervisors by the witnessing Chief.
- Bona fide emergencies will be handled on a case-by-case basis.
- Acceptable replacements are limited to Service Worker IV's and Service Worker III's (the chief will have the final say whom is qualified).
- The list will be established and renewed in one-year intervals.
- Each Utility Field Rep is required to perform one full duty per year.

PURPOSE:

This Public Works policy is to establish a uniform response during operational emergencies, ensure there is adequate and appropriate staff available, and set best management practices for optimizing employee schedules to ensure safe working conditions, shift durations, and overtime equality.

Policy and Procedure:

An operational emergency is defined as a breakdown or failure to comply with a regulatory requirement in critical services affecting customers which may cause harm or inconvenience at the loss of service or any circumstance endangering the Public requiring an immediate response by the City.

Examples of operational emergencies include but are not limited to the following:

- Water main breaks
- Sewer Force main breaks
- Loss of any water or wastewater treatment facilities function including pumping stations
- Sewer stoppages that have the potential to cause Sanitary Sewer Overflows (SSO)
- Major electrical failures
- Shift coverage due to employees absence
- Extreme weather events (Hurricanes, Tornados, Rain Events)
- Failure to meet a regulatory requirement (Florida Department of Health in Broward County and Florida Department of Environmental Protection)

It is critical that sufficient staffing levels be available during an operational emergency. During an operational emergency all essential personnel's normal shift working hours are suspended and emergency operational scheduling shall apply. All Public Works Utilities employees are considered essential but this level of operational emergency may only impact the specific services required for a response. The Incident Commander will determine the appropriate staffing types and numbers.

Scheduling of Personnel:

Depending on the time, day and size of the operational emergency, it may be necessary to assemble whichever staff is available until the proper personnel and scheduling can be established by the Incident Commander or their designee. Because of this, the initial shift working on an emergency may be up to sixteen hours. **No employee shall be scheduled or allowed to work in excess of sixteen hours without the permission of the Business Unit Manager**. An employee may be allowed to work in excess of sixteen hours but only after being visually examined for fatigue by their immediate supervisor or the Incident Commander. **This practice is highly discouraged and should only be used in extreme emergencies and then the employee should ultimately be limited to a total of an eighteen hour shift without a rest period.**

After the initial response, all additional work shifts shall be of twelve hours until the operational emergency is over. Every effort will be made to distribute the overtime in a fair and equitable manner keeping every employee's health and welfare in mind.

Overtime in response to an operational emergency shall be considered mandatory and all required personnel will be scheduled as needed. Scheduling should consider volunteers first when feasible and accommodations may be made for employees with legitimate scheduling conflicts or emergencies. These circumstances will be addressed on a case by case basis.

An employee that fails to report for scheduled or emergency overtime or duty will be considered Absent Without Leave (AWOL) and may be subject to discipline up to and including termination.

Communications, Purchasing, and Licensing

GENERAL- COMMUNICATIONS, PURCHASING, AND LICENSING- CELL PHONE POLICY

Rev: 0 | **Revision Date:** 6/26/2015 | **Print Date:** 6/26/2019
I.D. Number: PW-UTL-DC-GEN-CPL-1- Cell Phone Policy

This policy defines appropriate office and field cell phone use.

This cell phone directive is separated into two distinct groups of employees, those who receive a cell phone allowance from the City and those who do not.

Employees who do not receive a cell phone allowance from the City may only use their cell phone during their scheduled 15-minute breaks and during their scheduled lunch period. Employees who are operating heavy equipment, driving a vehicle, performing physical labor, actively overseeing a work area or task being performed, working in an office environment, or attending a meeting should not use a cell phone. Exceptions due to emergencies will be handled on a case-by-case basis.

Employees who receive a cell phone allowance from the City understand they may be contacted during their off-hours and must understand the necessity for a representative of the City to have the ability to contact them during working hours. Calls taken during working hours should be work related. Personal phone calls may be made during their scheduled 15-minute breaks and during the scheduled lunch period. Exceptions to this restriction due to emergencies will be handled on a case-by-case basis.

While at work employees should not use a cell phone while operating heavy equipment, driving a vehicle, performing physical labor, or when they are actively overseeing a work area or task being performed. If an employee is engaged in one of these activities and needs to use the cell phone for City business, the employee should find someone to replace them for the duration of the call, temporarily suspend the activity until the employee can devote their full attention to the work, or the employee should find someone else to answer the call. When in an office environment the employee should have their cell phones on silent or vibrate. Cell phones should not be used or answered during a meeting.

A violation of this policy may result in a revocation of the employee's cell phone allowance, a counseling, disciplinary action, or any combination of the above.

GENERAL- COMMUNICATIONS, PURCHASING, AND LICENSING- EMAIL RESPONSE PROCEDURE

Rev: 0 | **Revision Date:** 6/26/2015 | **Print Date:** 8/14/2018
I.D. Number: PW-UTL-DC-GEN-CPL-2- Email Response Procedure

This procedure was created to standardize the email response procedure to City Commission and City Manager's offices and to ensure the accuracy of the information provided.

This is a City Hall /Email Response SOP, for all off hour shifts;
3:30 PM – 11:30PM, 11:30 PM – 7:30 AM and weekend shifts.

Customer Service will follow standard procedures when disseminating a request for an investigation. In addition they will send an email to the D&C Chief and Supervisor or their designees.

D&C crews will follow the normal procedures (CH/SEC/SUBJ/PG) while investigating complaints.

D&C crews will update the Customer Service dispatcher (as the information is gathered) on critical work such as broken water and sewer emergencies.
D&C crews will update their Chief in writing or verbally as soon as possible (but no later than 9:00 AM the following business day) for all other complaints.

The D&C Chief will;

1. Verify the accuracy of the information.
2. Update Customer Service Supervisor or designee by 10:00 AM via e-mail.
3. D&C work cards will follow normal path after Chief verifies the accuracy of the information.
4. D&C Supervisor will assume responsibility in Chiefs absence (vacation/sick).

Approved by: Rick Johnson, Distribution & Collections Systems Manager
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WE BUILD COMMUNITY

This document contains guidelines for using a Requisition Authorization (RA) to pay for contracted services.

Followed Normal Path:

- In addition to the normal use of the RA the following products are being identified to be paid for using RA's:

  - ❖ Barricades
  - ❖ Sod
  - ❖ Construction Debris
  - ❖ Concrete
  - ❖ Asphalt

- Public Works Finance will complete the RA. When completing the RA they will choose a vendor from the system. If the vendor is not in the system Public Works Finance will email Procurement requesting the vendor be added to the Direct Purchase software. The RA will be created after the vendor is added. **SEE NOTE: WILL NOT BE USED.**

- Public Works Finance will ensure the contract number is listed on the RA.

- Public Works Finance will verify the purchase amounts are not to exceed the Commission approved contracted amount using the Buy Speed software.

- The RA will be processed and sent to an Administrative staff member to be logged in an electronic shared cabinet. The log will be recorded by vendor and a running total will again be verified against the Commission approved contracted amount.

- Once the RA is logged an Administrative staff member will route it to the appropriate personnel for their signatures.

- The final signature/authorization will be provided by the Procurement Department.

Purpose:

This document ensures all requisitions are consistent and filled out correctly.

All requisitions must include the following information:

- Chief or their designee's signature
- Fund
- Department
- Division
- Index/Project code number
- Sub-object number
- Address (written below in the description column)
- Service Request Number (SR#)
- Stock number
- Quantity desired
- Unit (ea., ft., yds., etc.)
- Description

Purpose:

This procedure ensures compliance with the Florida Administrative Code (FAC) regarding departmental licensing.

Background: All water utilities in the state of Florida were handed an un-funded mandate when the FAC Chapters 62-602 and 62-699 were amended by the Florida Department of Environmental Protection (FDEP) on October 15, 2007. The revised versions of FAC 62-602 and FAC 62-699 included a requirement to license water distribution system operators by May 2011.

Policy: Employees promoted into a Management, Service Worker III, Service Worker IV, Utility Field Representative, or Heavy Equipment Operator position after May 2010 should have their license and are required to maintain their license active and in good standing.
Chiefs will, at a minimum, spot check the validity of the employee's licenses under his purview annually.
Supervisors will, at a minimum, spot check the validity of the Manager's licenses under his or her purview annually.
An employee (Managers, SW IV, SW III, UFR & HEO) who is required to have a license (active and in good standing) and does not will be subject to the disciplinary process up to and including termination.

The employee will be charged with violating at least three major rules:

- Willfully falsifying any City records or knowingly providing false information.
- Neglect of Duty.
- Violation of City Charter, Ordinances, or administrative rules and regulations.

It is highly recommended that all employees who are required to hold a license ensure they meet all of the terms to hold and renew the license including continuing education units (CEUs).

Public Works Department- Safety Shoe Procedures

- The City may provide each appropriate employee two pairs of safety shoes per calendar year.
- Employee requests safety shoes from his/her supervisor when theirs are no longer usable.
- Supervisor will inspect shoes to make sure it is necessary for the employee to receive new shoes.
- Supervisor emails PW Finance Administrative Assistant who will determine if it has been at least 6 months since the previous pair was issued.
- If it has been at least 6 months, Supervisor will request a shoe voucher, and supply the correct PBS Index Code.
- The Supervisor will inform the employee that there is a $125.00 limit on the purchase. If the employee wishes to make a purchase which exceeds this amount then the employee must pay the difference. Exceptions for operational needs and medical reasons will be considered.
- Administrative Assistant fills out the voucher with:
    a. department number
    b. division number
    c. activity and Sub-activity numbers
    d. employee's name
    e. monthly PO number (in upper right hand corner), notes the $125.00 limit
    f. initials the voucher
    g. sends to Supervisor
- Administrative Assistant enters the request on the shoe request spreadsheet.
- Supervisor signs as the authorizing agent, and sends employee to the approved shoe vendor(s).
- Employee obtains the shoes, and returns all paperwork to the Supervisor.

- Supervisor returns paperwork to Administrative Assistant.

- Administrative Assistant will:
    a. update employee's shoe record on shoe list spreadsheet
    b. attach the green voucher copies to shoe receipt
    c. file yellow voucher copies
    d. submit voucher and receipt to Public Works Finance for payment

Construction

This document reiterates' and simplifies the instructions provided to you in each set of plans and specifications you received. This document is not meant to supersede the approved set of plans and specifications. It is meant to act as a check list to ensure quality work.

Restoration

Once the pipe has been installed per specification follow normal path;

1. Back fill and level trench to spring line of pipe
2. Compact with approved/assigned equipment (densities if required)
3. Fill and level trench with second layer of fill 12" to 15" from top of pavement
4. Compact with approved/assigned equipment (densities if required)
5. Install water line tape directly over water main
6. Cover line tape with fill (to prevent water line tape from moving)
7. Install and level first layer of lime rock 6"
8. Compact with approved/assigned equipment (densities if required)
9. Install and level second layer of lime rock 6"
10. Compact with approved/assigned equipment (densities if required)
11. No more than 2" & No less than 1" between compacted road rock & leveled pavement
12. No more than 500 linear feet of open trench at one time

Blow off installed

1. Blow off water main to remove debris and air
2. Blow off service lines to remove air
3. Conduct a preliminary pressure test
4. No leaks on preliminary test grass and asphalt restoration begins

5. Wash and sweep constructed area daily
6. Pressure test completed - Asphalt ASAP

Asphalt

1. Straight cut trench
2. Compacted road rock no more than 2" & no less than 1" from leveled pavement
3. No contaminants in trench (sand, fill & etc.)
4. Tack trench edges
5. Install asphalt (smooth and level)
6. Allow asphalt to cool before rolling (15 minutes +/-)

GENERAL- CONSTRUCTION- STAGING AREA

Rev: 0 | **Revision Date:** 6/29/2015 | **Print Date:** 8/14/2018
I.D. Number: PW-UTL-DC-GEN-CT-2- Staging Area

This document sets guidelines for selecting and operating a staging area for an extended construction project.

- The Chief in charge of the activity requiring the staging area will research the neighborhood for the site that will have the least impact on the neighborhood. The selection criteria should include proximity to the construction site, traffic implications, accessibility, and security.

- The Chief will then research the ownership of the property, contact the owner, and (assuming the owner is agreeable) secure permission to use the property in writing.

- The Chief will notify his Supervisor and Manager. The Manager will notify the Public Works Assistant Utilities Services Director – Operations, who will in turn notify the Public Works Director.

- Prior to using the property, the Chief and lead worker will distribute their contact information to the abutting property owners and silt fencing will be placed around the perimeter of the property.

- Material being stored on the site will be kept neat and to a minimum.

- During periods of inactivity such as weekends and holidays, there should be an extra effort to reduce the amount of material being stored on site.

- It is the responsibility of the lead worker to inspect the site daily to ensure the above criteria is being met. The lead worker should take additional care when the periods of inactivity are approaching.

- Upon completion of the project or the agreed upon term with the owner the site will be returned to its original condition or better.

Approved by: Rick Johnson, Distribution & Collections Systems Manager
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GENERAL- CONSTRUCTION- ROADWAY CLOSURES AND MAINTENANCE PRACTICES TO REDUCE POLLUTANTS

Rev: 0 | **Revision Date:** 6/29/2015 | **Print Date:** 8/14/2018
I.D. Number: PW-UTL-DC-GEN-CT-3- Roadway Closures and Maintenance Practices to Reduce Pollutants

This document contains guidelines for planned closures, unplanned closures, and methods to reduce pollutants during roadway maintenance.

Roadway repairs and maintenance may take place anywhere throughout the City's jurisdictional area, and is conducted on an as-needed basis. There are many possible causes for roadway repairs such as a leaking pipe, a sink hole, a construction project, etc. Major repair work is typically done as a construction project, while routine inspections are done as part of the construction site inspection program.
Minor repairs, are performed using the following practices:

- All planned road closures should be routed through the Assistant Public Works Director (APWD) for Utilities and the proper Maintenance of Traffic (MOT) completed. The APWD responsible for Utilities will notify the Public Works Director (PWD) of pending road closures.

- All un-planned road closures should be the result of an unforeseen emergency (pipe break, etc.). Field crews will secure the area using the industry standard methods available, request an MOT, and ensure the Division Manager and APWD responsible for Utilities are notified. The APWD responsible for Utilities will notify the PWD.

- Painting, striping, marking, and asphalt and concrete cutting or repair activities are to be performed in dry weather, when possible.

- Nearby storm drain inlets are to be protected by covers, straw bales, sand bags, filter fabric, or plastic to reduce the possible entry of wastes, dusts, overspray, and/or slurry.

- All waste and debris remaining after the work is to be removed.

- Water will be minimized when saw cutting concrete and the waste slurry will be removed.

- Maintenance supplies (e.g. cement bags, sealants, and tars) are to be stored properly.

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- Waste, scraps, rust, and paint from any sandblasting or painting projects is to be collected and disposed of properly.

This document instructs how asphalt should be laid when restoring pavement due to construction.

- The Lead Service Worker is responsible for ensuring that all work is completed accurately and safely. To accomplish this directive, the Lead Service Worker may need to assign tasks to other Service Workers; this does not absolve the Lead Service Worker of his responsibilities.
- Upon arriving, Service Workers will turn on hazard signals, put on safety vests, and set up the Maintenance of Traffic (MOT) which may include safety cones, arrow boards, and/or signs.
- As needed, a Service Worker will pick up asphalt from a designated vendor.
- Asphalt is usually laid after construction is finished and the trench has been filled in with dirt, sand, and road rock; with road rock being the top layer.
- Using the necessary tools (e.g. shovels, rakes, etc.), Service Workers will remove any debris on the trench.
- At times it may be necessary to add extra road rock to the trench; in these instances, Service Workers will use the necessary tools (e.g. Bobcat, Shovels, etc.) to lay additional road rock on the trench.
- Using the necessary tools (excavator, roller, etc.), Service Workers will level and pack the road rock.
- Once the road rock is level and packed, Service Workers will spray Tack on the trench to help the asphalt adhere to it.
- As needed, Service Workers will dump asphalt into the trench using the appropriate tools (e.g. loader, dump truck, etc.)
- In order to ensure the asphalt does not stick to the tolls, Service Workers will dip all tools that will touch the asphalt in diesel fuel.
- Using the necessary tools (e.g. shovels, rakes, etc.), Service Workers will distribute and level the asphalt.
- Once the asphalt is level, a Service Worker will use the roller to pack the asphalt.

- While using the roller on the asphalt the water attachment must remain on to prevent the asphalt from sticking to the roller.
- Service Workers will then clean the surrounding area leaving it as found or better.
- As necessary, Service Workers will remove and set up MOT to ensure traffic flow is not inhibited while the necessary work zones remain unharmed.
- The Service Worker responsible for the work will document all activities for the day and submit them to the Crew Chief upon return to CMS.

GENERAL- CONSTRUCTION- LETTERS TO NEIGHBORS AFFECTED BY D&C CONSTRUCTION

Rev: 0 | **Revision Date:** 7/28/2015 | **Print Date:** 8/14/2018
I.D. Number: PW-UTL-DC-GEN-CT-5-Letters to Neighbors Affected by D&C Construction

This document sets guidelines to be followed when sending information to neighbors who will be affected by D&C Construction in their area.

Due to the nature of the work performed by D&C, there will be times when D&C tasks affect our neighbors. The department will take all necessary steps to ensure that the effect is negligible and the duration is minimal, but at times this cannot be avoided. In order to ensure our neighbors are prepared and aware of any construction in their area, 30 days prior to construction beginning, D&C will send notification to all neighbors who may be affected. This notification will include information regarding the start date of the project, the duration of the project, the location of the project, and any responsibility the property owner may have. Also included in this notification will be answers to frequently asked questions regarding the specific nature of the work to be performed and the contact number for the 24hr Customer Service Center.

At times, it may be necessary for construction to take place in the right-of-way. This is land that is public property but is usually maintained by the property owner (e.g. swales, driveways, etc.). In the event that construction must take place in the right-of-way, it may be necessary for affected neighbors to relocate items such as fences, brick pavers, and other fixtures in the right of way until construction is complete. In the event that a neighbor must relocate items from the right-of-way, they will be notified by Crew Members as needed.

GENERAL- CONSTRUCTION- EXCAVATION OR PAVEMENT CUTS IN CITY STREET OR RIGHT OF WAY.

Rev: 0 | **Revision Date:** 8/5/2015 | **Print Date:** 8/14/2018
I.D. Number: PW-UTL-DC-GEN-CT-6- Excavation or Pavement Cuts in City Street of Right of Way

Policy:

1. An excavation or pavement cut in city streets or rights-of-way that will block one lane of traffic and/or will require three (3) hours or more to complete is to be reported, in advance to the Division Manager, and Assistant Director with possible escalation to the Public Works Director or City Manager, though the Public Services chief or designee. Dispatch will notify Customer Service and affected staff via email or phone.

Exception:

2. This does not include City Engineering Department projects.

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Purpose:

This document contains instructions to be followed when trenching or excavating on a job site.

- The Lead Service Worker is responsible for ensuring that all work is completed accurately and safely. To accomplish this directive, the Lead Service Worker may need to assign tasks to other Service Workers; this does not absolve the Lead Service Worker of his responsibilities.
- Upon arriving, Service Workers will turn on hazard signals, put on personal protection equipment safety vests, and set up the Maintenance of Traffic (MOT) which may include safety cones, arrow boards, and/or signs.
- Service Workers will visually inspect the site for any location markings and take the necessary precautions when digging around the existing lines.
- When necessary, Service Workers will use the appropriate tools (e.g. hand saw, walk behind saw, etc.) to cut a guideline for digging.
- Using the appropriate tools (e.g. backhoe, shovel, etc.), Service Workers will begin excavating the trench.
- While excavating, Service Workers will use caution and be on the lookout for any unmarked lines.
- Using the appropriate tools (e.g. loader, shovels, etc.), Service Workers will place ¾ rock in the trench to soak up any groundwater and solidify the flooring of the trench.

Purpose:

1. To improve field control and to adequately reconcile monthly billing of the flasher contractor.

Responsibility:

2. All flasher activity shall be included on the Work Log and it shall be the responsibility of all Supervisors and Chiefs to coordinate and control all Flasher Activity in their areas of work assignments in accordance with the following procedures.
    a. What new work is to be performed.
    b. How the job was preformed prior to requesting these tools.
    c. Who will be assigned the tools
    d. The life expectancy of the tools being purchased.
    e. Whether the tools are available by approved tool vendors.

Procedures:

3. All requests for flashers, etc. will be initiated through the dispatcher with the number and specific location given.

4. All Supervisors and/or Chiefs will maintain surveillance on all flashers and their locations in their area of responsibility for the purpose of security and any possible unauthorized movement.

5. Partial transfers from one location to another are not permitted at any time.

6. All of the above activity is to be noted in the Q-Alert "More" tab of the job number. See PW-UTL-DC-GEN-CT-9-Recording Procedure for Flasher Activity.

7. Transferring any flashers from a work-in-progress or dangerous location will not be permitted at any time.

Purpose

The purpose of the Concrete Restoration Procedure is to provide clear rules and guidelines for concrete restoration during sidewalk/easement repairs.

Policy

1. All planned utility repairs on City of Fort Lauderdale's public rights-of-way or easements which involves the use of concrete, brick pavers, etc., are to be properly routed through the City's Q-Alert program by Customer Service or the individual crew. Q-Alerts shall be distributed based on priority and/or the order in which they were received.

2. All requests are to be completed properly within the allotted three to five-day timeframe, including time cards (work cards) and updating Q-Alert with all required information and documentation completed for closing and reallocation purposes.

3. All jobs shall be completed to City, County, and State standards/regulations. These standards are **mandatory**.

4. If Maintenance of Traffic (M.O.T) is required, cancellation of M.O.T. must be reported to dispatch upon project completion.

5. Proper Personal Protective Equipment (P.P.E.) must always be worn while working in or around work zones.

6. Community Builder(s) must have all materials, supplies, tools, etc., required for completing the job, secured to the work truck prior to leaving the yard, supply house, and/or job site(s).

7. During downtime, while waiting for concrete to set up through the curing process, utilize time for cleaning and organizing work trucks in a professional manner.

8. Job sites, vehicles, and work areas are to be maintained in a safe, secure and professional manner at all times.

9. All debris and unused material shall be removed and discarded from each job or work site daily.

10. All vehicles must be thoroughly checked for materials and restocked appropriately at end of every shift; ready for any emergency.

Safety Instructions

1. Safely park vehicle in a secure position
2. Put on safety vest
3. Use Maintenance of Traffic (M.O.T.) signage to divert traffic from lane closest to sidewalk being repaired and foot traffic from area
4. Remove any trip hazards

Procedure

1. Arrive on site
    a. Make sure proper Personal Protection Equipment (P.P.E.) is worn.
        i. Uniform
        ii. Respirator (when required)
        iii. Safety glasses
        iv. Hard hat (when required)
        v. Reflective vest (At **ALL** times)
        vi. Gloves (when required)
        vii. Work boots (At **ALL** times)
    b. Secure site safety – ensure M.O.T. signage is in place to divert traffic for public safety.
2. Site Preparation.
3. Prepare/mix material according to MSDS standards (see supplement A).
4. Pour, level and finish concrete.
5. While concrete dries, remove materials/tools not being used to truck in a safe and organized manner.
6. Clean job site to ensure all materials/tools are removed and placed back in the work truck in the appropriate location.
7. Clear worksite while maintaining safety of crew and property.

***Please note that this internal policy is meant to supplement, not supersede, any existing City Policy, Personnel Rules, or labor agreement.

Contractors

This document establishes procedures for dealing with Priority or Routine Valve work orders.

Priority Valves - Work Orders

- Priority work orders will be called to Customer Service Dispatch and entered into Q-Alert as a Service Request denoting the Service Worker responsible for work as the 'initiated by'. Service Request will be assigned to Customer Service Field Ops Chief.

- Assigned work orders will be printed daily and assigned for evaluation. Service Request information will be added by the Customer Service Field Ops Chief to a spreadsheet maintained in the Z:\Departmental\D&C\Wachs Maps\WACHS-Work Orders\WACHS High Priority.

- The Field Ops/Service Worker will verify the condition of the valve and make a determination on the necessary repair/replacement.

- If valve is frozen, Field Ops will attempt to exercise the valve using the valve truck. If successful, Service Request will be updated and closed in Hansen. The spreadsheet will be updated to reflect date closed and action taken. Evaluation should be completed as soon as possible (next work day) but should occur within 48 hours of assignment completion.

- If valve spins freely or is unable to be moved using valve truck and must be replaced, area will be isolated to insure water can be shut down without delay. When a test shut down is required due to the affected area, this shut down will be scheduled as soon as possible, dependent on size of area affected, valve locations, traffic concerns, etc.

- Upon isolating the valve, the Service Request will be assigned to the D&C Chief for assignment to Operations Staff and spreadsheet in shared folder will be updated with resolution.

Routine Work Orders

- Less critical valves are valves that cannot be located, covered over, misaligned, etc. The less critical valves will come through the normal channels and will be addressed as they come in.

- A report has been created in Crystal Report writer which will extract WACHS work orders from the Hansen work order.

- A spreadsheet indicating valves identified by WACHS is maintained in the Z:\Departmental\D&C\Wachs Maps\WACHS-Work Orders\WACHS Work Orders. This report will be updated each Monday by Administrative Staff and emailed to the Customer Service Field Ops Chief. Utilities Finance will enter the invoices into Buyspeed within one business day and update the spreadsheet titled "Working Payables". Invoices are then routed through the approval process and processed for payment in Accounts Payable.

This document contains guidelines to clarify responsibilities and procedures when inspecting a contractor who is exercising valves.

Responsibilities:

- The D&C Manager and Supervisor will designate a Service Worker (SW) to inspect the contractor's daily activities.
- The SW will be given a copy of the contract.
- The duties of the SW are to be familiar with the contract. If the SW finds discrepancies in the work that the contractor is doing, he should bring it to the attention of his Chief or the Supervisor.
- The SW will be on the job site, available, or accessible to the contractor.
- The SW will make decisions based on his knowledge of the infrastructure.
- If the SW is not sure of something, he will contact his Chief and or the D&C Supervisor.
- The D&C Chief will ensure that the daily spreadsheet is updated with pertinent information of the contractor's daily activities (i.e. how many valves they touched, the problems they encountered, etc.).

Critical Valves:

- The SW will contact dispatch with all critical valves to get a service request number (SR#). Critical valves are those valves that are not operating as per the manufactured recommendations (broken, free spinning, etc.).
- The SW will give the SR# to the contractor. The contractor will add the SR# to their comment section of the Work Order number (WO#) when they send their monthly report.
- A spreadsheet indicating critical valves identified by the contractor is maintained in the Z:\Departmental\D&C\Wachs Maps\WACHS-Work Orders\WACHS High Priority
- The service request will be assigned in Q-Alert to the Customer Service Field Operations Chief. Upon assignment, the service request will be reassigned to a Customer Service Service Worker to inspect the valve and determine the necessary action for repair. Initial inspection will occur within 48 hours of assignment.
- If determined the valve must be replaced, the Customer Service Field Representative will isolate the valve, confirming that the water is able to be turned off.

- Once this process is completed, the Q-Alert service request will be updated with steps taken and action needed, the job will be referred to Operations, and the Spreadsheet in the shared folder will be updated with resolution.
- Operations will call for all digging locations.
- Operations will either replace or repair the valves. This work should be completed within 2 weeks. After receiving confirmation, the water can be shut down by the Customer Service Field Representative.
- All SR#'s that are created for the contractor will be given the same problem code. The problem code is WSCV (WACHS Service Critical Valves).
- The SW will keep records of the SR# created. The records will be provided to customer service so the SR# can be linked with the WO#. Then the work order can be closed out so as not to delay critical valve work.
- Critical valves will be the only valves that will receive SR#s right away. This is for the express purpose of expediting repair or replacement of the valve.
- SR#s will be closed out through normal channels. Work cards should be filled out properly by the operations crew and turned in to Data Control.

Less Critical Valves:

- Less critical valves are valves that cannot be located, covered over, misaligned, etc.
- The less critical valves will come through the normal channels and will be addressed as they come in.
- A spreadsheet indicating valves identified by the contractor is maintained in the Z:\Departmental\D&C\Wachs Maps\WACHS-Work Orders\WACHS Work Orders
- The less critical valves should be evaluated within 2 weeks by the Customer Service Field Representative.
- Customer Service Chief will update WACHS Work Orders spreadsheet with outcome of evaluation.
- WACHs work orders will be added to the spreadsheet each Monday.
- The less critical valves will be assigned to the proper Chief per customer service findings.
- Work orders should reflect all work performed and closed out at the appropriate time.

This procedure contains guidelines for presenting Atlas sections to a contractor for the purpose of working on infrastructure.

- Before atlas sections are presented to the Valve Exercising Contractor the D&C Manager, D&C Supervisor, or their designee must approve it.
- The employee (program inspector) will notify the GIS employees of which atlas sections are needed.
- The GIS department will create the atlas sections and store them in the shared folder. S:\Departmental\D&C\Wachs Maps.
- The D&C Supervisor or his designee will review the atlas sections.
- The D&C Supervisor or his designee will highlight all critical areas. (Hospitals, dialysis center, etc.)
- The D&C Supervisor or his designee will verify the accuracy of the "General Notes" section on every atlas section.
- The D&C Supervisor or his designee will provide the contractor a new atlas section when they have reached substantial completion of the current atlas sections.
- Before atlas sections are presented to the contractor the D&C Manager, D&C Supervisor, or their designee must approve it.

This document contains guidelines for tracking work that has been contracted out and has been completed.

Each week the contractor will submit an invoice which will include a brief description of the task completed and the number of times each task was done. It is the D&C Chiefs responsibility to update any necessary spreadsheets and track the number of tasks completed by the contractor each week in order to accurately reflect the quantity of work completed.

Equipment

GENERAL- CONTRACTORS-EQUIPMENT POLICY

Rev: 0 | **Revision Date:** 6/29/2015 | **Print Date:** 8/14/2018
I.D. Number: PW-UTL-DC-GEN-EQ-1- Equipment Policy

Purpose:

This document determines responsibility for equipment used by D&C Crew Members.

Due to the nature of their work, D&C Crew Members will be assigned equipment to assist them with their daily tasks. For the purpose of this policy, the term equipment includes any item that is assigned to a Crew Member to assist them in their day to day duties (e.g. radios, steel saws, backhoes, etc.).

Assignment of Equipment Responsibility:

When the City assigns a piece of equipment, it is entrusting that equipment to the assignee and it is expected to be handled, cared for, and returned in working condition. Upon receiving the equipment, the Crew Member is assuming responsibility for the equipment and is agreeing to handle and care for it accordingly. Lost, damaged, or destroyed equipment will be handled on a case by case basis and may result in a counseling or disciplinary action up to and including termination.

PURPOSE:

This document determines responsibility and instructs how vehicles should be maintained on a daily basis.

Daily Vehicle Inspection Responsibility:

Service Worker assigned to vehicle

While vehicles may be used by more than one individual on any given day, it is the responsibility of the Service Worker assigned to the vehicle to ensure that daily vehicle maintenance is performed. This means that even if the Service Worker who has been assigned the vehicle is not driving the vehicle that day, the vehicle maintenance is still their responsibility.

Back up Service Worker assigned to vehicle

If the Service Worker assigned the vehicle is out for any reason, the vehicle will be assigned to a backup, who will then be responsible for daily maintenance until the primary Service Worker returns.

Daily vehicle inspection process

Before leaving the yard each day Service Workers should perform a visual walk around to check for damage and leaks. The walk-around should include checking the engine oil, coolant, doors, latches, windows, tire wear and pressure, headlights, taillights, turn signals, emergency lights and devices, fire extinguisher, warning triangles, wipers, horn, fuel level, gauges, dash warning lights, registration, insurance, City radio communication device, emergency brakes, regular brakes, and seat belts.

Daily vehicle cleaning and general maintenance of vehicle

The Service Worker responsible should also clean the vehicle inside and out on a daily basis. If during the walk around any items are noticed to be broken, damaged, or in need of repair, they should be reported to a Supervisor before moving the vehicle.

GENERAL- EQUIPMENT- JET TRUCK DAILY VEHICLE MAINTENANCE

Rev: 0 | **Revision Date:** 6/29/2015 | **Print Date:** 8/14/2018
I.D. Number: PW-UTL-DC-GEN-EQ-3- Jet Truck Daily Vehicle Maintenance

This document contains guidelines for daily vehicle maintenance to be done by the Jet Cleaning Crew.

- Upon arrival and when leaving for the day, service workers should complete a visual inspection of their vehicle.
- A visual inspection will include checking the tires, lights, gauges, oil, gas, water level reader, filter, strainer, pipes, and hoses on jet truck. It should also include verifying cooler, vests, hearing equipment, basic supplies, and cones are in stock. Refuel and restock as needed.
- Jet Truck supplies should include masks, gloves, boots, fire extinguisher, flag poles, hoses, night lights, drop lights, first aid kit, medical supplies, any necessary tools, and caution tape.
- Daily inspect the water level reader, filter, strainer, pipes, and hoses on the jet truck.
- When full, dump and clean the debris filter.
- Do any and all other necessary maintenance as needed.
- If vehicle is in need of repair take to the shop.

Approved by: Rick Johnson, Distribution & Collections Systems Manager
Uncontrolled in hard copy unless otherwise marked

WE BUILD COMMUNITY

GENERAL- EQUIPMENT- WET WELL CREW DAILY VEHICLE MAINTENANCE

Rev: 0 | **Revision Date:** 6/29/2015 | **Print Date:** 8/14/2018
I.D. Number: PW-UTL-DC-GEN-EQ-4- TV Survey Crew Daily Vehicle Maintenance

This document contains guidelines for daily vehicle maintenance to be done by the TV Survey Crew.

- Upon arriving at work and when leaving for the day, Service Workers will complete an audio and visual inspection of their vehicle.
- A visual inspection will include checking the tires, lights, gauges, oil, generator and gas. It should also include verifying cooler, vests, basic supplies, and cones are in stock.
- Refuel and restock as needed.
- An audio inspection consists of listening to the engine for any abnormalities.
- TV Truck supplies should include tractor, camera, spare wheels and parts for the tractor/camera, suits, masks, gloves, boots, fire extinguisher, gas gauges, flag poles, plugs, hoses, night lights, drop lights, first aid kit, medical supplies, any necessary tools, and caution tape.
- Do any and all other necessary maintenance as needed.
- If the vehicle is in need of repair take it to the shop.

GENERAL- EQUIPMENT- WET WELL CREW DAILY VEHICLE MAINTENANCE

Rev: 0 | **Revision Date:** 6/29/2015 | **Print Date:** 8/14/2018
I.D. Number: PW-UTL-DC-GEN-EQ-5- Wet Well Crew Daily Vehicle Maintenance

This document contains guidelines for daily vehicle maintenance to be done by the Wet Well Crew.

- Upon arrival and when leaving for the day, service workers will complete a visual inspection of their vehicle.
- A visual inspection will include checking the tires, lights, gauges, pumps, oil, and gas. It should also include verifying cooler, vests, hearing equipment, basic supplies, and cones are in stock. Refuel and restock as needed.
- Service Truck supplies should include but is not limited to harnesses, suits, masks, gloves, boots, air blower, fire extinguisher, gas detector, gas gauges, canopy, oxygen tanks, oxygen masks, winch, tripod, plugs, hoses, night lights, drop lights, first aid kit, medical supplies, any necessary tools, caution tape, flag poles, safety cones, stop signs, arrow boards, and any other MOT equipment.
- A Daily inspection of the water level reader, filter, strainer, pipes, and hoses on a vacuum truck will be completed.
- At the end of each day and before weekends and holidays, the Jet Truck will be driven to the compost dump and the tank will be emptied and the filter cleaned.
- Do any and all other necessary maintenance as needed.

Approved by: Rick Johnson, Distribution & Collections Systems Manager
Uncontrolled in hard copy unless otherwise marked

WE BUILD COMMUNITY

Purpose:

1. To provide guidelines for the safe hauling and towing of Public Services equipment.

Policy:

2. No vehicle shall be driven or moved or any highway unless it is constructed and loaded to prevent any of its load from dropping, shifting, or otherwise escaping.

3. Heavy equipment and materials shall be securely fastened and properly situated to avoid shifting.

4. Chains or tie-downs of sufficient strength shall be provided for securing all heavy equipment.

5. All boom hooks shall be fitted with a safety clip.

6. When towing another vehicle or trailer, the drawbar or other connection shall be of sufficient strength to pull all towed weight, and shall not exceed 15 feet.

7. Pipe, ladders, etc. shall be loaded parallel with the truck length and carried as high as is practical above the height of the cab or pick-ups, or lying flat and properly secured on the beds of other trucks which carry such equipment.

8. Whenever a load extends to the rear 3' 5" or more beyond the bed or body of a vehicle, red flags not less than 12 inched square, must be placed on the load to mark its length and width during daylight hours. At night, a red lamp shall be attached. Red flags approved clearance lights shall be attached to loads extending wo (2) feet of more beyond the front of the vehicle.

9. Tools, equipment and materials shall not be permitted to extend beyond the permanent fixtures provided on the sides of the truck.

10. Employees shall not ride on materials or equipment being carried on trucks, nor shall they be permitted to sit on binds, stand up (unless handholds are provided), ride on the running board, fenders, or any part of any motorized equipment. They are to sit on seats, if they are provided, or as near the bed of the vehicle as possible.

Exception:

11. Distance can exceed 15 feet when transporting poles, pipes, machinery, or other objects that cannot be readily dismembered. When the connection consists of a chain, rope, or cable, a white flag not less than 12 inches square must be displayed on the connection.

Responsibility:

12. It shall be the responsibility of each Supervisor to insure that all hauling equipment in use is checked at the beginning of each shift to assure that the parts, equipment, and accessories are in safe operating condition and free of apparent damage which could cause failure while in use.

Purpose:

1. To advise that all Supervisors will be responsible for the maintenance, repair, and record keeping requirements of all self-contained breathing apparatus assigned to their Plant/Facility in accordance with the following:

Procedures:

1. All self-contained breathing apparatus must be stored in a convenient, clean, dry and accessible location, adjacent to a facility area that may require usage (not in CL2) room. If in doubt contact the Safety and Training Office.

2. All apparatus must be site-inspected by the 10th of each month and such inspections are to be documented on the Work Log to show:
    a. P.C. number
    b. Date
    c. Condition of the unit
    d. Action taken if necessary (i.e., specific repairs/ tank filled etc.) and location-sub-location number. (i.e., Work code 112… sub-code 200.

3. The mask and hose are to be checked every month and each time before use, as well as cleaned and disinfected after each use. The tanks are to be hydrostatically testes at five (5) year intervals from the anniversary date stamped on the tank. This service is available in accordance with the current contract.

4. All Number 2 Fire Station located at 528 NW 2nd Street will handle necessary repairs for valves, regulators, and hoses **ONLY.** They will forward appropriate charges to the department on an itemized ETV. Replacements due to deterioration beyond repair will be based on the recommendations of the Fire Department.

5. All requests for these types of repairs to the Fire Department will be accompanied by a Public Services Administration Form #20. Copies will be distributed to the Fire Department, Finance, and the Supervisor.

6. All service requests to the Fire Department must be accompanied by written approval from the Chief/Mechanic/Supervisor and must include property control of numbers and location codes. (Use Form 20.)

7. Each supervisor will be responsible for the initial and periodic refresher training of the employees assigned to him for the proper usage if the units. Including principal characteristics, location, routing maintenance requirements and limitations of the units, as well as pertinent procedures necessary to routing and emergency operations requiring the use of such units.

8. Assistance with specialized training may be obtained by contacting the Safety and Training Office.

9. All tanks are to be refilled immediately following training which requires actual demonstrations of the units when air is used. Tanks can be refilled at Number 2 Fire Station with written approval of the Manager or Supervisor.

10. All such Safety Training must be documented on the work Log in accordance with procedures outline in the Work Request Job Control System, i.e., subject matter, employees trained, total training hours for each session, location/sub-location number and work code, i.e., Work code 0112 Sub-code 270.

Purpose:

This is to establish guidelines for the purchase of first issue new and replacement of worn or lost tools, equipment, and parts.

Failure to follow this standard operating procedure can result in disciplinary action up to and including termination.

Procedure:

For first issue tools, equipment, and parts all Division Chiefs and Supervisors shall determine what tools, equipment, and parts are needed to complete the job responsibilities by the workers/crews.

The worker/crew is accountable for the tools and repair parts in their vehicle or shop.

The tool and equipment request form must be completed and approved prior to purchasing tools or equipment as follows:

Approval Level	Amount of Expenditure (Tools & Equipment)
Chief	**$100 - $500 (<)**
Supervisor	**$500 and greater (>)**

The tools, equipment, and parts request form may be completed in the aggregate if more than one tool is being purchased.

Responsibility:

1. Worker/Crew:

    i. The worker/crew are to complete a tools, equipment, and parts request form and submit to the Chief for approval prior to making the purchase.

2. Chiefs and Supervisors:

    i. Chiefs and Supervisors are to review all tools, equipment, and parts request forms received from their employees and ensure requirement and appropriateness to do the job prior to approving the purchase.

    ii. Chiefs and Supervisors are to complete a tools, equipment, and parts request form and obtain approval from their direct supervisor prior to making the purchase.

3. Tools, equipment, and parts request form for a value less than $5,000 < should be charged to sub-object tools and equipment (3946) or office equipment (3925) whichever is applicable.

2. Tools, equipment, and parts for a value greater than $5,000 > should be charged as a fixed asset and use Capital Outlay character (60). For example sub-object 6499 is used for other equipment.

3. If a tool is being replaced because it is missing, damaged, vandalized, or stolen property, reference procedure PW-UTL-DC-GEN EQ-16 for action and reporting requirements.

Replacement Considerations:

4. Under what circumstances was the tool missing (e.g. on the job, overnight, missing from the truck, etc.)
5. What efforts have been made to locate missing tools?
6. What action has been taken to prevent similar occurrences?
7. Is replacement due to reaching life expectancy of the tool?
8. Is the tool broken and no longer usable?
9. Can the tool be repaired?

Property Control and Retirements

The City's General Fixed Assets Policy both for Capital assets and Closely – Controlled Items shall be followed. Reference the City's Policy and Standards Manual - Ch. 9 Sec. 16 Sub. 1. Departmental.

Once tools or equipment have been replaced, they are declared surplus and are either sold at auction or recycled; depending on its condition. The Sanitation Program Manager is responsible for coordinating the disposal of surplus shop tools and equipment with the City's Purchasing Buyer.

Attachment:

- Tools and Equipment Request Form

Related Standard Operating Procedures

- PW-UTL-DC-GEN-EQ-11 - Vehicle Tools and Repair Parts Inventory.
- PW-UTL-DC-GEN EQ-15 - Missing, Damaged, Vandalized, or Stolen Property, Reference Procedure.

This section is intentionally left blank……

Date: ___8-2-19_____

Requested By: _____Larry Teich_____

Check one below:

New Tools, Equipment, and Parts: ☐ *Replacement of Tools or Equipment:* ■

Tools, Equipment, and Repairs Parts:

_____Office Chair_____-
_____

Tools or Equipment Cost: $_____$408.40_____
(Form must be completed for tools, equipment, and parts that cost $100.00 or greater).

Reason for Request: _____
Office chair warned out
Index Code: PBS690602 Sub-Object: _____3926_____

Tools & Equipment – use sub-object 3946 or for Office Equipment use sub-object 3925.

In which inventory will this Tool, Equipment, or Repair Part will be maintained: _____

If this part is being installed in the infrastructure, provide the related Q-Alert # _____.

Employee Requesting Tool Signature _____Date:_____

Approved by Supervisor: _____Date:_____

Approved by Manager:_____ Date:_____

Approval Level	Amount of Expenditure (Tools & Equipment)
Chief	**$100 - $500 (<)**
Supervisor	**$500 and greater (>)**

Date: _____

Requested By: _____

Check one below:

New Tools or Equipment: ☐ *Replacement of Tools or Equipment:* ☐

Tools or Equipment Requested: _____

*Tools or Equipment Cost: $*_____
(Form must be completed for tools or equipment that cost $100.00 or greater). A Police Report shall be completed for missing tools with a value greater than $500.

Reason for Request: _____
_____
_____
_____

Index Code: _____ Sub-Object: _____
Tools & Equipment – use sub-object 3946 or for Office Equipment use sub-object 3925.

Employee Requesting Tool Signature _____Date:_____

Approved by Supervisor: _____Date:_____

Approval Level	Amount of Expenditure (Tools & Equipment)
Chief	**$100 - $500 (<)**
Supervisor	**$500 and greater (>)**

PURPOSE

This Public Works policy is to provide guidance for Preventive Maintenance (PM) which consists of scheduled servicing, inspections, and vehicle repairs to prevent potential problems, maximize vehicle availability, and proactively avoid or reduce vehicle breakdowns.

The Public Works Department will follow appropriate vehicle maintenance protocol listed but not limited to below:

1. Follow Preventative Maintenance service routines in a timely manner to identify vehicle problems and keep vehicle systems in good repair.

2. Schedule repairs promptly in order to minimize service interruptions and vehicle downtime.

3. Ensure that City vehicles are safe, serviced regularly, and clean.

4. Conduct daily inspections to identify any vehicle damage according to Public Works procedure PW-UTL-DC-GEN-EQ-2- Daily Vehicle Maintenance and any other appropriate vehicle maintenance procedures.

PREVENTITIEVE MAINTENANCE SCHEDULING

Public Works Fleet Services implemented a Preventative Maintenance program that is mileage based. The maintenance schedule takes into account the vehicle type, model, manufacturer, preventative maintenance required for warranty, and industry standard remediation for preventative maintenance for each vehicle.

Procedure:

1. Fleet Services provides monthly notification to all City Departments of required vehicle preventative maintenance. This report includes the vehicle number, description, mileage intervals, responsible supervisor, and preventative

maintenance due date.

a. Utilities Managers, Supervisors, Chiefs, and staff must comply with the preventative maintenance schedule and take their vehicle for maintenance during their scheduled service intervals.

b. When the vehicle is taken to First Vehicle Services (Fleet Vendor) for maintenance, it is the vehicle's operator's responsibility to remove portable tools and to return them back to the vehicle when the maintenance is completed.

c. Compliance with the preventative maintenance is **mandatory and will be monitored.** While there may be operational events (emergencies) that prevent a vehicle from being sent for regular preventative maintenance, this should be the exception, not the norm. When this arises, the operator of the vehicle must elevate this situation to his/her supervisor for rescheduling of the preventative maintenance with First Vehicle Services (Fleet Vendor).

2. An important aspect of preventive maintenance is the establishment of strong communication between the drivers and management.

Purpose:

This policy is to establish guidelines for conducting and maintaining vehicle, Equipment, tools, and repair parts inventories.

This inventory procedure is in line with the City's General Fixed Assets Policy referenced in the Policy Standards Manual – Chapter 9 Section 16 Subsection 1.

Failure to follow this standard operating procedure can result in disciplinary action up to and including termination.

Truck/Vehicle Tools Inventory Guidelines:

For vehicle tools and repair parts inventory, all Division Chiefs or Supervisors shall determine what tools are needed to complete the job functions by the workers or a crew. The inventory will be assigned to the driver of the vehicle.

The inventory shall contain tools and repair parts. It may contain tools that are unique to a trade, individual's skills, and discipline.

What to consider for a Vehicle Inventory:

- What work is being performed?
- Is the worker part of a team and works in a crew?
- What specialty function will the worker be working in?
- The life expectancy of the tools being purchased.
- Whether the tools are available by approved tool vendors.
- If a worker is taking a previously vacated position, the tools assigned to the employee vacating the position should be taken into account before purchasing additional tools.

Items to Inventory

Tools, equipment, and parts of a value of $500 and greater shall to be inventoried. The supervisor may deem it necessary that other tools, equipment, and parts of a value less than $500 be inventoried.

Vehicle/Truck Driver Inventory Responsibility:

- **Inventory verification, frequency, and record keeping:**

  A vehicle tool inventory shall be completed daily at the beginning of each shift and after each crew change, or as determined by the Division Manager.

  1. The Emergency Trailers' inventory shall be done after each use or at a minimum monthly.

  2. The driver of the vehicle will maintain a binder or electronic copies of each completed daily inventory log.

  3. The Chief or Supervisor shall maintain a binder or electronic copy with the original daily completed inventory logs for the vehicles under their responsibility.

  4. The logs will be scanned weekly and archived in the shared folder. The folders will be maintained in the following network location: S:\Departmental\D&C\Inventories.

- **Tool Inventory verification steps:**

  1. Perform the vehicle inventory at the beginning of each shift or after a crew change.

  2. Record the inventory item information and quantities in the vehicle inventory log.

  3. Upon completion of the inventory, the driver shall sign, make a copy, and turn-in the original inventory log to the Chief daily.

  4. The copy of the inventory log is to be placed back in the inventory binder and maintained in the vehicle.

  5. If the inventory shows discrepancies, the driver taking the inventory shall complete the log with the quantity on hand and

follow the steps in the Missing, Damaged, or Stolen Property Procedure (PW-UTL-DC-GEN-EQ-15) for notification and reporting.

- **Sharing Vehicles:**

6. When a vehicle is shared, the employee completing the shift shall be present when the next driver is taking the inventory. This is to address any differences and have a chain of custody.

7. If the inventory shows discrepancies, the driver taking the inventory shall complete the log with the quantity on hand and follow the steps in the Missing, Damaged, or Stolen Property Procedure (PW-UTL-DC-GEN-EQ-15) for notification and reporting.

- **Borrowing Tools:**

8. If a tool needs to be borrowed and used by another crew, notification will need to be provided (email, text) to the supervisor and update the inventory accordingly.

Chief or Supervisor Responsibility:

- The Chief or Supervisor shall verify daily or as instructed by the Division Manager that the vehicle inventories under their responsibility were completed. The verification of the Vehicle Inventory Log consists of review and approval signature for each vehicle under their responsibility.

- In order to maintain record retention, the section Chief or Supervisor shall maintain a binder with the completed daily inventories for the vehicles under their responsibility.

- The logs will be scanned weekly and archived in the network shared folder. The folders will be maintained in the following network location: S:\Departmental\Inventories.

- When an employee is vacating a position, an inventory shall be conducted by the Chief or designee responsible for the inventory on the

vehicle assigned to the employee vacating position so there is a transfer of responsibility from the employee to the supervisor or designee.

Division Supervisor, Facilities Manager, and Manager Responsibility:

- The Division Supervisor and Manager shall oversee, guide, support, and verify that the Chief and drivers responsible for the vehicle inventories are being done, reported, and that all staff involved are following this procedure.

Missing, Damaged, Vandalized, and Stolen Tools Guidelines:

- If items are missing, damaged, vandalized, or stolen, the employee shall follow the reporting procedure PW-UTL-DC-GEN-EQ-15 which is in line with the City's Risk Management Manual noted in the Property Insurance Section - Reporting Procedures. The Chief, Supervisor, and Manager are responsible for the timely execution of reports necessary in the event that items are missing, damaged, lost, or stolen.

  Note: If the equipment is damaged, verify with the Supervisor if it's still under warranty.

Tools and Equipment Retirement and Disposal:

- Once tools or equipment have been replaced, they are declared surplus and are either sold at auction or recycled; depending on its condition. The Sanitation Program Manager coordinates the disposal of surplus tools and equipment with the City's Purchasing Buyer.

- Retirements apply to all assets including land, buildings, machinery and equipment, vehicles, and general infrastructure. For details reference City General Fixed Assets Policy - PSM 9.16.1.

Definition (s):

Tool, Equipment, and Part: A device or part used to or in the repair of the water and wastewater infrastructure.

Related Standard Operating Procedures:

Public Works:

- PW-UTL-DC-GEN-EQ - 8 – Purchase Procedure – Tools, Equipment, Parts and Request Form
- PW-UTL-DC-GEN-EQ - 12 – Vehicle Inventory Log
- PW-UTL-DC-GEN-EQ - 15 – Missing, Damaged, or Stolen Property

Risk Management:

- Report of Damage or Loss to City Property Form
- City's Risk Management Manual noted in the Property Insurance Section - Reporting Procedures (Page 22).

Finance:

- City General Fixed Assets Policy - 9.16.1

VEHICLE INVENTORY								
DATE:								
VEHICLE #:								
CREW #:								
RESPONSIBLE CHIEF (PRINT NAME)								
ITEM NAME AND DESCRIPTION	**MAKE**	**MODEL**	**SERIAL #**	**ASSET TAG for (>=$5,000)**	**PURCHASE DATE**	**PURCHASE OR ESTIMATED COST**	**QUANTITY**	**COUNT**
PREPARED BY *(SIGNATURE)*				TITLE:		DATE:		

APPROVED BY (SIGNATU			TITLE:		DATE:

Purpose:

This policy is to establish guidelines for conducting and maintaining shop inventories.

This inventory procedure is in line with the City's General Fixed Assets Policy referenced in the Policy Standards Manual – Chapter 9 Section 16 Subsection 1.

Failure to follow this standard operating procedure can result in disciplinary action up to and including termination.

Shop Inventory Guidelines:

For Shop inventory, all Division Chiefs or Supervisors shall determine what tools are needed to complete the job functions by the workers. The inventory will be assigned to one worker per shop.

The inventory shall contain tools and repair parts. It may contain tools that are unique to the trade, individual's skills, and discipline.

Items to Inventory

Tools, equipment, and parts of a value of $500 and greater shall be inventoried. The supervisor may deem it necessary that other tools, equipment, and parts of a value less than $500 be inventoried.

Inventory Responsibility:

- **Inventory verification, frequency, and record keeping:**

1. A shop inventory shall be completed monthly.

2. A shop inventory binder shall be maintained by the worker assigned to the inventory.

3. The logs will be scanned monthly and archived in the network shared folder. The folders will be maintained in the following network location: S:\Departmental\Inventories.

- **Shop Inventory verification steps:**

    1. Worker assigned to the shop inventory will perform the inventory monthly.

    2. Record the inventory item information and quantities in the shop inventory log.

    3. Upon completion of the inventory, the worker shall sign, make a copy, and turn-in the original inventory log monthly to the supervisor.

    4. The copy of the inventory log is to be placed back in the inventory binder and maintained in the shop.

    5. If the inventory shows discrepancies, the worker performing the inventory shall update the log with the quantity on hand and follow the steps in the Missing, Damaged, or Stolen Property Procedure (PW-UTL-DC-GEN-EQ-15) for notification and reporting.

Chief or Supervisor Responsibility:

- The Supervisor shall verify monthly that the shop inventories under their responsibility were completed. The verification of the Shop Inventory Log consists of review and approval signature for each inventory under their responsibility.

- The logs will be scanned monthly and archived in the network shared folder. The folders will be maintained in the following network location: S:\Departmental\Inventories.

- When an employee is vacating a position, an inventory shall be conducted by the Chief or designee responsible for the inventory so there is a transfer of responsibility from the employee to the supervisor or designee.

Division Supervisor and Manager Responsibility:

- The Division Supervisor and Manager shall oversee, guide, support, and verify that the Chief and workers responsible for the Shop inventories are being done, reported and that all staff involved are following this procedure.

Missing, Damaged, Vandalized, and Stolen Tools Guidelines:

- If items are missing, damaged, vandalized, or stolen, reference procedure PW-UTL-DC-GEN-EQ-15 for property reporting which is in line with the City's Risk Management Manual noted in the Property Insurance Section - Reporting Procedures. The Chief, Supervisor, and Manager are responsible for the timely execution of reports necessary in the event that items are missing, damaged, lost, or stolen.

  Note: If the equipment is damaged, verify with the Supervisor if it's still under warranty.

Tools and Equipment Retirement and Disposal:

1. Once tools or equipment have been replaced, they are declared surplus and are either sold at auction or recycled; depending on its condition. The Sanitation Program Manager coordinates the disposal of surplus tools and equipment with the City's Purchasing Buyer.

2. Retirements apply to all assets including land, buildings, machinery and equipment, vehicles, and general infrastructure. For details reference City General Fixed Assets Policy – PSM 9.16.1.

Definition (s):

Tool, Equipment, and Parts: A device or part used to or in the repair of the water and wastewater infrastructure.

Related Standard Operating Procedures:

Public Works:

- PW-UTL-DC-GEN-EQ -8-Purchase Procedure – Tools, Equipment, Parts and Request Form
- PW-UTL-DC-GEN-EQ-14-Shop Inventory Log
- PW-UTL-DC-GEN-EQ-15–Missing, Damaged, or Stolen Property

Finance:

- City General Fixed Assets Policy - PSM 9.16.1 & Fixed Asset Disposal Form

SHOP INVENTORY LOG								
DATE:								
LOCATION								
WORKER NAME								
RESPONSIBLE SUPERVISOR (PRINT N								
ITEM NAME AND DESCRIPTION	**MAKE**	**MODEL**	**ASSET TAG for (>=$5,000)**	**SERIAL #**	**PURCHASE DATE**	**PURCHASE OR ESTIMATED COST**	**QUANTITY**	**COUNT**
PREPARED BY *(SIGNA*			TITLE:			DATE:		

APPROVED BY (SIGN)		TITLE:			DATE:

Purpose:

The purpose of this procedure is to establish departmental guidelines in the event of missing, damaged, vandalized, or stolen City property. This procedure is in line with the City's Risk Management Manual noted in the Property Insurance Section - Reporting Procedures.

Failure to follow this standard operating procedure can result in disciplinary action up to and including termination.

Responsibilities:

- Anytime a tool or equipment is missing or possibly stolen, an immediate search shall be initiated by the crew or worker responsible for the property.

- If the property cannot be located after a search, the following notifications and report shall be executed.

Reporting Procedures:

- Reporting procedure for missing items with a cost of **$100 - $499**:

    1. The Driver or Worker shall immediately notify the Chief of missing items.
    2. Complete and submit as soon as possible the "Report of Damage to City Property" form to Risk Management.

- Reporting Procedures for missing items with a cost of **$500 or greater**:

    1. The Driver or Worker shall immediately notify the Chief of missing items.
    2. Complete an inventory of all stolen property and establish monetary values.
    3. The Chief shall immediately notify their supervisor and upper management on their chain of command.
    4. The Police Department's non-emergency number (954-764-4357) shall be contacted immediately to complete a police report for missing, damaged, vandalized, or stolen property.

5. Complete and submit the Risk Management "Report of Damage to City Property" form within 24-hours or as soon as possible.

6. Complete Risk Management Supervisor's Accident or Incident Report - FORM K-104 Rev 11/99 within 24-hours or as soon as possible.

Risk Management Requirements:

1. Fidelity and crime losses or incidents shall be reported to Risk Management.

2. If the loss is expected to exceed $5,000, notification of such incidents shall be immediately provided to the Risk Management Division at (954) 828-5177 or riskmanagement2@fortlauderdale.gov.

3. Immediately contact the Police Department to complete a report. (954)-764-4357.

4. In the event of serious incidents after normal working hours, such as significant injury, death, or losses of $25,000 or more, please contact:
    a. Risk Manager at (954) 483-8776 or ghine@fortlauderdale.gov
    b. Risk Management Coordinator at (954) 554-5467 or mcobb@fortlauderdale.gov

5. All pertinent information shall be documented immediately by the supervisor or department director. Do not rely on the police investigation solely.
6. Complete Report of Damage to City Property (Exhibit 1).
7. Complete the Supervisor's Accident Investigation Report, Form K-104 (Exhibit 2).
8. Complete an inventory of all stolen property and establish monetary values.

The Report of Damage to City Property Report shall contain the following known information:

1. Department, Division, and Section name
2. Date and approximate time of incident.
3. Including location of incident.
4. Police Report number.
5. Property information.
6. Description of property loss.
7. Estimated value of missing property.
8. Employee and immediate supervisor name and signature

Missing Property Considerations:

i. Under what circumstances was property missing? (e.g. on the job, overnight, missing from the truck, etc.)
ii. What action has been taken to prevent similar occurrences?

Related Standard Operating Procedures and Forms:

- City's Risk Management Manual noted in the Property Insurance Section, Reporting Procedures.
  - Report of Damage to City Property (Exhibit 1).
  - The Supervisor's Accident Investigation Report, Form K-104 (Exhibit 2).

Purpose:

The vehicle Inspection Form is a legal form. If you have a crash and there's a legal investigation, the investigators are going to look for the vehicle Inspection forms and make sure that you did not detect any defects with that vehicle. They may review previous forms to make sure that the driver didn't note a defect on that vehicle for weeks before the accident.

Responsibilities:

Vehicle Inspection Forms should be completed:

1) Before the vehicle leaves the yard in the morning

2) Whenever another driver is assigned to, or takes over your vehicle.

You must do a vehicle inspection on the piece of equipment (vehicle) you are driving.

You must perform a new vehicle inspection when you transfer your vehicle to a new driver on a job that keeps your vehicle working past your shift. When the other driver comes in, you do a new vehicle inspection with the incoming driver to document the vehicle condition at the time of transfer.

Procedures:

1. Complete the vehicle Inspection Form in its entirety.
2. Describe in detail any deficiencies that are found in the “Notes” section below the checklist.
3. Print your name and sign at the bottom.
4. Make a copy of the form. Give the original to your Chief and place the copy into the binder in your vehicle. The current form should be on top in the appropriate section.
5. Advise your Chief of any deficiency that needs immediate attention. Do not drive an unsafe vehicle.

Vehicle Inspection Report

Vehicle Number_____ Odometer Reading (no tenths)_____ Date:_____ Time:_____

Describe any deficiencies in the notes section below.

Exterior	**OK**	**NOT OK**
Body Condition	☐	☐
Windshield	☐	☐
Wiper Blades	☐	☐
Windows	☐	☐
Mirrors	☐	☐
Exhaust System	☐	☐
Tires, Inflated	☐	☐
Tires, Damaged	☐	☐
Lug Nuts	☐	☐
Fluid Leaks	☐	☐
Mud Flaps	☐	☐
Trailer Hitch	☐	☐
Vehicle Number Visible	☐	☐
Compartment Locks	☐	☐
Lights		
Head lights	☐	☐
Tail lights	☐	☐
Back-up Lights	☐	☐
Turn Signals	☐	☐
Safety Lights	☐	☐
License Plate	☐	☐

Engine Compartment	**OK**	**NOT OK**
Oil Check	☐	☐
Brake Fluid	☐	☐
Transmission Fluid	☐	☐
Coolant Check	☐	☐
Power Steering Fluid	☐	☐
Hoses	☐	☐
Belts	☐	☐
Washer Fluid Level	☐	☐
Operation		
No Warning Lights (On dash)	☐	☐
Oil Pressure	☐	☐
Steering Operation	☐	☐
Transmission	☐	☐
Brakes	☐	☐
Dump Operation	☐	☐
Boom Operation	☐	☐
Back-up Alarm	☐	☐
Back-up Camera	☐	☐

Interior	**OK**	**NOT OK**
Air Conditioner	☐	☐
Heater	☐	☐
Door Locks	☐	☐
Foot Pedals	☐	☐
Horn	☐	☐
Wipers Function	☐	☐
Light Switches	☐	☐
Instrument Gauges	☐	☐
Fuel Level	☐	☐
Dash lights	☐	☐
City Radio	☐	☐
Fire Extinguisher	☐	☐
First Aid Kit	☐	☐
Brakes	☐	☐
Parking Brake	☐	☐
Seat belts	☐	☐
Clean interior	☐	☐
Insurance Card	☐	☐
Registration	☐	☐

Notes:_____
_____
_____
_____

Driver Print Name _____ Driver Signature _____

Supervisor Name _____ Supervisor Signature _____

VEHICLE, EQUIPMENT & TOOLS SECURITY - POLICY

Rev: 1 | **Revision Date:** 9/21/2018
I.D. Number: PW-UTL-DC-GEN-EQ-19-Vehicle Equipment & Tools Security
Uncontrolled in hard copy unless otherwise marked

Purpose

The purpose of the Vehicle, Equipment & Tools Security Policy is to define and provide basic rules for keeping City vehicles and equipment properly secured. This is being done in an effort to ensure that community builders take appropriate precautions to prevent loss or theft of City vehicles and equipment.

Policy

General:

1. Vehicles and vehicle compartments shall be locked at all times. This includes:
    a. When vehicles are parked on City properties, such as City Hall, Public Works Administrative Compound, Central Maintenance Shop (CMS), Prospect and Dixie Wellfields, Water and Wastewater Plants, Pump Stations, and other Public Works Facilities.
    b. While vehicles are parked on job sites.
    c. While vehicles are in transit to and from sites.

2. City Equipment and Tools shall be stored in their proper storage compartments and the compartments shall be locked in order to prevent unauthorized access. No tools or equipment are to be left out in open truck beds without some method of securing to prevent theft.

3. Community builders agree to take responsibility for the security of their equipment and tools. Whenever a tool is used on a jobsite, the user assumes responsibility for the physical security of the tool.

4. Community builders shall take proper care of their tools and equipment. Carelessness or negligence in the use of City property is grounds for discipline as per City Policy 6.7.1, Disciplinary Action.

Any employee found to have violated this policy may be subject to disciplinary action, up to and including termination of employment.

Related Policies and SOP's

- PW-UTL-DC-GEN-EQ-11- Vehicle Tools, Equipment, and Repair Parts Inventory.
- PSM 6.7.1 Disciplinary Action
- PSM 9.11.5 Mobile Device Policy

Events

This document contains guidelines to be followed when determining what areas are affected by an event.

- The Utility Field Representative will determine the number of valves needed to isolate the incident (either water or sewer pipe break, or other event which may require infrastructure to be isolated).
- The Utility Field Representative will verify the valves are operational.
- The number and location of the valves will be communicated to the GIS Specialist.
- The GIS Specialist will then identify the affected properties on a map and estimate the number of affected neighbors.
- The GIS Specialist will then email the deliverable to the Division Managers.

Purpose:

To unify individual departmental SSO Polices into one standard interdepartmental SSO Policy and to provide detailed instructions on how to complete the attached SSO worksheet.

Section 1:
To be completed by the First Responder and Manager

1. If you are the first responder, please complete Section 1, items I through 25. Note, the first responder should be a representative from the affected area (Distribution & Collection (D&C), Water Treatment, Wastewater Treatment, etc.), but it does not have to be. Once a Manager from the affected area is on site, the partially completed SSO Worksheet can be given to the Manager or a designee to complete. If the event takes place over multiple shifts then the Manager or the designee will assign the record keeping responsibilities as he or she sees fit.
2. Write the Q-ALERT number assigned to the event in this box.
3. Write the time you're filling out the form in this box.
4. Write your name in this box. You are the first responder.
5. Write the address of the event in this box.
6. Write your crew number or radio call number in this box.
7. Write the time you received the call from the dispatcher in this box.
8. Write your Department and Division in this box, for example D&C would write 70/66.
9. Write the time you arrived on scene in this box.
10. Write the name of the Dispatcher you have been communicating with in this box.
11. Ask the Dispatcher for the time the first call came in and write that in this box.

12. Write the Manager's name that is on site. This person should represent the owner, for example, an event at a water treatment plant would require a member of the water treatment plant management team to be on site. Managers are expected to be on site if the estimated spill is over 500 gallons.
13. Write the time when the flow or discharge was stopped in this box.
14. Write the name of the Environmental Representative on site in this box.
15. If you believe the spill is between 0 and 999 gallons check the box in front of that selection. If you believe the spill is between 1,000 and 10,000 gallons check the box in front of that selection. If you believe the spill is more than 10,000 gallons, check the box in front of that selection.
16. Write the name of the Public Information representative contacted.
17. Before writing a number in this box the volume must be calculated using a repeatable method and the results approved by a Division Manager. This calculation can be done after the repairs are made but must be completed before closing out the event.
18. Describe the possible cause in a couple of words, such as "Pipe Break", "Clogged Gravity", etc.
19. Check the boxes that most appropriately describe the SSO. For example, if there is a clogged lateral on the owner's side and the clog is due to palm tree roots you would check the boxes that read Private, Lateral, and Gravity; write 4" next to Size; write Cast Iron next to Material; check the box in front of Roots; and describe the SSO in more detail in the open space.
20. Check all boxes that apply. For example, if the SSO was in the parking lot of a mall and entered a private catch basin, you check the Catch Basin, Ground, Public Access Area boxes. If you know the Catch Basin is part of an Exfiltration System, you would check that box as well.

At this point you now have now gathered enough information to be able to apply the specific policy designed to address the specific situation.

A. Procedures for gravity pipe breaks and/or overflows

- All staff should follow the appropriate safety procedures at all times. The police should be called to maintain traffic patterns if needed.
- Determine the location of the stoppage or damaged pipe.
- If an SSO is occurring, by-pass pump or tanker the system until the overflow condition ceases or the main is repaired.
- If the main is clogged, use the equipment available (roding machine, snake, vacuum truck, etc.) to break the stoppage.
- If the main is broken determine the depth:
  (1) If it is able to be repaired by in-house crews then make the repair.
  (2) If it is not able to be repaired by in-house crews then refer it to the annual emergency repair contractor after consultation with the D&C Division Manager, or the corresponding Plant Manager as applicable.
- Sanitize and deodorize the area.

B. For pressure pipe breaks / force mains /pump stations

- All staff should follow the appropriate safety procedures at all times. The police should be called to maintain traffic patterns if needed.
- Redirect flow to an alternate force main if available.
- In the event there is no alternate force main available tankering or bypass pumping will be implemented.
- Isolate the damaged force main or station.
- Turn off pumping stations impacting the damaged area.
- Determine the depth:
  (1) If it is able to be repaired by in-house crews then make the repair.
  (2) If it is not able to be repaired by in-house crews then refer it to the annual emergency repair contractor after consultation with the D&C Division Manager.

- Place the force main or station back in service.
- Sanitize and deodorize the area.

21. Write the name of the Dispatcher or Customer Service representative you spoke with when you provided an update in this box.
22. Write the time and date the update was given to Customer Service in this box.
23. Describe the cleanup effort in this box. Include a count of the number of vacuum truck loads taken from the event site, the capacity of the vacuum trucks used, and any other cleanup methods used such as truckloads of wet soil removed.
24. Describe the repair method used in this box.
25. This box will be filled out by a Manager after considering the alternatives.

Section 2:
To be completed by a Customer Service Representative

26. Write the date and time the informational email was sent in this box. Customer Service will send an email to "key" personnel and the following people must be included on this type of email:

    - Armondo Kale; Chaz Adams; Christian Carbonera; Christopher Woolweaver ; Donna McMahon; Donnell Cunningham; Erin Saey; Fred Ross ; Gary Durrant ; Jeanne Brown ; Jina Moore ; Joe Heyward ; Joseph Precanico ; Jud Hopping; Keith Hutchison ; Kenya Baker ; Larry Teich ; Marie Pierce ; Marla Donald; Mary Crance; Matt Little; Melissa Doyle ; Randy Rufrano ; Reina Gonzalez ; Rick Johnson ; Rosemary Collette ; Shannon Vezina; Steve Roberts Jr ; Talal Abi-Karam ; Todd Hiteshew ; Troy Balint ; Nancy Gassman; Glen Hadwen.

There is a prepared email script to use for the first notification, as well

as for any follow up emails necessary.

Please utilize the following script when notifying chain of command.

As the issue occurs:

Please be advised that an event may have occurred at (address) that the Environmental Department may need to respond to. This event is being investigated by the field crews. The Environmental Department, (staff member name), has been notified . (staff member name) will communicate with the field crews and determine the response.

Use this script after the issue has occurred and for follow up:

The event did not require any further action by Staff.
Or
(Staff member name) has informed us that the following has occurred:_____--'
(Fill in the blanks)

A. Customer Service Policy

- When Customer Service receives a report from anyone that indicates that sewage has overflowed into any public area (SSO), Customer Service has an obligation to contact the appropriate people in a timely manner.
- This issue must be repo1ted to the Environmental Services Division by the person who takes the initial call.
- First, get all of the pertinent information from the person reporting the SSO, including name, address of the issue, and a contact phone number.

- Next, create a Q-Alert Service Request and dispatch a crew. Call takers must verbally alert dispatch whenever the call is

received from the public.

- Then call the Environmental Services Division, either via phone or radio, making note of you are referring this issue to. Provide Environmental staff the Q-Alert SR# and who is responding in the field. The Environmental Services Division has an obligation to report this type of issue to Broward County Environmental Protection and Growth Management Depa1tment (EPGMD) within 8 hours of receiving notification that sewage has overflowed onto a public area.

27. Enter the names of the key personnel emailed in this box, including those listed above.

Section 3:
To be completed by an Environmental Services Representative

28. Write the name of the Environmental Services representative coordinating the efforts name and contact information in this box.

A. Environmental Services Policy

- If Sanitary Sewer (SS) hits the street, dispatch is to notify the on-call Environmental Services duty officer.

- Environmental Services duty officer needs to get the following information for notification purposes:
  - Date:
  - Address/ Location of Discharge: oSource of Discharge:

  - Time Sanitary Sewer Overflow (SSO) started:
  - Estimated Discharge/ Flow: *Discharge to:
  - Stormdrain/Waterway impacts:
  - Name of Waterway:
  - Plan of action:
  - Time SSO ended or is estimated to end:
  - Q-Alert #
  - Name and contact # of crew member onsite:

- Notify Broward County Hotline at 954-519-1 499. Leave the details above, as well as your name and contact phone number for BCH duty officer to call you back with questions or clarification. Document Call Date/Time for reporting form. (Notification timeframe is 8 hours).
- Notify the local West Palm Beach office of the Florida Department of Environmental Protection at 561-681-6694. Leave the details above, as well as your name and contact phone number for BCH duty officer to call you back with questions or clarification. Document Call Date/ Time for reporting form. (Notification timeframe is 8 hours).
- If the SS discharge is greater than 1,000 gallons and there is a stormdrain/waterway impact, the State Warning Point (SWP) must be notified at 1-800-320-0519. In this case, a duty officer with the United States Coast Guard (USCG) will answer and prompt you with questions, most of which can be answered by the information outlined above
- Additional information for the waterway name will be requested by the SWP duty officer.
- Environmental Services duty officer must document the CASE # for reporting form.

- A SS discharge greater than 1,000 gallons and discharged to a water body is the threshold for mandatory sampling. The duty officer will notify and coordinate sampling with the City's

Environmental Laboratory staff to ensure sample holding times are met. The laboratory's phone number is 954-828-7883.

- Based on the Point of Entry (POE), (SS discharge) the sampling locations in the water body will need to be determined , but at minimum they should include the following:
  - One sample at POE
  - One sample 200 feet upstream from the POE
  - One sample 200 feet downstream from the POE
- A map should be pulled from GIS to indicate documentation and reporting purposes.
  - Waterway access may dictate that sampling locations need to increased or decreased depending on the site topography.

- All of the information above should be documented by the Environmental Services duty officer and the Distribution and Collection (D&C) responding staff. Staff is responsible for generating and submitting the field SSO report to the Environmental Services Division the next business day so that the SS discharge can be documented and the wastewater utility/ abnormal event reporting form can be filled out and submitted to Broward County within the regulatory compliance period. Reporting period is 3 working days.
- For SS discharges greater than 1,000 gallons the following information will need to be documented by staff in addition to a creating a detailed timeline that can be utilized for developing and submitting a written report to the regulatory agencies, (e.g., Broward County and DEP).

29. Attach a copy of the map identifying the location.
30. Describe the sampling locations and attach a map.
31. Write the names, phone numbers, and any report numbers received from BCEPGMD, DEP WPB, and/or DOH in this box.

32. Write any questions or requests received from BCEPGMD, DEP WPB, or DOH in this box.
33. Write the responses give to BCEPGMD, DEP WPB, or DOH in this box.

34. Write the name of the City's Environmental Laboratory staff person contacted in this box.
35. Write the Date and time Environmental Services reported the laboratory test results in this box and attach the results.

Section 4:
To be completed by a Public Information Specialist:

36. Write the name of the Public Information Specialist coordinating communications for the event and contact information in this box.
37. Insert a copy of the Code Red message(s) in this box.
38. Insert a copy of the Press Release(s) in this box..
39. List other PIO tools used in this box.

Section 5:
The appropriate representatives should complete their respective boxes in this section.

40. The First Responder will sign in this box.
41. The First Responder will write the time and date he/she signed the form in th is box.
42. The Manager from the affected area reviewing the document will sign in this box.
43. The Manager from the affected area reviewing will write the time and date he/she signed the form in this box.
44. The Environmental Representative will print his/her name in this box.
45. The Environmental Representative will write the time and date he/she signed the form in this box.
46. The Environmental Representative will sign his/her name in this box.
47. The Public Information Specialist will print his/her name in this box.
48. The Public Information Specialist will write the time and date he/she signed the form in this box.
49. The Public Information Specialist will sign his/her name in this box.
50. The Environmental Laboratory Supervisor will print his/her name in this box.
51. The Environmental Laboratory Supervisor will write the time and date he/she signed the form in this box.
52. The Environmental Lab Supervisor will sign his/her name in this box.
53. The individual who gave the last update will print his/her name in this box.
54. The individual who gave the last update will write the time and date he/she signed the form in this box.
55. The individual who gave the last update will sign his/her name in this box.

56. The Manager from the affected area on-site will print his/her name in this box.
57. The Manager from the affected area on-site will write the time and date he/she signed the form in this box.
58. The Manager from the affected area on-site will sign his/her name in this box.

The template for the SSO Form is stored in the shared drive S:\Departmental\Environmental Resources\SSO. The policy /instructions are housed in the same location.

All completed sections will also be stored in the shared drive S:\Departmental\Environmental Resources\SSO \year

A representative from the Environmental Services Division will keep track of and assign the event number. The event number is a combination of the year, a hyphen, and a numerical value representing the next integer chronologically. For example, if the year the event occurred is 2013 and it is the fifth event of the year, the event number would be 2013-5. This number will be placed in the upper left hand corner of every page of the worksheet. The form will be titled by year, event number, address, section, and revision number. For example 2013-5 123 Main Street PIO (2). This tells the reader the year the event occurred was 2013, it was the fifth event of the year, the address was 123 Main Street, and that this was PIO's second revision.

Attachments:
SSO Form

SECTION 1: This section should be completed by the first responder, reviewed by Management, and submitted to Environmental Services within 24 hours (or within the next business day) of the event being reported.

1. Current Date:		**2. QAlert Number:**	
3. Current Time:		**4. Name:**	
5. Address:		**6. Crew Number:**	
7. Time SSO Reported:		**8. Department / Division of the Event**	
9. Time the initial responder arrived:		**10. Dispatcher:**	
11. Date and Time SSO started:		**12. Management representative:**	
13. Date and Time SSO ended:		**14. Environmental Representative:**	
15. Estimated volume of the spill in gallons:	☐ 0-999 ☐ 1,000 – 10,000 ☐ 10,001 +	**16. Public Information Officer contacted:**	
17. Calculated volume of the spill in gallons:	If you do not know, do not guess	**18. Possible Cause:**	
19. Describe the SSO:	***Source:*** ☐ Private ☐ Lateral ☐ Manhole ☐ Gravity ☐ Main ☐ Valve ☐ Force Main ☐ Pump Station ☐ Plant If Pipe: Size_____ Material_____ Age_____ ***Cause***: ☐ Roots ☐ Grease ☐ Debris ☐ Broken Pipe ☐ Pump Station Issue ☐ Other *Include the failed component. For example, A7 wet well overflowed or 18" force main break. Include a description of the area. For example, spill is contained in a 10' x 10' area. Attach any pictures taken.*		
20. Where did the overflow discharge to? Place a check mark next to all that apply. If other is used, write in a description.	☐ Catch Basin ☐ Exfiltration System ☐ Positive Drainage System ☐ Ground ☐ Water Body ☐ Park ☐ Public Access Area ☐ Other: Attach pictures taken.		
21. Follow up information provided to Customer Service. Name of dispatcher:		**22. Time and date the follow up was provided.**	

23. Describe the cleanup effort:	*Include the type of equipment used, chemicals, and the number of people on site. For example, two vacuum trucks and two crew trucks were on site from 9 p.m. to 11 p.m. Six employees used the two vacuum trucks, brooms, and shovels to clean the area while two employees spread disinfectant and deodorizer. In addition, include the number of vacuum truckloads removed from the site. Attach any pictures taken.*
24. Describe the Repair:	*For example, used a vacuum truck and jet to clean the line and break the stoppage or excavated and sleeved in a new piece of pipe. Attach any pictures taken.*
25. Steps taken to prevent reoccurrence:	
SECTION 2: This section to be completed by Customer Service.	
26. Date and time the informational email sent:	**Add Date, Time, Location** Please be advised that an event may have occurred at **(Location of event).** Environmental has been notified. **(Larry/Troy)** will communicate with the field crews and determine the response **(QAlert number)**
27. Key personnel contacted. Include date and time:	Send email to: PWCustomerService@fortlauderdale.gov As of August 2015 this distribution list includes: **Armondo Kale; Chaz Adams; Christian Carbonera; Christopher Woolweaver ; Donna McMahon; Donnell Cunningham; Erin Saey; Fred Ross ; Gary Durrant ; Jeanne Brown ; Jina Moore ; Joe Heyward ; Joseph Precanico ; Jud Hopping; Keith Hutchison ; Kenya Baker ; Larry Teich ; Marie Pierce ; Marla Donald; Mary Crance; Matt Little; Melissa Doyle ; Randy Rufrano ; Reina Gonzalez ; Rick Johnson ; Rosemary Collette ; Shannon Vezina; Steve Roberts Jr ; Talal Abi-Karam ; Todd Hiteshew ; Troy Balint ; Nancy Gassman; Glen Hadwen**
SECTION 3: This section to be completed by Environmental Services.	
28. Environmental representative coordinating the effort:	

29. Make a map showing the location of the event.	Attach a copy
30. Mark up a map showing the sampling location.	Attach a copy
31. Contact BCEPGMD/DEP WPB/ State Warning Point/ DOH as needed. List names, phone numbers, and report numbers if any.	
32. List questions / requests from BCEPGMD/DEP WPB/ State Warning Point/ DOH	
33. List the responses to the questions / requests from BCEPGMD/DEP WPB/ State Warning Point/ DOH.	
34. Lab person contacted	
35. Lab test results reported.	Attach a copy
SECTION 4: This section to be completed by the Public Information Officer.	
36. Public Information Officer coordinating the effort	

37. CodeRED message used			
38. Press Release Messages used	Attach a copy		
39. List other PIO tools used	Attach a copy		
SECTION 5: The following boxes in this section should be completed and signed by the			
40. First Responder Signature:		**41. Date/Time:**	
42. Reviewed By:		**43. Date/Time:**	
44. Env. Representative:		**45. Date/Time:**	
46. Signature :			
47. Public Info Officer:		**48. Date/Time:**	
49. Signature:			
50. Env. Lab Supervisor:		**51. Date/Time:**	
52. Signature:			
53. Last Updated By:		**54. Date/Time:**	
55. Signature:			
56. Manager On-site:		**57. Date/Time:**	
58. Signature:			

GENERAL- EVENTS- DISCHARGE AND OVERFLOWS

Rev: 0 | **Revision Date:** 6/29/2015 | **Print Date:** 8/14/2018
I.D. Number: PW-UTL-DC-GEN-EVT-3- Discharge and Overflows

This procedure is used when repairing a leak or stopping an overflow, to reduce the impact on the environment.

1. Determine the source of the discharge or overflow. If it is clean water or ground water, go to #2, if it is wastewater, go to #5.

CLEAN WATER OR GROUNDWATER

2. If the discharge is from a leak or overflow, the first priority is to stop the leak or overflow. If your assistance is not needed for this, you should attempt to prevent the flow from reaching a location where it can threaten the health or safety of the public, property, or environment. You may use the following options:

   a. Divert flow by creating a berm of fill, road rock, or sandbags. Try to divert the flow to swales or green areas first where the water can filter through the sand or evaporate. If there is no such area you can create the berm around the place you're trying to keep the flow from reaching. For example, building a berm at a seawall to keep the flow out of a canal or lake. Another example is building a berm or placing sandbags around a storm drain inlet.

   b. Use screens or filter fabric to filter out solids. An example would be to surround a storm drain inlet with fabric mounted on stakes (see attached detail drawing). Another example would be to place a length of fabric over a storm drain inlet and secure it down with a load of fill or rock. This may be the easiest and most effective option.

   c. Use hay bales or 3/4" washed rock to filter out solids. An example would be to surround a storm drain inlet with hay bales or 3/4" washed rock.

3. If the discharge is coming from a dewatering pump, position the discharge hose to direct the flow to a swale, grassy area, or an area where the water will cause the least damage or inconvenience. If that is not sufficient, use one or more of the above options.

4. If flow is draining into a storm drain system or into a surface water body, advise the dispatcher to notify Environmental Resources Division. They will decide whether to notify the environmental authorities.

WASTEWATER OR CONTAMINATED WATER

5. All discharges of wastewater or contaminated water are to be immediately reported to our Environmental Resources Division through the dispatcher.

If the discharge is from a leak or overflow, the first priority is to stop the leak or overflow. If your assistance is not needed for this, you should attempt to prevent the flow from reaching a location where it can threaten the health or safety of the public, property, or environment. You may use the following options:

   a. Divert flow by creating a berm of fill, road rock, or sandbags. Try to divert the flow to swales or green areas first where the water can filter through the sand or evaporate. If there is no such area you can create the berm around the place you're trying to keep the flow from reaching. For example, building a berm at a seawall to keep the flow out of a canal or lake. Another example is building a berm or placing sandbags around a storm drain inlet.

   b. Use an impermeable (watertight) fabric to keep the flow out. An example would be to place a length of fabric over a storm drain inlet and secure it down with a load of fill or rock.

6. Wastewater, or other contaminated water, is to be pumped only to sanitary sewer manholes or wet wells. If this is impossible, vacuum or tanker trucks may be used to dewater the site. Discharging directly on the ground is prohibited unless there is absolutely no choice. If this is the case the wastewater should be pumped directly to a swale or grassy area that will not reach a storm drain inlet, surface water body, or cause a hazard or serious inconvenience. If Wastewater has been discharged on the ground or on the street the area must be immediately disinfected, contact your supervisor for assistance.

7. All berms, screens, sandbags, or hay bales must be removed at the completion of the job and the area restored if necessary.

8. All storm drain structures must be uncovered and inspected. If sand, dirt, or other solids were deposited in the inlet or pipe, notify Crew Leader or Chief for referral to storm drain cleaning crew.

GENERAL- EVENTS- RAIN EVENT POLICY

Rev: 1 | **Revision Date:** 11/18/2015~~6/29/2015~~ | **Print Date:** 8/14/2018~~0/0/0000~~
I.D. Number: PW-UTL-DC-GEN-EVT-4- Rain Event Policy

This document contains guidelines to be followed in the event of significant rainfall.

Prior to a known significant rain event occurring:

Staff will be directed to clean the storm stations.

Staff will be directed to check the problem areas and each catch basin will be:

- Inspected visually.
- Cleared of debris including grate and outfall opening.
- The waste will be disposed of at the City's designated permit dewatering site for storm debris.

During a significant rain event:

Crews will be split into two person crews and redirected to monitor known problem areas and there again each catch basin will be:

- Inspected visually.
- Cleared of debris including grate and outfall opening.
- The waste will be disposed of at the City's designated permit dewatering site for storm debris.

City of Fort Lauderdale
Public Works Department

Hurricane Procedures

Index:

Introduction and Administrative Procedures 3

General Procedures for Supervisors.....4

Procedures for General Employees.....5

Engineering Bureau/ Divisional Plans
- General 6
- Facilities Maintenance Operations.....7-9
- Sanitation 1O

Utilities Bureau/ Divisional Plans
- Administration & Technical Services
  - Safety & Training 11-12
  - Process Control/ Communications 12
  - Process Control/ Wastewater 12-13
  - Process Control/ Water. 13-14
- Customer Operations
  - Field Operations.....15
  - Office Operations/ Data Control 16
  - Office Support/ Inventory Depot/ Fuel Facility.....16-17

Distribution & Collection.....18-19

Treatment 20-21
- Environmental Resources.....22-23

EXOI 1iple of i=1011lca1 1e Cl 1ecR:llsl fo1 i=acllllles 24

Saffir-Simpson Hurricane Scale 25

Evacuation Map and American Red Cross Regional Hurricane Shelters ..27

Hurricane Tracking Map 27

HURRICANE SEASON - JUNE 1 TO NOVEMBER 30

Hurricane Information

This handbook is designed as a quick reference guide for Public Works personnel and to emphasize the importance of coordinating everyone's efforts during emergency and hurricane operations.

HURRICANE WATCH – An announcement from the National Weather SeNice (NWS) that a hurricane or tropical storm has become a threat to our coastal area, received first by the Police Department. This is issued 48 hours in advance of the anticipated onset of tropical-storm-force winds.

HURRICANE WARNING – An announcement from the National Weather Service (NWS) that winds of 74 MPH or higher, possibly with high water, are imminent. This is issued 36 hours in advance of the anticipated onset of tropical-storm-force winds.

CITY EMPLOYEE INFORMATION - Employees of the City of Fort Lauderdale will receive return to work information on local television stations and on radio station WIOD 610 AM. In addition a storm hotline has been set up for employees to call for return to work information. Public Works employees should call 954-828-7999; all others call 954-828-5900.

Administrative Procedures

When the HURRICANE WATCH is announced, the Public Works Director will have a staff meeting with all Managers and Supervisors, and will designate a Flurricor re Coordir 10101. **fl** 1e Flur1ico11e Coo1di1 10101 will mpor I lo II 1e oblic Works Director in the Emergency Operations Center (EOC), located at 2200 Executive Airport Way, Fort Lauderdale, and will be responsible for the storm preparation and the overall operations of the Public Works Department during and immediately after the storm, or until the Public Works Director restores normal administrative duties.

If the approac rng storm Is a Category 3, 4 or 5 Hurricane, it is mandatory that the Communication Control Center (CCC) shall be established for Public Works in the Fiveash Water Plant. The CCC may also be established for a storm of lesser strength, to be determined by the Public Works Director or his designee. Under the supervision of the Hurricane Coordinator, the CCC will perform specific administrative and supervisory duties. These duties are to include, but are not limited to, the duties listed below:

I. Establish the Communication Control Center at Fiveash;coordinate departmental preparations and direct utility operations until normal chain of command is restored.
2. Maintain communication with the Public Works Director and City's EOC, located at 2200 Executive Airport Way, Fort Lauderdale
3. Coordinate and disseminate information to key personnel within the Public Works Department to include states of alert.
4. Supply administrative support to all divisions
5. Assign two Public Works Employees to the EOC immediately after the storm as a Damage Assessment Team (with a 4x4 vehicle)
6. Maintain activity log and supervisors' report

The Hurricane Coordinator shall have the authority to draw upon the necessary personnel to accomplish these and other functions.

Division heads are directly responsible to the Hurricane Coordinator for the assignments and tasks in their respective areas.

eneral Procedures for Supervisors

At the Hurricane WATCH:

- At the hurricane "WATCH", supervisors will inform employees of storm proximity, strength, speed, and go over general procedures for that section. (Procedures are located under Divisional Plans)
- At the "WATCH", supervisors will ensure that all employees understand return to work policies (below, under employees) and how to get return to work instructions if necessary.
- Supervisors will coordinate with their managers in order to accomplish orderly progression through divisional hurricane plans.
- Supervisors will notify managers when "Watch" procedures are complete.

At the Hurricane WARNING:

- At the "WARNING", supervisors will start a log to document message assignments, and communications with managers, crew assignments, work hours and condition reports from crews in the field. This will be most important after the storm, as crews are being assembled and sent out to assignments, and in reporting via Managers to Coordinator.
- Make arrangements for comfort, wellbeing, and meals for personnel that will be on duty.
- Supervisors will advise the managers when "WARNING" procedures are completed, and of any emergencies.
- Supervisors will notify Environmental Services of any health-related issues, and log concern.
- Supervisors may, with managers' confirmation, assign City vehicles to employees to drive home for quicker response after the storm.
- Supervisors will send employees home at the end of normal work shift is "WARNING" procedures are completed or from notification from Manager or Hurricane Coordinator. (Remind employees of return to work procedures)

AFTER the storm:

- Supervisors will return to work AS SOON AS POSSIBLE. If it is not possible to return immediately after the storm, it is very important that supervisors communicate their inability to return to Manager or Coordinator.
- Supervisors will assemble crews, as employees return to work, and follow guidelines in divisional plans.
- After the hurricane, the water plants and well field will receive top priority to restore service, then water distribution, pumping stations, and wastewater plants.

Procedures for General Employees

- A storm hotline has been set up for employees to call for return to work information; Public Works employees may call 954-828-7999; all others call 954-828-5900.
- All employees not given to specific assignments will report to work as instructed on the Public Works Hurricane Hotline: 954-828-7999. Workers unable to report to work because of storm damage will make every attempt to call in.
- Upon returning to work, employees will be assembled into work crews and assigned tasks. The crew configurations, working hours, and work assignments may be different from normal operations. (Note: Under Article 7, Section 3 of the Teamsters, Local Union 769 Contract, the City Manager has the right to suspend contractual provisions during civil emergencies.)

General:.

At the Hurricane WATCH:

- At the hurricane "WATCH", the City Engineer will direct staff to instruct all contractors working on the City projects to cease work, secure their construction site, and remove or tie down all construction materials and debris so as to limit the possibility of damage from flying debris.

Locating

This document instructs how to locate existing services.

- Upon arriving, Service Workers will turn on hazard signals, put on safety vests, and set up the Maintenance of Traffic (MOT) which may include safety cones, arrow boards, and/or signs.
- Utility Field Representatives will use engineering prints to estimate existing service line locations.
- Using the appropriate tools (e.g. transmitter and locator, metal detector, etc.), Field Representatives will locate existing underground services.
- Field Representatives will mark the location and type of service, using the appropriate tools (e.g. spray paint, measuring wheel, etc.).
- If it is not possible to mark directly on top of the service, Field Representatives will mark the nearest possible location and note the distance and direction of the service.
- When marking the location of a service, the Field Representative will use green paint for sewer and stormwater, blue paint for water, and white paint when marking out a dig area.

This document describes when and how to use Locating Paint on a decorative service.

The City of Fort Lauderdale has elected to use *water based* paint for marking its utilities. This paint was chosen to lessen the harmful effects on the environment and for its ability to fade faster than an alkaline based paint.

Decorative surfaces include but are not limited to; Paver Bricks, Stamped Concrete, Color Infused Sidewalks, Walls, Planters, New Asphalt or Concrete, Wooden Docks or Decks, Etc. Everything except grass, concrete, and asphalt should be considered a decorative surface. The following principles are to be used when locating underground utilities on or around decorative surfaces.

- Use only the paint that has been issued by the City.
- When painting decorative surfaces, use offset marks whenever possible unless the decorative surface is to be removed during excavation.
- When painting near decorative surfaces, use the minimum standard allowed under Florida Statute.
- Be sure to contact the excavator/representative to explain offset locations.
- Utility markings are to be as close to the construction area as possible. Avoid unnecessary marking.
- If the locate ticket is not clear as to the exact area and type of work to be done, contact the contractor/representative to clarify the scope of the planned work.
- Use the minimum amount of paint necessary for the location to be visible to the excavator. Do not over apply the paint.

NSF

City of Fort Lauderdale
Distribution & Collections
NSF Certification
Training Quiz

Name		**Date**	
Signature			
Reviewed By		**Score**	

For each question, circle the correct or best answer from the choices provided.

1. Name the Florida Administrative Code that concerns the operation and maintenance of public water systems.

   a. NSF 60
   b. F.A.C. 62-550
   c. NSF 61
   d. F.A.C. 62-555

2. What product(s) are certified under NSF 60?

   a. Chemical tanks
   b. Water meters
   c. Calcium Hypochlorite
   d. Pump Lubricants

3. The AWWA Standard for disinfecting water mains is:

   a. C651
   b. C652

c. C561
d. C562

4. Health Department approval must be obtained before returning repaired water mains to service:

   a. True

   b. False

5. How many methods does the AWWA Standard recognize for disinfecting storage tanks?

   a. 1

   b. 3

   c. 5

   d. None of the above

6. How can you determine if a chemical is NSF certified?

   a. Look for the NSF mark

   b. Call 800-NSF-MARK

   c. Log on to nsf.org

   d. All of the above

7. NSF certification involves testing that tries to determine:

   a. That potable water is safe to drink

b. That disinfectants are effective in killing coliform organisms

c. That disinfectants don't add any contaminants to the potable water

d. How effective disinfectants are at various pH values

8. NSF 60 certification of bleach is still valid if the bleach is placed in a non-certified container for transport:

a. True

b. False

9. Following disinfection of a storage tank and prior to returning to service, the water should be tested to determine that it:

a. Meets NSF standards

b. Meets expected parameters typical in the collection system

c. Meets raw water quality

d. Meets water quality appropriate for distribution

10. Licensed contractors are exempt from the use of NSF certified products.

a. True

b. False

11. NSF testing covers all products that contact drinking water from source to tap:

a. True

b. False

12. According to AWWA Standard C651, water mains that undergo emergency repairs do not have to be disinfected.

    a. True

    b. False

Answer Key:

1. Name the Florida Administrative Code that concerns the operation and maintenance of public water systems.

    a. NSF 60
    b. F.A.C. 62-550
    c. NSF 61
    d. F.A.C. 62-555

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b. False

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    a. True

    b. False

Reporting

To accurately record and report the activities of the SRS to Broward County.

Broward County has provided the City with two forms for the purpose of recording and reporting the activities of the SRS. The forms are titled, "Waste Transporters Monthly Report," and "Waste Transfer Station Monthly Report." These forms will be completed and returned to Broward County in the following manner:

- The "Waste Transporters Monthly Report" (sample attached) will report the total number of gallons collected at our various facilities (pump stations, GTL, etc.) and transported to the SRS.
  - ❖ The Chief will track (via spreadsheet) the date, decal number, vehicle number, collection site, disposal site, crew number, operator, and number of gallons transported for each trip. This spreadsheet will be included as an attachment to the form.
  - ❖ The header information should be completed as it is on the attached sample.
  - ❖ The information gathered through the Chief's spreadsheet should be reported as a total in the row labeled "sludge" and the column labeled "total gallons/tons". This value is reported in gallons. This value is then multiplied by the fee and the dollar amount is placed in the "total" column.
  - ❖ Once the form is completed it is sent via interoffice mail, scanned and sent electronically, to the City of Fort Lauderdale Sanitation Department's Senior Accounting Clerk to process the payment to Broward County. The Broward County representative should be copied on the email.
- The "Waste Transfer Station Monthly Report," (sample attached) will report the total number of tons received, decanted, and sent to the Central Landfill.
  - ❖ The Chief will track (via spreadsheet) the date material is received at SRS, the date the material is sent to the Central Landfill, and the number of tons per trip.
  - ❖ The header information should be completed as it is on the attached sample.
  - ❖ The information from the spreadsheet will be verified against the information on the "Waste Transporters Monthly Report".
  - ❖ The information (once verified) will be transferred to the report from the spreadsheet.

It is the Chiefs responsibility, once this form is completed, to ensure the original is mailed to the Broward County contact listed on the form and an electronic copy is sent via email.

Safety

GENERAL- SAFETY- PIPE SAWS AND CUTTING EQUIPMENT SAFETY

Rev: 0 | **Revision Date:** 6/29/2015 | **Print Date:** 8/14/2018
I.D. Number: PW-UTL-DC-GEN-SFT-1-Pipe Saws and Cutting Equipment Safety

This document identifies and clarifies the safety concerns during the use of pipe saws and other cutting equipment.

As of October 5, 2006 the D&C Division has chosen to implement measures for using pipe saws and other cutting equipment.

- All Crew Leaders and/or Fire Watch persons have been instructed and designated to oversee the cutting of pipe in all excavated areas.

- A committee was convened to evaluate the different full-face shields available. It was the Safety Coordinator's recommendation that the Division use an approved helmet and safety glasses when operating cutting equipment. The safety equipment has been purchased for every crew which operates a saw. Each person who operates cutting equipment is responsible for requesting replacements when needed. See below for a list of approved face Personal Protective Equipment (PPE).

- All saws have been inspected and are operating properly. (Specifically checking for the proper operation of the auto/run and disengage feature.) Each saw will be re-inspected each time it is maintained or serviced. All saws should be serviced semi-annually.

- Abrasive blades are being used in place of diamond blades whenever the cutting equipment is being used in an excavation.
- The Safety Coordinator has distributed training manuals received from the manufacturers.

- Crew leaders are responsible for training new employees on the proper use of the cutting equipment.

All hot work operations (which includes all cutting equipment) conducted in the field (open and well ventilated areas) shall be performed following the fire watch procedures outlined in this procedure as long as competent personnel have removed all flammable and/or combustible hazards in the immediate work area (for further guidelines see PWD PSM 6-7-13).

Approved by: Rick Johnson, Distribution & Collections Systems Manager
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WE BUILD COMMUNITY

GENERAL- SAFETY- SAFETY MEETING POLICY

Rev: 0 | **Revision Date:** 6/29/2015 | **Print Date:** 8/14/2018
I.D. Number: PW-UTL-DC-GEN-SFT-2- Safety Meeting Policy

This document specifies how Safety meetings should be performed and tracked.

Due to the nature of the work performed by D&C Workers, safety is a primary focus within the department. For this reason, each Chief will hold safety meetings with their respective crews on a regular basis, to be determined by the D&C Manager. During the safety meeting the Chief will distribute a copy of the Safety Training Materials to each Crew Member and review the safety materials answering any questions Crew Members may have. At the end of each meeting Crew Members will sign the sign-in sheet verifying they have read and received the Safety Training Materials. As of 6/11/2013 Safety Meetings are to be performed each week by Tuesday and the Safety Sign-in Sheets should be submitted by Wednesday of that same week. As of 9/1/2013 Safety Meetings are to be performed the first Tuesday of each month and the Safety Sign-in Sheets should be submitted by Wednesday of that same week. The Chief will be responsible to ensure that any crew member not present at the meeting receives the Safety Training Materials and signs the Safety Sign-in Sheet. As additional signatures are received, Chiefs will submit updated copies of the Safety Sign-in Sheet. The employee responsible for the work will scan and save the Safety Sign-in Sheet to the following location "Z:\Departmental\D&C\Meeting&Training Sign in Sheets", keep a hardcopy of each sheet in a binder, and update both as necessary.

GENERAL- SAFETY- SAFETY MEETING POLICY

Rev: 0 | **Revision Date:** 6/29/2015 | **Print Date:** 8/14/2018
I.D. Number: PW-UTL-DC-GEN-SFT-3- Safety Vest Policy

This policy defines responsibilities regarding safety vests to be worn by D&C Workers.

Due to the nature of their work, D&C Workers need to be seen during poor lighting, poor weather conditions, or when working in environments where there are a lot of moving vehicles and/or equipment. In order to ensure workers are visible in various environments and lighting, workers must wear a safety vest at all times, while in the field. Each worker will be given up to two safety vests per year and upon receiving the safety vest, it becomes the workers responsibility to maintain the vest in proper working condition. In the event the safety vest becomes faded, torn, soiled, or defaced, the worker may be given a second vest at the Chief's discretion. While safety is a primary concern of the D&C Department, it is ultimately the responsibility of each individual worker to uphold safety practices.

Approved by: Rick Johnson, Distribution & Collections Systems Manager
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GENERAL- SAFETY- WORKING ON PRIVATE PROPERTY

Rev: 0 | **Revision Date:** 6/29/2015 | **Print Date:** 8/14/2018
I.D. Number: PW-UTL-DC-GEN-SFT-4- Working on Private Property

This document sets guidelines for when it may be necessary to work on private property and what must be done prior to beginning the work or if necessary entering a structure on the private property.

Due to the nature of D&C work, at times it may be necessary for Crew Members to work on private property. Instances where it will be necessary for D&C Crew Members to work on private property include: operating a faucet to verify water access, taking a sample from a faucet for the lab, locating and/or inspecting a cleanout, or a genuine emergency. Prior to performing any tasks on the property, Crew Members will attempt to inform the property owner of the tasks to be performed on their property.

It is not permissible for D&C Crew Members to enter a structure on private property, except in cases of extreme circumstance (e.g. no outdoor faucets, etc.). In the event that a D&C Crew Member feels it is necessary to enter a structure on private property, they must inform the Crew Chief of the situation. If the Chief agrees it is necessary to enter the structure, the Crew Member may enter the structure accompanied by the Chief. Prior to entry, the Chief and Crew member will request the property owners consent to enter the structure and perform any necessary tasks.

For the purpose of this document, private property refers to land owned by a person or group other than the City and structure refers to anything that has been constructed on that land (e.g. house, shed, etc.).

Approved by: Rick Johnson, Distribution & Collections Systems Manager
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WE BUILD COMMUNITY

Subject: Respiratory Protection Program

Purpose and Scope:

1. The City of Fort Lauderdale, Public Services Division has developed the Respiratory Protection Program described herein/ The program is designed to protect employees from the harmful effects pf contaminated atmospheres within their work environment and provide them guidelines in the selection of proper equipment to utilize for their protection. It will also outline the required training necessary for the proper use and care of their equipment.
2. Requirements for this program are outlines in the State of Florida, Department of Labor and Employment Security, Division of Safety Rule 38I-20 Safety and Health Standards. This rule has adopted the Occupational Safety and Health Act (OSHA) standards under 29 CFR 1910.134- Respirator Protection.
3. The Respiratory Protection Program shall apply to all City of Fort Lauderdale, Public Services Department employees who are exposed to atmospheric conditions contaminated with harmful dusts, fogs, fumes, mists, gases, smokes, sprays or vapors that could cause injury of impairment in the function of any part of the body.
4. Each Facility and/or Section shall:
    a. Evaluate all work assignments to determine the need for respiratory equipment for the safe performance of all work assignments.
    b. Identify all contaminates present and determine whether respiratory protection is necessary of if other methods can be utilized to control the atmospheric conditions.
    c. Facilitate the incorporation of engineering controls to eliminate or confine the operation so that contaminates can be ventilated or removed more readily from these areas.
5. Proper Selection of respirators shall be made in accordance with the guidance of American National Practices for Respiratory Protection Z88.2-1969

6. The Safety & Training Coordinator of a representative from the Fire Department Training section shall be designated as the "Competent Person" in regards to the proper selection of respiratory equipment. They will review all identified hazardous areas and select the appropriate equipment for each situation.
7. Respiratory protection devices shall be provided to all affected employees of the City of Fort Lauderdale Public Services Department at no cost to the employee.
8. All employees who are required to utilize a respirator during the course of their job assignments will be given a "PULMONARY FUNCTION" or "SPIROMETARY TEST" at an approved medical facility. This will then be evaluated by a medical physician to determine if the employee has any physical limitations that prevent them from utilizing the equipment safely. This evaluation will be recorded in the employees personnel records and in their training record.
9. Employees will be trained in the proper use and care of these devices prior to utilizing them in the regularly cleaned and disinfected even if they have not been used recently. Cleaned and disinfected respirators should be stored in a clean, re-sealable plastic bags to offer an additional level of protection from contamination.
10. During each cleaning session, a thorough inspection shall be conducted to determine if there are any worn or deteriorated parts that need replacement. Worn or damaged equipment shall be immediately removed from service until fully repaired and tested for serviceability.
11. Respiratory devised shall not be utilized by more than one individual without being properly cleaned and disinfected before use.
12. Respirators for emergency use such as Self Contained Breathing Apparatus (SCBA) shall be stored in approved cabinets which are located in convenient locations to eliminate harmful exposure while employee is trying to don the equipment during emergencies. These cabinets will be marinated in a clean and sanitary condition at all times.
13. All respirators shall be thoroughly inspected at least once a month and after each use. Various plant maintenance personnel, who have had the proper training, will be assigned the task of performing frequent inspections of all respirators. They shall document their findings in the appropriate logs or inspection record sheets. Inspection records shall be maintained with each device or in an accessible location and made available upon request.

14. Self-Contained Breathing Apparatus (SCBA) that is utilized for life support in contaminated atmospheres shall be filled with approved compressed air.
15. All compressed air cylinders are to be re-filled by authorized personnel at Fire Station #13 at 2781 E Sunrise Blvd.
16. All compressed air cylinders are to be inspected and pressure tested as required in the Shipping Container Specification Regulations of the Department of Transportation (49 CFR part 178). Periodic internal inspections shall be conducted to check for corrosion of contamination of the inside of the cylinder. Required hydrostatic pressure testing shall be performed on each cylinder to insure that the cylinder has not deteriorated to the point that it cannot safely maintain the pressure.
17. Compressed aid shall meet at least the requirements of the specification for Grade D breathing air as described in Compressed Gas Association Commodity Specification G-7.1-1966.
18. Only compressed air shall be utilized for SCBA equipment. Compressed oxygen, liquid air, and liquid oxygen should never be used in place of compressed air.
19. Canister of cartridge type respirator masks shall have the appropriate canister of cartridge for the atmospheric contaminates that are present in the particular work environment. Each canister/cartridge shall be clearly labeled as to its specific application. Consult manufacturer recommendations concerning usage time allowed for each canister/cartridge and change when required. It if unknown as to when the canister/cartridge was last changed; it must be replaced with a new unit.
20. The City of Fort Lauderdale, Public Services Division shall conduct a training program for all employees who need to utilize a respirator device in the course of their job performance.
21. This training shall include all the information and guidance necessary for their proper selection, use, fit, and care of these devices. The correct respirator should be specified for each hazard encountered throughout their work environment and the employees shall be trained in the proper use of each device.
22. Procedures for checking proper fit and leak detection shall be shown to all employees. Each employee shall be given the opportunity to put on the individual masks during their training sessions so that they become more familiar with their operation.

23. Periodic refresher training shall be conducted either on the job by authorized trained individuals or through classroom training sessions. This refresher training shall be documented in each employee's training records maintained by this department.
24. Employees are to be encouraged to practice with these devises whenever they have the opportunity and to perform the cleaning and disinfection serviced to insure the masks are maintained in the best possible working conditions.
25. Instruction shall be given to employees in how to recognized respiratory hazards and how to evaluate what safety precautions are necessary before entering an area to perform work.
26. It is the responsibility of each employee to insure that they are aware of these guidelines pertaining to respiratory protective devices and how to properly use them in the course of their work performance. If the employee feels that they need additional instruction concerning these devices, they are to inform their Supervisor/ Chief/ Foreman.
27. It will be the responsibility of the Supervisor/ Chief/ Foreman of the affected areas to insure that respiratory protection is available for their employees and that it is properly used. Individuals who fail to utilize the protective equipment shall be immediately removed from the exposure area and instructed in the required procedures for working in contaminated environments. Supervisor/ Chief/ Foreman are to insure that prescribed training is made available to all affected individuals under their supervision. Continued failure to use protective devices could result in disciplinary action.
28. The Public Services Division Safety and Training Coordinator will be responsible for insuring that all hazards are identified and that appropriate protective devices are available for all affected employees. He/she is also responsible for insuring that training classes are available to all individuals needing training. He/she will also be considered the COMPETENT PERSON in reference to any and all matters relating to the selection, care, and use of any of these devices.
29. The Public Services Director of his/her designee is responsible for insuring that the procedures outlined in this program are carried out.
30. The City of Fort Lauderdale, Public Services Department shall post a copy of the Respiratory Program in the work place and shall make copies of it available to employee representatives. It will be the employee's

responsibility to become familiar with the requirements outlined in this program and to comply with them throughout the course of their work assignments.

31. All employees training information will be forwarded to the Training office for information into employee training records. It will be the responsibility of the Supervisor/Chief/Foremen to insure that all training is documented and entered into the file of each employee. All mandatory refresher training shall be conducted in the required time periods and documented the training records of each employee.

32. All training records shall be maintained for the duration of the employees' employment. Upon termination of employment, the employee will be provided a copy of his/her record.

33. The City of Fort Lauderdale, Public Services Department shall provide, upon require, all related materials to the authorized representatives of the Secretary of the Florida Department of Labor & Employment Security and to the Director of of the National Institute for Occupational Safety and Health.

FIVEASH WATER TREATMENT PLANT – OPERATIONS
LOCK-OUT/ TAG-OUT

Rev: 0 | **Revision Date:** 8/4/2015 | **Print Date:** 8/14/2018
I.D. Number: PW-UTL-DC-GEN-SFT-6-Lock-Out/ Tag-Out

1. PURPOSE

To insure that equipment and piping is secured in the closed or OFF-position, so that it is safe to perform (maintenance) work.

2. PREPARATION

Work plan identifying equipment and piping to be locked-out / tagged-out.

3. PRECAUTIONS AND WARNINGS (SAFETY AND HEALTH CONSIDERATIONS)

3.1 Properties of Chlorine

- A pungent, greenish yellow gas. The characteristic, penetrating odor of chlorine gas gives warning of its presence in the air. Its greenish yellow color makes it visible when high concentrations are present.
- Chlorine gas is approximately 2.5 times heavier than air. Thus, it will seek the lowest level in the building or area in which a leak occurs.
- When exposed to normal atmospheric pressure and temperature, liquid chlorine vaporizes to chlorine gas rapidly. One volume of liquid chlorine will yield about 460 volumes of gas.

3.2 Health Hazards

- Chlorine gas is primarily a respiratory irritant. Exposure to low levels (3-5 ppm) may cause skin and eye irritation, burning of mucous membranes (nose, mouth and throat) and a choking sensation.
- The symptoms of exposure to high concentrations (5-15 ppm) are retching and vomiting followed by difficult breathing.
- In extreme concentrations (> 100 ppm), the difficulty of breathing may increase to the point where death can occur from suffocation. Concentrated gas or liquid can severely burn the skin or the eyes.

3.3 Caution Statements

Not applicable.

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3.4 Warning Statements

Not applicable.

4. OPERATING LIMITS

Not applicable.

5. SAFETY SYSTEMS

- SCBA (Self contained breathing apparatus) are located in the following areas:
  - Four units are located in the filter gallery on the east wall between filters 18 and 19,
  - One unit is located in the filter gallery across from the old control room by filter 6,
  - One unit is located in the elevator landing, on the second floor of the chemical building,
  - One unit is located in the mechanics shop.
- The Chlorine Leak Detector is located in the evaporator room and is capable of automatically detecting leaks as low as 1 ppm. The Detector will sound an alarm on the DCC panel in the filter gallery and on the plant computer in the control room. It will not reset until the air is clear or manually disabled.
- The C-Kit for the 90-ton tank car is located in the mechanics shop.
- The windsock is located above the south end of the diesel high-service pump building.

6. OPERATING INSTRUCTIONS

1. Please refer to Attachment 1.

7. ATTACHMENTS

Attachment 1: City of Ft. Lauderdale Public Service Department Policy Manual Lock-Out / Tag-Out Procedure

GENERAL- SAFETY- HOT WORK SAFETY POLICY

Rev: 0 | **Revision Date:** 8/4/2015 | **Print Date:** 8/14/2018
I.D. Number: PW-UTL-DC-GEN-SFT-7- Hot Work Safety Policy

Purpose:

This policy is designed to prevent injury and loss of property from fire explosion as a result of Hot Work in all spaces and activities. It establishes minimum requirements for performing Hot Work during repair maintenance and construction type activities. Additional guidelines and recommendations can be found in 29 CFR OSHA 1910.147 Control of Hazardous Energy, 1910.252-254, 1910.352, 1910.1200 Hazard Communication and NFPA 51B.

Policy & Procedure:

It is the policy of the Public Works Department to administer a safety program so that each employee works in a safe and secure environment free from accidents and potential hazards. It is the responsibility of all Public Works personnel to review their work environments on a continuing basis for unsafe and/or hazardous conditions. No employee shall permit unsafe or unhealthy conditions to exist in their areas.

All managers and/or supervisors have the responsibility and authority to halt any unsafe practices not in accordance with this policy or any other safety policy. When an unsafe or hazardous condition is uncovered, prompt action will be taken to immediately correct the situation.

Scope, Definitions & Duties:

This Hot Work Safety Policy covers welding and allied processes. Those processes such as arc welding, arc cutting, hot riveting, oxy-fuel gas welding, open-flame soldering, brazing, heat treating, grinding, thermal spraying, powder-actuated tools, oxygen cutting and all other similar policy does not cover use of candles, laboratory activities, cooking equipment, pyrotechnics or special effects.

All hot work operations conducted in the field (open and well ventilated areas) shall be performed following the fire watch procedures outlined in this policy as long as competent personnel have removed all flammable and/or combustible hazards in the immediate work area.

All hot work operations in confined spaces may require additional safeguards as stated in 29 CFR ISHA 1910.146 and PWD 6.7.14, Confined Space.

Any hot work operation in and near building systems and piping may also require additional safeguards as stated in PW-UTL-DC-GEN-SFT-6-Lock-Out/ Tag-Out.

Before any hot work operations begin in a non-designated location, a completed hot work permit prepared by the Competent Hot Work Supervisor (CHWS) is required (Appendix I). Based on local conditions, the CHWS must determine the length of the period not to exceed 24 hours, for which the hot work permit is valid.

The following conditions must be confirmed by the CHWS before permitting the hot work to commence:

a. Equipment to be used (e.g. welding equipment, shields, personal protective equipment, fire extinguishers) must be in satisfactory operating condition and in good repair.
b. The floor must be swept clean for a radius of 35ft if combustible materials, such as paper or wood shavings are on the floor.
c. Combustible floors, except wood on concrete must be kept wet of be covered with damp sand (note: where floors have been wet down, personnel operating arc welding or cutting equipment shall be protected from possible shock), or be protected by noncombustible or fire retardant shields.
d. All combustible materials must be moved at least 35 ft. away from the hot work operations. If relocation is impractical, combustibles must be protected with fire retardant covers, shields, or curtains. Edges of covers at the floor must be tight to prevent sparks from going at the floor must be tight to prevent sparks from going under them, including where several covers overlap when protecting a large pile.
e. Opening or cracks in walls, floors or ducts within 35 feet of the site must be tightly covered with fire-retardant noncombustible material to prevent passage of sparks to adjacent areas.
f. If hot work is done near walls, partitions, ceilings or roofs of combustible construction, fire-retardant shields or guards must be provided to prevent ignition.
g. If hot work is to be done on a wall, partition, ceiling, or roof precautions shall be taken to prevent ignition of combustibles on the other side by relocation of combustibles. If it is impractical to relocate combustibles, a fire watch on the opposite side form the work must be posted.
h. Hot work must not be attempted on a partition, wall, celling or roof that has combustible covering or insulation, or on walls or partitions of combustible sandwich-type panel construction.

i. Hot work that is to be performed on pupes or other metal that is in contact with combustible walls, partitions, ceilings, roofs, roofs, or other combustibles must not be undertaken if the work is close enough to cause ignition by conduction.
j. Fully charged and operable fire extinguishers that are appropriate for the possible fire type shall be available immediately at the work area. These extinguishers should be supplied by the group preforming the hot work. The fire extinguishers normally located in the building are not considered to fulfill this requirement.
k. If hot work is done in proximity to a sprinkler head, a wet rag shall be laid over the head and then removed at the conclusion of the welding or cutting operation. During hot work, special precautions shall be taken to avoid accidental operation of automatic fire detection or suppression systems (for example, special extinguishing systems or sprinklers).
l. Nearby personnel must be suitable protected against heat, sparks and slag.

Hot Work Operation Requirements:
Hot work is allowed only in areas that are or have been made fire-safe by the CHWS. Hot work may only be performed in either designated areas or permit-required areas.

a. A designated area is a specific area designed or approved by the CHWS for such work, such as maintenance ship of detached outside location that is noncombustible or fire-resistive construction, essentially free of combustible or fire-resistive construction, essentially free of combustible and flammable contents, and suitably segregated from adjacent areas.
b. A permit-required area is an area made fire-safe by removing protecting combustibles from ignition sources. Hot work is not allowed:
    1. In building equipped with sprinklers if the fire protection is impaired.
    2. In the presence of explosive atmospheres or potentially explosive atmospheres (e.g. on drums previously containing solvents)
    3. In explosive atmospheres that can develop in areas with an accumulation of combustible dust.

Competent Hot Work Supervisor:

The Competent Hot Work Supervisor (CHWS) shall have successfully completed the competent person training to be considered competent and the CHWS

cannot be the hot work operator. The CHWS is responsible for the safe operation of hot work activity under their supervision. These duties include but are not limited to the following:

a. Establish permissible areas for hot work to be performed.
b. Ensure that only approved apparatus are used
c. Ensure that all individuals involves in the hot work operations are familiar with Hot Work requirements.
d. Ensure that all individuals involved in the hot work operation are trained in the safe operation of their equipment and the safe use of the process.
e. Determine site-specific flammable materials, hazardous process, or other potential fire hazards present of likely to be present in the work location per 29 CFR 1910.106 Flammable and Combustible Liquids.
f. Ensure combustibles are protected free from ignition by the following means:
    1. Move the work to a location free from combustibles.
    2. If the work cannot be moved, ensure the combustibles are moved to a safe distance (minimum 35 feet) or have the combustibles properly shielded against ignition.
    3. Ensure hot work is scheduled such that operations that could expose flammables or combustibles to ignition do not occur during hot work operations.
    4. If any of these conditions cannot be met, then hot work must not be performed.
g. Determine that fire protection and extinguishing equipment are properly located and readily available.
h. Ensure sufficient local exhaust ventilation is provided to prevent accumulation of any smoke or fume.
i. Ensure that a fire watch is posted at the site when:
    1. Hot work is performed in a location where other than a minor fire might develop.
    2. Combusible materials in building construction or contents are closer than 35ft to the point of hot work.
    3. Combustible material are more than 35 ft away but are easily ignited by sparks.
    4. Wall of floor openings are within 35ft and empose combustible materials in adjacent areas. This included combustible materials concealed in walls or floors.
    5. Combustible materials are adjacent to the opposite side of partitions, walls, ceilings, or roofs are are likely to be ignited.

j. Where a fire watch is not required, the CHWS shall make a final inspection 1.2 hour after the completion of hot work operations to detect and extinguish possible smoldering fires.

Hot Work Operator:

The Hot Work Operator (HWO) is an individual designated by management to perform hot work under the authorization of a CHWS. The hot work operator shall handle the equipment safely and perform work so as not to endanger lives and property. Specific duties include:

a. No hot work shall be conducted without specific written authorization from the CHWS via completion of the Hot Work Permit (Appendix I).
b. The operator must cease hot work operations if unsafe conditions develop.
c. The operator must notify the CHWS for reassessment of the situation in the event of suspected unsafe conditions or concerns expressed by affected persons.

Fire Watch:

The Fire Watch (FW) person is an individual posted in specific circumstances, as described above. The function of the fire watch is to observe the actual hot work and monitor conditions to ensure that a fire or explosion does not occur as a result of the work performed. The fire watch is authorized to stop any unsafe operation or activity. Specific duties and responsibilities include:

a. Be alert and attentive at all times and watch for fires, smoldering material or other signs of combustion.
b. Be aware of the inherent hazards of the work site and of the hot work.
c. Ensure that safe conditions are maintained during hot work operations and stop the hot work operations if unsafe conditions develop.
d. Have fire-extinguishing equipment readily available and be trained in its use.
e. Extinguish fires when the fires are obviously within the capacity of the equipment available. If the fire is beyond the capacity of the equipment, sound the alarm immediately.
f. Be familiar with the facilities and procedures for sounding an alarm in the event of a fire.
g. A fire watch shall be maintained for at least ½ hour after completion of hot work operations in order to detect and extinguish smoldering fires.
h. More than one fire watch shall be required if combustible materials that could be ignited by the hot work operation cannot be directly observed by

a single fire watch. (e.g. in adjacent rooms where hot work is done on a common wall.)

Work Closeout

a. A fire watch shall be maintained for at least 30 minutes after completion of hot work operations in order to detect and extinguish smoldering fires.
b. The CHWS shall inspect the job site 30 minutes following completion of hot work and close out the permit with the time and date of the final check.
c. The completed Hot Work Permit shall be retained and filed following completion of the project.

Purpose:

1. The City of Fort Lauderdale, Public Services Department has developed the Hearing Conservation Program described therein. The program is designed to protect our employees from the deleterious effects of excessive noise exposure.

Requirements:

2. Requirements for this program are outlined in the State of Florida Department of Labor and Employment Security, Division of Safety, Rule 38I-20, Safety and Health Standards. This rule has adopted the Occupational Safety and Health Act (OSHA) standards under 29 CFR 1910.95-Occupational Noise Exposure.

Applicability:

3. This Hearing Conservation Program shall apply to all City of Fort Lauderdale, Public Services Department facilities where noise exposure can exceed 85 decibels on the "A" weighted scale ("dba"). This is equivalent to or greater than 50% of the allowable dose when noise exposures are monitored by personal dosimeter.

Procedures:

4. Each work area suspected to contain noise levels which would expose employees to a time weighted average ("TWA") equal to or greater than 85 decibels on the "A" weighted scale ("dBA") shall be tested for noise levels at least annually or whenever changed occur which could affect the area's noise levels.

5. Each work area where noise levels are known to be equal to or greater than a TWA of 85 dba shall be retested for noise levels every two years or whenever changes occur which could affect the area's noise levels.

6. Each work area where noise levels are equal to or greater than a TWA of 85 dba shall have engineering controls implemented to reduce noise levels below a TWA of 85 dBA when economically and operationally feasible.

7. Each work area where noise is equal to or greater than a TWA of 85 dBA shall be posted with signs stating hearing protection is required. The signs shall be in English. Signs in other languages, such as Spanish or Creole shall be provided if necessary.

8. Employees will be provided with effective hearing protection when noise levels are equal to or exceed a TWO of 85 dBA.

9. The City of Fort Lauderdale, Public Services Department shall provide at no expense to employees a variety of hearing protection effective for the noise levels encountered.

10. Only hearing protection which is effective enough to reduce noise exposure below a TWA of 85 dBA shall be used. The reduced level of exposure is calculated by subtracting 7 from the Noise Reduction rating (NRR) given by the hearing protection manufacturer. This calculated reduction is then subtracted, from the area's noise level.

11. Where use of hearing protection is required, supervisors and/or other management shall insure hearing protection is properly worn, and shall administer appropriate disciplinary action when necessary.

12. Adequacy of hearing protection shall be re-evaluated when employee noise exposures increase due to changes in the work environment of the employee's work assignments.

13. All new employees who are to be assigned to work areas where the noise level is equal to or exceeds a TWA of 85 dBA shall have an audiogram within two weeks after starting employment.

14. Existing employees who have been re-assigned from non-noise areas to work areas where the noise level is equal to or exceeds a TWA of 85 dBA shall have an audiogram within two weeks after starting the new assignment.

15. Employees who work in areas where the noise level it equal to or exceeds a TWA of 85 dBA shall have a yearly audiogram.

16. Audiometric testing shall be in compliance with the Occupational Safety and Health Act, 29 CFR 1910.95.

17. Audiometric testing shall be at the expense of the City of Fort Lauderdale, Public Services Department.

18. Audiometric testing shall be performed by a licensed or certified audiologist, otolaryngologist (ear, nose and throat specialist), or other physician.

19. Audiograms shall be performed pursuant to the guidelines established by the Council of Accreditation in Occupational Hearing Conservation.

20. Audiograms shall be preceded by at least 14 hours without exposure to workplace noise. This requirement may be met by requiring employees to wear hearing protectors which will reduce the employee's exposure to a sound level of 80 dBA or below.

21. City of Fort Lauderdale, Public Services Department shall notify employees of the needs to avoid high levels of non-occupational noise exposure for a period of 14 hours prior to the employee's audiogram.

22. Employees with colds, ear infections or similar ailments shall not be tested until at least a week after the employee has completely recovered.

23. Each employee's audiogram shall be compared to that employee's baseline audiogram to determine if the audiogram is valid and if a Standard Threshold Shift ("STS" has occurred)

24. A STS is defined as a reduction in hearing ability of 10 bB or more 2000, 3000 and 4,000 Hz in either ear.

25. In determining if a STS has occurred, allowances may be made for normal loss of hearing ability which occurs with age, known as presbycusis.
See table F-1 and F-2 listed in 29 CDR 1910.95 for application for application of age correction values.

26. If the annual audiogram shows that an employee has suffered STS, the City of Fort Lauderdale, Public Services Department may retest the employee within 30 days and use the retest results as the basis for comparison.
27. An audiologist, otolaryngologist (ear, nose and throat specialist) or physician shall review problem audiograms and determine whether there

is a need for further evaluation. It is possible for hearing losses to occur due to build-up of ear wax, or there may be some other type of problem.

28. An employee who has been determined to have STS shall be informed of this fact in writing within 21 days of the determination.

29. Unless a physician determine that a STS is not caused or aggravated by workplace noise, the City of Fort Lauderdale, Public Services Department shall take the following steps:
    a. If the employee is not using hearing protection, the employee shall be fitted with hearing protection, trained in their use and care and be required to use them when in the noisy work areas.

    b. An employee already using hearing protection shall be refitted retrained in their use. Hearing protection with greater attenuation shall be used if necessary.

    c. Refer the employee for a clinical audiological evaluation of an ontological exam, as appropriate if additional testing is necessary or if it is suspected that a medical condition of the ear is caused or aggravated by the wearing of hearing protection.

    d. Inform the employee for the need of an ontological examination if a medical condition of the ear is suspected which is unrelated to the use of hearing protection.

30. An annual audiogram may be substituted for the baseline audiogram when in the judgment of the audiologist otolaryngologist or physician who is evaluating the audiogram that the STS has been persistent of the new audiogram shows a significant improvement over the baseline audiogram.

31. Reasonable efforts should be made to obtain an exit audiogram on every employee terminating the City of Fort Lauderdale Public Services Department employment.

32. The City of Fort Lauderdale, Public Services Division shall conduct a training program for all employees who are exposed to noise at a TWA greater than or equal to 85 dBA. The training shall be interpreted into languages necessary for all participating employees'' comprehension. The training program shall contain at least the following topics:

a. The effect of noise on hearing, especially the following facts:
    i. Hearing loss due to noise is non-reversible
    ii. Loss due to noise is cumulative from exposure on and off the job.
    iii. Hearing loss is not noticed during its early stages
    iv. Employees will be able to hear better in noisy environments when wearing hearing protection.

b. The purpose of hearing protection

c. The advantages, disadvantages and attenuation of the various types of hearing protection.

d. Insturctions on selection, property use and fit and care of the hearing protection.

e. The purpose of audiometric testing and an explanation of the testing process.

f. Where damaging levels of noise are found at the various facilities within the City of Fort Lauderdale, Public Services Division.

33. The training program shall be repeated annually for all employees who are exposed to noise at a TWA greater than or equal to 85 dBA.

34. Documentation of training shall be marinated, including the dates of the training, duration of the sessions and the names of the attendees.

35. The City of Fort Lauderdale, Public Services Department shall post a copy of the Hearing Conservation Program in the workplace and shall make copies of it available to employees' representatives.

36. The City of Fort Lauderdale, Public Services Division shall keep copies of employee aduigrams and training documentation. These documents must be maintained for 30 years.

37. The City of Fort Lauderdale, Public Services Division shall provide upon request, all related materials to the authorized representatives of the

Secretary of the Florida Department of Labor and the Director, National Institute for Occupational Safety and Health.

Purpose:

1. To establish procedures to protect workers from electrical shock whole working on new or existing water service lines and meters, and when repairing water leaks on water service lines.

Procedure:

2. New or existing meters and new service lines. Prior to doing work such as changing a meter, service workers must install a non0insulated No. 6 copper bypass wire with (UL approved) clams and grounding screws for ¾" through 2" around the work area. After installation is completed, low voltage rubber gloves will no longer be necessary.

3. Repairing water leaks on service lines. Prior to repating water leasks on service lines, service workers must (a) ground the metal water line using a 3' jumper cable, to a grounding point or (b) bypass the repair section with the cable. In both cases, low voltage rubber gloves must be worn because the ground cannot be verified.

4. Recordkeeping. When a No. 6 copper bypass wire is installed, service workers are to note the installation on the blue or yellow time cards.

5. Use of low voltage rubber gloves. The gloves shall be ordered by size, by the immediate supervisor, and wil be worn with a glove protector. Prior to each use, the service worker must test the glove for air leakage. Where this type of work is done frequently, the gloves should be replaced at least three (3) times a year.

6. Actions to be taken when an electrified meter or service line is found. If any electrical spark is noticed upon contact between two conductors, the work must be stopped and the immediate supervisor notified promptly. The incident will be reported to dispatch.
    a. The Dispatcher will record the complaint in "Electrified Meter Log," notify the electrotech supervisor or duty electrotech, and FP&L (954-581-5668), requesting a written response from FP&L to the dispatcher.

b. The crew or crew members shall stand by for one hour for FP&L and the electrotech. If FP&L does not arrive in one hour, the crew member will notify the Dispatcher and supervisor or his designee, and tie a red ribbon (safety take) around the hot meter inside the box. The ribbon shall be removed after the problem is corrected.

c. If electrical current is found in the service line, FP&L must correct the problem or turn off the electrical current before the service worker can continue the work.

7. Follow up actions. When Dispatch received the written response from FP&L, Dispatch will record it in the "Electrified Meter Log" and send the written response to Environmental Resources for follow-up. Inspections will relay the problem to Building and Zoning for resolution, requiting a written response. When Environmental Resources received a response, the original reporting crew is to be notified of the results.

8. Supervision. The Building Services Supervisor is designated to continuously track the number of electrified water line reports to determine if this procedure is effective, and bypass wired describe in #2 above are installed as a routine procedure. This supervisor shall make recommendations for modifications of this policy as necessary.

Appendix AD

Fats, Oils, and Grease Technical Memorandum

Hazen

Technical Memorandum

Date: October 3, 2019

To: Viviana Torres Ortiz, PE (Project Manager II, Public Works Department)

From: Hazen and Sawyer

Sewer Design and Implementation Program

Contract No. 476-11906, Task Order 11 – Asset Management and Capacity, Management, Operation and Maintenance Program Development

Task 3 – Grease Trap Ordinance and Program Enforcement Plan, Draft Memorandum

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This memorandum documents review of the City's existing grease trap ordinance and program enforcement plan. A comparison to USEPA guidance is provided, and possible expansions to the existing program are presented for consideration. The memorandum represents the deliverable under the City of Fort Lauderdale's Sewer Design and Implementation Program contract, City Contract 476-11906, Task Order Number 11, Task 3. The final deliverable for the project, the AM-CMOM Development Plan, will incorporate the content of this and other AM-CMOM program deliverables.

1. Introduction

The City entered into Consent Order (CO) Number 16-1487 with the Florida Department of Environmental Protection (FDEP) Office of the General Council on September 29, 2017. The CO identifies corrective actions, with completion deadlines, to improve sanitary sewer service within the City. Paragraph 6(i) of the CO required the City develop and submit an Asset Management and Capacity, Management, Operation and Maintenance (AM-CMOM) Development Plan to FDEP by August 28, 2018. The CO further specifies that the AM-CMOM **Program** is due to FDEP within 18 months of receipt of FDEP comments on the AM-CMOM Development Plan.

Hazen and Sawyer (Hazen) is the CO Program Manager and is responsible for overall program management. This task order to develop the AM-CMOM Program is part of the larger Project No. 476-11906, and consists of the following subtasks:

- **Task 1 – Develop CMOM Program**. Develop a prioritized CMOM Program that meets the requirements of the CO, follows the AM-CMOM Program Development Plan, and is consistent with Effective Utility Management (EUM) goals. The CMOM Program component is focused primarily on overall operations to prevent sewer system spills.
- **Task 2 – Develop Updated Sanitary Sewer Overflow Response Plan (SSORP)**. Review and update the CITY's SSORP so that it is consistent with the CITY's target Levels of Service (LOS), includes best practices, and protects the water quality and public health.

- **Task 3 – Develop Grease Trap Ordinance and Program Enforcement Plan**. Review and update the current Program to minimize the risk of grease-related blockages in the gravity and pressure sewer system.
- **Task 4 – Develop Collection System Asset Management Program**. Develop a robust Collection System Asset Management Program consistent with USEPA Guidance and as outlined in the AM-CMOM Program Development Plan. The AM Program Component is primarily focused on efforts to maximize the life of assets at the lowest cost while maintaining the target LOS. The focus of this program component is identifying risk and measures to mitigate the risk throughout the collection system.
- **Task 5 – Develop AM-CMOM Program Schedule**. Develop a prioritized schedule to implement components of the Asset Management and CMOM Programs including specific timelines to achieve key milestones. The schedule will include a component for completion of the CO Exhibit C projects as well as other Phase II projects identified during the force main condition assessment program.
- **Task 6 – Develop AM-CMOM Report**. Develop a report for submittal to FDEP for review summarizing Tasks 1 through 5.
- **Task 7 – AM-CMOM, ISO 9001, and EUM Integration**. Develop documentation to demonstrate the connections between the AM-CMOM Program, ISO 9001, and 10 EUM Attributes as well as illustrate how the AM-CMOM Program components advance the CITY's progress and level of achievement in the ISO 9001 and EUM program efforts. Assist the CITY in developing its Keys to Management Success, to create a supportive context for achieving desired outcomes for each Attribute and integrating improvement efforts across the Attributes.

This memorandum documents work completed under Task 3 and is intended to support a progressive development of consensus culminating in the deliverable to FDEP as described under Task 6.

2. Background

The AM-CMOM Development Plan, submitted to FDEP in August of 2018, addressed grease trap ordinance monitoring and enforcement as one of the program areas intended for development in the eventual AM-CMOM Program. Possible program components were summarized as outlined below.

- A Fats, Oils, and Grease (FOG) characterization study to identify sources of FOG causing problems in the wastewater collection and transmission system, and the most appropriate methods or mechanisms to control the discharge of FOG.
- The legal authority to control discharges of FOG, including ability to implement a permit and enforcement program for commercial and industrial sources.

- Specifications of accepted FOG control devices, development of standards for the design and construction of FOG control devices, and establishment of FOG control device management, operations and maintenance standards or best management practices.
- Establishment of protocols for construction inspection as well as compliance inspection.
- Development of a FOG disposal manifest system, including a requirement that FOG and Septage not be commingled.
- Establishment of programs for enforcement, compliance assistance, and comprehensive public education.
- Establishment of staffing (technical and legal) and equipment requirements for the FOG Control Program.
- A regularly maintained list of current commercial establishment FOG generators, including FOG generating processes.
- Establishment of performance indicators to measure effectiveness of the FOG Control Program.
- A schedule to review, evaluate and revise the FOG Control Program on at least an annual basis.

In February of 2017, prior to the CO, the City completed a Grease Trap Pilot Project analysis to assess the level of compliance with the existing ordinance and evaluate the need for a grease trap permitting and inspection program. The Pilot Project included field assessments of thirty restaurants with grease traps, as well as a survey of the same properties to characterize existing grease trap maintenance operations and obtain owner/operator feedback on potential changes to the program. The 30 surveys were completed by a representative of the property under inspection.

The City reached the following conclusions based on the field assessments and survey results:

- A dedicated grease trap program was not necessary at that time. Voluntary compliance and maintenance of grease traps were sufficient to prevent excessive grease from entering the City's sanitary sewer system.
- Revisions to the City's sewer ordinance were warranted to further define acceptable levels of maintenance and measures for enforcing compliance. A comparison to other utilities should be performed and amendments proposed.

As a result of the Pilot Project, minor modifications were recommended and adopted in the City's sewer ordinance. Modifications include changes to the compliance metric, definition of acceptable levels of maintenance, and recordkeeping requirements. **Attachment A** contains a copy of the City's *Grease Trap Pilot Project Analysis* documenting the work performed as well as associated conclusions and recommendations. **Attachment B** contains a copy of the City's sewer use ordinance; Division 3 (pages 4 and 5) presents the revised requirements for pretreatment facilities.

3. Best Management Practices for Fats, Oils, and Grease

Good business practice for all sanitary sewer collection systems includes integration of AM-CMOM principles into the ongoing management, design, operation, and maintenance of the system. An AM-CMOM program assembles and documents these important concepts and related Best Management Practices (BMPs) customized to the specific characteristics and needs of an individual utility's collection system, customer base, organizational structure, policies, budget, and other factors and limitations. An AM-CMOM program is a pathway of continuous processes that is proactive and intended to reduce the occurrence of sewer overflows and improve or maintain regulatory compliance. In addition to these and other benefits, it provides a tool for training new employees and helps ensure continuity through staff transition and turnover. Like many other utilities, the City of Fort Lauderdale has been performing various collection system AM-CMOM tasks for years but does not yet have a formal, fully implemented program in place.

Development of a formal AM-CMOM program requires assessment of current collection system activities and evaluation of the extent to which applicable BMPs are being implemented. It is important to note that the CO does require the City's programs to be "consistent with the EPA guidance referenced in Subparagraph 6(i)," specifically the following document: EPA 305-B-05-002, *Guide for Evaluating Capacity, Management, Operation, and Maintenance (CMOM) Programs at Sanitary Sewer Collection Systems*. Therefore, while EPA 305-B-05-002 (hereafter, EPA Guide) provides some flexibility in implementation based on the needs and circumstances of individual utilities, the CO requires that at minimum the City's practices related to Fats, Oils, and Grease (FOG) control and enforcement be evaluated as to alignment with the EPA Guide.

The EPA Guide primarily addresses FOG control and enforcement in the following sections:

- *Checklist Section III. F., Collection System Management: Legal Authority*.
- *Checklist Section IV. B., Collection System Operation: Compliance*.

In general, the EPA Guide specifies that sewer owners/operators should have an ordinance or legal document that contains general prohibitions, prohibitions on stormwater inflow and infiltration from laterals, new construction standards, and **adequate grease control measures**. The grease control section of the document should contain the requirement to install grease traps at appropriate facilities such as restaurants, as well as mandate that grease traps be properly maintained and pumped out on a regular basis. Periodic inspections of grease traps by collection system personnel, and the ability to enforce compliance through fines or other measures, should also be addressed.

Alignment of the City's existing practices with the EPA Guide and with other utility practices is reviewed below.

4. EPA Guidance and Other Utility Practices

FOG-related measures and considerations from the EPA Guide are summarized below. Also summarized are operational practices commonly implemented by other utilities to control FOG. It is proposed that these practices and considerations be further discussed and evaluated following

review of this Technical Memorandum by City personnel. Major changes to the City's current FOG program are **not** proposed; however, it is suggested that certain practices implemented by other utilities be discussed and considered for possible future implementation.

4.1 EPA Guide

FOG-related items from the EPA Guide are summarized below along with an assessment concerning the status of the item for Fort Lauderdale. These items could be considered minimum program components based on CO requirements.

1. *Does the collection system receive flow from satellite communities?* Yes, these include Broward County (Port Everglades), City of Oakland Park, City of Wilton Manors, portions of the Town of Davie, and portions of the City of Tamarac.
2. *Does the owner or operator require satellite communities to enter into an agreement?* Yes, the City has Large User Wastewater Agreements with all satellite communities.
3. *Does the agreement include the requirements listed in the sewer use ordinance (SUO)?* Yes, the Large User Wastewater Agreements require the satellite communities to adopt regulations that are at least as stringent as the City's own.
4. *Do the agreements have a date of termination and allow for renewal under different terms?* Yes, each Large User Wastewater Agreement has a date of termination and allows for renewal under different terms.
5. *Are standards, inspections, and approval for new connections clearly documented in a SUO?* Yes, the SUO provides requirements for new connections and grants the City authority to inspect and approve.
6. *Does the SUO require satellite communities to adopt the same industrial and commercial regulator discharge limits as the owner or operator?* Yes, the Large User Wastewater Agreements require the satellite communities to adopt regulations that are at least as stringent as the City's own.
7. *Does the SUO require satellite communities to adopt the same inspection and sampling schedules as required by the pretreatment ordinance?* Yes, the Large User Wastewater Agreements require the satellite communities to adopt regulations that are at least as stringent as the City's own.
8. *Does the SUO require the satellite communities or the owner or operator to issue control permits for significant industrial users?* Yes, the Large User Wastewater Agreements require the satellite communities to adopt regulations that are at least as stringent as the City's own.
9. *Does the SUO contain procedures for the following: inspection standards, pretreatment requirements, building/sewer permit issues?* Yes, the City's SUO provides general guidance for these, and requires pretreatment facilities to be available to the City for inspection in Section 28, Article V, Division 3 of the City Code of Ordinances.

10. *Does the SUO contain general prohibitions of the following materials: fire and explosion hazards, oils or petroleum, corrosive materials, materials which may cause interference at the wastewater treatment plant, obstructive materials?* Yes, the City's SUO contains prohibitions of these in Section 28, Article V, Division 2 of the City Code of Ordinances.

11. *Does the SUO contain procedures and enforcement actions for the following: fats, oils, and grease (FOG); I/I; building structures over the sewer lines; storm water connections to sanitary lines; defects in service laterals located on private property; sump pumps, air conditioner?* Yes, via notice of violation requiring an explanation of the violation and a plan for the satisfactory correction and prevention thereof, to include specific required actions, to be submitted by the user to the City.

12. *Does the owner or operator have inter-jurisdictional or inter- municipal agreements?* Yes, the City has Large User Wastewater Agreements with Broward County, the Town of Davie, and the Cities of Tamarac, Oakland Park, and Wilton Manors.

13. *Is there a sewer-use and a grease ordinance?* Yes, both are covered in the City Code of Ordinances and apply to satellite communities.

14. *Is there a process in place for enforcing sewer and grease ordinances?* Yes, the Sewer Use Ordinance and Grease Trap Ordinance provide the City with inspection and enforcement authority.

15. *Are all grease traps inspected regularly?* No, but the City does inspect grease traps periodically and has the legal authority to do so.

16. *How does the owner or operator learn of new or existing unknown grease traps?* Development information is obtained from the Department of Sustainable Development.

17. *Who is responsible for enforcing the sewer ordinance and grease ordinance? Does this party communicate with the utility department on a regular basis?* Enforcement is the responsibility of Code Enforcement.

18. *Are there any significant industrial dischargers to the system?* There are multiple industrial operations within the City and satellite communities.

19. *Is there a pretreatment program in place?* Yes, the Sewer Use Ordinance requires pretreatment with numeric criteria established by local limits.

4.2 EPA Fact Sheet

The EPA also published a Fact Sheet titled "*Controlling Fats, Oils, and Grease Discharges from Food Service Establishments*" (EPA-833-F-12-003, September 2012). The Fact Sheet reviews the practices commonly implemented by utilities to control FOG. Applicable portions of this document are briefly summarized below for consideration.

1. Use of Geographic Information System (GIS) mapping to inventory and locate entities that produce FOG constituents, paired with a complaint database that notes when FOG is responsible for blockages, can be a powerful tool in assessing problems and developing

solutions. With knowledge of the sources and of problems areas, a number of steps can then be taken to ensure that FOG does not impact the smooth functioning of the system.

2. A utility may work towards amending or putting in place a FOG ordinance to be followed in the community, and/or establish design requirements for grease traps or other structures to prevent FOG from entering the collection system.

3. Utilities should establish an enforcement program to ensure compliance with FOG-related policies and ordinances, including an inspection program to ensure that related equipment is working properly.

4. Food service establishments can adopt a variety of best management practices or install interceptor/collector devices to control and capture the FOG material before discharge to the collection system.

5. Proper design, installation, and maintenance procedures for interceptor/collector devices are critical for these devices to control and capture the FOG. For example, interceptor/collector devices must be designed and sized appropriately to allow FOG to cool and separate in a non-turbulent environment, and operators must be diligent in having their interceptor/collector devices serviced at regular intervals.

6. More utilities are addressing FOG discharges by imposing mandatory measures of assorted kinds, including inspections, periodic grease pumping, penalties for violators, and "strong waste" monthly surcharges added to restaurant sewer bills to cover the cost of inspections and upgraded infrastructure.

7. Pretreatment programs are developing and using inspection checklists for both food service establishments and utility pretreatment inspectors to control FOG discharges. EPA identified typical numeric local limits controlling oil and grease in the range of 50 mg/L to 450 mg/L with 100 mg/L as the most commonly reported numeric pretreatment limit.

4.3 Other Operational Practices

Some of the additional practices used at other utilities to control FOG are summarized below. The City recently made the assessment that voluntary compliance and maintenance of grease traps are sufficient to prevent excessive grease from entering the City's sanitary sewer system, and that a dedicated FOG control program is not necessary at this time; accordingly, the below items are provided for review and discussion.

1. **Fats, Oil, and Grease Best Management Practices Manual**. The City of St. Petersburg Water Resources Department (Environmental Compliance Division, Grease Management Program) compiled educational material specifically designed to promote understanding and compliance on the part of food service facilities. The manual contains detailed pollution prevention and compliance information as well as Frequently Asked Questions (**Attachment C**).

2. **Preferred Hauler Program**. JEA (Jacksonville, Florida) has implemented a Preferred Hauler Program with the goal of developing a program that is effective without being unduly burdensome on FOG generators. Preferred Haulers are waste haulers that have met JEA established criteria demonstrating their competencies in maintaining grease traps, responsibly disposing of FOG, and submitting reports. Accordingly, Preferred Haulers can assume some of the responsibilities (and regulatory burden) for their facility clients as follows:

    a. JEA Preferred Haulers submit all required reports and maintenance records for the facility.

    b. Any follow up inspections of the facility will be geared towards Preferred Hauler performance not the restaurant's compliance.

    c. Any discrepancies associated with report submission or grease trap maintenance will be handled directly through the Preferred Hauler.

    The Preferred Hauler Program allows facilities to operate without requiring permits, permit fees, or inspection fees.

3. **Fats, Oils, and Grease (FOG) Control Program**. Miami-Dade County has implemented a full-blown control program that includes the following elements:

    a. Specific prohibitions on discharges.

    b. Corrective procedures for breached FOG control devices and FOG generators found to be in violation.

    c. Corrective procedures for residential FOG sources.

    d. Permit requirements for FOG generators.

    e. Detailed requirements for FOG control device permit drawing submittals including drains and piping, control devices, sampling points, FOG control device sizing calculations and assumptions, model numbers and third-party certifications, waste storage areas, and wash-down areas.

    f. Best management practices, FOG control device maintenance requirements and cleaning frequencies, and requirements for waste storage areas and wash-down areas.

    g. Requirements applicable to waste haulers.

    h. Training requirements for facility staff concerning FOG control devices, best management practices, waste storage, wash-down areas, and recordkeeping and reporting.

    i. Recordkeeping and reporting requirements for maintenance, service calls, and facility staff training.

j. Prescribed forms for recordkeeping and reporting.

k. Requirements related to inspection upon closure of a facility.

l. Causes for revocation of operating permits.

m. Permitting and training requirements for transporters and disposal facilities.

n. Monthly reporting requirements for utilities within Miami-Dade County, including dates and locations where FOG-related cleaning/maintenance was performed.

A copy of the 27-page ordinance is provided in **Attachment D**.

Attachment A

Grease Trap Pilot Project Analysis
City of Fort Lauderdale
Prepared by Mike Pafford
City of Fort Lauderdale Public Works Sustainability Division
Environmental and Regulatory Affairs program
February 2017

EXECUTIVE SUMMARY

From December 2014 through October 2016, over 40% of sanitary sewer overflows were caused by blockages. Since grease is a contributing factor in blockages in pipes and at lift stations, the Public Works Sustainability Division Environmental and Regulatory Affairs Program conducted a pilot project to determine the level of compliance with the existing ordinance and determine if there is a need for a grease trap permitting and inspection program. Of the 30 facility grease traps inspected in the fall 2016, eighty-seven percent (87%) were rated as good or fair and thirteen (13%) were rated poor. A survey completed by a representative of the facility inspected revealed that most businesses were not experiencing problems with their grease traps and were pumping them out at a cost of more than $100 per pump out at least three times per year. In addition, if the city required a permit, the majority of respondents would want the permit fee to be a fixed cost regardless of business size but they would be most supportive of a mandated frequency for the pump out or an annual reporting requirement. Based on the results of the inspection pilot project and the survey results, staff recommends minor modification of the ordinance to change the compliance metric and to further define acceptable levels of maintenance.

INTRODUCTION

The City has been experiencing a higher frequency of Sanitary Sewer Overflows (SSOs) than expected. From December 2014 through October 2016, seventy-six (76) SSOs were reported. Thirty-one (31) were due to blockages. FOG (Fats, Oils, and Greases) has long been recognized as contributing factors to sanitary sewer blockages and overflows. Although grease was only identified as the cause in one of the blockages, the actual number may have been greater. In addition to impacting the wastewater sewer pipes, grease has been identified as a major component for lift station maintenance throughout the system. As such, grease should be reduced or eliminated as much as practical in order to reduce maintenance, decrease odors, increase pump life, and increase pipe longevity. The goal of the Grease Trap Pilot Project was to determine the level of compliance by commercial facilities with the existing ordinance and determine if there is a need for a grease trap permitting and inspection program.

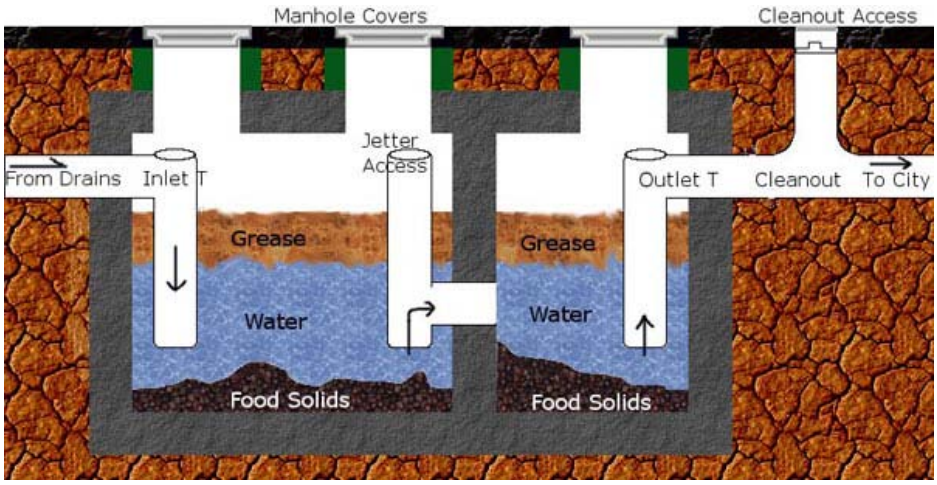


Figure 1 – Typical Grease Trap Schematic

Wastewater flows into a grease trap where the FOG rises to the top, solids settle to the bottom and clean water exits the trap into the City's sanitary sewer system (Figure 1). Based on their activities, some commercial facilities are required to install and maintain a grease trap to prevent FOG from reaching the sanitary sewer system. FOG enter the wastewater collection system may cause a buildup inside pipes which may result in blockages (Figure 2).

Figure 2 – Examples of FOG blockages

The City's current Sewer Use Ordinance; specifically Section 28-209, requires a grease trap to be maintained regularly but not exceed 50% of the capacity. The ordinance relies primarily on voluntary compliance.

Sec. 28-209. - Pretreatment facilities requirements.

(a) Users shall provide wastewater treatment as necessary to comply with this article and shall achieve compliance with all categorical pretreatment standards, local limits, and prohibitions set out in division 2 of this article within the time limitations specified by EPA, the state, or the director, whichever is more stringent.

(e) The director may require grease traps, oil traps, or sand traps, separators, or both, when deemed necessary. The interceptor shall be installed by the industrial users when they are necessary for the proper handling of liquid wastes containing grease in excessive amounts, or any flammable wastes, sand or other harmful ingredients. All traps, separators, or both shall be of a type and capacity approved by the director based on industry standards, and shall be located as to be readily and easily accessible for cleaning and inspection.

(1) All traps, separators, or both, shall be cleaned by a licensed liquid waste hauler as often as necessary to maintain at least fifty percent (50%) of the retention capacity.

(2) No bacterial or enzymatic treatment that improves the discharge flow shall be a partial or complete substitute for adequate maintenance."

SCOPE OF THE PILOT PROJECT

To understand the impacts grease may have on the sanitary sewer system, 50 restaurants located between Sunrise and Oakland Park Boulevard on Federal Highway were targeted for grease trap inspection and evaluation. Of the fifty (50) restaurants in our sample group, twenty (20) were closed or did not require a trap. Grease traps in restaurants receive waste water from sinks, floor drains, dishwashers, etc., and collect the FOG before they enter the City's sanitary sewer system. These traps must be in proper working condition to be effective.

A measuring device was constructed to measure the following from each trap (Figures 3 and 4):

- Distance from the bottom of the tank to the bottom of the top layer of grease
- Distance from the bottom of the tank to the top of the tank
- Thickness of sediment layer
- Thickness of top layer of grease

Figure 3

Figure 4

Criteria were developed to evaluate each trap and rated poor, fair, or good based on:

- Thickness of the top layer of grease
- Estimated age of the grease based on color, odor, texture
- Depth of the sediment layer
- Overall condition of the contents and tank (rust, insects)

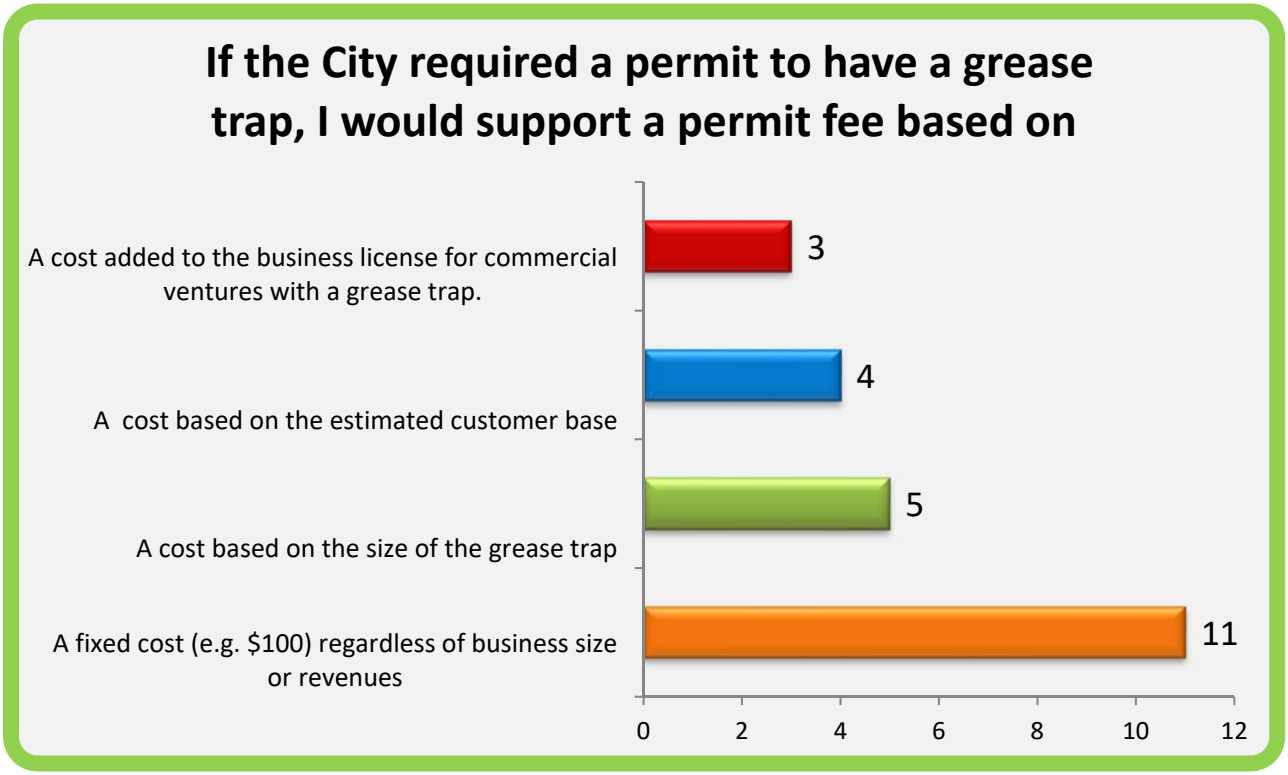
	Good	Fair	Poor
Grease Thickness	0-2”	2-4”	>4”
Age of Grease	Fresh appearance, Yellow to brown, not solidified, normal sewer odor	Slightly aged with some dirt, brown to yellow, solidified but easily broken, dank with slight pungent rotting odor	Old and molded, brown to black, solid and cracking due to top desiccation, pungent rotting odor
Depth of Sediment	0-2”	2-4”	>4”
Overall Condition	Clean rim and cover, cement smooth and piping in good condition, some insects but minimal	Cover and rim rusted but operational, cement worn with some pitting and chipping, piping operational or in need of minor repair, structure obviously worn but still functional, insects present but not excessive	Cover corroded thin in spots and rim may not be solidly attached, cement worn and pitted with exposed rebar, piping in need of repair/replacement, structure may not be functioning as designed, excessive insects with multi-generational stages present

Of the thirty (30) evaluated, four (4) were rated poor, two (2) were rated fair, and twenty-four (24) were rated good. Eighty-seven percent (87%) were rated as good or fair and thirteen percent (13%) were rated poor.

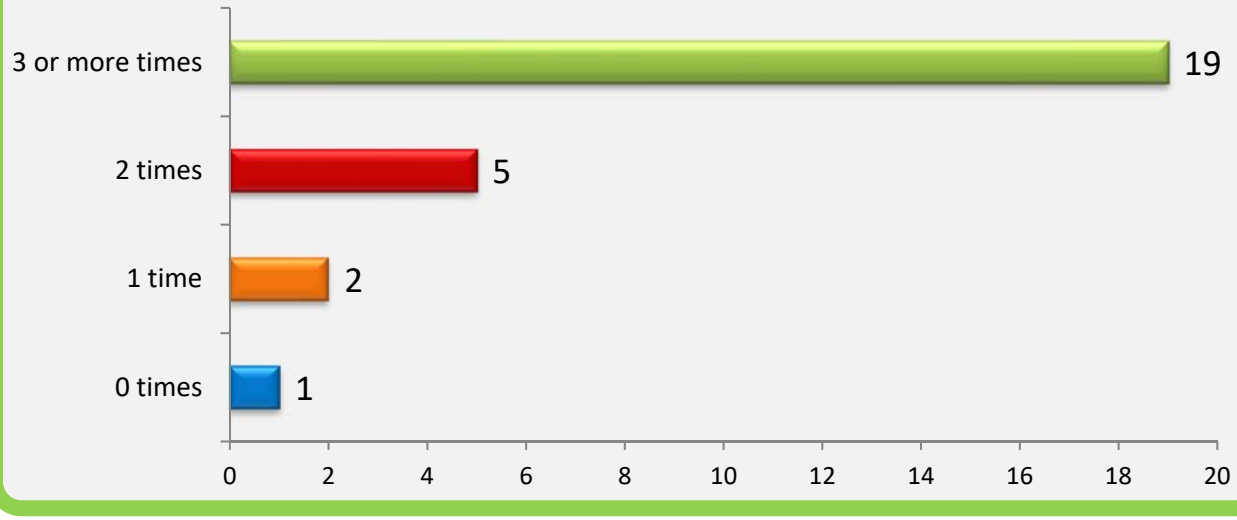
SURVEY

In addition to the physical assessments, a survey (Attached) was used to evaluate existing operations at the restaurants related to grease trap maintenance as well as to obtain feedback on potential changes to the program. The 30 surveys were completed by a representative of the property under inspection. Not all questions were answered in each survey.

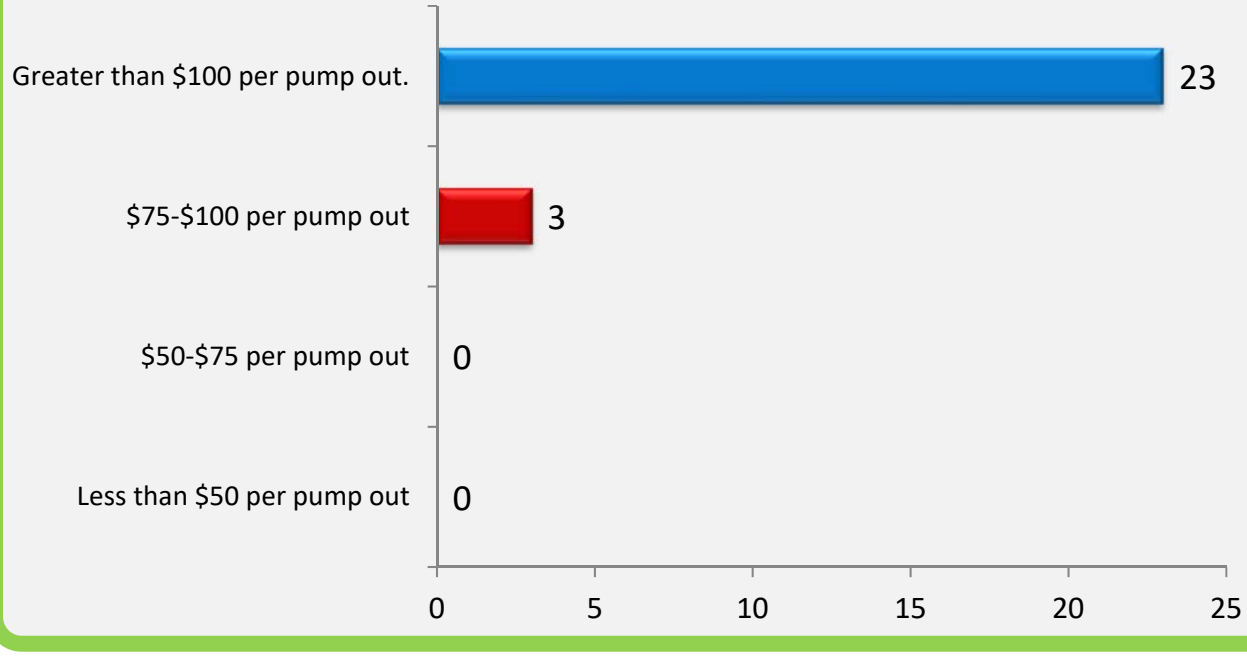
The survey results are the following:



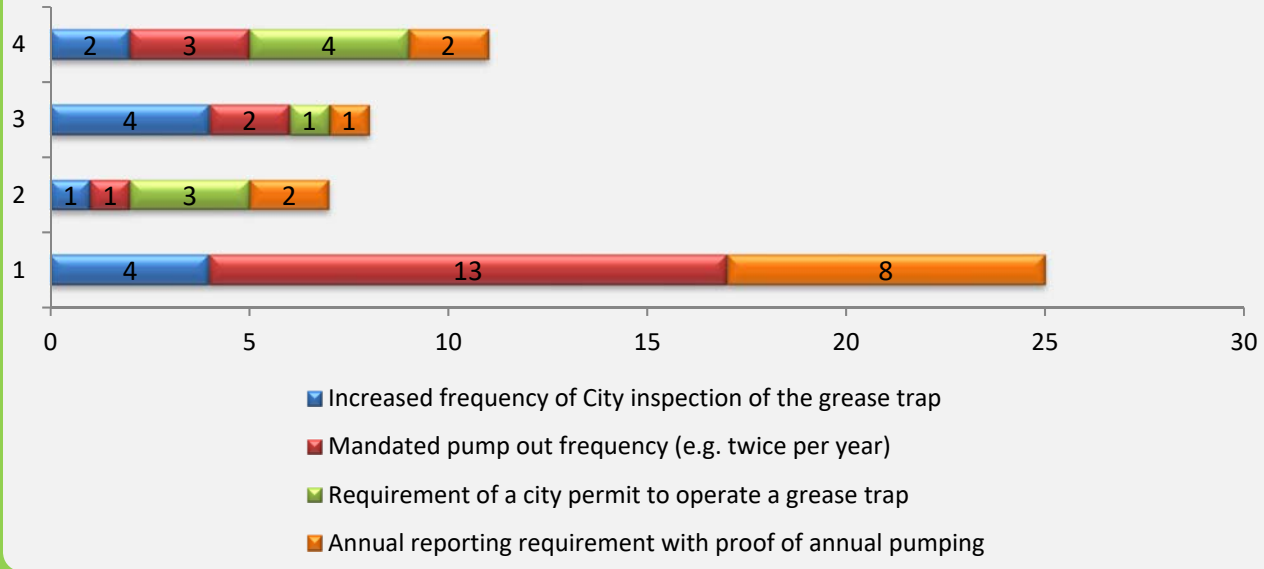
How often do you pay to have your grease trap pumped out annually?



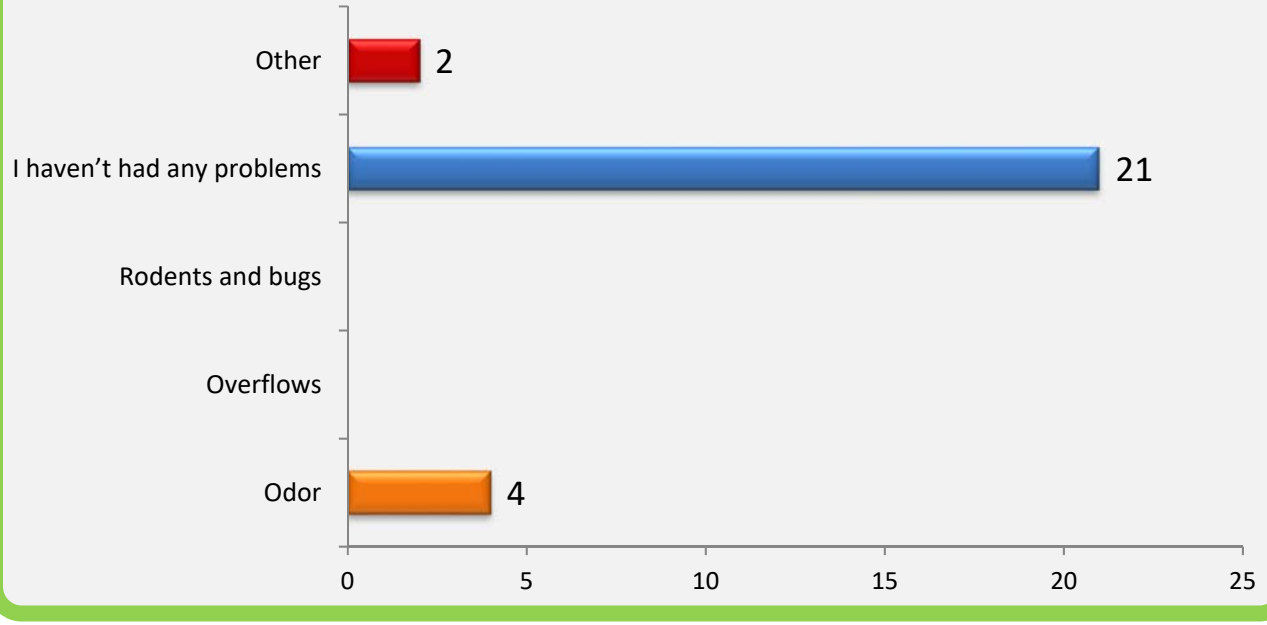
What is the average cost of the pump out?



The City has had issues with grease causing sanitary sewer blockages. To reduce the occurrence of grease related blockages, the City is considering a number of actions. Please rank the following with one (1) being the action you would be most supportive



What kinds of problems have you had with your grease trap?



The last survey question asked if there were trade groups that could be contacted. Four (4) responders indicated that there were no trade groups for contact or feedback concerning grease traps.

CONCLUSIONS

Based on these results, voluntary compliance and maintenance of grease traps are sufficient to prevent excessive grease from entering the City's sanitary sewer system. A dedicated grease trap program is not necessary at this time.

Revisions to the City's sewer ordinance should be pursued to further define acceptable levels of maintenance and measures. Utilizing a percentage of capacity, 50%, for the interceptor when the total capacity is unknown will allow too many variables for enforcing compliance. A comparison to other utilities should be performed and amendments proposed.

ORDINANCE MODIFICATION RECOMMENDATION

Sec. 28-209. - Pretreatment facilities requirements.

(a) Users shall provide wastewater treatment as necessary to comply with this article and shall achieve compliance with all categorical pretreatment standards, local limits, and prohibitions set out in division 2 of this article within the time limitations specified by EPA, the state, or the director, whichever is more stringent.

(e) The director may require grease traps, oil traps, or sand traps, separators, or both, when deemed necessary. The interceptor shall be installed by the industrial users when they are necessary for the proper handling of liquid wastes containing grease in excessive amounts, or any flammable wastes, sand or other harmful ingredients. All traps, separators, or both shall be of a type and capacity approved by the director based on industry standards, and shall be located as to be readily and easily accessible for cleaning and inspection.

(1) All traps, separators, or both, shall be cleaned by a licensed liquid waste hauler at least 3 times per year or as often as necessary to ~~maintain at least fifty percent (50%) of the retention capacity~~ prevent grease from entering

the City's sanitary sewer system as evidenced by grease residue in the clean out, whichever is more frequent. Receipt for pump-out services must be retained for two years and be available for inspection by the City upon request.

(2) No bacterial or enzymatic treatment that improves the discharge flow shall be a partial or complete substitute for adequate maintenance."

Attachment B

ARTICLE V. - SEWER USE REGULATIONS

DIVISION 1. - PURPOSE; SCOPE; APPLICABILITY; FEES

Sec. 28-201. - Purpose.

It is the purpose of this article to:

(a) Establish limitations and prohibitions on the quantity and quality of wastewater which may be lawfully discharged into the WWF.

(b) Establish uniform rules and regulations pertaining to users of the WWF.

(c) Prevent the introduction of pollutants into the WWF that will interfere with its operation.

(d) Prevent the introduction of pollutants into the WWF that will pass through the WWF, inadequately treated, or otherwise be incompatible with operation of the WWF.

(e) Protect both WWF personnel and the general public who may be affected by wastewater and sludge.

(f) Enable the city to comply with its national pollutant discharge elimination system permit conditions, sludge use and disposal requirements, and any other federal or state laws to which the wastewater treatment facilities are subject, including but not limited to the Clean Water Act of 1987, F.S. ch. 403, and F.A.C. ch. 62-625.

(g) Improve the opportunity to reuse reclaimed water, residuals and industrial wastewaters and sludges.

(h) Provide for equitable distribution of the cost of operation, maintenance and improvement of the WWF.

(Ord. No. C-98-61, § 3, 10-20-98; Ord. No. C-12-49, § 6, 12-18-12)

Sec. 28-202. - Applicability.

This article shall apply to all users of the WWF. This article authorizes the issuance of wastewater discharge permits; provides for monitoring, compliance, and enforcement activities; establishes administrative review procedures; requires user reporting; provides for permitting; and provides for the authority for the setting of fees.

(Ord. No. C-98-61, § 3, 10-20-98)

Sec. 28-203. - Administrative.

Except as otherwise provided herein, the director shall administer, implement, and enforce the provisions of this article. Any powers granted to the director or duties imposed upon the director may be delegated by the director to his or her duly authorized representative.

(Ord. No. C-98-61, § 3, 10-20-98)

DIVISION 2. - GENERAL SEWER USE REQUIREMENTS

Sec. 28-204. - Prohibited discharges.

(a) *General prohibition.* No user shall introduce or cause to be introduced into the WWF any pollutant or wastewater which causes pass through or interference. These general prohibitions apply to all users of the WWF whether or not they are subject to a categorical pretreatment standard or any other national, state, or local pretreatment

standards.

(b) *Specific prohibitions.* No user shall introduce or cause to be introduced into the WWF the following pollutants, substances, or wastewater:

(1) Pollutants which create a fire or explosive hazard in the WWF;

(2) Wastewater having a pH of less than 5.5 or more than 11.0, or otherwise causing corrosive structural damage to the WWF or equipment;

(3) Solid or viscous substances in quantities or of such size capable of causing obstruction to the flow of the sewers or interference with the operation of, or which cause injury to the WWF including, but not limited to, uncomminuted garbage or food waste with particles greater than one-half inch (½") in any direction, animal processing waste, ashes, cinders, sand, spent lime, stone or marble dust, metal, glass, straw, shavings, grass clippings, rags, waste paper, wood, plastics, gas, tar, asphalt residues, residues from refining or processing of fuel or lubricating oil, mud or glass grinding or polishing wastes;

(4) Pollutants, including oxygen-demanding pollutants (such as BOD by way of example), released in a discharge at a flow rate, pollutant concentration, or both, which, either singly or by interaction with other pollutants, will cause interference with the WWF;

(5) Wastewater having a temperature greater than one hundred fifty degrees Fahrenheit (150 F) or which will inhibit biological activity in the treatment plant resulting in interference, but in no case wastewater which causes the temperature at the introduction into the treatment plant to exceed one hundred four degrees Fahrenheit (104 F);

(6) Petroleum oil or products of mineral oil origin;

(7) Trucked or hauled pollutants, except by the establishment of a special agreement by the director;

(8) Noxious or malodorous liquids, gases, solids, or other wastewater which, either singly or by interaction with other wastes, are sufficient to create a public nuisance or a hazard to life, or to prevent entry into the sewers for maintenance or repair;

(9) Wastewater containing any radioactive wastes or isotopes except in compliance with applicable state or federal regulations;

(10) Storm water, surface water, ground water, artesian well water, roof runoff, subsurface drainage, swimming pool drainage, condensate, deionized water, noncontact cooling water, and unpolluted wastewater, unless specifically authorized by the director;

(11) Wastewater causing, alone or in conjunction with other sources, the treatment plant's effluent to fail a toxicity test;

(12) Detergents, surface-active agents, or other substances which may cause excessive foaming to such a degree as to interfere with the operation of the WWF or which affects the health or safety of the employees of the WWF;

(13) Any water or waste containing fats, wax, grease, oils or related substances, whether or not emulsified, in excess of four hundred (400) parts per million by weight or which may solidify or become viscous at temperatures between four and five-tenths degrees Celsius (4.5 C), forty degrees Fahrenheit (40 F) and sixty-five and five-tenths degrees Celsius (65.5 C), one hundred fifty degrees Fahrenheit (150 F). Specifically prohibited is the heating of the contents of grease traps and subsequent discharge to the sewer system;

(14) Any concentrated dye wastes or other wastes which are highly colored to the extent as to cause undue expense or affect operation of or interfere with the WWF;

(15) Pollutants which result in the presence of toxic gases, vapors, or fumes within the WWF in a quantity that will cause acute worker health and safety problems;

(16) Pollutants, substances, or wastewater prohibited by this section shall not be processed or stored in such a manner that they could be discharged to the WWF.

(Ord. No. C-98-61, § 3, 10-20-98; Ord. No. C-12-49, § 7, 12-18-12)

Sec. 28-205. - National categorical pretreatment standards.

(a) The categorical pretreatment standards found at F.A.C. ch. 62-660, as existing or as may be amended from time to time, are hereby incorporated by reference herein. Industrial users who are now or who hereafter (as determined by the EPA) may become subject to national categorical pretreatment standards promulgated by the EPA specifying quantities or concentrations of pollutants or pollutant properties which may be discharged into the WWF shall comply with all requirements of such standards, and shall also comply with any additional or more stringent limitations contained in this article. Upon the promulgation of new national categorical pretreatment standards, if more stringent than limitations imposed under this article for sources in that subcategory, such standards shall immediately supersede the limitations imposed under this article. The director shall notify all known affected users of the applicable reporting requirements. Compliance with national categorical pretreatment standards for new sources shall be required upon promulgation of the standard or prior to connection to the WWF.

(1) When wastewater subject to a categorical pretreatment standard is mixed with wastewater not regulated by the same standard, the director may impose an alternate limit using the combined wastestream formula in F.A.C. 62-625.410.

(2) A user may obtain a variance from a categorical pretreatment standard if the user can prove, pursuant to the procedural and substantive provision in F.A.C. 62-625.410, that factors relating to its discharge are fundamentally different from the factors considered by EPA when developing the categorical pretreatment standard.

(3) A user may obtain a net gross adjustment to a categorical standard in accordance with F.A.C. 62-625.820.

(b) The director reserves the right to establish, by ordinance or in individual wastewater discharge permits, more stringent pretreatment standards or requirements on discharges to the WWF consistent with the purpose of this article.

(Ord. No. C-98-61, § 3, 10-20-98; Ord. No. C-12-49, § 8, 12-18-12)

Sec. 28-206. - State requirements.

State requirements and limitations on discharges shall apply in any case where they are more stringent than either federal requirements and limitations or those requirements contained in this article.

(Ord. No. C-98-61, § 3, 10-20-98)

Sec. 28-207. - Local limits.

(a) No person shall discharge wastewater containing pollutants in excess of the local limits for those pollutants which have been established for city's WWFs using standard procedures, calculations and methods acceptable to FDEP to protect against pass through, interference, protection of WWF employees, and adverse effects on wastewater residuals disposal. No user shall discharge process waste streams, unregulated waste streams, or dilute waste streams in excess of the concentrations set forth by the director. Local limits shall be included as permit conditions and attached to each SIU wastewater permit issued.

(b) The established local limits are subject to change and shall be modified as needed based on regulatory requirements and standards, WWF operation, performance and processes, the user base, potable water quality and domestic wastewater characteristics. Modifications to the established local limits must be reviewed and approved by FDEP prior to implementation. Implementation shall be effective thirty (30) days from notice of acceptance of the modified limits by FDEP. Permitted SIUs shall also be issued an addendum to their wastewater discharge permit containing the new local limits.

(c) The established local limits apply at the point where the wastewater is discharged to the WWF. All concentrations for metallic substances are for total metal unless indicated otherwise.

A copy of the approved local limits is available upon request at the following location:

City of Fort Lauderdale
949 NW 38 Street
Fort Lauderdale, FL 33309
Attn: Environmental Services

(d) The director may develop BMPs, by ordinance or in individual wastewater discharge permits to implement local limits and the requirements of section 28-204.

(Ord. No. C-98-61, § 3, 10-20-98; Ord. No. C-08-26, § 2, 6-17-08 ; Ord. No. C-12-49, § 9, 12-18-12)

Sec. 28-208. - Dilution prohibited.

No user shall increase the use of process water, or in any way attempt to dilute a discharge, as a partial or complete substitute for adequate treatment to achieve compliance with a discharge limitation unless expressly authorized by an applicable pretreatment standard or requirement. The director may impose mass limitations on users who are using dilution to meet applicable pretreatment standards or requirements, or in other cases when the imposition of mass limitation is appropriate.

(Ord. No. C-98-61, § 3, 10-20-98)

DIVISION 3. - PRETREATMENT OF WASTEWATER

Sec. 28-209. - Pretreatment facilities requirements.

(a) Users shall provide wastewater treatment as necessary to comply with this article and shall achieve compliance with all categorical pretreatment standards, local limits, and prohibitions set out in division 2 of this article within the time limitations specified by EPA, the state, or the director, whichever is more stringent.

(b) Plans, specifications and operating procedures for such wastewater pretreatment facilities shall be prepared in accordance with accepted engineering practices and signed by a professional engineer registered in the state and shall be submitted to the director for review. The director shall review said plans within sixty (60) days and shall make appropriate comments to the user. Prior to beginning construction of said pretreatment facility, the user shall also secure such building, plumbing or other permits that may be required by the city or any other regulatory authority having jurisdiction.

(c) An industrial user shall, at its own expense, design, construct, operate, and maintain such wastewater pretreatment facilities whenever necessary to reduce or modify the user's wastewater strength set forth in this article, to meet applicable pretreatment standards, or to meet any other wastewater condition or limitation contained in this article.

(d) The director may require users to restrict their discharge during peak flow period, designate that certain wastewater be discharged only into specific sewers, relocate, consolidate, or both, points of discharge, separate sewage wastestreams from industrial wastestreams, and such other conditions as may be necessary to protect the WWF, or to protect the health and safety of employees of the WWF and determine the user's compliance with the requirements of this article.

(e) The director may require grease traps, oil traps, or sand traps, separators, or both, when deemed necessary. The interceptors shall be installed by the industrial users when they are necessary for the proper handling of liquid wastes containing grease in excessive amounts, or any flammable wastes, sand or other harmful ingredients. All

traps, separators, or both shall be of a type and capacity approved by the director based on industry standards, and shall be located as to be readily and easily accessible for cleaning and inspection.

(1) All traps, separators, or both, shall be pumped and cleaned by a licensed liquid waste hauler at least three (3) times per year and as often as necessary to prevent grease from entering the city's sanitary sewer system as evidenced by grease residue in the cleanout. Receipts for pump-out and cleaning services must be retained for two (2) years and be available for inspection by the city upon request.

(2) No bacterial or enzymatic treatment that improves the discharge flow shall be a partial or complete substitute for adequate maintenance.

(f) Users with the potential to discharge flammable substances may be required to install and maintain an approved combustible gas detection meter.

(Ord. No. C-98-61, § 3, 10-20-98; Ord. No. C-17-13 , § 1, 6-20-17)

Sec. 28-210. - Accidental or slug discharge control plan requirements.

At least once every two (2) years, the director shall evaluate whether each significant industrial user needs an accidental discharge/slug control plan where the slug discharge may affect or interfere with the operation of the WWF or the health, safety and welfare of the employees of the WWF. New SIUs must be evaluated within one (1) year of being designated an SIU. The director may require any user to develop, submit for approval, and implement such a plan. An accidental discharge/slug control plan shall address, at a minimum, the following:

(a) Description of discharge practices, including nonroutine batch discharges.

(b) Description of stored chemicals.

(c) Procedures for immediately notifying the director of any accidental or slug discharges, including any discharge that would violate a prohibition in section 28-204 of this article, with procedures for follow-up written notification within five (5) days, in accordance with section 28-225 of this article.

(d) Procedures to prevent adverse impact from any accidental spills. Such procedures include, but are not limited to, inspection and maintenance of storage areas, handling and transfer of materials, loading and unloading operations, control of plant site runoff, worker training, building of containment structures or equipment, measures for containing toxic organic pollutants including solvents, or measures and equipment for emergency response.

(Ord. No. C-98-61, § 3, 10-20-98; Ord. No. C-12-49, § 10, 12-18-12)

Sec. 28-211. - Hauled wastewater procedures.

All liquid waste haulers shall be licensed by Broward County and comply with all operating requirements specified in Chapter 27 of the Broward County Code.

(Ord. No. C-98-61, § 3, 10-20-98; Ord. No. C-12-49, § 11, 12-18-12)

DIVISION 4. - WASTEWATER DISCHARGE PERMIT REQUIREMENTS

Sec. 28-212. - Wastewater discharge permit application.

(a) *Wastewater survey.* When requested by the director, a user must submit information on the nature and characteristics of its wastewater within thirty (30) days of the request. The director is authorized to prepare a form for this purpose and may periodically require users to update this information. Failure to complete this survey shall

be reasonable grounds for terminating service to the industrial user and shall be considered a violation of this article.

(b) *Wastewater discharge permit requirement.*

(1) No significant industrial user shall discharge wastewater into the WWF without first obtaining a wastewater discharge permit from the director, except that a significant industrial user that has filed a timely application pursuant to section 28-212(c) of this article may continue to discharge for the time period specified therein.

(2) The director may require other users to obtain wastewater discharge permits as necessary to carry out the purposes of this article.

(3) Any violation of the terms and conditions of a wastewater discharge permit shall be deemed a violation of this article and subjects the wastewater discharge permittee to the sanctions set out in Division 6 of this article. Obtaining a wastewater discharge permit does not relieve a permittee of its obligation to comply with all federal and state pretreatment standards or requirements or with any other requirements of federal, state, and local law.

(c) *Wastewater discharge permitting: existing connections.* Any user required to obtain a wastewater discharge permit who was discharging wastewater into the WWF prior to the effective date of this ordinance and who wishes to continue such discharges in the future, shall, within ninety (90) days after said date, apply to the director for an individual wastewater discharge permit in accordance with section 28-212(e) of this article and shall not cause or allow discharges to the WWF to continue after one hundred and eighty (180) days of the effective date of this article except in accordance with an individual wastewater permit issued by the director.

(d) *Wastewater discharge permitting: new connections.* Any user required to obtain a wastewater discharge permit who proposes to begin or recommence discharging into the WWF must obtain such permit prior to the beginning or recommencing of such discharge. An application for this wastewater discharge permit, in accordance with section 28-212(e) of this article, must be filed at least one hundred eighty (180) days prior to the date upon which any discharge will begin or recommence.

(e) *Wastewater discharge permit application contents.* All users required to obtain a wastewater discharge permit must submit a permit application. The director may require all users to submit as part of an application the following information:

(1) *Identifying information.* The user shall submit the name and address of the facility, including the name or the operator and owners.

(2) *Permits.* The user shall submit a list of any pollution control permits held by or for this facility.

(3) *Description of operations.*

a. The user shall submit a brief description of the nature, average rate of production (including each product produced by type, amount, processes, and rate of production), and standard industrial classification (SIC) codes of the operations carried out by such user. This description shall include a schematic process diagram which indicates points of discharge to the WWF from the regulated processes;

b. Types of wastes generated, and a list of all raw materials and chemicals used or stored at the facility which are, or could accidentally or intentionally be, discharged to the WWF;

c. Number and type of employees, hours of operation, and proposed or actual hours of operation;

d. Type and amount of raw materials processed (average and maximum per day); and

e. Site plans, floor plans, mechanical and plumbing plans, and details to show all sewers, floor drains, and appurtenances by size, location, and elevation, and all points of discharge.

(4) Time and duration of discharges.

(5) The location for monitoring all wastes covered by the permit.

(6) *Flow measurement.* The user shall submit information showing the measured average daily and maximum daily f the WWF from each of the following:

a. Regulated process streams; and

b. Other streams as necessary to allow for the use of the combined waste stream formula of Chapter 62-625.410, F.A.C. Verifiable estimates of these flows are permitted, where justified by cost or feasibility considerations.

(7) *Measurement of pollutants.*

a. The user shall identify the pretreatment standards applicable to each regulated process.

b. In addition, the user shall submit the results of sampling and analysis identifying the nature and concentration (or mass, where required by the pretreatment standard or city) of regulated pollutants in the discharge from each regulated process.

c. Both daily maximum and average concentration (or mass, where required) shall be reported. The sample shall be representative of daily operations.

d. In cases where the pretreatment standard requires compliance with a BMP or pollution prevention alternative, the user shall submit documentation as required by the director or the applicable standards to determine compliance with the standard;

e. Sampling and analysis must be performed in accordance with procedure set out in sections 28-230 and 28-231 of this article.

(8) Any requests for a monitoring waiver (or a renewal of an approved monitoring waiver) for a pollutant neither present nor expected to be present in the discharge based on section 28-223 of this article.

(9) Any other information as may be deemed necessary by the director to evaluate the wastewater discharge permit application.

Incomplete or inaccurate applications will not be processed and will be returned to the user for revision.

(f) *Application signatories and certification.*

(1) All wastewater discharge permit applications must be signed by an authorized representative of the user, as defined in section 28-26, and contain the certification statement in section 28-232.

(2) If the designation of an authorized representative of the user is no longer accurate because of a different individual or position has responsibility for the overall operation of the facility or overall responsibility for environmental matters for the company, a new written authorization satisfying the requirements of this section must be submitted to the director prior to or together with any application signed by an authorized representative of the user.

(3) A facility determined to be a nonsignificant categorical industrial user by the director pursuant to section 28-26 must annually submit the signed certification statement in section 28-232.

(g) *Wastewater discharge permit decisions.* The director will evaluate the data furnished by the user and may require additional information. Within one hundred twenty (120) days of receipt of a complete wastewater discharge permit application, the director will determine whether or not to issue a wastewater discharge permit. The director may deny any application for a wastewater discharge permit.

(Ord. No. C-98-61, § 3, 10-20-98; Ord. No. C-08-26, § 3, 6-17-08 ; Ord. No. C-12-49, § 12, 12-18-12)

Sec. 28-213. - Wastewater discharge permit issuance process.

(a) *Wastewater discharge permit duration.* A wastewater discharge permit shall be issued for a specified time period, not to exceed five (5) years from the effective date of the permit. A wastewater discharge permit may be issued for a period less than five (5) years, at the discretion of the director. Each wastewater discharge permit will indicate a

specific date upon which it will expire.

(b) *Wastewater discharge permit contents.* A wastewater discharge permit shall include such conditions as are deemed reasonably necessary by the director to prevent pass through or interference, protect the quality of the water body receiving the treatment plant's effluent, protect worker health and safety, facilitate sludge management and disposal, and protect against damage to the WWF.

(1) Wastewater discharge permits must contain:

a. A statement that indicates wastewater discharge permit duration, which in no event shall exceed five (5) years;

b. A statement that the wastewater discharge permit is nontransferable without prior notification to the city and without providing a copy of the existing permit to the new owner or operator.

c. Effluent limits, including BMPs based on applicable general pretreatment standards found in F.A.C. Chapter 62-625, categorical pretreatment standards, local limits, and state and local law;

d. Self-monitoring, sampling, reporting, notification, and record-keeping requirements. These requirements shall include an identification of pollutants to be monitored, sampling location, sampling frequency, and sample type based on the applicable pretreatment standards found in F.A.C. Chapter 62-625, categorical pretreatment standards, local limits, and state and local law;

e. The process for seeking a waiver for a pollutant neither present nor expected to be present in the discharge in accordance with section 28-223 of this article or a specific waived pollutant in the case of an individual permit;

f. A statement of applicable civil and criminal penalties for violation of pretreatment standards and requirements, and any applicable compliance schedule. Such schedule may not extend the time for compliance beyond that required by applicable federal, state, or local law;

g. Requirements to control slug discharges, if determined by the director to be necessary; and

h. Any grant of the monitoring waiver by the director must be included as a condition of the user's permit.

(2) Wastewater discharge permits may contain, but need not be limited to, the following conditions:

a. Limits on the average and/or maximum rate of discharge, time of discharge, and/or requirements for flow regulation and equalization;

b. Requirements for the installation of pretreatment technology, pollution control, or construction of appropriate containment devices, designed to reduce, eliminate, or prevent the introduction of pollutants into the treatment works;

c. Requirements for the development and implementation of spill control plans or other special conditions including management practices necessary to adequately prevent accidental, unanticipated, or nonroutine discharges;

d. Development and implementation of waste minimization plans to reduce the amount of pollutants discharged to the WWF;

e. The unit charge or schedule of user charges and fees for the management of the wastewater discharged to the WWF;

f. Requirements for installation and maintenance of inspection and sampling facilities and equipment;

g. A statement that compliance with the wastewater discharge permit does not relieve the permittee of responsibility for compliance with all applicable federal and state pretreatment standards, including those which become effective during the term of the wastewater discharge permit; and

h. Other conditions as deemed appropriate by the director to ensure compliance with this article, and state and federal laws, rules, and regulations.

(Ord. No. C-98-61, § 3, 10-20-98; Ord. No. C-08-26, § 3, 6-17-08 ; Ord. No. C-12-49, § 13, 12-18-12)

Sec. 28-214. - Wastewater discharge permit appeals.

The director shall provide public notice of the issuance of a wastewater discharge permit. An applicant may petition the director to reconsider the terms of a wastewater discharge permit within thirty (30) days of notice of its issuance.

(a) Failure to submit a timely petition for review shall be deemed to be a waiver of the administrative appeal.

(b) In its petition, the appealing party must indicate the wastewater discharge permit provisions objected to and the reasons for this objection and the alternative condition, if any, it seeks to place in the wastewater discharge permit.

(c) The effectiveness of the wastewater discharge permit shall not be stayed pending the appeal.

(d) If the director or city manager fails to act within ninety (90) days of the petition, a request for reconsideration shall be deemed to be denied. Decisions not to reconsider a wastewater discharge permit or not to modify a wastewater discharge permit shall be considered final administrative actions for purposes of judicial review.

(e) Any industrial user whose discharge has been determined by the director to be unacceptable may appeal to the city manager for a further review within thirty (30) days of the director's decision and subsections (a), (b), (c) and (d) above shall apply.

(Ord. No. C-98-61, § 3, 10-20-98; Ord. No. C-12-49, § 14, 12-18-12)

Sec. 28-215. - Wastewater discharge permit modification.

The director may modify a wastewater discharge permit for good cause, including but not limited to the following reasons:

(a) To incorporate any new or revised federal, state or local pretreatment standards or requirements.

(b) To address significant alterations or additions to the user's operation, processes or wastewater volume or character since the time of wastewater discharge permit issuance.

(c) There is a change in the WWF that requires either a temporary or permanent reduction or elimination of the authorized discharge.

(d) There is information indicating that the permitted discharge poses a threat to the city's WWF, city personnel, the receiving waters, or the WWF beneficial sludge use.

(e) There is a violation of any terms or conditions of the wastewater discharge permit.

(f) There is a misrepresentation or failure to fully disclose all relevant facts in the wastewater discharge permit application or in any required reporting.

(g) There is a revision of or a grant of a variance from categorical pretreatment standards pursuant to 40 CFR 403.13.

(h) To correct typographical or other errors in the individual wastewater discharge permit.

(i) To reflect a transfer of the facility ownership or operation to a new owner or operator.

(Ord. No. C-98-61, § 3, 10-20-98; Ord. No. C-12-49, § 15, 12-18-12)

Sec. 28-216. - Wastewater discharge permit transfer.

Wastewater discharge permits may be transferred to a new owner or operator only if the permittee gives at least thirty (30) days advance written notice to the director and the director approves the wastewater discharge permit transfer. The notice to the director must include a written certification by the new owner or operator which:

(a) States that the new owner, operator, or both, has no immediate intent to change the facility's operations and pro

(b) Identifies the specific date on which the transfer is to occur.

(c) Acknowledges full responsibility for complying with the existing wastewater discharge permit.

The director will respond to the request in writing. In the event the director denies the request, the new owner/operator must submit a new permit application in accordance with this article. Failure to provide advance notice of a transfer renders the wastewater discharge permit void as of the date of facility transfer.

(Ord. No. C-98-61, § 3, 10-20-98)

Sec. 28-217. - Wastewater discharge permit revocation.

The director may revoke a wastewater discharge permit for good cause, including but not limited to the following reasons:

(a) Failure to notify the director of significant changes to the wastewater prior to the changed discharge.

(b) Failure to provide prior notification to the director of changed conditions pursuant to this article.

(c) Misrepresentation or failure to fully disclose all relevant facts in the wastewater discharge permit application.

(d) Falsifying self-monitoring reports.

(e) Tampering with monitoring equipment.

(f) Refusing to allow city inspectors timely access to the facility premises and records.

(g) Failure to meet effluent limitations.

(h) Failure to pay fines.

(i) Failure to pay municipal service charges.

(j) Failure to meet compliance schedules.

(k) Failure to complete a wastewater survey or the wastewater discharge permit application.

(l) Failure to provide advance notice of the transfer of business ownership of a permitted facility.

(m) Failure to comply with any pretreatment standard or requirement or any terms of the wastewater discharge permit or this article.

(Ord. No. C-98-61, § 3, 10-20-98)

Sec. 28-218. - Wastewater discharge permit reissuance.

A user with an expiring wastewater discharge permit shall apply for wastewater discharge permit reissuance by submitting a complete permit application, in accordance with this article, a minimum of thirty (30) days prior to the expiration of the user's existing wastewater discharge permit.

(Ord. No. C-98-61, § 3, 10-20-98)

Sec. 28-219. - Regulation of waste received from other jurisdictions.

No waste shall be accepted from other jurisdictions, unless it meets the terms agreed upon in the large user agreement with the appropriate government agencies.

(a) If another municipality or user located within another municipality contributes wastewater to the WWF, the director shall enter into an agreement with the contributing municipality.

(b) Prior to entering into an agreement required above, the director shall request the following information from the contributing municipality:

(1) A description of the quality and volume of wastewater discharged to the WWF by the contributing municipa

(2) An inventory of all users located within the contributing municipality that are discharging to the WWF.

(3) Such other information as the director may deem necessary.

(c) An agreement as required by subsection (a) above shall contain the following conditions:

(1) A requirement for the contributing municipality to adopt an ordinance containing the provisions of the City of Fort Lauderdale's municipal sewer use ordinance or one which is at least as stringent as this article. The requirement shall specify that such ordinance and limits must be revised as necessary to reflect changes made to the city's ordinance or local limits.

(2) A requirement for the contributing municipality to submit a revised user inventory on at least an annual basis.

(3) A provision specifying which pretreatment implementation activities, including wastewater discharge permit issuance, inspection and sampling and enforcement, will be conducted by the contributing municipality; which of these activities will be conducted by the director ; and which of these activities will be conducted jointly by the contributing municipality and the director.

(4) A requirement for the contributing municipality to provide the director with access to all information that the contributing municipality obtains as part of its pretreatment activities.

(5) Limits on the nature, quality and volume of the contributing municipality's wastewater at the point where it discharges to the WWF.

(6) Requirements for monitoring the contributing municipality's discharge, if requested by the director.

(7) A provision ensuring city inspectors access to the facilities of users located within the contributing municipality's jurisdictional boundaries for the purpose of inspection, sampling and any other duties deemed necessary by the director.

(8) A provision specifying remedies available for breach of the terms of the agreement.

(Ord. No. C-98-61, § 3, 10-20-98)

DIVISION 5. - REPORTING REQUIREMENTS

Sec. 28-220. - Baseline monitoring reports.

(a) Within either one hundred eighty (180) days after the effective date of a categorical pretreatment standard, or the final administrative decision on a category determination under 40 CFR 403.6(a)(4), whichever is later, existing categorical users currently discharging to, or scheduled to discharge to, the WWF shall submit to the director a report which contains the information listed in subsection (b) of this section. At least ninety (90) days prior to commencement of their discharge, new sources, and sources that become categorical users subsequent to the promulgation of an applicable categorical standard, shall submit to the director a report which contains the information listed in subsection (b) of this section. A new source shall report the method of pretreatment it intends to use to meet applicable categorical standards. A new source also shall give estimates of its anticipated flow and quantity of pollutants to their discharge.

(b) Users described above shall submit the information set forth below.

(1) *Identifying information.* The name and address of the facility, including the name of the operator and owner.

(2) *Permits.* A list of any pollution control permits held by or for the facility.

(3) *Description of operations.* A brief description of the nature, average rate of production, and standard industrial classifications of the operations carried out by such user. This description shall include a schematic

process diagram which indicates points of discharge to the WWF from the regulated process.

(4) *Flow measurement.* Information showing the measured average daily and maximum daily flow, in gallons per day, to the WWF from regulated process streams and other streams, as necessary, to allow use of the combined wastestream formula set out in 62-625.410 F.A.C.

(5) *Measurement of pollutants.*

a. The user shall identify the categorical pretreatment standards applicable to each regulated process.

b. The results of sampling and analysis identifying the nature and concentration, mass, or both, where required by the standard or by the director, of regulated pollutants in the discharge from each regulated process.

c. Both daily maximum and average concentration shall be reported. The sample shall be representative of daily operations.

d. In cases where the pretreatment standard requires compliance with a BMP or pollution prevention alternative, the user shall submit documentation as required by the director or the applicable standards to determine compliance with the standard.

e. The user shall take a minimum of one (1) representative sample to demonstrate data is in compliance with these requirements.

f. Samples shall be taken immediately downstream from pretreatment facilities, if such exist, or immediately downstream from the regulated process if no pretreatment exists. If other wastewaters are mixed with the regulated wastewater prior to pretreatment, the user shall measure the flows and concentrations necessary to allow use of the combined waste stream formula of subsection 62-624.410(6), F.A.C., in order to evaluate compliance with the pretreatment standards.

g. Sampling must be performed in accordance with procedures set out in this article.

h. The user may submit a baseline report which utilizes only historical data so long as the data provides information sufficient to determine the need for industrial pretreatment measures.

i. The BMR shall indicate the time, date and place of sampling, methods of analysis, and test results for each component and shall certify that such sampling and analysis is representative of normal work cycles and expected pollutant discharges to the WWF.

(6) *Certification.* A statement, reviewed by an authorized representative of the user indicating whether pretreatment standards are being met on a consistent basis, and if not, whether additional O&M or additional pretreatment is required for the user to meet the pretreatment standards and requirements.

(7) *Compliance schedule.* If additional pretreatment or operations and maintenance (O&M) will be required to meet the pretreatment standards, the user shall provide such additional pretreatment or O&M as specified in a compliance schedule. The completion date in this schedule shall not be later than the compliance date established for the applicable pretreatment standard. A compliance schedule pursuant to this section must meet the requirements set out in section 28-221 of this article.

(8) *Signature and report certification.* All BMRs must be certified in accordance with section 28-232 of this article and signed by an authorized representative of the user as defined in section 28-26.

(Ord. No. C-98-61, § 3, 10-20-98; Ord. No. C-12-49, § 16, 12-18-12)

Sec. 28-221. - Compliance schedule progress reports.

The following conditions shall apply to the compliance schedule required by this article:

(a) The schedule shall contain progress increments in the form of dates for the commencement and completion of major events leading to the construction and operation of additional pretreatment required for the user to

meet the applicable pretreatment standards. No increment referred to above shall exceed nine (9) months.

(b) Within fourteen (14) days following each date in the schedule and the final date for compliance, the user shall submit a progress report to the director including, at a minimum, whether or not it met with the increment of progress to be met on such date, and if not, the date on which it expects to comply with this increment of progress, the reason for any delay, and, if appropriate, the steps being taken by the user to return to the established schedule. In no event shall more than nine (9) months elapse between such progress reports to the director.

(Ord. No. C-98-61, § 3, 10-20-98; Ord. No. C-08-26, § 4, 6-17-08 ; Ord. No. C-12-49, § 17, 12-18-12)

Sec. 28-222. - Reports on compliance with categorical pretreatment standard deadline.

Within ninety (90) days following the date for final compliance with applicable categorical pretreatment standards, or in the case of a new source following commencement of the introduction of wastewater into the WWF, any user subject to such pretreatment standards and requirements shall submit to the director a report containing the information described in this article. For users subject to equivalent mass or concentration limits established in accordance with the procedures in 40 CFR 403.6(c), this report shall contain a reasonable measure of the user's long-term production rate. For all other users subject to categorical pretreatment standards expressed in terms of allowable pollutant discharge per unit of production (or other measure of operation), this report shall include the user's actual production during the appropriate sampling period. All compliance reports must be signed by an authorized representative of the user and certified in accordance with this article.

Sampling and analysis shall be performed in accordance with sections 28-230 and 28-231 of this article.

(Ord. No. C-98-61, § 3, 10-20-98; Ord. No. C-12-49, § 18, 12-18-12)

Sec. 28-223. - Periodic compliance reports.

(a) Any categorical industrial user, except an NSCIU, after the compliance date of such pretreatment standard, or, in the case of a new source, after the commencement of the discharge into the WWF, shall submit to the director during the months of June and December, unless required more frequently in the pretreatment standard or by the director, in accordance with this article, a report indicating the nature and concentration of pollutants in the effluent which are limited by such categorical pretreatment standards. In addition, this report shall include a record of measured or estimated average and maximum daily flows for the reporting period for the discharge reported in section 28-220(b) of this article. In cases where the pretreatment standard requires compliance with a BMP or pollution prevention alternative, the user shall submit documentation required by the director or the pretreatment standard necessary to determine the compliance status of the user. The user may request submission of this report in months other than June and December, if based on such factors as local high or low flow rates, holidays, or budget cycles, the alternate dates more accurately represent actual operating conditions.

(b) The city may authorize a user to waive sampling of a pollutant regulated by a categorical pretreatment standard if the user demonstrates the following through sampling and other technical factors:

(1) The pollutant is neither present nor expected to be present in the discharge, or the pollutant is present only at background levels from intake water and without any increase in the pollutant due to activities of the user; and

(2) The pollutant is determined to be present solely due to sanitary wastewater discharged from the facility provided that the sanitary wastewater is not regulated by an applicable categorical standard and otherwise includes no process wastewater.

(c) The authorization of the monitoring waiver is subject to the following conditions and does not supersede certification processes and requirements established in categorical pretreatment standards, except as specified in

the categorical pretreatment standard:

(1) The monitoring waiver is valid only for the duration of the effective period of the individual wastewater discharge permit, but in no case longer than five (5) years. The user must submit a new request for the waiver before the waiver can be granted for each subsequent individual wastewater discharge permit;

(2) In making a demonstration that a pollutant is not present, the user must provide data from at least one (1) sampling of the facility's process wastewater prior to any treatment present at the facility that is representative of all wastewater from all processes. Non-detectable sample results may only be used as a demonstration that a pollutant is not present if FDEP's approved method from Rule 62-4.246, F.A.C., with the lowest MDL for that pollutant was used in the analysis;

(3) The request for a monitoring waiver must be certified in accordance with this article and signed by an authorized representative of the user as defined in section 28-26;

(4) The authorization must be included as a condition in the user's permit. The reasons supporting the waiver and any information submitted by the user in its request for the waiver must be maintained by the director for three (3) years after expiration of the waiver;

(5) Upon approval of the monitoring waiver and revision of the user's individual wastewater discharge permit by the director, the user must certify on each report the statement in section 28-232(b) of this article; and

(6) In the event that a waived pollutant is found to be present, or is expected to be present based on changes that occur in the user's operations, the user must immediately notify the director and comply with the monitoring requirements of section 28-223 of this article or other more frequent monitoring requirements imposed by the director.

(d) All periodic compliance reports must be certified in accordance with this article and signed by an authorized representative of the user as defined in section 28-26.

(e) Sampling and analysis shall be performed in accordance with this article.

(f) For this report, the user will be required to collect the number of grab samples necessary to assess and assure compliance with applicable pretreatment standards and requirements.

(g) All wastewater samples must be representative of the user's discharge. Wastewater monitoring and flow measurement facilities shall be properly operated, kept clean, and maintained in good working order at all times. The failure of a user to keep its monitoring facility in good working order shall not be grounds for the user to claim that sample results are unrepresentative of its discharge.

(h) If a user subject to the reporting requirement in this section monitors any pollutant more frequently than required by the director, using the procedures prescribed by this article, the results of this monitoring shall be included in the report.

(Ord. No. C-98-61, § 3, 10-20-98; Ord. No. C-12-49, § 19, 12-18-12)

Sec. 28-224. - Reports of changed conditions.

(a) Each user must notify the director of any planned significant changes to the user's operations or system which might alter the nature, quality, or volume of its wastewater at least thirty (30) days before the change.

(b) The director may require the user to submit such information as may be deemed necessary to evaluate the changed condition, including the submission of a wastewater discharge permit application.

(c) The director may modify an existing wastewater discharge permit in response to changed conditions or to include the changed conditions as an addendum until the issuance of a scheduled permit renewal.

(d) For purposes of this requirement, significant changes include, but are not limited to, flow increases of twenty percent (20%) or greater, and the discharge of any previously unreported pollutants.

(Ord. No. C-98-61, § 3, 10-20-98)

Sec. 28-225. - Reports of accidental discharges.

(a) In the case of an accidental discharge or slug discharge by a user, it is the responsibility of that user to immediately inform the WWF of the incident no later than one (1) hour after the discharge. Notification should inform the WWF of the exact location of the discharge, type of waste, concentration, volume and corrective action taken.

(b) Costs incurred by the city to correct any damage resulting from such a discharge shall be charged to the user, and failure to report such a discharge shall be a violation and result in an additional charge of one thousand five hundred dollars ($1,500.00) in addition to costs of correction. Each such discharge shall be considered separately and costs and charges levied accordingly. Each day on which there is such a discharge shall be considered a separate discharge and charges shall be levied accordingly.

(c) A notice shall be posted on the premises advising employees whom to call in the event of an accidental discharge. Employers shall ensure that all employees who may be present when such accidental or slug discharges may occur are advised of the emergency procedures.

(d) Within five (5) days following an accidental or slug discharge, the user shall submit to the director a detailed written report describing the cause of the discharge and the measures to be taken to prevent similar future occurrences and requesting a hearing on such discharge and fine should the user desire.

(e) All users are required to notify the director immediately of any changes at its facility affecting the potential for a slug discharge.

(Ord. No. C-98-61, § 3, 10-20-98; Ord. No. C-12-49, § 20, 12-18-12)

Sec. 28-226. - Reports from unpermitted users.

All users not required to obtain a wastewater discharge permit shall provide appropriate reports to the director as the director may require for the purpose of monitoring compliance with pretreatment standards and requirements and the prevention of any potential harm to health, safety or welfare of the citizens of the city and the employees of the WWF.

(Ord. No. C-98-61, § 3, 10-20-98)

Sec. 28-227. - Special agreements.

Whenever necessary or expedient in order to carry out the provisions of this article, the city may enter into special agreements with the users of the city's facilities setting forth terms under which the discharge of such users will be acceptable to the city.

(Ord. No. C-98-61, § 3, 10-20-98)

Sec. 28-228. - Notice of violation/repeat sampling and reporting.

If sampling performed by a user indicates a violation, the user shall notify the director within twenty-four (24) hours of becoming aware of the violation by calling (954) 828-8000. The user shall also repeat the sampling and analysis and submit the results of the repeat analysis to the director within thirty (30) days after becoming aware of the violation. Where the city has performed the sampling and analysis in lieu of the user, the city will perform the repeat sampling and analysis, unless the user is notified and required to perform the repeat analysis. Resampling is not required if the city performs sampling at the user's facility at a frequency of at least once per month, or if the city performs sampling at the user's facility between the time when the initial sampling was conducted and the time when the user or the city receives the results of this sampling.

(Ord. No. C-98-61, § 3, 10-20-98; Ord. No. C-12-49, § 21, 12-18-12)

Sec. 28-229. - Notification of hazardous waste discharge.

(a) The industrial user shall notify the director in writing of any discharge into the WWF of a substance regulated under F.A.C. ch. 62-730. Such notification shall include the name of the hazardous waste, the EPA hazardous waste number, and the type of discharge (continuous, batch, or other). If the industrial user discharges more than 100 kilograms of such waste per calendar month to the WWF, the notification shall also contain the following information to the extent such information is known and readily available to the industrial user: an identification of the hazardous constituents contained in the wastes, an estimation of the mass and concentration of such constituents in the wastestream discharged during that calendar month, and an estimation of the mass of constituents in the wastestream expected to be discharged during the following twelve (12) months. Industrial users who commence discharging after the effective date of the ordinance from which this article is derived shall provide the notification no later than one hundred eighty (180) days after the discharge of the listed or characteristic hazardous waste. Any notification under this subsection needs to be submitted only once for each hazardous waste discharged. The notification requirement in this section does not apply to pollutants already reported under the self-monitoring requirements of this article.

(b) Discharges are exempt from the requirements of subsection (a) of this section, during a calendar month in which they discharge no more than fifteen (15) kilograms of hazardous wastes, unless the wastes are acute hazardous wastes as specified in F.A.C. ch. 62-730. Discharges of more than fifteen (15) kilograms of nonacute hazardous waste in a calendar month, or of any quantity of acute hazardous wastes as specified in F.A.C. ch. 62-730, require a one-time notification. Subsequent months during which the industrial user discharges more than such quantities of any hazardous waste do not require additional notification.

(c) In the case of any new regulations identifying additional characteristics of hazardous waste or listing any additional substance as a hazardous waste, the industrial user must notify the director of the discharge of such substance within ninety (90) days of the effective date of such regulations.

(d) In the case of any notification made under this section, the industrial user shall certify that it has a program in place to reduce the volume and toxicity of hazardous wastes generated to the degree it has determined such to be economically practical.

(e) This provision does not create the right to discharge any substance not otherwise permitted to be discharged by this ordinance, a permit issued thereunder, or any applicable federal or state law.

(Ord. No. C-98-61, § 3, 10-20-98; Ord. No. C-12-49, § 22, 12-18-12)

Sec. 28-230. - Analytical requirements.

Analytical tests shall be performed in accordance with applicable test procedures identified in 40 CFR Part 136, as of July 1, 2009. If a test for a specific component is not listed in 40 CFR Part 136, or if the test procedure has been determined to be inappropriate for the analyte in question (e.g., insufficient sensitivity) the laboratory, with the approval of the user and the city, shall identify and propose a method for use in accordance with Rules 62-160.300 and 62-160.330, F.A.C. If a sampling procedure is not available or none of the approved procedures are appropriate for collecting the samples, the sampling organization, with the approval of the user and the city, shall identify and propose a method for use in accordance with Rule 62-160.220, F.A.C.

(Ord. No. C-98-61, § 3, 10-20-98; Ord. No. C-12-49, § 23, 12-18-12)

Sec. 28-231. - Sample collection.

(a) Except in the case of NSCIUs, the reports required in sections 28-220, 28-222 and 28-223 of this article shall contain the results of sampling and analysis of the discharge, including the flow and the nature and concentration, or production and mass where requested by the director, of pollutants contained therein which are limited by the applicable pretreatment standards. This sampling and analysis may be performed by the city in lieu of the user. Where the city performs the required sampling and analysis in lieu of the user, the user is not required to submit

the compliance certification required in section 28-220(b)(6) and 28-222 of this article. In addition, where the city collects all the information required for the report, including flow data, the user is not required to submit the report. All laboratory analytical reports shall comply with Rule 62-160.340 F.A.C

(b) The reports required in sections 28-220, 28-222 and 28-223 shall be based upon data obtained through sampling and analysis performed during the period covered by the report. These data shall be representative of conditions occurring during the reporting period. The director will indicate the frequency of monitoring necessary to assess and assure compliance by the user with applicable pretreatment standards and requirements.

(c) For all sampling required by this ordinance, grab samples must be used for pH, cyanide, total phenols, oil and grease, sulfide, and volatile organic compounds. For all other pollutants, twenty-four-hour composite samples must be obtained through flow-proportional composite sampling techniques, unless time-proportional composite sampling or grab sampling is authorized by the director. Where time-proportional composite sampling or grab sampling is authorized by the director, the sample must be representative of the discharge and the decision to allow the alternative sampling will be documented in the user's file. Using protocols (including appropriate preservation) specified in Chapter 62-160, F.A.C., and DEP-SOP-001/01, multiple grabs collected during a twenty-four-hour period may be composited prior to analysis as follows:

(1) Samples for cyanide, total phenols, and sulfides may be composited in the laboratory or in the field;

(2) Samples for volatile organics and oil and grease may be composited in the laboratory; and

(3) Composite samples for other parameters unaffected by the compositing procedures as allowed in FDEP's approved sampling procedures and laboratory methodologies may be authorized by the director, as appropriate.

(d) Oil and grease samples shall be collected in accordance with paragraph (c) above unless the sampling location or point cannot be physically accessed to perform a direct collection of a grab sample. In these instances, the sample shall be pumped from the sampling location or point into the sample container using a peristaltic-type pump. All pump tubing used for sample collection must be new or pre-cleaned and must be changed between sample containers and sample points. The pump tubing shall not be pre-rinsed or flushed with sample prior to collecting the sample. The report of analysis shall indicate that a peristaltic pump was used to collect the oil and grease sample. Samples for oil and grease, temperature, pH, cyanide, total phenols, sulfides, and volatile organic compounds must be obtained using grab collection techniques.

(e) Sampling required in support of the BMR and ninety-day compliance report required in this article shall be conducted as follows:

(1) For users where historical sampling data do not exist, a minimum of four (4) grab samples must be used for pH, cyanide, total phenols, oil and grease, sulfide and volatile organic compounds.

(2) For users where historical sampling data are available, the director may authorize a lower minimum.

(Ord. No. C-98-61, § 3, 10-20-98; Ord. No. C-08-26, § 4, 6-17-08 ; Ord. No. C-12-49, § 24, 12-18-12)

Sec. 28-232. - Recordkeeping and certification statements.

(a) *Recordkeeping.*

(1) Any user subject to the reporting requirements of this ordinance shall:

a. Maintain records of all information resulting from any monitoring activities required by this ordinance, including documentation associated with BMPs. All sampling and analysis activities shall be subject to the record-keeping requirements specified in Chapter 62-160, F.A.C.; and

b. Maintain for a minimum of three (3) years any records of monitoring results (whether or not such monitoring activities are required by this ordinance), including documentation associated with BMPs and shall make such records available for inspection and copying by the director and FDEP. This period of

retention shall be extended during the course of any unresolved litigation regarding the user or the city where the user has been specifically notified of a longer retention period by the director.

(2) Records shall include the date, exact place, method, and time of sampling, and the name of the person(s) taking the samples; the dates analyses were performed; who performed the analyses; the analytical techniques or methods used; and the results of such analyses.

(b) *Certification statements.*

(1) The following certification statement is required to be signed and submitted by users submitting permit applications in accordance with section 28-212(f); users submitting BMRs in accordance with section 28-220(b)(8); users submitting reports on compliance with the categorical pretreatment standard deadlines in accordance with section 28-222; users submitting periodic compliance reports in accordance with section 28-223(f); and users submitting an initial request to forego sampling of a pollutant on the basis of section 28-223(c)(3).The following certification statement must be signed by an authorized representative of the user as defined in section 28-26:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

(2) *NSCIU certification statements.* Annual certification for NSCIUs—A user determined to be a NSCIU by the director in accordance with section 28-26 must annually submit the following certification statement, signed by an authorized representative of the user as defined in section 28-26. This certification must accompany any alternative report required by the director:

"Based on my inquiry of the person or persons directly responsible for managing compliance with the categorical pretreatment standards under 40 CFR [specify applicable national pretreatment standard part(s)], I certify that, to the best of my knowledge and belief that during the period from [month, day, year] to [month, day, year]:

(a) The facility described as [user name] met the definition of a NSCIU as described in paragraph 62-625.200(25)(c), F.A.C.;

(b) The facility complied with all applicable pretreatment standards and requirements during this reporting period; and

(c) The facility never discharged more than 100 gallons of total categorical wastewater on any given day during this reporting period. This compliance certification is based on the following information: [documentation of basis to continue exemption]."

(3) *Certification of pollutants not present.* Upon approval of the monitoring waiver and revision of the user's individual wastewater discharge permit, the user must certify each report with the following statement in accordance with section 28-223(c) of this article

"Based on my inquiry of the person or persons directly responsible for managing compliance with the pretreatment standard for 40 CFR [specify applicable national pretreatment standard part(s)], I certify that, to the best of my knowledge and belief, there has been no increase in the level of [list pollutant(s)] in the wastewaters due to the activities at the facility since filing of the last periodic report under paragraph 62-625.600(4)(a), F.A.C."

(Ord. No. C-98-61, § 3, 10-20-98; Ord. No. C-12-49, § 25, 12-18-12)

Sec. 28-233. - Report due dates.

Written reports will be deemed to have been submitted on the date postmarked. The reports required in this article shall be based upon data obtained through sampling and analysis performed during the period covered by the report. The data shall be representative of conditions occurring during the reporting period. The director shall require frequency of monitoring necessary to assess and assure compliance by industrial users with applicable pretreatment standards and requirements.

(Ord. No. C-98-61, § 3, 10-20-98; Ord. No. C-12-49, § 26, 12-18-12)

Sec. 28-234. - Right of entry; inspection and sampling.

City inspectors shall have the right to enter the premises of any user to determine whether the user is complying with all requirements of this article and any wastewater discharge permit or order issued hereunder. Users shall allow city inspectors reasonable access to all parts of the premises for the purposes of inspection, sampling, related records examination and copying, and the performance of any additional duties.

(a) Where a user has security measures in force which require proper identification and clearance before entry into its premises, the user shall make necessary arrangements with its security guards so that, upon presentation of suitable identification, city inspectors will be permitted to enter without delay for the purposes of performing specific responsibilities.

(b) The director shall have the right to place on the user's property, or require installation of, such devices as are necessary to conduct sampling, metering, or both of the user's operations.

(c) The director may require the user to install monitoring equipment as necessary. The facility's sampling and monitoring equipment shall be maintained at all times in a safe and proper operating condition by the user at its own expense. All devices used to measure wastewater flow and quality shall be calibrated prior to the renewal of the annual permit to ensure their accuracy.

(d) Any temporary or permanent obstruction to safe and easy access to the facility to be inspected, sampled, or both shall be promptly removed by the user at the written or verbal request of the director and shall not be replaced. The costs of clearing such access shall be borne by the user.

(e) Unreasonable delays in allowing the director access to the user's premises shall be a violation of this article.

(f) If the monitoring facility is constructed in the public right-of-way or easement, the location of the monitoring facility shall provide ample room in or near the monitoring facility to allow accurate sampling and preparation of samples and analysis. If constructed on public or private property, the monitoring facilities should be provided in accordance with the owner's requirements and all applicable local construction standards and specifications, and such facilities shall be constructed and maintained in such manner so as to enable the owner to perform independent monitoring activities.

(Ord. No. C-98-61, § 3, 10-20-98; Ord. No. C-12-49, § 27, 12-18-12)

Sec. 28-235. - Search warrants.

If city inspectors have been refused access to a building, structure, or property, or any part thereof, and are able to demonstrate probable cause to believe that there may be a violation of this article, or that there is a need to inspect, sample, or both, as part of a routine inspection and sampling program of the city designed to verify compliance with this article or any permit or order issued hereunder, or to protect the overall public health, safety and welfare of the community, then the director may seek issuance of a search warrant from the appropriate court.

(Ord. No. C-98-61, § 3, 10-20-98)

Sec. 28-236. - Confidential information.

In accordance with F.S. Ch. 119, all information and documents submitted to the city are considered to be public information, and as such are available to the public for reading and copying. However, in accordance with F.S. § 403.111, any information submitted to the city in accordance with this chapter may be claimed as confidential by the submitter. Any such claim must be asserted at the time of submission in the manner prescribed on the application form or instructions, or, in the case of other submissions, by stamping the words "confidential business information" on each page containing such information. If no claim is made at the time of submission, the city shall make the information available to the public without further notice. If a claim is asserted, the information will be treated in accordance with the procedures in F.S. § 403.111.

Effluent information and data provided to the city in accordance with this ordinance shall be available to the public without restriction.

(Ord. No. C-98-61, § 3, 10-20-98; Ord. No. C-12-49, § 28, 12-18-12)

DIVISION 6. - ENFORCEMENT REMEDIES

Sec. 28-237. - Notification of violation.

(a) When the director finds that a user has violated, or continues to violate, any provision of this article, a wastewater discharge permit or order issued hereunder, or any other pretreatment standard or requirement, the director shall serve upon that user a notice of violation. Within ten (10) days of the receipt of the notice of violation, an explanation of the violation and a plan for the satisfactory correction and prevention thereof, to include specific required actions, shall be submitted by the user to the director. Submission of this plan in no way relieves the user of liability for any violations occurring before or after receipt of the notice of violation. Nothing in this section shall limit the authority of the director to take any action, including emergency actions or any other enforcement action, without first issuing a notice of violation.

(b) Failure of the violator to respond within ten (10) days upon receipt of the notice may constitute significant noncompliance (SNC) and the director may issue a notice of SNC as described in this article.

(c) If the violator requests additional time to correct the violation, a consent agreement may be entered into, at the discretion of the director.

(Ord. No. C-98-61, § 3, 10-20-98)

Sec. 28-238. - Consent agreements.

The director may enter into consent agreements, assurances of voluntary compliance, or other similar documents establishing an agreement with any user responsible for noncompliance. Such documents will include specific action to be taken by the user to correct the noncompliance within a time period specified by the document.

(Ord. No. C-98-61, § 3, 10-20-98)

Sec. 28-239. - Compliance schedules.

When the director finds that a user has violated any provision of this article, a wastewater discharge permit or order issued hereunder, or any other pretreatment standard or requirement, the director may issue a first compliance schedule to the user responsible for the discharge directing that the user come into compliance within a specified time. When the director finds that a

user continues to be in violation after the issuance of a first compliance schedule and has failed to respond or comply the director may issue a final compliance schedule. Compliance schedules also may contain other requirements to address the noncompliance, including additional self-monitoring and management practices designed to minimize the amount of pollutants discharged to the sewer. A compliance schedule may not extend the deadline for compliance established for a pretreatment standard or requirement, nor does a compliance schedule relieve the user of liability for any violation, including any continuing violation. Issuance of a compliance schedule shall not be a bar against, or a prerequisite for, taking any other action against the user.

(a) Once a violator has received a first compliance schedule:

(1) Failure of the violator to implement the first compliance schedule may cause the director to seek a fine in the amount of up to five hundred dollars ($500.00) and issue a final compliance schedule as described in subsection (b) of this section.

(2) If the violator complies with the first compliance schedule within the specified time period, the director may cease further enforcement action.

(3) If the director determines that compliance has not been achieved after the time specified in the first compliance schedule, or no response has been received from the violator, he may seek a fine in the amount of up to five hundred dollars ($500.00) and issue a final compliance schedule as described in subsection (b) below.

(b) Once a violator has received a fine of up to five hundred dollars ($500.00) and a final compliance schedule:

(1) Failure of the violator to implement the final compliance schedule within ten (10) working days of receiving the schedule may cause the director to revoke the IWDP, terminate the violator's sewer service and seek to fine the violator in an amount not less than one thousand dollars ($1,000.00) per violation.

(2) If the violator complies with the final compliance schedule within the specified time period, the director may cease further enforcement action.

(3) If the director determines that compliance has not been achieved after the time specified in the final compliance schedule, or no response has been received from the violator, he may revoke the IWDP, terminate the violator's sewer service and seek to fine the violator in an amount not less than one thousand dollars ($1,000.00) per violation.

(4) For the purposes of this section, Chapter 1, section 1-6 (c) of the City Code of Ordinances shall not apply.

(Ord. No. C-98-61, § 3, 10-20-98; Ord. No. C-12-49, § 29, 12-18-12)

Sec. 28-240. - Emergency suspensions.

The director may immediately suspend a user's discharge after verbal notice, including notice by telephone, to the user whenever such suspension is necessary to stop an actual or threatened discharge which reasonably appears to present or cause an imminent or substantial endangerment to the health or welfare of persons. The director may also immediately suspend a user's discharge after notice and opportunity to respond that threatens to interfere with the operation of the WWF or which presents or may present an endangerment to the environment.

(a) Any user notified of a suspension of its discharge shall immediately stop or eliminate its contribution. In the event of a user's failure to immediately comply voluntarily with the suspension order, the director may take such steps as deemed necessary, including immediate severance of the sewer connection, to prevent or minimize damage to the WWF, its receiving stream or endangerment to any individuals. The director may allow the user to recommence its discharge when the user has demonstrated to the satisfaction of the director that the period of endangerment has passed.

(b) A user that is responsible in whole or in part for any discharge presenting imminent endangerment shall submit a detailed written statement describing the causes of the harmful contribution and the measures taken

to prevent any future occurrence to the director.

Nothing in this section shall be interpreted as requiring a hearing prior to any emergency suspension under this section.

(Ord. No. C-98-61, § 3, 10-20-98)

Sec. 28-241. - Notice of significant noncompliance and publication.

(a) The director shall publish annually, notification of users which were in SNC with applicable pretreatment requirements at any time during the previous twelve (12) months. Public notification shall be included in a newspaper(s) of general circulation within the jurisdiction served by the WWF that meets the requirements of F.S. §§ 50.011 and 50.013. For the purpose of this ordinance, a user is in SNC if its violation meets one (1) or more of the following criteria:

(1) Chronic violations of wastewater discharge limits defined here as those in which sixty-six (66) percent or more of all the measurements taken during a six-month period exceed (by any magnitude), a numeric pretreatment standard or requirement, including instantaneous limits; or

(2) Technical review criteria (TRC) violations defined here as those in which thirty-three (33) percent or more of all the measurements taken during a six (6) month period equal or exceed the product of the numeric pretreatment standard or requirement including instantaneous limits, multiplied by the applicable TRC (TRC = 1.4 for BOD, TSS, total oil and grease, and 1.2 for all other pollutants except pH); or

(3) Any other violation of a pretreatment standard or requirement (daily maximum, long-term average, instantaneous limit, or narrative standard) that the director determines has caused, alone or in combination with other discharges, interference or pass through (including endangering the health of WWF personnel or the general public); or

(4) Any discharge that has resulted in the director's exercise of its emergency authority to halt or prevent such a discharge; or

(5) Failure to meet, within ninety (90) days after the schedule date, a compliance schedule milestone contained in an individual wastewater discharge permit or enforcement order for starting construction, completing construction, or attaining final compliance; or

(6) Failure to provide, within forty-five (45) days after the due date, any required reports such as BMRs, reports on compliance with categorical pretreatment standard deadlines, periodic self-monitoring reports, and reports on compliance with compliance schedules; or

(7) When the SIU fails to respond within the specified time stated on the notice of violation issued by the director; or

(8) When the SIU fails to accurately report noncompliance; or

(9) When the SIU reports false "information"; or

(10) When the SIU intentionally or negligently violates a permit condition or requirement; or

(11) When the SIU refuses to permit entry to the director for inspection; or

(12) Any other violation or group of violations, including a violation of BMPs, which the director determines will adversely affect the operation or implementation of the pretreatment program.

(b) In response to the notice of SNC:

(1) Failure of the violator to respond within ten (10) working days of the date of receipt may cause the director to issue an administrative fine to the violator in the amount of five hundred dollars ($500.00) and issue a final compliance schedule.

(2) If the violator requests additional time to correct the violation, it shall submit a compliance schedule outlining

what steps will be taken to gain compliance and prevent reoccurrence of the violation(s). The director shall evaluate this request, modify it as he deems necessary and may issue a first compliance schedule requiring the corrective action to be made within a specified period of time.

(Ord. No. C-98-61, § 3, 10-20-98; Ord. No. C-12-49, § 30, 12-18-12)

Sec. 28-242. - Termination of service.

Any user who violates the following conditions is subject to service termination:

(a) Violation of wastewater discharge permit conditions.

(b) Failure to accurately report the wastewater constituents and characteristics of its discharge.

(c) Failure to report significant changes in operations or wastewater volume, constituents and characteristics prior to discharge.

(d) Refusal of reasonable access to the user's premises for the purpose of inspection, monitoring or sampling.

(e) Violation of the pretreatment standards of this article.

(Ord. No. C-98-61, § 3, 10-20-98)

Sec. 28-243. - Injunctive relief.

When the director finds that a user has violated or continues to violate any provision of this article, a wastewater discharge permit or order issued hereunder or any other pretreatment standard or requirement, the director may petition the Broward County Court through the city attorney's office for the issuance of a temporary or permanent injunction, as appropriate, which restrains or compels the specific performance of the wastewater discharge permit, order or other requirement imposed by this article on activities of the user. The director may also seek such other action as is appropriate for legal, equitable relief, or both, including a requirement for the user to conduct environmental remediation. A petition for injunctive relief shall not be a bar against or a prerequisite for taking any other action against a user.

(Ord. No. C-98-61, § 3, 10-20-98)

Sec. 28-244. - Civil penalties.

(a) A user who has violated or continues to violate any provision of this article, a wastewater discharge permit, or order issued hereunder or any other pretreatment standard or requirement shall be liable to the city for a civil penalty of at least one thousand dollars ($1,000.00) per violation, per day. In the case of a monthly or other long-term average discharge limit, penalties shall accrue for each day during the period of the violation.

(b) A user who has violated or continues to violate any provision of this article shall be liable to the city for reasonable attorneys' fees, court costs and other expenses associated with enforcement activities, including sampling and monitoring expenses and the cost of any actual damages incurred by the city.

(c) In determining the amount of civil liability, the court shall take into account all relevant circumstances, including, but not limited to, the extent of harm caused by the violation, the magnitude and duration of the violation, any economic benefit gained through the user's violation, corrective actions by the user, the compliance history of the user and any other factors as justice requires.

(d) Instituting prosecution for civil penalties shall not be a bar against or a prerequisite for taking any other action against a user.

(e) For the purposes of this section, chapter 1, section 1-6(c) of the city Code of Ordinances shall not apply.

(Ord. No. C-98-61, § 3, 10-20-98; Ord. No. C-12-49, § 31, 12-18-12)

Sec. 28-245. - Criminal prosecution.

(a) A user who violates any provisions of this article, a wastewater discharge permit, or order issued hereunder, or any other pretreatment standard or requirement shall, upon conviction, be punishable by a fine of at least one thousand dollars ($1,000.00) per violation, per day, or imprisonment for not more than six (6) months, or both.

(b) A user who willfully or negligently introduces any substance into the WWF which causes personal injury or property damage shall, upon conviction, be guilty of a misdemeanor and be subject to a penalty of at least one thousand dollars ($1,000.00), or be subject to imprisonment for not more than six (6) months, or both. This penalty shall be in addition to any other cause of action for personal injury or property damage available under state or federal law.

(c) A user who knowingly makes any false statements, representations, or certifications in any application, record, report, plan, or other documentation filed, or required to be maintained, pursuant to this article, wastewater discharge permit, or order issued hereunder, or who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required under this article shall, upon conviction, be punished by a fine of at least one thousand dollars ($1,000.00) per violation, per day, or imprisonment for not more than six (6) months, or both.

(d) Filing a suit for criminal prosecution shall not be a bar against or prerequisite for taking any other action against a user.

(e) For the purposes of this section, chapter 1, section 1-6(c) of the city Code of Ordinances shall not apply.

(Ord. No. C-98-61, § 3, 10-20-98; Ord. No. C-12-49, § 32, 12-18-12)

Sec. 28-246. - Administrative fines.

(a) When the director finds that a user has violated or continues to violate any provision of this article, a wastewater discharge permit or order issued hereunder or any other pretreatment standard or requirement, the director may serve upon that user an administrative citation and fine in an amount of two hundred fifty dollars ($250.00) per day. Such fines shall be assessed on a per violation per day basis. In the case of monthly or other long term average discharge limits, fines shall be assessed for each day during the period of violation.

(b) In the event the user fails to timely pay the amounts due or to timely serve a written notice of contest to the administrative citation, a lien for unpaid fines and costs shall be recorded in the public records of Broward County. The assessed fines and costs shall bear interest at the highest lawful rate and may be foreclosed in the manner provided by law for municipal tax or special assessment liens. In any action brought by the city for payment of the liens assessed herein, the user shall be responsible for the payment of all costs of foreclosure, including, but not limited to, reasonable attorneys' fees, incurred by the city. All liens assessed hereunder following the effective date of the ordinance from which this article is derived shall remain, until discharge, liens equal in rank and dignity with the lien for ad valorem taxes and superior in rank and dignity to all other liens and encumbrances.

(c) Any user who has been served hereunder with an administrative citation may file and serve upon the director a written notice of contest to the administrative citation and administrative fine within thirty (30) days of the date of the administrative citation. The notice of contest shall specify all defenses to the administrative citation. The director shall conduct a hearing at which formal rules of evidence shall not apply. At the conclusion of the hearing, the director shall issue an order either (1) upholding, in whole or in part, the administrative citation or assessment of fine, costs and providing reasonable time for compliance or both, or (2) dismiss, in whole or in part, such portions of the administrative citation.

(d) Issuance of an administrative citation and administrative fine hereunder shall not be a bar against or a prerequisite for taking any other action against the user.

(e) An appeal of an administrative order shall be by petition for writ of certiorari filed in the circuit court within the time proscribed by the court rules.

(Ord. No. C-98-61, § 3, 10-20-98)

Sec. 28-247. - Remedies nonexclusive and show cause hearing.

The remedies provided for in this article are not exclusive. The city may take any, all or any combination of these actions against a noncompliant user. Enforcement of pretreatment violations will generally be in accordance with the city's enforcement response plan. However, the director may take other action against any user when the circumstances warrant. Further, the director is empowered to take more than one (1) enforcement action against any noncompliant user.

The city may order any user who causes or allows an unauthorized discharge to enter the WWF to show cause before the city commission why the proposed enforcement action should not be taken. A notice shall be served on the user specifying the time and place of a hearing to be held by the city commission regarding the violation, the reasons why the action is to be taken, the proposed enforcement action, and directing the user to show cause before the city commission why the proposed enforcement action should not be taken. The notice of the hearing shall be served personally or by registered or certified mail (return receipt requested) at least ten (10) days before the hearing. Service may be made on any agent or officer of a corporation.

The city commission may itself conduct the hearing and take the evidence, or may designate any of its members or any officer or employee of the city to:

(1) Issue in the name of the city commission notices of hearings requesting the attendance and testimony of witnesses and the production of evidence relevant to any matter involved in such hearings;

(2) Transmit a report of the evidence and hearing, including transcripts and other evidence, together with recommendations to the city commission for action thereon: or

(3) Take the evidence.

At any hearing held pursuant to the pretreatment ordinance, testimony taken must be under oath and recorded stenographically. The transcript, so recorded, will be made available to any member of the public or any party to the hearing upon payment of the usual charges thereof.

After the city commission has reviewed the evidence, it may issue an order to the user responsible for the discharge directing that, following a specified time period, the sewer service be discontinued unless adequate treatment facilities, devices or other related appurtenances shall have been installed on existing treatment facilities and are properly operated. Further orders and directives as are necessary and appropriate may be issued.

(Ord. No. C-98-61, § 3, 10-20-98; Ord. No. C-12-49, § 33, 12-18-12)

Sec. 28-248. - Affirmative defenses to discharge violations; upset.

(a) An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

(b) An upset shall constitute an affirmative defense to an action brought for noncompliance with pretreatment standards if the requirements of subsection (c), below, are met.

(c) An industrial user who wishes to establish the affirmative defense of an upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

(1) An upset occurred and the user can identify the cause(s) of the upset.

(2) The facility was at the time being operated in a prudent and workman-like manner and in compliance with applicable operation and maintenance procedures.

(3) The user has verbally submitted the following information to the director within twenty-four (24) hours of becoming aware of the upset, with a written submission to be provided within five (5) days.

a. A description of the indirect discharge and cause of noncompliance.

b. The period of noncompliance, including exact dates and times or, if not corrected, the anticipated time the noncompliance is expected to continue.

c. Steps being taken or planned to reduce, eliminate and prevent recurrence of the noncompliance.

(d) In any enforcement proceeding, the user seeking to establish the occurrence of an upset shall have the burden of proof.

(e) The industrial user shall control production or all discharges to the extent necessary to maintain compliance with pretreatment standards upon reduction, loss, or failure of its treatment facility until the facility is restored or an alternative method or treatment is provided. This requirement applies in the situation where, among other things, the primary source of power of the treatment facility is reduced, lost or fails.

(Ord. No. C-98-61, § 3, 10-20-98)

Sec. 28-249. - Affirmative defenses; bypass.

An industrial user may allow any bypass to occur which does not cause pretreatment standards or requirements to be violated, but only if it is for essential maintenance to assure efficient operation. These bypasses are not subject to the provision of subsections (c) and (d) of this section.

(a) If an industrial user knows in advance of the need for a bypass, it shall submit a notice to the director at least ten (10) days before the date of the bypass. If the industrial user does not know of the need for a bypass ten (10) days prior to the bypass, then the industrial user shall notify the director immediately upon knowledge of the need for the bypass.

(b) An industrial user shall submit notice as described in section 28-248(c).

(c) Bypass is prohibited, and the director shall take enforcement action against an industrial user for a bypass, unless:

(1) Bypass was unavoidable in order to prevent loss of life, personal injury, or severe property damage.

(2) There were no technically feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance.

(3) The industrial user submitted notices as required under subsection (b) of this section.

(d) The director may approve an anticipated bypass, after considering its adverse effects, if the director determines that it will meet the three (3) conditions set forth above.

(Ord. No. C-98-61, § 3, 10-20-98)

Sec. 28-250. - Affirmative defenses; prohibited discharge standards.

A user shall have an affirmative defense to an enforcement action brought against it for noncompliance with the prohibited discharge standards in section 28-204 of this article if it can show that it did not know, or have reason to know, that its discharge, alone or in conjunction with discharges from other sources, would cause pass through or interference and that either:

(a) A local limit designed to prevent pass through or interference was developed in accordance with subsection 62-625.400(3), F.A.C. for each pollutant in the user's discharge that caused pass through or interference and the user was in compliance with each such local limit directly prior to and during the pass through or interference; or

(b) If a local limit designed to prevent pass through or interference has not been developed in accordance with subs 625.400(3), F.A.C. for the pollutants that caused pass through or interference, and the user's discharge directly pr the pass through or interference did not change substantially in nature or constituents from the user's discharge the WWF was regularly in compliance with the WWF's permit requirements and applicable requirements for dom residuals.

(Ord. No. C-98-61, § 3, 10-20-98; Ord. No. C-12-49, § 34, 12-18-12)

DIVISION 7. - CHARGES AND FEES

Sec. 28-251. - Pretreatment charges and fees.

The city may adopt reasonable fees for reimbursement of the costs of setting up and operating the city's pretreatment program which may include:

(a) Fees for wastewater discharge permit applications, including, but not limited to, the cost of processing such applications.

(b) Fees for monitoring, inspection, surveillance and response procedures, including, but not limited to, the cost of collection and analyses of a user's discharge and reviewing monitoring reports submitted by users.

(c) Fees for reviewing and responding to accidental discharge procedures and facility construction.

(d) Other fees as the city may deem necessary to carry out the requirements contained herein. These fees relate solely to the matters covered by this article and are separate from all other fees, fines and penalties chargeable by the city.

(Ord. No. C-98-61, § 3, 10-20-98; Ord. No. C-12-49, § 35, 12-18-12)

Secs. 28-252—28-254. - Reserved.

Sec. 28-255. - Wastewater plant and collection system capital expansion fee.

(a) An applicant for a building permit to construct a new facility, expand or change the existing use requiring additional capacity for the applicant's property shall pay appropriate capital expansion fees of two dollars and seventeen cents ($2.17) per gallon or six hundred fifty-one dollars ($651.00) per equivalent residential connection (three hundred (300) gallons per day) as determined in accordance with Table A contained in the "Guidelines for the Calculation of Sanitary Sewer Connection Fees" developed by the department of public services and adopted by resolution of the city commission.

(b) An applicant for a building permit to connect to the sanitary sewer system under the WaterWorks 2011 Program shall be exempt.

(c) Existing customers who connected to the sanitary sewer system under the WaterWorks 2011 Program expanding or changing usage which requires additional capacity for the applicant's property shall pay appropriate capital expansion fees of two dollars and seventeen cents ($2.17) per gallon or six hundred fifty-one dollars ($651.00) per equivalent residential connection (three hundred (300) gallons per day) as determined in accordance with Table A contained in the "Guidelines for the Calculation of Sanitary Sewer Connection Fees" developed by the department of public services and adopted by resolution of the city commission, calculated on the amount of additional capacity needed.

(d) Capital expansion fees as provided in this section shall be collected and held in a separate fund of the city to be used to pay only the cost, expenses and fees associated with capital expenditures for the sanitary sewer system

required to meet the needs of development occurring on or after the effective date of this section.

(Ord. No. C-05-21, § 1, 9-7-05)

Sec. 28-256. - Potable water plant and distribution capital expansion fee.

(a) An applicant for a building permit to construct a new facility, expand or change the existing use requiring additional capacity for the applicant's property shall pay appropriate capital expansion fees of four dollars and sixty-two cents ($4.62) per gallon or one thousand three hundred eighty-six dollars ($1,386.00) per equivalent residential connection (three hundred (300) gallons per day) as determined in accordance with Table A contained in the "Guidelines for the Calculation of Sanitary Sewer Connection Fees" developed by the department of public services and adopted by resolution of the city commission.

(b) Capital expansion fees as provided in this section shall be collected and held in a separate fund of the city to be used to pay only the cost, expenses and fees associated with capital expenditures for the potable water system required to meet the needs of development occurring on or after the effective date of this section.

(Ord. No. C-05-21, § 2, 9-7-05)

Sec. 28-257. - Collection of fees.

The city manager or his designee shall have the authority at any time, upon his or her initiative or in response to a properly filed petition from the proper owner, to change the capital expansion fees provided in section 28-255 and section 28-256 ("CEF") for a property based on the presentation of competent and substantial evidence, correct any error in applying or calculating the CEF for a particular lot or parcel of property, or both. Any such correction shall be considered valid ab initio and shall in no way affect the enforcement of the CEF imposed under sections 28-255 and 28-256. All requests from affected property owners for any such changes shall be referred to, and processed by the city manager or designee.

(Ord. No. C-05-21, § 3, 9-7-05)

Attachment C

Fats, Oil, and Grease Best Management Practices Manual

Information, Pollution Prevention and Compliance Information
For
Food Service Facilities

City of St. Petersburg
Water Resources Department
Environmental Compliance Division
Grease Management Program

Contact Information:

Environmental Compliance Division
Grease Management Program
1650 3rd Avenue North
St. Petersburg, FL 33713
Telephone: (727) 892-5622
Fax: (727) 892-5842
www.stpete.org/water/grease_management.asp

INTRODUCTION

Food service facilities generate literally tons of cooking oil, grease, and food wastes everyday. If this waste is not managed properly, it can cause major environmental problems. Animal and vegetable-based oil and grease often enter the wastewater collection system in the liquid form. An important property of oil and grease is its ability to separate and float on the water, in other words, they are hydrophobic compounds. Once in the wastewater collection system these fats, oil, and grease cool and solidify. Grease will cling to sewer pipes and the surface of a grease build-up causing a clog to form from the top of the pipe. These blockages and subsequent spills are unsightly, clean-up is difficult, time consuming, and costly. Sewage backups in businesses present a potential health hazard as raw sewage may carry harmful bacteria, viruses, and pathogens. In the City of St. Petersburg, there are up to 35 recorded sewer blockages per month and many of these are a result of grease buildup. Nationwide, 30 to 35 percent of all sanitary sewer overflows are caused by fats, oil, and grease blockages. In an effort to resolve this problem, the EPA mandated that the City of St. Petersburg create a program, whereby non-residential facilities would be monitored for grease discharge through a permit program.

The Grease Management Program will combat the grease problem through regulation, education, inspections, and enforcement. In June of 2002, the City of St. Petersburg's sewer use ordinance was amended to require grease removal devices in all food service facilities as well as grease interceptor/trap cleaning and reporting. Additionally, an inspection program has been implemented to visit each facility and verify compliance with the local ordinance.

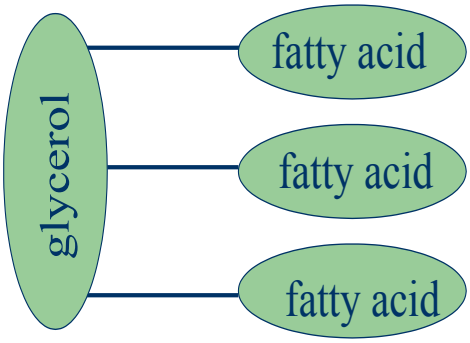
This manual is designed to inform facility personnel of the local requirements and to educate management and workers in established practices. Grease waste minimization begins at the source. Every food service facility should have a manager or someone in charge of overseeing proper waste disposal from the beginning to the end of the operation. This person must be able to recognize common practices and modify them so that grease wastes are controlled at the discharge point. By having a sound plan for grease disposal the food service facility operator may save hundreds of dollars in reduced maintenance and plumbing costs. Grease Management Program officials, working with business owners, can effectively prevent oil and grease buildup, and associated problems, for both the wastewater collection systems and the food service facility owner.

What is grease?

Everyone knows that oils and grease are used for cooking, baking, and preparing foods of all varieties, some for private consumption such as in residential homes and some for commercial consumption as in restaurants and cafeterias. Few people realize that grease, fat and oil are lipid-based compounds that originate from animal and vegetable matter. Lipids are substances, including fats, greases and waxes, combined with proteins and carbohydrates that make up structural components of living cells.

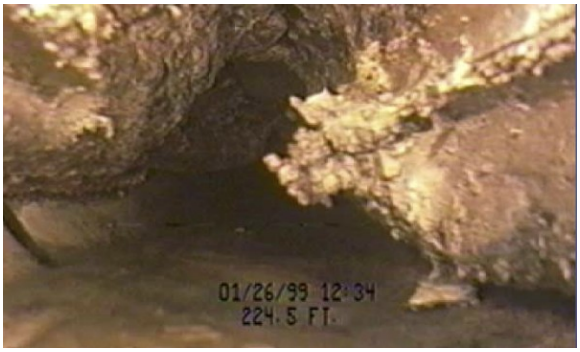
BASIC GREASE MOLECULE

TRIGLYCERIDE MOLECULE



Is grease a problem?

In the sewage collection and treatment business the answer is an emphatic YES! Problems range from blocked sewer lines, rancid odors, potential health hazards, to pump station failure. Large amounts of oil and grease in the wastewater cause trouble in the collection system pipes. It often decreases pipe capacity and therefore, requires that piping systems be cleaned more often and/or some piping to be replaced sooner then otherwise expected. Oil and grease also hamper effective treatment at the wastewater treatment plant. Concerns caused by wastes generated by food service facilities have served as the basis for ordinances and regulations governing the discharge of grease material to the wastewater collection system. This type of waste has forced the requirements of the installation of preliminary treatment devices, commonly known as grease traps or interceptors.



Who generates grease?

Greasy wastewater that ends up in the City of St. Petersburg's wastewater collection system originates from a variety of sources like residential, commercial, industrial, public, and private facilities.

What is a grease trap?

A grease trap is a device that is installed inside the building or under the sink to separate and retain grease and solid materials from the waste stream while allowing the balance of the liquid waste to discharge to the wastewater collection system by gravity. Baffles in the grease trap retain the wastewater long enough for the grease to congeal and rise to the surface. Traps have a removable lid on the top surface to facilitate inspection and cleaning.

What is a grease interceptor?

A grease interceptor is a device that is installed outside the building to separate and retain grease and solid materials from the waste stream while allowing the balance of the liquid waste to discharge to the wastewater collection system by gravity. The capacity of the interceptor provides adequate residence time so that the wastewater has time to cool, allowing any grease time to congeal and rise to the surface where it accumulates until the interceptor is cleaned.

What are Best Management Practices?

Best Management Practices are practices that a food service facility operator or anyone who cooks or prepares food can utilize to minimize the amount of grease being discharged from their business. The following Best Management Practices (BMP's) for Food Service Facilities are provided to the owners/ managers of businesses to assist them in developing procedures and/or practices which effectively reduce the discharge of Fats, Oil, and Grease from their wastewater discharge.

Prevent Blockages in the Wastewater Collection System

1. Implement a training program to educate kitchen staff and other employees about how they can help ensure BMP's are followed. People are more willing to support an effort if they understand the basis for it.

2. Post NO GREASE signs above sinks and on the front of dishwashers. The signs will serve as a constant reminder for staff working in the kitchens.

3. Always use sink basket strainers to collect food wastes.

4. Dry wipe pots and pans and dishware prior to dishwashing. This will reduce the amount of material going to the grease traps/interceptors, which will require less frequent cleaning thereby reducing maintenance costs.

5. Capture accumulated oil during the cleaning of wok stoves and ventilation/exhaust hoods and dispose of through solid waste procedures after absorbing all free liquid. The majority of this type of solid waste is converted to energy in the Pinellas County Incinerator.

6. Dispose of food waste by recycling and/or solid waste disposal. Recycling food waste will reduce the cost of solid waste disposal. Solid waste disposal of food waste will reduce the frequency and cost of grease trap/ interceptor cleaning.

7. Use water temperatures less than 140 degrees Fahrenheit in all the sinks. Temperatures in excess of 140 degrees Fahrenheit will dissolve grease, but the grease can re-congeal or solidify in the wastewater collection system as the water cools. This has an added benefit for the food service establishment of reducing its costs for the energy used in heating the water.

8. Eliminate the use of garbage disposals and/or food grinders. These devices put large quantities of solids into the collection and treatment systems.

9. Recycle waste cooking oil through an established, reputable recycling facility. The food service establishment may be paid for the waste material and will reduce the amount of garbage it must pay to have hauled away.

10. Do not discharge caustics, acids, or solvents to the wastewater collection system. Caustics, acids and solvents can have other harmful effects on the wastewater treatment system and can be hazardous to employees working in the wastewater collection system.

11. Do not use biological or emulsifying agents without written approval from the Director.

Properly Maintain Grease Traps and Interceptors to Prevent Introduction of Grease into the Wastewater Collection System

1. Clean under the sink grease traps a minimum of once per week. If the total volume of captured grease and solid material displaces more than 20% of the total volume of the unit, the cleaning frequency needs to be increased. If the grease trap is not providing adequate protection of the wastewater collection system, the establishment may be required to install a grease interceptor.

2. Clean grease interceptors routinely. Grease interceptors must be cleaned a minimum of once per month or more frequently, to ensure that grease accumulation does not cause the interceptor to operate poorly. Grease interceptors not cleaned regularly can produce very unpleasant odors.

3. When contracting with a grease pumper service, it is in your best interest to find out how the contractor will dispose of the waste. Obtain references from other businesses that use their services. Poor disposal practices cause problems, which include odors, creation of rodent habitats and potential threats to groundwater and surface waters.

4. Witness all grease interceptor cleaning and maintenance to ensure the device is properly operating. The food service establishment will ensure it is getting value for the cost of cleaning the grease interceptor. To properly clean the interceptor the entire contents must be removed, which includes the scraping of the walls, floor, baffles and pipework. The return of gray water back into the interceptor is strictly prohibited without the written authorization of the food service facility.

5. Keep a bound maintenance log. The maintenance log serves as a record of the frequency and volume of grease collected during the grease trap/interceptor cleaning. It also serves as a record of all maintenance and repairs pertaining to the grease trap/interceptor. It is required by the pretreatment program to ensure that the grease trap/interceptor maintenance is performed on a regular basis.

Prevent Grease from Entering Surface Waters through the Storm Drain

1. Cover outdoor grease storage containers so that they do not collect rainwater. Since grease floats on water, the rainwater can cause an overflow onto the ground, which will eventually reach the stormwater system.

2. Locate grease storage containers away from storm drain catch basins.

3. Use absorbent pads or other material to clean up spilled material around outdoor equipment and grease storage containers and dispose of through solid waste procedures. Do not use free flowing absorbent material such as kitty litter that can discharge to the storm drain system.

4. Do not clean equipment outdoors in an area where water can flow to the gutter, storm drain or street.

Grease Trap Maintenance

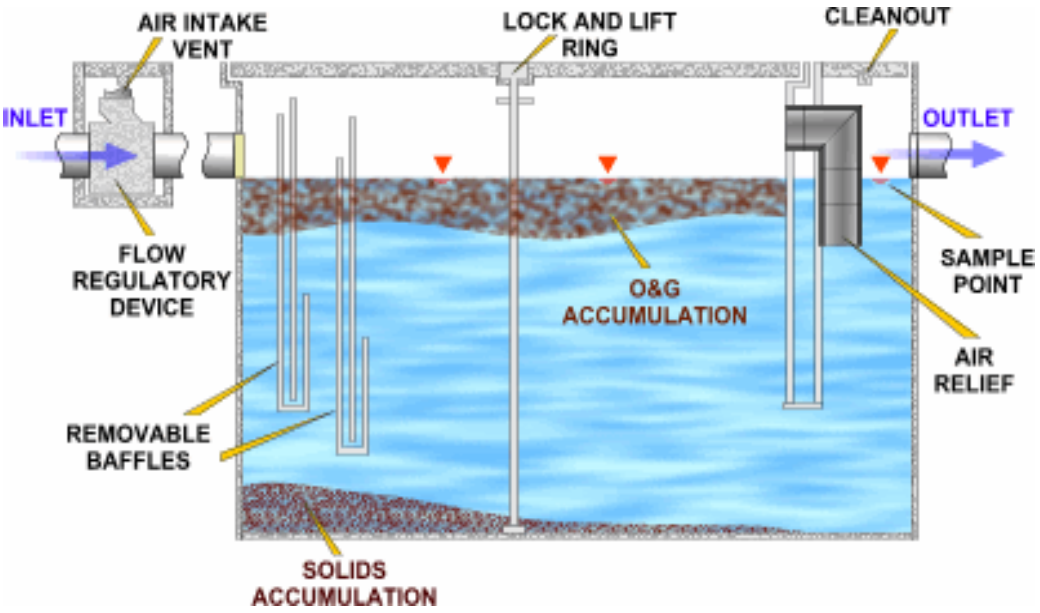
Maintenance staff or other employees of the establishment usually perform grease trap maintenance. Facilities with grease traps must clean their traps weekly at a minimum or sometimes even daily. When performed properly and at the appropriate frequency, grease trap maintenance can greatly reduce the discharge of fats, oil, and grease to the wastewater collection system. In many cases, an establishment that implements BMP's will realize financial benefit through a reduction in their required grease trap maintenance frequency.

WARNING! Do not use hot water, acids, solvents, caustics or emulsifying agents when cleaning a grease trap.

Maintenance Instructions

1. Bail out any water in the trap to facilitate cleaning. The water should be discharged to the wastewater collection system.
2. Remove baffles if possible.
3. Dip the accumulated grease out of the trap and place in a watertight container.
4. Scrape the sides, lid, and the baffles with a putty knife to remove as much of the grease and solids as possible. Deposit the waste material in a watertight container.
5. Contact a hauler or recycler for grease pick-up or dispose of through solid waste procedures.
6. Replace the baffles and lid.
7. Record maintenance in maintenance log and include the following:
   (a) Date of maintenance
   (b) Person performing maintenance
   (c) Estimated volume of grease removed
   (d) Disposal location
   (e) Manager's signature or initials for verification

Typical Grease Trap Design



Grease Interceptor Maintenance

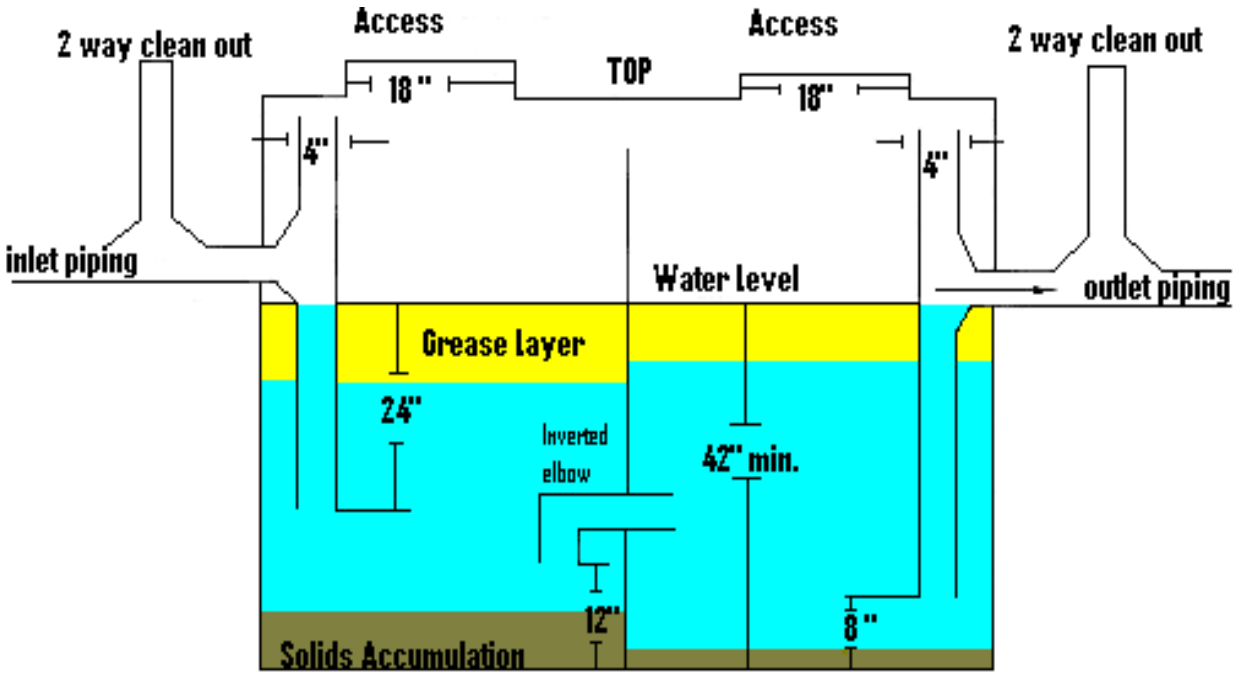
Grease interceptor maintenance is usually performed by a permitted grease pumper. The pumper's will empty the entire contents of the interceptor with a pumper truck and haul the grease and sludge to an approved disposal facility. The Grease Management Program requires that grease interceptors be cleaned a minimum of once per month. Facilities with high grease loading may need to clean their interceptors more often. When performed properly and at the appropriate frequency, grease interceptor maintenance can greatly reduce the discharge of fats, oil and grease to the wastewater collection system. In many cases, an establishment that implements BMP's will realize financial benefit through a reduction in their required grease interceptor maintenance frequency.

WARNING! Do not use hot water, acids, solvents, caustics or emulsifying agents when cleaning a grease interceptor.

Maintenance Instructions

1. Contact a grease hauler or recycler for cleaning,
2. Record maintenance in maintenance log and include the following:
   (a) Date of maintenance
   (b) Person performing maintenance
   (c) Estimated volume of grease removed
   (d) Disposal location
   (e) Manager's signature or initials for verification
3. Retain receipt or manifest from grease pumper or recycler.

Typical Grease Interceptor Design



Frequently Asked Questions

How often must I clean my grease trap or interceptor?

Grease traps must be opened and cleaned out at a minimum frequency of **ONCE A WEEK** and you must document the cleaning process in a bound logbook. You must also determine if your device needs to be cleaned more than once per week by referring to the requirements in the ordinance. Grease interceptors must be pumped-out and cleaned by a permitted grease hauler at least **ONCE PER MONTH**. You are responsible

Can I apply for a variance for my grease interceptor pumping frequency?

The ordinance contains a procedure for you to apply for a variance from the monthly required pump-out frequency for a grease interceptor. The fee for the variance is $275.00 and the maximum allowable variance is 180 days. There is no variance available for grease trap cleaning frequency.

How often will my facility be inspected?

As often as necessary to ensure proper maintenance is being applied to all grease pretreatment systems and their structural integrity is intact. You may or may not be informed ahead of time when an inspection is scheduled. Failure to allow a duly authorized inspector access to the premises, at reasonable times to conduct an inspection, is a violation of the ordinance.

What will the inspector look for and do?

The inspector will look at all equipment and food processing and storage areas paying special attention to the processes that produce wastewater which is discharged from the facility through the grease removal device. The inspector will also open and inspect the grease trap or interceptor and request to see all records pertaining to the maintenance and repair of the device. The inspector will ask questions to ascertain whether procedures outlined in the “Best Management Practices” manual have been implemented. Any deficiencies will be noted by the inspector and you will receive a written notice of non-compliance together with a schedule for correcting the deficiencies and a re-inspection date. If you have not corrected the deficiencies at the time of the re-inspection, you will be billed for the cost of the re-inspection and all future re-inspections.

What records do I need to keep?

You are required to keep the following records:

1. A bound logbook in which a written record of all trap or interceptor maintenance is entered including dates, details of pump-outs or cleaning, details of repairs, and any other pertinent records;
2. A written protocol for cleaning the grease trap;
3. A file containing copies of the plumbing system schematics, the permit, and all invoices, bills, etc. related to the maintenance of the grease trap or interceptor.

An inspector will ask to see these documents during an inspection.

Do I have to file any reports?

Yes, you must submit a quarterly report on a City prepared form. Reports must indicate when the grease interceptor was serviced or repaired, who serviced them and must include details of the pump-out procedure. If you are more than 30 days late in submitting the report, you will be charged a late fee of $50.00.

Attachment D

Sec. 24-42.6. - Fats, Oils and Grease (FOG) Control Program.

The intent and purpose of this section is to safeguard public health, safety and welfare, and protect the sanitary sewer collection, transmission and treatment systems by setting minimum requirements and standards for the design and operation of FOG generating facilities. Nothing in this Section shall limit such facilities from the application of Section 24-42.2 and all other applicable provisions of Chapter 24 of the Code of Miami-Dade County.

(1) No person shall dispose of any wastewater, FOG or food waste, or cause, let, permit, suffer or allow disposal or discharge of any wastewater, FOG or food waste to be disposed or discharged into any stormwater drainage system, ground or groundwater, surface water, private street, public right-of-way, or any other location not approved by the Director or Director's designee.

(2) When a breached FOG control device is the source of wastewater, FOG or food waste discharge as prohibited above, the FOG generator or FOG control device operator shall:

(a) Make temporary repairs within seven (7) days of the date the Director or the Director's designee determines that the FOG control device is breached.

(b) Within 30 days of the date the Director or the Director's designee determines that the FOG control device is breached, the FOG generator or FOG control device operator shall submit plans to the Department for review and approval for the installation of a new FOG control device that complies with design requirements in Section 24-42.6(9).

(c) Within 90 days of the date the Director or the Director's designee determines that the FOG control device is breached, the FOG generator or FOG control device operator shall obtain all required approvals and permits and install the Department approved FOG control device.

(d) Cease the discharge of FOG and wastewater as prohibited above. Failure to stop the discharge of FOG and wastewater as prohibited above shall result in the Director or the Director's designee directing the FOG generator or FOG control device operator to cease operating or ordering the utility providing water service to the facility to cease providing such service.

(3)

No person shall dispose of any FOG, or cause, let, permit, suffer or allow disposal or discharge of any FOG into any onsite sewage treatment and disposal system, non-utility or utility sanitary sewer system in quantities which hinder the operation of any onsite sewage treatment and disposal system, sewage collection, transmission or treatment system, exceeds the Oil and Grease standard applicable to FOG generators in Section 24-42.4, or causes a sanitary nuisance.

(a) When a FOG generator or a FOG control device operator is found to have violated Section 24-42.6(3), the FOG generator or FOG control device operator shall immediately cease and desist from discharging FOG in such quantities or concentrations. The FOG generator or FOG control device operator shall submit a corrective action plan to the Department within 30 days of the date the Director or the Director's designee determines that the FOG generator or FOG control device operator discharged FOG in such quantities or concentrations. The corrective action plan shall include equipment, process or procedure modifications proposed to prevent discharging FOG in such quantities or concentrations. The corrective action plan shall be implemented within the timeframe provided in the Department's approval of the corrective action plan. Until the corrective action plan is approved by the Director or Director's designee and implemented in accordance with the Director or Director designee's approval, the FOG generator or FOG control device operator shall take all necessary actions to prevent the discharge of FOG in such quantities or concentrations and to prevent causation of a sanitary nuisance.

(b) When a Residential FOG Source is found to have violated Section 24-42.6 (3), the Residential FOG Source shall immediately cease and desist from discharging FOG in such quantities or concentrations.

(i) When a Residential FOG Source is located in an apartment building or condominium, the building manager, association, property owner, or other responsible party shall submit a corrective action plan to the Department within 30 days of the date the Director or the Director's designee determines that the FOG residential source

has violated Section 24-42.6(3). The corrective action plan shall be implemented within the timeframe provided in the Department's approval of the corrective action plan.

(ii) The corrective action plan shall include equipment, process or procedure modifications proposed to correct the FOG discharge.

(iii) Until the corrective action plan is approved by the Director or Director's designee and implemented in accordance with the Director or Director designee's approval, the building manager, association, property owner, or other responsible party shall take all necessary actions to prevent violation of Section 24-42.6(3) and to prevent causation of a sanitary nuisance.

(4) Existing FOG generators with a current FOG operating permit issued prior to the effective date of this section, not proposing to increase seating capacity, dining area or drive-thru capacity, nor proposing to make any other modification, any of which will increase the discharge of FOG, shall comply with the following:

(a) Where there is an existing FOG control device and sampling point, the sampling point shall be located after the point of no further treatment and shall be directly accessible for visual inspection and sampling.

(b) Where there is no FOG control device, plans shall be submitted to the Department for the installation of a FOG control device which shall be installed in accordance with plans approved by the Director or Director's designee and within 90 days of the date the Director or the Director's designee determines that there is no FOG control device. The FOG generator shall take all necessary actions to prevent the discharge of FOG to the building sanitary drains and to prevent causing a sanitary nuisance until a FOG control device is properly installed.

(c) Where the discharge from a FOG control device exceeds the Oil and Grease standard applicable to FOG generators in Section 24-42.4, or causes the accumulation of FOG in building sanitary drains or building sewer, the FOG control device shall be repaired, upgraded or replaced within 90 days of the date the Director or the Director's designee determines that Section 24-42.4 Oil and Grease standard applicable to FOG generators have been exceeded, or from the date the Director or

the Director's designee determines that FOG has accumulated in building sanitary drains or building sewer. Repairs or upgrades that render third party certifications or approvals null and void are prohibited.

(d) Where the Director or Director's designee determines that there is no sampling point or the existing sampling point is not reasonably accessible or adequate for sampling, a new reasonably accessible sampling point shall be installed within 60 days of the determination of the Director or Director's designee.

(e) Where a FOG control device or sampling point are required to be repaired, replaced or installed, plans shall be submitted to the Department for review and approval and all required permits shall be obtained prior to repair, replacement or installation. Replacement or new FOG control devices shall be designed pursuant to Section 24-42.6 (9). Repairs or upgrades that render third party certifications or approvals null and void are prohibited.

(f) FOG generators shall comply with their current FOG generator operating permit conditions until the permit expires. Thereafter, FOG generators shall comply with permit conditions based on Section 24-42.6(10) requirements.

(5) Existing FOG generators and FOG control device operators that discharge to a utility or non-utility owned or operated sanitary sewer system, without a valid FOG operating permit issued prior to the effective date of this section, shall comply with the following:

(a) Submit as-built plans prepared by a Florida Professional Engineer and condition assessment prepared by a licensed plumber or Florida Professional Engineer within 60 days from the Director or the Director designee's determination that the FOG generator or FOG control device operator does not have a valid FOG operating permit. As-built plans and condition assessment shall demonstrate the following, where applicable:

(i) That all existing back of the house fixtures discharge to existing FOG control devices and not directly to the building sanitary drains or building sewers.

(ii) That existing FOG control devices comply with Section 24-42.6(9).

(iii) That the FOG control device is functioning in accordance with the manufacturer's specifications and its integrity is not compromised.

(iv) That a sampling point is located after the point of no further treatment, is reasonably accessible for visual inspection and sampling, and complies with Section 24-42.6(8).

(v) That existing yellow and brown grease storage areas prevent the release of FOG to ground, groundwater, surface waters or storm sewers.

(vi) That existing mat and equipment wash-down areas prevent the release of FOG to ground, groundwater, surface waters or storm sewers and prevent inflow of stormwater.

(b) FOG generators or FOG control device operators that cannot comply with Sections 24-42.6(5)(a) shall submit plans to upgrade the facility pursuant to Section 24-42.6(5)(a)(i), (ii), (iii), and (iv) within 90 days of the date the Director or the Director's designee determines that the FOG generator or FOG control device operator does not have a valid FOG operating permit. The facility upgrade shall be completed within 180 days of the date the Director or the Director's designee determines that the FOG generator or FOG control device operator does not hold a valid FOG operating permit.

(c) Within five days of the Director or the Director designee's approval of the as-built plans or plans to upgrade the facility pursuant to Section 24-42.6(5)(b), a FOG operating permit application shall be submitted to the Department pursuant to Sections 24-18(A)(18) and 24-42.6(10).

(6) Existing FOG generators and FOG control device operators that discharge to an onsite sewage treatment and disposal system located in a wellfield protection area of any utility potable water supply wells, without a valid FOG operating permit issued prior to the effective date of this section, shall comply with the following within one year of Department notification:

(a) Submit as-built plans prepared by a Florida Professional Engineer and condition assessment prepared by a licensed plumber or Florida Professional Engineer. As-built plans and condition assessment shall demonstrate the following, where applicable:

(i) That all existing back of the house fixtures discharge to existing FOG control devices and not directly to the building sanitary drains or building sewers.

(ii) That existing FOG control devices comply with Chapter 64E-6, FAC.

(iii) That the FOG control device is functioning in accordance with the manufacturer's specifications and its integrity is not compromised.

(iv) That the outlet tee of the last grease interceptor is reasonably accessible for visual inspection and sampling.

(v) That existing yellow and brown grease storage areas prevent the release of FOG to ground, groundwater, surface waters or storm sewers.

(vi) That existing mat and equipment wash-down areas prevent the release of FOG to ground, groundwater, surface waters or storm sewers and prevent inflow of stormwater.

(b) FOG generators or FOG control device operators that cannot comply with Section 24-42.6(6)(a) shall submit plans to upgrade the facility pursuant to Section 24-42.6(6)(a)(i), (ii), (iii), and (iv) and implement upgrades within one (1) year of Department notification.

(c) Within five days of the Director or the Director designee's approval of the as-built plans or plans to upgrade the facility pursuant to Section 24-42.6(6)(b), a FOG operating permit application shall be submitted to the Department pursuant to Sections 24-18(A)(18) and 24-42.6(10).

(7) Notwithstanding any provision of this Code, no county or municipal officer, agent, employee or board shall approve, grant or issue any building permit, certificate of occupancy, certificate of completion, certificate of use or municipal occupational license for a FOG generator or FOG control device operator until prior written approval of the Director or the Director's designee has been obtained. Furthermore, no person shall construct, utilize, operate, occupy or cause, allow, let, permit or suffer to be constructed, utilized, operated or occupied any FOG generator or FOG control device until prior written approval of the Director or the Director's designee has been obtained.

(a)

For new FOG generators or FOG control operators discharging to a utility or non-utility owned or operated sanitary sewer collection system or to an onsite sewage treatment and disposal system located in a wellfield protection area of any utility potable water supply wells, the Director or the Director's designee shall not issue a written approval until the Director or the Director's designee finds that:

(i) For the issuance of a building permit, construction plans have been found to be in compliance with Section 24-42.6(8).

(ii) For the issuance of a certificate of occupancy, certificate of completion, or municipal equivalent, the FOG control devices have been inspected by the Department and found to be in compliance with Section 24-42.6(9) and with Department approved construction plans pursuant to Section 24-42.6(7)(a)(i). Compliance with approved plans shall be determined by construction inspection. No building/plumbing permit final inspection, certificate of occupancy or certificate of completion shall be issued prior to the Department's inspection finding that the FOG control devices have been installed in compliance with Department approved construction plans.

(iii) For the issuance of a certificate of use or municipal equivalent, the FOG operating permit application has been submitted and found to be in compliance with Sections 24-18(A)(18), 24-42.6(10), 24-42.6 (7)(a)(i) and 24-42.6(7)(a)(ii).

(b) For existing FOG generators discharging to a utility or non-utility owned or operated sanitary sewer system or discharging to an onsite sewage treatment and disposal system located in a wellfield protection area of any utility potable water supply wells, proposing to increase seating capacity, dining area or drive-thru capacity, or other modification any of which will increase the discharge of FOG, the Director or the Director's designee shall not issue a written approval until the Director or the Director's designee finds that the proposed increased seating capacity, dining area or drive-thru capacity, or other modification any of which will increase the discharge of FOG, complies with Section 24-42.6 (7)(a)(i), (ii) and (iii).

(c) For changes in ownership or other changes that require the issuance of a certificate of use, municipal occupational license, or equivalent municipal approval to operate or use a business, the Director or the Director's designee shall not issue a written approval until the Director or the Director's designee finds that:

(i) The prior use had a valid FOG operating permit within the last 12 months.

(ii) There is no construction proposed or required.

(iii) There are no changes to the back of house.

(iv) No changes have been made, or are proposed, to the plumbing system, use, or facility operations that will impact the FOG control device.

(v) A FOG control device condition assessment is performed by a licensed plumber or Florida Professional Engineer and the findings, submitted to the Department in a form prescribed by the Director or the Director's designee, show that the FOG control device is functioning in accordance with the manufacturer's specifications and instructions and that the sampling point complies with Section 24-42.6(8).

(d) For changes in ownership or other changes that require the issuance of a certificate of use, municipal occupational license, or equivalent municipal approval to operate or use a business, that do not comply with Section 24-42.6(7)(c) shall be required to comply with Section 24-42.6(7)(a)(i), (ii) and (iii) prior to the Department approval of the change in ownership or other changes that require the issuance of a certificate of use, municipal occupational license, or equivalent municipal approval to operate or use a business.

(8) Plans. Where required in Section 24-42.6, plans shall include the following minimum information:

(a) Florida Professional Engineer signature, seal and date.

(b) All existing and proposed back of the house and front of the house areas and drive-thru lanes are shown and labeled.

(c)

Plan and isometric drawings showing and labeling all existing and proposed drainage pipes, fixtures, sumps, pumps, ejectors, solids separators, FOG control devices and sampling points. All drainage pipes that receive or can receive waste from back of the house fixtures, and other fixtures that can discharge food waste or FOG, shall be labeled grease waste drains or GW and shall include slope, diameter and drainage fixture units. Back of the house fixtures include floor drains, floor sinks, trough drains, mop sinks, three-compartment sinks, hand sinks, pre-rinse station/sink, preparation sink, pot sink, wok sink, self-cleaning kitchen exhaust hoods, and any and all fixtures, appurtenances and equipment that have the potential to introduce food waste or FOG into drainage pipes. Screens shall be shown and labeled in all sinks and drains.

(d) Where multiple users/tenant spaces connect to a common FOG control device, the plans shall include all users/tenant spaces.

(e) Plan and isometric drawings showing grease waste drains and sanitary drains from bathrooms and other non-FOG drains connecting to building drain and include slope, diameter and drainage fixture units.

(f) All grease waste drains are connected to a FOG control device that complies with Section 24-42.6(9). FOG control devices shall not receive flow under pressure. No pump, ejector or any equipment that can mechanically emulsify FOG, or reduce the efficiency of a FOG control device, shall connect directly or indirectly to a FOG control device.

(g) FOG control devices installed below ground/grade to intersect the building grease waste drain. When installation below grade is not physically possible, the Director or Director's designee may approve a single above grade installation if the FOG control device required pursuant to Section 24-42.6(9) is rated at 25 gallons per minute or less and includes an air gap or air break.

(h) At least one sampling point, located after the point of no further treatment, shown and labeled.

(i)

Profiles, sections and details of FOG control device and sampling point drawn to scale. FOG control devices and sampling points shall be accessible for cleaning. At a minimum, four feet of vertical clearance and three feet of horizontal clearance shall be provided for each.

(j) Where FOG control device access risers are required, the riser height shall not exceed 30 inches. A greater riser height may be approved by the Director or Director's designee where access for inspection and cleaning can be achieved and demonstrated.

(k) Construction material for FOG control devices shall be labeled and shall be compatible with all waste, including waste with a pH of 3 or less.

(l) The point and method of wastewater discharge for kiosk and booths using holding tanks shall be shown and labeled. The point of discharge shall be a grease waste drain or FOG control device sized for the quantity of waste generated. All waste containers shall be shown on plans.

(m) FOG control device sizing calculations and assumptions, including peak flow rate, temperature, FOG and solids loading rates, and frequency of FOG and solids removal shall be shown and labeled. Where the FOG control device will serve multiple users/tenants, each user/tenant shall be identified and their flows and loading rates shall also be included on the plans. Loading rates shall include waste from food preparation and cleaning associated with eat-in, take-out and drive-thru meals. FOG loading shall include all FOG sources, including kitchen exhaust hoods. For self-cleaning kitchen exhaust hoods, the manufacturer's specifications for peak discharge shall be included.

(n) Manufacturer's and third party certification installation requirements.

(o) FOG control device model numbers and third party certifications shall be shown and labeled. Plan profiles and sections shall demonstrate how all labels and markings on FOG control devices remain visible during and after installation.

(p) State Health Office's designated approval/tank numbers for grease interceptors designed in accordance with 64E-6, Florida Administrative Code, shall be shown and labeled. All labels and markings on FOG control devices shall be visible before and after installation.

(q) For concrete precast FOG control devices, the precast concrete plant name and precast concrete plant certifying agency accepted by the Florida Department of Transportation shall be shown and labeled accordingly. Site cast FOG control devices are not permitted.

(r) Dishmachines and dishwashers shall be connected to a FOG control device sized to account for emulsified FOG.

(s) Locations and details for all stored waste, including yellow and brown grease, shall be shown and labeled. Storage areas shall be designed to prevent the release of FOG to ground, groundwater, surface waters or storm sewers. Storage containers shall be identified by waste type and capacity in gallons and sized to prevent overfilling. All storage containers shall have a lid that prevents rainwater inflow and that can be locked to prevent vandalism.

(t) Locations and details for all wash-down areas shall be shown and labeled. All wash-down areas shall be designed to prevent the release of wash-water and FOG to ground, groundwater, surface waters, storm sewer or any other location not approved by the Director or Director's designee. Where mat and equipment wash-down is to be performed in a mop sink, the mop sink shall be sized and labeled.

(u) Solids separation is provided prior to existing or proposed FOG control devices that require a flow control device or that are not certified to handle solids.

(v) Access is provided for cleaning of FOG in grease waste drains where the horizontal run from the source of food waste and FOG is greater than 50 feet from the solids separator or FOG control device. Access points shall not be spaced greater than 50 feet, measured center-to-center. Location of access points and details for access point shall be provided in drawings. Where the horizontal run from the source of food waste and FOG is greater than 100 feet, plans shall include provisions for preventing clogging by FOG and other waste. Where the FOG control device is located at a remote location, it shall be equipped with a functional Interceptor Monitoring Alarm or Device. Remote locations include a different floor, or any horizontal distance exceeding 100 feet from the back of the house area.

(w) Sanitary wastes from bathrooms and stormwater are not discharged into grease waste drains, solids separators, FOG control devices or sampling point. Only grease waste lines and drains shall connect to a FOG control device.

(9) FOG Control Device Sizing. Where required in Section 24-42.6, FOG control devices shall be sized for all intended users, facilities and tenants using one of the following criteria and approved by the Director or Director's designee:

(a) Gravity Grease Interceptors. The minimum design volume for gravity grease interceptors shall be the largest volume of the following:

(i) Calculations or selection based on the Florida Building Code, latest edition.

(ii) Alternative calculations:

1. Calculations prepared by a Florida Professional Engineer that include peak flow rate, 30 minute hydraulic detention time calculated using net wet volume, temperature, FOG and solids loading rates, and proposed frequency of FOG and solids removal. Net wet volume shall be total wet volume minus the maximum volume of waste stored between cleaning cycles; or

2. Calculations prepared by a Florida Professional Engineer that include peak flow rate; temperature; FOG and solids loading rates; proposed frequency of FOG and solids removal; third party certification of the maximum FOG containment capacity; and third party certification of the effluent concentration or of the FOG removal efficiency. The certified effluent concentration shall be equal to or less than the FOG sanitary sewer discharge limitation and pretreatment standards referenced in Section 24-42.4. The minimum FOG removal efficiency shall be 99% at the third party certified flow rate and minimum required FOG containment capacity.

(iii) Where Chapter 64E-6, Florida Administrative Code, applies, as determined by the Director or Director's designee, total volume shall be calculated using seats and meals, where meals are used to calculate the volume associated with take out, drive through and

other FOG loads not accounted for in seats, and the total volume is increased to account for the maximum volume of waste stored between cleaning cycles. As an alternative to calculating the maximum volume of waste stored between cleaning cycles, the following multiplication factors can be used to increase the volume calculated by seats and meals:

Cleaning Cycle	Multiplication Factor
Every 30 days	1.0
Every 60 days	1.15
Every 90 days	1.25

(b) Where more than one gravity grease interceptor is required to provide the largest volume calculated in Section 24-42.6(9)(a), they shall be installed in series with consideration given to minimize disturbance between tanks by utilizing appropriately sized pipes and influent and effluent appurtenances that maximize FOG separation.

(c) Hydromechanical Grease Interceptors. The minimum size and number of hydromechanical grease interceptors shall be the greatest of the following:

(i) Twenty (20) gallons per minute.

(ii) Calculations or selection based on the Florida Building Code, latest edition.

(iii) Calculations prepared by a Florida Professional Engineer that include projected peak flow rate; temperature; FOG and solids loading rates; proposed frequency of FOG and solids removal; third party certification of the maximum FOG containment capacity; and third party certification of the effluent concentration or of the FOG removal efficiency. The certified effluent concentration shall be equal to or less than the Oil and Grease

standard applicable to FOG generators referenced in Section 24-42.4. The minimum FOG removal efficiency shall be 99% at the third party certified flow rate and minimum required FOG containment capacity.

(d) Where more than one hydromechanical grease interceptor is required to provide the required removal efficiency, they shall be installed in series and the removal efficiency shall be based on third party testing of the proposed configuration and number of grease interceptors proposed. The test configuration, including flow control, air entrainment and other appurtenances, shall match the proposed field installation.

(e) FOG Control Devices not classified by the Director or Director's designee as hydromechanical or gravity grease interceptors. The minimum size and number of FOG control devices shall be the greatest of the following:

(i) Calculations or selection based on the Florida Building Code, latest edition.

(ii) Calculations prepared by a Florida Professional Engineer that include peak flow rate; temperature; FOG and solids loading rates; FOG and solids biological and chemical removal rates; frequency of FOG and solids removal; and third party certification of maximum FOG containment capacity and effluent concentration. The certified effluent concentration shall be equal to or less than the Oil and Grease standard applicable to FOG generators referenced in Section 24-42.4.

(f) Where more than one FOG control device, not classified by the Director or Director's designee as hydromechanical or gravity grease interceptors, is required to provide the required effluent concentration, it shall be based on third party testing of the proposed configuration and number of grease interceptors proposed. The test configuration, including flow control, air entrainment and other appurtenances, shall match the proposed field installation.

(g) Peak Flow Rate. Where peak flow rate is required in Section 24-42.6, it shall be estimated as follows:

(i)

Shell buildings. Peak flow shall be calculated using Manning's Formula for full pipe flow for the grease waste drain nominal diameter and slope and a roughness coefficient of 0.0113.

(ii) Plans with complete plumbing design. Peak flow shall be estimated as provided above for shell building, total fixture flow rate using one or two minute drain time, or drainage fixture units (DFUs). For DFUs, the peak flow rate shall be calculated by multiplying the proposed DFUs by the flow rate calculated using Manning's Formula for full pipe flow and a roughness coefficient of 0.0113 and divided by the maximum number of DFUs allowed under the Florida Building Code, latest edition, for the grease waste drain diameter and slope. Calculated flow shall not be less than the minimum peak flow in the table below:

Nominal pipe size in inches	Minimum Total Flow Rate at Grease Interceptor Influent
1.25—2.5	20 gpm
3	23 gpm
4	50 gpm
5	91 gpm
6	147 gpm
8	317 gpm
10	576 gpm
12	936 gpm
15	1,697 gpm

(10) Operating Permits for FOG Generators and FOG Control Device Operators. No person shall operate, cause, let, permit, suffer or allow the operation of a FOG generating facility or FOG control devices serving FOG generators discharging to a utility or non-utility owned or operated sanitary sewer system or an onsite sewage treatment and disposal system located in a wellfield protection area of any utility potable water supply wells without a valid FOG operating permit issued by the Director or the Director's designee or in violation of any condition, limitation or restriction which is part of a FOG operating permit.

(a) Existing FOG generators and FOG control device operators that do not hold a valid FOG operating permit issued prior to the effective date of this section, that discharge to an onsite sewage treatment and disposal system located in a wellfield protection area of any utility potable water supply wells, shall apply for and obtain a FOG operating permit using a form prescribed by the Director or Director's designee in accordance with Section 24-42.6(6).

(b) Applications for new FOG generators and new FOG control device operators shall be in a form prescribed by the Director or Director's designee. When the FOG operating permit applicant is a tenant, the application shall be completed and signed by the tenant(s) and property owner(s) as co-applicants. The owner's section of the application shall include a statement acknowledging that the property owner(s) is responsible for the proper closure of a FOG generator pursuant to Section 24-42.6(10)(d)(vi).

(c) Each FOG generator shall, on an annual basis, submit a FOG control device certification form which is prescribed by the Director or the Director's designee. Where made available by the Department, certification shall be completed using a secure online system or by an equivalent system developed by the Department. Said certification shall be prepared by a Florida Professional Engineer or licensed plumber or liquid waste transporter, attesting that the existing FOG control devices

are functioning as designed and are in good working order. Where required in this Section, the renewal shall also include training certificates for staff trained pursuant to Section 24-42.6(10)(d)(iv).

(d) Operating permits for new FOG generators and new FOG control device operators, and renewal of same, discharging to a utility or non-utility owned or operated sanitary sewer system or an onsite sewage treatment and disposal system located in a wellfield protection area of any utility potable water supply wells shall include the following:

(i) Best management practices. The Director or Director's designee shall maintain a list of approved best management practices and update the list as necessary.

(ii) Maintenance. All FOG control devices and equipment shall be serviced to function properly and continuously to prevent the discharge of FOG into building sanitary drains, building sewers, utility or non-utility owned or operated sanitary sewer systems, or onsite sewage treatment and disposal systems. Where cleaning of FOG control devices is required in Section 24-42.6, cleaning shall include the complete removal of the full contents of the FOG control device, including settled solids, wastewater and floating materials. Side walls, baffle walls, cross-pipes, and inlet and outlet pipes shall be pressure washed or scraped to remove all attached materials. Decanting, skimming, or backflushing is prohibited. Emulsifiers, grease cutters or other chemicals or detergents which could cause FOG to pass through the system to the building sanitary drains or building sewers are prohibited and shall not be used. At a minimum, the following maintenance shall be performed:

1. Grease Waste Drains, Building Sanitary Drains and Building Sewers. When jetting, rodding or other cleaning activities are required, FOG shall not be flushed, discharged, conveyed or allowed to pass through to utility or non-utility owned or operated sanitary sewer systems or onsite sewage treatment

and disposal systems. All FOG shall be collected and transported by a liquid waste transporter, permitted by the Department, to an approved disposal facility.

2. Kitchen Exhaust Hoods. All waste generated by manual hood cleaning shall not be flushed, discharged, conveyed or allowed to pass through to utility or non-utility owned or operated sanitary sewer systems or onsite sewage treatment and disposal systems. All wastes shall be collected and transported by a liquid waste transporter permitted by the Department to an approved disposal facility. Where a hood is designed to be self-cleaning, the FOG control device shall be designed for the maximum cold water and hot water flow rates. Where a surfactant/detergent is used, the FOG control device shall be sized to provide sufficient detention time to allow FOG waste separation so that the effluent does not exceed the standards set forth in Section 24-42.4.
3. Yellow and Brown Grease Storage Areas. Yellow and brown grease storage areas shall be maintained free of debris and storage containers shall not be overfilled. Storage containers shall be visually inspected daily and emptied before they reach 90 percent capacity. Spills shall be contained and cleaned using absorbent materials. Wet cleanup methods shall not be used. Storage container lids shall be maintained to prevent rainwater inflow and locked to prevent vandalism.
4. Mat and Equipment Wash-Down Areas. Mat and equipment wash-down areas shall be maintained free of debris and wash-water shall not be released to ground, groundwater, surface waters, storm sewer or any other location not approved by the Director or Director's designee. Wash-down areas shall not allow stormwater or rainwater to enter the building sanitary drains, building sewers, utility or non-utility owned or operated sanitary sewer systems, or onsite sewage treatment and disposal systems.
5.

Solids Separators. Where installation of a solids separator is required or approved pursuant to Section 24-42.6(8), solids separators shall be serviced to function as designed and shall not be missing or have defective elements or components that reduce its ability to separate solids. All solids separators shall be visually inspected daily to prevent excessive accumulation and discharge of food solids to FOG control devices, building sanitary drains, building sewers, utility or non-utility owned or operated sanitary sewer systems, or onsite sewage treatment and disposal systems. Solids shall be properly discarded as solid waste or removed by a liquid waste transporter permitted by the Department.

6. Hydromechanical Grease Interceptors. Cleaning of grease interceptors shall be performed as follows:
    a. Automatic grease interceptors shall be cleaned by a liquid waste transporter, permitted by the Department, monthly or more frequently so that the FOG capacity limit or the Oil and Grease standard applicable to FOG generators in Section 24-42.4 are not exceeded. The contents of the strainer/screen and automatic storage receptacles shall be emptied by the FOG generator or FOG control device operator on a daily basis and transferred to waste containers intended and approved for such use to prevent overfilling or spills. If at any time the automatic elements or components do not function as intended and designed, the malfunctioning automatic grease interceptor shall be operated and reported as a manual grease interceptor and cleaned by a liquid waste transporter, permitted by the Department, on a daily basis until the system is repaired. In no instance shall the automatic grease interceptor be allowed to cause a sanitary nuisance at any time. In the event of a sanitary nuisance, such conditions shall be abated within 24 hours pursuant to Section 24-28. The automatic grease

interceptor shall be repaired within 30 days of malfunctioning. If the automatic grease interceptor is not capable of repair, it shall be replaced within 90 days of malfunctioning. Plans for replacement shall be reviewed and approved by the Director or Director's designee pursuant to Section 24-42.6(9).

b. Manual grease interceptor shall be cleaned monthly by a liquid waste transporter permitted by the Department or more frequently when necessary to avoid exceeding the FOG capacity limit or effluent standards in Section 24-42.4. The FOG generator or FOG control device operator may remove floating materials and settled solids on a regular basis, between cleaning intervals performed by a liquid waste transporter, and may transfer the waste to containers intended and approved for such use to prevent overfilling or spills.

c. Alternative cleaning frequencies, not to exceed 90 days, may be approved by the Director or Director's designee based on a complete engineering analysis, pursuant to Section 24-42.6(9), or the results of a field study approved by the Director or Director's designee that demonstrates that less frequent cleaning is appropriate and will not result in an exceedance of the Oil and Grease standard applicable to FOG generators referenced in Section 24-42.4.

d. Exception. Notwithstanding the foregoing, a FOG generator shall not be required to have a liquid waste transporter clean the grease interceptor on a monthly basis, as required above in Section 24-42.6(10)(d)(ii)6., if the FOG generator does not discharge FOG or food waste in quantities which hinder the operation of any onsite sewage treatment and disposal system, sewage collection, transmission or treatment system, or exceed the oil and grease standard applicable to FOG

generators in Section 24-42.4, or cause a sanitary nuisance, provided that the FOG generator: does not have fryers; is not required by the Florida Building Code Mechanical (latest edition) to have a Type I kitchen exhaust hood; has a grease interceptor rated at 20 gallons per minute or less; and cleans the grease interceptor daily.

7. Gravity Grease Interceptors. Cleaning of gravity grease interceptors shall be performed as follows:
    a. Gravity grease interceptors shall be cleaned every 60 days by a liquid waste transporter permitted by the Department or more frequently when necessary to avoid exceeding the FOG capacity limit or the Oil and Grease standard applicable to FOG generators in Section 24-42.4.
    b. Single and grouped gravity grease interceptors equipped with a functional Interceptor Monitoring Device shall all be cleaned by a liquid waste transporter permitted by the Department at an interval not to exceed 180 days, the FOG capacity limit, or the Oil and Grease standard applicable to FOG generators in Section 24-42.4.
    c. Alternative cleaning frequencies may be approved pursuant to Section 24-42.6(10)(d)(ii)6.c.
8. FOG Control Devices not classified by the Director or Director's designee as hydromechanical or gravity grease interceptors: FOG control devices shall be cleaned pursuant Section 24-42.6(10)(d)(ii)6.

(iii) Record Keeping. Each FOG generator and FOG control device operator shall maintain records of maintenance and repair activities, service calls and staff training. All records shall be retained onsite for a period of not less than three years and made available onsite to Department staff upon request. Offsite records shall not be an acceptable substitute for onsite records required

herein. At a minimum, each FOG generator and FOG control device operator shall maintain the following records using forms prescribed by the Director or Director's designee.

1. Scheduled and unscheduled service calls to clean grease waste drains, building sanitary drains, or building sewers.
2. Repairs required resulting from food or FOG accumulation or blockages.
3. Kitchen exhaust hood cleaning.
4. FOG control device cleaning, maintenance and repair.
5. Waste manifest forms pursuant to Sections 24-42.6(10)(c)(v) and 24-46.
6. Staff training records pursuant to Section 24-42.6(10)(d)(iv).

(iv) Training Requirements. Each FOG generator and FOG control device operators shall maintain trained staff to ensure compliance with the requirements of Section 24-42.6(10). The content and form of training shall be prescribed by the Director or Director's designee. Training shall include orientation of new employees and quarterly training of existing employees. On or before January 1, 2019, each FOG generator and FOG control device operator shall have one trained person on staff which has working knowledge of the following where applicable:

1. Kitchen exhaust hoods.
2. Solids separators.
3. FOG control devices.
4. Best management practices.
5. Yellow and brown grease storage.
6. Mat and equipment wash-down areas.
7. Record keeping and reporting.

(v) Reporting. Each FOG generator and FOG control device operator shall submit reports to the Department using forms prescribed by the Director or Director's designee pursuant to maintenance schedules in Section 24-42.6(10)(d)(ii). Where made available by the

Department, reporting shall be completed using a secure online system or by an equivalent system developed by the Department. Reports shall include the date and the name of liquid waste transporter.

(vi) Closure Requirements. No more than 30 days after a FOG generator ceases operation, the property owner shall notify the Department to perform a closure inspection. On or before the closure inspection, the property owner shall have all yellow and brown grease containers and bins emptied, storage areas cleaned and FOG control devices cleaned. Decanting, skimming, or backflushing is prohibited. Emulsifiers, grease cutters or other chemicals and detergents which could cause FOG to pass through the system to the drain lines are prohibited and shall not be used. All waste shall be disposed at a permitted facility, using an approved liquid waste transporter with manifests submitted to the Department.

(e) Existing FOG generators with a current FOG operating permit, issued prior to the effective date of this section, proposing to increase seating capacity, dining area or drive-thru capacity, or other modification, any of which will increase the discharge of FOG, shall comply with Sections 24-42.6(7)(a)(i), (ii) and (iii), and 24-42.6(9).

(f) FOG generators discharging to an onsite sewage treatment and disposal system located in a wellfield protection area of any utility potable water supply wells, proposing to increase seating capacity, dining area or drive-thru capacity, or other modification, any of which will increase the discharge of FOG, shall comply with Sections 24-42.6(6)(b), and 24-42.6 (9).

(g) FOG generators discharging to an onsite sewage treatment and disposal system located in a wellfield protection area of any utility potable water supply wells, not proposing to increase seating capacity, dining area or drive-thru capacity, or other modification, any of which will increase the discharge of FOG, shall apply for and obtain an operating permit pursuant to Section 24-42.6(6).

(h)

Any FOG operating permit approved and issued by the Department may be revoked for failure to comply with permit conditions or conditions established in Section 24-42.6. Cause for revoking an operating permit may include, but not be limited to, the following:

(i) Falsifying information on any record or document required by the county; or

(ii) Failure to have a FOG control device cleaned properly or in a timely manner as described in Section 24-42.6(10); or

(iii) Having a FOG control device cleaned by a person not permitted by the Department to perform such cleaning; or

(iv) Utilizing a liquid waste transporter not permitted by the Department; or

(v) Failure to comply with any permit condition; or

(vi) Violation of any federal, state, or local regulation governing the handling of FOG wastes; or

(vii) Failure to pay invoices, fees, fines, judgments or liens owed to the county.

(viii) The revocation of an operating permit shall be in addition to any penalties assessed for violation of this Chapter, or provided elsewhere in the Code of Miami-Dade County.

(11) FOG Liquid Waste Transporters. Notwithstanding any provision of this Code, no person shall collect, pump, transport, or cause, let, permit, suffer or allow any FOG, yellow grease, brown grease or black grease to be collected, pumped or transported without a valid operating permit issued by the Department pursuant to Sections 24-18, and 24-46. In addition to the requirements enumerated in Section 24-46, FOG liquid waste transporters shall comply with the following:

(a) All waste transported and FOG control device condition assessments shall be manifested using forms prescribed by the Director or Director's designee and reported using a secure online system or an equivalent system developed by the Department. Reporting shall be completed no later than 20 days after the end of the month during which cleaning was performed.

(b) FOG, yellow grease, black grease and brown grease shall only be stored or disposed at private or public facilities approved by the Department.

(c) FOG control device cleaning shall include completely removing the full contents of the FOG control device, including settled solids, wastewater and floating materials, pressure washing or scraping side walls, baffle walls, cross-pipes, and inlet and outlet pipes to remove all attached materials. Decanting, skimming, or backflushing is prohibited. Emulsifiers, grease cutters or other chemicals and detergents which could cause FOG to pass through the system to the building sanitary drains or building sewers are prohibited and shall not be used.

(d) Effective January 1, 2019, liquid waste transporter staff shall be trained to ensure compliance with the requirements of Sections 24-42.6(10)(d)(ii) and 24-42.6(11)(c). The content and form of training shall be prescribed by the Director or Director's designee. At a minimum, one trained staff member shall be present while FOG control devices are being cleaned. Staff performing assessments of the condition of any system or part thereof (condition assessments) stipulated in Section 24-42.6(11) shall be trained in accordance with this Section.

(e) Septage or other waste shall not be commingled with yellow or brown grease.

(f) Liquid waste transporters shall perform FOG control device condition assessments when cleaning is required pursuant to Section 24-42.6(10). The condition assessment shall be performed and reported pursuant to Section 24-42.6(11)(a). At a minimum, the condition assessment shall document the following:

(i) The water level and thickness of floating FOG and settled solids prior to cleaning.

1. Where FOG control devices are installed below ground and the water level prior to cleaning is below the invert of the outlet pipe, or groundwater infiltration is observed during or after cleaning, the condition assessment shall document leaks.

2.

Where FOG control devices are installed above ground and leaks are observed, the condition assessment shall document leaks.

3. Should a leak cause a sanitary nuisance, the sanitary nuisance shall be removed, abated or corrected within 24 hours or such other reasonable time as the Director or the Director's designee may determine.

(ii) Integrity of solids separators and FOG control devices, including the inlet and outlet appurtenances; interior, bottom, top, side walls, baffle walls, and cross-pipes; manhole rings, extenders and covers; sampling points and cleanouts; interceptor monitoring alarms and devices; and other elements and equipment approved by the Department.

(iii) The condition of yellow and brown grease containers and bins.

(12) FOG Disposal Facilities. All facilities accepting, storing, transferring or treating FOG, yellow grease or brown grease shall obtain an operating permit pursuant to Section 24-18(A)(22) and comply with the following:

(a) Maintain trained staff to assure compliance with the requirements of Section 24-42.6. The content and form of training shall be prescribed by the Director or Director's designee. Training shall be completed prior to permit renewal starting January 1, 2019. At a minimum, one trained staff member shall be present during maintenance and repair of the system and/or system components.

(b) Submit monthly reports to the Department using forms prescribed by the Director or Director's designee. Where made available by the Department, reporting shall be completed using a secure online system or by an equivalent system developed by the Department. Monthly reports shall include total volume of each waste stream accepted, collected, stored, treated, disposed, or transported and include waste manifests for all waste transported. Waste manifests shall track waste from the point of origin to the final disposal facility.

(13) Utilities. Utilities shall submit a monthly report to the Department that includes the following minimum information:

(a)

A list with dates and locations where accelerated FOG maintenance was performed to prevent a sanitary sewer overflow. Locations shall also be identified in a geographical information system (GIS) format based on the utilities atlas pursuant to Section 24-42.2(6).

(b) A description of accelerated FOG maintenance performed, including quantities of waste removed, recovered, collected or treated to prevent a sanitary sewer overflow. The information shall be provided in text and GIS form.

(c) Cost of accelerated FOG maintenance, including, equipment and materials. Labor shall include field and office staff.

(Ord. No. 18-22, § 10, 2-21-18)

Part B

Collection System Asset Management Program

CITY OF FORT LAUDERDALE

City of Fort Lauderdale
Wastewater Consent Order Program
Part B: Collection System
Asset Management Program

June 25, 2020

Prepared by Hazen

Table of Contents

B1. Introduction 1-1
B1.1 Program Overview 1-1
B1.2 CSAMP Goals and Organization 1-3
B1.3 Levels of Service and Performance Measures 1-3
B2. Condition Assessment 2-1
B2.1 Gravity Collection System 2-1
B2.2 Pump Stations 2-2
B2.3 Force Mains 2-3
B2.4 Reporting and Control Systems 2-4
B3. Asset Valuation 3-1
B3.1 Linear Collection System 3-1
B3.1.1 Gravity Sewer 3-1
B3.1.2 Manholes 3-2
B3.1.3 Force Mains 3-3
B3.2 Pump Stations 3-4
B3.3 Assets not Included in the Valuation 3-5
B3.4 Collection System Asset Valuation Summary 3-6
B4. Risk Assessment 4-1
B4.1 Gravity Mains 4-2
B4.1.1 Likelihood of Failure Score 4-2
B4.1.2 Consequence of Failure Score 4-6
B4.1.3 Risk Score 4-14
B4.2 Pump Stations 4-17
B4.2.1 Likelihood of Failure Score 4-17
B4.2.2 Consequence of Failure Score 4-20
B4.2.3 Risk Score 4-26
B4.3 Force Mains 4-29
B4.3.1 Likelihood of Failure Score 4-29
B4.3.2 Consequence of Failure Score 4-37
B4.3.3 Risk Score 4-45

B4.3.4 Force Mains Condition Assessment Report Recommendations....4-47

B5. Collection System Repair, Upgrade, and Replacement Program....5-1

B5.1 Repair and Replacement Needs Identification and Prioritization....5-1

B5.2 Desktop Risk Assessment....5-2

B5.3 Asset Valuation....5-2

B5.4 Condition Assessment....5-2

B5.5 Residual Life Assessment....5-3

B5.6 Asset Renewal Capital Improvement Program Planning Prioritized by LOF and COF....5-3

B5.7 Prioritized Repair, Upgrade and Replacement Program Implementation....5-4

List of Tables

Table B1-1. The Five Core Questions of Asset Management Framework.... 1-2
Table B1-2. Metric Development and Definition.... 1-5
Table B3-1: Gravity Main Asset Inventory Summary and Replacement Cost.... 3-2
Table B3-2: Manhole Asset Inventory Summary and Replacement Cost.... 3-3
Table B3-3: Force Main Asset Inventory Summary and Replacement Cost.... 3-4
Table B3-4: Pump Station Asset Inventory.... 3-4
Table B3-5: Total Replacement Value of Active City-Owned Collection System Assets.... 3-6
Table B4-1: Gravity Main Likelihood of Failure Category Weighting Factor.... 4-3
Table B4-2: Gravity Main Likelihood of Failure Scoring Criteria.... 4-3
Table B4-3: Gravity Main COF Financial Impact Weighting Factor.... 4-7
Table B4-4: Gravity Main COF Community Impact Weighting Factor.... 4-7
Table B4-5: Gravity Main Consequence of Failure Category Weighting Factor.... 4-8
Table B4-6: Gravity Main Consequence of Failure Scoring Criteria.... 4-9
Table B4-7: Pump Station Likelihood of Failure Category Weighting Factor.... 4-17
Table B4-8: Pump Station Likelihood of Failure Scoring Criteria.... 4-18
Table B4-9: Pump Station COF Financial Impact Weighting Factor.... 4-21
Table B4-10: Pump Station COF Community Impact Weighting Factor.... 4-21
Table B4-11: Pump Station Consequence of Failure Category Weighting Factor.... 4-21
Table B4-12: Pump Station Consequence of Failure Scoring Criteria.... 4-22
Table B4-13: Force Main Likelihood of Failure Category Weighting Factor.... 4-31
Table B4-14: Force Main Likelihood of Failure Scoring Criteria.... 4-32
Table B4-15: Force Main Consequence of Failure Category Weighting Factor.... 4-38
Table B4-16: Force Main Consequence of Failure Scoring Criteria.... 4-39

List of Figures

Figure B3-1: Pump Station Rehabilitation Cost per Installed Horsepower.... 3-5
Figure B3-2: Total Replacement Value of Active City-Owned Collection System Assets.... 3-6

Figure B4-1: Gravity Main LOF Score for Years since Pipe Installation & Pipe Material 4-4
Figure B4-2: Gravity Main LOF Score for External & Internal Physical Factors 4-4
Figure B4-3: Gravity Main LOF Score for Pipe Maintenance 4-5
Figure B4-4: Gravity Main Overall LOF Score 4-6
Figure B4-5: Gravity Main COF Scores for Pipe Diameter 4-10
Figure B4-6: Gravity Main COF Scores for Depth to Pipe Invert 4-10
Figure B4-7: Gravity Main COF Scores for Surface Type 4-11
Figure B4-8: Gravity Main COF Scores for Residential & Essential Services Impact 4-11
Figure B4-9: Gravity Main COF Scores for Environmental Compliance 4-12
Figure B4-10: Gravity Main Overall COF Financial Impact Scores 4-12
Figure B4-11: Gravity Main Overall COF Community Impact Scores 4-13
Figure B4-12: Gravity Main Overall COF Score 4-14
Figure B4-13: Gravity Main Risk Score Breakdown 4-15
Figure B4-14: Gravity Main Risk Score Prioritization Matrix 4-15
Figure B4-15: Gravity Main Risk Scores 4-16
Figure B4-16: Pump Station LOF Score for Potential for Overflow 4-18
Figure B4-17: Pump Station LOF Score for Condition 4-19
Figure B4-18: Pump Station LOF Score for Age 4-19
Figure B4-19: Pump Station Overall LOF Score 4-20
Figure B4-20: Pump Station COF Scores for Total Horsepower 4-22
Figure B4-21: Pump Station COF Scores for Average Dry Weather Flow 4-23
Figure B4-22: Pump Station COF Scores for Residential & Essential Services Impact 4-23
Figure B4-23: Pump Station COF Scores for Environmental Compliance 4-24
Figure B4-24: Pump Station Overall COF Financial Impact Scores 4-24
Figure B4-25: Pump Station Overall COF Community Impact Scores 4-25
Figure B4-26: Pump Station Overall COF Score 4-26
Figure B4-27: Pump Station Risk Score Breakdown 4-27
Figure B4-28: Pump Station Risk Score Prioritization Matrix 4-27
Figure B4-29: Pump Station Risk Scores 4-28
Figure B4-30: Force Main LOF for Years Since Pipe Installation 4-33
Figure B4-31: Force Main LOF for Pipe Material 4-34
Figure B4-32: Force Main LOF for Pipe Break Information 4-34
Figure B4-33: Force Main LOF for Force Main Peak Operating Pressures 4-35
Figure B4-34: Force Main LOF for Pipe Layout Profile 4-35
Figure B4-35: Force Main LOF for Pipe Maintenance 4-36
Figure B4-36: Force Main LOF for External & Internal Factors Affecting Asset 4-36
Figure B4-37: Force Main Overall LOF Score 4-37
Figure B4-38: Force Main COF Scores for Pipe Diameter 4-41
Figure B4-39: Force Main COF Scores for Proximity to Potable Water Wellfields 4-41
Figure B4-40: Force Main COF Scores for Residential & Essential Services Impact 4-42
Figure B4-41: Force Main COF Scores for System Reliability 4-42
Figure B4-42: Force Main COF Scores for Financial Impact on Utility 4-43
Figure B4-43: Force Main COF Scores for Community Impact 4-43
Figure B4-44: Force Main COF Scores for Environmental Compliance 4-44
Figure B4-45: Force Main Overall COF Score 4-45

Figure B4-46: Force Main Risk Score Breakdown..... 4-46
Figure B4-47: Force Main Risk Score Prioritization Matrix..... 4-46
Figure B4-48: Force Main Risk Scores..... 4-47

List of Appendices

Appendix BA: Level of Service Metrics
Appendix BB: Map of Gravity Main Overall Likelihood of Failure Scores
Appendix BC: Map of Gravity Main Overall Consequence of Failure Scores
Appendix BD: Map of Gravity Main Overall Risk Scores
Appendix BE: Map of Pump Station Overall Likelihood of Failure Scores
Appendix BF: Map of Pump Station Overall Consequence of Failure Scores
Appendix BG: Map of Pump Station Overall Risk Scores
Appendix BH: Map of Force Mains Overall Likelihood of Failure Scores Following Tier 1 Condition Assessment
Appendix BI: Map of Force Mains Overall Consequence of Failure Scores
Appendix BJ: Map of Force Mains Overall Risk Scores Following Tier 1 Condition Assessment
Appendix BK: City-owned Pressurized Mains Recommended Future Work

List of Acronyms

Acronym	Definition
ARV	Air Release Valve
AC	Asbestos Cement
AM-CMOM	Asset Management & Capacity, Management, Operation and Maintenance
ADWF	Average dry weather flow
CI	Cast Iron
CIP	Capital Improvement Program
City	City of Fort Lauderdale
CS	Collection System
CSAP	Continuous Sewer Assessment Program
CO	Consent Order
COF	Consequence of Failure
CIPP	Cured-in-Place Pipe
D&C	Distributions and Collections
DIP	Ductile Iron Pipe
EUM	Effective Utility Management
EPA	Environmental Protection Agency
EUL	Expected Useful Life
FDEP	Florida Department of Environmental Protection
FMCA	Force Main Condition Assessment
FM	Force Main
GIS	Geographical Information Systems
gpm	Gallons per Minute
GM	Gravity Main
HDPE	High-Density Polyethylene
HDD	Horizontal Directional Drilling
hp	Horsepower
I&C	Instrumentation and Controls
LOS	Levels of Service

Acronym	Definition
LOF	Likelihood of Failure
MH	Manhole
NASSCO	National Association of Sewer Service Companies
OEM	Original Equipment Manufacturers
PACP	Pipeline Assessment Certification Program
PE	Polyethylene
PVC	Polyvinyl Chloride
PSI	Pounds per Square Inch
PS	Pump Station
RCP	Reinforced Concrete Pipe
RUL	Remaining Useful Life
RFQ	Request for Qualifications
RS	Risk Score
SSES	Sanitary Sewer Evaluation Survey
VCP	Vitrified Clay Pipe

Section B1
Introduction

B1. Introduction

B1.1 Program Overview

The City of Fort Lauderdale (City) entered into Consent Order (CO) Number 16-1487 with the Florida Department of Environmental Protection (FDEP) Office of the General Council on September 29, 2017. The CO identifies corrective actions, with completion deadlines, to improve sanitary sewer service within the City. Paragraph 6(i) of the CO required the City develop and submit an Asset Management and Capacity, Management, Operation and Maintenance (AM-CMOM) Development Plan for the collection system to FDEP by August 28, 2018. The CO further specifies that the AM-CMOM **Program** is due to FDEP within 18 months of receipt of FDEP comments on the AM-CMOM Development Plan.

The program described herein addresses the AM component of the City's AM-CMOM Program. For the purposes of this AM-CMOM program, the CMOM program focuses on operations-related spending and activities that involve day-to-day operations and maintenance of the collection system to prevent sewer spills, whereas the Collection System AM Program (CSAMP) focuses on overall risk of asset failure and ways to minimize the cost of balancing risk with desired level of service (LOS). The primary focus of the AM program is the allocation of capital expenditures to maintain the desired LOS, and as such it is primarily capital focused. It is important to note that, in terms of actual implementation, the two programs are closely related.

The CO specifically references the United States Environmental Protection Agency (EPA) publication EPA 816-F-08-014, *Asset Management: A Best Practices Guide* as a required guidance document for the City's CSAMP, and notes the availability of other EPA references online. For purposes of implementation by a wastewater utility, asset management can be defined as an integrated set of processes to minimize the life-cycle costs of infrastructure assets, at an acceptable level of risk, while continuously delivering established levels of service. As noted, the primary focus is intended to involve the *long-term life cycle* of the asset and its sustained performance, rather than short-term, day-to-day aspects of the asset.

While EPA guidance allows for flexibility on the part of each utility in determining what approaches and practices will be most beneficial in providing the best service to its customers, it does provide an asset management framework based on five core questions (and associated sub-questions) as summarized in **Table B1-1** below. The five core framework questions provide the foundation for asset management best practices, examples of which are listed in association with each core question.

Table B1-1. The Five Core Questions of Asset Management Framework

Core Questions	Best Practices
1. What is the current state of my assets? • What do I own? • Where is it? • What is its condition? • What is its remaining useful life? • What is its remaining economic value?	• Prepare an asset inventory and system map. • Develop a condition assessment and rating system. • Assess remaining useful life by consulting projected-useful-life tables or decay curves. • Determine asset values and replacement costs.
2. What is my required level of service? • What level of service do my stakeholders and customers demand? • What do the regulators require? • What is my actual performance? • What are the physical capabilities of my assets?	• Analyze current and anticipated customer demand and satisfaction with the system. • Understand current and anticipated regulatory requirements. • Write and communicate to the public a level of service "agreement" that describes your system's performance targets. • Use level of service standards to track system performance over time.
3. Which assets are critical to sustained performance? • How can assets fail? • How do assets fail? • What are the likelihoods (probabilities) and consequences of asset failure? • What does it cost to repair the asset? • What are the other costs (social, environmental, etc.) that are associated with asset failure?	• List assets according to how critical they are to system operations. • Conduct a failure analysis (root cause analysis, failure mode analysis). • Determine the probability of failure and list assets by failure type. • Analyze failure risk and consequences. • Use asset decay curves. • Review and update your system's vulnerability assessment.
4. What are my minimum life cycle costs? • What alternative strategies exist for managing O&M, personnel, and capital budget accounts? • What strategies are the most feasible for my organization? • What are the costs of rehabilitation, repair, and replacement for critical assets?	• Move from reactive maintenance to predictive maintenance. • Know the costs and benefits of rehabilitation versus replacement. • Look at lifecycle costs, especially for critical assets. • Deploy resources based on asset conditions. • Analyze the causes of asset failure to develop specific response plans.
5. What is my best long-term funding strategy? • Do we have enough funding to maintain our assets for our required level of service? • Is our rate structure sustainable for our system's long-term needs?	• Revising the rate structure. • Funding a dedicated reserve from current revenues (i.e., creating an asset annuity). • Financing asset rehabilitation, repair, and replacement through borrowing or other financial assistance.

The City's CSAMP is intended to address the five core questions in the AM framework and lead to well-developed and advanced practices that focus on the long-term life cycle of wastewater collection system assets and sustained performance over time.

B1.2 CSAMP Goals and Organization

The City's CSAMP is designed to achieve the goals of CO compliance and optimization of expenditure of capital dollars to maintain the target LOS. While the timing of the program is aligned with the CO schedule, the overriding long-term goal is to optimize decisions concerning investments in maintenance, repair, and renewal to provide the lowest life cycle costs while meeting appropriate levels of service.

The City's goals will involve modifications to processes affecting both operational and capital expenditures that are designed to result in a more proactive, less reactive mode of operations. Central to this transition will be a focus on risk-based prioritization of investments and an emphasis on information regarding asset condition to guide the timing of projects. As program implementation advances and better information is gathered concerning asset condition, initial assumptions concerning probability of failure will be refined with condition-based assessments.

In broad outlines, the program will involve the following phases:

- Asset inventory and condition assessment
- Risk assessment
- Asset valuation
- Capital Improvement Program development and prioritization

Details concerning each phase are presented in the remainder of this report.

The City's intention concerning program organization is to begin with one individual whose primary responsibility is CSAMP implementation. As the appointed individual coordinates program implementation throughout the City's organization, additional resource needs will be identified. The City also intends to coordinate the CSAMP with other asset management initiatives addressing wastewater treatment assets as well as water and stormwater assets.

B1.3 Levels of Service and Performance Measures

LOS are the parameters that reflect social, political, economic and environmental outcomes that an organization delivers to its customers and key stakeholders. These parameters typically relate to service attributes such as quality, reliability, responsiveness, sustainability, timeliness, accessibility and cost.

A LOS statement is preliminarily identified below. The intent is to provide an overview of the City's mission for asset management and set a foundation for specific LOS.

> ***The City of Fort Lauderdale endeavors to provide reliable sanitary sewer service that benefits existing users and future development while protecting the natural environment. Sustainable, cost-effective operations will be achieved through infiltration and inflow reduction, proactive management of aging utility assets, and maintenance of a quality workforce.***

Specific collection system LOS targets include the following:

- Provide uninterrupted sanitary sewer service without back-ups or overflows.
- Limit excessive infiltration and inflow (I/I).
- Provide suitable maintenance and replacement of aging components to meet present and future demands.
- Maintain work area safety and minimize adverse impacts to the public from sewer system operations.
- Develop and manage business processes to update asset condition on an ongoing basis.
- Determine appropriate staffing and provide training needed to perform condition assessments.
- Develop a business process team to perform continuous monitoring, introduce innovative improvements, and provide support to the assessment teams.
- Maintain financial strategies that meet long-term needs at the minimum life cycle cost.

Operational Performance Measures are measures that track activities being implemented to meet target LOS. Both are related and are metrics. Defining appropriate LOS and associated Operational Performance Measures is an important component of any asset management and/or capital improvement program. Metrics are intended to have the following attributes:

- Provide a communication mechanism with key stakeholders to report performance results, focus organizational efforts, and prioritize investments.
- Be aligned with the utility's strategic asset management goals, linking strategic goals to operational objectives.
- Help establish accountability by allowing measurement of progress in achieving asset management program performance goals.
- Be clearly defined, measurable and controllable, and comprised of high-quality data.
- Be continually updated as assets are acquired or decommissioned and conditions change.
- Reflect conditions and priorities unique to Fort Lauderdale.

The City conducted a series of workshops to develop a list of metrics for possible tracking and evaluation. The initial focus of this effort has been the wastewater collection and transmission system, although separate efforts are under consideration for wastewater treatment as well as water system assets. Metrics have been assessed with respect to the Cityworks implementation broadly. **Table B1-2** summarizes the process followed in development and definition of each metric.

Table B1-2. Metric Development and Definition

Metric Definition	Clearly written explanation of what the City wants to measure.
How Calculated	Formula or equation and the units that will be used.
Data Source(s)	Where the information comes from (Cityworks, QAlert, Financial Information System).
Frequency of Measurement	How often the metric will be measured (monthly, quarterly, annually).
Priority (1/2/3)	Importance of tracking metric and meeting the assigned Target Value.
Responsible Person	Principal data keeper who can also comment on performance.
Target Value	Number or percentage that the City wants to reach.
Benchmark Available (Yes/No)	Indicates if other utility data are available for comparison to Target Value.
Metric Source	Source in industry literature, if applicable.

Appendix BA contains a spreadsheet summarizing the list of metrics developed. Developing LOS and performance metrics and goals is a key part of the Ten Attributes of Effective Utility Management (EUM) developed by the EUM Utility Leadership Group. The City is following the EUM model extensively, and accordingly the LOS categories are mapped to applicable EUM attributes. It was acknowledged that efforts to populate the "Target Value" column should be postponed until a later time, most likely following data collection and establishment of a baseline when realistic target values could be assessed. Similarly, the "Responsible Person" column is still under development pending consensus on the optimal approach for implementation. The City anticipates refinement or modification of metrics based on feedback and experience during implementation.

Section B2

Condition Assessment

B2. Condition Assessment

The first core question of asset management relates to condition of an asset. The International Infrastructure Management Manual defines condition assessment or condition monitoring as: "The inspection, assessment, measurement and interpretation of the resultant data, to indicate the condition of a specific component as to determine the need for some preventive or remedial action."

According to the EPA, condition assessment is defined as a method used for collecting data and information for different components of a sewer system such as gravity mains, pumps stations, and force mains. Condition assessment is used for direct and indirect inspection, observation, and monitoring of the components. By applying the data gathered from condition assessment, operational and performance status of infrastructure can be evaluated (EPA, 2007). Condition assessment provides insight into the remaining useful physical life of the asset and is used to identify assets that may need maintenance and prioritize repairs. Condition information is an important component of an asset's likelihood of failure (LOF) or potential to fail. As the condition of an asset deteriorates, the LOF increases.

Information collected during a condition assessment varies for each asset class, but can generally be summarized by the following:

- Structural information
- Performance information
- Indications of atypical operation (i.e. unusual noise, vibration, temperature, or leakage)
- Indications of deterioration
- Age information

The City is committed to evaluating the condition and performance of the sewer system components on an ongoing basis. Condition assessment activities for specific asset classifications are further explained in the subsequent subsections.

B2.1 Gravity Collection System

Gravity mains are currently evaluated through the Sanitary Sewer Evaluation Survey (SSES) program. Gravity mains may be inspected by the City's Distribution and Collections (D&C) Section or the work may be contracted out. The City has committed to taking a proactive approach to address gravity system failures by completing regular condition assessment activities, as outlined in the CMOM program plan Sections A3 and A5, and summarized below:

- **Closed-Circuit Television Inspection**. The City will continue its program of CCTV inspection to evaluate the internal condition of collection system piping. After the interior of the line is cleaned to remove grease and debris that might mask defects, a camera is self-propelled or pulled with cables through the pipeline and a video recording is made of

the entire line segment in accordance with National Association of Sewer Service Companies' Pipeline Assessment Certification Program (NASSCO PACP) standards. The City then initiates a careful review of the video to identify defects such as cracks, separated joints, leaking service connections, and other defects that may contribute to I/I and risk of pipe failure. Following the review, decisions are made concerning rehabilitation and replacement needs, methods, and priorities. Where the video indicates that laterals are a possible source of infiltration, such "suspect" laterals are prioritized for follow-up inspection using a camera system especially designed for that purpose.

- **Manhole Condition Assessment.** Similarly, the City will continue its program of visually inspecting manholes. The City conducts aboveground surveys to record potential or obvious inflow sources. As a part of this aboveground survey, manhole inspections are performed to identify I/I sources, and repairs associated with these structures. Manhole inspections are completed using a standard inspection form with which inspectors electronically record the physical, structural, and hydraulic aspects of the manholes.
- **Smoke Testing.** Smoke testing is conducted to detect inflow sources such as roof drains, area drains, leaking service connections, and illegal connections. Smoke testing is preferably performed during dry weather and low-groundwater and low-wind conditions. Public notification, and coordination with fire and police departments, are performed in advance of the work. An air blower is used to force smoke into the pipes, and observers document smoke coming out of the ground, catch basins, and other sources as the test progresses. While television inspection focuses on the sewer mains, smoke testing is predominantly useful with respect to sewer laterals, which are generally shallower and located above the water table. The City then reviews the smoke test results, identifies repair tasks to be performed by the City or its contractors, and identifies corrective actions for which property owners will be notified and held responsible to complete.

CCTV inspection of gravity mains and laterals, smoke testing, manhole inspections, mainline lining, lateral lining, abandonment of inactive laterals via sectional liner installation, and rehabilitation of manholes has been ongoing in the six basins that were identified in Paragraph 6(d) of the CO. The City has also begun additional preventative SSES work in non-consent order basins. The CMOM program plan, Section A3, describes the progress of the City's SSES program to date.

B2.2 Pump Stations

Pump stations are inspected and maintained by the City on a routine basis. The most critical pump stations are visited as often as necessary and as frequently as daily. Less critical pump stations are visited at least twice weekly. Critical pump stations are defined in various ways and include the following:

- The five largest stations.
- All stations having a re-pump function.
- Stations having a recent maintenance history or power failure.

- Stations with small wet wells or limited holding time.
- Stations with a history of graffiti problems.

Maintenance checklists are filled out during each visit and include assessment and reporting on each of the following:

- Blower
- Lights
- Clock
- Wastewater level
- Electric controls
- Motors
- Pumps
- Compressors
- Water seal unit
- Check and isolation valves
- Bubbler system
- Sump pump
- Paint condition
- Housekeeping
- Landscaping
- Graffiti

The City has developed multiple Standard Operating Procedures (SOPs) related to pump station preventive maintenance as well as emergency response. These address routine electrical and mechanical maintenance, wet well cleaning, and testing of emergency generators where applicable. Frequencies of specific maintenance tasks are also specified, ranging from continuously performed daily/weekly inspections to more in-depth monthly, quarterly, and annual assessments involving tasks such as amperage testing, infrared readings, and panel maintenance. Pump station condition assessment activities are discussed in more detail in the CMOM program plan, Section A5. Collectively, the City's pump station preventive maintenance SOPs enable the identification of mechanical, structural, and electrical/instrumentation priorities and inform the continuous updating of LOF ratings.

B2.3 Force Mains

Force mains are evaluated and maintained by the City's D&C Section. Force main inspection is intended to proactively identify problems within the transmission system, with the primary goal of pre-empting structural failures. A condition assessment of the City's force mains is being completed as part of the Force Main Condition Assessment requirements of Paragraph 6(h) of the CO, which is discussed in more detail in the CMOM program plan, Section A5.2.

Direct contributors to pipe failure in force main systems include internal corrosion due to hydrogen sulfide, and external corrosion due to aggressive soil environments or galvanic effects from dissimilar pipe materials. Hydrogen sulfide damage to force mains most commonly occurs at locations where air pockets develop (unprotected high points) and at areas of connection between force mains and gravity systems such as manholes. Another contributor to corrosion-related failures in force mains is improper re-coating by contractors after field-cutting pipe.

An evaluation of the layout and design of existing transmission systems can be used to help identify areas that may be vulnerable to corrosion problems. While any type of pipeline is subject to degradation over time, metallic sewer force mains in particular may exhibit internal corrosion due to the presence of hydrogen sulfide in air pockets within the pipeline. High points in the pipeline are typically most vulnerable to such accumulations of air, particularly when air release valves (ARVs) are not present or may not be maintained and functioning properly.

The City has committed to taking a proactive approach to address force main failures by completing regular condition assessment activities, as outlined in the CMOM program plan, Section A5.2, and summarized below:

- **Desktop assessment.** Collect and compile existing drawings, rupture and repair information, air release valve details and manufacturer information, and other appropriate record information related to the force main. Review the information and identify key areas of concern such as potential high points and taps in the pipeline.
- **Field inspection.** Conduct a field inspection of the pipeline. Walk the pipeline route to confirm the location and condition of existing air release valves, isolation valves, and other important aboveground features. Obtain GPS locations for these items and record these locations for future reference.
- **Customer analysis.** Industrial and large commercial customers may have discharges that increase the risk of corrosion due to pH or other factors. Identify the locations of such operations and develop a program to assess whether such discharges may present cause for concern or warrant additional corrosion-prevention measures.
- **Air release valve maintenance.** To minimize internal corrosion at force main high points, an air release valve preventative maintenance program has been implemented to ensure that valves are operational. Automatic and manual ARVs are exercised and maintained or replaced as warranted.

B2.4 Reporting and Control Systems

In April of 2017, the City advertised a Request for Qualifications (RFQ) for a service provider to assist in the purchase and implementation of a GIS-centric Enterprise Asset Management System (AMS) for long-range planning, life-cycle costing, proactive operations and maintenance, and capital replacement planning activities. The intent was to replace the City's existing Cayenta Work Order Management software with a system that could interface with multiple other

existing business applications to provide comprehensive, end-to-end asset management capabilities.

As a result of the RFQ, the City selected Woolpert to implement Cityworks AMS. The selection of Cityworks was based on a functional ability to fulfill the following City priorities:

- Maximize the City's Esri ArcGIS investments to provide a seamless map-based asset management solution and eliminate the need to maintain and synchronize two asset systems of record (CMMS and GIS). Provide residence for the asset inventory in ArcGIS geodatabases.
- Support existing City-defined service requests, work orders, and inspections as originally configured in Cayenta.
- Provide full life-cycle management of work order and asset management information requirements.
- Facilitate integrations between the new Cityworks AMS solution and existing City business applications including QAlert, the public service request system, and Infor EPA for financials.
- Store all service request, work order and inspection data for gravity sewers, pump stations, and force mains. Provide integration with gravity sewer CCTV software.
- Track operation and maintenance costs including labor, equipment, and materials.
- Track asset condition and risk scores.
- Track system performance to inform budgeting as well as repair/renewal/replacement needs and priorities.
- Allow future integration with the Assetic suite of decision support tools, to further extend the Cityworks AMS solution and provide the ability to predict and analyze asset risk, develop long-term infrastructure investment plans, and inform asset management decision processes.

The Cityworks implementation was initiated in December of 2018 and has been ongoing throughout 2019. At this time, the City of Fort Lauderdale expects Cityworks to "go live" during the third quarter of 2020.

Section B3
Asset Valuation

B3. Asset Valuation

This asset valuation serves to estimate the total replacement cost of capital assets in the City's sanitary sewer collection system including gravity sewers, manholes, pump stations, force mains, and valves. The effort was conducted from July 2019 through December 2019 with the objective of determining the overall total replacement cost of active City-owned assets that were included in the most current version of the City's Geographical Information Service (GIS) database.

The results of the asset valuation along with the results of the Risk Assessment (discussed in Section B4) are used to estimate the City's funding needs (discussed in Section B5).

To estimate asset replacement cost value, a combination of industry standards, research reports, Original Equipment Manufacturer (OEM) guidelines, and bid information from ongoing and completed construction projects were utilized in this assessment. The costs produced from the asset valuation are Class V costs and are intended to be used for high-level planning.

A factor of 60% was added to the construction costs to represent contingency, engineering, City labor, construction management and inspection costs, and other non-construction costs. Thus, the total replacement cost was assumed to be 160% of the initially estimated cost of construction.

Only active and City-owned assets are considered in the replacement cost. Assets in the GIS that did not have information on activity and/or ownership were assumed to be active and City-owned, which may lead to a conservative estimate of the system's replacement value.

Prior to completing the asset valuation, an inventory of all of the City's collection and transmission systems assets was compiled using the City's GIS database. The inventory is summarized in the following subsections.

B3.1 Linear Collection System

The City's linear collection system assets are inventoried within the City's GIS geodatabase and comprise of the following asset classes:

- Gravity Mains (GM)
- Force Mains (FM)
- Manholes (MH)
- Air Release Valves (ARV)
- System Valves

B3.1.1 Gravity Sewer

The "CFL_AGWU_Sewer_Submittal_Final" feature dataset, "ssGravityMain" feature class within the City's GIS database was used to develop the inventory of gravity sewers. All City-

owned sewers (i.e. not Private or County owned) were included in the inventory, unless identified as abandoned or inactive.

Gravity sewer replacement costs were calculated by multiplying the length (Shape_Length field) of each sewer segment by estimated unit costs for each diameter. These costs assume open cut replacement of pipes and do not include trenchless rehabilitation or installation. A diameter of 8-inches was assumed for all sewers of unknown diameter. Due to uncertainty with the installations and the likelihood that they may actually be private sewers, 1,840 LF of gravity sewers labeled with a diameter of less than 6-inches were not assigned any value.

Table B3-1 summarizes the gravity main asset inventory and associated replacement unit costs by diameter.

Table B3-1: Gravity Main Asset Inventory Summary and Replacement Cost

Pipe Diameter (inches)	Length (LF)	Length (miles)	Unit Cost ($/LF)	Unit Cost * Length (millions $)
< 6	1,840	0.3	-	-
6	9,327	1.8	$100	$0.93
8	1,716,080	325	$130	$223
10	652,176	124	$150	$97.8
12	94,772	17.9	$160	$15.2
15	31,223	5.9	$180	$5.62
16	2,226	0.4	$190	$0.42
18	18,330	3.5	$200	$3.67
24	3,966	0.8	$240	$0.95
Unknown and 0 (assume 8)	16,025	3.0	$130	$2.08
TOTAL	**2,544,123**	**482**	**-**	**$350**

B3.1.2Manholes

The "CFL_AGWU_Sewer_Submittal_Final" feature dataset, "ssManhole" feature class within the City's GIS geodatabase was used to develop the inventory of manholes. All City-owned manholes (i.e. not Private or County owned) were included in the inventory, unless identified as abandoned or inactive.

Manhole replacement costs were estimated based on manhole depth. Manhole depth was calculated by subtracting the deepest invert elevation from the rim elevation. If invert elevation or rim elevation was unknown, the manhole was assumed to be between 4 and 6 feet deep. The unit costs that were used for manholes in each depth class are based on review of recent City of Fort Lauderdale bid information supplemented with bid tabs from other local projects.

Table B3-2 summarizes the manhole asset inventory and associated replacement unit costs by depth of manhole.

Table B3-2: Manhole Asset Inventory Summary and Replacement Cost

Depth of Manhole (feet)	Number of Manholes	Unit Cost ($ per manhole)	Unit Cost * Number of Manholes (millions $)
0 to 4	388	$10,100	$3.92
4 to 6	2301	$11,900	$27.4
6 to 8	1317	$19,600	$25.8
8 to 10	703	$24,800	$17.4
10 to 12	392	$30,800	$12.1
12 to 16	335	$42,200	$14.1
16 to 20	39	$50,900	$1,99
20 to 24	3	$62,000	$0.19
Unknown (assume 4 to 6)	4613	$11,900	$54.9
TOTAL	**10,091**	**-**	**$158**

B3.1.3Force Mains

The "CFL_AGWU_Sewer" feature dataset, "PressurizedMain" feature class within the City's GIS geodatabase was used to develop the inventory of force mains. All City-owned force mains (i.e. not Private or County owned) were included in the inventory, unless identified as abandoned or inactive.

Force main replacement costs were calculated by multiplying the length (Shape_Length field) of each force main segment by estimated unit costs for each force main diameter. For the purposes of the unit price cost estimation, it was assumed that the open cut method of pipe installation would be used for force mains under 24-inches and diameter and that horizontal directional drilling (HDD) would be used for force mains greater than 24-inches in diameter. HDD is a trenchless method of pipe installation which causes less disruption to the community. The City has recently indicated preference for HDD and has completed various construction projects using HDD. A diameter of 12-inches was assumed for all force mains of unknown diameter, based on the majority of the system of known diameter.

Replacement costs for air release valves and system valves are accounted for in the cost of the force main unit cost, as it is assumed that a valve will be replaced at the same time as a force main segment.

Table B3-3 summarizes the force main asset inventory and associated replacement unit costs by diameter.

Table B3-3: Force Main Asset Inventory Summary and Replacement Cost

Pipe Diameter (inches)	Length (LF)	Length (miles)	Unit Cost ($/LF)	Unit Cost * Length (millions $)
2	889	0.2	$76	$0.07
3	5,984	1.1	$86	$0.52
4	50,431	9.6	$97	$4.88
6	56,948	10.8	$118	$6.72
8	49,353	9.3	$128	$6.32
10	26,943	5.1	$160	$4.32
12	92,668	17.6	$182	$16.8
14	16,628	3.1	$203	$3.37
16	54,622	10.3	$224	$12.2
18	37,685	7.1	$256	$9.65
20	29,807	5.6	$266	$7.93
24	59,207	11.2	$1,152	$68.2
30	35,713	6.8	$1,440	$51.4
36	16,026	3.0	$1,728	$27.7
42	23,935	4.5	$2,016	$48.3
48	15,188	2.9	$2,304	$35.0
54	10,545	2.0	$2,592	$27.3
Unknown and 0 (assume 12)	129	0.1	-	$0.02
TOTAL	**582,701**	**110.3**	**-**	**$331**

B3.2 Pump Stations

The pump station assets are maintained and inventoried in the City's GIS geodatabase. The "CFL_AGWU_Sewer_Submittal_Final" feature dataset, "ssPumpStation" feature class within the City's GIS database was used to develop the inventory of pump stations. All City-owned pump stations (i.e. not Private or County owned) were included in the inventory, unless identified as abandoned or inactive.

Pump station costs were estimated based on the total installed horsepower (hp) of the station. **Table B3-4** summarizes the pump station asset inventory. For any station where installed hp was unknown, an Installed hp of 25 hp was assumed.

Table B3-4: Pump Station Asset Inventory

Installed HP of Pump Station (hp)	Number of Stations
Unknown (assume 25hp)	2
0 to 25	73
25 to 50	42
50 to 100	25
100 to 200	28
Over 200	7
TOTAL	**177**

Pump station cost estimates were based on recent bid data for comparable pump station rehabilitation projects. Although it is important to distinguish between rehabilitation and replacement costs, the projects selected for the analysis involved considerable structural, mechanical, and electrical improvements (including the replacement of pumps, electrical equipment and instrumentation, piping, and other significant upgrades) and accordingly were used as a basis for development of replacement cost.

An R^2 value of 0.9 was obtained when plotting the total installed hp of the station against the cost per installed hp ($/hp) for the eight projects. The plot is provided in **Figure B3-1**. The equation of best fit obtained from the plot was then used to assign rehabilitation costs for the active City-owned pump stations.

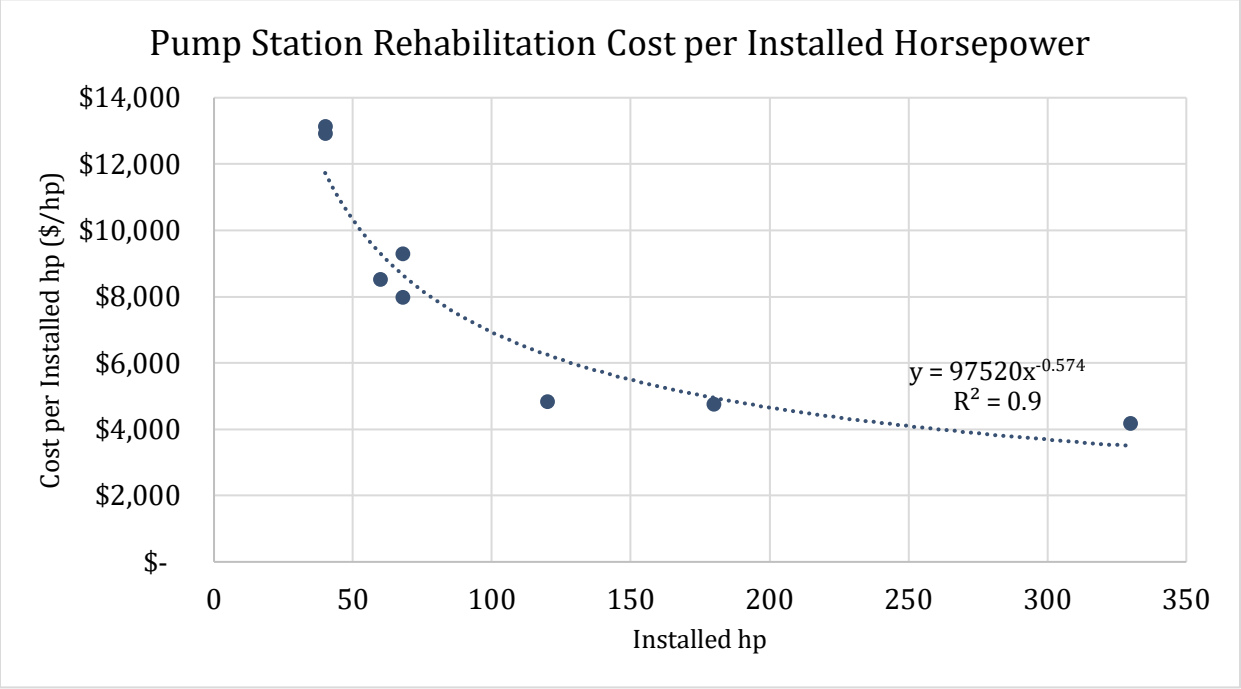


Figure B3-1: Pump Station Rehabilitation Cost per Installed Horsepower

B3.3 Assets not Included in the Valuation

The following assets were not included in the asset valuation:

- Treatment plant processes and facilities
- Administrative and maintenance facilities
- Land and easements
- Laboratory equipment
- Spare parts
- Inactive and abandoned assets

B3.4 Collection System Asset Valuation Summary

The results of the asset valuation on the active City-owned collection system is shown in the **Table B3-5** and **Figure B3-2**.

Table B3-5: Total Replacement Value of Active City-Owned Collection System Assets

Component	Replacement Value (millions $)
Gravity Mains	350
Force Mains	331
Manholes	158
Pump Stations	134
TOTAL	975

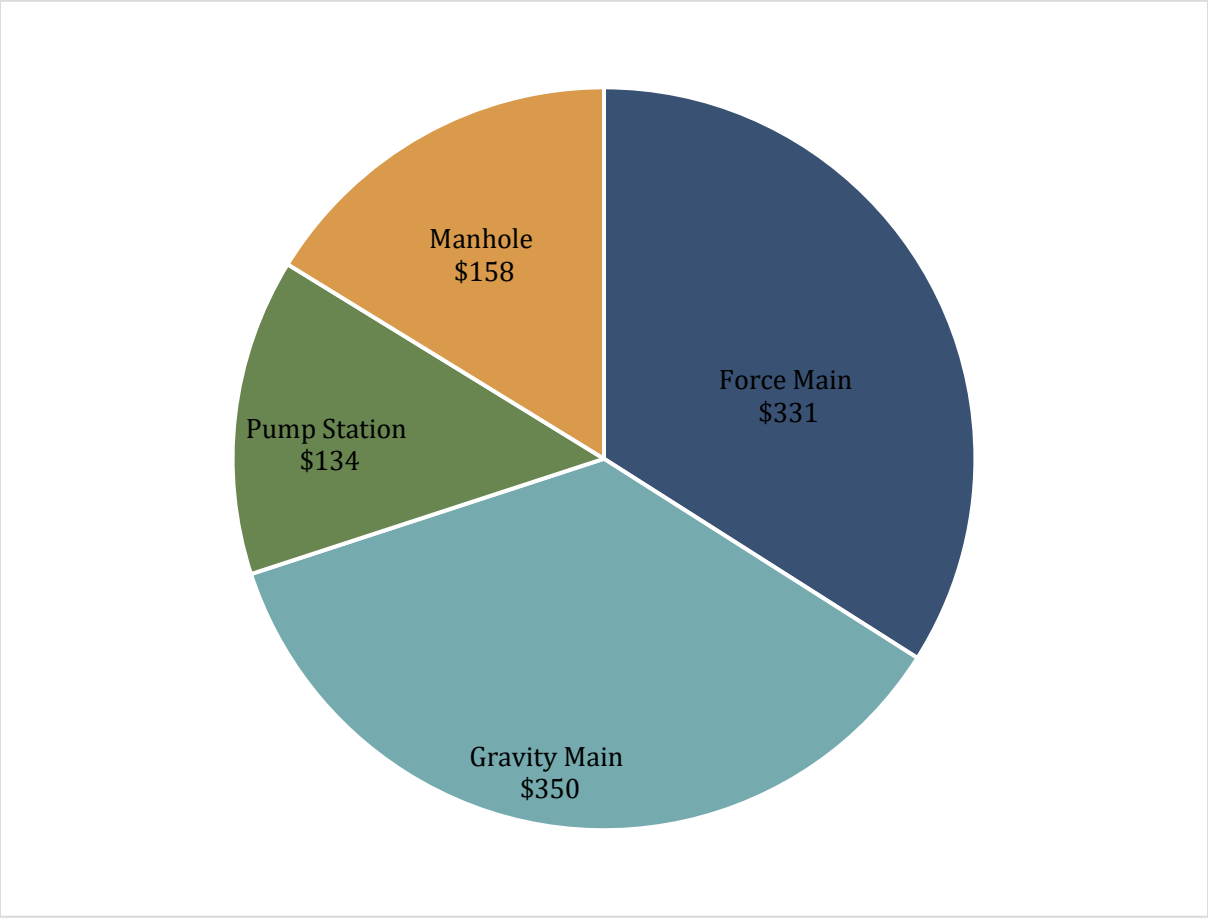


Figure B3-2: Total Replacement Value of Active City-Owned Collection System Assets

Section B4
Risk Assessment

B4. Risk Assessment

Risk is a combination of the consequence of failure (COF) and likelihood of failure (LOF) of a particular asset. The LOF provides a relative indication of the probability that an asset will fail (e.g., a pipe will undergo a collapse, a pump station will become inoperable, or some other change in an asset will occur that results in a detrimental impact on the sewer system performance, the public right-of-way, or public health). The COF provides a relative indication of the level of impact (e.g., cost impacts, social impacts, etc.) if the asset fails.

An asset-by-asset risk assessment was completed for active City-owned gravity mains and pump stations as part of the CSAMP report. A COF and LOF were established for each asset by assigning weighted scores based on various criteria. The COF and LOF were combined into an overall Risk score. These procedures and the results of the gravity main and pump station risk assessments are described below in Section 4.1 and Section 4.2, respectively.

Paragraph 6(h) of the CO requires that the City submit a Force Main Condition Assessment (FMCA) Plan to FDEP. The FMCA Plan was completed under Task Order 4. It established that the FMCA project would be completed in three phases:

- FMCA Phase 1 – Development of Risk Matrix and Implementation Plan
- FMCA Phase 2 – Implementation of the Force Main Condition Assessment
- FMCA Phase 3 – Force Main Condition Assessment Report

Phase 1 of the FMCA was submitted to the City as a part of Task Order 12 on August 16, 2019. Under Phase 1, a Risk Assessment was completed where a COF, LOF, and Risk Score was assigned to each force main segment. The FMCA Risk Assessment is summarized in Section 4.3 and is used in the prioritization analysis presented in Section 5.0 of this report.

B4.1 Gravity Mains

B4.1.1 Likelihood of Failure Score

For the purpose of this risk assessment, the LOF is the possibility of structural or blockage-related failure of a pipe. Other modes of failure, such as capacity and operational performance, are assessed separately but can be combined to inform overall infrastructure priorities.

The LOF can be estimated based on a variety of information if available. The ideal way to estimate the LOF is to utilize CCTV inspection data, however, not all pipes have CCTV data available. Therefore, an indirect method is needed to develop an initial LOF score, which can be refined in the future with field inspection data. CCTV data may be incorporated into the LOF score by using the NASSCO PACP Structural and O&M Quick Scores, which includes the worst structural and O&M defect in the first digit.

For the pipes with no CCTV inspection data available, the data was analyzed through identification of patterns and correlations to the criteria listed below:

- Years since pipe installation and pipe material
- External and internal factors affecting the asset
- Pipe maintenance history

The LOF criteria used for the Risk Assessment are described below:

- Years since pipe installation and pipe material: All pipe segments in any gravity main network age and deteriorate over time. The rate of deterioration depends on the age and the material of the pipe. Plastic gravity pipes, such as polyvinyl chloride (PVC) are not as susceptible to corrosion or abrasion as the ferrous and concrete pipes. Pipes that have recently been rehabilitation by cured-in-place pipe (CIPP) lining, are also less likely to fail. Most ferrous pipes, such as ductile-iron pipe (DIP) and cast-iron (CI) pipe are susceptible to corrosion. Reinforced concrete pipe (RCP) are susceptible to abrasion. Vitrified clay pipe (VCP) is susceptible to cracking, especially as the pipe ages. In general, any pipe over 100 years of age regardless of material is considered more likely to fail.
- External and internal factors affecting the asset including proximity to saltwater intrusion line and proximity to downstream force main discharge: Corrosion from both external and internal factors directly impacts pipe failure. The proximity to the coast and the saltwater intrusion line directly impacts the potential for external corrosion if the pipe is below groundwater. Gravity main piping that is downstream of a force main discharge is also more susceptible to corrosion and was given a higher LOF if the material is subject to corrosion.
- Pipe maintenance: Pipe maintenance is an important factor that impacts the likelihood of pipe failure. If a pipe is maintained well with a regular cleaning schedule, there are fewer maintenance related failures. Sufficient maintenance records are not available for a significant portion of the system. Therefore, all pipes were given the same score on a

preliminary basis, with the expectation that this will be refined as more data become available.

The weighting factor for each LOF criteria is presented in **Table B4-1**.

Table B4-1: Gravity Main Likelihood of Failure Category Weighting Factor

Likelihood of Failure Category	Weight
Years since pipe installation and pipe material	61
External and internal factors affecting the asset including proximity to saltwater intrusion line and proximity to downstream force main discharge	26
Pipe maintenance	13

Based on information from the City's GIS, as-built records, and institutional knowledge held by key personnel, the LOF scores were assigned to each pipe segment using the scoring criteria presented in **Table B4-2**.

Table B4-2: Gravity Main Likelihood of Failure Scoring Criteria

Likelihood Category	Negligible = 1	Unlikely = 2	Possible = 4	Likely = 7	Very Likely = 10
Years since Pipe Installation and Pipe Material	• < 30-year- old PVC **OR** • CIPP lined	• < 30-year-old VCP, RCP, CI, DIP, or Unknown Material	• 30- to 50-year old VCP, RCP, or PVC **OR** • Any pipe with unknown installation date	• 50- to 100-year-old VCP, PVC, or RCP **OR** • 30- to 75- year DIP, CI, or Unknown Material	• >100-year-old VCP, PVC, or RCP **OR** • >75-year-old DIP, CI, or Unknown Material
External and Internal Physical Factors Affecting the Asset	• Pipe is resistant to corrosion **OR** • Pipe is above the water table and outside of the saltwater intrusion line	• Pipe is subject to corrosion **AND** • Pipe is below the water table and outside of the saltwater intrusion line **OR** • Pipe is greater than 1,000 feet from a downstream FM discharge	• Pipe is subject to corrosion **AND** • Pipe is above water table and within the saltwater intrusion line **OR** • Pipe is between 500 and 1,000 feet from a downstream FM discharge	• Pipe is subject to corrosion **AND** • Pipe is below water table and within the saltwater intrusion line **OR** • Pipe is between 250 and 500 feet from a downstream FM discharge	• Pipe is subject to corrosion **AND** • Pipe is below water table and within the saltwater intrusion line **OR** • Pipe is within 250 feet from a downstream force main discharge
Pipe Maintenance	• Operators report no maintenance needs in sewer basin	• Operators report rare maintenance needs in sewer basin	• Operators report average maintenance needs in sewer basin	• Operators report higher than average maintenance needs in sewer basin	• Operators report frequent maintenance in sewer basin

Figure B4-1 through **Figure B4-3** present the LOF scores for each of the scoring criteria listed in Table B4-2. These figures also show the miles of gravity main in the system that account for each of the LOF scores.

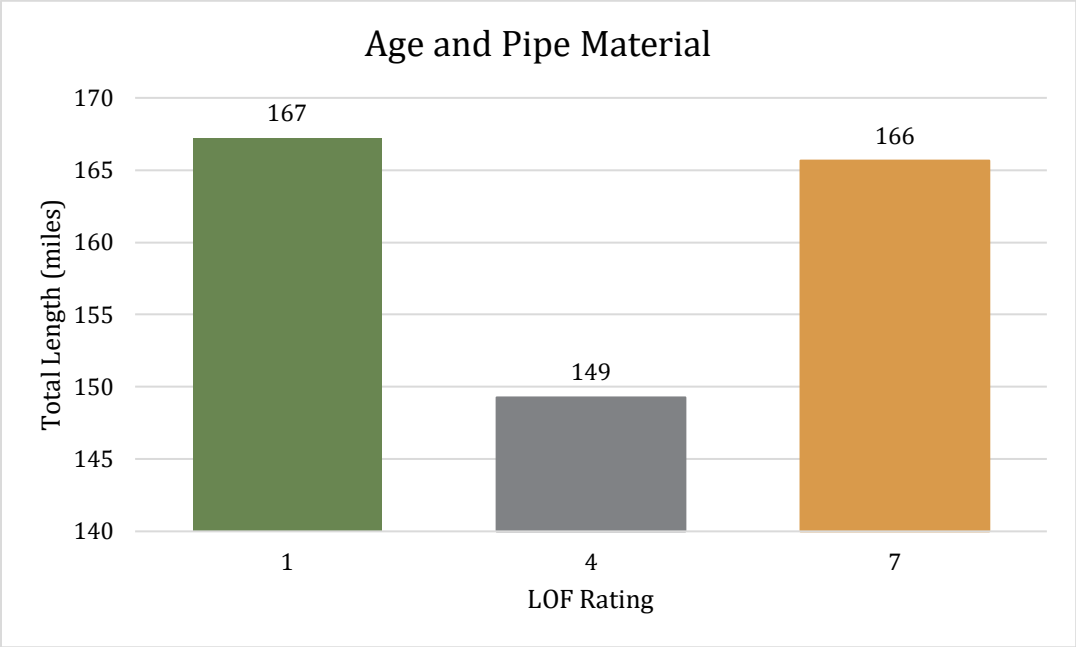


Figure B4-1: Gravity Main LOF Score for Years since Pipe Installation & Pipe Material

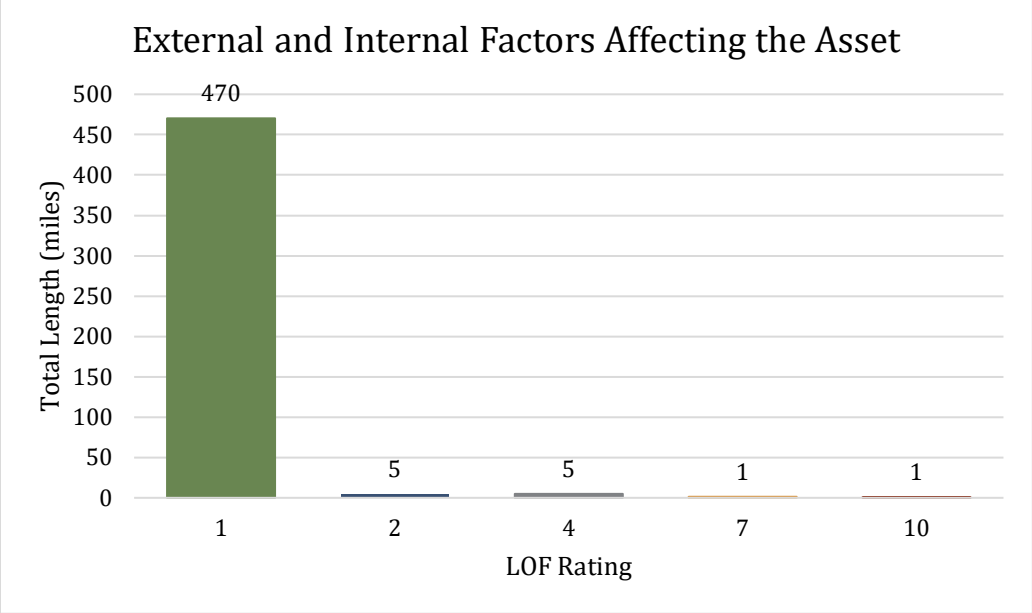


Figure B4-2: Gravity Main LOF Score for External & Internal Physical Factors

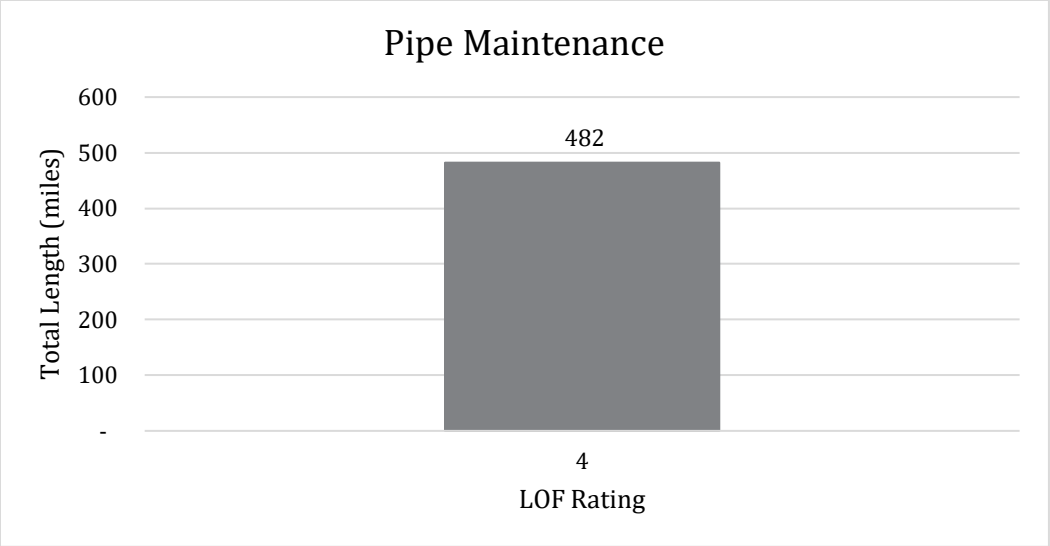


Figure B4-3: Gravity Main LOF Score for Pipe Maintenance

Utilizing the LOF scores listed above and the weighting factors from Table B4-1, an overall LOF score was calculated for all gravity mains in the network. **Figure B4-4** shows the scores and the miles of gravity main in the system that account for each range of the LOF scores.

The ranges of LOF scores were chosen as 1.39 to 3.22 to indicate a low LOF (minimum value to 40th percentile), greater than 3.22 to 5.05 indicates a moderate LOF (40th percentile to 90th percentile), and greater than 5.05 to 7.39 is considered a high LOF (90th percentile to maximum LOF). **Appendix BB** shows a map of all the gravity mains in the network color coded with their calculated LOF score. As is illustrated in Figure B4-4, 2 percent of the gravity main pipe length had a high LOF score.

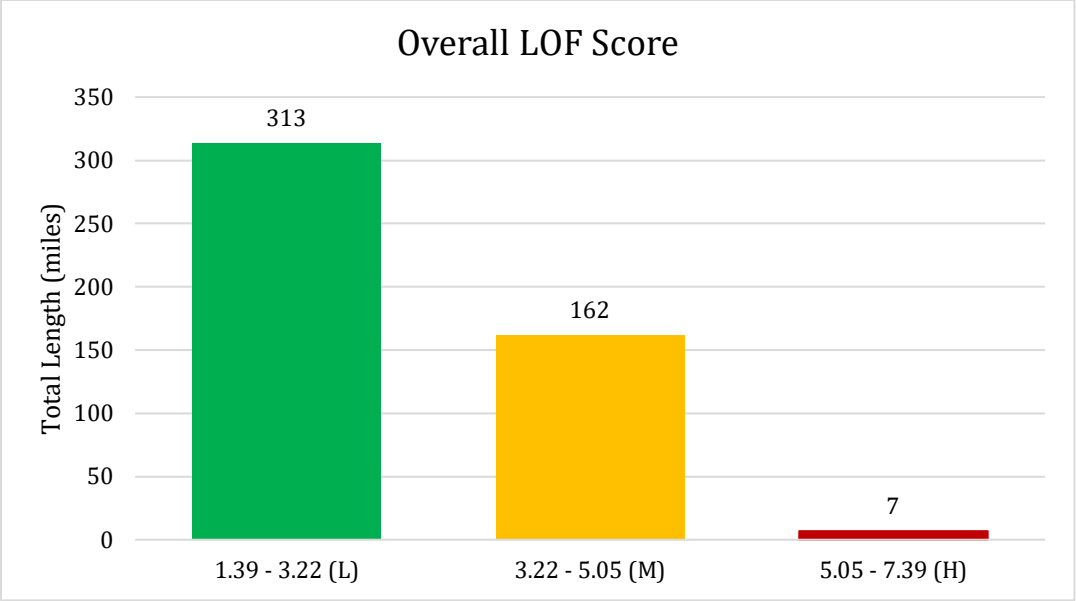


Figure B4-4: Gravity Main Overall LOF Score

B4.1.2Consequence of Failure Score

The COF parameter represents the consequences to the City and to the environment, as well as to the community and its socioeconomic functions. The COF is calculated by considering both direct cost impacts to the City and community impacts to residents, business owners, and other stakeholders.

The financial impact on the Utility is typically dependent on the following factors:

- Pipe Diameter
- Depth to Pipe Invert
- Surface Type

The description of each of the COF criteria related to Cost Impact is provide below.

- Pipe diameter: In general, the cost per linear foot to replace a gravity main increases with increase in diameter and larger pipe carries more flow and requires more expensive bypass pumping.
- Depth to pipe invert: In general, the cost per linear foot to replace a gravity main increases with increase in depth of the pipe, due to need for deeper excavations, trench support, potential dewatering, and additional crews and equipment.
- Surface Type: Surface Type includes vicinity to busy roads, buildings, railroads, and water bodies, which relates to the magnitude and cost of repair. For example, work on a

pipeline under a busy highway requires road closures, maintenance of traffic, repaving following the repair, and other costs relative to repair of a pipeline in a swale area.

The weighting factors for the Financial Impact sub-categories are provided in **Table B4-3**.

Table B4-3: Gravity Main COF Financial Impact Weighting Factor

Financial Impact Subcategory	Weight
Pipe Diameter	35
Depth to Pipe Invert	30
Surface Type	35

The community impact on the Utility is typically dependent on the following factors:

- Residential and Essential Services Impact
- Environmental Compliance
- Surface Type

The description of each of the COF criteria related to Community Impact is provided below.

- Residential and Essential Services Impact: Gravity mains that are near a hospital, school, railroad, or other critical facility are more likely to disrupt the community following a failure. Proximity to potable water wellfields or private water wells was also included in this category.
- Environmental Compliance: Proximity of a pipeline to a water body increases the likelihood that the spill reaches a waterway, which in turn increases the chance of water quality impacts and public health risks. The diameter of the pipeline influences the amount of spill that may reach the water body. This affects compliance with legislation and impacts public accessibility, aesthetics, and recreation.
- Surface Type: Surface Type includes vicinity to roads, buildings, railroads, and water bodies. The proximity of the pipeline to the public increases the community impact when a failure occurs. For example, closing a busy road typically impacts more commuters as well as businesses.

The weighting factors for the Community Impact sub-categories are presented in **Table B4-4**.

Table B4-4: Gravity Main COF Community Impact Weighting Factor

Community Impact Subcategory	Weights
Residential and Essential Services Impact	SEE NOTE
Environmental Compliance	50
Surface Type	50

Note: The Community Impact Score is calculated as the higher of the Residential and Essential Services Impact Score or the Weighted Combination of Environmental Compliance and Surface Type. The idea is that a pipe near a critical facility should be considered a high COF regardless of its other criteria scores.

The total COF score was calculated using the Financial Impact Scores and the Community Impact Scores using the weighting factors in **Table B4-5**, as shown below:

Total COF = (0.33*Community Impact) +(0.67*Financial Impact)

Table B4-5: Gravity Main Consequence of Failure Category Weighting Factor

Community Impact Subcategory	Weights
Financial Impact	33
Community Impact	67

Based on information from the City's GIS, as-built records and institutional knowledge held by key personnel, the COF scores were assigned to each pipe segment using the scoring criteria presented in **Table B4-6**.

Table B4-6: Gravity Main Consequence of Failure Scoring Criteria

Consequence Category	Negligible = 1	Low = 4	Moderate = 7	Severe = 10
FINANCIAL IMPACT				
Pipe Diameter	• <8 inches	• 8 inches and Unknown	• >8 inches and <= 12 inches	• >12 inches
Depth to Pipe Invert	• <5 feet	• 5 - 10 feet	• 10 - 15 feet	• >15 feet
Surface Type	• Pipeline is not located within 100 feet of a major roadway **AND** • Pipeline is not located within 100 feet of a building **AND** • Pipeline is not located within100 feet of a railroad **AND** • Pipeline is not located within 100 feet of a water body	• Pipeline is located within 100 feet of a major roadway **OR** • Pipeline is located within 100 feet of a building **OR** • Pipeline is located within 100 feet of a railroad **OR** • Pipeline is located within 100 feet of a water body	• Pipeline is located within 50 feet of a major roadway **OR** • Pipeline is located within 50 feet of a building **OR** • Pipeline is located within 50 feet of a railroad **OR** • Pipeline is located within 50 feet of a water body	• Pipeline is located within 25 feet of a major roadway **OR** • Pipeline is located within 25 feet of a building **OR** • Pipeline is located within 25 feet of a railroad **OR** • Pipeline is located within 25 feet of a water body
COMMUNITY IMPACT				
Residential and essential services impact	• No essential service facility within a 500-foot radius **AND** No wells located within a 1-mile radius	• No essential service facility within a 500-foot radius **OR** Well located within 1-mile radius	• Moderate priority essential services, such as railway, port, and industrial area within a 250-foot radius **OR** • Well located within 1/2-mile radius	• High priority essential service, such as hospitals, schools, or downtown areas within a 125-foot radius **OR** • Well located within 1/4-mile radius
Environmental Compliance	• Pipeline is not located within 100 feet of a water body • Pipe diameter <8 inches	• Pipeline is located within 100 feet of a water body • Pipe diameter 8 inches	• Water body located within 50 feet of the pipeline • Pipe diameter 10 - 12 inches	• Water body located within 25 feet of the pipeline • Pipe diameter >12 inches
Surface Type	• Pipeline is not located within 100 feet of a major roadway **AND** • Pipeline is not located within 100 feet of a building **AND** • Pipeline is not located within 100 feet of a railroad **AND** • Pipeline is not located within 100 feet of a water body	• Pipeline is located within 100 feet of a major roadway **OR** • Pipeline is located within 100 feet of a building **OR** • Pipeline is located within 100 feet of a railroad **OR** • Pipeline is located within 100 feet of a water body	• Pipeline is located within 50 feet of a major roadway **OR** • Pipeline is located within 50 feet of a building **OR** • Pipeline is located within 50 feet of a railroad **OR** • Pipeline is located within 50 feet of a water body	• Pipeline is located within 25 feet of a major roadway **OR** • Pipeline is located within 25 feet of a building **OR** • Pipeline is located within 25 feet of a railroad **OR** • Pipeline is located within 25 feet of a water body

Figure B4-5 through **Figure B4-9** present the COF scores for each of the scoring criteria listed in Table B4-3 and Table B4-4. These figures also show the miles of gravity main in the system that account for each of the COF scores.

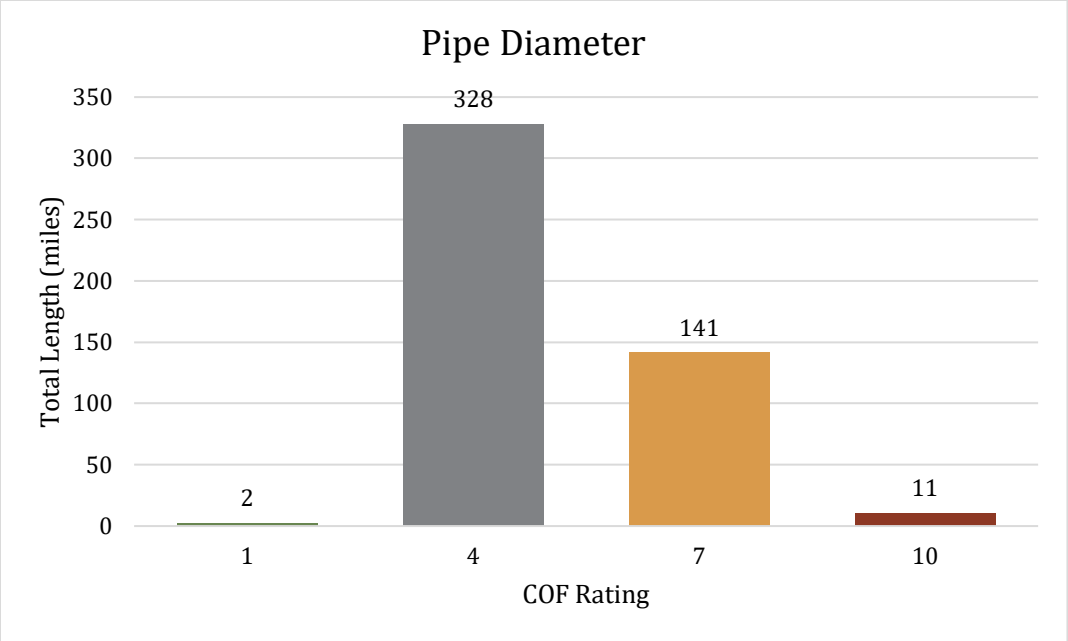


Figure B4-5: Gravity Main COF Scores for Pipe Diameter

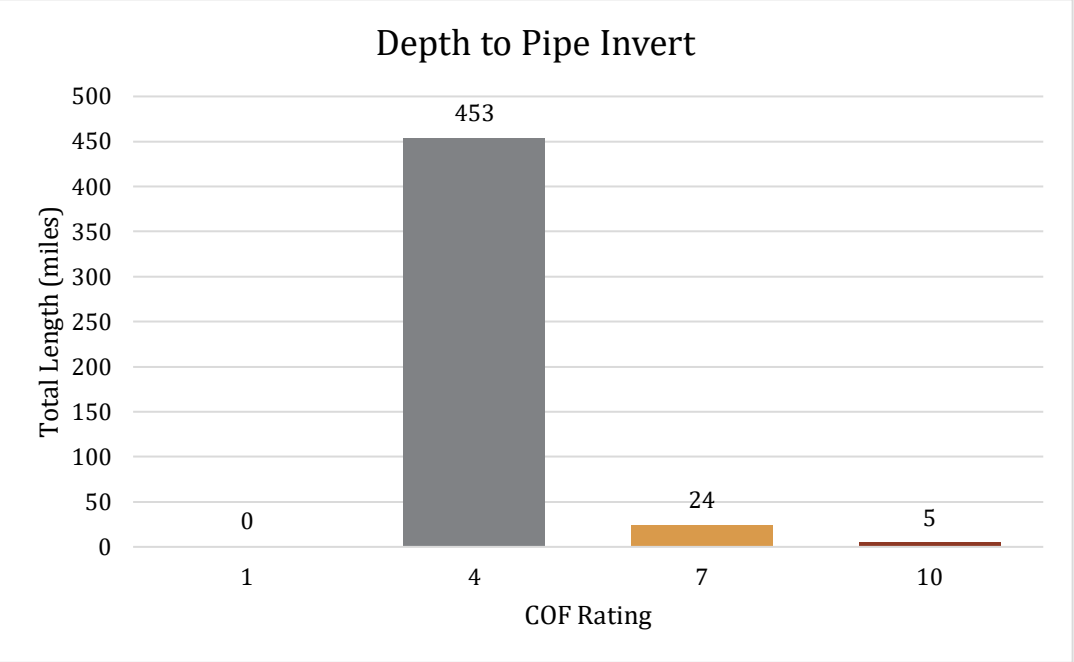


Figure B4-6: Gravity Main COF Scores for Depth to Pipe Invert

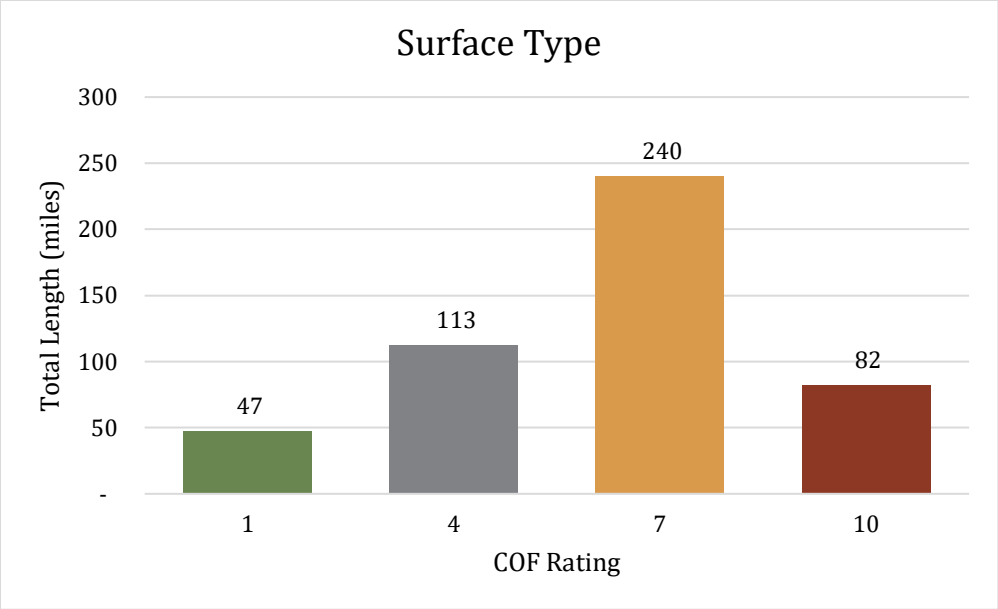


Figure B4-7: Gravity Main COF Scores for Surface Type

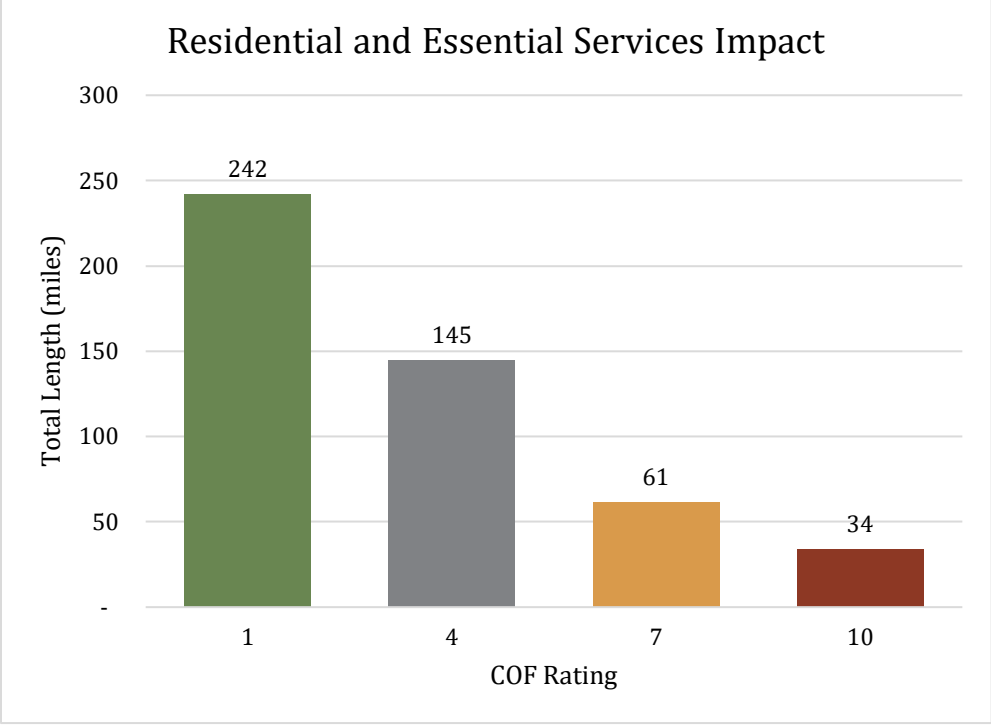


Figure B4-8: Gravity Main COF Scores for Residential & Essential Services Impact

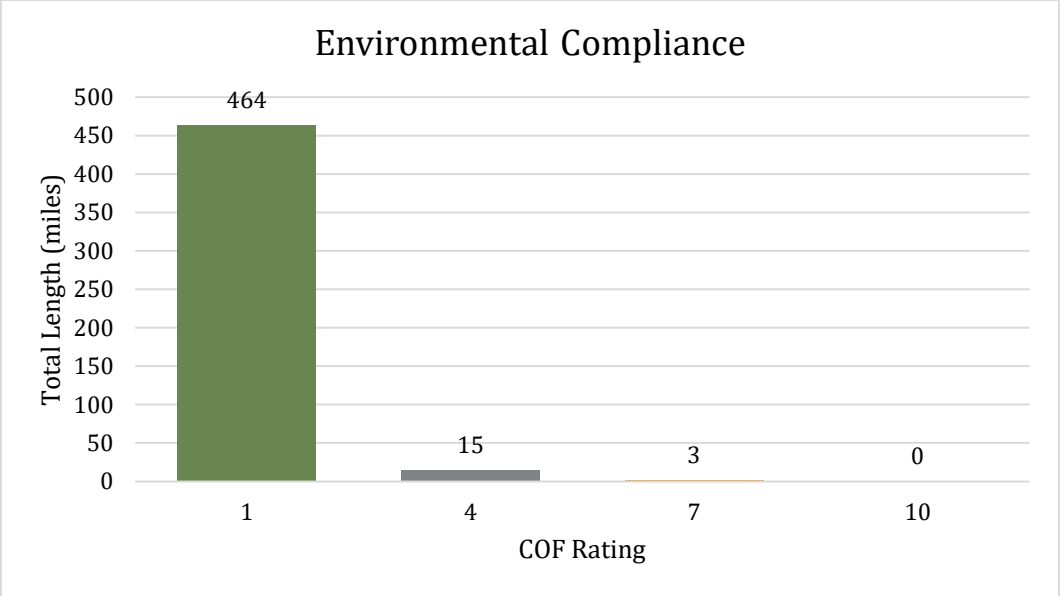


Figure B4-9: Gravity Main COF Scores for Environmental Compliance

COF Financial Impact Scores and COF Community Impact Scores were calculated for the active City-owned gravity mains in the network. **Figure B4-10** and **Figure B4-11** show the scores and the miles of gravity main in the system that account for the Financial COF score and the Community COF score, respectively.

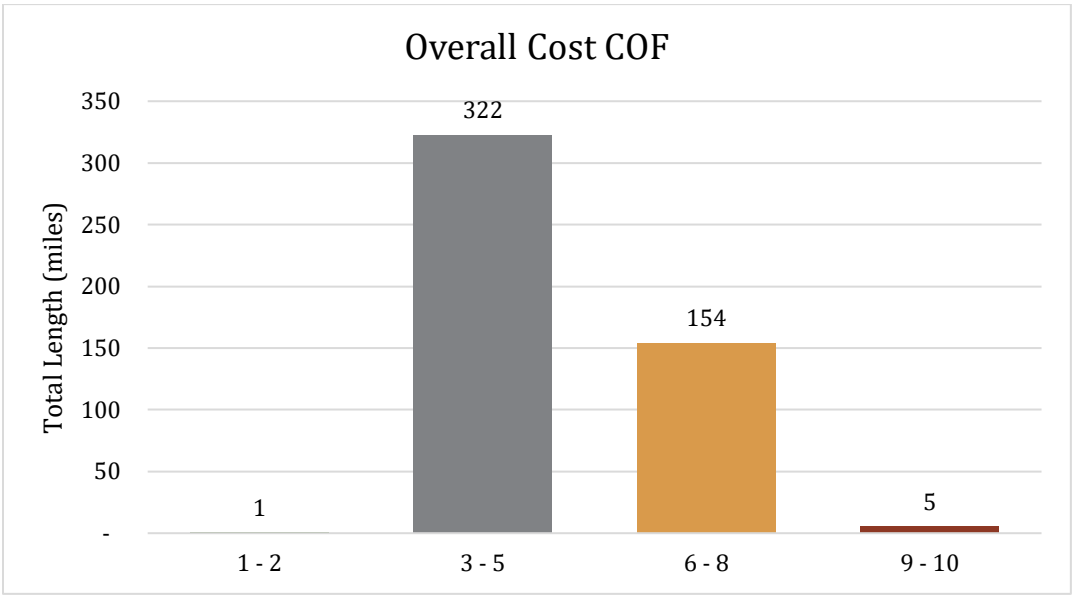


Figure B4-10: Gravity Main Overall COF Financial Impact Scores

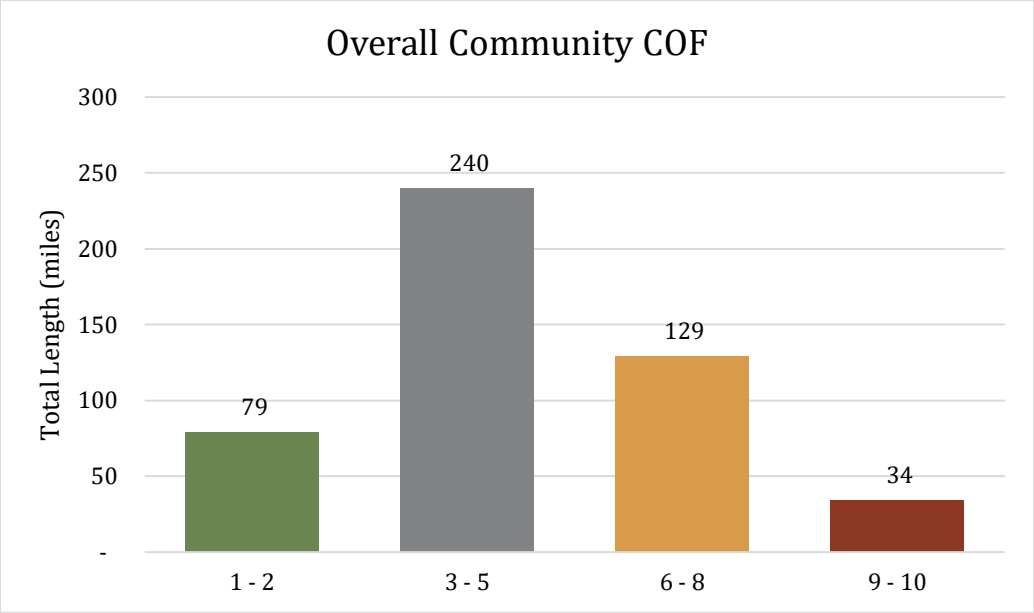


Figure B4-11: Gravity Main Overall COF Community Impact Scores

Utilizing the COF scores listed above and the weighting factors from Table B4-6, an overall COF score was calculated for all gravity mains in the network. **Figure B4-12** shows the scores and the miles of gravity main in the system that account for each range of the COF scores.

The ranges of COF scores were chosen as 1.00 to 4.35 to indicate a low COF (minimum value to 40th percentile), greater than 4.35 to 5.70 indicates a moderate COF (40th percentile to 90th percentile), and greater than 5.70 to 10.0 is considered a high COF (90th percentile to maximum COF). **Appendix BC** shows a map of all the gravity mains in the network color coded with their calculated COF score. As is illustrated on Figure B4-12, 8 percent of the gravity main pipe length had a high COF score.

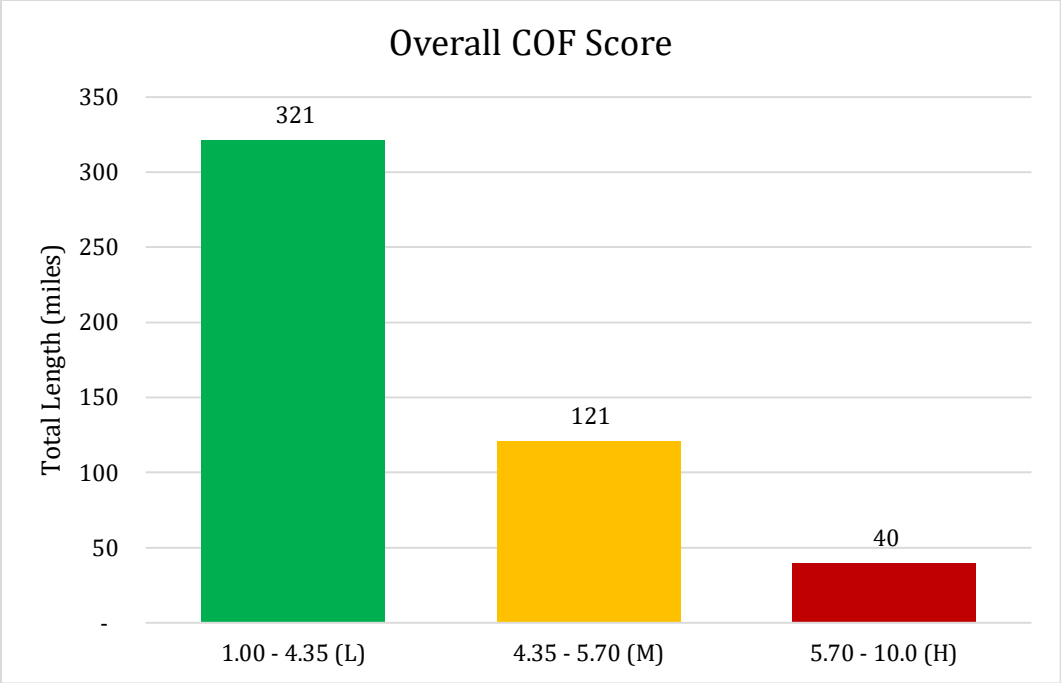


Figure B4-12: Gravity Main Overall COF Score

B4.1.3Risk Score

Utilizing the LOF and COF scores for each of the gravity main segments, a Risk Score (RS) was calculated based on a combination of the COF and LOF using the following formula:

$$RS = LOF \times COF$$

To summarize the Risk Assessment, **Figure B4-13** shows the factors that influence the overall Risk Score.

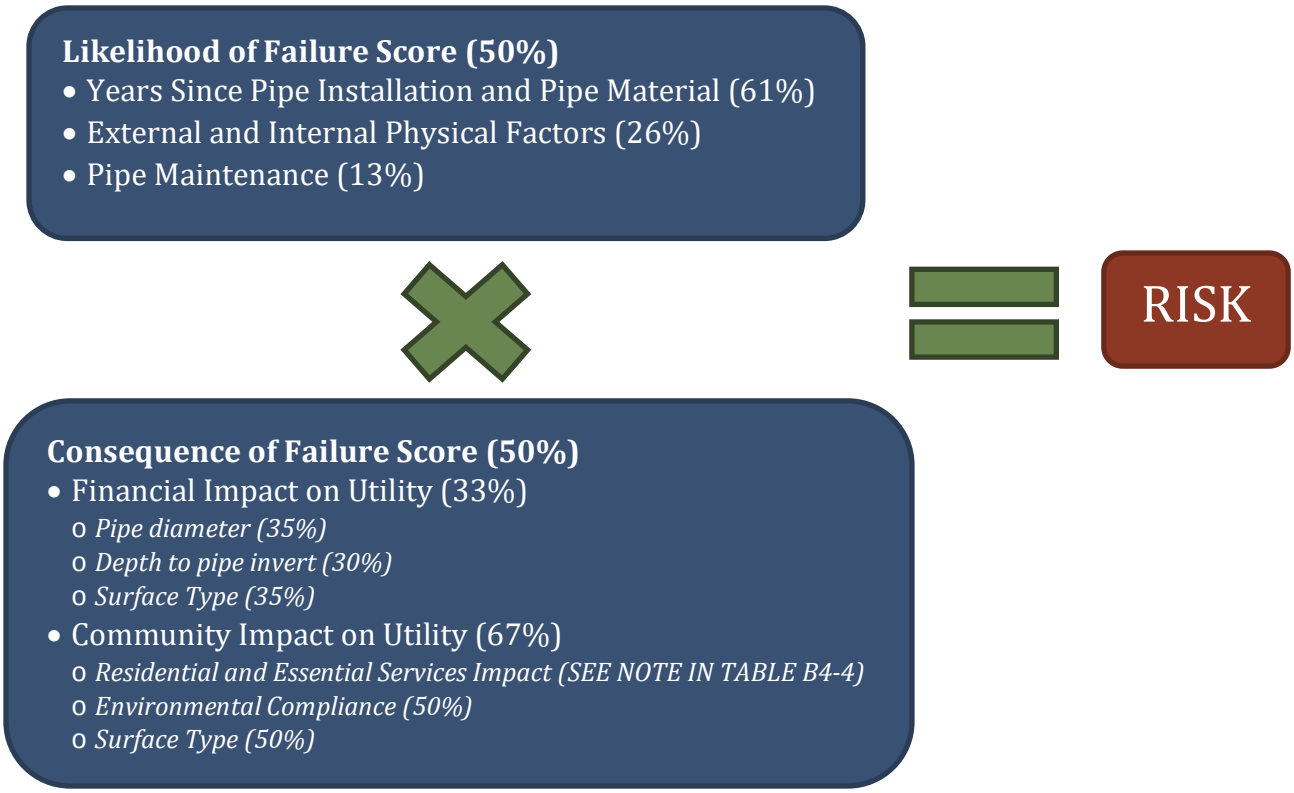


Figure B4-13: Gravity Main Risk Score Breakdown

The severity of the Risk was assigned based on the Risk Score Prioritization matrix shown in **Figure B4-14**. **Appendix BD** includes a map showing the overall risk scores calculated for each segment, color coded with the corresponding severity.

POF \ COF	1	4	7	10
1	1	4	7	10
2	2	8	14	20
4	4	16	28	40
7	7	28	49	70
10	10	40	70	100

1 - 4	Low Risk Priority
5 - 28	Medium Risk Priority
29 - 100	High Risk Priority

Figure B4-14: Gravity Main Risk Score Prioritization Matrix

Figure B4-15 shows the miles of gravity main in the system corresponding to each Risk Score.

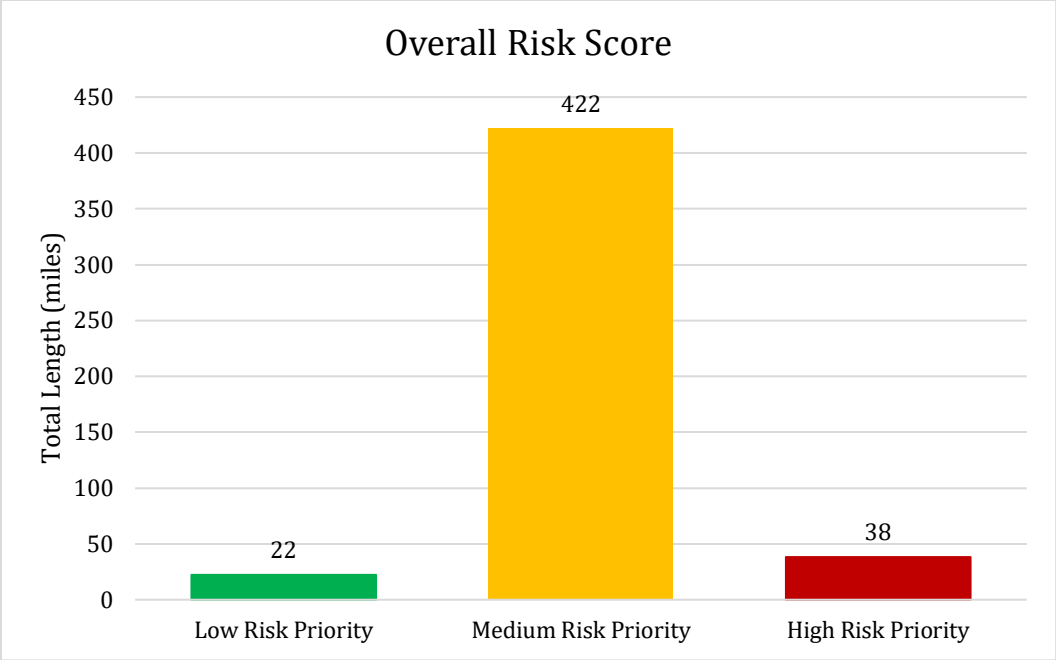


Figure B4-15: Gravity Main Risk Scores

B4.2 Pump Stations

B4.2.1 Likelihood of Failure Score

The LOF parameter represents the probability of a pump station failure from lack of capacity or from a mechanical failure, which in turn causes a spill to occur. The LOF was estimated based on hydraulic modeling results, available SCADA data, inspection notes from Operators, and other information obtained from the City. The LOF will be dependent on the following factors:

- Potential for Overflow
- Condition
- Service Life

The LOF criteria used for the Risk Assessment are described below:

- Potential for Overflow: Hydraulic modeling was completed under Task Order Number 8 as required by Paragraph 6(j) of the CO. The potential for the modeled wet well to overflow directly relates to failure of a pump station. The maximum modeled wet well level was compared to the finished floor elevation for each pump station under wet weather conditions. As this quantity becomes smaller, the pump station approaches overflow condition and the LOF increases.
- Condition: Condition information collected and maintained by Operations was used to determine the condition of each pump station. If Operations identified that no rehabilitation work was needed or that rehabilitation work was in progress, a score of 1 was assigned to the station. A score of 2 was not used for this category. If Operations identified that rehabilitation work was required within 10 years, a score of 4 was assigned to the pump station. If Operations identified that rehabilitation work was required within 5 years, a score of 7 was assigned to the pump station. If Operations identified that immediate rehabilitation work was required (within 2 years), a score of 10 was assigned to the pump station.
- Age: The build, install, and/or rehabilitation date of each pump station was obtained using available as-built information, information obtained from Operations, and data in the GIS database. An older pump station is more likely to require upgrade, refurbishment, or replacement, and was given a higher LOF score.

The weighting factor for each LOF criteria is presented in **Table B4-7**.

Table B4-7: Pump Station Likelihood of Failure Category Weighting Factor

Likelihood of Failure Category	Weight
Potential for Overflow	20
Condition	40
Age	40

Based on information from the City's GIS, as-built records, and institutional knowledge held by key personnel, the LOF scores were assigned to each pump station using the scoring criteria presented in **Table B4-8**.

Table B4-8: Pump Station Likelihood of Failure Scoring Criteria

Likelihood Category	Negligible = 1	Unlikely = 2	Possible = 4	Likely = 7	Very Likely = 10
Potential for overflow based on modeled wet well level	• Peak wet weather wet well greater than 3 feet below rim elevation	• Peak wet weather wet well level 2-3 feet below rim elevation	• Peak wet weather wet well level 1-2 feet below rim elevation	• Peak wet weather wet well level less than one foot below rim elevation	• Peak wet weather wet well level at or above rim elevation
Condition	• Operations identified no work needed	• NOT USED	• Operations identified upgrades were needed within 10 years	• Operations identified upgrades were needed within 5 years	• Operations identified upgrades were needed immediately (within 2 years)
Age	• Pump station is less than 10 years old	• Pump station is between 10 and 20 years old	• Pump station is between 20 and 35 years old	• Pump station is between 35 and 50 years old	• Pump station is greater than 50 years old

Figure B4-16 through **Figure B4-18** present the LOF scores for each of the scoring criteria listed in Table B4-8. These figures also show the number of pump stations in the system that account for each of the LOF scores.

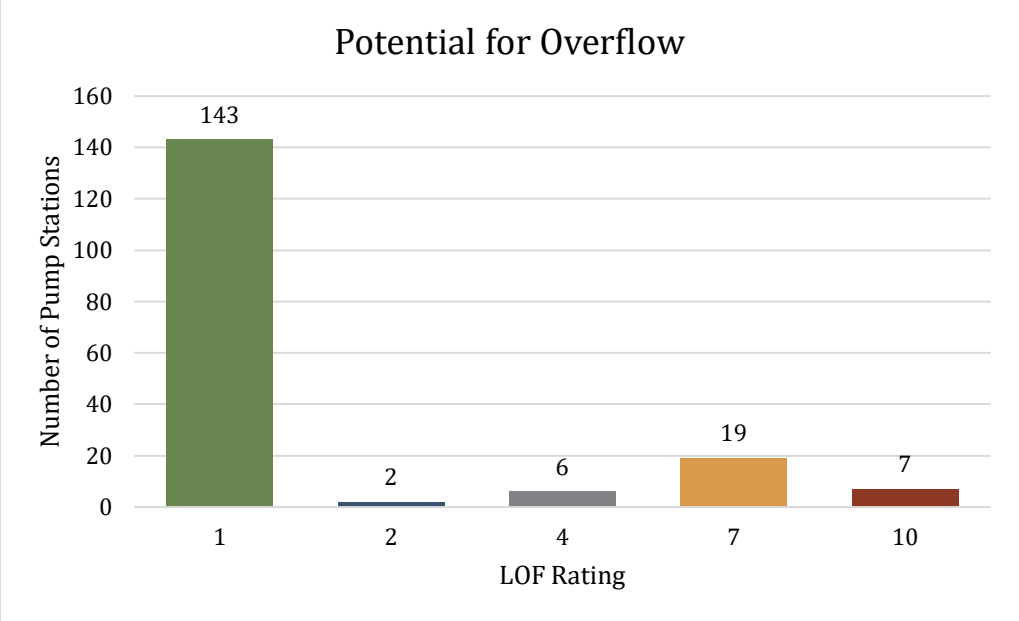


Figure B4-16: Pump Station LOF Score for Potential for Overflow

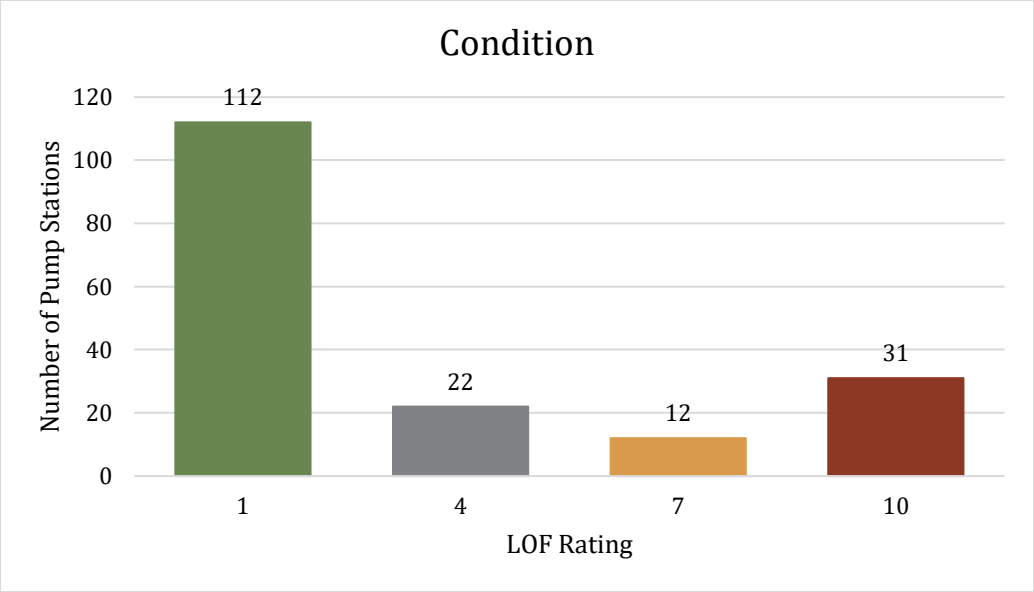


Figure B4-17: Pump Station LOF Score for Condition

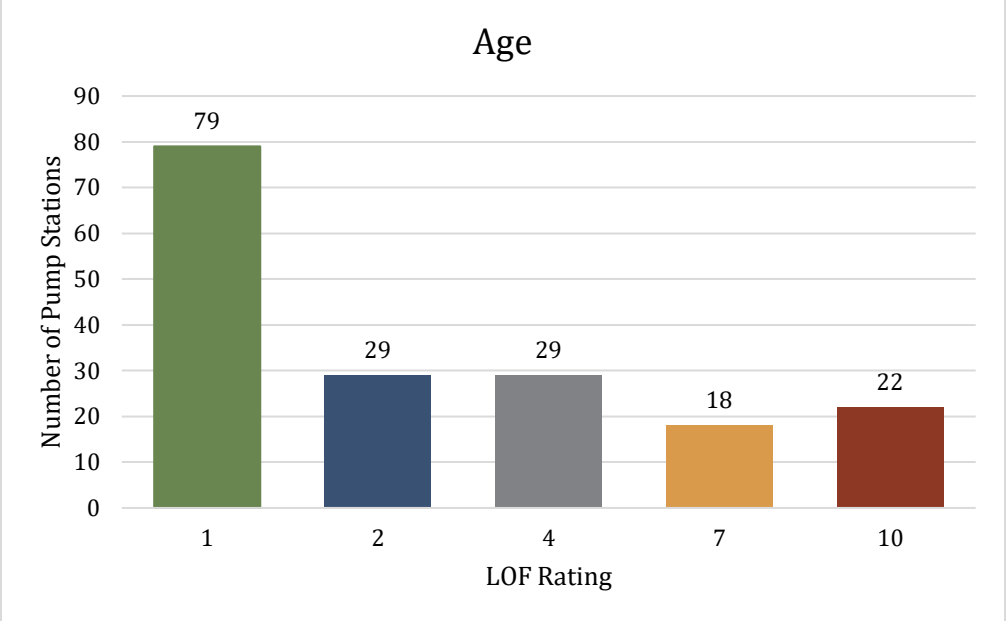


Figure B4-18: Pump Station LOF Score for Age

Utilizing the LOF scores listed above and the weighting factors from Table B4-7, an overall LOF score was calculated for all active City-owned pump stations in the network. **Figure B4-19** shows the scores and the number of pump stations in the system that account for each range of the LOF scores.

The ranges of LOF scores were chosen as 1.00 to 2.20 to indicate a low LOF (minimum value to 40th percentile), greater than 2.20 to 5.20 indicates a moderate LOF (40th percentile to 90th percentile), and greater than 5.20 to 9.40 is considered a high LOF (90th percentile to maximum LOF). **Appendix BE** shows a map of all the pump stations in the network color coded with their calculated LOF score. As is illustrated on Figure B4-19 10% percent of the pump stations had a high LOF score.

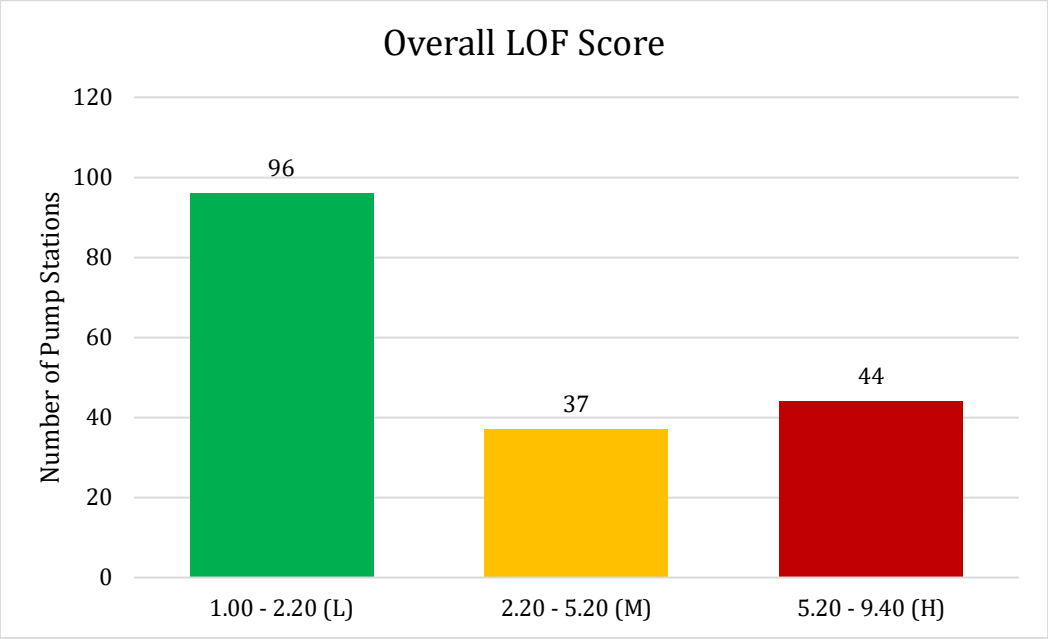


Figure B4-19: Pump Station Overall LOF Score

B4.2.2Consequence of Failure Score

The COF parameter represents the consequences to the City and to the environment, as well as to the community and its socioeconomic functions. The COF is calculated by considering both direct cost impacts to the City and community impacts to residents, business owners, and other stakeholders.

The financial impact on the Utility is indirectly measured through use of the pump station total horsepower (number of pumps x horsepower per pump). Horsepower and number of pumps was based on information obtained from the City during the hydraulic modeling effort. Total horsepower has a direct relationship with cost to upgrade components of the station.

Only total horsepower was used to determine the financial COF, and therefore accounts for 100% of the Financial Impact score, as shown in **Table B4-9**.

Table B4-9: Pump Station COF Financial Impact Weighting Factor

Financial Impact Subcategory	Weight
Total Horsepower	100

The community impact will be dependent on the following factors:

- Average Dry Weather Flow (ADWF)
- Residential and Essential Services Impact
- Environmental Compliance

The description of each of the COF criteria related to Community Impact is provide below.

- ADWF: The modeled ADWF to the station relates to the volume of sewage being spilled when a pump station experiences a failure. A larger ADWF (meaning a larger spill) is more likely to adversely impact the surrounding public and the community.
- Residential and Essential Services Impact: Pump stations that are near a hospital, school, railroad, or other critical facility are more likely to disrupt the community following a failure. Proximity to potable water wellfields or private water wells was also included in this category.
- Environmental Compliance: Proximity of a pump station to a water body increases the likelihood that a spill reaches a waterway. This affects compliance with legislation and impacts public accessibility, aesthetics, and recreation.

The weighting factors for the Community Impact sub-categories is provided in **Table B4-10**.

Table B4-10: Pump Station COF Community Impact Weighting Factor

Community Impact Subcategory	Weight
ADWF	30
Residential and Essential Services Impact	35
Environmental Compliance	35

The total COF score was calculated using the Financial Impact Scores and the Community Impact Scores using the weighting factors in **Table B4-11**, as shown below:

Total COF = (0.33*Community Impact) +(0.67*Financial Impact)

Table B4-11: Pump Station Consequence of Failure Category Weighting Factor

COF Subcategory	Weights
Financial Impact	33
Community Impact	67

Based on information from the City's GIS, as-built records and institutional knowledge held by key personnel, the COF scores were assigned to each pump station using the scoring criteria presented in **Table B4-12**.

Table B4-12: Pump Station Consequence of Failure Scoring Criteria

Consequence Category	Negligible = 1	Low = 4	Moderate = 7	Severe = 10
FINANCIAL IMPACT				
Total Horsepower	• Pump station is less than 25 hp	• Pump station is between 25 hp and 100 hp	• Pump station is between 100 hp and 200 hp	• Pump station is greater than 200 hp
COMMUNITY IMPACT				
Residential and essential services impact	• No essential service facility within a 500-foot radius **AND** No wells located within a 1-mile radius	• Essential service facility within a 500-foot radius **OR** Well located within 1-mile radius	• Essential service facility within a 250-foot radius **OR** • Well located within 1/2-mile radius	• Essential service facility within a 125-foot radius **OR** • Well located within 1/4-mile radius
Environmental Compliance	• Water body is not located within 300 feet of the pump station	• Water body is located within 300 feet of the pump station	• Water body is located within 100 feet of the pump station	• Water body is located within 50 feet of the pump station
ADWF	• ADWF is less than 50 gpm	• ADWF is between 50 gpm and 200 gpm	• ADWF is between 200 gpm and 400 gpm	• ADWF is greater than 400 gpm

Figure B4-20 through **Figure B4-23** present the COF scores for each of the scoring criteria listed in Table B4-9 and Table B4-10. These figures also show the number of pump stations in the system that account for each of the COF scores.

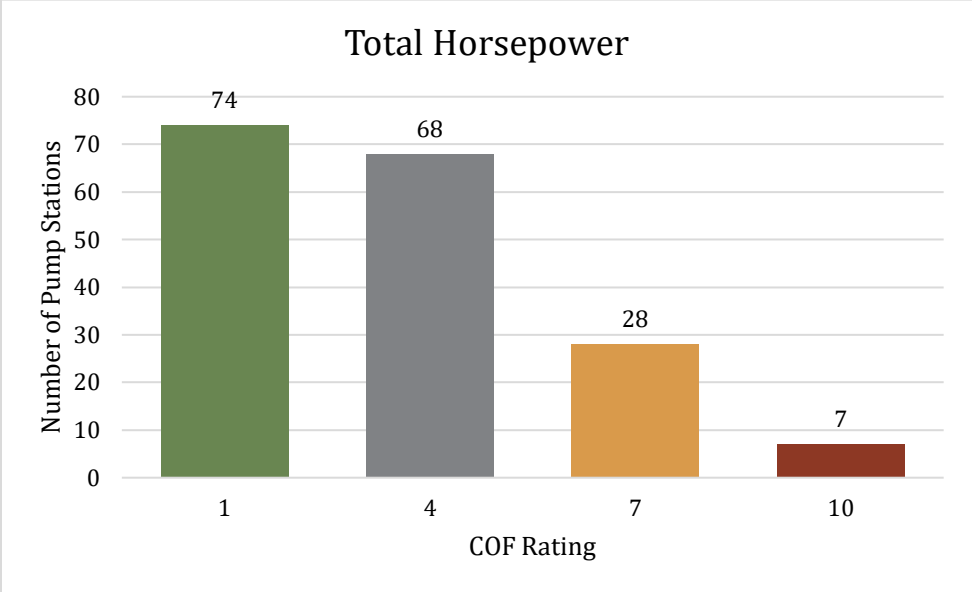


Figure B4-20: Pump Station COF Scores for Total Horsepower

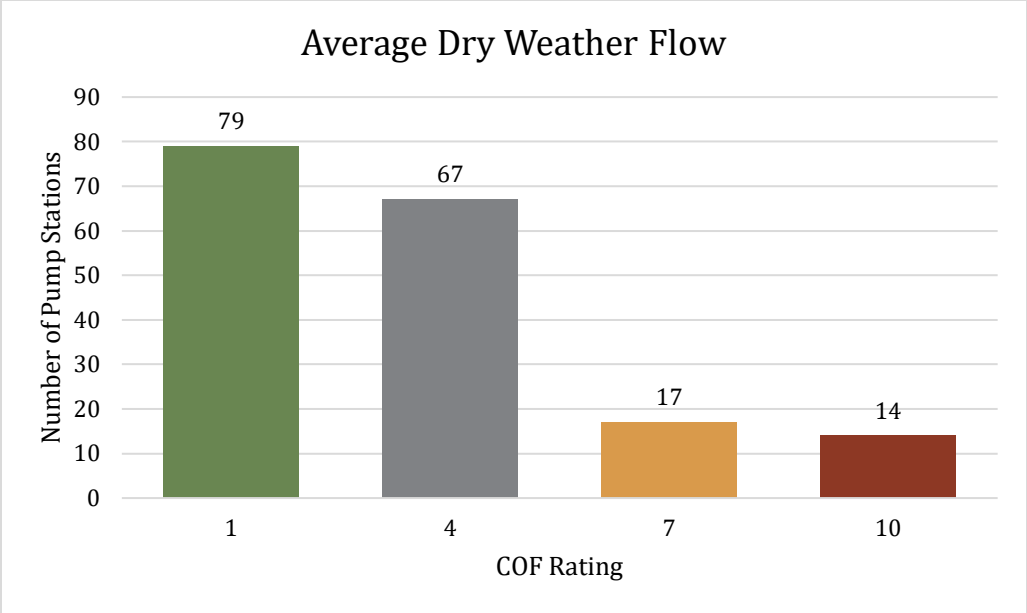


Figure B4-21: Pump Station COF Scores for Average Dry Weather Flow

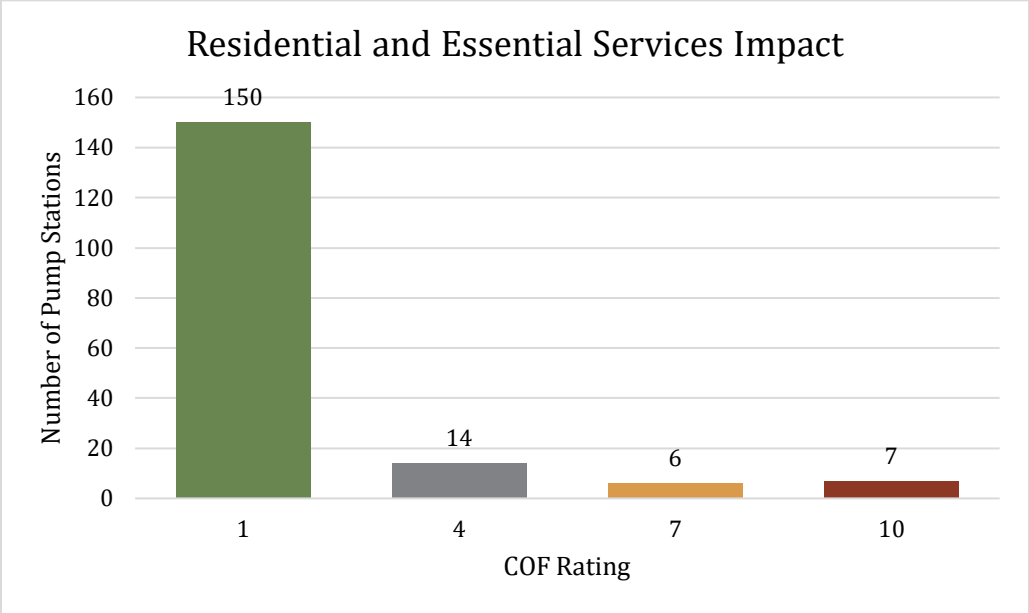


Figure B4-22: Pump Station COF Scores for Residential & Essential Services Impact

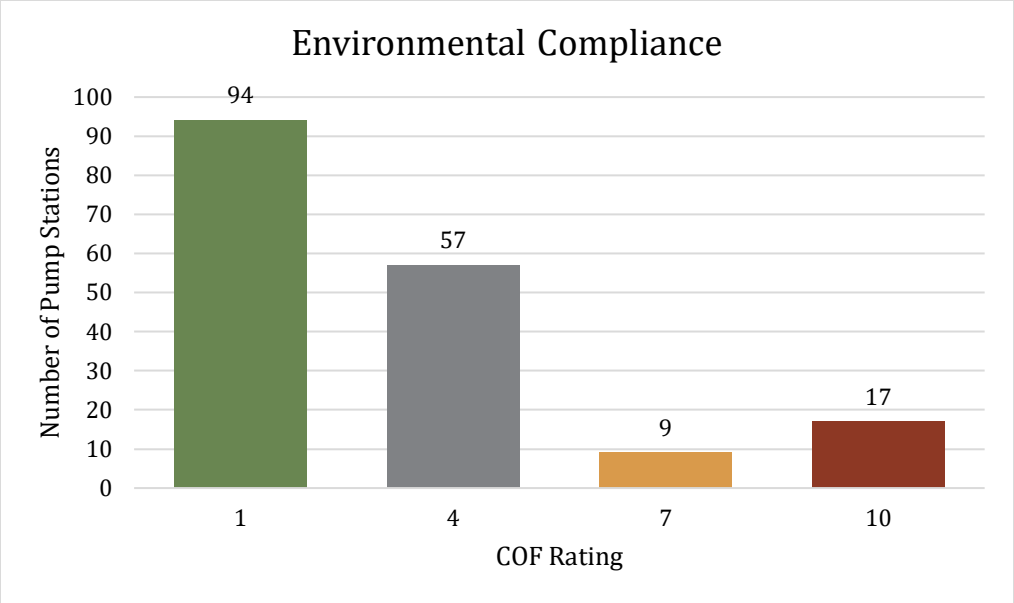


Figure B4-23: Pump Station COF Scores for Environmental Compliance

COF Financial Impact Scores and COF Community Impact Scores were calculated for the active City-owned pump stations in the network. **Figure B4-24** and **Figure B4-25** show the scores and the number of pump stations in the system that account for the Financial COF score and the Community COF score, respectively.

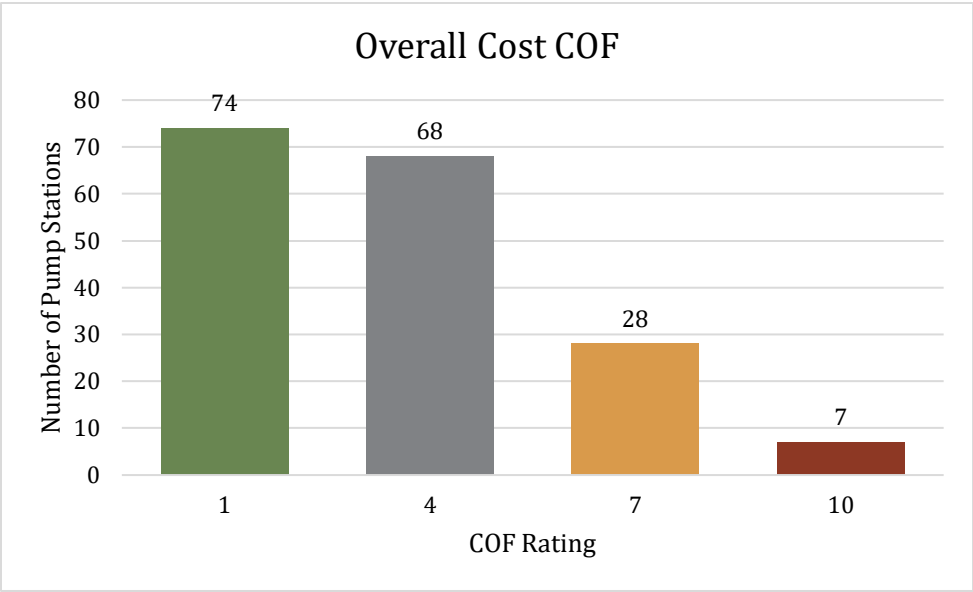


Figure B4-24: Pump Station Overall COF Financial Impact Scores

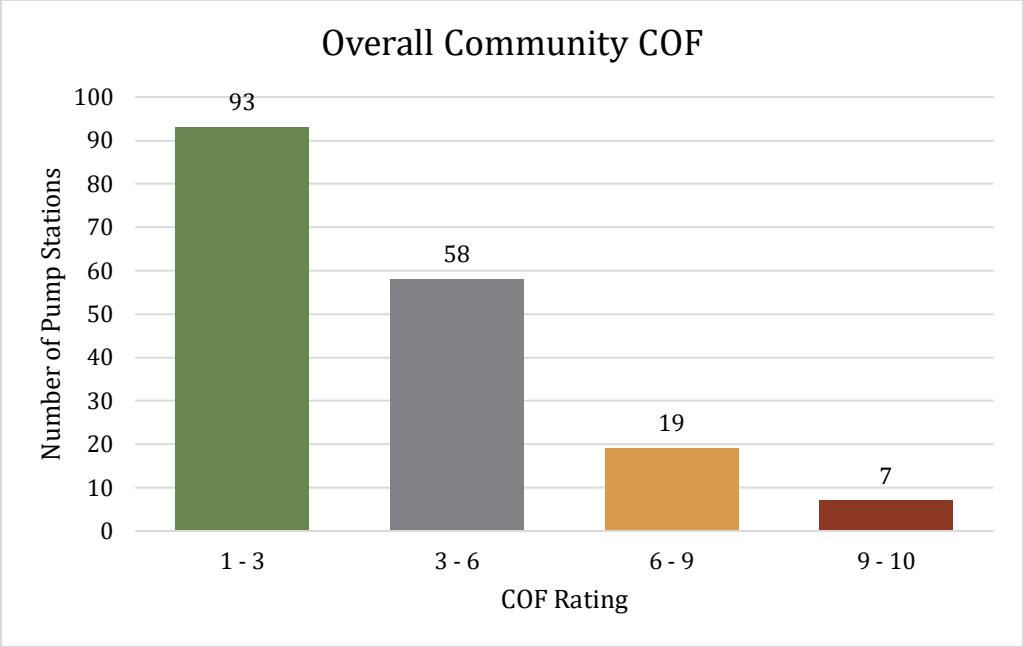


Figure B4-25: Pump Station Overall COF Community Impact Scores

Utilizing the COF scores listed above and the weighting factors from Table B4-11**,** an overall COF score was calculated for all pump stations in the network. **Figure B4-26** shows the scores and the number of active City-owned pump stations in the system that account for each range of the COF scores.

The ranges of COF scores were chosen as 1.00 to 3.00 to indicate a low COF (minimum value to 40th percentile), greater than 3.00 to 6.01 indicates a moderate COF (40th percentile to 90th percentile), and greater than 6.01 to 10.0 is considered a high COF (90th percentile to maximum COF). **Appendix BF** shows a map of all the active City-owned pump stations in the network color coded with their calculated COF score. As is illustrated on **Figure B4-26**, 10% percent of the pump stations had a high COF score.

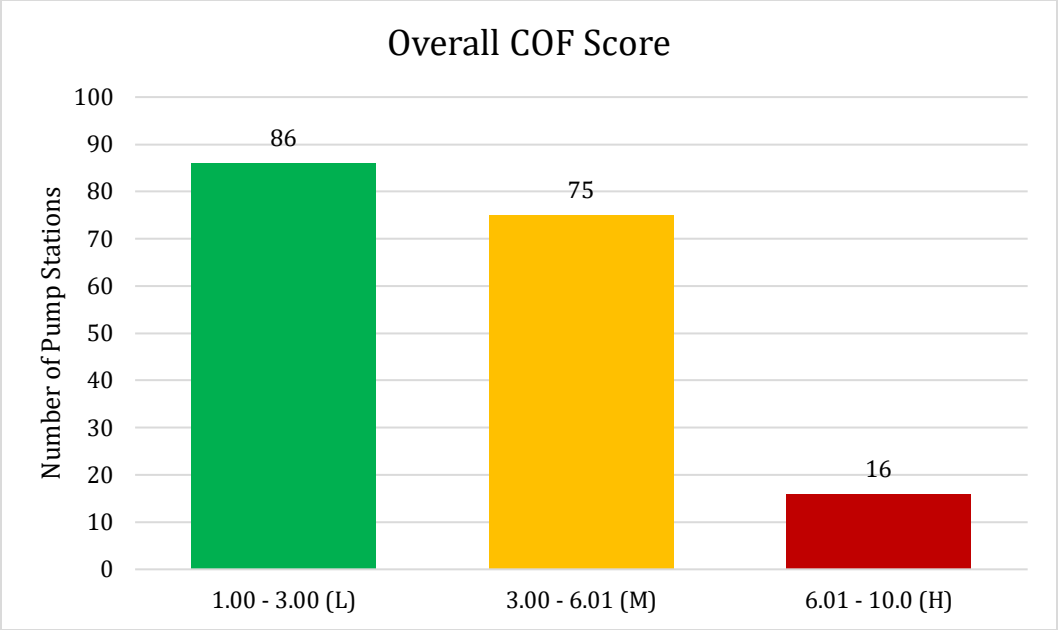


Figure B4-26: Pump Station Overall COF Score

B4.2.3Risk Score

Utilizing the LOF and COF scores for each of the pump stations, a RS was calculated based on a combination of the COF and LOF using the following formula:

$$RS = LOF \times COF$$

To summarize the Risk Assessment, **Figure B4-27** shows the factors that influence the overall Risk Score.

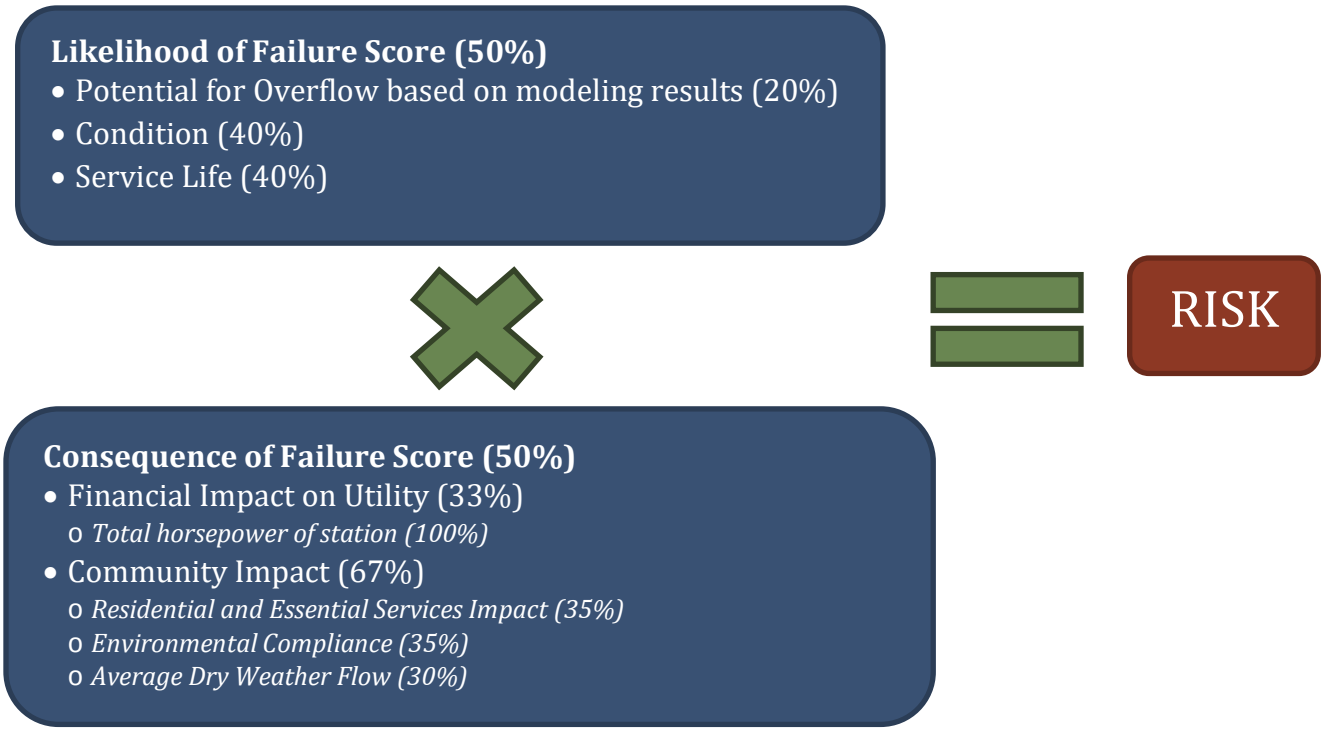


Figure B4-27: Pump Station Risk Score Breakdown

The severity of the Risk was assigned based on the Risk Score Prioritization matrix shown in **Figure B4-28**. **Appendix BG** includes a map showing the overall risk scores calculated for each pump station, color coded with the corresponding severity.

POF \ COF	1	4	7	10
1	1	4	7	10
2	2	8	14	20
4	4	16	28	40
7	7	28	49	70
10	10	40	70	100

1 - 4	Low Risk Priority
5 - 28	Medium Risk Priority
29 - 100	High Risk Priority

Figure B4-28: Pump Station Risk Score Prioritization Matrix

Figure B4-29 shows the miles of gravity main in the system corresponding to each Risk Score.

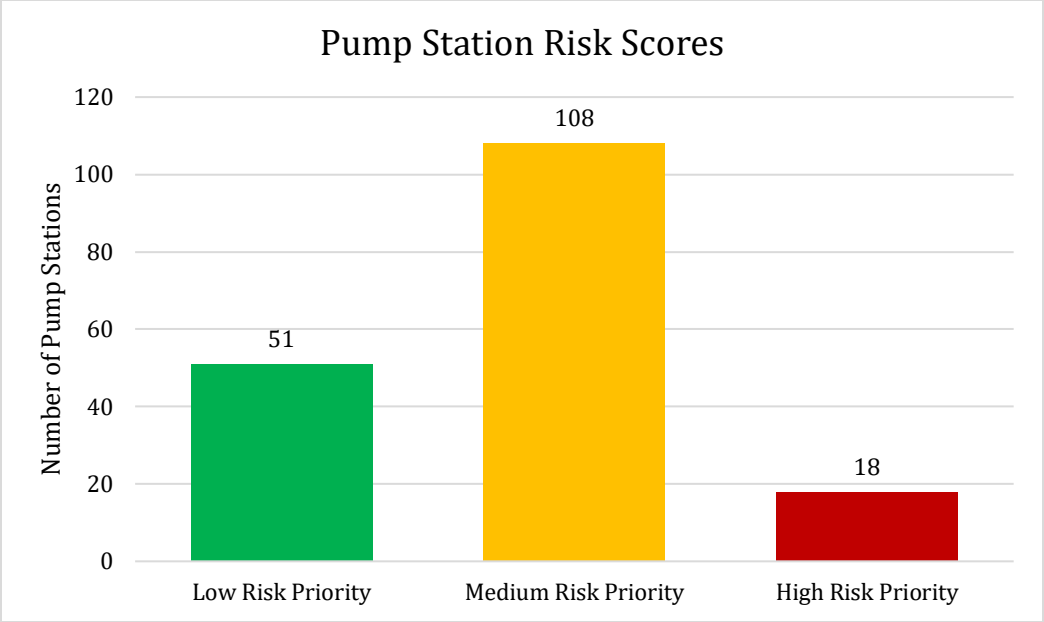


Figure B4-29: Pump Station Risk Scores

B4.3 Force Mains

Paragraph 6(h) of the CO requires that the City submit a FMCA Plan to FDEP to be implemented following approval. The FMCA would be conducted in three phases:

- FMCA Phase 1 – Development of Risk Matrix and Implementation Plan
- FMCA Phase 2 – Implementation of the FMCA
- FMCA Phase 3 – FMCA Report

The FMCA Plan (CH2M and Hazen, 2018) was submitted to FDEP on September 4, 2018. The FMCA Plan stated that the City's force main network would be assessed in two main steps. The first step is comprised of a desktop risk assessment based on available information. The second step is comprised of a tiered condition assessment based on the results of the desktop risk assessment. As part of the FMCA Plan a risk score was developed based on the LOF and COF. Risk score is the product of LOF (based on the condition and vulnerability of the asset) and COF (based on the criticality of the asset and impacted surroundings).

$$Risk = LOF \; x \; COF$$

Based on the desktop risk assessment, approximately 42 miles of the City's 110 miles of active FM were identified to be of moderate to high risk and were identified for further Tier 1 assessment using external corrosion surveys. Soil resistivity and pipe-to-soil tests were performed on segments that were safely accessible from January 6 through January 23, 2020. Based on the results of the Tier 1 assessment, FM LOF scores were revised, and new Risk Scores were calculated. The results of this effort was documented in the Force Main Condition Assessment Report (Hazen and Jacobs, 2020) which was submitted to FDEP on March 23, 2020. Key findings and conclusions of the Force Main Condition Assessment (FMCA) Report are summarized herein.

B4.3.1 Likelihood of Failure Score

The LOF parameter represents probability of pipe failure based on the location and physical characteristics of the pipe. Evaluation of LOF for each pipe segment also helps prioritize the pipe segments that are more likely to break in the force main network. The LOF criteria used for the FMCA Report are described below:

- Years since pipe installation—All pipe segments in any FM network age and deteriorate over time because of abrasive, mechanical, and corrosive conditions. In general, pipes installed more than 50 years ago are considered more likely to fail.
- • Pipe material—Pipe material is one of the most important criteria responsible for segment failure. Most ferrous pipes, such as ductile iron pipe (DIP) and cast-iron pipe, are susceptible to corrosion, while concrete pipes, such as asbestos-cement (AC) pipe and prestressed concrete pipe, are susceptible to abrasion. Most plastic pipes, such as

polyvinyl chloride (PVC), polyethylene (PE), and high-density polyethylene (HDPE), are not as susceptible to corrosion or abrasion as the ferrous and concrete pipes.

- Pipe break information - Pipe breaks indicate the FM's condition and integrity. Pipe breaks can also occur from construction activities or failed valves. As part of this assessment, only failures recorded from a structural integrity compromise are included in the criteria. Also, any pipe with more than two breaks is more likely to fail than a pipe that has no breaks. The criteria also recognize and score the pipes that have no historical pipe break information accordingly.
- FM operating pressures - Pipes are more likely to fail if they convey high pressures. The FM peak operating pressures were determined from a sewer system hydraulic model run at the design wet-weather flow. Based on experience in the industry, pipe breaks for the pipe materials prevalent in the City's FM system become possible at 60 pounds per square inch (psi) and very likely at 100 psi.
- Pipe layout profile - An FM is more likely to fail at high points in the system where air pockets may form and allow internal microbial-induced corrosion. To analyze this criterion, the FM was assumed to have a high point if an air release valve (ARV) was present on the pipe section in the geographic information system (GIS).
- External and internal factors affecting the asset including proximity to salt water intrusion line - Corrosion from both external and internal factors directly affects pipe failure. Based on discussions with the City, the wastewater composition does not change significantly across the City's sewer system, so variation in internal corrosion factors (beyond those accounted for in the "pipe layout profile" criteria described above) were not considered. Factors such as abrasion from sand and grit or impacts of chemical addition that could results in internal pipe loss could not be determined based on available information during the analysis. However, the proximity to the salt water intrusion line does directly affect the potential for external corrosion if the pipe is below groundwater. Pipes below groundwater were given higher scores than pipes that are outside of the salt water intrusion area or that are above groundwater.
- Pipe maintenance - Pipe maintenance is an important factor that affects the likelihood of pipe failure. If a pipe is maintained well, with a regular cleaning schedule and air relief valve exercising, then the likelihood of failure is lessened. City staff indicated that sufficient maintenance records are not available for a significant portion of the City's FM system. Therefore, all pipes were given the same score. However, this criterion has been retained in the risk matrix as an important parameter for future tracking and evaluation.

A workshop was held with City staff to determine weighting factors for each LOF category as presented in **Table B4-13.**

Table B4-13: Force Main Likelihood of Failure Category Weighting Factor

LOF Category	Weights
Years Since Pipe Installation	16%
Pipe Material	17%
Pipe Break Information (from 2014–2018)	23%
Force Main Peak Operating Pressures	16%
Pipe Layout Profile	7%
External and Internal Physical Factors Affecting the Asset/Proximity to Saltwater Intrusion	14%
Pipe Maintenance (includes cleaning techniques, such as flushing and rodding as well as previous inspections if performed)	7%

Based on information from the City's GIS, as-built records, institutional knowledge provided by key personnel, and the results from the field work and analysis of the Tier 1 assessment, LOF scores were assigned to each pipe segment using the scoring criteria presented in **Table B4-14**.

Table B4-14: Force Main Likelihood of Failure Scoring Criteria

Likelihood Category	Negligible = 1	Unlikely = 2	Possible = 4	Likely = 7	Very Likely = 10
Years Since Pipe Installation	<20 years	≥20 years to <30 years	≥30 years to <40 years	≥40 years to <50 years	≥50 years or unknown
Pipe Material	HDPE, PVC, or PE	DIP ≤30 years old	Cast-iron pipe	• DIP ≥30 years old and DIP without date of installation • Asbestos concrete pipe • Prestressed concrete cylinder pipe with a 1970's installation date	Unknown
Pipe Break Information (from 2014–2018)	0 breaks	Not used	No historical pipe break information available/provided from 2014 through 2018	At least one break in pipe segment	Two or more breaks in pipe segment
Force Main Peak Operating Pressures	Modeled force main peak operating pressure <60 psi	Not used	Modeled force main peak operating pressure between 60 psi and 100 psi	Not used	Modeled force main peak operating pressure >100 psi
Pipe Layout Profile	No ARV/high point on segment	Not used	One ARV/high point on segment	Not used	Not used
Pipe Maintenance	Not used	Not used	Pipe maintenance records are not available	Not used	Not used
External and Internal Physical Factors Affecting the Asset	PVC, HDPE, and PE pipe materials	Mildly corrosive	Moderately corrosive	Corrosive	Severely corrosive

Figure B4-30 through **Figure B4-36** present the LOF scores for each scoring criteria listed in Table B4-14. The figures also show the miles of force main in the system that account for each LOF score.

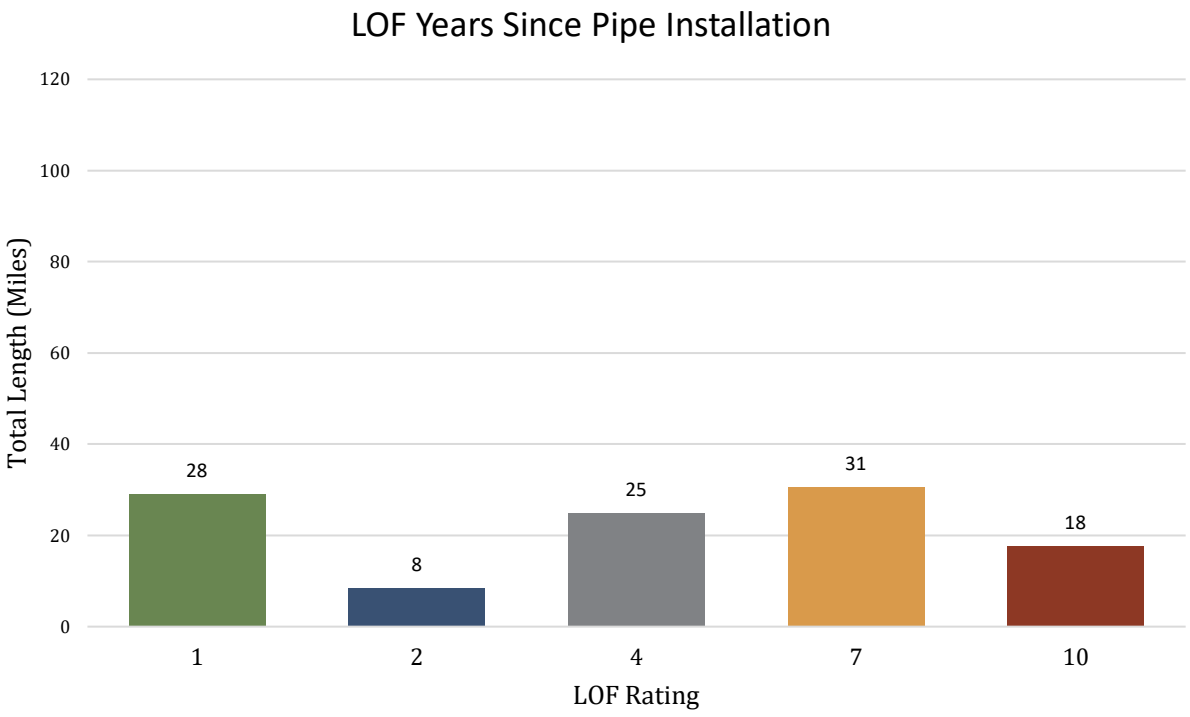


Figure B4-30: Force Main LOF for Years Since Pipe Installation

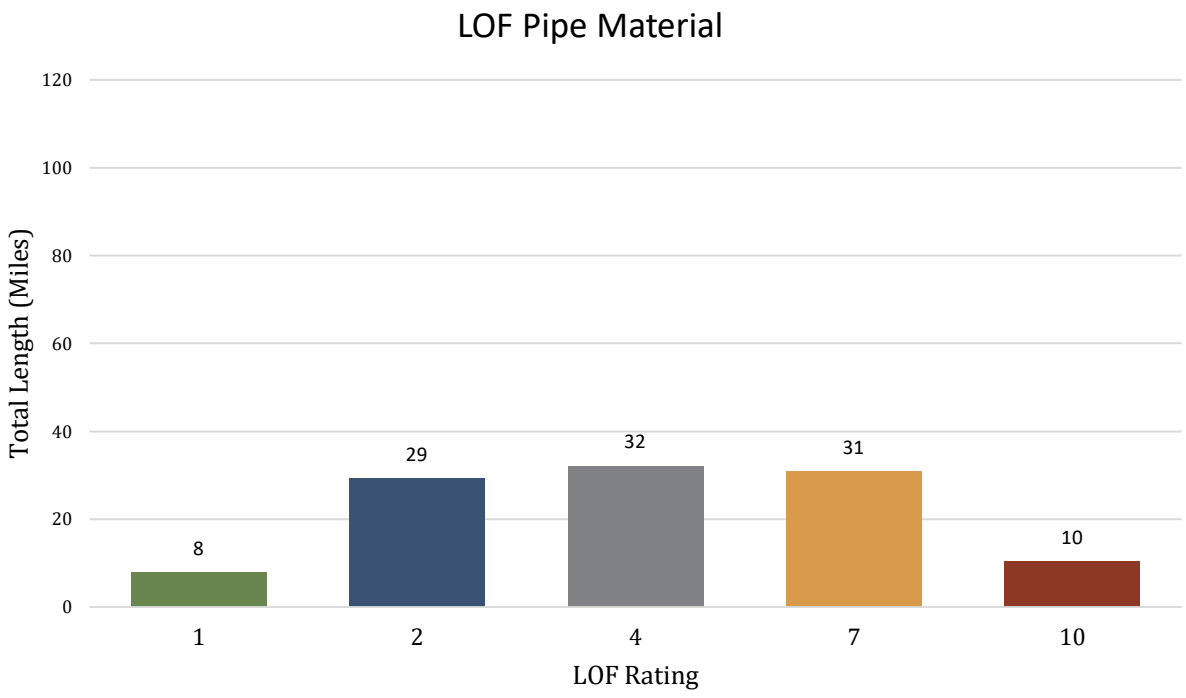


Figure B4-31: Force Main LOF for Pipe Material

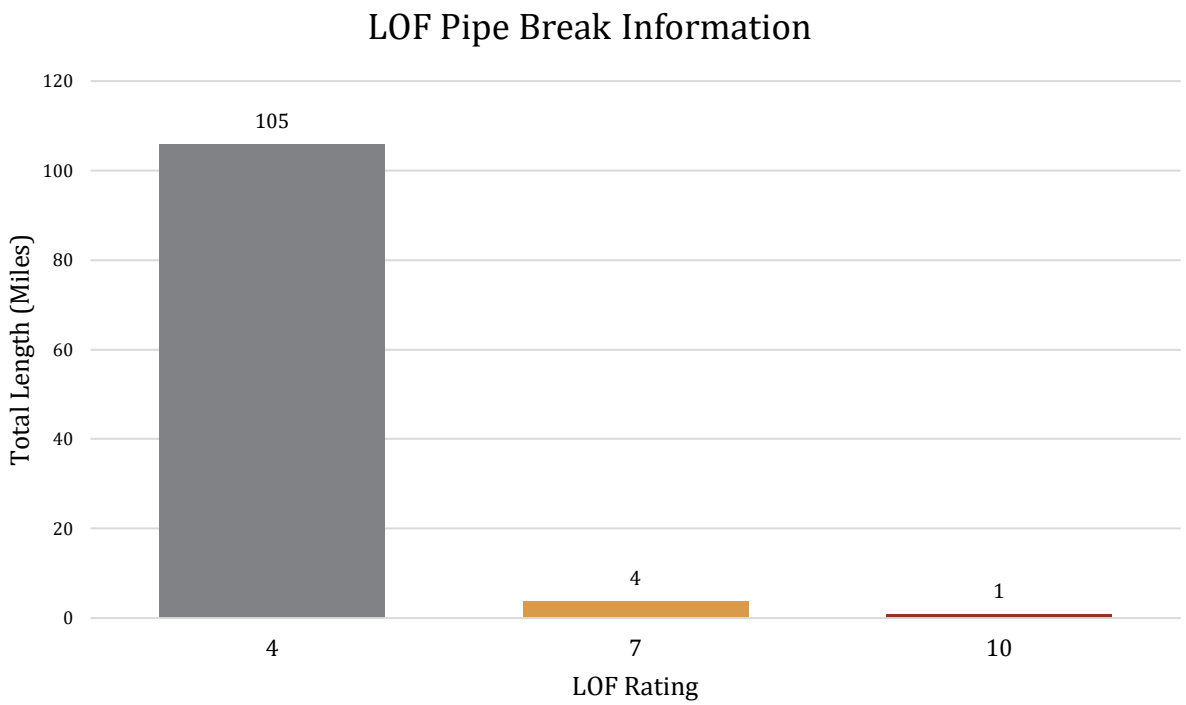


Figure B4-32: Force Main LOF for Pipe Break Information

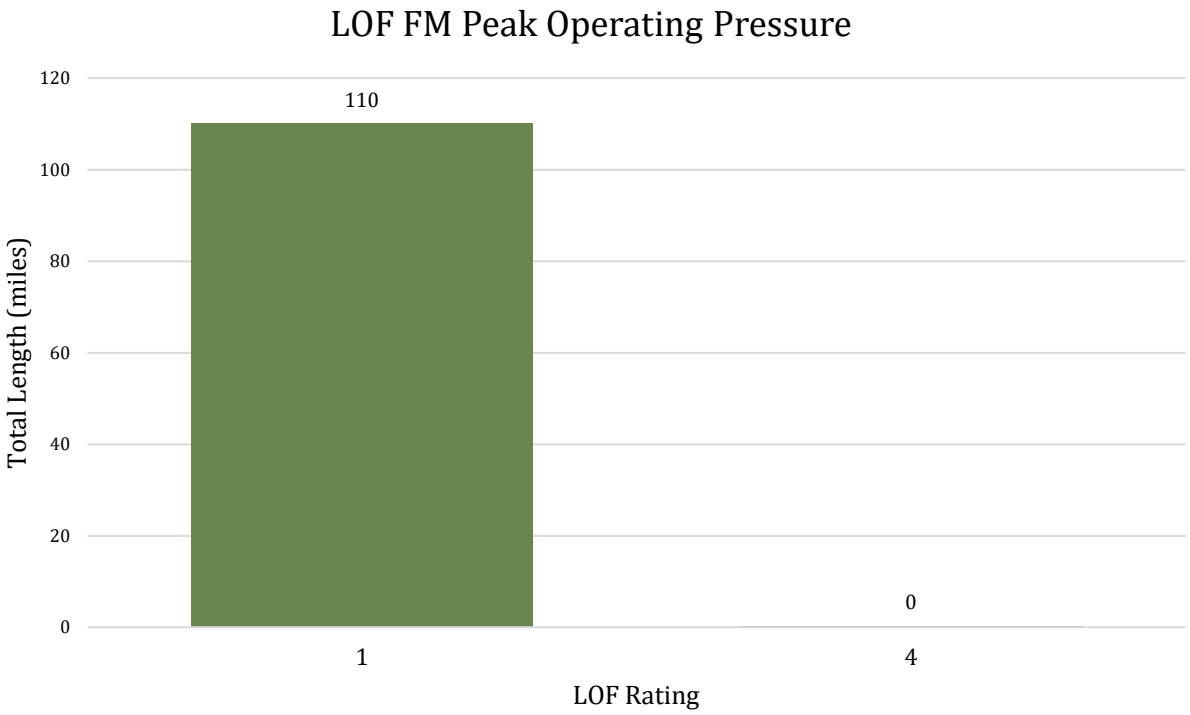


Figure B4-33: Force Main LOF for Force Main Peak Operating Pressures

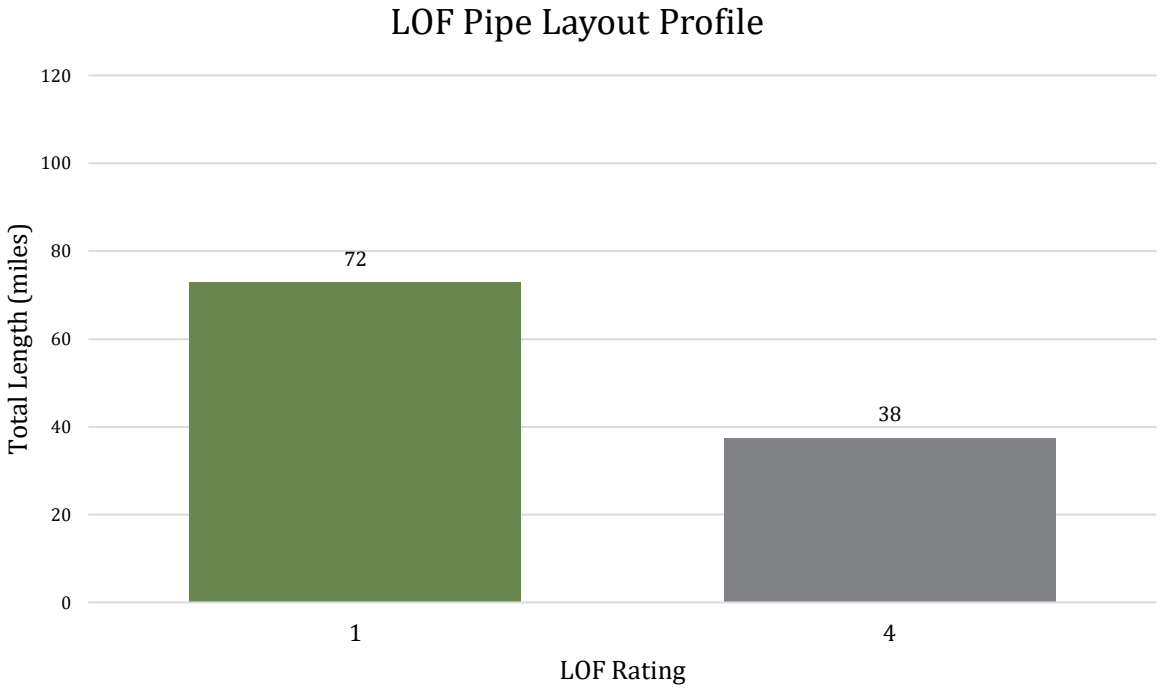


Figure B4-34: Force Main LOF for Pipe Layout Profile

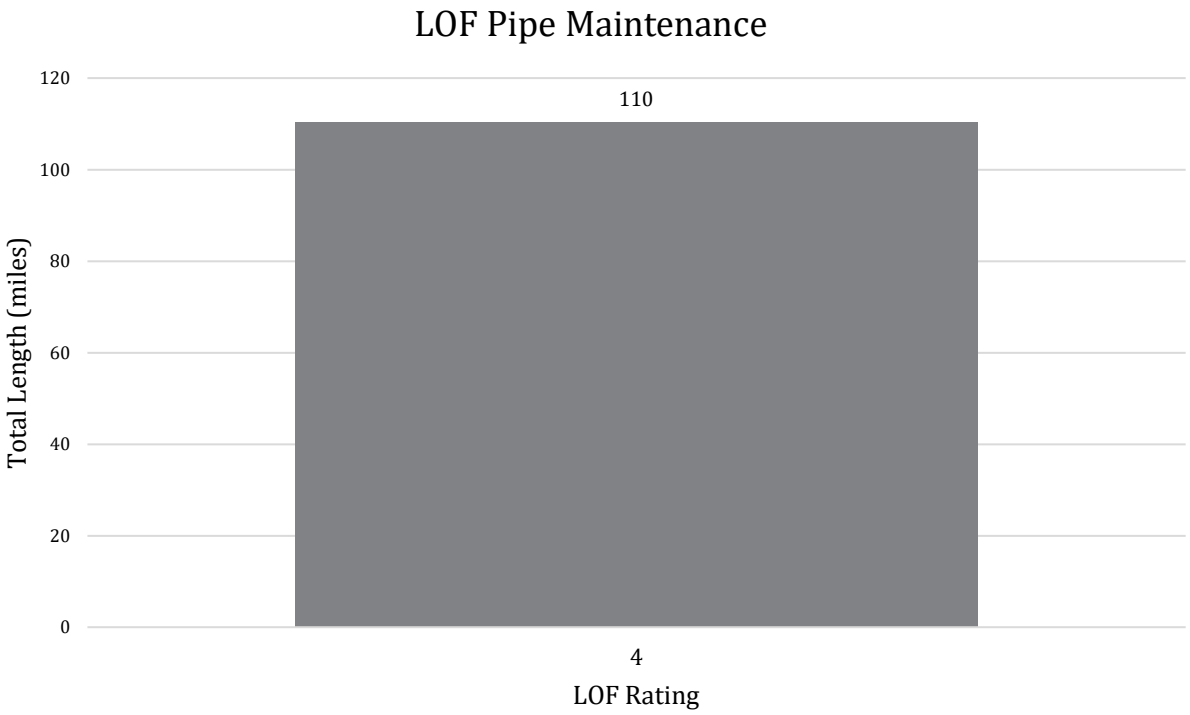


Figure B4-35: Force Main LOF for Pipe Maintenance

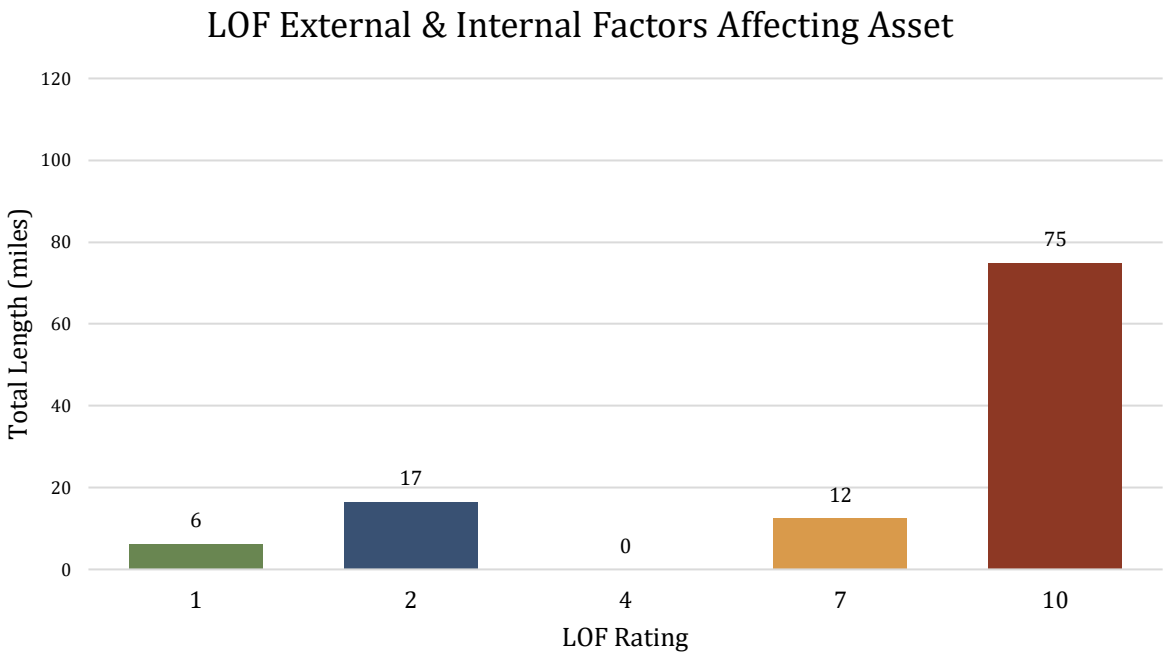


Figure B4-36: Force Main LOF for External & Internal Factors Affecting Asset

Using the various LOF scores and the weighting factors from **Table B4-13** and **Table B4-14**, an overall LOF score was calculated for all force mains in the network. **Figure B4-37** shows the scores and miles of force main in the system that account for each range of the LOF scores. The ranges of LOF scores were as follows: 1.9 to 3.7 indicates a low LOF (minimum value to 40th percentile), 3.7 to 5.5 indicates a moderate LOF (40th percentile to 90th percentile), and 5.5 to 6.8 is considered a high LOF (90th percentile to maximum LOF). **Appendix BH** shows a map of all the force mains in the network color coded with their calculated LOF score.

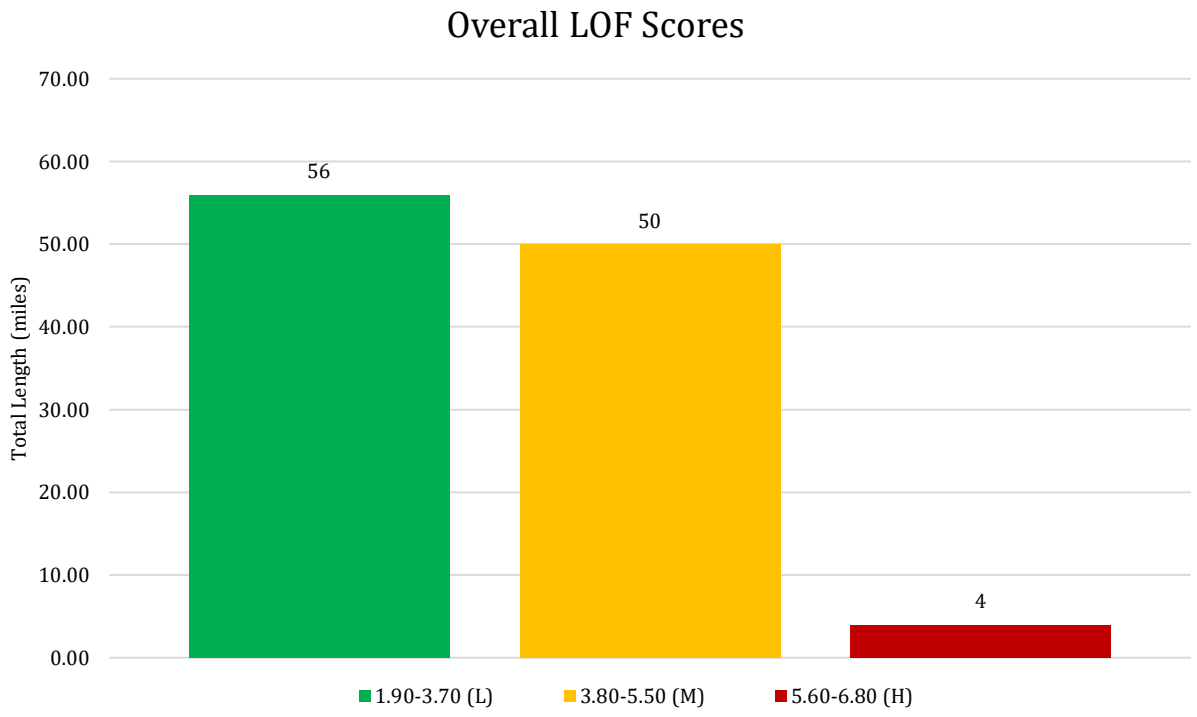


Figure B4-37: Force Main Overall LOF Score

B4.3.2Consequence of Failure Score

The COF parameter represents the consequences to the City and to the environment, as well as to the community and its socioeconomic functions. The COF criteria evaluated were:

- Pipe diameter: As pipe diameter increases, the volume of a spill increases, which increases the community impacts.
- Proximity to potable water wellfield or private water wells: If a force main breaks and it is near a potable water wellfield or private water well, the potential for cross-contamination and community impacts are greater.
- Residential and essential services impact: Force mains that are near a hospital, school, downtown area, or convention center that would cause shutdowns or boil water orders when a break occurs are the most critical. Additionally, as the density of residential areas

increases, a pipe break will impact more people; as such, the COF increases with residential density. Proximity to a waterway was also factored into the COF score, as a spill into a waterway reduces the quality of life within the area of the spill.

- System reliability: If a pipe has redundancy or a way to re-route flow through another system, then the COF is lower than for a pipe that does not have a way to re-route flow.
- Financial impact on utility: The financial impact to the utility is correlated with the direct failure cost of the pipeline. As the cost of repairing a pipeline increases, the utility often experiences increasing layers of approval to perform repair work, which can increase the indirect failure costs.
- Community impact: Community impact COF is determined by looking at the effects of a pipe break on the community, such as road closures, negative news media coverage, and odor complaints.
- Environmental compliance: The environmental compliance COF is based on the environmental impacts of a spill, including the spill volume. The volume of a spill is directly related to penalties outlined in the CO, with increasing penalties as the spill volume increases.

A workshop was held with City staff to determine the weighting factors for each COF category as presented in **Table B4-15**.

Table B4-15: Force Main Consequence of Failure Category Weighting Factor

COF	Weight
Pipe Diameter	10%
Proximity to Potable Water Wellfield or Private Water Wells	11%
Residential and Essentials Services Impact	17%
System Reliability	21%
Financial Impact on Utility	7%
Community Impact	14%
Environmental Compliance	20%

Based on information from the City's GIS, as-built records and institutional knowledge provided by key personnel, COF scores were assigned to each pipe segment using the scoring criteria presented in **Table B4-16**.

Table B4-16: Force Main Consequence of Failure Scoring Criteria

Consequence Category	Negligible = 1	Low = 4	Moderate = 7	Severe = 10
Pipe Diameter	•<8 inches	• ≥8 and <24 inches and unknown	• ≥24 and <42 inches	• ≥42 inches
Proximity to Potable Water Wellfield or Private Water Wells	•No well located within 1-mile radius	• Well located within 0.5-mile to 1-mile radius	• Well located within 0.25-mile to 0.5-mile radius	• Well located within 0.25-mile radius
Residential and Essential Services Impact	•No essential service facility nearby •Only low-density residential will be impacted •Proximity to waterway greater than 1/8 mile and low-density residential	• Discharge to canal or another waterway will be possible • Medium-density residential will be impacted • Proximity to waterway within 1/8 mile and low- or medium-density residential	• Moderate priority essential services, such as railway, port, and industrial area, will be impacted • High-density residential area will be impacted • Highway crossing impacted • Tourist and commercial areas, such as marinas, hotels, beaches, and parks will be impacted • Proximity to waterway within 1/8 mile and railways, ports, industrial, and/or high density residential	• High-priority essential service, such as hospitals, schools, or downtown areas and convention centers, will be impacted • Proximity to waterway within 1/8th mile and high priority essential service
System Reliability	•Pipe has redundancy if greater than 24 inches in diameter •No sanitary sewer overflows have occurred •Rerouted average dry weather flow is less than 2 mgd (1,400 gpm)	• Pipe has limited redundancy, but there is an ability to reroute flow elsewhere in system during repair • Rerouted average dry weather flow is 2 mgd (1,400 gpm) or more and less than 4 mgd (2,800 gpm)	• Pipe has limited redundancy with difficulty to re-route flow elsewhere in system during repair • Rerouted average dry weather flow is 4 mgd (2,800 gpm) or more and less than 7 mgd (4,900 gpm)	• Pipe has no redundancy and no ability to re-route flow elsewhere in the system during repair • Rerouted average dry weather flow is 7 mgd (4,900 gpm) or more
Financial Impact on Utility	• Direct failure cost is less than $25,000	• Direct failure cost is $25,000 or more but less than $50,000	• Direct failure cost is $50,000 or more and less than $100,000	• Direct failure cost is $100,000 or more

Table B4-16: Force Main Consequence of Failure Scoring Criteria

Consequence Category	Negligible = 1	Low = 4	Moderate = 7	Severe = 10
Community Impact	• Minor disruption; no narrow streets will impede repair • Minor service interruption; service restored without public reaction	• Minor disruption; no narrow streets will impede repair • Minor service interruption; service restored without public reaction	• Substantial but short-term disruption will occur due to narrow streets • Localized impacts on prominent businesses or residences	• Long-term impact will occur • Area-wide disruption will occur • Disruptive impacts to multiple prominent businesses or residences will occur • Public will express dissatis-faction with utility services
Environmental Compliance	• Volume of unauthorized discharge is less than 6,972 gal	• Volume of un-authorized discharge is 6,972 gal or more and less than 13,917 gal	• Volume of unauthorized discharge is 13,917 gal or more and less than 100,023 gal	• Volume of unauthorized discharge is 100,023 gal or more

gal = gallons
gpm = gallons per minute
mgd = million gallons per day

Figure B4-38 through **Figure B4-44** present the COF scores for each scoring criteria listed in Table B4-16. These figures also show the miles of force main in the system that account for each of the COF scores.

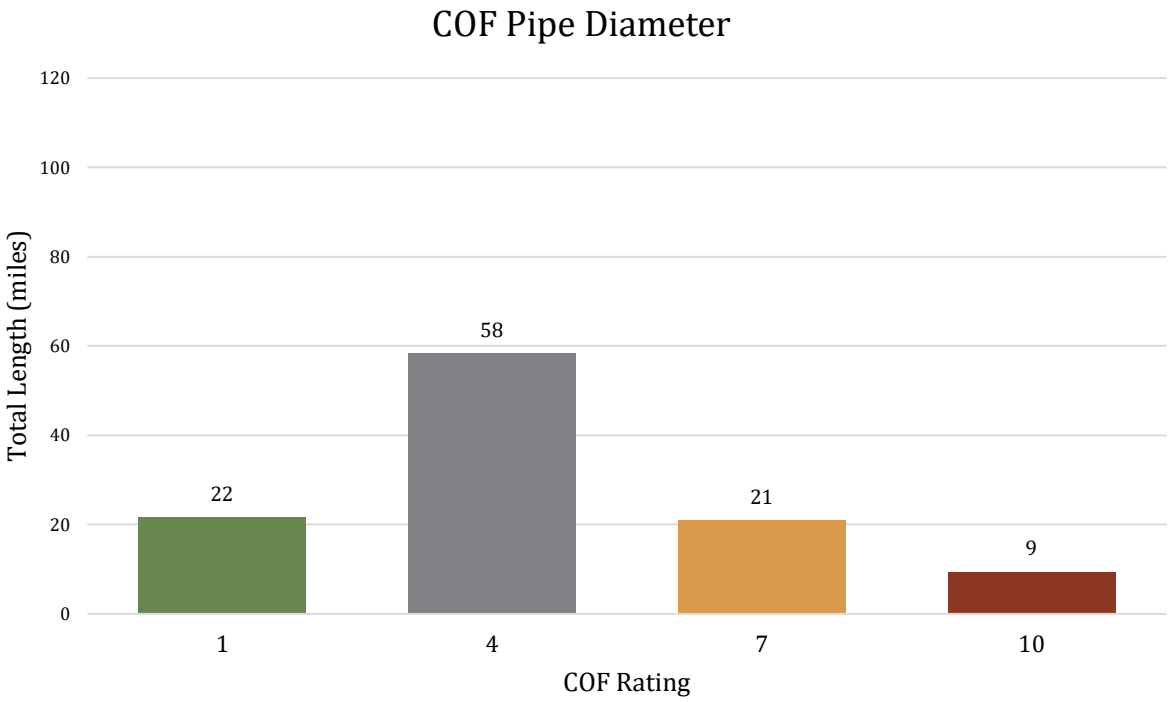


Figure B4-38: Force Main COF Scores for Pipe Diameter

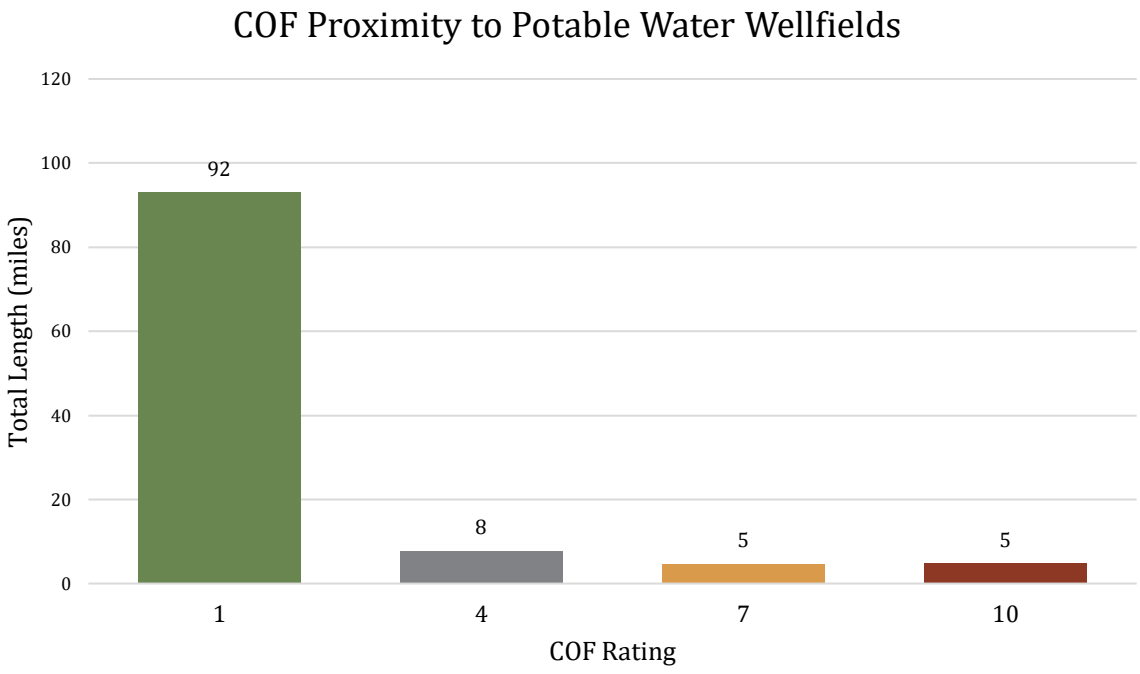


Figure B4-39: Force Main COF Scores for Proximity to Potable Water Wellfields

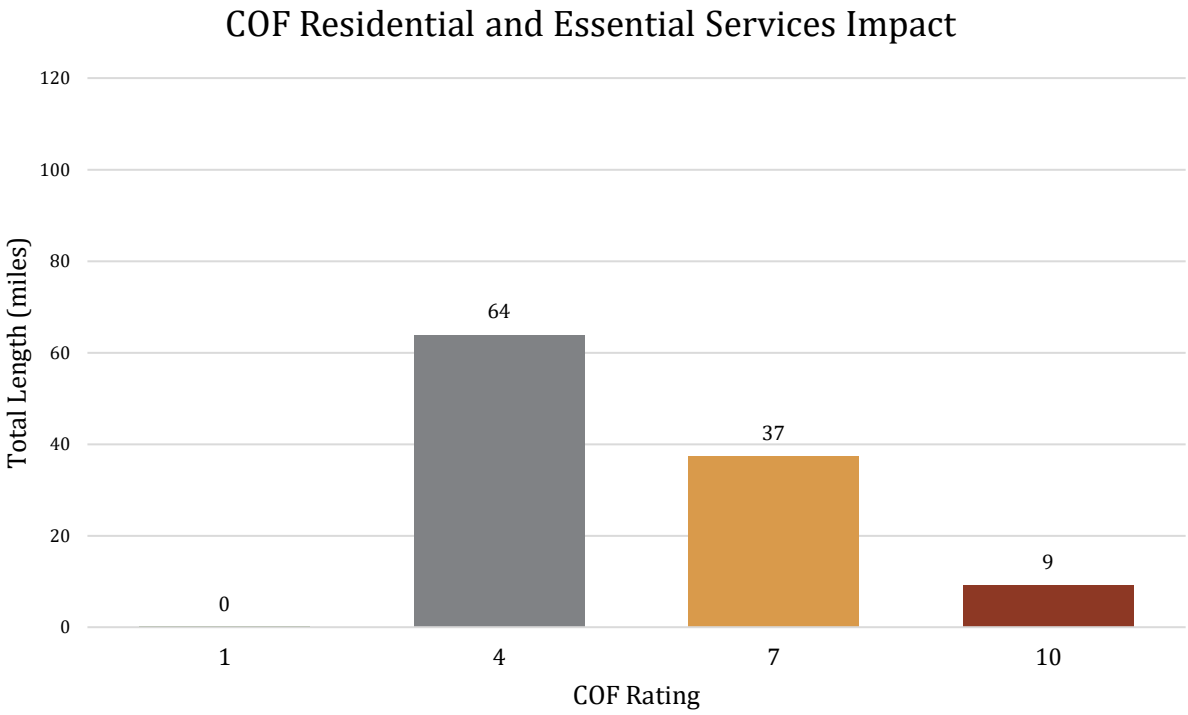


Figure B4-40: Force Main COF Scores for Residential & Essential Services Impact

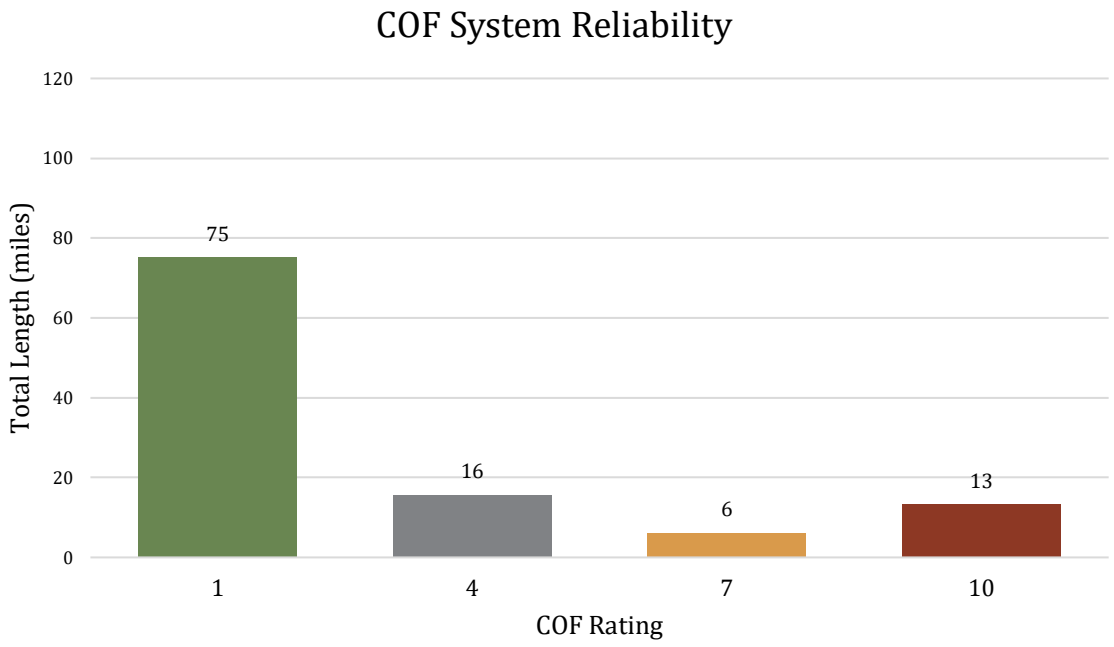


Figure B4-41: Force Main COF Scores for System Reliability

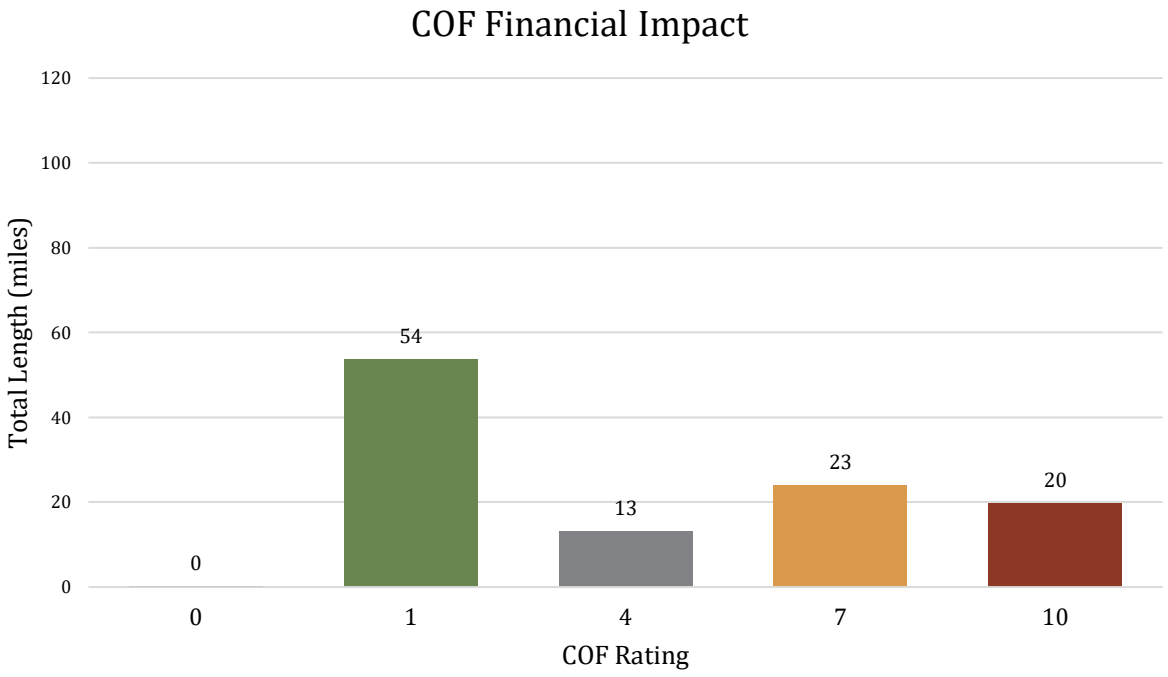


Figure B4-42: Force Main COF Scores for Financial Impact on Utility

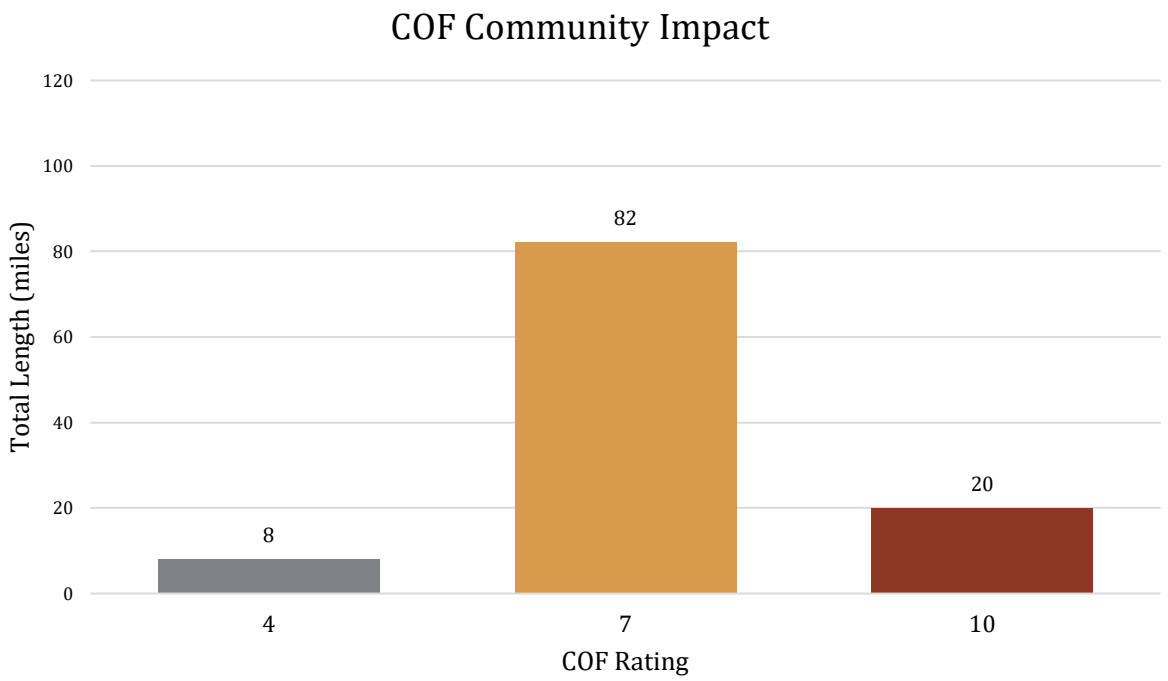


Figure B4-43: Force Main COF Scores for Community Impact

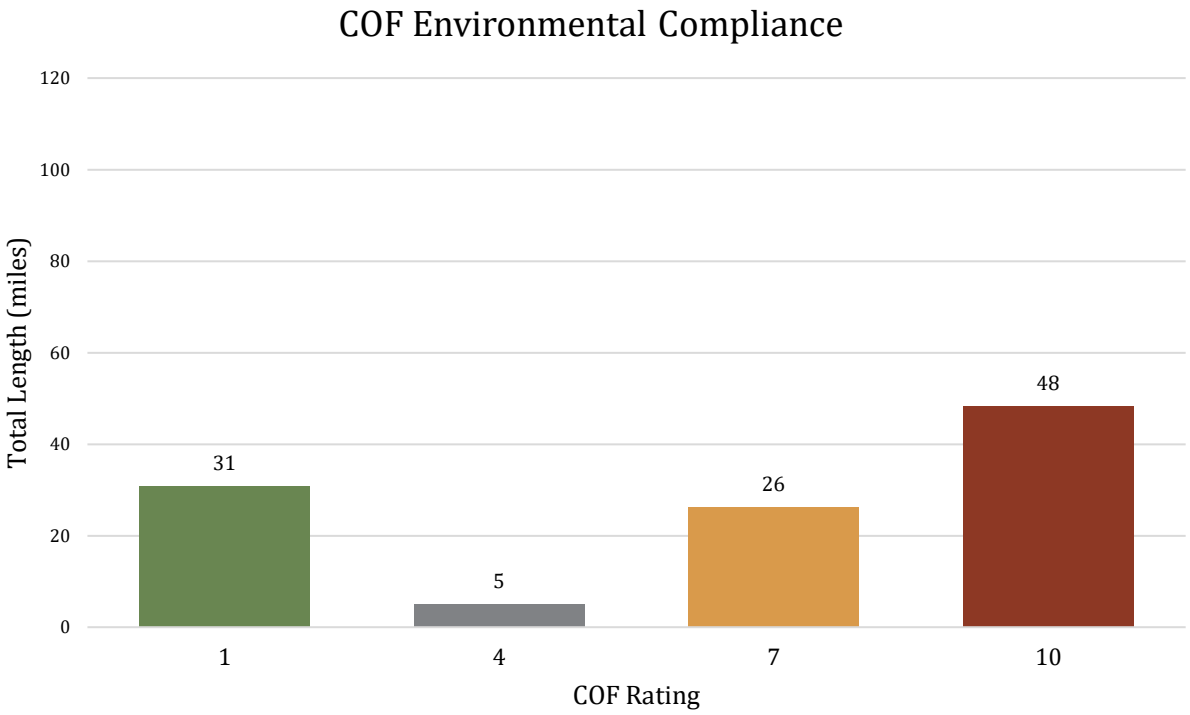


Figure B4-44: Force Main COF Scores for Environmental Compliance

Using the COF scores shown in the preceding figures and the weighting factors from **Table B4-15** and **Table B4-16**, overall COF scores were calculated for the City-owned force mains in the network. **Figure B4-45** shows the scores and miles of force main in the system that account for each of the COF scores. The ranges of COF scores were as follows: less than 3.30 indicates a low COF (minimum value to 40th percentile), 3.3 to 7.6 indicates a moderate COF (40th percentile to 90th percentile), and greater than 7.6 is considered a high COF (90th percentile to maximum COF). **Appendix BI** shows a map of all the force mains in the network color coded with their calculated COF score.

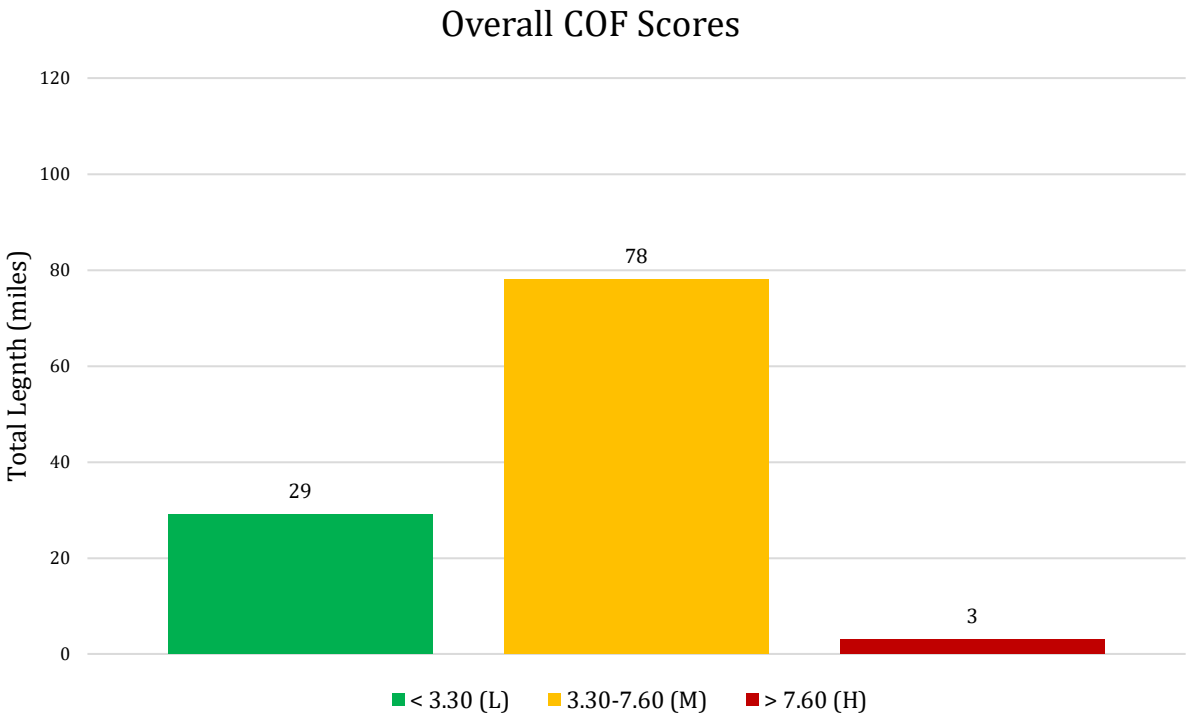


Figure B4-45: Force Main Overall COF Score

B4.3.3Risk Score

Using the LOF and COF scores for each force main segment, a risk score was calculated using the formula defined in the FMCA Plan (risk score = LOF x COF). To summarize the Risk Assessment, **Figure B4-46** shows the factors that influence the overall Risk Score. **Figure B4-47** shows the risk score prioritization based on LOF and COF scored presented in the FMCA Plan. **Figure B4-48** shows the miles of force main in the system corresponding to each Risk Score. **Appendix BJ** includes a map showing the overall risk scores calculated for the force mains, color coded with the corresponding risk score.

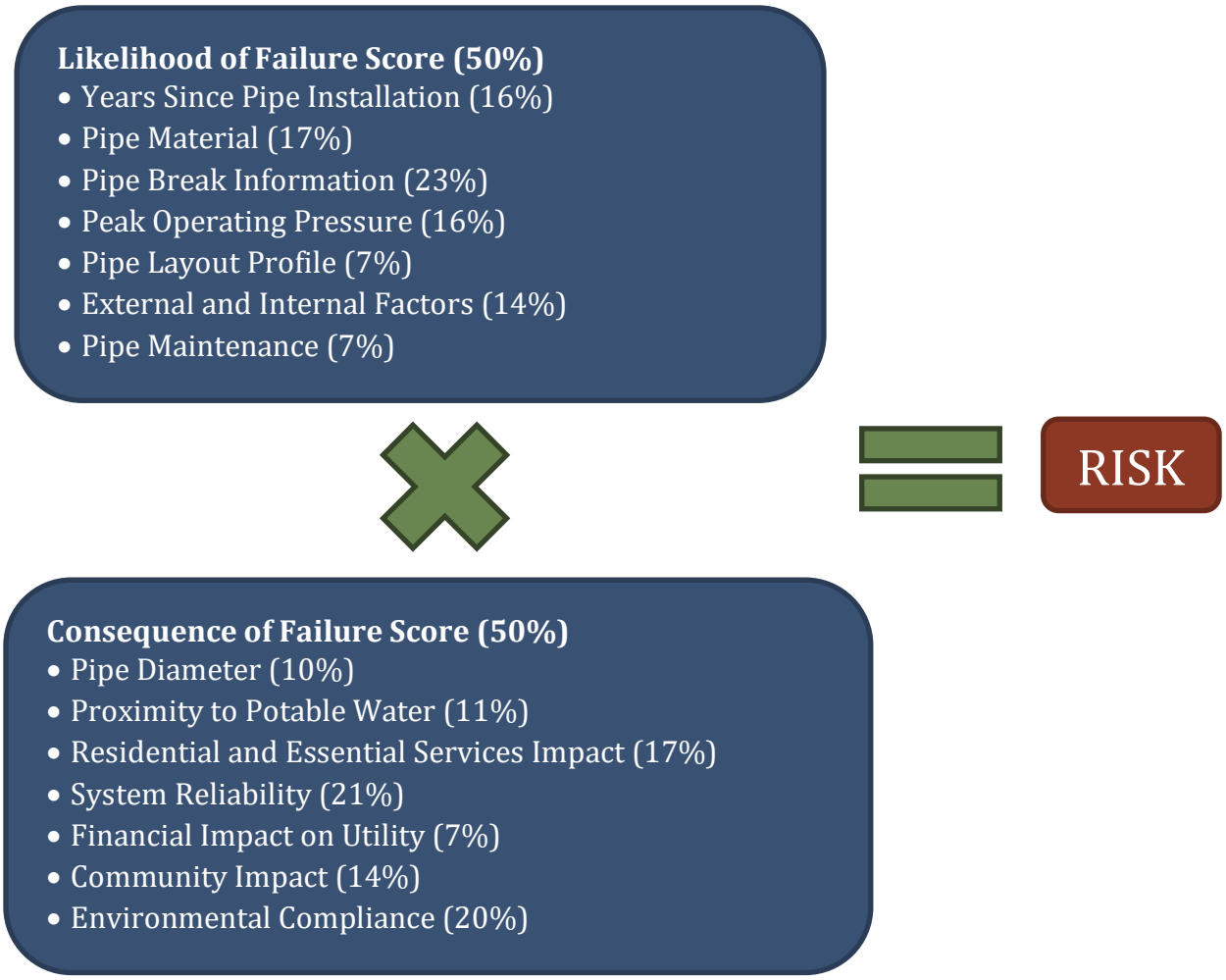


Figure B4-46: Force Main Risk Score Breakdown

POF \ COF	1	4	7	10
1	1	4	7	10
2	2	8	14	20
4	4	16	28	40
7	7	28	49	70
10	10	40	70	100

1 - 4	Low Risk Priority
4 - 28	Medium Risk Priority
28 - 100	High Risk Priority

Figure B4-47: Force Main Risk Score Prioritization Matrix

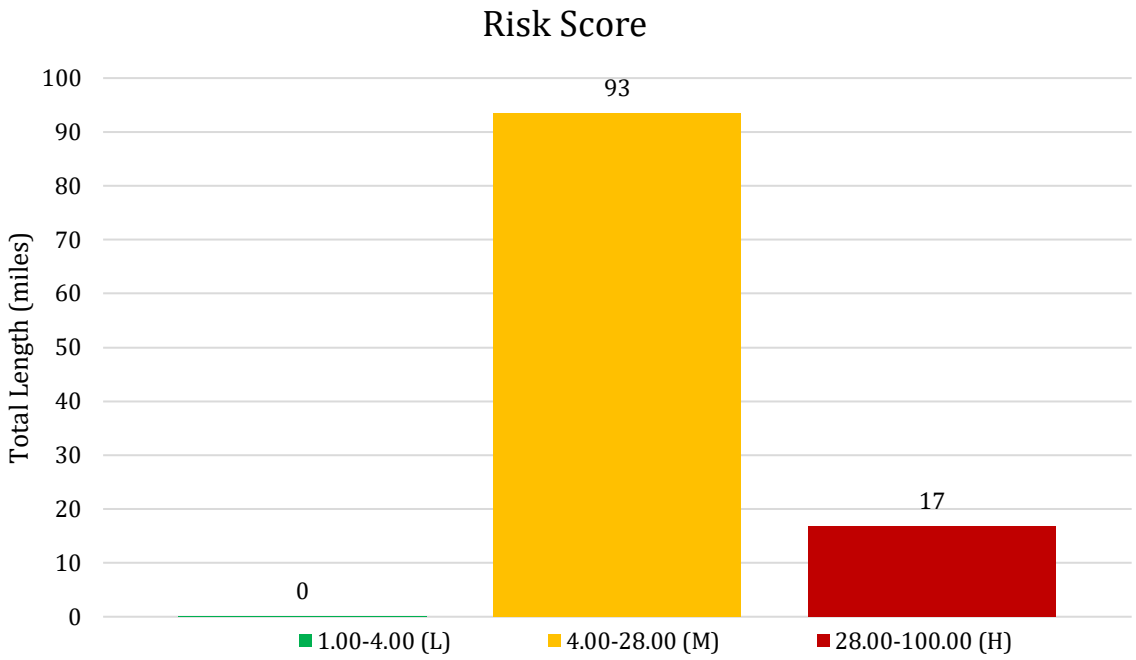


Figure B4-48: Force Main Risk Scores

B4.3.4 Force Mains Condition Assessment Report Recommendations

Based on the desktop evaluation and Tier 1 condition assessment performed, the FMCA Report recommended the following:

- Approximately 7.1 miles of FM to be included in Phase II of the CO for replacement or rehabilitation.
- Approximately 13.1 miles of FM to be added to the City's Community Investment Plan for future rehabilitation or replacement.

Appendix BK includes a map showing the recommended future work based on the FMCA.

Section B5

Repair, Upgrade, and Replacement Program

B5. Collection System Repair, Upgrade, and Replacement Program

B5.1 Repair and Replacement Needs Identification and Prioritization

The goal of this section is to describe how repairs, upgrades, and replacement of Collection System assets will be determined, prioritized, authorized, and funded. Most collection system assets have relatively long service lives. Therefore, predicting when an asset might fail is a very challenging task. However, this information is needed to properly identify, plan, and fund asset renewal for the near term and long term. High-level information on asset condition can be estimated or inferred based on various factors such as age, material or other considerations, which was already done as part of the risk analysis described in Section 4. However, this high-level assessment cannot be used by a utility to determine the specific funding needs and timing of asset renewal. What is needed is a more detailed condition assessment for assets to better inform remaining useful life.

The primary role of the desktop risk assessment, as described in Section 4, is to help inform and prioritize the condition assessment of assets so that better capital decisions can be made. Due to their high criticality and known elevated risks of failure, the **force mains** have been given initial priority for condition assessment, which is described in the Force Main Condition Assessment section. For other assets, a more detailed Continuous Sewer Assessment Program (CSAP) will be developed as described in the CMOM report, Section A5.1. The CSAP will further outline a long-term inspection program along with decision trees for next actions such as re-inspection, repair, or replacement. Cityworks, which is currently being implemented for the collection and transmission system assets, will serve as a critical tool in answering the “when” of asset renewal.

To optimize its capital investments, a utility must endeavor to ensure that capital investment decisions represent the right solutions at the right time. Capital investments in wastewater infrastructure are generally significant long-term investments with significant long-term consequences, and accordingly the decision-making process relies on careful evaluation to ensure that good and cost-effective decisions are consistently made.

The City has the goal of optimizing decisions concerning how collection system repairs, upgrades, and replacements will be identified, prioritized, authorized, and funded. It is important to note that the process of knowing when to replace assets is one of continuous improvement. The effort to refine predictions for asset life evolves as more data are obtained. This is why it is important to prioritize inspection on the highest risk assets.

Following is the order of activities needed to achieve the stated goals of this section:

1. Desktop risk assessment

2. Asset valuation
3. Condition assessment (structural and capacity)
4. Residual life assessment
5. Asset renewal capital improvement program planning prioritized by LOF and COF
6. Prioritized repair, upgrade and replacement program implementation

As mentioned above, the activities will be performed as part of a continuous improvement process and do not represent a one-time effort. Each phase in the process is briefly described below.

B5.2 Desktop Risk Assessment

Risk and criticality are concepts used within asset management to help prioritize repair, renewal, or replacement of existing assets and/or installation of new assets. Since not all projects can be constructed at the same time, the level of risk or the critical nature of a specific asset can help determine how long an organization can wait to repair, renew, or replace it versus doing something with another asset in the same condition.

A risk assessment was performed for the gravity sewer system, pump stations, and force mains. The risk assessment includes components for LOF and COF as well as overall risk, which is a combination of LOF and COF. The LOF component is based on best available condition data, and inference to non-inspected assets is made based on available data concerning the asset's physical attributes as well as operation and maintenance history. The results of this analysis are intended to inform the development of a prioritized condition assessment program for each asset class. Section 4 of this report presents the results of the risk assessment to date.

B5.3 Asset Valuation

Asset valuation is important since it provides an understanding of the overall replacement cost for the entire system. Section 3 describes the asset valuation that was done as part of developing the AM-CMOM program. These results can be used to help inform funding needs for long-term capital investments. Short- and long-term funding analyses can be done using this information, although the level of accuracy of that assessment is a function of the accuracy of the condition data. Very high-level funding assessments can be done using inferred condition data, but the results need to be interpreted appropriately and with caution.

B5.4 Condition Assessment

As mentioned previously, the next step is to conduct ongoing and prioritized condition assessments. Condition assessment has both structural and capacity components. The Capacity Evaluation and the resulting hydraulic model developed as part of the CO implementation is a powerful tool that will be used and refined long-term to inform capacity. The risk analysis conducted as part of Section 4 will inform where and when structural condition assessments occur. The force main condition assessment program has been developed, while the other

collection and transmission system asset assessment plans will be developed as part of the implementation of the AM-CMOM Program through the development of the CSAP. The overall strategy is to assess the most critical assets first. Information from the condition assessments will be entered into Cityworks once it is fully functional.

It is important to note that the City has already been conducting a significant amount of condition assessments on the gravity system as part of the SSES program. The development of the CSAP will also inform annual budgeting, staffing, and equipment needs to implement the ongoing program. Another key component of the strategy is that once assets are inspected, a decision tree will be developed to identify the next action and when it will be performed. The next action could be to rehabilitate, replace, or inspect the asset again in a specified number of years. This information can then be entered into Cityworks in the form of future work orders.

B5.5 Residual Life Assessment

Remaining Useful Life (RUL) is an estimate of the number of years that an asset (or group of assets) is reasonably expected to continue to be functional for its intended purpose. The estimated RUL is ideally determined through a condition assessment, which also includes capacity considerations. High-level RUL estimates can be also conducted by subtracting the asset's age from its expected useful life (EUL) or design life. There are no standards for the EUL of the collection system and transmission system assets, but there are some resources that provide ranges of values. These values should be used with care as the actual EUL of sewer assets are greatly impacted by in-situ conditions. While this approach can provide some general insights into the timing and long-term funding levels of improvements, it is not well-suited for detailed capital planning. The City may utilize a high-level analysis as an initial "look-ahead" but more detailed condition data are needed to better inform actual needs. Regardless, it is important to note that there is always an element of uncertainty regarding the RUL even with condition data. This uncertainty becomes important when planning asset renewal.

Since the actual useful life of an asset is impacted more by condition than by age, a prioritized condition assessment program could potentially benefit overall planning and financial management by providing better information related to scheduling of repairs, rehabilitation, or replacement. This could also affect decisions concerning a change in the required corrective action as time moves on. In the case of a pipe, for example, a point will come when replacement rather than rehabilitation may be needed and the lower cost alternative is no longer feasible.

B5.6 Asset Renewal Capital Improvement Program Planning Prioritized by LOF and COF

As condition data are obtained, decisions will be made regarding the next action for assets and the timing of those actions. The action and timing selected will be a function of the risk analysis. For example, an asset may be rehabilitated or replaced sooner than another with a lower estimated RUL because the COF may dictate that the remaining uncertainty in RUL is not worth the risk. The City will use software tools to help inform this planning. Currently the City is

planning to utilize a tool called Assetic Predictor®, which leverages condition data from Cityworks and COF values to forecast the timing and cost of improvements. The model can evaluate multiple scenarios to inform risk associated with various asset renewal plans and strategies. However, the development of a detailed plan still comes down to proper engineering review of the results and available funding considering other needs. It is emphasized that proper decisions will be made based on risk when prioritizing assets for repair and renewal. For example, force main failures will generally have a higher priority given the consequence of failure for force mains versus gravity sewer assets. Similarly, priority status will also be informed by assets identified as critical in the City's Master Plan.

The combination of condition data and risk modeling will empower the City to make prioritized and informed near-term and long-term capital planning and funding decisions, and decisions will become more robust as better condition data are obtained.

B5.7 Prioritized Repair, Upgrade and Replacement Program Implementation

The next step is to implement the repair and replacement program as part of the City's standard Capital Improvement Program (CIP) planning process. The goal is to take the results of the risk analysis by asset and bundle assets together to develop specific CIP projects. The development of project bundles can be informed by tools such as Assetic Predictor®, but these tools are decision support tools only and do not deliver the final decisions. The final decisions will be made by staff as part of the larger CIP process. Project priorities and timing will be informed by utility-wide priorities and needs across asset classes beyond just collection and transmission assets. Funding for the asset renewal projects will be done in accordance with City policies and procedures.

Appendix BA
Level of Service Metrics

No.	Metric	How Calculated	Data Source(s)	Frequency of Measurement	Priority (1 / 2 / 3)	Responsible Person	Target Value	Benchmark Available (Yes / No)	Metric Source
1. Product Quality									
	Sewage Overflow Rate. Records the rate of untreated sewage discharges, expressed as the total number of SSOs per 100 miles of system piping.	Number of SSOs per 100 miles of pipe.	Event reporting forms. GIS. Cityworks.	Monthly	1	Larry Teich		Yes (AWWA)	1
	Consent Order SSO Compliance. Reported number of SSOs per a certain period, and associated financial penalties.	Number of SSOs per quarter. Penalties in $ ÷ Number of SSOs.	Event reporting forms. FDEP communications. Cityworks.	Semi-annually	1	Larry Teich		No	
2. Customer Satisfaction									
	Average Time to Address Incidents or Complaints. Records the average response time following notification of a complaint or incident requiring assessment and/or action by utility personnel. The response time begins at the time notification is received via a customer or other source, and ends when sewer department staff arrives at the necessary location.	Average time from notification to arrival on scene of personnel.	Citworks.	Monthly	2	Donna McMahon		Yes (AWWA)	2
	First call resolution (%).	100 X (number of calls for which problem addressed on the first call ÷ total number of calls).	QAlert. Cityworks.	Monthly	2	Donna McMahon		Yes (AWWA)	1
	Overall customer satisfaction. Percent of positive or negative customer survey responses using a statistically valid or after-service survey. Surveys can focus on product quality, service reliability, billing accuracy, customer service, costs/rates/value, crew courtesy, and notification around street construction/service interruptions.	Dependent on structure of survey.	Survey responses.	Annually	2	Donna McMahon		Yes (AWWA)	1
3. Stakeholder Understanding and Support									
	SSO Reporting Compliance. Records the total number of failures to meet on-time regulatory reporting requirements.	Number of failures to report on time per selected period.	Event reporting forms.	Monthly	1	Larry Teich		No	2
	Wastewater Utility Spill/Abnormal Event Reports. Records the number of reportable events during a selected time period.	Number of event reports per selected period.	Event reporting forms. Cityworks.	Monthly	1	Larry Teich		No	
	Service Affordability. Records cost of service in relation to other local utilities.	Benchmarking with local utilities.	Rate comparisons.	Annually	2			Yes (benchmark by nature)	1
4. Financial Viability									
	Capital Expenditure (%).	100 x (Capital expenditures ÷ Capital budget).	Financial information system.	Annually	2			No	
	O&M Expenditure (%).	100 x (O&M expenditures ÷ asset value).	Financial information system.	Annually	2			No	
	R&R Program (%).	100 x (Annual expenditures ÷ Annual budget).	Financial information system.	Annually	2			No	
	R&R Program (Equipment Replacement).	Equipment replaced on schedule ÷ Equipment beyond scheduled replacement (Note 1).		Annually	2			No	
5. Operational Optimization									
	O&M Cost per Volume of Wastewater Delivered. Cost of pumps stations and linear system versus MGD conveyed to plant.	O&M Cost per Million Gallons Conveyed.	Cityworks. Financial Information System.	Annually	1			No (AWWA tracks by length of pipe)	
	O&M Cost per Volume of Wastewater Processed. Cost of WWTP and effluent disposal operations versus MGD processed.	O&M Cost per Million Gallons Processed.	Financial information system. WWTP DMRs.	Annually	1			Yes (AWWA)	
	Energy Use per Volume Processed.	KWH per Million Gallons Processed.	Abi? WWTP DMRs.	Annually	1			Yes (AWWA)	
6. Employee and Leadership Development									
	Employee Turnover. Can be refined to focus on causes of turnover including retirement, dismissals, and voluntary turnover (employment by other utility employment by private sector). Can be tracked by organizational unit as well.	Number of employee departures per selected period.	Human Resources.	Annually	2			Yes (AWWA)	1
	Certification coverage (percent). 100 X (number of certifications achieved or maintained ÷ number of needed certifications per year).	Number of certifications achieved or maintained per selected period.	ISO 9001 QMS Master Spreadsheet.	Annually	3			No	1
7. Enterprise Resiliency									
	OSHA-Recordable Injuries. Records the number of OSHA-recordable injuries during a selected time period. OSHA injury definitions may provide a useful reference regardless of OSHA jurisdiction.	Number of OSHA-recordable injuries per selected period.	Human Resources.	Annually	1			Yes (AWWA)	3
	Critical parts and equipment inventory. Longest lead time (hours or days) for repair or replacement of operationally critical parts or equipment.	Calculated by examining repair and replacement lead times for all identified critical parts and equipment and taking the longest single identified time.		Annually	1			No	1
8. Infrastructure Strategy and Performance									
	Wastewater Treatment Plant (WWTP) Dry Weather Influent BOD. Provides an indicator for system-wide, dry weather infiltration.	Monthly average dry day influent BOD (mg/L).	WWTP DMRs.	Monthly	2			No	
	Rainfall Dependent Infiltration and Inflow (RDII) Rate. Establishes a relationship between influent WWTP flow and rainfall quantity to indicate collection system RDII. Can be expressed using wet weather flow (total WWTP flow less daily dry weather flow).	Total WWTP flow less average dry weather flow ÷ rainfall in inches.	WWTP DMRs.	Monthly	2			No	
	Collection System Inspection Rate (%). Records the length of collection system cleaned and televised annually as a percentage of the total system length.	100 x (LF cleaned and televised ÷ LF of total system).	Cityworks.	Annually	1			Yes (AWWA)	2
	Collection System Inspection Rate (Manholes). Records the number of manholes inspected annually as a percentage of the total system manholes.	100 x (Manholes inspected ÷ Manholes in total system).	Cityworks.	Annually	1			Yes (AWWA)	2
	Force Main Integrity. Expressed as number of breaks per 100 miles of pipe.	Number of breaks per 100 miles of pipe.	Event reporting forms. GIS. Cityworks.	Annually	1			No	2, 3
	Preventive/Corrective Maintenance Ratio. Records preventive versus corrective maintenance in terms of dollars spent or numbers of work orders. Preventive maintenance is defined as planned, whereas corrective maintenance is defined as unplanned or emergency-related.	Preventive maintenance in $ ÷ Corrective maintenance in $ (Note 2).	Cityworks.	Quarterly	2			No (AWWA tracks time not $)	2
	Asset renewal/replacement rate (percent) for gravity system, pump stations, and force mains. 100 X (total number of assets replaced per year for each asset class ÷ total number of assets in each asset class).	100 X (Number of assets replaced ÷ Number of assets in asset class).	Cityworks.	Annually	2			Yes (AWWA)	1
	Asset renewal/ replacement rate (%); 100X (total number of assets replaced per year / total number of asset)... (R &R program)								
	Air Release Valve (ARV) Inspection and Testing Rate (%). Records the number of ARVs inspected and tested annually as a percentage of the total number of ARVs in the system.	100 X (Number of ARVs inspected and tested ÷ Number of ARVs in total system).	Cityworks.	Annually	1			No	
	In-Line Valve Inspection and Testing Rate (%). Records the number of in-line valves inspected and tested annually as a percentage of the total number in the system.	100 X (Number of valves tested ÷ Number of valves in total system).	Cityworks.	Annually	1			No	
	GIS Asset Attribution Rate (%). Records the assets with full attribution in GIS as a percentage of the total system assets.	100 X (Number of assets with full attribution in GIS ÷ Number of assets in total system).	GIS.	Annually	3			No	

	A	B	C	D	E	F	G	H	I	J
2	**No.**	**Metric**	**How Calculated**	**Data Source(s)**	**Frequency of Measurement**	**Priority (1 / 2 / 3)**	**Responsible Person**	**Target Value**	**Benchmark Available (Yes / No)**	**Metric Source**
41		**Preventive Maintenance (PM) Work Order Completion Rate (%).** Records the PM work orders completed on time as a percentage of the total PM work orders scheduled.	100 X (Number of PM work orders completed on time ÷ Number of PM work orders scheduled).	Cityworks.	Annually	2			No	
42		**Condition Assessment Coverage, Collection/Transmission (%).**	100 X (number of assets assessed ÷ total number of assets).	Abi?	Annually	2				
43		**Condition Assessment Coverage, Plant Equipment (%).**	100 X (number of assets assessed ÷ total number of assets).	Abi?	Annually	2				
44	**9. Community Sustainability**									
45		**Service Affordability.** Records cost of service in relation to other local utilities.	Benchmarking with local utilities.	Rate comparisons.	Annually	2			Yes (benchmark by nature)	1
46		**Bill affordability (%).** Median household income.	Average residental water bill ÷ Median household income	Cayenta. Census bureau income data (American Community Survey).	Annually	2			Yes (AWWA)	2
47		**Bill affordability (%).** Lowest quintile household income.	Average residental water bill ÷ Lowest quintile household income	Cayenta. Census bureau income data (American Community Survey).	Annually	2			No	
48	**10. Water Resource Sustainability**									
49		**I/I Contribution to System (%).**	Total WWTP flow less average sanitary flow ÷ Total MGD to WWTP	WWTP DMRs. Potable water billing records.	Quarterly	2				
50		**Deep Well Capacity Utilization (%).**	MGD Injected ÷ MGD Design Capacity	WWTP DMRs.	Annually	1				
51										

52 **Sources/Legend**

53 1 Effective Utility Management, A Primer for Water and Wastewater Utilities (January 2017)

54 2 Benchmarking Performance Indicators for Water and Wastewater Utilities (AWWA, 2018)

55 3 Utility Benchmarking for Wastewater (WERF, 2014)

56

Notes

1 Row 18 will require a process for justifying why certain equipment is not replaced in accordance with an existing schedule and updating the schedule accordingly (for example, if condition assessment reveals the estimated useful life can be extended).

2 Row 35 should be tracked using both dollars and hours.

Appendix BB

Map of Gravity Main Overall Likelihood of Failure Scores

Legend

- Manhole
- Pump Station

Gravity Main LOF

Overall LOF Score

- 1.4 - 3.2
- 3.2 - 5.0
- 5.0 - 7.4

PUMP AROUND ST E-9 ON

PUMP AROUND ST E-15 ON

E REPUMP

PUMP AROUND SB-13 ON

PUMP AROUND ST B-6 ON

PLANT A

PLANT B

E-16 PS

PS

0 2,500 5,000 10,000 Feet

CITY OF FORT LAUDERDALE

Hazen

City of Fort Lauderdale
Sewer Design and Implementation Program

Print Date:	6/5/2020 2:57 PM
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Active City-Owned Gravity Mains Overall LOF Scores

Appendix BB: Map of Gravity Main Overall Likelihood of Failure Scores

Plot date: 6/5/2020 2:57 PM By: akelly

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File = O:\GIS\Projects\43194-011\ArcGISPro\Task 4.3\Fort Lauderdale Risk Assessment-6.1.20\FtLauderdaleRisk.aprx Saved by akelly Save date = 6/1/2020 9:50 AM

Appendix BC

Map of Gravity Main Overall Consequence of Failure Scores

Legend

- Manhole
- Pump Station
  - Pump Station

Gravity Main COF
Overall COF Score
- 1.0 - 4.4
- 4.4 - 5.7
- 5.7 - 10

PUMP AROUND ST.E-9ON
PUMP AROUND ST.E-15ON
PUMP AROUND SB-13ON
PUMP AROUND ST.B-6ON
E REPUMP
PLANT A
PLANT B
PS

0 2,500 5,000 10,000 Feet

Plot date: 6/5/2020 2:59 PM By: akelly
Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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City of Fort Lauderdale
Sewer Design and Implementation Program

Active City-Owned Gravity Mains
Overall COF Scores

Appendix BC: Map of Gravity Main Overall Consequence of Failure Scores

Appendix BD

Map of Gravity Main Overall Risk Scores

Legend

- Manhole
- Pump Station
  - Pump Station

Gravity Main Risk

Overall Risk Score

- Low Risk Priority
- Medium Risk Priority
- High Risk Priority

N

0 2,500 5,000 10,000 Feet

Plot date: 6/5/2020 3:00 PM By: akelly
Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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City of Fort Lauderdale
Sewer Design and Implementation Program

Active City-Owned Gravity Mains
Overall Risk Scores

Appendix BD: Map of Gravity Main Overall Risk Scores

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Appendix BE

Map of Pump Station Overall Likelihood of Failure Scores

Legend

- Manhole
- Force Main
- Gravity Main

Pump Station LOF
Overall LOF Score

- 1.0 - 2.2
- 2.2 - 5.2
- 5.2 - 9.4

E-5 E-6 E-7 E-2 E-11 E-12 E-9 E-4 E-8 E-13 E-3 E REPUMP E-1 E-14

B-23 B-22 B-10 B-12 B-13 B-17 B-9 B-11 B-18 B-21 B-20 B-19 PLANT B B-1 B-2 B-7 B-3 B-8 B-6 B-14 B-5 B-15 B-16 B-4

A-38 A-32 A-31 A-48 A-105 A-106 A-46 A-1 A-47 A-45 A-28 A-20 A-33 A-23 A-104 A-2 A-3 PLANT A A-21 A-19 A-17 A-34 A-18 A-36 A-52 A-35 A-98 A-43 A-97 A-4 C-20 C-10 A-41 A-7 A-8 A-9 A-50 C-26 C-21 A-42 A-11 A-15 A-51 C-19 A-40 A-99 A-16 A-56 C-5 A-12 C-22 G-6 C-13 C-8 C-12 C-7 A-55 A-10 C-2 D-54 G-4 A-53 A-54 D-55 C-9 C-14 C-15 C-3 C-32 C-1 C-17 A-37 C-11 A-39 A-59 A-60 A-95 C-27 C-28 A-58 A-57

A-14 A-22 A-27 A-29 A-26 A-25 D-12 D-14 D-37 D-16 D-13 D-15 D-18 D-19 D-20 D-38 D-39 D-22 D-23 D-31 D-32 D-46 D-47 D-48 D-49 D-50 D-45 D-43 D-51 D-52 D-53 D-33 D-30 D-29 D-25 D-26 D-27 D-28 D-44 D-34 D-35 D-36 D-40 D-41 D-24 D-1 D-2 D-3 D-4 D-5 D-6 D-11 D-10 D-9 D-8 D-7

0 2,500 5,000 10,000 Feet

Plot date: 6/22/2020 4:30 PM By: akelly

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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Sewer Design and Implementation Program

Active City-Owned Pump Station Overall LOF Scores

Appendix BE: Map of Pump Station Overall Likelihood of Failure Scores

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Appendix BF

Map of Pump Station Overall Consequence of Failure Scores

Legend

- Manhole
- Force Main
- Gravity Main

Pump Station COF
Overall COF Score

- 1.0 - 3.0
- 3.0 - 6.0
- 6.0 - 10

N

0 2,500 5,000 10,000 Feet

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Hazen

City of Fort Lauderdale
Sewer Design and Implementation Program

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Active City-Owned Pump Station Overall COF Scores

Appendix BF: Map of Pump Station Overall Consequence of Failure Scores

Plot date: 6/22/2020 4:31 PM By: akelly

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Appendix BG

Map of Pump Station Overall Risk Scores

Legend

- Manhole
- Force Main
- Gravity Main

Pump Station Risk
Overall Risk Score

- Low Risk Priority
- Medium Risk Priority
- High Risk Priority

N

0 2,500 5,000 10,000 Feet

Plot date: 6/22/2020 4:32 PM By: akelly
Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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Sewer Design and Implementation Program

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Active City-Owned Pump Station Overall Risk Scores

Appendix BG: Map of Pump Station Overall Risk Scores

Appendix BH

Map of Force Mains Overall Likelihood of Failure Scores Following Tier 1 Condition Assessment

Appendix BH: Map of Force Mains Overall Likelihood of Failure Scores Following Tier 1 Condition Assessment

Hazen
JACOBS

Legend

Overall Risk Score

- Low Risk Priority
- Medium Risk Priority
- High Risk Priority

Pump Station Locations

- Pump Station
- Lift Station
- Repump Station

1 inch = 1,800 feet

0 feet 6,000
0 meters 1,828

Appendix BI

Map of Force Mains Overall Consequence of Failure Scores

Appendix BI: Map of Force Mains Overall Consequence of Failure Scores

Hazen
JACOBS

Legend

Overall COF Score

- 1.4 - 3.3
- 3.4 - 7.6
- 7.7 - 8.7

Pump Station Locations

- Pump Station
- Lift Station
- Repump Station

1 inch = 1,800 feet

0 feet 6,000
0 meters 1,828

Appendix BJ

Map of Force Mains Overall Risk Scores Following Tier 1 Condition Assessment

Appendix BJ: Map of Force Mains Overall Risk Scores Following Tier 1 Condition Assessment

Hazen
JACOBS

Legend

Overall Risk Score

- Low Risk Priority
- Medium Risk Priority
- High Risk Priority

Pump Station Locations

- Pump Station
- Lift Station
- Repump Station

1 inch = 1,800 feet

0 feet 6,000
0 meters 1,828

Appendix BK

City-owned Pressurized Mains Recommended Future Work

Appendix BK - City-owned Pressurized Mains Recommended Future Work

Hazen

JACOBS

Legend

Capital Planning

- Current Consent Order Project
- Recommended Rehab/Replacement Project to be Added to CIP
- Recommend Rehab/Replacement Project to be Added to Phase II Consent Order
- No Further Assessment

Pump Station Locations

- Pump Station
- Lift Station
- Repump Station

1 inch = 1,800 feet

0 feet 6,000

0 meters 1,828

Part C
Program Schedules

CITY OF FORT LAUDERDALE

City of Fort Lauderdale
Wastewater Consent Order Program
Part C: AM and CMOM
Program Schedules

June 25, 2020

Prepared by Hazen

Table of Contents

C1. Program Schedules 1

List of Figures

Figure C-1: Schedule for AM-CMOM Implementation 2
Figure C-2: Schedule for Phase II Improvement Projects 3
Figure C-3: Schedule for Projects Added to Phase II 4

Section C1
Program Schedules

C1. Program Schedules

The Consent Order specifies AM-CMOM Schedule submittal requirements in Subparagraph 6(l) as follow:

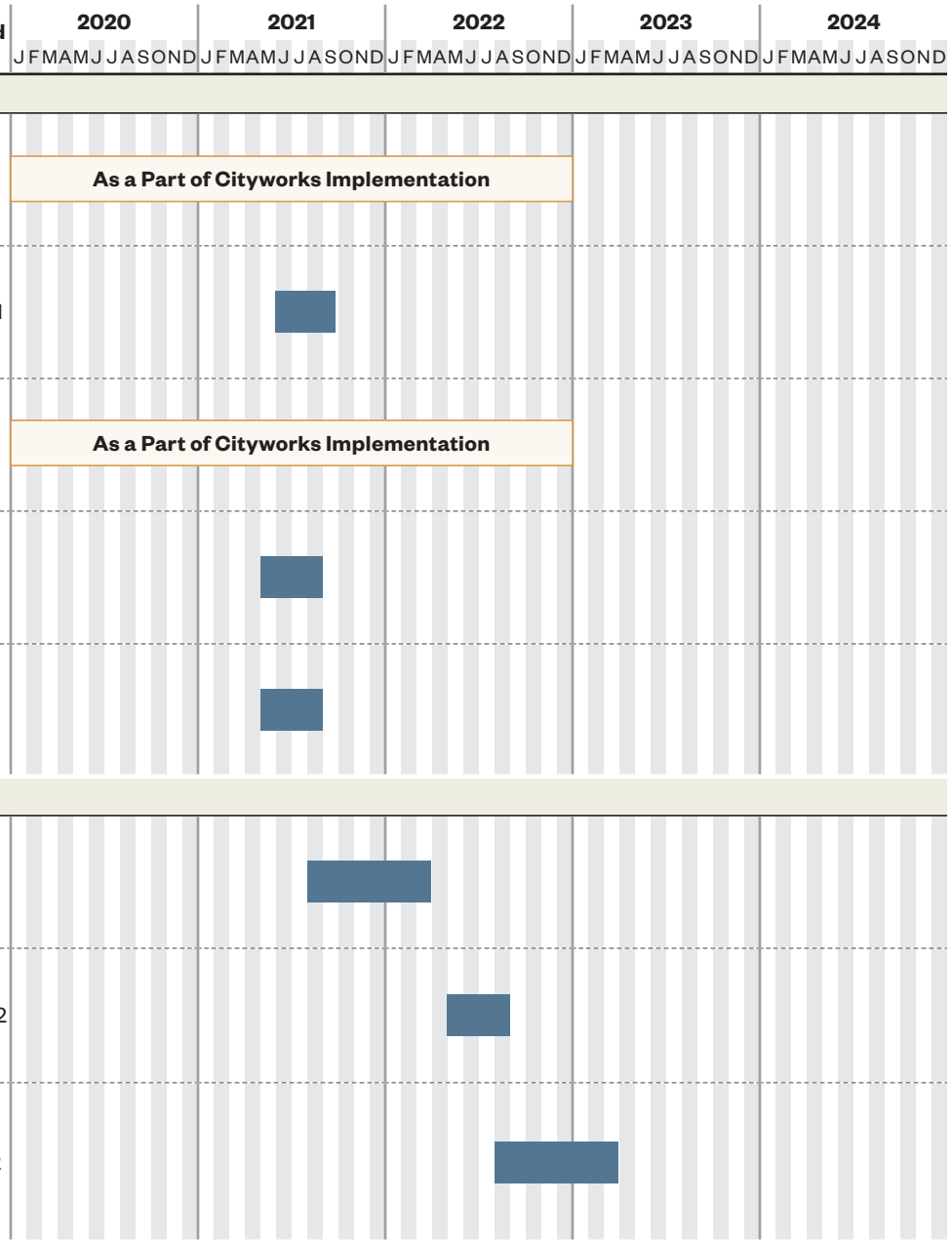
- A schedule for implementing the AM and CMOM Program, including when any software upgrades or integrations needed for initial implementation of the Program will be completed and put into service, when databases the software relies upon will be populated with the information from the sources listed in 6(k)(ii) above, and when the AM and CMOM Program will be fully incorporated into planning, funding, procuring resources, and scheduling work.
- A schedule showing the completion date for construction of each Phase II Improvement Project identified in Exhibit C of the Consent Order.
- A schedule for any other projects that need to be added to Phase II, as identified by the Force Main Condition Assessment Report submitted to FDEP on March 23, 2020.

The above-referenced schedules are presented herein as **Figure C-1**, **Figure C-2**, and **Figure C-3** respectively.

Fort Lauderdale is committed to continuous improvement in the CMOM Program. Each CMOM Program area previously discussed in this plan has defined an implementation plan and improvement initiatives where the City will focus attention to further develop existing programs. As part of the continuous improvement process, the City will revisit these improvement areas to assess progress, adjust actions, identify new areas of improvement, move areas completed off the implementation list, and make other adjustments as necessary to reflect circumstances at the time of the evaluation.

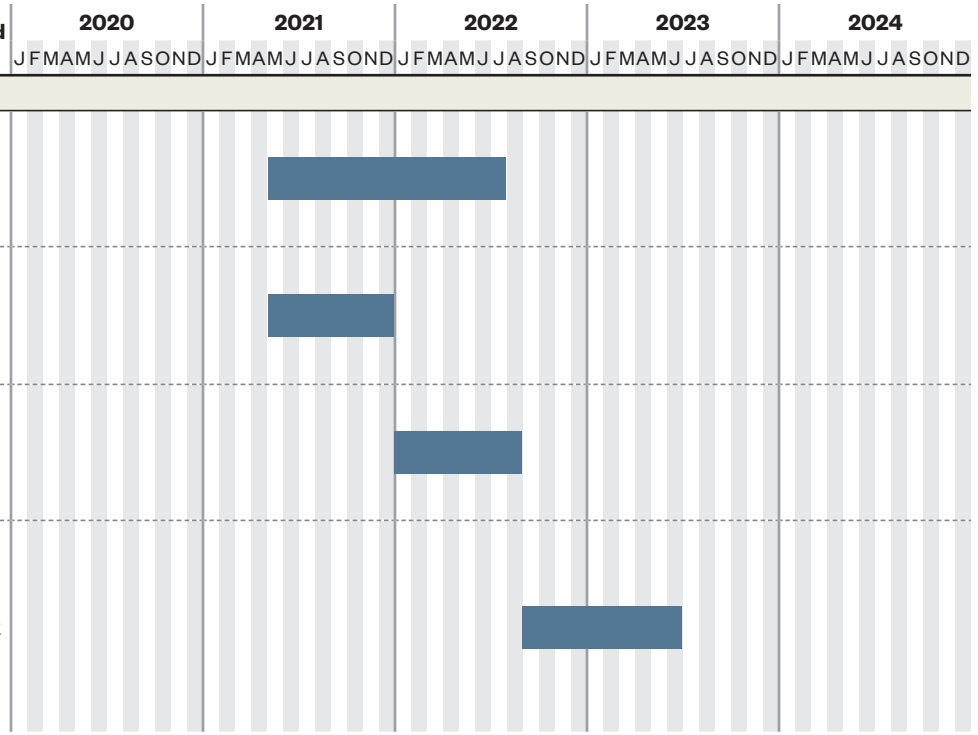
Figure C-1: Schedule for AM and CMOM Implementation

Ref #	Activity	Description	Planned Duration	Planned Start
Section A6.3: Information Management				
A6.3-1	Improve reporting	Implement consistency among work orders and customer complaints		
A6.3-2	Create GIS asset SOPs	Develop an SOP for creation/ verification of assets in GIS	4 months	June-21
A6.3-3	Evaluate application of Cityworks	Evaluate the potential for Cityworks to help with tracking and reporting of performance indicators		
A6.3-4	Improve data storage and security consistency	Begin recording maintenance procedures relating to data storage and security	4 months	May-21
A6.3-5	Further develop personnel descriptions	Create detailed description of personnel authorizations and applicable training	4 months	May-21
Section A6.4: Budgeting				
A6.4-1	Adjust funding	Develop a plan to implement a capital reserve (sinking) fund	8 months	Aug-21
A6.4-2	Further develop maintenance budgeting	Develop SOPs to track and record the percentages of maintenance types. Track and record the percent of the overall budget allocated to maintenance	4 months	May-22
A6.4-3	Assess budgeting modifications	Assess sufficiency of measures adopted to address the CUSMP conclusion. Assess budget impacts associated with the goal of shifting the operations focus. Ensure that budgets include maintenance backlogs	8 months	Aug-22



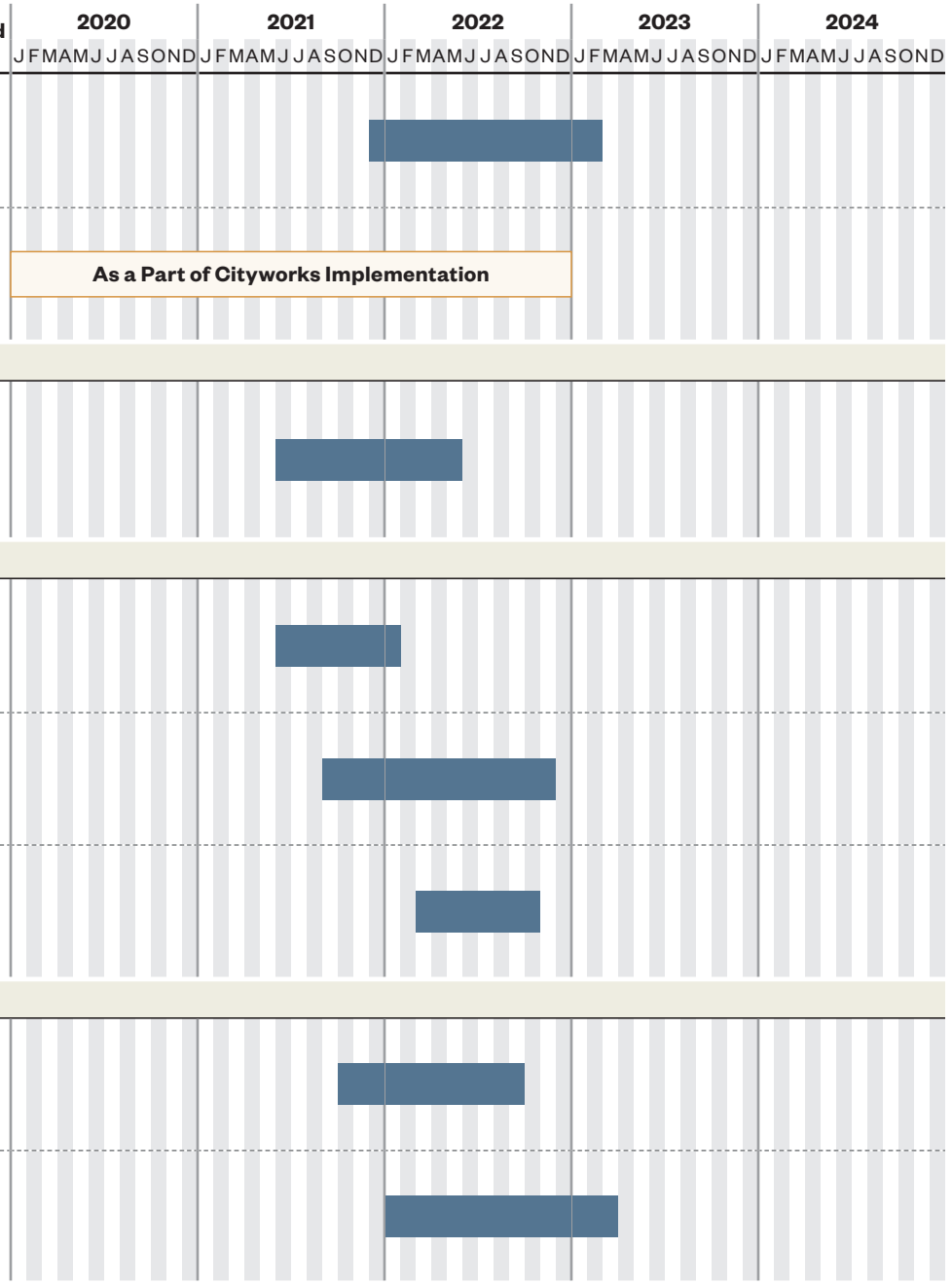
Note: Cityworks Implementation is currently approximately 50% complete and scheduled for go-live in late 2020 through early 2021.

Ref #	Activity	Description	Planned Duration	Planned Start
Section A3.2: Collection System Model and Capacity Assessment				
A3.2-1	Formalize management for capacity improvements	Formally designate management and support staff for capacity improvements and develop prioritization	15 months	May-21
A3.2-2	Evaluate resources and training	Determine a strategy regarding resources and training to maintain a hydraulic model and assess alternative improvements and demand scenarios	8 months	May-21
A3.2-3	SOP Review	Review existing SOPs to ensure adequate procedures are in place to evaluate the ability of capacity improvements	8 months	Jan-22
A3.2-4	Establish Pump Station Improvement review meeting	Establish a formal Pump Station Improvement Program review meeting to identify lessons learned, evaluate possible modifications/improvements and define associated implementation procedures, and assess progress in implementation of previously adopted modifications/improvements	10 months	Sep-22
Section A5.1: Gravity Sewer Operation and Maintenance				
A5.1-1	Coordinate with system-wide inspection and I/I analysis	Programmatically join sewer cleaning and inspection work to system-wide inspection and I/I analysis	15 months	Mar-21
A5.1-2	Develop root control procedures	Develop a formal plan and procedure for root control. Create a root control SOP	10 months	Jun-21
A5.1-3	Review rehabilitation contracts	Review existing rehabilitation contracts. Assess the City's ability to undertake manhole repairs using in-house resources. Develop contractor unit price pay items for manhole rehabilitation	8 months	Aug-21
A5.1-4	Further develop Continuous Sewer Assessment Program (CSAP)	Build from initial risk analysis to structure a data-driven, condition-based program of continuous sewer assessment	18 months	Oct-21



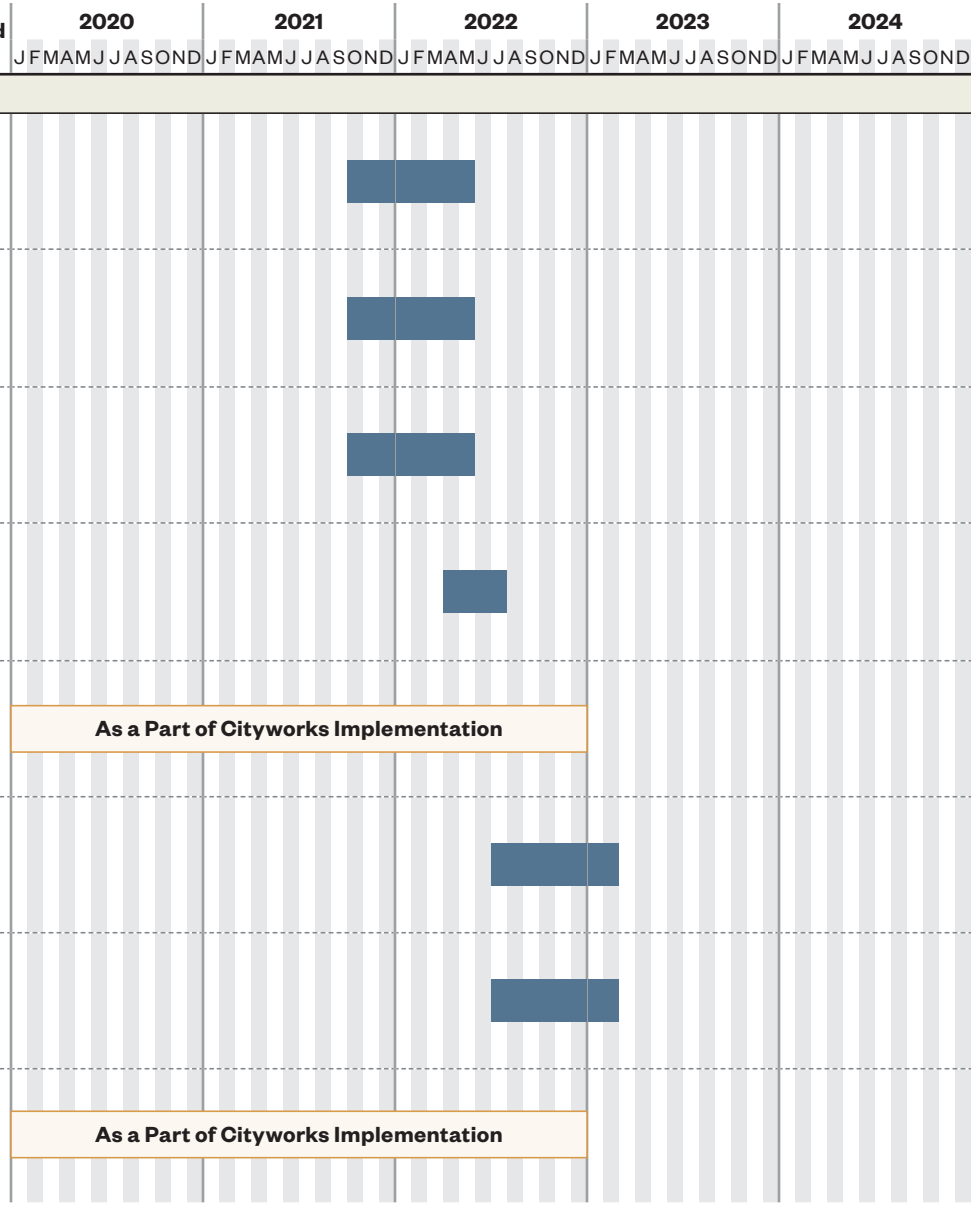
Note: Cityworks Implementation is currently approximately 50% complete and scheduled for go-live in late 2020 through early 2021.

Ref #	Activity	Description	Planned Duration	Planned Start
A5.1-5	Further develop GIS attributes	Create database and GIS layers attributes in GIS to map and assess the occurrence of reported blockages, SSOs, and permit violations. Consider entering SSO reports into Cityworks	15 monhts	Oct-21
A5.1-6	Ensure reports are implemented into Cityworks	Coordinate program with Cityworks implementation. Develop reports within Cityworks as the software is implemented to track performance measures		
Section A6.6: Legal Support				
A6.6-1	Review Large User Agreements and SUO	Review Large User Agreements and the City's SUO for consistency with additional commitments and demands related to Consent Order compliance and AM and CMOM Program implementation	12 months	Jun-21
Section A3.1: Sewer System Evaluation Survey				
A3.1-1	Formalize SSES Program management	Develop SOPs for flow data analysis, basin prioritization, manhole inspection, smoke testing, video review/interpretation, and repair selection/prioritization	8 months	Jun-21
A3.1-2	Review SSES Resources	Conduct a study to assess the need for additional resources and training	15 months	Sep-21
A3.1-3	Review SSES Program	Set up formal review meeting to identify lessons learned, modifications/improvements and associated implementation procedures, and assess progress in implementation	8 months	Mar-22
Section A4.1: Design and Construction Process				
A4.1-1	Review documents	Review existing forms, details, and SOPs to ensure adequate guidance is in place for conducting design reviews and involvement of O&M staff	12 months	Oct-21
A4.1-2	Implement life cycle analysis	Implement a life cycle cost analysis for new designs	15 months	Jan-22



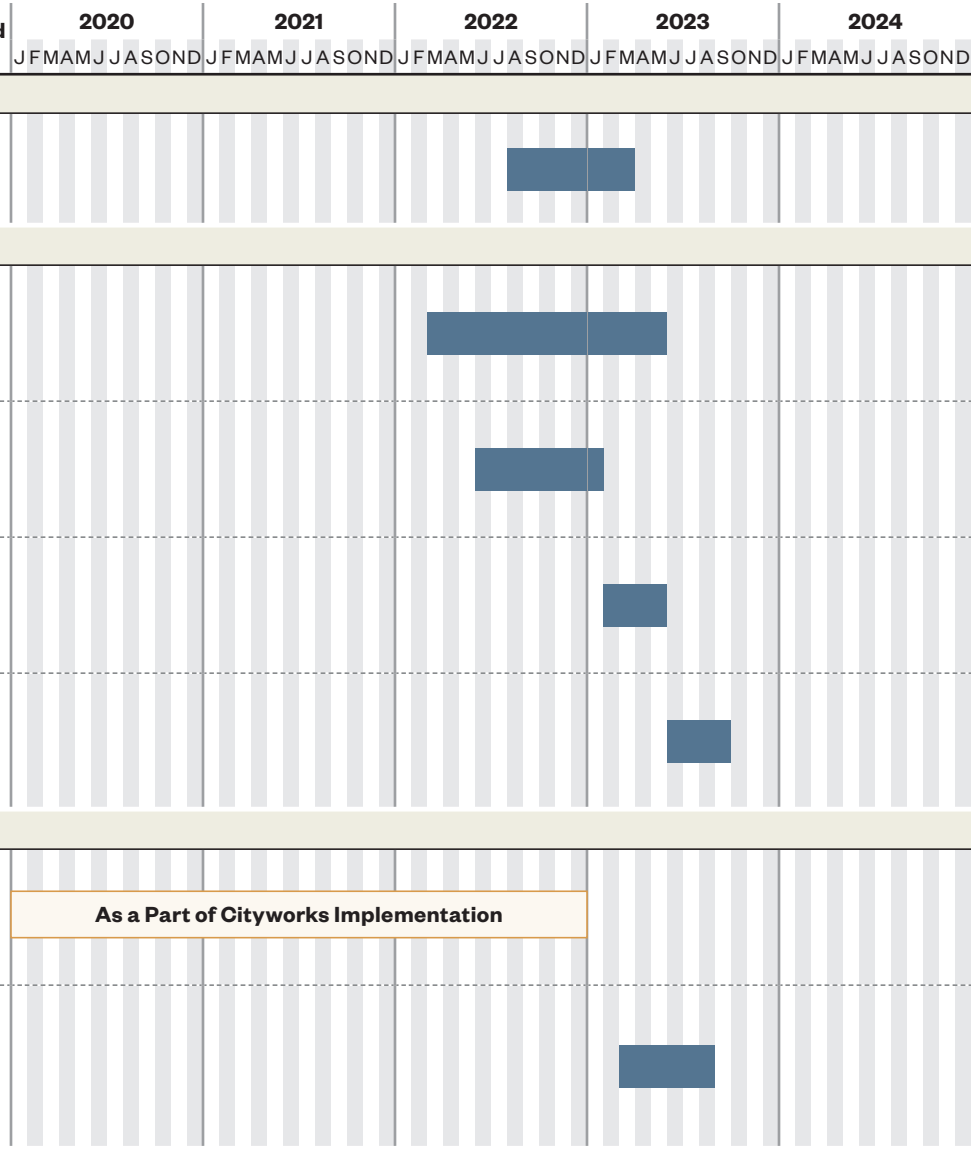
Note: Cityworks Implementation is currently approximately 50% complete and scheduled for go-live in late 2020 through early 2021.

Ref #	Activity	Description	Planned Duration	Planned Start
Section A5.2: Pump Station and Force Main Operation and Maintenance				
A5.2-1	Maintain technical specifications	Maintain and update existing records of technical specifications of each PS within the system	8 months	Oct-21
A5.2-2	Update preventative maintenance management	Maintain and update existing written preventative O&M schedules and procedures addressing predictive inspection and service for all pump stations	8 months	Oct-21
A5.2-3	Maintain written emergency O&M	Maintain and update existing written standard emergency/ reactive O&M procedures	8 months	Oct-21
A5.2-4	Establish documentation of outside services	Document the extent to which any required services are to be provided by an outside entity, the competencies and resources provided, and the utility's means of notification	4 months	Mar-22
A5.2-5	Improve Cityworks access	Consider provision of digital tablets for maintenance staff to access Cityworks in the field		
A5.2-6	Evaluate application of Cityworks	Evaluate the potential for Cityworks to support automated or detailed analysis using run time data or other data available through SCADA	8 months	Jul-22
A5.2-7	Optimize planned/ preventive maintenance	Leverage Cityworks to support an optimized planned or preventive maintenance on pump stations	8 months	Jul-22
A5.2-8	Improve backlog and performance documentation	Leverage Cityworks to help document and report maintenance backlog and O&M performance		



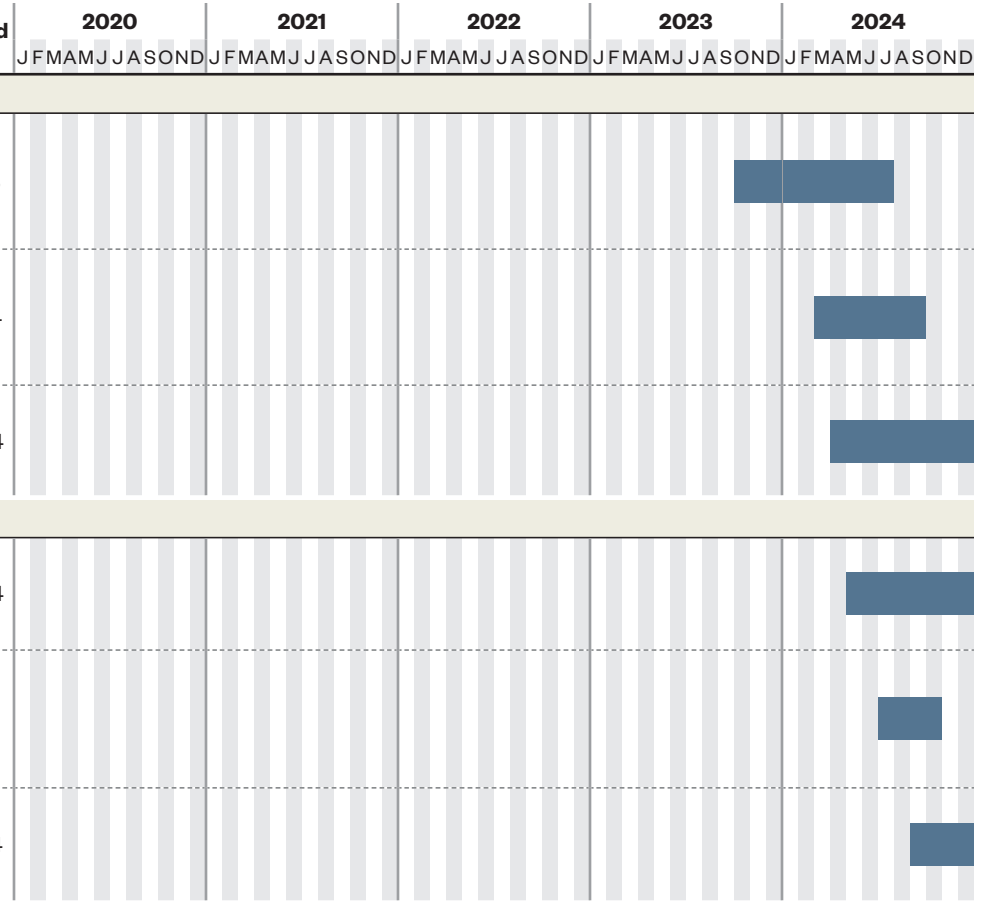
Note: Cityworks Implementation is currently approximately 50% complete and scheduled for go-live in late 2020 through early 2021.

Ref #	Activity	Description	Planned Duration	Planned Start
Section A6.2: Training				
A6.2-1	SOP Review	Review and update SOPs and curricula for all essential on-the-job training	8 months	Aug-22
Section A2.1: Sewer Overflow Response Plan				
A2.1-1	Advance GIS database	Populate GIS with SSO locations and additional SSO information	15 months	Mar-22
		Set up formal annual KPI review meeting	8 months	Jun-22
A2.1-2	Develop KPI review	Implement actions items discussed during the annual KPI review	4 months	Feb-23
		Check progress of action items discussed during the annual KPI review	4 months	Jun-23
Section A5.3: Equipment, Parts, and Tools Management				
A5.3-1	Evaluate application of Cityworks	Evaluate the potential for Cityworks to support and optimize inventory management		
A5.3-2	Further develop inventory analysis	Ensure that inventory analysis includes assessment of the frequency of usage of each part, how critical each part is, and how difficult each part is to obtain when determining how many to keep in stock.	6 months	Mar-23



Note: Cityworks Implementation is currently approximately 50% complete and scheduled for go-live in late 2020 through early 2021.

Ref #	Activity	Description	Planned Duration	Planned Start
Section A6.5: Customer Service				
A6.5-1	Review outreach programs	Review public education and outreach programs in view of additional commitments and demands related to CO and AM and CMOM	10 months	Oct-23
A6.5-2	Implement QAlert	Implement QAlert integration into Cityworks AMS	8 months	Mar-24
A6.5-3	Further track complaints	Track the percentage of customer complaints resolved within a time period selected to reflect the City's responsiveness goals	8 months	May-24
Section A6.7: Fats, Oils, and Grease				
A6.7-1	Develop GIS FOG Inventory	Use the GIS to inventory and locate entities that produce FOG constituents and link the inventory to a complaint database	8 months	May-24
A6.7-2	Establish periodic meeting regarding future costs	Create a meeting to periodically revisit the need for implementation of mandatory measures to cover the cost of inspections and upgraded infrastructure	4 months	Jul-24
A6.7-3	Establish periodic meeting regarding expansion	Create meeting to periodically revisit whether there is a need for expansion of programs and development of KPIs	4 months	Sep-24

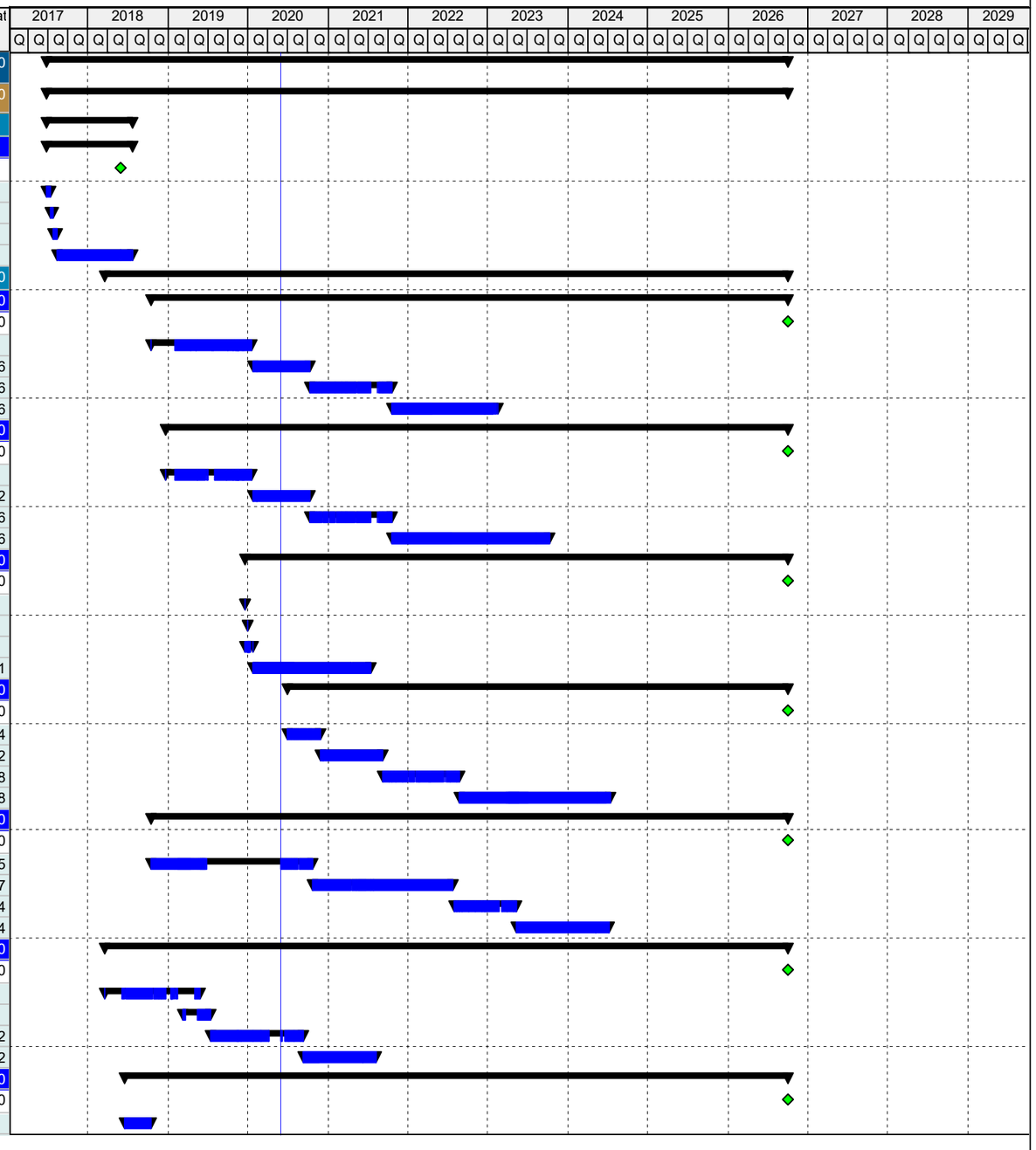


Note: Cityworks Implementation is currently approximately 50% complete and scheduled for go-live in late 2020 through early 2021.

Figure C-2: Schedule for Phase II Improvement Projects

Data Date: 31-May-20
Print Date: 22-Jun-20

Activity ID	Activity Name	Original Duration	Start	Finish	Total Float
City of Fort Lauderdale		2417	27-Jun-17 A	30-Sep-26	0
Consent Order Related Projects		2417	27-Jun-17 A	30-Sep-26	0
Paragraghs 6(a,b,e) High Risk FM Projects		403	27-Jun-17 A	23-Jul-18 A	
30-inch FM Emergency Repairs (P12319) Par. 6(b) & 6(e), Ph II, Exh. C, Ln. 3		403	27-Jun-17 A	23-Jul-18 A	
COM001	Required Completion Date (CO)	0		30-May-18 A	
Planning Phase		1	27-Jun-17 A	11-Jul-17 A	
Design Phase		0	12-Jul-17 A	26-Jul-17 A	
Bidding Phase		5	27-Jul-17 A	14-Aug-17 A	
Construction Phase		354	15-Aug-17 A	23-Jul-18 A	
Paragraph 6(e) - Phase II FM Rehabilitation Projects		2172	20-Mar-18 A	30-Sep-26	0
NE 25 Avenue - 24" Force Main (P12383) Par. 6(e), Ph II, Exh. C, Ln. 1		2907	16-Oct-18 A	30-Sep-26	0
COM001	Required Completion Date (CO)	0		30-Sep-26*	0
Planning Phase		430	16-Oct-18 A	21-Jan-20 A	
Design Criteria Package Phase		202	22-Jan-20 A	08-Oct-20	1356
Bidding Phase		377	09-Oct-20	20-Oct-21	1326
Design-Build Phase		480	20-Oct-21	13-Feb-23	1326
NE 38 Street & NE 19 Ave - 42" Force Main (P12384) Par. 6(e), Ph II, Exh. C, Ln. 2		2800	20-Dec-18 A	30-Sep-26	0
COM001	Required Completion Date (CO)	0		30-Sep-26*	0
Planning Phase		341	20-Dec-18 A	21-Jan-20 A	
Design Criteria Package Phase		270	22-Jan-20 A	09-Oct-20	1082
Bidding Phase		376	10-Oct-20	20-Oct-21	1086
Design-Build Phase		720	20-Oct-21	11-Oct-23	1086
Redundant Sewer Forcemain South (P12567) Par. 6(e), Ph II, Exh. C, Ln. 4&5		2477	20-Dec-19 A	30-Sep-26	0
COM001	Required Completion Date (CO)	0		30-Sep-26*	0
Planning Phase		1	20-Dec-19 A	20-Dec-19 A	
Design Criteria Package Phase		1	31-Dec-19 A	31-Dec-19 A	
Bidding Phase		21	20-Dec-19 A	24-Jan-20 A	
Design-Build Phase		556	24-Jan-20 A	18-Jul-21	1901
Rehabilitation of Existing 54-inch FM (P TBD) Par. 6(e), Ph II, Exh. C, Ln. 4&5		2283	01-Jul-20	30-Sep-26	0
COM001	Required Completion Date (CO)	0		30-Sep-26*	0
Planning Phase		148	01-Jul-20	25-Nov-20	814
Design Criteria Package Phase		286	25-Nov-20	07-Sep-21	812
Bidding Phase		351	08-Sep-21	24-Aug-22	808
Design-Build Phase		690	24-Aug-22	15-Jul-24	808
Treatment Plant to Injection Wells - Effluent Force Main (P12387) Par. 6(e), Ph II, Exh. C, Ln		2799	16-Oct-18 A	30-Sep-26	0
COM001	Required Completion Date (CO)	0		30-Sep-26*	0
Planning Phase		628	16-Oct-18 A	20-Oct-20	815
Design Phase		645	21-Oct-20	27-Jul-22	817
Bidding Phase		287	28-Jul-22	10-May-23	814
Construction Phase		425	11-May-23	09-Jul-24	814
NW 13 Street - 24" Force Main (P12388) Par. 6(e), Ph II, Exh. C, Ln. 7		3040	20-Mar-18 A	30-Sep-26	0
COM001	Required Completion Date (CO)	0		30-Sep-26*	0
Planning Phase		358	20-Mar-18 A	28-May-19 A	
Design Criteria Package Phase		123	12-Mar-19 A	12-Jul-19 A	
Bidding Phase		315	15-Jul-19 A	09-Sep-20	1882
Design-Build Phase		330	10-Sep-20	06-Aug-21	1882
NE 9 Street to Birch Rd. River Crossing - 18" Force Main (P12389) Par. 6(e), Ph II, Exh. C, L		3030	15-Jun-18 A	30-Sep-26	0
COM001	Required Completion Date (CO)	0		30-Sep-26*	0
Planning Phase		1	15-Jun-18 A	15-Oct-18 A	



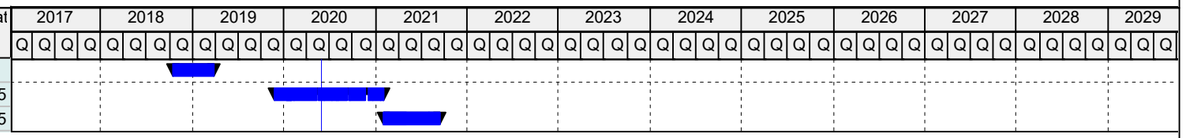
Remaining Level of Effort
Actual Level of Effort
CO Milestone
All Work
Remaining Work
Critical Remaining Work
summary

A = Actual Date
* = Consent Order Constraint Date

Figure C-2: Schedule for Phase II Improvement Projects

Data Date: 31-May-20
Print Date: 22-Jun-20

Activity ID	Activity Name	Original Duration	Start	Finish	Total Float
	Design Criterial Package Phase	163	16-Oct-18 A	27-Mar-19 A	
	Bidding Phase	616	26-Nov-19 A	03-Feb-21	1845
	Design-Build Phase	220	04-Feb-21	12-Sep-21	1845



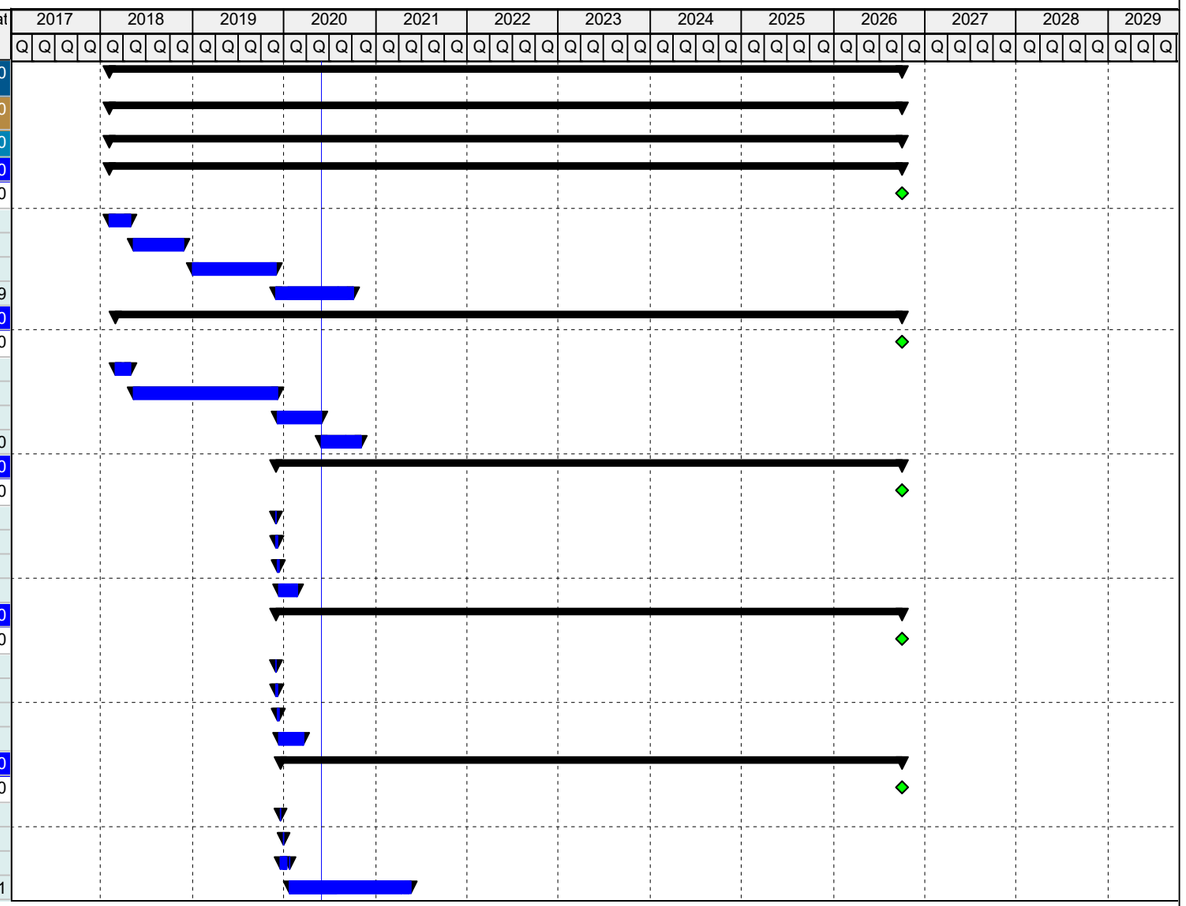
Remaining Level of Effort
Actual Level of Effort
CO Milestone
All Work
Remaining Work
Critical Remaining Work
summary

A = Actual Date
* = Consent Order Constraint Date

Figure C-3: Schedule for Projects Added to Phase II

Data Date: 31-May-20
Print Date: 22-Jun-20

Activity ID	Activity Name	Original Duration	Start	Finish	Total Float
City of Fort Lauderdale		2871	01-Feb-18 A	30-Sep-26	0
Consent Order Related Projects		2871	01-Feb-18 A	30-Sep-26	0
Paragraph 6(e) - Phase II FM Rehabilitation Projects		2871	01-Feb-18 A	30-Sep-26	0
South Middle River Force Main River Crossing (P12352) - Added by FMCA Report		4019	01-Feb-18 A	30-Sep-26	0
COM001	Required Completion Date (CO)	0		30-Sep-26*	0
Planning Phase		0	01-Feb-18 A	30-Apr-18 A	
Design Criteria Package Phase		1	11-May-18 A	30-Nov-18 A	
Bidding Phase		1	01-Jan-19 A	29-Nov-19 A	
Design-Build Phase		319	30-Nov-19 A	03-Oct-20	2189
Pump Station D-36 Discharge FM Replacement (P12413) - Added by FMCA Report		4019	01-Mar-18 A	30-Sep-26	0
COM001	Required Completion Date (CO)	0		30-Sep-26*	0
Planning Phase		60	01-Mar-18 A	30-Apr-18 A	
Design		537	11-May-18 A	05-Dec-19 A	
Bidding Phase		178	06-Dec-19 A	01-Jun-20 A	
Construction Phase		152	02-Jun-20 A	01-Nov-20	2160
Victoria Park FM Replacement (N/A) - Added by FMCA Report		4019	02-Dec-19 A	30-Sep-26	0
COM001	Required Completion Date (CO)	0		30-Sep-26*	0
Planning Phase		0	02-Dec-19 A	03-Dec-19 A	
Design Criteria Package Phase		1	03-Dec-19 A	06-Dec-19 A	
Bidding Phase		1	09-Dec-19 A	13-Dec-19 A	
Design-Build Phase		111	16-Dec-19 A	25-Feb-20 A	
NE 36th Street Repair Project (N/A) - Added by FMCA Report		4019	02-Dec-19 A	30-Sep-26	0
COM001	Required Completion Date (CO)	0		30-Sep-26*	0
Planning Phase		0	02-Dec-19 A	03-Dec-19 A	
Design Criteria Package Phase		1	03-Dec-19 A	06-Dec-19 A	
Bidding Phase		1	09-Dec-19 A	13-Dec-19 A	
Design-Build Phase		111	16-Dec-19 A	20-Mar-20 A	
Redundant Sewer Forcemain North (P12566) - Added by FMCA Report		2477	20-Dec-19 A	30-Sep-26	0
COM001	Required Completion Date (CO)	0		30-Sep-26*	0
Planning Phase		1	20-Dec-19 A	20-Dec-19 A	
Design Criteria Package Phase		1	31-Dec-19 A	31-Dec-19 A	
Bidding Phase		21	20-Dec-19 A	24-Jan-20 A	
Design-Build Phase		496	24-Jan-20 A	19-May-21	1961



Remaining Level of Effort
Actual Level of Effort
CO Milestone
All Work
Remaining Work
Critical Remaining Work
summary

A = Actual Date
* = Consent Order Constraint Date