CITY OF PORTLAND
ENVIRONMENTAL SERVICES
1120 SW Fifth Ave, Suite 613, Portland, Oregon 97204 ▪ Mingus Mapps, Commissioner ▪ Dawn Uchiyama, Interim Director

July 5, 2022

Biko Taylor
Chief Procurement Officer
City of Portland, Procurement Services
1001 SW 5th Avenue, Suite 400
Portland, Oregon 97204

Re: Emergency Declaration for a BES Sewer Repair Project

The Bureau of Environmental Services (BES) has determined that a threat to public health, property, and safety exists with regards to a failing sewer main in NE 33rd Ave at NE Knott St. A 66-inch 20-foot-deep combined sewer junction chamber has multiple holes and has no bottom of pipe in some locations. As a result of the condition of this asset a large sinkhole has developed in the middle of NE 33rd Ave south of NE Knott St.

For the reasons described, expediting the process by which this sewer main can be replaced is essential. Therefore, I am recommending that BES procure the services of a contractor to complete the described work using emergency contracting procedures upon your acceptance of this request.

Per Title 5 of the City Code and Charter, the Director of the Bureau of Environmental Services can authorize the City to enter into an Emergency Procurement Contract to perform this work. The Engineer's Estimate with contingency included is *$960,000* for this contract.

To maintain competition, we are pursuing an expedited solicitation process to received bids from five (5) local contractors, including MWESB contractors.

Thank you for your prompt attention to this matter. Please contact me if you have any questions.

John J. Bushard, PE PLS
Engineer - Wastewater Collection System Maintenance Engineering
Bureau of Environmental Services – City of Portland
503-823-6566
john.bushard@portlandoregon.gov

Emergency Declaration

"I, Mingus Mapps, hereby declare that an emergency exists that threatens public health, safety, property, and commerce due to a failed sewer."

Mingus Mapps, Commissioner — Date: 7/6/22

Approved as to Form:

Dawn Uchiyama — Digitally signed by Dawn Uchiyama Date: 2022.07.06 13:50:17 -07'00'

Dawn Uchiyama, Interm, Director — Date: 7/09/2022
Bureau of Environmental Services

Paul Suto — Digitally signed by Paul Suto Date: 2022.07.06 08:42:16 -07'00'

Paul Suto, Chief Engineer – Bureau of Environmental Services — Date: 7/6/2022

NE 33RD AVE & NE KNOTT ST-SEWER EMERGENCY

PROJECT AREA

SCALE 1:200

GENERAL NOTES:

1. EXISTING GRADES AND ELEVATIONS SHOWN IN PROFILE WERE PROVIDED BY THE CITY OF PORTLAND AND TAKEN ALONG THE CENTERLINE STATIONED ALIGNMENT OF SEWER MAIN. VERIFY ALL ELEVATIONS AND GRADES.
2. UTILITIES AND SERVICE LATERALS AS SHOWN IN THE CONTRACT DOCUMENTS ARE AT APPROXIMATE LOCATIONS. VERIFY ALL LOCATIONS IN THE FIELD PRIOR TO CONSTRUCTION.
3. NOT ALL WATER OR GAS SERVICE LATERALS ARE SHOWN.
4. PERMANENT TRAFFIC STRIPING AND MARKING TO BE COMPLETED BY THE BUREAU OF TRANSPORTATION AFTER COMPLETION OF WORK. CONTRACTOR SHALL MAINTAIN ALL TEMPORARY STRIPING AND COORDINATE WITH OWNER'S REPRESENTATIVE WHEN FINAL PAVING IS COMPLETE.
5. SEWER LATERALS SHALL BE 6-INCH ASTM 3034 PVC, SDR-35 AT 2% SLOPE (MINIMUM) UNLESS OTHERWISE SHOWN IN THE CONTRACT DOCUMENTS OR APPROVED BY THE OWNER'S REPRESENTATIVE.
6. SUPPORT UTILITIES, AS REQUIRED, TO PROTECT IN PLACE.
7. CONSTRUCT PER CURRENT CITY OF PORTLAND STANDARD DETAILS AND DRAWINGS, UNLESS OTHERWISE NOTED IN THE CONTRACT DOCUMENTS OR DIRECTED BY THE OWNER'S REPRESENTATIVE.
8. A SITE SPECIFIC UTILITY PROTECTION (UPP) WILL BE REQUIRED FOR PROTECTING AND MAINTAINING IN SERVICE THE EXISTING WATER MAIN DURING EXCAVATION FOR AND CONSTRUCTION OF THE SEWER MAIN LINE AND SERVICE LATERAL.
9. FOR POTHOLING OF PWB WATER FACILITIES, CONTACT ROY MARTINEZ (503-823-8311) 48 HOURS IN ADVANCE OF STARTING THE POTHOLING WORK IN ORDER TO COORDINATE OBTAINING THE PWB INSPECTION ASSISTANCE.

LEGEND:

MIDDLE LANE STRIPING

EXISTING

- PARKING METER
- BIKE RACK
- BORE HOLE
- ROAD SIGN
- CLEANOUT
- INLET
- SEWER MANHOLE
- JUNCTION BOX
- PEDESTRIAN LIGHT
- GAS VALVE
- POLE ANCHOR
- POLE WITH STREET LIGHT
- STREET LIGHT
- ELECTRICAL MANHOLE
- ELECTRICAL VAULT
- TELEPHONE MANHOLE
- TELEPHONE PEDESTAL
- UTILITY VALVE
- BUSH
- DECIDUOUS TREE
- CONIFEROUS TREE
- FIRE HYDRANT
- IRRIGATION CONTROL BOX
- WATER MANHOLE
- WATER METER
- WATER VALVE
- ABANDONED SEWER
- BURIED TROLLEY TRACKS
- COMBINED SEWER MAIN
- CURB
- E — ELECTRICAL UNDER GROUND
- FO — FIBER OPTIC
- G — GAS LINE
- INLET LEAD
- LIGHT RAIL, TROLLEY TRACK
- OH — OVERHEAD LINE
- SEWER SERVICE LATERAL
- PRIVATE SANITARY SEWER
- P/L — PROPERTY LINE
- R/W — RIGHT-OF-WAY
- SAN — SANITARY SEWER MAIN
- STM — STORM SEWER MAIN
- TEL — TELEPHONE LINE
- W — WATER LINE
- LANE STRIPING

PROPOSED

- CLEANOUT
- SEWER MANHOLE
- PERMANENT PLUG
- TEMPORARY PLUG
- INLET PROTECTION
- COMBINED SEWER MAIN
- PLUGGED LATERAL
- PROJECT SITE BOUNDARY
- SEWER SERVICE LATERAL

ABBREVIATIONS:

ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
CI	CAST IRON
COMB	COMBINATION, COMBINATION SEWER
CSP	CONCRETE SEWER PIPE
DI	DUCTILE IRON
DIA	DIAMETER
EL, ELEV	ELEVATION
E, ELEC	ELECTRIC OR ELECTRICAL
EXIST, EX.	EXISTING
G, GAS	GAS MAIN
GM	GAS METER
HDPE	HIGH-DENSITY POLYETHYLENE
IE	INVERT ELEVATION
MH	MANHOLE
NTS	NOT TO SCALE
OD	OUTSIDE DIAMETER
OH	OVERHEAD LINES
PL, P/L	PROPERTY LINE
PVC	POLYVINYL CHLORIDE
RCP	REINFORCED CONCRETE PIPE
R/W, ROW	RIGHT-OF-WAY
S	SLOPE
SAN	SANITARY, SANITARY SEWER
STM	STORM, STORM SEWER
TEL	TELEPHONE LINE
UG	UNDERGROUND
VAR	VARIES OR VARIABLE
VSP	VITRIFIED CLAY SEWER PIPE
WM	WATER METER

NOTICE TO EXCAVATORS:

ATTENTION: OREGON LAW REQUIRES YOU TO FOLLOW RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH OAR 952-001-0090. YOU MAY OBTAIN COPIES OF THE RULES BY CALLING THE CENTER. (NOTE: THE TELEPHONE NUMBER FOR THE OREGON UTILITY NOTIFICATION CENTER IS 503-232-1987).

POTENTIAL UNDERGROUND FACILITY OWNERS

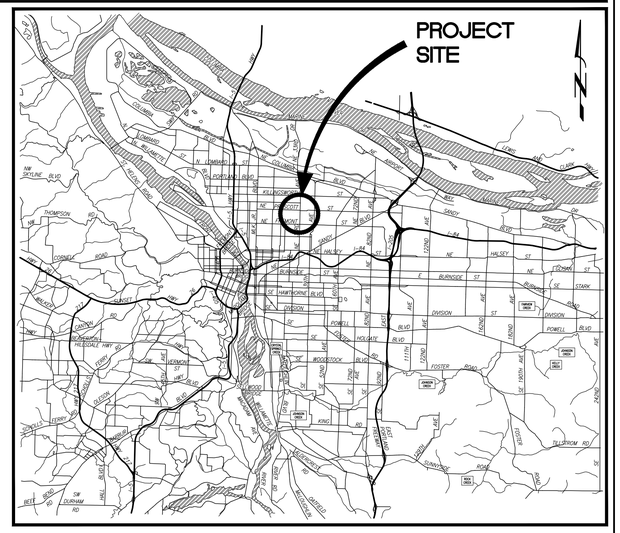
Dig Safely.

Call the Oregon One-Call Center

DIAL 811 or 1-800-332-2344

EMERGENCY TELEPHONE NUMBERS

NW NATURAL GAS	
M-F 7am-6pm	503-226-4211 Ext.4313
AFTER HOURS	503-226-4211
PGE	503-464-7777
CENTURYLINK	1-800-573-1311
CITY BUREAU OF MAINTENANCE	503-823-1700
CITY WATER	503-823-4874
VERIZON	1-800-483-1000



PORTLAND, OREGON
VICINITY MAP
NOT TO SCALE

CONSTRUCTION NOTES:

1. 1+65 CONSTRUCT 120" MAINTENANCE HOLE WITH CAST-IN PLACE BASE PER STANDARD DETAILS P-150 AND P-151. USE REDUCING SLAB AFTER ON 120" MAINTENANCE HOLE SECTION TO REDUCE TO 48" RISER SECTION, STACK OUT AND FINISH GRADE.. REFERENCE REDUCING SLAB PER DETAIL P-152. DEPTH TO BOTTOM OF SEWER IS APPROXIMATELY 20FT.
2. NOT USED
3. NOT USED
4. NOT USED
5. PROTECT EXISTING UTILITY
6. TRENCH REHAB SINKHOLE ABOVE MAIN.

SHEET INDEX

CITY OF PORTLAND VERTICAL DATUM AND OCRS83.PORTLANDIF

NO.	DATE	DESCRIPTION	APPD.

REVISION

XREF(S) USED: ..\COP_VICINITY_MAP
ROTATION ANGLE:
CONSTRUCTED BY
PROJECT COMPLETED
MAP CORRECTED BY ____ CHECKED BY ____
FINAL MAP DATA
DRAWING NAME: E11501_G01.dwg

DESIGNED BY | JJB
DRAWN BY | RSW
CHECKED BY

DATE APPROVED
ENGR. SUPV.
ENGR. DIV. MGR. | JVD
CONST. DIV. MGR. | EAM

CITY OF PORTLAND
ENVIRONMENTAL SERVICES

MINGUS MAPPS
COMMISSIONER

PAUL SUTO, P.E.
CHIEF ENGINEER

APPROVAL

ENVIRONMENTAL SERVICES CHIEF ENGINEER
REG. PROF. ENGR. NO. 82245

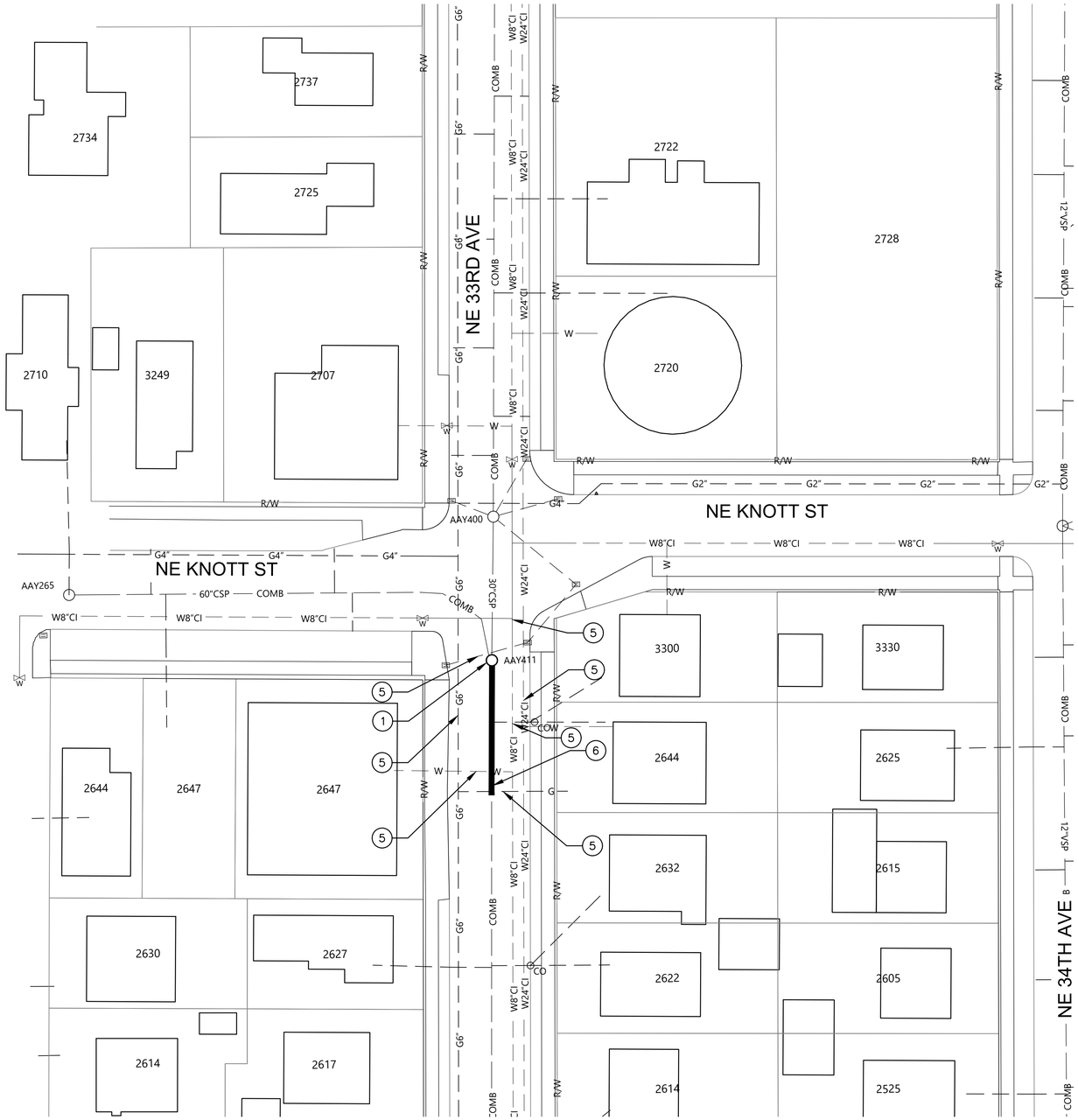
REGISTERED PROFESSIONAL ENGINEER
74515PE
OREGON
JULY 31, 2010
JOHN J. BUSHARD
Expires12/31/2023

NE 33RD AVE & NE KNOTT ST
SEWER EMERGENCY

VINCITY MAP, PROJECT AREA, ABBREVIATIONS, AND SHEET INDEX
GENERAL NOTES, AND CONSTRUCTION NOTES

1/4 SECTION 2734
JOB NO. E11501
SHEET NO. G01
1 OF 4

Q:\RICKW\E11501_NE_33RD AVE & NE_KNOTT ST\E11501_G01.DWG 7/1/2022 WASHINGTON, RICK



CONSTRUCTION NOTES:

1. 1+65 CONSTRUCT 120" MAINTENANCE HOLE WITH CAST-IN PLACE BASE PER STANDARD DETAILS P-150 AND P-151. USE REDUCING SLAB AFTER ON 120" MAINTENANCE HOLE SECTION TO REDUCE TO 48" RISER SECTION, STACK OUT AND FINISH GRADE.. REFERENCE REDUCING SLAB PER DETAIL P-152. DEPTH TO BOTTOM OF SEWER IS APPROXIMATELY 20FT.
2. NOT USED
3. NOT USED
4. NOT USED
5. PROTECT EXISTING UTILITY
6. TRENCH REHAB SINKHOLE ABOVE MAIN.

SCALE

30 0 15 30 60

SCALE FEET

NO.	DATE	DESCRIPTION	APPD.

REVISION

XREF(S) USED:
ROTATION ANGLE: ######
CONSTRUCTED BY
PROJECT COMPLETED
MAP CORRECTED BY ____ CHECKED BY ____
FINAL MAP DATA
DRAWING NAME: E11501_C01.dwg

DESIGNED BY	JJB	DATE APPD.	
DRAWN BY	JSW	PROGRAM MGR.	###
CHECKED BY		CONST. MGR.	###
DESIGN MGR.	###		

CITY OF PORTLAND
ENVIRONMENTAL SERVICES

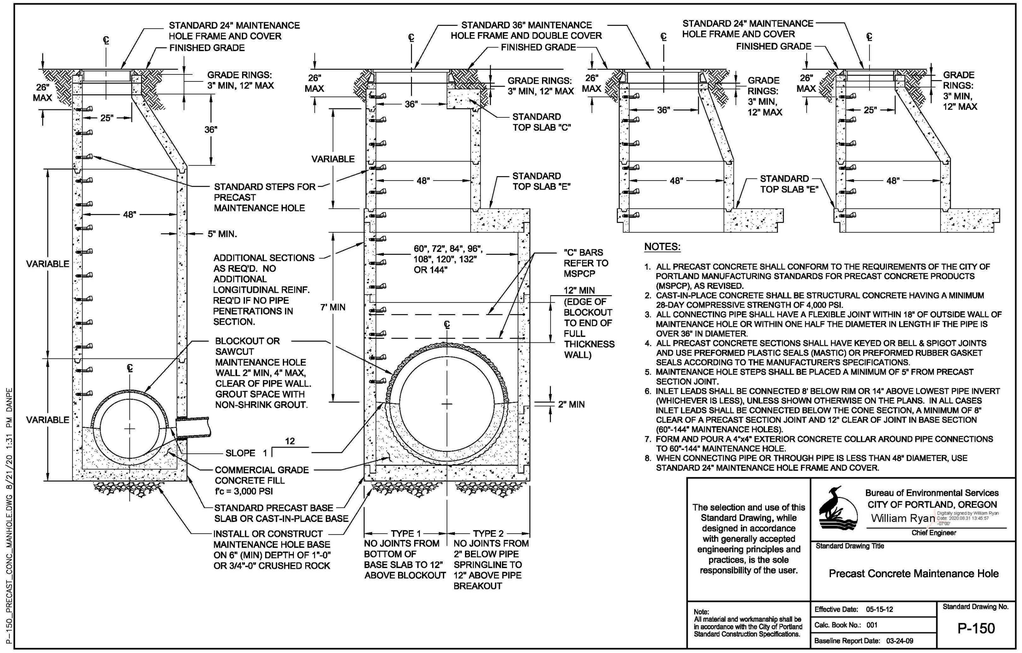
REGISTERED PROFESSIONAL ENGINEER
74515PE
OREGON
DECEMBER 31, 2010
JOHN J. BUSHARD
Expires12/31/2023

NE 33RD AVE & NE KNOTT ST
SEWER EMERGENCY

PLAN AREA OF CONSTRUCTION

1/4 SECTION 2734
JOB NO. E11501
SHEET NO. C01
2 OF 4

Q:\RICKW\E11501_NE_33RD AVE & NE_KNOTT ST\E11501_C01.DWG 7/1/2022 WASHINGTON, RICK



NOTES:

1. ALL PRECAST CONCRETE SHALL CONFORM TO THE REQUIREMENTS OF THE CITY OF PORTLAND MANUFACTURING STANDARDS FOR PRECAST CONCRETE PRODUCTS (MSPCP), AS REVISED.
2. CAST-IN-PLACE CONCRETE SHALL BE STRUCTURAL CONCRETE HAVING A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 4,000 PSI.
3. ALL CONNECTING PIPE SHALL HAVE A FLEXIBLE JOINT WITHIN 18" OF OUTSIDE WALL OF MAINTENANCE HOLE OR WITHIN ONE HALF THE DIAMETER IN LENGTH IF THE PIPE IS OVER 36" IN DIAMETER.
4. ALL PRECAST CONCRETE SECTIONS SHALL HAVE KEYED OR BELL & SPIGOT JOINTS AND USE PREFORMED PLASTIC SEALS (MASTIC) OR PREFORMED RUBBER GASKET SEALS ACCORDING TO THE MANUFACTURER'S SPECIFICATIONS.
5. MAINTENANCE HOLE STEPS SHALL BE PLACED A MINIMUM OF 5' FROM PRECAST SECTION JOINT.
6. INLET LEADS SHALL BE CONNECTED 8' BELOW RIM OR 14" ABOVE LOWEST PIPE INVERT (WHICHEVER IS LESS), UNLESS SHOWN OTHERWISE ON THE PLANS. IN ALL CASES INLET LEADS SHALL BE CONNECTED BELOW THE CONE SECTION, A MINIMUM OF 8" CLEAR OF A PRECAST SECTION JOINT AND 12" CLEAR OF JOINT IN BASE SECTION (60"-144" MAINTENANCE HOLES).
7. FORM AND POUR A 4'x4" EXTERIOR CONCRETE COLLAR AROUND PIPE CONNECTIONS TO 60"-144" MAINTENANCE HOLE.
8. WHEN CONNECTING PIPE OR THROUGH PIPE IS LESS THAN 48" DIAMETER, USE STANDARD 24" MAINTENANCE HOLE FRAME AND COVER.

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user.

Bureau of Environmental Services
CITY OF PORTLAND, OREGON
William Ryan
Digitally signed by William Ryan
Date: 2020.09.01 13:45:57 -07'00'
Chief Engineer

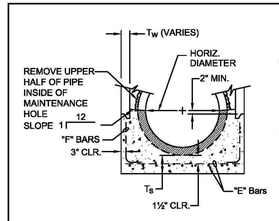
Standard Drawing Title
Precast Concrete Maintenance Hole

Note: All material and workmanship shall be in accordance with the City of Portland Standard Construction Specifications.

Effective Date: 05-15-12
Calc. Book No.: 001
Baseline Report Date: 03-24-09

Standard Drawing No.
P-150

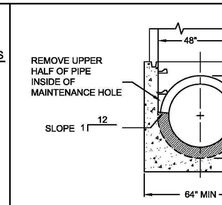
P-150_PRECAST_CONC_MANHOLE.DWG 8/21/20 1:31 PM DANPE



CAST-IN-PLACE BASE FOR 60"-144" MAINTENANCE HOLES

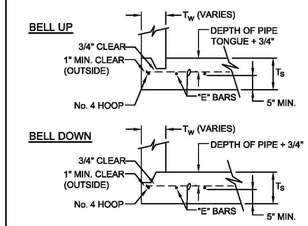
- CONCRETE SHALL BE STRUCTURAL CONCRETE HAVING A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 4,000 PSI.
- REINFORCING STEEL SHALL HAVE A YIELD STRENGTH OF 60,000 PSI.
- PROVIDE GROUT OR PREFORMED PLASTIC SEAL (MASTIC) AT JOINT WITH PRECAST MAINTENANCE HOLE SECTION. GROUT OR SEAL NOT REQUIRED WHEN BASE CAST IN CONTACT WITH PRECAST SECTION.

MH SIZE	DEPTH (Invert to Street)	T_S	"E" BARS	"F" BARS
60"	0 - 15'	7"	#4 @ 10"	#4 @ 10"
	15' - 30'	9"	#4 @ 9"	#4 @ 9"
72"	0 - 15'	7"	#4 @ 7"	#4 @ 7"
	15' - 30'	9"	#4 @ 6"	#4 @ 6"
84"	0 - 15'	8"	#4 @ 6"	#4 @ 6"
	15' - 30'	10"	#5 @ 9"	#5 @ 9"
96"	0 - 15'	9"	#4 @ 6"	#4 @ 6"
	15' - 30'	11"	#5 @ 7"	#5 @ 7"
108"	0 - 15'	10"	#5 @ 9"	#5 @ 9"
	15' - 30'	12"	#6 @ 9"	#6 @ 9"
120"	0 - 15'	11"	#5 @ 8"	#5 @ 8"
	15' - 30'	13"	#6 @ 8"	#6 @ 8"
132"	0 - 15'	12"	#5 @ 8"	#5 @ 8"
	15' - 30'	14"	#6 @ 7"	#6 @ 7"
144"	0 - 15'	13"	#5 @ 7"	#5 @ 7"
	15' - 30'	16"	#6 @ 7"	#6 @ 7"



CAST-IN-PLACE BASE FOR 48-INCH MAINTENANCE HOLE

- CONCRETE SHALL BE STRUCTURAL CONCRETE HAVING A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 4,000 PSI.
- BASE MAY BE POURED TO A HEIGHT OF 8" ABOVE TOP OF SEWER.
- PROVIDE GROUT OR PREFORMED PLASTIC SEAL (MASTIC) AT JOINT WITH 48" RISER SECTION. GROUT OR SEAL NOT REQUIRED WHEN BASE CAST IN CONTACT WITH RISER SECTION.



PRECAST BASE SLAB FOR 48"-144" MAINTENANCE HOLES

- ALL PRECAST CONCRETE SHALL CONFORM TO THE REQUIREMENTS OF THE CITY OF PORTLAND MANUFACTURING STANDARDS FOR PRECAST CONCRETE (MSPCP), AS REVISED.
- REFER TO MSPCP FOR SIZE AND REINFORCEMENT SCHEDULE.
- PROVIDE PREFORMED PLASTIC SEAL (MASTIC) AT JOINT WITH PRECAST MAINTENANCE HOLE SECTION, ACCORDING TO MANUFACTURER'S SPECIFICATIONS.
- 48" BASE SLABS SHALL BE A MINIMUM OF 5" THICK. REINFORCEMENT SHALL BE PLACED ABOVE MIDPOINT OF BASE SLAB THICKNESS AND SHALL CONSIST OF A MINIMUM OF 0.12 in²/LF IN BOTH DIRECTIONS.

The selection and use of this Standard Detail, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user.

Bureau of Environmental Services
CITY OF PORTLAND, OREGON
William Ryan
Digitally signed by William Ryan
Date: 2020.09.01 11:46:31 -07'00'
Chief Engineer

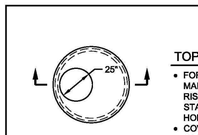
Standard Drawing Title
Maintenance Hole Cast-In-Place Base & Precast Base Slab

Note: All material and workmanship shall be in accordance with the City of Portland Standard Construction Specifications.

Effective Date: 01-01-09
Calc. Book No.: 001
Baseline Report Date: 03-24-09

Standard Drawing No.
P-151

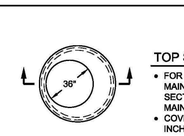
P-151_MAINTENANCE_HOLE_BASE.DWG 8/21/20 1:36 PM DANPE



TOP SLAB "A"

- FOR USE WITH 48" MAINTENANCE HOLES OR RISER SECTIONS AND STANDARD 24" MAINTENANCE HOLE FRAME.
- COVER DEPTH LESS THAN 15 INCHES.

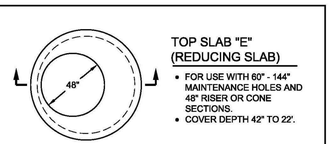
SECTION



TOP SLAB "C"

- FOR USE WITH 48" MAINTENANCE HOLES OR RISER SECTIONS AND STANDARD 36" MAINTENANCE HOLE FRAME.
- COVER DEPTH LESS THAN 22 INCHES.

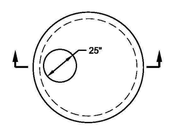
SECTION



TOP SLAB "E" (REDUCING SLAB)

- FOR USE WITH 60" - 144" MAINTENANCE HOLES AND 48" RISER OR CONE SECTIONS.
- COVER DEPTH 42" TO 22'.

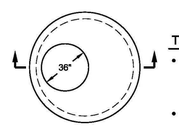
SECTION



TOP SLAB "B"

- FOR USE WITH 60" - 96" MAINTENANCE HOLES AND STANDARD 24" MAINTENANCE HOLE FRAME.
- COVER DEPTH LESS THAN 22 INCHES.

SECTION



TOP SLAB "D"

- FOR USE WITH 60" - 144" MAINTENANCE HOLES AND STANDARD 36" MAINTENANCE HOLE FRAME.
- COVER DEPTH LESS THAN 22 INCHES.

SECTION

NOTES:

1. ALL PRECAST CONCRETE SHALL CONFORM TO THE REQUIREMENTS OF THE CITY OF PORTLAND MANUFACTURING STANDARDS FOR PRECAST CONCRETE PRODUCTS (MSPCP), AS REVISED.
2. FOR EACH TOP SLAB, REFER TO MSPCP FOR COMPLETE SIZE AND REINFORCEMENT DETAILS.
3. ALL TOP SLABS SHALL HAVE KEYED OR BELL & SPIGOT JOINTS AND SHALL USE PREFORMED PLASTIC SEALS (MASTIC) OR PREFORMED RUBBER GASKET SEALS ACCORDING TO THE MANUFACTURER'S SPECIFICATIONS.

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user.

Bureau of Environmental Services
CITY OF PORTLAND, OREGON
William Ryan
Digitally signed by William Ryan
Date: 2020.09.01 13:47:07 -07'00'
Chief Engineer

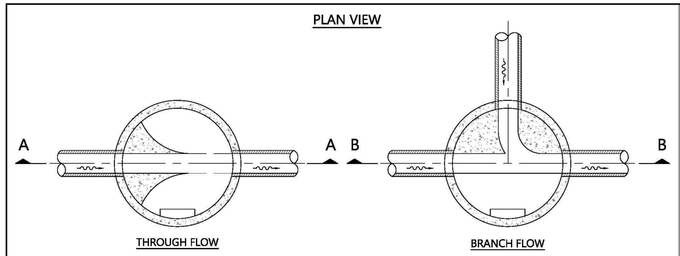
Standard Drawing Title
Top Slabs for Precast Concrete Maintenance Holes

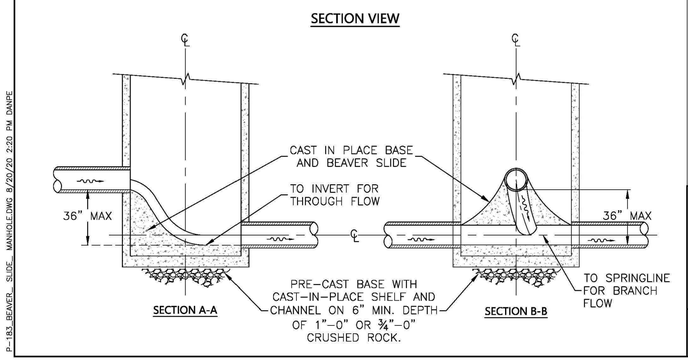
Note: All material and workmanship shall be in accordance with the City of Portland Standard Construction Specifications.

Effective Date: 01-01-09
Calc. Book No.: 001
Baseline Report Date: 03-24-09

Standard Drawing No.
P-152

P-152_TOP_SLABS_PRECAST_CONC_MH.DWG 8/21/20 1:38 PM DANPE





NOTES:

1. BEAVER SLIDES ARE TO BE USED ONLY WHEN DIRECTED BY OWNER'S REPRESENTATIVE.
2. 36-INCH MAX HEIGHT OR DROP, OR AS APPROVED BY OWNER'S REPRESENTATIVE.
3. CONCRETE SHALL CONFORM TO SPECIFICATION 00440, MINIMUM STRENGTH OF 3,000 PSI.
4. PREFER TO STANDARD DRAWING P-150 FOR ADDITIONAL REQUIREMENTS.

The selection and use of this Standard Detail, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user.

Bureau of Environmental Services
CITY OF PORTLAND, OREGON
William Ryan
Digitally signed by William Ryan
Date: 2020.09.01 14:36:04 -07'00'
Chief Engineer

Standard Detail Title
Maintenance Hole with Beaver Slide

Note: All material and workmanship shall be in accordance with the City of Portland Standard Construction Specifications.

Effective Date: 10-29-18
Calc. Book No.: N/A
Baseline Report Date: N/A

Standard Detail No.
P-183

P-183_BEAVER_SLIDE_MANHOLE.DWG 8/20/20 2:20 PM DANPE

NO.	DATE	DESCRIPTION	APPD.
		REVISION	

XREF(S) USED:
ROTATION ANGLE:
CONSTRUCTED BY
PROJECT COMPLETED
MAP CORRECTED BY ____ CHECKED BY ____
FINAL MAP DATA
DRAWING NAME: E11501_CD01.dwg

DESIGNED BY	JJB	DATE APPD.	
DRAWN BY	KSW	PROGRAM MGR.	
CHECKED BY		CONST. MGR.	
DESIGN MGR.			

CITY OF PORTLAND
ENVIRONMENTAL SERVICES

REGISTERED PROFESSIONAL ENGINEER
74515PE
OREGON
DECEMBER 31, 2010
JOHN J. BUSHARD
Expires12/31/2023

NE 33RD AVE & NE KNOTT ST
SEWER EMERGENCY

STANDARD MANHOLE DETAILS

1/4 SECTION	2734
JOB NO.	E11501
SHEET NO.	CD01
	3 OF 4

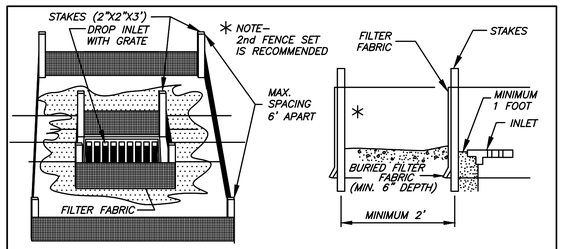
Q:\RICKW\E11501_NE_33RD AVE & NE_KNOTT ST\E11501_CD01.DWG 7/1/2022 WASHINGTON, RICK

GENERAL NOTES FOR EROSION AND SEDIMENT CONTROL:

1. EROSION AND SEDIMENT CONTROL IS REQUIRED FOR THIS PROJECT.
2. PREPARE AN EROSION AND SEDIMENT CONTROL PLAN (ESCP) BEFORE BEGINNING WORK. KEEP A COPY OF THE ESCP AND THE CITY EROSION AND SEDIMENT CONTROL MANUAL (MARCH 2008) ON SITE AT ALL TIMES DURING THE PROJECT.
3. THE EROSION AND SEDIMENT CONTROL FACILITIES AS SHOWN IN THE CONTRACT DOCUMENTS ARE THE MINIMUM REQUIREMENTS FOR THE ANTICIPATED PROJECT WORK AREA AND SEASONAL CONDITIONS. UPGRADE THESE FACILITIES TO ADDRESS CHANGING WORK OR WEATHER CONDITIONS.
4. SELECT BEST MANAGEMENT PRACTICES (BMPs) FROM THE FOLLOWING DOCUMENTS:
   1) THE CITY OF PORTLAND EROSION AND SEDIMENT CONTROL MANUAL
   2) THE STANDARD CONSTRUCTION SPECIFICATIONS
   3) THE PROJECT CONTRACT DOCUMENTS
5. INSTALL, MONITOR, REPLACE AND UPGRADE ALL FACILITIES AND MEASURES AS SPECIFIED IN THE CONTRACT DOCUMENTS. PERFORM MAINTENANCE TO ENSURE THEIR CONTINUED FUNCTIONING.
6. INSPECT AND MAINTAIN ALL FACILITIES AND MEASURES UNTIL PROJECT WORK AREAS ARE PERMANENTLY RESURFACED OR STABILIZED.
7. COMPLETE AN EROSION CONTROL MONITORING FORM AFTER EACH INSPECTION. INCLUDE THE INSPECTION DATE AND TIME. SUBMIT COMPLETED FORMS THROUGH THE HERON PROCESS. PROVIDE THEM UPON REQUEST TO THE OWNERS REPRESENTATIVE.
8. NO VISIBLE AND MEASURABLE SEDIMENT SHALL EXIT THE SITE, ENTER A PUBLIC RIGHT-OF-WAY OR BE DEPOSITED INTO ANY WATER BODY OR STORM DRAINAGE SYSTEM.
9. FOLLOWING A STORM EVENT, INSPECT AND ADJUST, REPAIR, IMPROVE OR REPLACE ALL DEFICIENT OR FAILING FACILITIES AND MEASURES.
10. PROTECT ALL FUNCTIONING STORMWATER INLETS AND CATCH BASINS FROM RECEIVING UNFILTERED SEDIMENT AND SEDIMENT-LADEN RUNOFF.
11. REMOVE SEDIMENT AND DEBRIS FROM INLETS AND CATCH BASINS BEFORE AND AFTER PAVING. DO NOT FLUSH SEDIMENT-LADEN WATER INTO THE DOWNSTREAM SYSTEM.
12. STABILIZE ALL EXPOSED SOIL IMMEDIATELY FOLLOWING GROUND DISTURBING ACTIVITY.
13. STABILIZE AND PROTECT STOCKPILED SOIL WITH APPROVED MEASURES.
14. REMOVE TEMPORARY EROSION AND SEDIMENT CONTROL FACILITIES AFTER THE PROJECT IS COMPLETED AND ACCEPTED BY THE OWNERS REPRESENTATIVE.

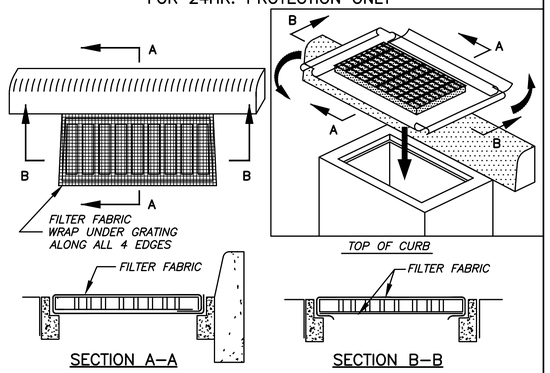
TREE PROTECTION NOTES

1. INSTALL TREE PROTECTION FENCING PRIOR TO COMMENCEMENT OF WORK. INSPECTION AND APPROVAL OF FENCING BY THE URBAN FORESTRY ARBORIST IS REQUIRED PRIOR TO COMMENCEMENT OF WORK, INCLUDING EQUIPMENT AND MATERIALS STAGING AND MOBILIZATION. CALL 503-823-TREE (8733) TO REQUEST A TREE PRESERVATION INSPECTION ONCE THE TPF IS INSTALLED.
2. TREE PROTECTION FENCING SHALL NOT BE MOVED, DISCONNECTED OR REMOVED DURING THE PROJECT.
3. NO ENTRY IS ALLOWED INTO TREE PROTECTION AREAS FOR THE DURATION OF THE PROJECT UNLESS A PERMIT IS OBTAINED FROM THE URBAN FORESTRY ARBORIST.
4. MAINTAIN FENCING THROUGHOUT THE ENTIRE PROJECT. NO ACCESS IS PERMITTED WITHIN FENCED AREAS.
5. WHERE TREE ROOTS ARE ENCOUNTERED OR ANTICIPATED, EXCAVATION SHALL BE COMPLETED WITH HAND TOOLS.
6. TREE ROOTS OVER 2-INCH DIAMETER MAY NOT BE CUT TO OR DAMAGED WITHOUT A ROOT PRUNING INSPECTION AND PERMIT ISSUED BY THE URBAN FORESTRY INSPECTOR. CALL URBAN FORESTRY AT 503-823-TREE (8733) FOR ROOT INSPECTION SPECIFIC TO THIS PROJECT. INSPECTION AND ISSUANCE OF A PERMIT MAY TAKE UP TO 48 HOURS. IF APPROVED, ROOTS AND/OR BRANCHES MUST BE PROPERLY PRUNED USING APPROVED ARBORICULTURAL TECHNIQUES.
7. FIELD ADJUSTMENTS OR ALTERNATIVE METHODS MAY BE NEEDED IF LARGE ROOTS ARE ENCOUNTERED.
8. TREES WITHIN THE LIMITS OF DISTURBANCE DESIGNATED TO BE PROTECTED WILL NOT BE REMOVED. CONTRACTOR IS DIRECTED TO COMPLETE CUT AND FILL OPERATIONS WITH CARE NEXT TO THESE TREES. URBAN FORESTRY MUST APPROVE ALL TREE REMOVALS.



FILTER FABRIC INLET BARRIER (BEST FOR FIELD INLETS)
DRAWING NOT TO SCALE

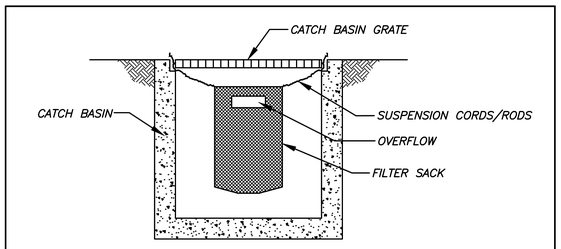
FOR 24HR. PROTECTION ONLY



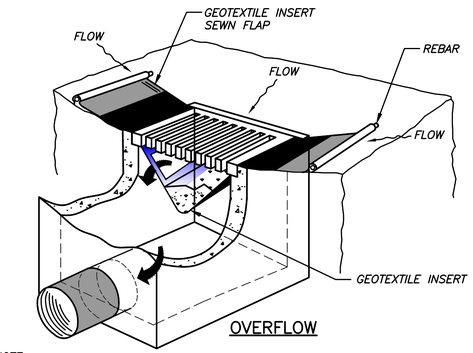
FABRIC WRAPPED INLET GRATE
DRAWING NOT TO SCALE

EROSION CONTROL MANUAL	INLET PROTECTION MEASURES Detail Drawing 4.3–F

FILE DRAFT:INSPECTORS GRAPHICS DRAWING PLOT 1:1



INSERT SACK
FRONT VIEW



OVERFLOW

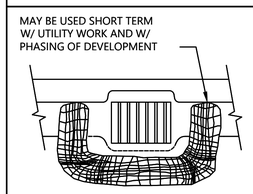
NOTE:
RECESSED CURB INLET MUST BE BLOCKED WHEN USING FIILTER FABRIC INLET SACKS. SIZE OF FILTER FABRIC INLET SACK TO BE DETERMINED BY MANUFACTURER.

DRAWING NOT TO SCALE

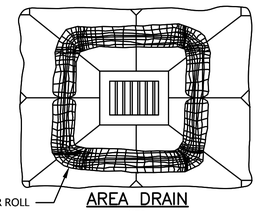
EROSION CONTROL MANUAL	INLET INSERT Detail Drawing 4.3–G

FILE DRAFT:INSPECTORS GRAPHICS DRAWING PLOT 1:1

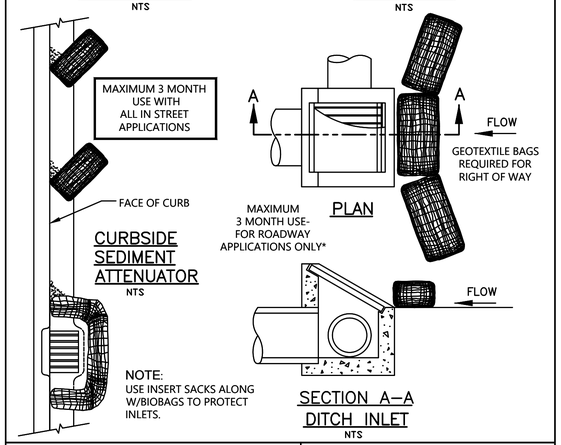
*BIOBAGS MUST BE REMOVED AT END OF JOB



CATCH BASIN
NTS



AREA DRAIN
NTS

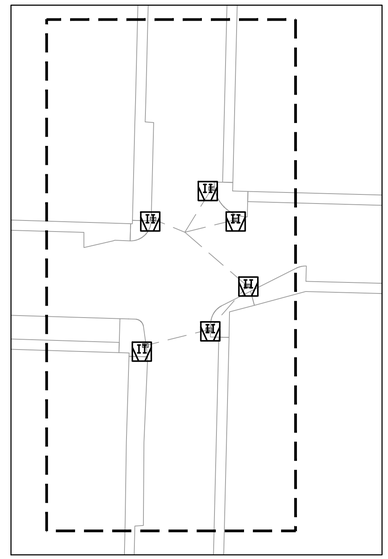


CURBSIDE SEDIMENT ATTENUATOR
NTS

SECTION A–A
DITCH INLET
NTS

EROSION CONTROL MANUAL	FILTRATION BAGS, SOCKS, & ROLLS FOR TEMPORARY INLET PROTECTION Detail Drawing 4.3–B

FILE DRAFT:INSPECTORS GRAPHICS DRAWING PLOT 1:1



PROJECT AREA

SCALE
50 0 25 50 100
SCALE FEET

Q:\RICKW\E11501_NE_33RD AVE & NE_KNOTT ST\E11501_CE01.DWG 7/1/2022 12:46 PM WASHINGTON, RICK

NO.	DATE	DESCRIPTION	APPD.
		REVISION	

XREF(S) USED:
ROTATION ANGLE:
CONSTRUCTED BY
PROJECT COMPLETED
MAP CORRECTED BY ____ CHECKED BY ____
FINAL MAP DATA
DRAWING NAME: E11501_CE01.dwg

DESIGNED BY JJB | DATE APPD.
DRAWN BY RKW | PROGRAM MGR.
CHECKED BY | CONST. MGR.
DESIGN MGR:

CITY OF PORTLAND
ENVIRONMENTAL SERVICES

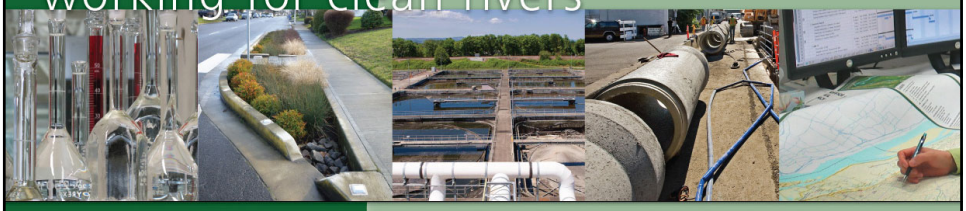
REGISTERED PROFESSIONAL ENGINEER
74515PE
OREGON
DECEMBER 31, 2023
JOHN J. BUSHARD
Expires12/31/2023

NE 33RD AVE & NE KNOTT ST
SEWER EMERGENCY

EROSION CONTROL PLAN DETAILS
AND TREE PROTECTION NOTES AND DETAILS

1/4 SECTION 2734
JOB NO. E11501
SHEET NO. CE01
4 OF 4

working for clean rivers



ENVIRONMENTAL SERVICES
CITY OF PORTLAND

TED WHEELER, MAYOR | Dawn Uchiyama, DIRECTOR

E11501 NE 33rd & NE Knott Sewer Emergency

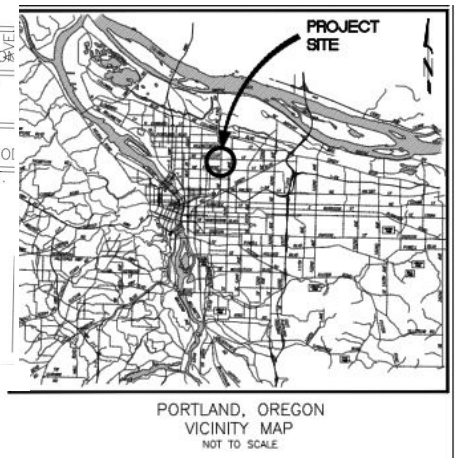
Commissioner Briefing for Ordinance

John Bushard BES District Maintenance Engineer
Bureau of Environmental Services

August 1, 2022

1

Emergency Ordinance for Procurement Contract

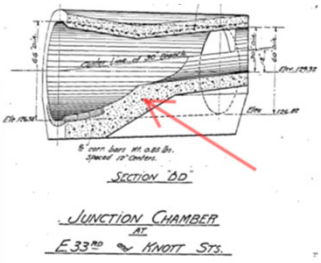


PORTLAND, OREGON
VICINITY MAP
NOT TO SCALE

2

Emergency Ordinance for Procurement Contract

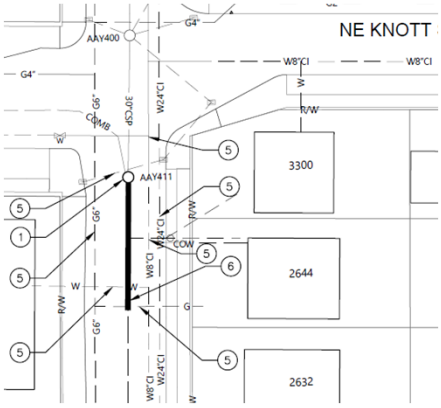
- Late May 2022 sinkhole above 110-year-old 66” sewer structure
- June 2022 developed plan to replace structure
- July 2022 Emergency Declaration letter signed July 9, held Pre-bid meeting inviting 5 contractors, Bids received July 13



Emergency Ordinance for Procurement Contract

- Engineer’s Estimate $960,000, Low Bid $724,100.00
- August 4, 2022 – Construction begins, NE 33rd Ave Closed just south of NE Knott St.
- Large excavation, no traffic through construction zone
- Anticipate completion end of September 2022.

Emergency Procurements over $500K can be awarded through Commissioner in charge, followed by City Council authorization by ordinance



Emergency Ordinance for Procurement Contract

- BES Public Involvement (PI)
  - Door hanger notices to neighbors with PI hotline and contractor
  - Traffic Advisory about closure
  - Outreach to PPS, work will be underway during start of school year
- Emergency Ordinance August 24th
  - Consent agenda
- Questions?

Table 1

City of Portland BES
E11501 NE 33rd Ave and NE Knott Sewer Emergency
Preliminary Construction Cost Estimates for Recommended Repair Alternative

		New 144" Junction Chamber (full road closure)				New 144" Junction Chamber (open to traffic)			
Item	**Description**	**Estimated Quantity**		**Unit Price**	**Total**	**Estimated Quantity**		**Unit Price**	**Total**
1	Mobilization	1	LS	$ 81,836	$ 81,836	1	LS	$ 112,695	$ 112,695
2	Erosion/Pollution Control	1	LS	$ 11,860	$ 11,860	1	LS	$ 15,147	$ 15,147
3	Traffic Control	1	LS	$ 35,581	$ 35,581	1	LS	$ 113,603	$ 113,603
4	Diversion of Flow	1	LS	$ 75,000	$ 75,000	1	LS	$ 120,000	$ 120,000
5	Removal of Existing Junction Chamber	1	LS	$ 45,000	$ 45,000	1	LS	$ 45,000	$ 45,000
6	Construct New Junction Structure	1	LS	$ 410,616	$ 410,616	1	LS	$ 529,956	$ 529,956
7	Trench Rehabilitation	60	FT	$ 1,700	$ 102,000	60	FT	$ 1,700	$ 102,000
8	Video Inspection of Sewers, Mainline	120	FT	$ 45	$ 5,400	120	FT	$ 45	$ 5,400
	Construction Subtotals				**$ 767,293**				**$ 1,043,801**
	Contingency	-10%			$ (76,729)	-10%			$ (104,380)
	Contingency	25%			$ 191,823	25%			$ 260,950
	Estimated Cost Range			**(low)**	**$ 690,564**			**(low)**	**$ 939,421**
				(high)	**$ 959,117**			**(high)**	**$ 1,304,751**

Notes:

1. Estimated unit costs were obtained from late 2021/early 2022 bids and estimates for similar work.
2. "Traffic Control" for 'full road closure' assumed 6% of direct construction (per PBOT cost tables) and 'open to traffic' assumed 15%.
3. "Diversion of Flow" assumed $15,000 per week for bulkheads and flow-through pipes inside the shaft.
4. "Construct New Junction Structure" includes shoring design/install/removal, shaft excavation/disposal, utility protection, concrete base, 144" MH structure, sewer re-connections, beaver slide, shaft backfill, roadway reconstruction, paving, and all incidentals.
5. "Trench Rehabilitation" assumed 8-ft wide by 8-ft deep. Includes saw-cutting, excavation, disposal, shoring, backfill, and all incidentals.

Technical Memorandum

To:	John Bushard, PE, PLS, BES	Project:	E11501 NE 33rd Ave & NE Knott St Sewer Emergency
From:	Matt Bartlett, PE Wolfe Lang, PE, GE Conner Bauman, PE	Job No:	6377.0
Date:	July 29, 2022		
Subject:	Alternatives Evaluation and Repair Recommendations – FINAL		

1.0 Background

In late May 2022, BES was notified that a sinkhole had developed in the middle of NE 33rd Ave on the south side of the intersection with NE Knott St. A second sinkhole was later identified approximately 60 feet south of the first sinkhole. Both sinkholes were covered temporarily with steel street plates and traffic control devices as shown in Photos 1 and 2.

Photo 1: First sinkhole at NE 33rd Ave & NE Knott (crosswalk on south side)

Photo 2: Second sinkhole on NE 33rd Ave (approx. 60 feet south of first sinkhole)

2.0 Organization of this Memo

This memo will describe McMillen Jacobs' findings from the site investigation and data review (Section 3), provide an engineering opinion of the problem (Section 4), discuss feasible structural repair alternatives with estimated costs and schedule (Section 5), and provide recommendations on the high priority repair scope and future rehabilitation (Section 6). At the end of this memo is the preliminary construction cost estimate for the recommended repair alternative. McMillen Jacobs recommends structuring the Bid Form in a similar manner.

3.0 Findings from Data Review and Site Visits

McMillen Jacobs reviewed existing data and performed site visits to better understand the problem, site constraints, and construction impacts. Outlined below are the key findings from this endeavor:

- **Existing junction chamber (AAY411):** As-built drawings dated 1912 (110 years old) showed 30" and 60" concrete pipes combining to a 66" concrete pipe. At the junction, the 30" invert is about 2.5 feet above the 66" invert, resulting in cascading flow at the base of the junction chamber (see Figure 1). The existing junction chamber is about 25-feet below ground surface.
- **Existing access points:** AAY411 is a blind wye with no direct access to the junction chamber. AAY400 on NE 33rd Ave provides access to the 30" sewer (approx. 55 feet north of AAY411). AAY265 on NE Knott St provides access to the 60" sewer (approx. 240 feet west of AAY411). ABD159 on NE 33rd Ave provides access to the 66" sewer (approx. 505 feet south of AAY411).
- **CCTV inspection video:** In late May 2022, BES inspected the 30" sewer from AAY400 to the junction chamber and the 66" sewer from ABD159 to the junction chamber. The CCTV videos showed severe deterioration in the invert of the 30" sewer and at the base of the junction chamber where flow cascaded. The bricks and concrete invert appeared to be missing at both locations (see Photos 3 and 4). The first sinkhole developed directly above.

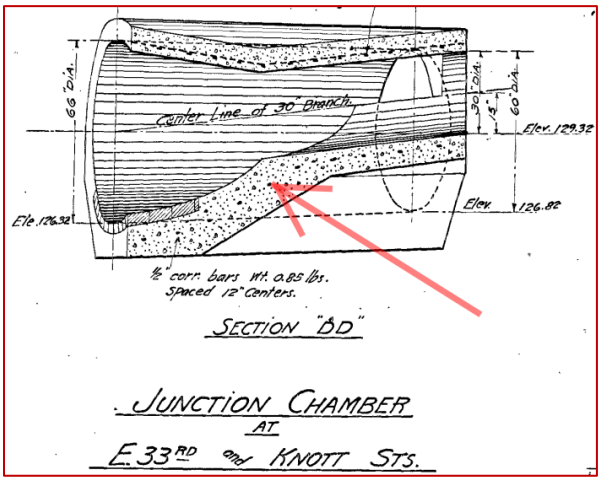


Figure 1: As-built detail from 1912

Photo 3: Deteriorated invert at 30"/60" junction, looking downstream 53 feet from AAY400

Photo 4: Scoured invert where 30" cascades to 66"

- **Existing utilities:** Numerous existing utilities are in the vicinity of the two sinkholes, which must be potholed and protected during construction of the sewer repair.
    - Water line (24" cast iron) in NE 33rd Ave, northbound lane, about 3 feet from curb. Faint blue painted lines are evident in Photo 2.
    - Water line (8" cast iron) in NE 33rd Ave, middle of northbound lane. Faint blue painted lines are evident in Photo 2.
    - Gas line (6" steel) in NE 33rd Ave, southbound lane, about 3 feet from curb. Faint yellow painted lines are evident in Photo 1.
    - Storm drain (10" PVC) in NE 33rd Ave, crossing diagonal from west inlet to east inlet, above existing junction structure (AAY411). Paving patch is evident in Photo 1.
    - Sewer and gas laterals and water taps to local residences and businesses.
    - Traffic signal at the intersection.
    - Overhead power lines on both sides of NE 33rd Ave.
- **Recent construction activities:** There are paving patches in NE 33rd Ave above the storm drain, sewer lateral, and gas lateral – evidence of recent construction activity. PBOT-MO performed the storm drain work in Spring 2021. NW Natural performed the gas lateral work in 2021. The two sinkholes developed in the same vicinity as this recent work.
- **Traffic impacts and risks:** Both NE 33rd Ave and NE Knott St are high volume roadways with a traffic signal and crosswalks at the intersection. NE 33rd Ave is 36 feet wide. The temporary steel street plates and traffic control devices currently in the middle of NE 33rd Ave are 10 to 12 feet wide. While there is sufficient lane width at the current time to maintain two-way traffic along the sides of the sinkhole zone, Trimet buses have only inches of clearance from the curb and cones.
- **Geology:** The closest geotechnical data is 3 to 4 blocks from the sinkholes on NE 33rd Ave. Existing geotechnical data indicated that subsurface conditions consist primarily of silt and silty sand to depths greater than 60 feet. No gravels were encountered in the borings. Based on the data available, McMillen Jacobs assumed the following values for preliminary shoring design calculations: unit weight = 120 pcf; friction angle = 32 to 36 degrees.
- **Groundwater:** No groundwater was encountered in any of the existing borings. Boring logs indicated soils were moist to wet, varying seasonally with precipitation. A layer of perched groundwater was encountered at a depth of 44 feet in one boring in Grant Park. Based on the data available, McMillen Jacobs does not anticipate that dewatering wells will be required for this sewer repair. Sumping from inside the shoring may be necessary to control nuisance water.
- **Flow Bypass:** BES Integrated Planning/Risk Assessment evaluated bypass pumping scenarios and flow monitoring data under dry weather and wet weather conditions. In summary, dry weather bypass flow rates (1-year) for the 60" sewer = 600 gpm; and 30" sewer = 250 gpm. Wet weather bypass flows are more than 10 times greater. This sewer repair must be performed during dry weather conditions. The Contractor will need to either divert flows from upstream maintenance holes on the 30" and 60" sewers or handle the flows from inside the access shaft excavation with bulkheads and flow-through pipes.

- **Additional community impacts:**
    - Residential driveways: Two residences have driveways in the sinkhole zone on NE 33rd Ave. Access to these driveways will need to be maintained during construction.
    - Local businesses: Orthodontist, newly remodeled medical office, attorney's office. Construction noise will impact these businesses. However, access to the business entrances and parking lots will not be impacted by proposed construction activities.
    - Bus stops: There are two Trimet bus stops in the sinkhole zone on NE 33rd Ave, one north of the intersection and one south of the intersection.

4.0 Engineering Opinion of the Problem

Based on the above, it is McMillen Jacobs' opinion that the root cause of the sinkholes in the middle of NE 33rd Ave at NE Knott St was the severely deteriorated invert of the junction chamber directly below. Over many years, flow from the 30" sewer dropped into the junction chamber, scouring the invert. Eventually, the invert was fully eroded and the bare soil outside the junction chamber was exposed. This allowed the fine-grained soils around the junction chamber to slowly wash into the sewer each time it rained. Soil erosion and settlement increased over time as storm water infiltration found the path of least resistance. With the second sinkhole developing about 60 feet downstream of the junction chamber, soil erosion around the outside of the existing sewer appears to have propagated both upwards and down gradient at least 60 feet from the scoured invert. It is unknown what impact, if any, that recent construction activities may have had, but suffice to say that compaction of trench backfill above the sewer exacerbated the problem and accelerated ground settlement.

In summary, McMillen Jacobs believes there are two "problems" on NE 33rd Ave and NE Knott St: (1) severe structural defect at the 30"/60" junction chamber, and (2) resulting subsurface soil erosion and settlement over the years.

5.0 Repair Alternatives Evaluation

McMillen Jacobs considered three alternatives to address the sinkholes in the middle of NE 33rd Ave & NE Knott St:

- In-situ repair of junction chamber invert with new beaver slide at 30" sewer connection
- Construct new junction chamber using 144" maintenance hole structure
- Ground modification grouting

These repair alternatives are described in more detail below. The degree to which each alternative addresses one or both "problems" varies.

5.1 In-situ Invert Repair and Beaver Slide

The first alternative would consist of repairing the invert of the junction chamber from inside the pipe and constructing a beaver slide at the 30" sewer connection to reduce energy and avoid scour. The intent of this alternative would be to minimize the excavation footprint and surface disturbance. In theory, this repair option would not require an access shaft above the junction chamber; but an access shaft would still be required downstream on the 66" sewer because existing access points (see Section 3 above) are too far to construct this repair safely and efficiently.

In addition to a new access shaft, this option would require temporary bypass pumping to divert flows from the 30" sewer and 60" sewer for approximately one month. This effort would be costly and highly disruptive. Furthermore, the final product of this repair alternative would be a new concrete improvement anchored to a 110-year-old concrete junction chamber. It is McMillen Jacobs' opinion that this is a temporary solution with uncertain structural capacity. While the localized structural defect would be repaired, the remaining useful life of the junction chamber would remain unchanged.

5.2 Construct New Junction Chamber

The second alternative would consist of excavating/shoring an access shaft above the existing junction chamber, removing the existing structure, placing a base slab, installing a new concrete maintenance hole, and constructing a beaver slide for the 30" sewer. To accommodate the three penetrations (30", 60", 66"), a 144" maintenance hole would be required. As such, the access shaft footprint (inside dimensions) would need to be at least 16-feet wide by 18-ft long. Allowing an extra 5-feet around the shaft perimeter for shoring, personnel access, and traffic control, the resulting work zone would be at least 26-feet wide, centered in the middle of NE 33rd Ave (36-feet wide). This would leave only about 5-feet on each side of the work zone, which is not sufficient for vehicular traffic.

While existing utilities could be protected in place and flow bypass could be managed with bulkheads and flow-through pipes inside the access shaft, traffic control requirements will drive the schedule and cost for this alternative. If NE 33rd Ave can be fully closed during construction (south of NE Knott St), then the shoring could extend above the road surface (slide rail or steel beams/plates) and the crew could work safer and more efficiently, not having to secure the work zone each shift and re-open for traffic. If, however, NE 33rd Ave cannot be fully closed and traffic through the work zone needs to be maintained, then a more robust shoring system (soldier piles/lagging) would be required that does not extend above the road surface and can accommodate street plates or concrete deck panels. Four flaggers would be required during work hours; and the crew would spend at least one hour at the beginning and end of each shift opening and closing the work zone.

McMillen Jacobs performed preliminary shoring design calculations for this alternative. Figure 2 illustrates one feasible shoring method – soldier pile/lagging with two levels of internal bracing.

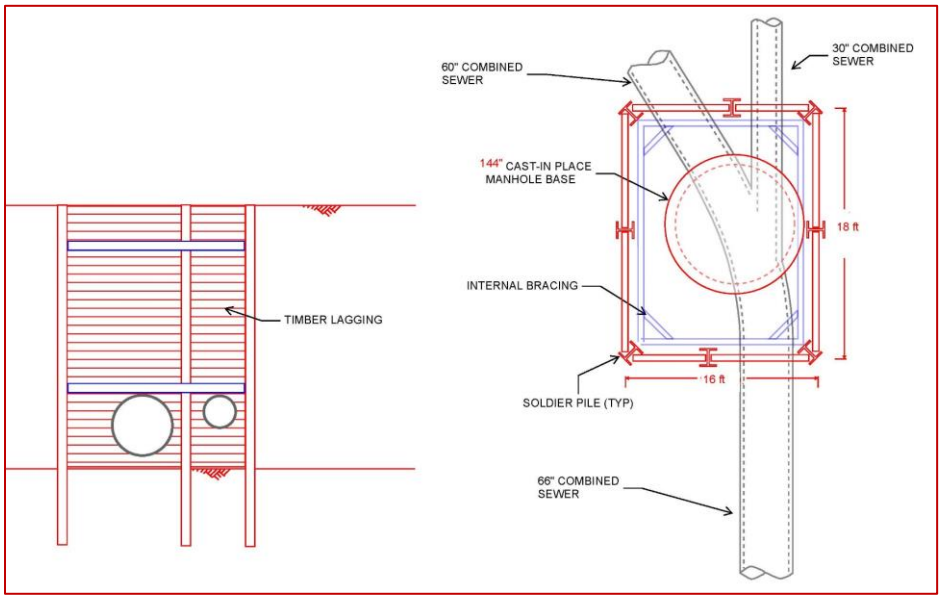


Figure 2: Feasible soldier pile/lagging shoring for new junction chamber

The cost and schedule impacts of keeping NE 33rd Ave open during construction are significant. McMillen Jacobs estimated the total construction cost and schedule for constructing a new 144" junction chamber with the two traffic control scenarios as follows:

- Full road closure: $690,000 to $960,000; about 5 to 6 weeks from mobilization
- Open during non-work hours: $940,000 to $1,305,000; about 8 to 10 weeks from mobilization

5.3 Ground Modification Grouting

The third alternative would stabilize the ground by drilling and injecting grout into the soil either from the surface, from inside a new access shaft, or from inside the pipe. A well-designed ground modification program could resolve the settlement and sinkhole problem; but would not accomplish the primary objective – repairing the severe structural defect inside the junction chamber. As such, this alternative would have to be combined with one of the other two options. In addition, exploratory borings and soil testing would be required to design the grouting program. This would add cost and several weeks to the front-end design phase. Protection of the existing water lines and gas line could also be a challenge, depending on the grouting method employed.

6.0 Recommendations

In light of the above, McMillen Jacobs recommends construction of a new junction chamber with a 144" maintenance hole, reducer slab, and 48" riser. This alternative prioritizes worker safety, public safety, cost, schedule, and long-term benefits. Upon conclusion of the repair, the new junction chamber will eliminate infiltration into the sewer (at this location), restore soil confinement around the existing sewer, reduce flow velocity/energy from the 30" sewer, and provide safe, convenient access for future maintenance and rehabilitation.

Regarding the second sinkhole approximately 60 feet south of the junction chamber, very little is known about this issue. McMillen Jacobs recommends further exploration to determine an appropriate sinkhole repair. During construction of the new junction chamber, shaft excavation will provide some indication of the problem. Potholing and trench excavation between the two sinkholes would provide additional input. Ground modification grouting may or may not be appropriate. It would be most economical and expeditious to have the Contractor perform the additional exploration and eventual repair. For bidding purposes, McMillen Jacobs recommends including a Bid Item called "Trench Rehabilitation" with a defined scope and typical detail – say 8-feet wide by 8-feet deep by 60-feet long – to get competitive pricing for this effort. After the Contractor is on board and the Team gains a better understanding, the scope of repair for the second sinkhole can be developed and implemented.

6.1 Scope of Repair

McMillen Jacobs recommends the following scope of work:

- Mobilization
- Erosion/pollution control – Assume standard City Specifications for BMP's and spill prevention.
- Traffic control – BES to provide key assumptions (ie. road open or closed).
- Existing utility protection – See Section 3 for key assumptions.
- Temporary flow bypass – See Section 3 for key assumptions.
- Remove existing junction chamber – See 1912 as-built drawing for assumed configuration.

- Construct 144" maintenance hole – Recommend Lump Sum bid item to include shoring design/installation/removal, shaft excavation/disposal, utility protection, concrete base, 144" MH structure, sewer re-connections, beaver slide transition from 30" sewer to 66" sewer, shaft backfill, roadway section reconstruction, paving, site restoration, and all incidentals.
- Trench rehabilitation – Assume 8-feet wide by 8-feet deep by 60-feet long between the two sinkholes. Recommend Unit Price bid item (per linear foot) to include saw-cutting, excavation, disposal, shoring, backfill, and all incidentals.

Using the above work activities as Bid Items, Table 1 presents McMillen Jacobs' preliminary (Class 5) construction cost estimate for the recommended sewer repair alternative. The Bid Form could be structured in a similar manner. Preliminary cost estimates were prepared for the two traffic control scenarios discussed above ("full road closure" and "open to traffic"). Estimated unit costs were obtained from late 2021/early 2022 bids and estimates for similar work. Contingency was included at –10% and +25% to establish the low/high ranges presented above.

6.2 Future Rehabilitation

Given the advanced age of the existing concrete sewers (30", 60", 66") and challenging lack of safe access to these sewers, additional structural rehabilitation will be necessary at some point in the future. CCTV inspection video of the existing 30" sewer indicated severe deterioration in the invert upstream of the junction chamber. The existing maintenance hole AAY400 in NE 33rd Ave appeared to have minor defects and inflows around two storm drain penetrations (see Photo 5). In addition, this MH was oval approximately 30" diameter, which may not be large enough to facilitate CIPP rehabilitation in the future.

Photo 5: CCTV inspection photo of AAY400 on NE 33rd Ave

For future planning purposes, the total estimated construction cost to remove the existing AAY400 and replace with a new 48" maintenance hole (large enough to facilitate CIPP rehabilitation) would be $384,000 to $533,000 and take about 3 to 4 weeks. Alternatively, AAY400 could be patched from the inside for much less cost and time. This would repair the minor defects/infiltration and postpone construction of suitable access until the 30" sewer is scheduled for rehabilitation.

Table 1

City of Portland BES
E11501 NE 33rd Ave and NE Knott Sewer Emergency
Preliminary Construction Cost Estimates for Recommended Repair Alternative

		New 144" Junction Chamber (full road closure)				New 144" Junction Chamber (open to traffic)			
Item	**Description**	**Estimated Quantity**		**Unit Price**	**Total**	**Estimated Quantity**		**Unit Price**	**Total**
1	Mobilization	1	LS	$ 81,836	$ 81,836	1	LS	$ 112,695	$ 112,695
2	Erosion/Pollution Control	1	LS	$ 11,860	$ 11,860	1	LS	$ 15,147	$ 15,147
3	Traffic Control	1	LS	$ 35,581	$ 35,581	1	LS	$ 113,603	$ 113,603
4	Diversion of Flow	1	LS	$ 75,000	$ 75,000	1	LS	$ 120,000	$ 120,000
5	Removal of Existing Junction Chamber	1	LS	$ 45,000	$ 45,000	1	LS	$ 45,000	$ 45,000
6	Construct New Junction Structure	1	LS	$ 410,616	$ 410,616	1	LS	$ 529,956	$ 529,956
7	Trench Rehabilitation	60	FT	$ 1,700	$ 102,000	60	FT	$ 1,700	$ 102,000
8	Video Inspection of Sewers, Mainline	120	FT	$ 45	$ 5,400	120	FT	$ 45	$ 5,400
	Construction Subtotals				**$ 767,293**				**$ 1,043,801**
	Contingency	-10%			$ (76,729)	-10%			$ (104,380)
	Contingency	25%			$ 191,823	25%			$ 260,950
	Estimated Cost Range			**(low)**	**$ 690,564**			**(low)**	**$ 939,421**
				(high)	**$ 959,117**			**(high)**	**$ 1,304,751**

Notes:

1. Estimated unit costs were obtained from late 2021/early 2022 bids and estimates for similar work.
2. "Traffic Control" for 'full road closure' assumed 6% of direct construction (per PBOT cost tables) and 'open to traffic' assumed 15%.
3. "Diversion of Flow" assumed $15,000 per week for bulkheads and flow-through pipes inside the shaft.
4. "Construct New Junction Structure" includes shoring design/install/removal, shaft excavation/disposal, utility protection, concrete base, 144" MH structure, sewer re-connections, beaver slide, shaft backfill, roadway reconstruction, paving, and all incidentals.
5. "Trench Rehabilitation" assumed 8-ft wide by 8-ft deep. Includes saw-cutting, excavation, disposal, shoring, backfill, and all incidentals.