Storm Drain Condition Assessment Report

Appendix D

W 32nd AVENUE and E. 33rd AVENUE UPGRADES

STORM DRAIN CONDITION ASSESSMENT

AUGUST 2017

Prepared By:

Stephl Engineering LLC
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907-562-1468

Stephl Engineering LLC

Memorandum

To: Matt Edge P.E., CRW Engineering Group LLC

From: Russ Porter, P.E., Stephl Engineering LLC

Date: August 15, 2017

Re: W. 32ND and E. 33RD Avenue Upgrades-Storm Drain Condition Assessment

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This memorandum presents the results of the pipe inspections and storm drain structure inspections by Stephl Engineering LLC (Stephl) in July 2017.

1.0 Background

The purpose of this condition assessment report is to describe the condition of the existing storm drain structures and piping on 32nd Avenue and 33rd Avenue between Arctic Boulevard and Denali Street. Figures showing the project area, pipes and structures inspected are included in Appendix A.

2.0 Inspection Procedures

2.1 Pipe Inspection Procedure

The pipe inspection work was completed by Stephl. Stephl used a Quickview Camera to perform the pipe inspection work. A Quickview Camera is a pole mounted "zoom" camera. The Quickview Camera is inserted into a storm drain structure and takes a video of the pipe from the storm drain structure. The Quickview Camera does not enter and travel along the pipe. It uses the camera's zoom capabilities to observe the pipe and record a video image of the inside of the pipe. The Quickview Camera can observe between 10 to 300 feet of pipe depending on existing pipe condition, slope and pipe diameter. Below are some images of the Quickview Camera in operation.

Quickview Camera-being lowered into pipe

Quickview Camera- Recording the condition of the existing pipe

Image of pipe taken from Quickview Camera

Where existing CMP pipe entered storm drain structures the bottom half of the CMP pipe was probed from the ground surface with a metal bar and moderate force to check for weak/metal on the existing CMP pipe. No structures were manually entered during inspection. The only pipes checked for missing/weak invert were the pipes that could be reached from the ground surface with a metal bar. The pipe outside the manhole wall was not probed. Where the metal was soft or missing it was noted in the inspection logs and figures.

The pipe inspection work was documented on inspection logs and DVD recordings. Storm drain structure numbers were obtained from the Municipality of Anchorage's Department of Maintenance and Operations Stormwater Grid Maps. Grid Map numbers are used to identify the segments of pipe and are also used to identify individual storm drain structures. The pipe inspection logs are contained in this report in Appendix B. The DVD recordings are contained in this report in Appendix C.

2.2 Structure Inspection Procedure

The storm drain structures were inspected by Stephl during July 2017. Storm drain structure characteristics and defects were recorded on written logs and photographs that are contained in this report. The condition of the storm drain structures was obtained by viewing the structures from the top of the storm drain structures. No structures were entered during the inspection of the storm drain system along 32nd Avenue and 33rd Avenue.

The storm drain structures depth, material of construction, pipe connections, general condition and defects were documented. Descriptions are provided in the storm drain structure inspection logs in Appendix B.

When inspecting the storm drain structures, the defects and the overall condition of the structure were scored (between 1 and 5) according to the following grades:

Score	Example Defect
1 = No defect	none
2 = Minor defect	spalling concrete, offset frame, corrosion on pipe steps
3 = Moderate defect	damaged concrete, cracks in structure,
4 = Significant defect	broken concrete, soil visible, large cracks,
5 = Most significant defect	collapsing structure

3.0 Inspection Results

Figures of the existing storm drain system inspected are included in Appendix A. The figures shows the existing storm drain system on 32nd and 33rd Avenue and the major defects observed during the storm drain inspection work. For a summary of the pipe and storm drain structure condition and inspection logs see Appendix B. See Appendix C for the pipe inspection videos.

3.1 Pipe Inspection Results

Pipe included in the assessment limits consisted of approximately 4,335 linear feet (LF) of storm drain pipe. The existing storm drain system included 1,800 LF Corrugated Polyethylene Pipe (CPEP), 1,680 LF Corrugated Metal Pipe (CMP), 435 LF of Fiberglass Reinforced Pipe (FRP) pipe, 400 LF of pipe unknown due to not being able to inspect, and 20 LF of cast iron. 3,900 LF of storm drain pipe is estimated to have been inspected during the Quickview pipe inspection work. It is estimated that 435 LF of storm drain pipe was not inspected. The estimated portions of the pipe that could be observed are shown in the figure included in Appendix A.

It is likely that where pipe inverts were missing or weak within structures that the pipe outside the manhole wall was also missing or has weak inverts. For this report it is assumed that if the invert within the structure was missing/weak that the invert elsewhere along the pipe alignment was also missing or weak.

The significant defects found during the inspection were:

- Missing/weak inverts were present in almost all the corrugated metal pipe (CMP) pipes in 32nd Avenue between Arctic Blvd and Dawson Street. Pipe inverts were probed where the pipe enters the storm drain structures and were soft and missing. This is approximately 1,520 LF of 12-inch and 15-inch CMP.
- Numerous FRP pipes at the intersection of 32nd Avenue and A street had holes present in the pipe wall.
- The FRP pipe between MH 1630-170 and MH 1630-214 has a large hole and is beginning to collapse. The crown was deformed down approximately 3 inches and soil was visible behind the hole.
- The effluent pipe from MH 1631-131 taps directly into an 18-inch CPEP between MH 1631-132 and MH 1631-090. 12-inch CPEP protrudes approximately 10-inches into the 18-inch CPEP and is blocking flow.
- Approximately 50% of the pipes had debris and sediment blocking flow in the pipes. The depth of sediment varies between 1-inch to 6-inches.

3.2 Structure Inspection Results

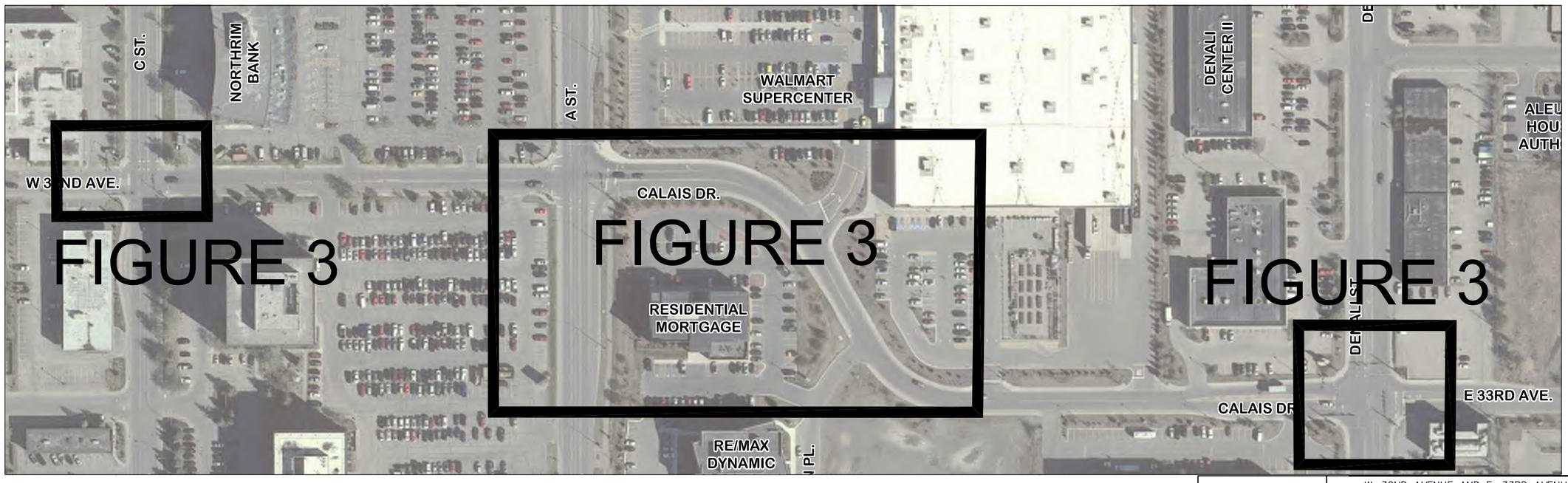
Forty-six storm drain structures were inspected. None of the storm drain structures inspected appeared to be failing at this time. For a summary of the storm drain structure condition see Appendix B.

- Approximately 50 percent of the structures had cracked or missing grout on the pipe penetrations.
- Approximately 20 percent of the structures had cracked bases.
- Approximately 60 percent of the structures had significant sediment buildup (greater than 4 inches) in the structure sumps.

For significant defects see summary inspection logs for pictures and further storm drain structure inspection information (Appendix B).

Appendix A

Storm Drain Figures



File: S:\1705 Midtown Corridor Storm\07 - CADD\figure 7-20-2017.dwg

Stephl ENGINEERING LLC

PROJECT: 1705

STATUS:

MUNICIPALITY OF ANCHORAGE

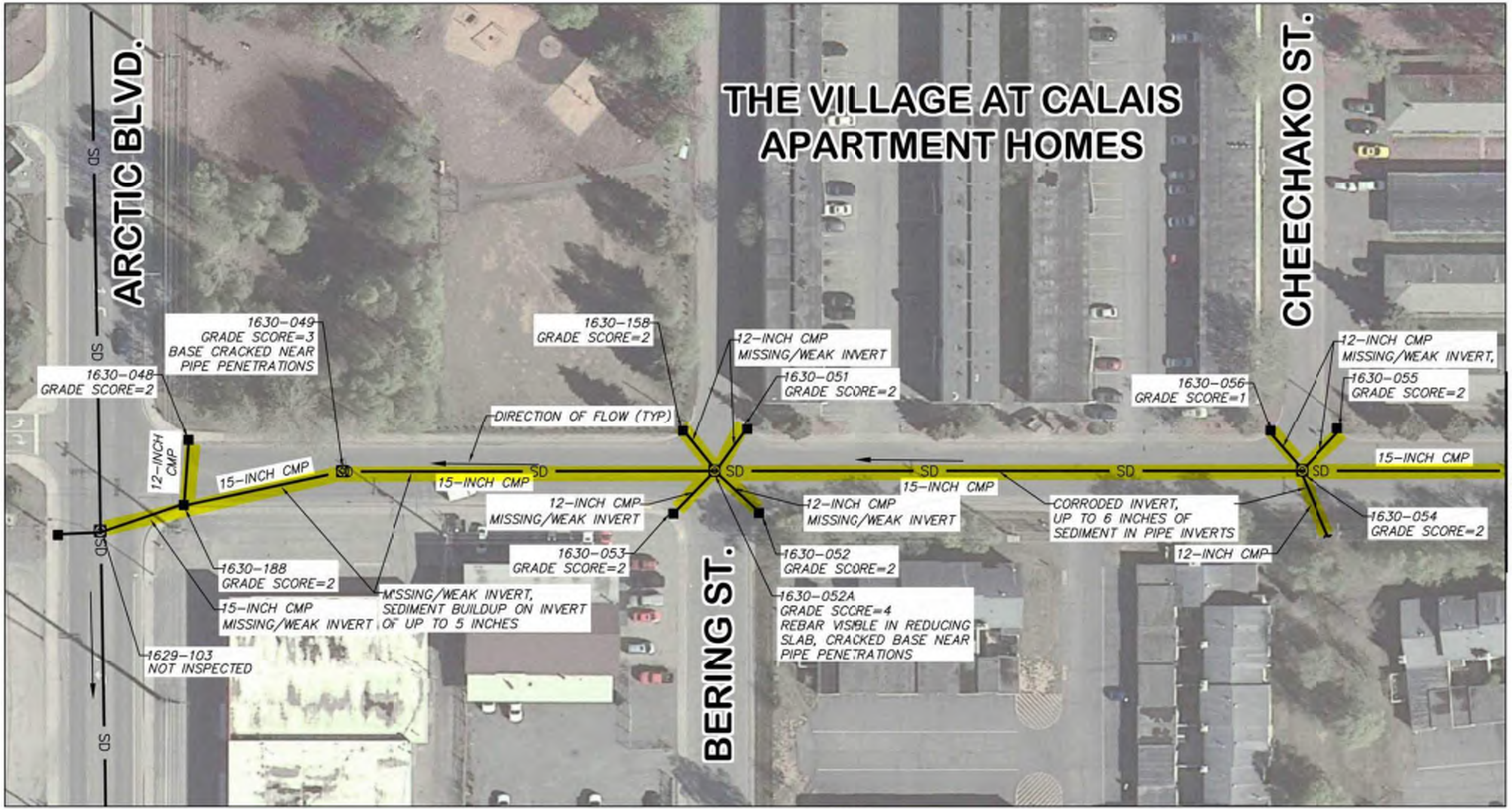
W. 32ND AVENUE AND E. 33RD AVENUE UPGRADES

STORM DRAIN KEY MAP

STORM DRAIN CONDITION ASSESSMENT

DATE Aug 2017

FIGURE KEY MAP



ARCTIC BLVD TO CHEEKACHO ST

1"=60'

Estimated Pipe Observed

Stephl ENGINEERING LLC

PROJECT: 1705

STATUS:

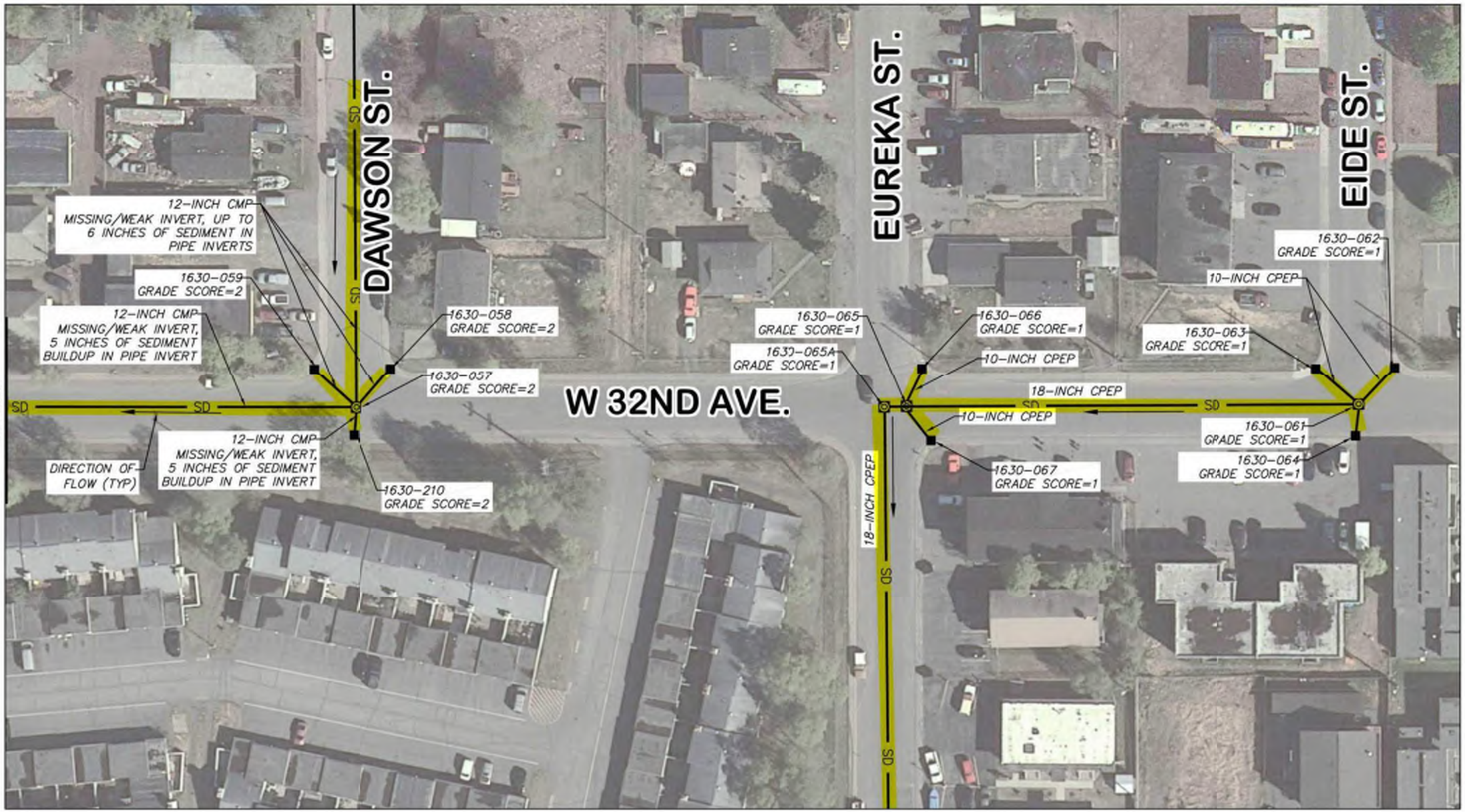
W. 32ND AVENUE AND E. 33RD AVENUE UPGRADES

FIGURE 1 – ARCTIC TO CHEECHAKO

STORM DRAIN CONDITION ASSESSMENT

DATE Aug 2017

FIGURE 1



Estimated Pipe Observed

DAWSON ST TO EDIE ST

1"=60'

Stephl ENGINEERING LLC

PROJECT: 1705

STATUS: –

W. 32ND AVENUE AND E. 33RD AVENUE UPGRADES

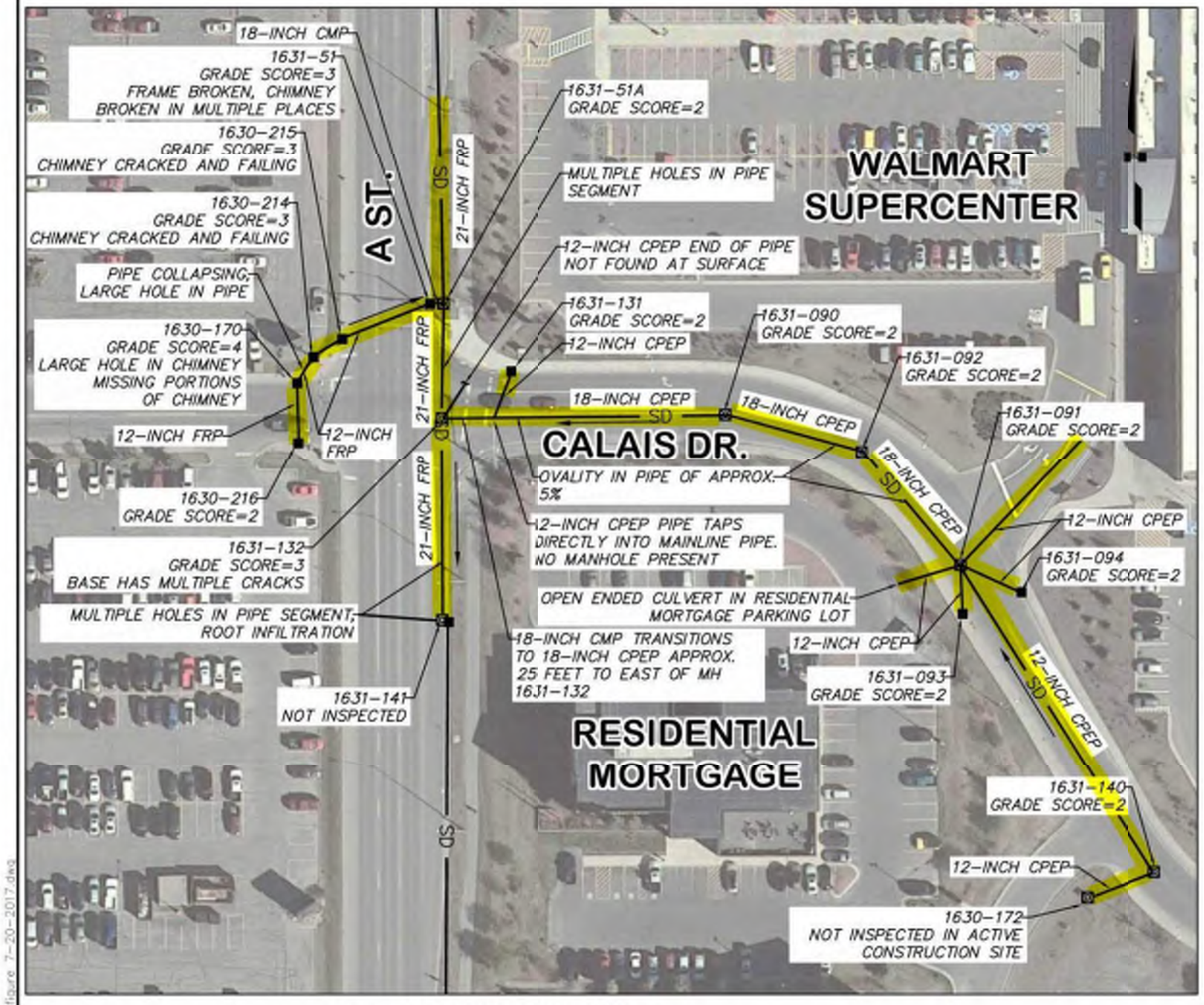
FIGURE 2 – DAWSON TO EDDIE

STORM DRAIN CONDITION ASSESSMENT

DATE: Aug 2017

FIGURE 2

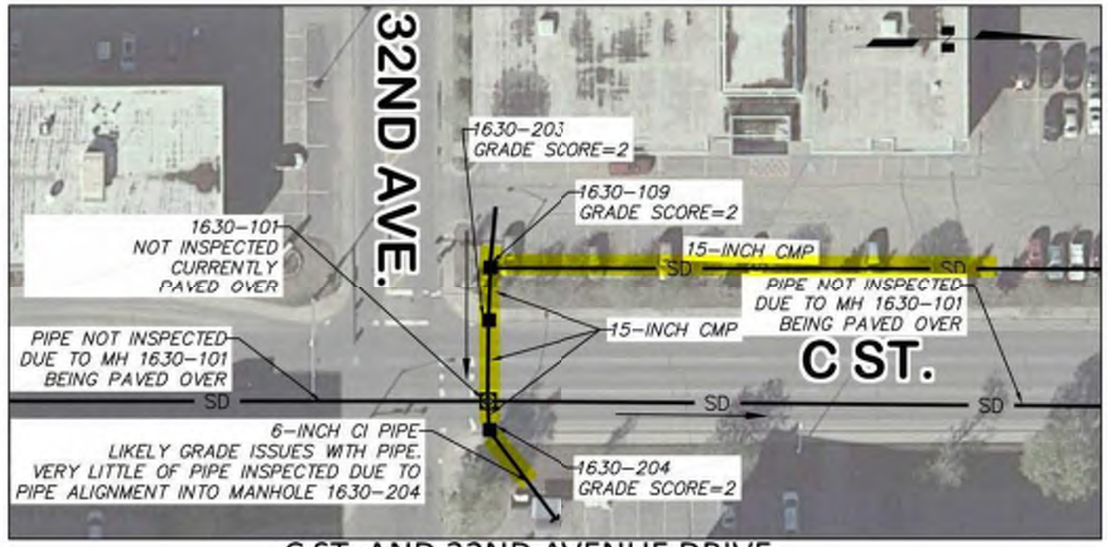
File: S:\1705 Midtown Corridor Storm\07 – CADD\figure 7-20-2017.dwg



A ST AND CALAIS DRIVE

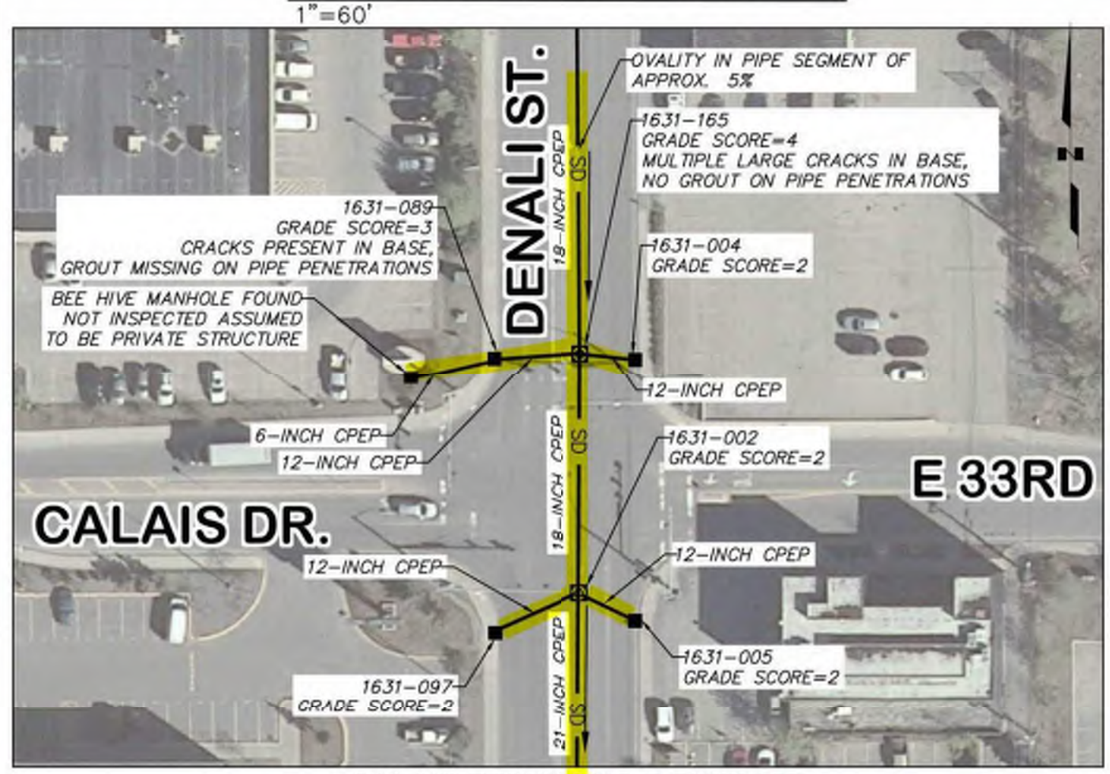
1"=80'

Estimated Pipe Observed



C ST AND 32ND AVENUE DRIVE

1"=60'



CALAIS DRIVE AND DENALI ST

1"=60'

Stephl ENGINEERING LLC

PROJECT: 1705

STATUS: –

MUNICIPALITY OF ANCHORAGE

W. 32ND AVENUE AND E. 33RD AVENUE UPGRADES

FIGURE 3 – C STREET TO DENALI

STORM DRAIN CONDITION ASSESSMENT

DATE: Aug 2017

FIGURE: 3

File: S:\1705 Midtown Corridor Storm\07 – CADD\Figure 7-20-2017.dwg

Appendix B

Storm Drain Structure and Pipe Inspection Summary Table

and

Storm Drain Structure and Pipe Inspection Logs

32nd and 33rd Avenue Upgrades Storm Drain Condition Assessment Report

Storm Drain Structure Condition and Pipe Inspection Summary			Defect grades: *1=No Defect, 2=Minor Defect, 3=Moderate Defect, 4=Significant Defect, 5=Most Significant Defect*											
		Material	Condition of Components											
Structure No.	Rim-Invert (in) (of effluent pipe)	Type	Overall	Cover	Frame	Chimney	Steps	Cone (all eccentric)	Reducing Slab	Base	Connections (Influent)	Connections (Effluent)	Storm Drain Structure Observations	Pipe Inspection Observations (Approx. 10 to 300 feet)
1630-048	41	Precast Concrete	2	2	2	N/A	N/A	N/A	2	2	N/A	2	12-inch effluent pipe partially blocked with debris,	6-inches of sediment buildup in invert, invert of pipe was soft when probed with moderate force
1630-049	54	Precast Concrete	3	2	2	2	2	2	N/A	3	3	3	Base was cracked near pipe penetrations	Inverts were probed on pipes protruding into structure and were soft when probed with moderate force, Minor root intrusion in pipe
1630-051	37	Precast Concrete	2	2	2	2	N/A	N/A	2	2	N/A	3	Chimneys were offset from frame 3-inches	3-inches of sediment buildup in invert
1630-052	32	Precast Concrete	2	2	2	2	N/A	N/A	2	2	N/A	4	No grout at pipe connection	6-inches of sediment buildup in invert, invert of pipe was soft when probed with moderate force
1630-052A	44	Precast Concrete	4	2	2	2	N/A	N/A	4	4	3	3	Reinforcement mesh is visible in reducing slab, cracked base near pipe connections	Up to 3-inches of sediment buildup in inverts, inverts of pipes were soft when probed with moderate force
1630-053	31	Precast Concrete	2	3	3	N/A	N/A	N/A	2	2	N/A	4	Frame and cover has metal loss present, grout is cracked and missing at pipe penetration	Up to 3-inches of sediment buildup in invert, invert of pipe was soft when probed with moderate force
1630-054	70	Precast Concrete	2	2	2	2	2	N/A	2	2	2	1		Up to 2-inches of sediment buildup in inverts, inverts of pipes were soft when probed with moderate force
1630-055	44	Precast Concrete	2	2	2	2	N/A	N/A	2	2	N/A	2		Invert was probed on pipe protruding into structure and was soft when probed with moderate force
1630-056	42	Precast Concrete	1	3	3	2	N/A	N/A	2	1	N/A	2	Metal loss present on frame and cover	inverts of pipes were soft when probed with moderate force
1630-057	61	Precast Concrete	2	2	2	2	1	2	N/A	2	2	1	Asphalt is cracked and failing around frame of manhole	Dent observed in pipe, up to 4-inches of sediment buildup in inverts, inverts of pipes were soft when probed with moderate force
1630-058	44	Precast Concrete	2	2	2	3	N/A	N/A	2	1	N/A	1	Cracks in chimneys	Up to 5-inches of sediment buildup in invert, invert of pipe was soft when probed with moderate force
1630-059	43	Precast Concrete	2	2	2	2	N/A	N/A	2	1	N/A	2	1/2 inch gap between frame and chimney	Up to 6-inches of sediment buildup in invert, invert of pipe was soft when probed with moderate force
1630-061	56	Precast Concrete	1	1	1	1	1	N/A	1	1	1	1		
1630-062	40	Precast Concrete	1	1	1	1	N/A	N/A	1	1	N/A	1		
1630-063	36	Precast Concrete	1	1	1	1	N/A	N/A	1	1	N/A	1		
1630-064	38	Precast Concrete	1	1	1	1	N/A	N/A	1	2	N/A	1	Small crack in either base or grout near pipe penetration at effluent	
1630-065	69	Precast Concrete	1	1	1	1	1	N/A	1	1	1	1		
1630-065A	70	Precast Concrete	1	1	1	1	1	1	N/A	1	1	1		
1630-066	38	Precast Concrete	1	1	1	1	N/A	N/A	1	1	N/A	1		
1630-067	40	Precast Concrete	1	1	1	1	N/A	N/A	1	1	N/A	1		
1630-101													Unable to inspect due to being paved over in C Street	Unable to inspect due to being paved over in C Street
1630-109	60	Precast Concrete	2	2	2	N/A	2	3	N/A	2	4	4	Grout missing on all pipe connections, small crack in cone	Root intrusion in pipe, up to 6 inches of sediment buildup in invert,
1630-158	35	Precast Concrete	2	2	2	3	N/A	N/A	2	2	N/A	3	Chimney is cracked, grout is cracked on effluent pipe connection	Invert was probed on pipe protruding into structure and was soft when probed with moderate force, up to 6 inches of sediment buildup in invert
1630-170	22	Cast in Place	4	2	2	4	N/A	N/A	N/A	3	3	3	Large hole in chimney approximately 4-inches tall by 10 inches long, multiple cracks in base, grout cracked and missing at pipe penetrations	Hole in top of pipe with root intrusion between the 10 o'clock and 2 o'clock position, up to 4 inches of sediment buildup in invert
1630-188	42	Precast Concrete	2	2	2	1	N/A	N/A	1	2	2	2	Soil protruding between frame and chimney. Separation is approximately 1/2 inch. Frame is offset from chimney and reducing slab approximately 6 inches.	Up to 6-inches of sediment buildup in invert, invert of pipe was soft when probed with moderate force, possible hole in pipe at 8 o'clock position with root intrusion
1630-203	59	Cast in Place	2	2	2	N/A	N/A	N/A	N/A	2	2	3	Grout missing on effluent pipe connection	Up to 2 inches of sediment buildup in invert
1630-204	61	Cast in Place	2	2	2	N/A	N/A	N/A	N/A	2	4	3	No grout on influent pipe protrusion, soil visible	Potential grade issues in pipe very little of pipe inspected due to pipe alignment into storm drain structure

32nd and 33rd Avenue Upgrades Storm Drain Condition Assessment Report

Storm Drain Structure Condition and Pipe Inspection Summary			Defect grades: *1=No Defect, 2=Minor Defect, 3=Moderate Defect, 4=Significant Defect, 5=Most Significant Defect*											
		Material	Condition of Components											
Structure No.	Rim-Invert (in) (of effluent pipe)	Type	Overall	Cover	Frame	Chimney	Steps	Cone (all eccentric)	Reducing Slab	Base	Connections (Influent)	Connections (Effluent)	Storm Drain Structure Observations	Pipe Inspection Observations (Approx. 10 to 300 feet)
1630-210	45	Precast Concrete	2	2	2	3	N/A	N/A	1	1	N/A	2	Invert of effluent pipe was missing where pipe penetrates the manhole, grout cracked between chimney and frame	Up to 5 inches of sediment buildup in invert, invert of pipe entering manhole was corroded and missing
1630-214	28	Cast in Place	3	2	2	4	N/A	N/A	N/A	3	1	3	Cracks in base of manhole, Hole in effluent pipe connection	Pipe is collapsing and existing pipe is failing, Transitions between CMP and fiberglass pipe between pipe segments
1630-215	42	Cast in Place	3	2	2	4	N/A	N/A	N/A	2	1	3	Multiple cracks in chimney, effluent pipe has multiple cracks in the grout	Could not inspect much of pipe due to alignment of pipe into storm drain structure, Up to 2 inches of sediment buildup in invert of pipe
1630-216	24	Cast in Place	3	2	2	3	N/A	N/A	N/A	2	N/A	4	No grout on effluent pipe connection, chimney is cracked and pieces are beginning to break	Up to 2 inches of sediment buildup in invert
1631-002	55	Precast Concrete	3	2	2	2	1	N/A	1	4	3	2	Multiple cracks in base of manhole	Up to 3 inches of sediment buildup in invert
1631-004	31	Precast Concrete	2	2	2	N/A	N/A	N/A	1	2	N/A	4	Grout is broken and missing on effluent pipe connection	
1631-005	36	Precast Concrete	2	2	2	2	N/A	N/A	1	2	N/A	3	Grout is broken and missing on effluent pipe connection	
1631-051	46	Cast in Place	3	2	4	5	N/A	N/A	N/A	2	2	2	Frame is broken and missing metal, chimney is broken multiple pieces are missing and crumbling from chimney	Up to 2 inches of sediment buildup in invert
1631-051A	55	Precast Concrete	2	2	2	4	2	N/A	2	2	2	2	Chimney is in poor condition missing grout and appears to have been repaired at some point in time	Root intrusion in pipe
1631-089	36	Precast Concrete	3	2	2	2	N/A	N/A	1	3	4	3	Grout is missing at pipe connections, base is cracked at pipe connection points	Up to 2 inches of sediment buildup in invert
1631-090	51	Precast Concrete	2	2	2	3	2	N/A	2	2	2	2	Chimney has cracks and grout is missing	Pipe damaged where connected to structure between the 11 o'clock and 1 o'clock position, ovality observed in pipe approximately 5%
1631-091	55	Precast Concrete	2	2	2	2	2	N/A	2	3	3	3	Cracks in base between pipe connections, grout is flaking and missing on pipe penetrations	Ovality observed in pipe approximately 5%
1631-092	53	Precast Concrete	2	2	2	3	2	N/A	2	2	3	3	Small cracks not separated in reducing slab and chimney, small cracks not separated in base	Ovality observed in pipe approximately 5%
1631-093	40	Precast Concrete	2	2	2	2	N/A	N/A	1	1	N/A	3	Grout is cracked on pipe connection, frame is offset 5 inches from chimneys	
1631-094	39	Precast Concrete	2	2	2	2	N/A	N/A	2	2	N/A	2		Up to 2 inches of sediment buildup in invert
1631-097	35	Precast Concrete	2	2	2	3	N/A	N/A	1	2	N/A	3	Grout is broken and missing on effluent pipe connection	
1631-131	26	Precast Concrete	2	2	2	N/A	N/A	N/A	2	2	N/A	1		Pipe leaving 1631-131 connects directly to pipe in Calais Drive between MH 1631-132 and 1631-090 without a storm drain structure
1631-132	56	Precast Concrete	3	2	2	2	2	N/A	2	4	3	2	Base has multiple cracks in it near pipe penetrations	Multiple holes in pipe varying in size, pipe from structure 1631-131 taps directly into pipe between MH 1631-132 and 1631-090 without a storm drain structure
1631-140	49	Precast Concrete	2	2	2	2	4	N/A	2	2	2	3	Cracked grout on effluent	Small grade breaks in pipe throughout pipe alignment
1631-165	52	Precast Concrete	4	2	2	2	4	N/A	1	4	4	2	Multiple cracks in base, Grout is missing on pipe penetrations, Step is no of use it is under reducing slab	Ovality observed in pipe approximately 5%, Up to 3 inches of sediment buildup in invert
N/A=not available, not applicable														

32nd and 33rd Avenue Upgrades

SEWER MANHOLE INSPECTION REPORT

Manhole # 1630-048

DATE, INSPECTOR(S), & LOCATION DATA

Date of Inspection: Tuesday, July 11, 2017 **Inspector(s):** Porter, Bailey

Atmosphere: O_2- N/A **LEL-** N/A **H_2S-** N/A **CO-** N/A

General Location Features: North Corner of Arctic Blvd and 32nd Avenue

PIPE CHARACTERISTICS

In-Effluent Pipe Size/Type/Diameter	Rim to Invert	Depth of Flow
1. 12-inch CMP Effluent	41"	6"

Depth of Sum, Depth of Debris in Sump: 12-inch sump, 4-inches debris

MANHOLE CHARACTERISTIC

***Defect grades**: 1=No Defect, 2=Minor Defect, 3=Moderate defect, 4=Significant defect, 5=Most significant defect*

Overall Structural Condition: 2.

Material of Construction: Precast

Manhole Shape: Circular

Dimensions: 48-inch

Cover/Lid: 22x18-inch, CI, with a grade score of 2

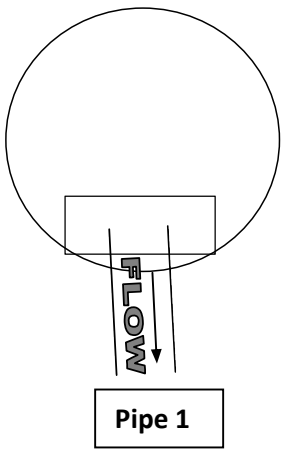
Frame: 7 inch tall, CI, with a grade score of 2

Reducing slab: 1-8 inch with a grade score of 2 crack in reducing slab not separated

Base: 1-38-inch with a grade score of 2

Effluent Pipe Connection: 3-inch protrusion grout is flaking grade score of 2

Additional Comment: 12-inch effluent pipe is clogged with debris. Surface corrosion on frame and cover



MH 1630-048 looking northwest

MH looking north

MH frame and inlet

effluent pipe

12-inch effluent

crack in reducing slab not seperated

32ND AND 33RD Avenue Upgrades

Structure Number 1630-048

Pipe Inspection Results

Location of Storm Drain Structure: North corner of Arctic Blvd and 32nd Avenue

Camera type: Quickview Camera

Quickview camera can observe from 10 to 300 feet of pipe depending on existing pipe condition, slope, and diameter.

1 Pipe viewing sequence number

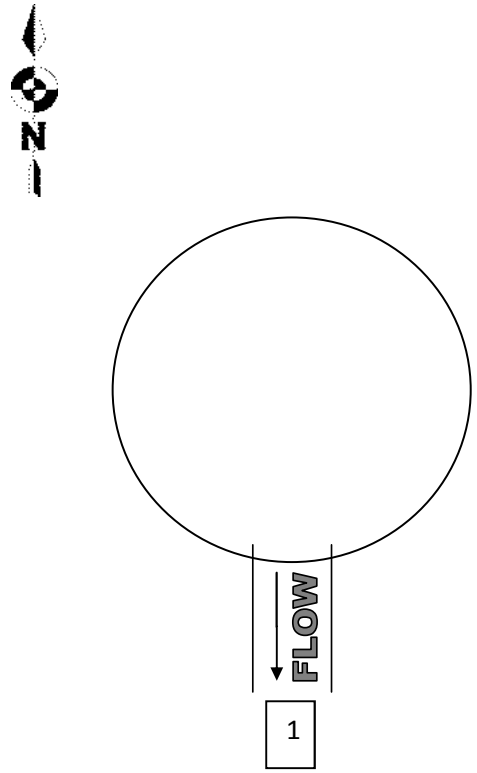
Pipe Observations:

Segment 1-

Pipe type: 12-inch CMP

General Comments

- Up to 6-inches of sediment buildup in invert (see photo)
- Invert soft when probed with moderate force



6-inches of debris in invert blocking flow

32nd and 33rd Avenue Upgrades

SEWER MANHOLE INSPECTION REPORT

Manhole # 1630-049

DATE, INSPECTOR(S), & LOCATION DATA

Date of Inspection: Wednesday, July 12, 2017 **Inspector(s):** Porter, Bailey

Atmosphere: O_2- N/A **LEL-** N/A **H_2S-** N/A **CO-** N/A

General Location Features: Center of 32nd Avenue in front of Mattress Ranch

PIPE CHARACTERISTICS

In-Effluent Pipe Size/Type/Diameter	Rim to Invert	Depth of Flow
1. 15-inch CMP Influent	54"	Min.
2. 15-inch CMP Effluent	54"	Min.

Depth of Sum, Depth of Debris in Sump: too much debris to determine

MANHOLE CHARACTERISTIC

***Defect grades**: 1=No Defect, 2=Minor Defect, 3=Moderate defect, 4=Significant defect, 5=Most significant defect*

Overall Structural Condition: 3.

Material of Construction: Precast

Manhole Shape: Circular

Dimensions: 48-inch

Cover/Lid: 25-inch lid, CI, with a grade score of 2

Frame: 7 inch tall, CI, with a grade score of 2

Chimney 1-6 inch, with a grade score of 2

Cone: 28-inch with a grade score 2

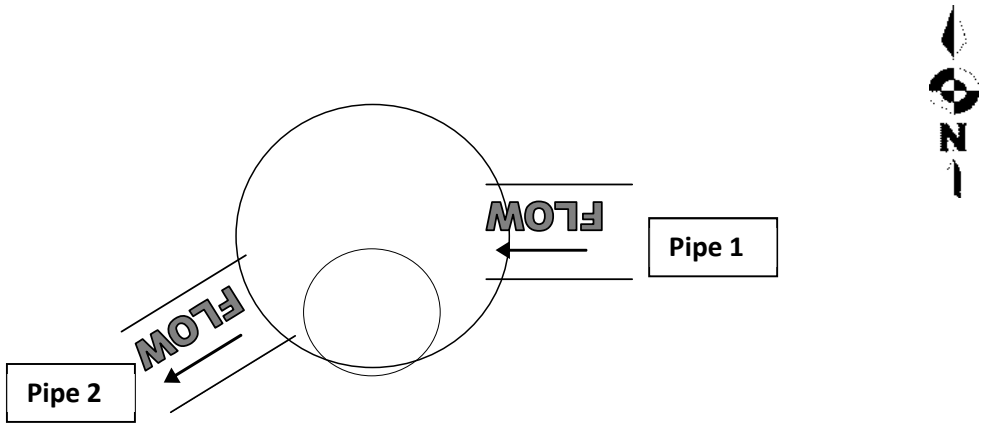
Steps: 2- metal with a grade score 2

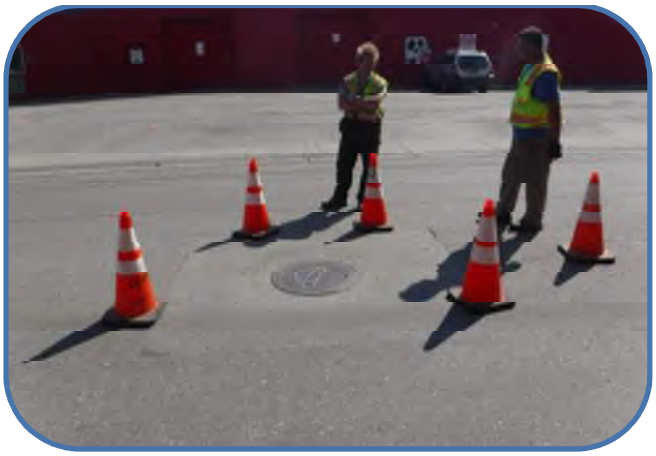
Base: Too much debris to determine height of base, with a grade score 3, base is cracked near pipe connections

Influent Pipe Connection: influent pipe protrudes 6 inches has a grade score of 3, grout is flaking and cracking

Effluent Pipe Connection: Effluent pipe connection protrudes 6 inches grout is flaking and cracking, Grade score of 3.

Additional Comment: frame is offset from chimney, inverts were probed on manhole and all were soft.





MH 1631-049 looking south towards Mattress Ranch

MH frame

offest frame 1-inch from chimney

effluent cracked around pipe connections

pipe 3 influent, sump full of debris

base to cone connection

32ND AND 33RD Avenue Upgrades

Structure Number 1630-049

Pipe Inspection Results

Location of Storm Drain Structure: West of Arctic Blvd in center of 32nd Avenue

Camera type: Quickview Camera

Quickview camera can observe from 10 to 300 feet of pipe depending on existing pipe condition, slope, and diameter.

1 Pipe viewing sequence number

Pipe Observations:

Segment 1-

Pipe type: 12-inch CMP

General Comments

- 3-inches of debris on invert

Segment 2-

Pipe type: 15-inch CMP

General Comments

- 2-inches of debris in invert
- Root intrustion in pipe see photo 2
- Invert soft when probed with moderate force

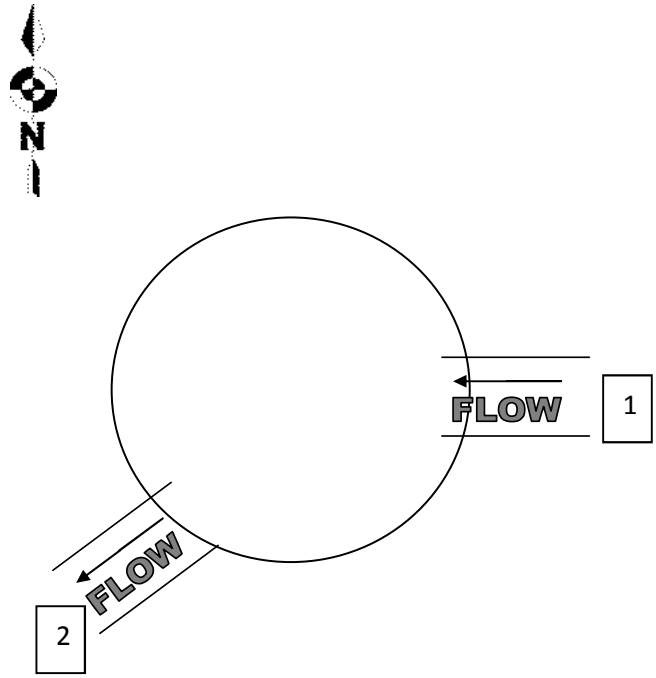


Photo 1-root intrusion at crown

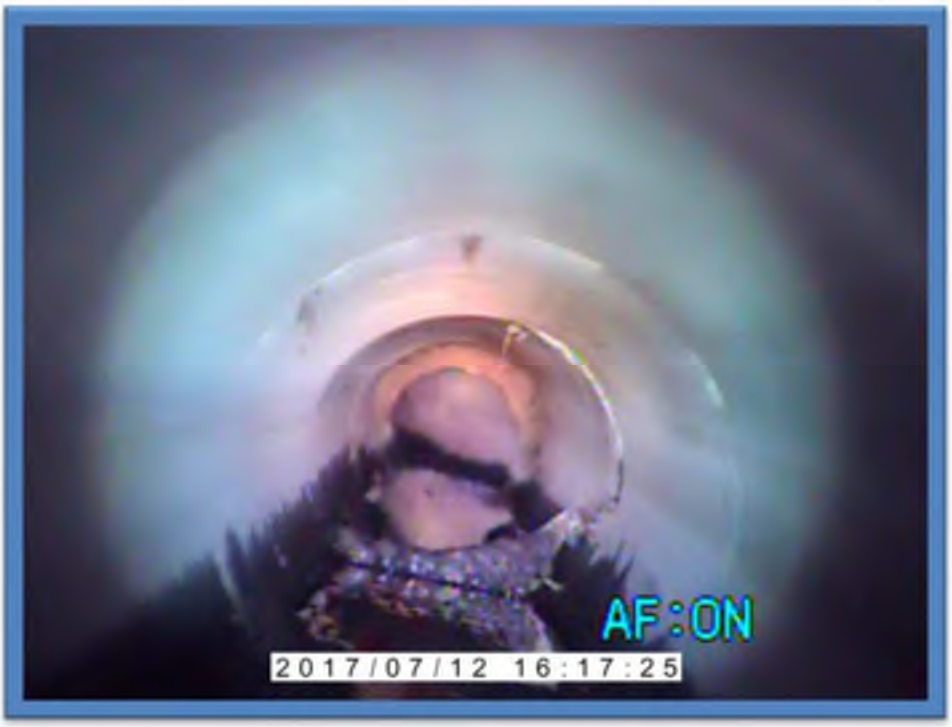


Photo 2-root intrusion at 4 o'clock

32nd and 33rd Avenue Upgrades

SEWER MANHOLE INSPECTION REPORT

Manhole # 1630-051

DATE, INSPECTOR(S), & LOCATION DATA

Date of Inspection: Tuesday, July 11, 2017 **Inspector(s):** Porter, Bailey

Atmosphere: O_2- N/A **LEL-** N/A **H_2S-** N/A **CO-** N/A

General Location Features: Northeast corner of Bering and 32nd Avenue

PIPE CHARACTERISTICS

In-Effluent Pipe Size/Type/Diameter	Rim to Invert	Depth of Flow
1. 12-inch CMP Effluent	37”	1”

Depth of Sum, Depth of Debris in Sump: sump full of debris, depth undetermined

MANHOLE CHARACTERISTIC

***Defect grades**: 1=No Defect, 2=Minor Defect, 3=Moderate defect, 4=Significant defect, 5=Most significant defect*

Overall Structural Condition: 2.

Material of Construction: Precast

Manhole Shape: Circular

Dimensions: 48-inch

Cover/Lid: 25x18-inch, CI, with a grade score of 2 rolled curb

Frame: 4 inch tall, CI, with a grade score of 2

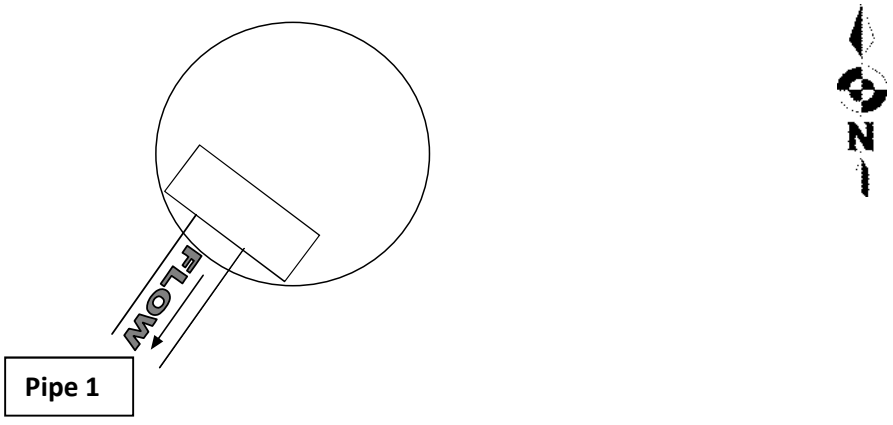
Chimney: 2-4 inch chimneys, with a grade score of 2

Reducing slab: 1-6 inch, with a grade score of 2

Base: Could not tell height due to sump being full of debris, grade score 2

Effluent Pipe Connection: 5-inch protrusion grout is flaking, grade score of 3

Additional Comment: Frame offset from reducing slab 1-inch



MH 1630-051 looking north

MH looking east

MH frame and inlet

offset frame

12-inch effluent and cracked grout

grout cracked

32ND AND 33RD Avenue Upgrades

Structure Number 1630-051

Pipe Inspection Results

Location of Storm Drain Structure: Northeast corner of 32nd Avenue and Bering Street

Camera type: Quickview Camera

Quickview camera can observe from 10 to 300 feet of pipe depending on existing pipe condition, slope, and diameter.

1 Pipe viewing sequence number

Pipe Observations:

Segment 1-

Pipe type: 12-inch CMP

General Comments

- Up to 3-inches of sediment buildup in invert

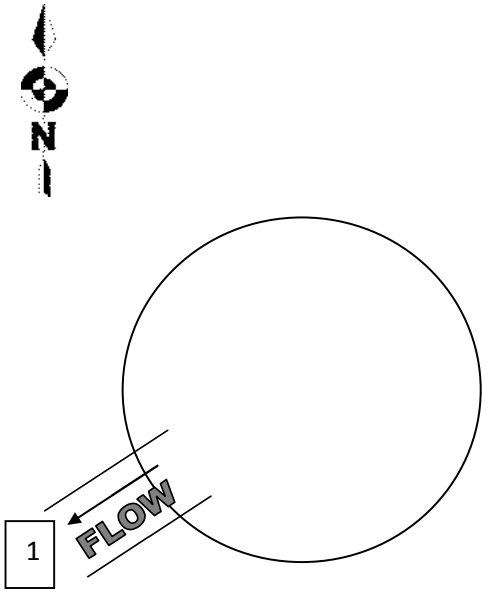


Photo 1-6 inches of debris in invert blocking flow

32nd and 33rd Avenue Upgrades

SEWER MANHOLE INSPECTION REPORT

Manhole # 1630-052

DATE, INSPECTOR(S), & LOCATION DATA

Date of Inspection: Monday, July 10, 2017 **Inspector(s):** Porter, Bailey

Atmosphere: O_2- N/A **LEL-** N/A **H_2S-** N/A **CO-** N/A

General Location Features: Southeast corner of Bering and 32nd Avenue

PIPE CHARACTERISTICS

In-Effluent Pipe Size/Type/Diameter	Rim to Invert	Depth of Flow
1. 12-inch CMP Effluent	32"	5"

Depth of Sum, Depth of Debris in Sump: debris was greater than 6-inches deep could not determine depth of sump.

MANHOLE CHARACTERISTIC

***Defect grades**: 1=No Defect, 2=Minor Defect, 3=Moderate defect, 4=Significant defect, 5=Most significant defect*

Overall Structural Condition: 2.

Material of Construction: Precast

Manhole Shape: Circular

Dimensions: 48-inch

Cover/Lid: 25x18-inch, CI, with a grade score of 2 rolled curb

Frame: 4 inch tall, CI, with a grade score of 2

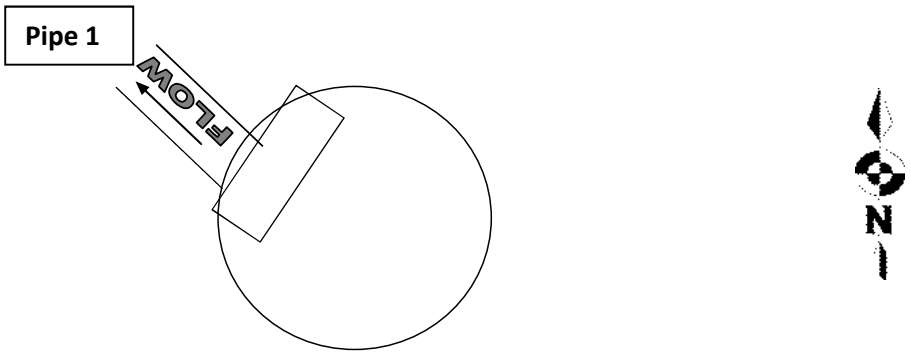
Chimney: 3-chimneys totaling 10-inches, with a grade score of 2

Reducing slab: 1-6 inch, with a grade score of 2

Base: unable to measure depth due to debris in sump, with a grade score 2

Effluent Pipe Connection: 7-inch protrusion no grout grade score of 4.

Additional Comment: invert was soft when probed with moderate force within manhole



MH 1630-052 looking east

MH looking south

MH frame and inlet

effluent pipe

12-inch effluent cracked grout

32ND AND 33RD Avenue Upgrades

Structure Number 1630-052

Pipe Inspection Results

Location of Storm Drain Structure: Southeast corner of Bering Street and 32nd Avenue

Camera type: Quickview Camera

Quickview camera can observe from 10 to 300 feet of pipe depending on existing pipe condition, slope, and diameter.

1 Pipe viewing sequence number

Pipe Observations:

Segment 1-

Pipe type: 12-inch CMP

General Comments

- Up to 6-inches of sediment buildup in invert blocking most of photo (see photo 1)
- Invert soft when probed with moderate force

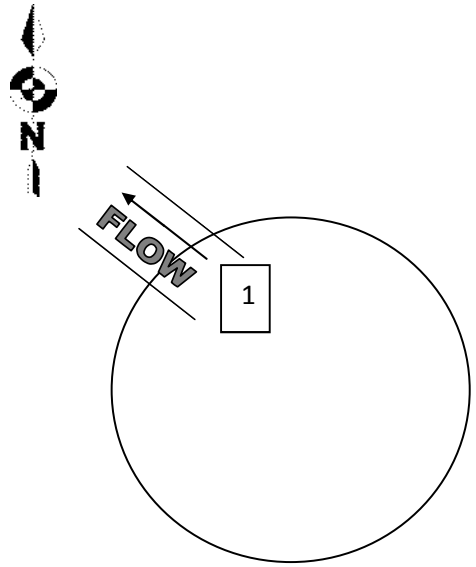


Photo 1-6 inches of debris in invert blocking flow

32nd and 33rd Avenue Upgrades

SEWER MANHOLE INSPECTION REPORT

Manhole # 1630-052A

DATE, INSPECTOR(S), & LOCATION DATA

Date of Inspection: Wednesday, July 12, 2017 **Inspector(s):** Porter, Bailey

Atmosphere: O_2- N/A **LEL-** N/A **H_2S-** N/A **CO-** N/A

General Location Features: Center of Bering and 32nd Avenue

PIPE CHARACTERISTICS

In-Effluent Pipe Size/Type/Diameter	Rim to Invert	Depth of Flow
1. 12-inch CMP Influent	44”	Min.
2. 15-inch CMP Influent	44”	Min.
3. 12-inch CMP Influent	44”	Min.
4. 12-inch CMP Influent	44”	Min.
5. 15-inch CMP Effluent	44”	Min.
6. 12-inch CMP Influent	44”	Min.

Depth of Sum, Depth of Debris in Sump: too much debris to determine

MANHOLE CHARACTERISTIC

***Defect grades**: 1=No Defect, 2=Minor Defect, 3=Moderate defect, 4=Significant defect, 5=Most significant defect*

Overall Structural Condition: 4.

Material of Construction: Precast

Manhole Shape: Circular

Dimensions: 48-inch

Cover/Lid: 25-inch lid, CI, with a grade score of 2

Frame: 7 inch tall, CI, with a grade score of 2

Chimney 2-totaling 9 inches in height, with a grade score of 2

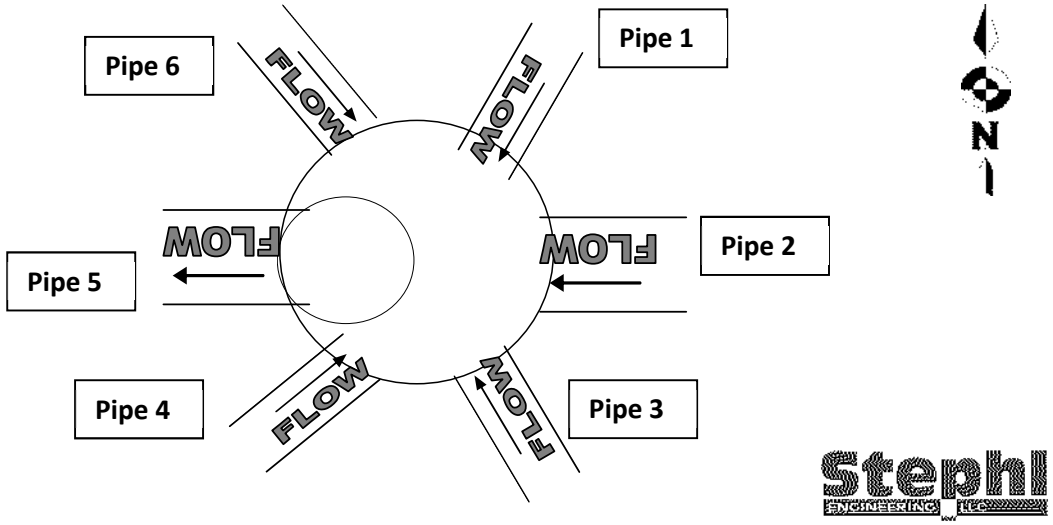
Reducing Slab: 1-8 inch with a grade score 4, wire mesh on east side of reducing slab is exposed see photos

Base: Too much debris to determine height of base, with a grade score 4, circumferential crack through pipe connections

Influent Pipe Connection: All influent pipes have a grade score of 3, grout is flaking and cracking.

Effluent Pipe Connection: Effluent pipe connection protrudes 4 inches grout is flaking and cracking, grade score of 3.

Additional Comment: frame is offset from chimney, inverts were probed on manhole and all were soft.



MH 1631-052 looking north

MH frame

reinforcement exposed in reducing slab

effluent with crack between pipe connections

pipe 3-influent sump full of debris

pipe 5-effluent and pipe 4- influent cracked base

32ND AND 33RD Avenue Upgrades

Structure Number 1630-052A

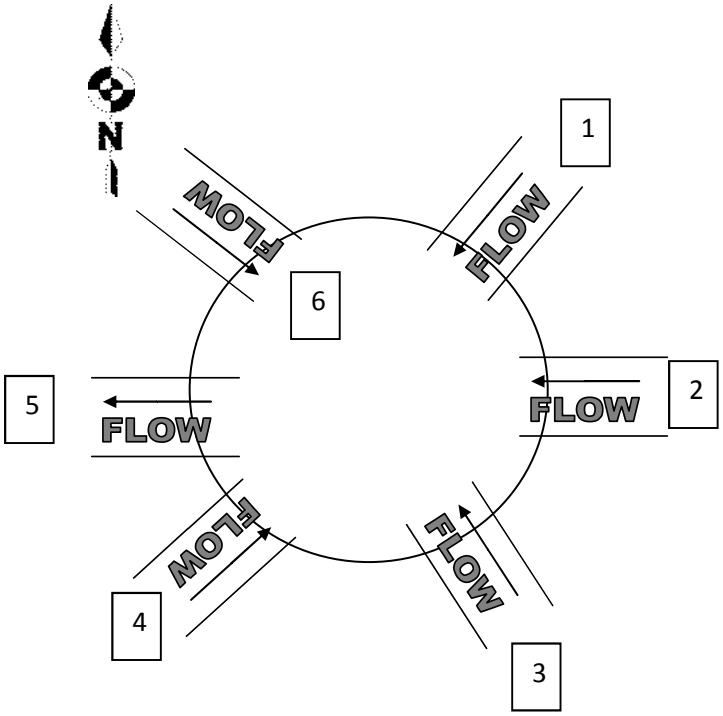
Pipe Inspection Results

Location of Storm Drain Structure: Center of Bering Street and 32nd Avenue

Camera type: Quickview Camera

Quickview camera can observe from 10 to 300 feet of pipe depending on existing pipe condition, slope, and diameter.

1 Pipe viewing sequence number



Pipe Observations:

Segment 1-

Pipe type: 12-inch CMP

General Comments

- 3-inches of debris on invert

Segment 2-

Pipe type: 15-inch CMP

General Comments

- 3-inches of debris in invert
- Invert soft when probed with moderate force

Segment 3-

Pipe type: 12-inch CMP

General Comments

- 2-inches of debris invert in pipe.
- Invert soft when probed with moderate force

Segment 4-

Pipe type: 12-inch CMP

General Comments

- 2-inches of debris in invert of pipe

Segment 5-

Pipe type: 15-inch CMP

General Comments

- Invert soft when probed with moderate force.
- 1-2-inches of derbis on invert of pipe

Segment 6-

Pipe type: 12-inch CMP

General Comments

- 2 inches of debris on invert of pipe

32nd and 33rd Avenue Upgrades

SEWER MANHOLE INSPECTION REPORT

Manhole # 1630-053

DATE, INSPECTOR(S), & LOCATION DATA

Date of Inspection: Monday, July 10, 2017 **Inspector(s):** Porter, Bailey

Atmosphere: O_2- N/A **LEL-** N/A **H_2S-** N/A **CO-** N/A

General Location Features: Southwest corner of Bering and 32nd Avenue

PIPE CHARACTERISTICS

In-Effluent Pipe Size/Type/Diameter	Rim to Invert	Depth of Flow
1. 12-inch CMP Effluent	31"	none

Depth of Sum, Depth of Debris in Sump: 12-inch, 2-3 inches

MANHOLE CHARACTERISTIC

***Defect grades**: 1=No Defect, 2=Minor Defect, 3=Moderate defect, 4=Significant defect, 5=Most significant defect*

Overall Structural Condition: 2.

Material of Construction: Precast

Manhole Shape: Circular

Dimensions: 48-inch

Cover/Lid: 25x18-inch, CI, with a grade score of 3 rolled curb

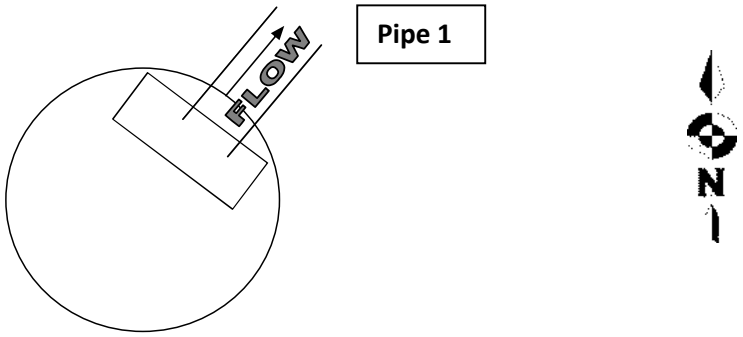
Frame: 4-inch tall, CI, with a grade score of 3

Reducing slab: 1-2 and 1-4 inch with a grade score of 2

Base: 36-inch grade score 2

Effluent Pipe Connection: 7-inch protrusion no grout with a grade score of 4.

Additional Comment: frame and cover have corrosion that is leading to minor metal loss



MH 1630-053 looking north

MH looking east

MH frame and inlet

missing metal on frame

12-inch effluent

grout cracked and missing

32ND AND 33RD Avenue Upgrades

Structure Number 1630-053

Pipe Inspection Results

Location of Storm Drain Structure: Southwest corner of Bering and 32nd Avenue

Camera type: Quickview Camera

Quickview camera can observe from 10 to 300 feet of pipe depending on existing pipe condition, slope, and diameter.

1 Pipe viewing sequence number

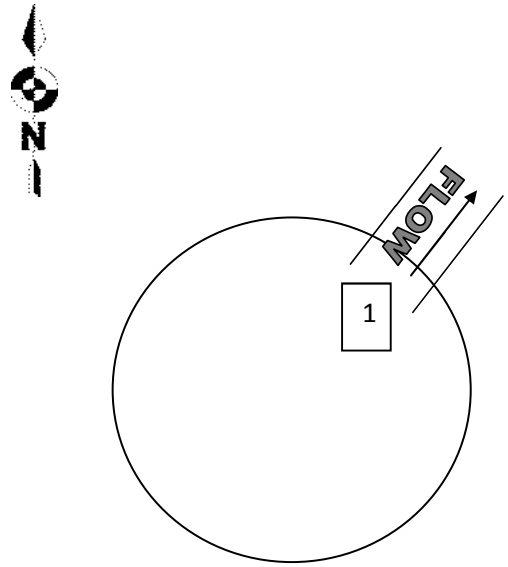
Pipe Observations:

Segment 1-

Pipe type: 12-inch CMP

General Comments

- Up to 3-inches of sediment buildup in invert
- Invert soft when probed with moderate force



32nd and 33rd Avenue Upgrades

SEWER MANHOLE INSPECTION REPORT

Manhole # 1630-054

DATE, INSPECTOR(S), & LOCATION DATA

Date of Inspection: Wednesday, July 12, 2017 **Inspector(s):** Porter, Bailey

Atmosphere: O_2- N/A **LEL-** N/A **H_2S-** N/A **CO-** N/A

General Location Features: Center of Cheekako and 32nd Avenue

PIPE CHARACTERISTICS

In-Effluent Pipe Size/Type/Diameter	Rim to Invert	Depth of Flow
1. 12-inch CMP Influent	70”	Min.
2. 15-inch CMP Influent	70”	Min.
3. 12-inch CMP Influent	69”	Min.
4. 15-inch CMP Effluent	70”	Min.
5. 12-inch CMP Influent	70”	Min.

Depth of Sum, Depth of Debris in Sump: too much debris to determine

MANHOLE CHARACTERISTIC

***Defect grades**: 1=No Defect, 2=Minor Defect, 3=Moderate defect, 4=Significant defect, 5=Most significant defect*

Overall Structural Condition: 2.

Material of Construction: Precast

Manhole Shape: Circular

Dimensions: 48-inch

Cover/Lid: 25-inch lid, CI, with a grade score of 2

Frame: 7-inch tall, CI, with a grade score of 2

Chimney 1-5 inch, with a grade score of 2

Reducing Slab: 1-4 inch with a grade score 2

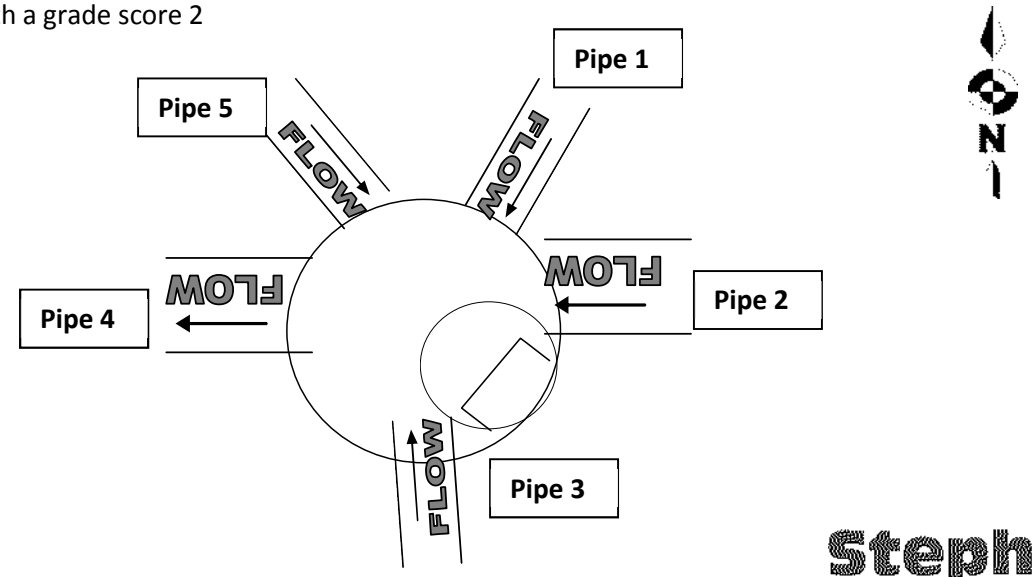
Steps: 3 metal steps with a grade score 2

Base: Too much debris to determine height of base, with a grade score 2

Influent Pipe Connection: All influent pipes have a grade score of 2.

Effluent Pipe Connection: Effluent pipe connection protrudes 6 inches, grade score of 1.

Additional Comment: frame is offset from chimney, inverts were probed on manhole and all were soft.



MH 1631-054 looking north

MH frame

north is up in photo

pipe 1, 2 and 5 influents

pipe 3 influent sump full of debris

pipe 4 effluent and pipe 5 influent

32ND AND 33RD Avenue Upgrades

Structure Number 1630-054

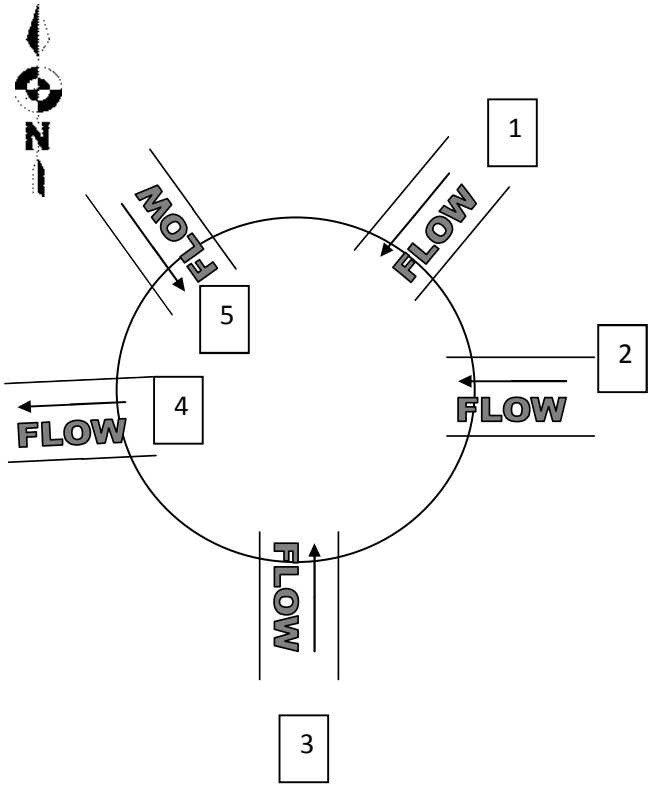
Pipe Inspection Results

Location of Storm Drain Structure: Center of Cheechako Street and 32nd Avenue

Camera type: Quickview Camera

Quickview camera can observe from 10 to 300 feet of pipe depending on existing pipe condition, slope, and diameter.

1 Pipe viewing sequence number



Pipe Observations:

Segment 1-

Pipe type: 12-inch CMP

General Comments

- No defects observed

Segment 2-

Pipe type: 15-inch CMP

General Comments

- Invert soft when proved with moderate force

Segment 3-

Pipe type: 12-inch CMP

General Comments

- 2-inches of debris invert in pipe
- Dent in top of pipe, see photo 1

Segment 4-

Pipe type: 15-inch CMP

General Comments

- Invert soft when proved with moderate force

Segment 5-

Pipe type: 12-inch CMP

General Comments

- No defects observed

Photo 1-Dent in crown of pipe between 11 o'clock and 1 o'clock

32nd and 33rd Avenue Upgrades

SEWER MANHOLE INSPECTION REPORT

Manhole # 1630-055

DATE, INSPECTOR(S), & LOCATION DATA

Date of Inspection: Monday, July 10, 2017 **Inspector(s):** Porter, Bailey

Atmosphere: O_2- N/A **LEL-** N/A **H_2S-** N/A **CO-** N/A

General Location Features: Northeast corner of Chechako and 32nd Avenue

PIPE CHARACTERISTICS

In-Effluent Pipe Size/Type/Diameter	Rim to Invert	Depth of Flow
1. 12-inch CMP Effluent	44"	Min.

Depth of Sum, Depth of Debris in Sump: Too full to measure debris and sump depth

MANHOLE CHARACTERISTIC

***Defect grades**: 1=No Defect, 2=Minor Defect, 3=Moderate defect, 4=Significant defect, 5=Most significant defect*

Overall Structural Condition: 2.

Material of Construction: Precast

Manhole Shape: Circular

Dimensions: 48-inch

Cover/Lid: 25x18-inch, CI, with a grade score of 2 rolled curb

Frame: 4-inch tall, CI, with a grade score of 2

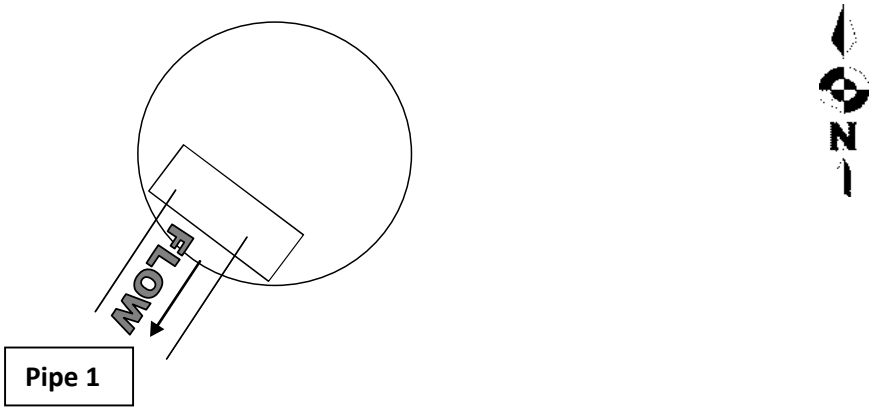
Chimney 3-totaling 10-inches with a grade score of 2

Reducing slab: 1-6 inch with a grade score of 2

Base: Could not determine height Grade score 2

Effluent Pipe Connection: 4-inch protrusion grout ok, grade score of 2.

Additional Comment: Invert in effluent pipe soft when probed with moderate force.



MH 1630-055 looking north

MH frame and inlet

MH chimneys

MH effluent

32ND AND 33RD Avenue Upgrades

Structure Number 1630-055

Pipe Inspection Results

Location of Storm Drain Structure: Northeast corner of Cheechako Street and 32nd Avenue

Camera type: Quickview Camera

Quickview camera can observe from 10 to 300 feet of pipe depending on existing pipe condition, slope, and diameter.

1 Pipe viewing sequence number

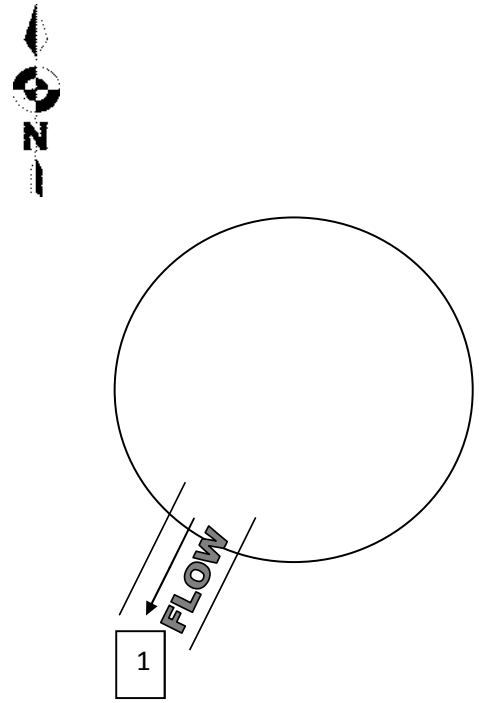
Pipe Observations:

Segment 1-

Pipe type: 12-inch CMP

General Comments

- No defects observed



32nd and 33rd Avenue Upgrades

SEWER MANHOLE INSPECTION REPORT

Manhole # 1630-056

DATE, INSPECTOR(S), & LOCATION DATA

Date of Inspection: Monday, July 10, 2017 **Inspector(s):** Porter, Bailey

Atmosphere: O_2- N/A **LEL-** N/A **H_2S-** N/A **CO-** N/A

General Location Features: Northwest corner of Cheechako and 32nd Avenue

PIPE CHARACTERISTICS

In-Effluent Pipe Size/Type/Diameter	Rim to Invert	Depth of Flow
1. 12-inch CMP Effluent	42"	min"

Depth of Sum, Depth of Debris in Sump: debris was greater than 6-inches deep could not determine depth of sump.

MANHOLE CHARACTERISTIC

***Defect grades**: 1=No Defect, 2=Minor Defect, 3=Moderate defect, 4=Significant defect, 5=Most significant defect*

Overall Structural Condition: 1.

Material of Construction: Precast

Manhole Shape: Circular

Dimensions: 48-inch

Cover/Lid: 25x18-inch, CI, with a grade score of 3 rolled curb corrosion present on manhole cover and frame leading to metal loss

Frame: 4-inch tall, CI, with a grade score of 3

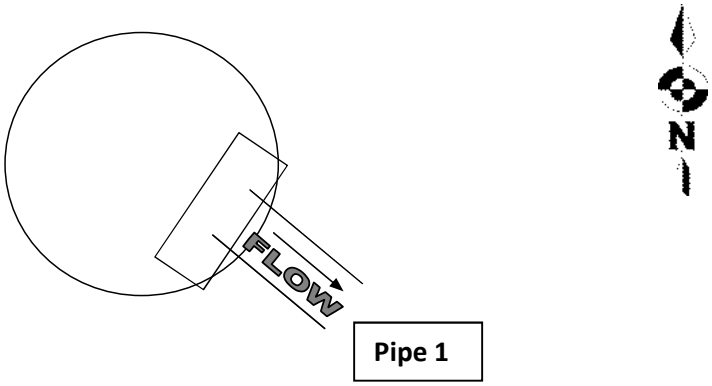
Chimney: 2-chimneys totaling 10-inches with a grade score of 2

Reducing slab: 1-6 inch with a grade score of 2

Base: Unable to measure depth due to debris in sump with a grade score 1

Effluent Pipe Connection: 6-inch protrusion no grout grade score of 2.

Additional Comment: invert was soft when probed with moderate force within manhole



MH 1630-056 looking north

MH frame and inlet

MH frame corrosion on frame

effluent pipe

manhole wall base

32ND AND 33RD Avenue Upgrades

Structure Number 1630-056

Pipe Inspection Results

Location of Storm Drain Structure: Northwest corner of Cheechako Street and 32nd Avenue

Camera type: Quickview Camera

Quickview camera can observe from 10 to 300 feet of pipe depending on existing pipe condition, slope, and diameter.

1 Pipe viewing sequence number

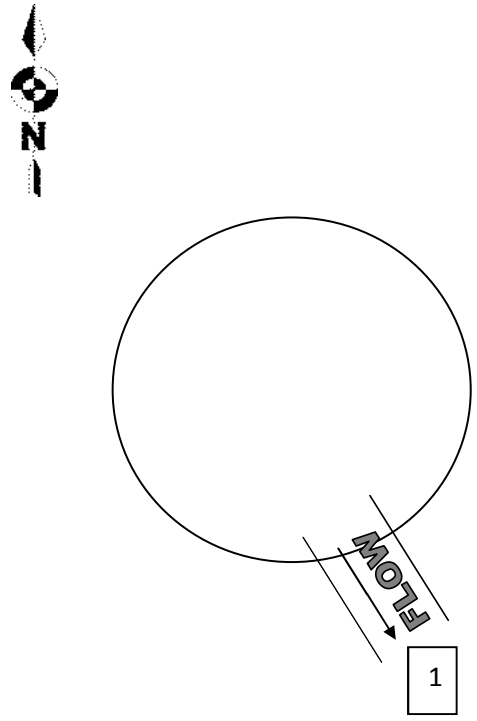
Pipe Observations:

Segment 1-

Pipe type: 12-inch CMP

General Comments

- No defects observed



32nd and 33rd Avenue Upgrades

SEWER MANHOLE INSPECTION REPORT

Manhole # 1630-057

DATE, INSPECTOR(S), & LOCATION DATA

Date of Inspection: Wednesday, July 12, 2017 **Inspector(s):** Porter, Bailey

Atmosphere: O_2- N/A **LEL-** N/A **H_2S-** N/A **CO-** N/A

General Location Features: Center of Dawson and 32nd Avenue

PIPE CHARACTERISTICS

In-Effluent Pipe Size/Type/Diameter	Rim to Invert	Depth of Flow
1. 12-inch CMP Influent	59”	Min.
2. 12-inch CMP Influent	61”	Min.
3. 12-inch CMP Influent	61”	Min.
4. 15-inch CMP Effluent	61”	Min.
5. 12-inch CMP Influent	61”	Min.

Depth of Sum, Depth of Debris in Sump: Too much debris to determine

MANHOLE CHARACTERISTIC

***Defect grades**: 1=No Defect, 2=Minor Defect, 3=Moderate defect, 4=Significant defect, 5=Most significant defect*

Overall Structural Condition: 2.

Material of Construction: Precast

Manhole Shape: Circular

Dimensions: 48-inch

Cover/Lid: 25-inch lid, CI, with a grade score of 2

Frame: 7-inch tall, CI, with a grade score of 2

Chimney 2 totaling 10, with a grade score of 2

Cone: 1-30 inch with a grade score 2

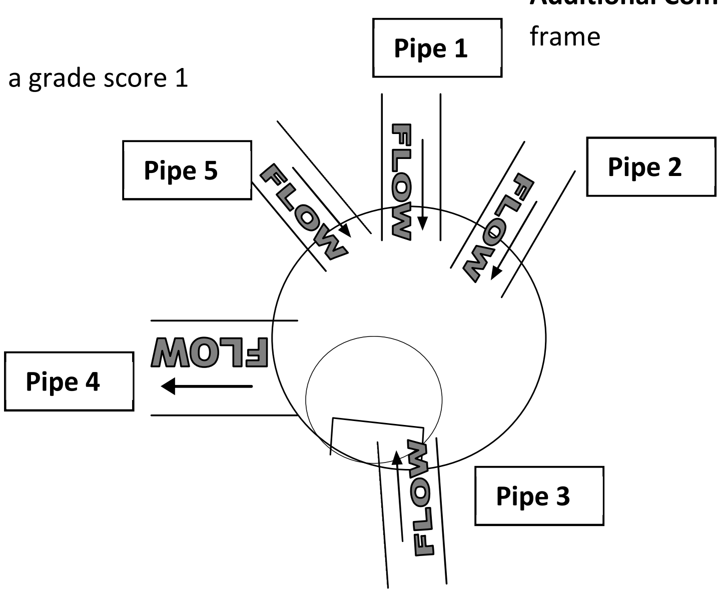
Steps: 2 metal steps with a grade score 1

Base: Too much debris to determine height of base, with a grade score 2

Influent Pipe Connection: Pipe 1 and pipe 2 protrude 2-inches and have a grade score of 2. Pipe 3 and pipe 5 protrudes 5-inches and have a grade score of 2, grout is beginning to crack

Effluent Pipe Connection: Effluent pipe connection protrudes 4 inches. Grade score of 1.

Additional Comment: asphalt cracked around frame



MH 1631-057 looking north west

MH frame

Pipes 1, 2 and 5

pipe 3 influent

pipe 4 effluent

32ND AND 33RD Avenue Upgrades

Structure Number 1630-057

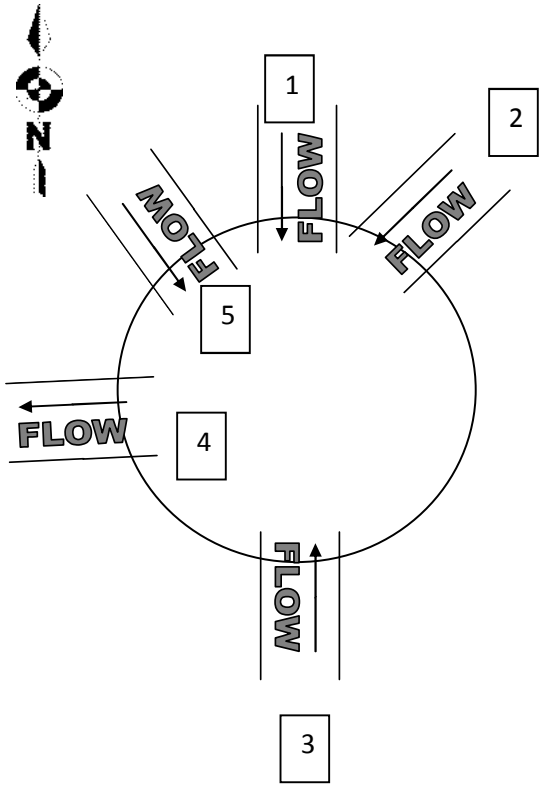
Pipe Inspection Results

Location of Storm Drain Structure: Center of Dawson and 32nd Avenue

Camera type: Quickview Camera

Quickview camera can observe from 10 to 300 feet of pipe depending on existing pipe condition, slope, and diameter.

1 Pipe viewing sequence number



Pipe Observations:

Segment 1-

Pipe type: 12-inch CMP

General Comments

- 2-inch dent in top of pipe between 11 o'clock and 1 o'clock, see photo 1

Segment 2-

Pipe type: 12-inch CMP

General Comments

- 2-inches of debris in invert

Segment 3-

Pipe type: 12-inch CMP

General Comments

- 2-inches of invert in pipe.
- Invert soft when probed with moderate force

Segment 4-

Pipe type: 15-inch CMP

General Comments

- Invert soft when probed with moderate force

Segment 5-

Pipe type: 12-inch CMP

General Comments

- 4-inches of debris in invert

Photo 1-Dent in crown of pipe between 11 o'clock and 1 o'clock

32nd and 33rd Avenue Upgrades

SEWER MANHOLE INSPECTION REPORT

Manhole # 1630-058

DATE, INSPECTOR(S), & LOCATION DATA

Date of Inspection: Monday, July 10, 2017 **Inspector(s):** Porter, Bailey

Atmosphere: O_2- N/A **LEL-** N/A **H_2S-** N/A **CO-** N/A

General Location Features: Northeast corner of 32nd and Dawson Street

PIPE CHARACTERISTICS

In-Effluent Pipe Size/Type/Diameter	Rim to Invert	Depth of Flow
1. 12-inch CMP Effluent	44"	Minimal

Depth of Sum, Depth of Debris in Sump: debris was greater than 6-inches deep could not determine depth of sump

MANHOLE CHARACTERISTIC

***Defect grades**: 1=No Defect, 2=Minor Defect, 3=Moderate defect, 4=Significant defect, 5=Most significant defect*

Overall Structural Condition: 2.

Material of Construction: Precast

Manhole Shape: Circular

Dimensions: 48-inch

Cover/Lid: 25x18-inch, CI, with a grade score of 2 rolled curb

Frame: 4-inch tall, CI, with a grade score of 2

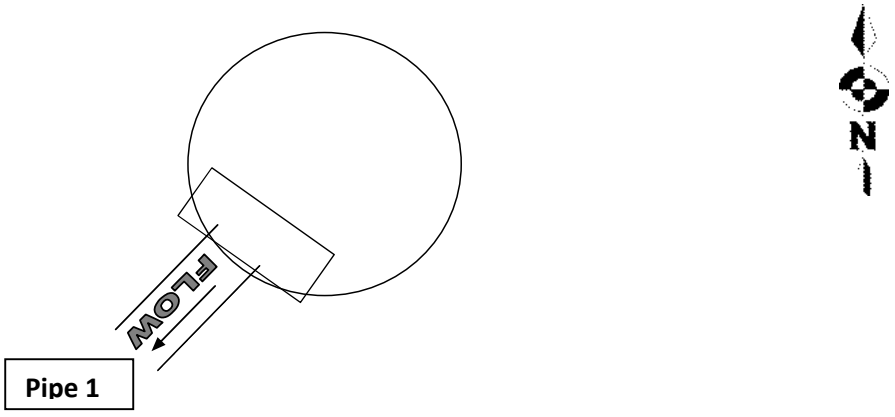
Chimney: 4-chimneys totaling 11-inches with a grade score of 3

Reducing slab: 1-6 inch with a grade score of 2

Base: Unable to measure depth due to debris in sump, grade score 1

Effluent Pipe Connection: 7-inch protrusion no grout grade score of 2

Additional Comment: Cracked chimneys, hole in chimneys approximately 3-inches tall and 6 inches long



MH 1630-058 looking west

MH looking north

MH frame

effluent pipe

cracked chimney with hole

32ND AND 33RD Avenue Upgrades

Structure Number 1630-058

Pipe Inspection Results

Location of Storm Drain Structure: Northeast corner of Dawson Street and 32nd Avenue

Camera type: Quickview Camera

Quickview camera can observe from 10 to 300 feet of pipe depending on existing pipe condition, slope, and diameter.

1 Pipe viewing sequence number

Pipe Observations:

Segment 1-

Pipe type: 12-inch CMP

General Comments

- 5 inches of debris blocking flow, see photo 1

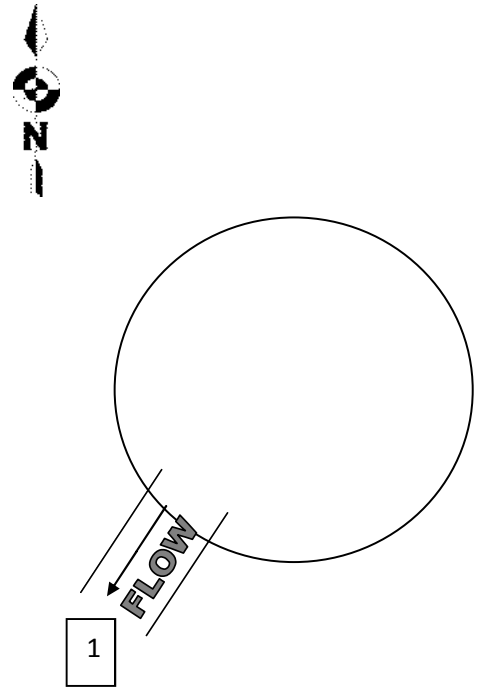


Photo 1-6-inches of debris in invert blocking flow

32nd and 33rd Avenue Upgrades

SEWER MANHOLE INSPECTION REPORT

Manhole # 1630-059

DATE, INSPECTOR(S), & LOCATION DATA

Date of Inspection: Monday, July 10, 2017 **Inspector(s):** Porter, Bailey

Atmosphere: O_2- N/A **LEL-** N/A **H_2S-** N/A **CO-** N/A

General Location Features: Northwest corner of 32nd and Dawson

PIPE CHARACTERISTICS

In-Effluent Pipe Size/Type/Diameter	Rim to Invert	Depth of Flow
1. 12-inch CMP Effluent	43"	4-inches

Depth of Sum, Depth of Debris in Sump: debris was greater than 6-inches deep could not determine depth of sump.

MANHOLE CHARACTERISTIC

***Defect grades**: 1=No Defect, 2=Minor Defect, 3=Moderate defect, 4=Significant defect, 5=Most significant defect*

Overall Structural Condition: 2.

Material of Construction: Precast

Manhole Shape: Circular

Dimensions: 48-inch

Cover/Lid: 25x18-inch, CI, with a grade score of 2 rolled curb

Frame: 4-inch tall, CI, with a grade score of 2

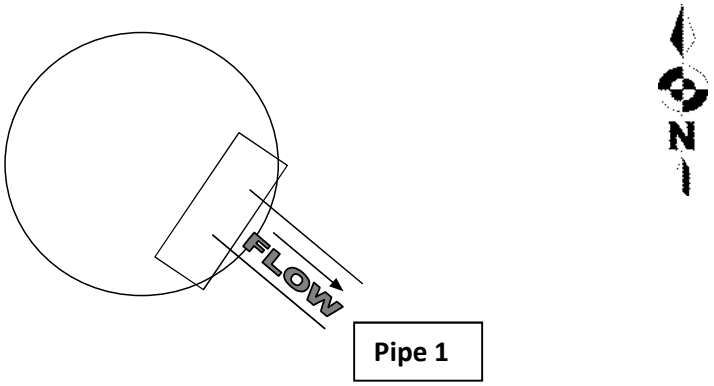
Chimney: 2-chimneys totaling 9-inches with a grade score of 2

Reducing slab: 1-6 inch with a grade score of 2

Base: Unable to measure depth due to debris in sump with a grade score 1

Effluent Pipe Connection: 6-inch protrusion grade score of 2.

Additional Comment: Invert was soft when probed with moderate force within manhole



MH 1630-059 looking north

MH frame and inlet

MH frame

effluent pipe

gap between chimney and frame

32ND AND 33RD Avenue Upgrades

Structure Number 1630-059

Pipe Inspection Results

Location of Storm Drain Structure: Northwest corner of Dawson Street and 32nd Avenue

Camera type: Quickview Camera

Quickview camera can observe from 10 to 300 feet of pipe depending on existing pipe condition, slope, and diameter.

1 Pipe viewing sequence number

Pipe Observations:

Segment 1-

Pipe type: 12-inch CMP

General Comments

- 6 inches of debris blocking flow (see photo 1)

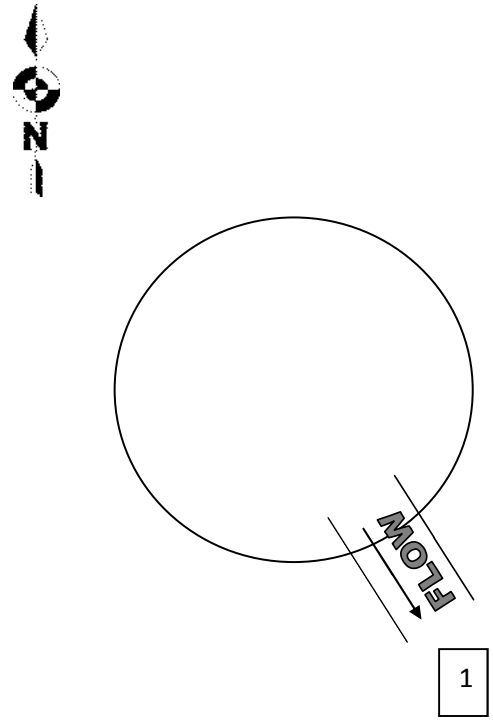


Photo 1-6-inches of debris in invert blocking flow

32nd and 33rd Avenue Upgrades

SEWER MANHOLE INSPECTION REPORT

Manhole # 1630-061

DATE, INSPECTOR(S), & LOCATION DATA

Date of Inspection: Wednesday, July 12, 2017 **Inspector(s):** Porter, Bailey

Atmosphere: O_2- N/A **LEL-** N/A **H_2S-** N/A **CO-** N/A

General Location Features: Center of Eide Street and 32nd Avenue

PIPE CHARACTERISTICS

	In-Effluent Pipe Size/Type/Diameter	Rim to Invert	Depth of Flow
1.	18-inch CPEP Influent	56”	Min.
2.	10-inch CPEP Influent	54”	Min.
3.	10-inch CPEP Influent	54”	Min.
4	18-inch CPEP Effluent	56”	Min.
5.	10-inch CPEP Influent	54”	Min.

Depth of Sum, Depth of Debris in Sump: Too much debris to determine

MANHOLE CHARACTERISTIC

***Defect grades**: 1=No Defect, 2=Minor Defect, 3=Moderate defect, 4=Significant defect, 5=Most significant defect*

Overall Structural Condition: 1.

Material of Construction: Precast

Manhole Shape: Circular

Dimensions: 72-inch

Cover/Lid: 25-inch lid, CI, with a grade score of 1

Frame: 7- inch tall, CI, with a grade score of 1

Chimney 15-inches total of chimneys due to grout could not tell individual chimneys, with a grade score of 1

Reducing Slab: 1-8 inch with a grade score 1

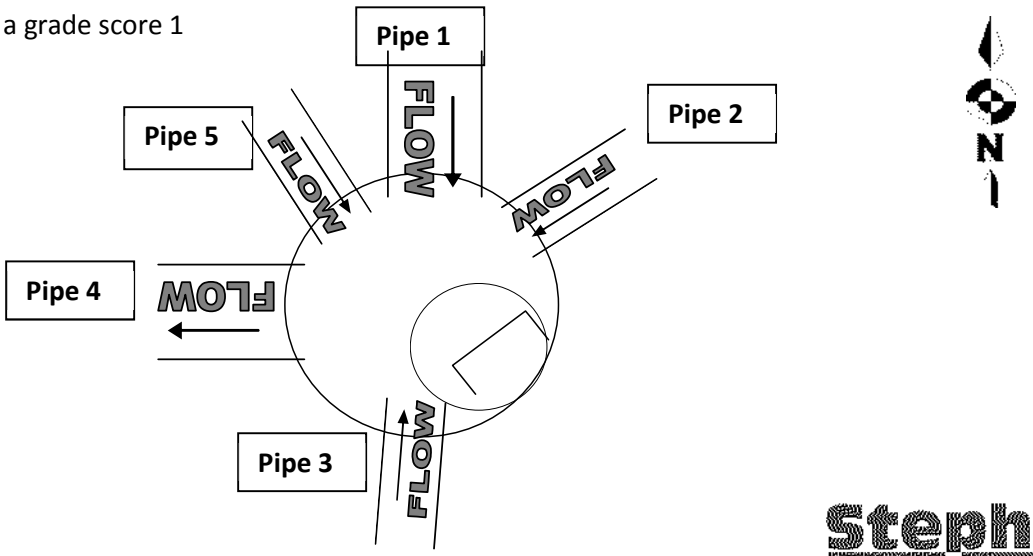
Steps: 3 poly steps with a grade score 1

Base: Too much debris to measure depth, with a grade score 1

Influent Pipe Connection: Influent pipe connection protrudes 2 inches, grade score of 1.

Effluent Pipe Connection: Effluent pipe connection protrudes 2 inches, grade score of 1.

Additional Comment: manhole appears to be newly installed.



MH 1631-061 looking south

MH frame

chimney

influent pipes photo taken looking north

influent pipe photo taken looking south

effluent pipe and influent 10-inch cpep photo taken looking west

Stephl Engineering, LLC

32ND AND 33RD Avenue Upgrades

Structure Number 1630-061

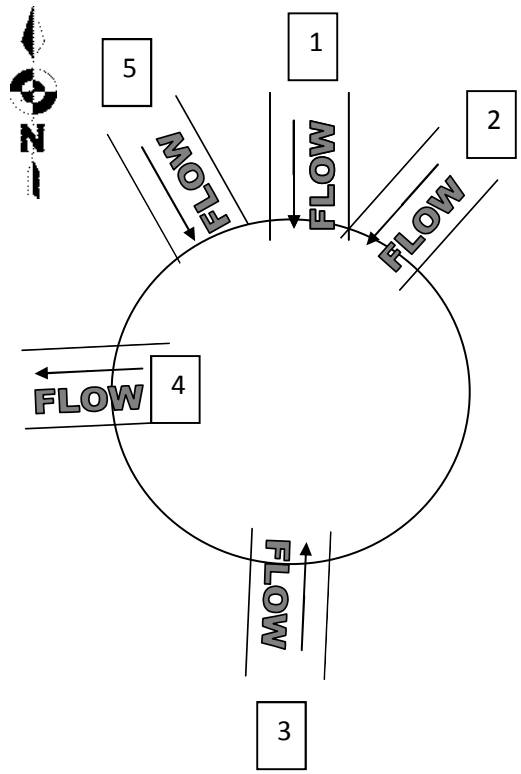
Pipe Inspection Results

Location of Storm Drain Structure: Center of Eide and 32nd Avenue

Camera type: Quickview Camera

Quickview camera can observe from 10 to 300 feet of pipe depending on existing pipe condition, slope, and diameter.

1 Pipe viewing sequence number



Pipe Observations:

Segment 1-

Pipe type: 18-inch CPEP

General Comments

- No defects observed.

Segment 2-

Pipe type: 10-inch CPEP

General Comments

- No defects observed.
- Very little of pipe observed due to alignment of pipes into manhole

Segment 3-

Pipe type: 10-inch CPEP

General Comments

- No defects observed

Segment 4-

Pipe type: 18-inch CPEP

General Comments

- No defects observed

Segment 5-

Pipe type: 10-inch CPEP

General Comments

- No defects observed
- Very little of pipe observed due to alignment of pipes into manhole

32nd and 33rd Avenue Upgrades

SEWER MANHOLE INSPECTION REPORT

Manhole # 1630-062

DATE, INSPECTOR(S), & LOCATION DATA

Date of Inspection: Monday, July 10, 2017 **Inspector(s):** Porter, Bailey

Atmosphere: O_2- N/A **LEL-** N/A **H_2S-** N/A **CO-** N/A

General Location Features: Northeast corner of 32nd Avenue and Eide Street

PIPE CHARACTERISTICS

In-Effluent Pipe Size/Type/Diameter	Rim to Invert	Depth of Flow
1. 10-inch CPEP Effluent	40”	Minimal

Depth of Sum, Depth of Debris in Sump: 18-inch sump with 2-inches of debris

MANHOLE CHARACTERISTIC

***Defect grades**: 1=No Defect, 2=Minor Defect, 3=Moderate defect, 4=Significant defect, 5=Most significant defect*

Overall Structural Condition: 1.

Material of Construction: Precast

Manhole Shape: Circular

Dimensions: 48-inch

Cover/Lid: 25x18-inch, CI, with a grade score of 1 rolled curb

Frame: 4-inch tall, CI, with a grade score of 1

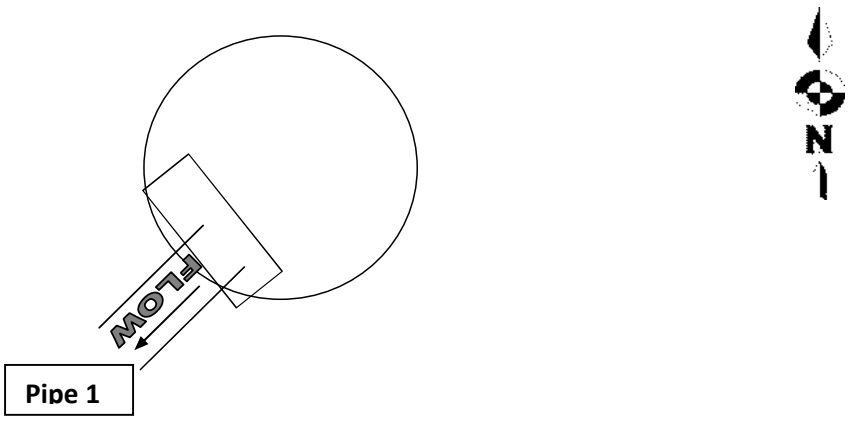
Chimney: 2-chimneys totaling 8-inches with a grade score of 1

Reducing slab: 1-6 inch with a grade score of 1

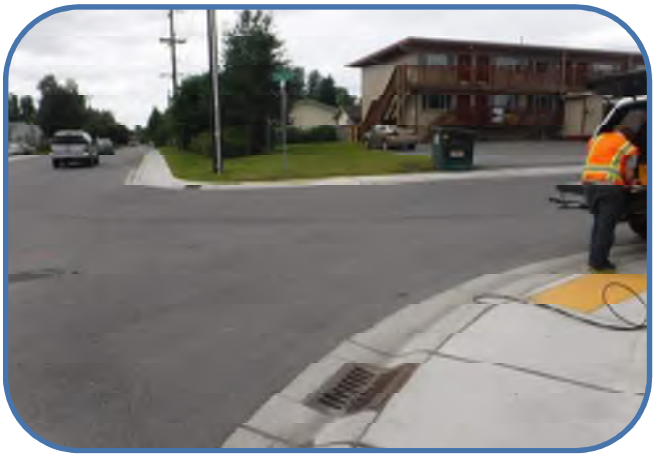
Base: 36-inch with a grade score 1

Effluent Pipe Connection: 4-inch protrusion grout grade score of 1.

Additional Comment: Manhole in good condition



MH 1630-062 looking south



MH 1630-062 looking west

MH frame

chimney and reducing slab

effluent pipe

32ND AND 33RD Avenue Upgrades

Structure Number 1630-062

Pipe Inspection Results

Location of Storm Drain Structure: Northeast corner of Eide Street and 32nd Avenue

Camera type: Quickview Camera

Quickview camera can observe from 10 to 300 feet of pipe depending on existing pipe condition, slope, and diameter.

1 Pipe viewing sequence number

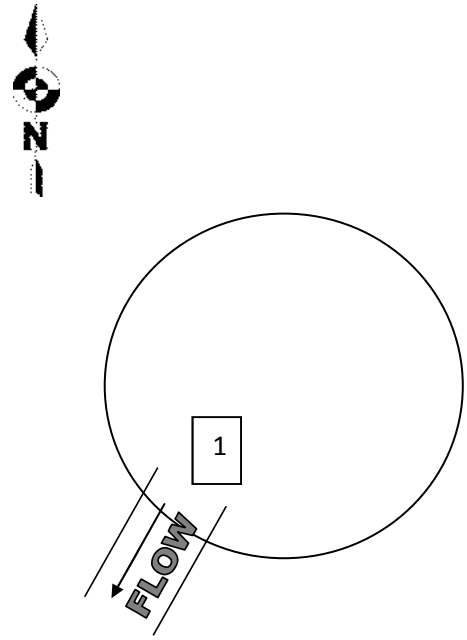
Pipe Observations:

Segment 1-

Pipe type: 10-inch CPEP

General Comments

- No defects observed



32nd and 33rd Avenue Upgrades

SEWER MANHOLE INSPECTION REPORT

Manhole # 1630-063

DATE, INSPECTOR(S), & LOCATION DATA

Date of Inspection: Monday, July 10, 2017 **Inspector(s):** Porter, Bailey

Atmosphere: O_2- N/A **LEL-** N/A **H_2S-** N/A **CO-** N/A

General Location Features: Northwest corner of 32nd Avenue and Eureka Street

PIPE CHARACTERISTICS

In-Effluent Pipe Size/Type/Diameter	Rim to Invert	Depth of Flow
1. 10-inch CPEP Effluent	36"	Minimal

Depth of Sum, Depth of Debris in Sump: 18-inch sump with 4-inches of debris

MANHOLE CHARACTERISTIC

***Defect grades**: 1=No Defect, 2=Minor Defect, 3=Moderate defect, 4=Significant defect, 5=Most significant defect*

Overall Structural Condition: 1.

Material of Construction: Precast

Manhole Shape: Circular

Dimensions: 48-inch

Cover/Lid: 25x18-inch, CI, with a grade score of 1 rolled curb

Frame: 4-inch tall, CI, with a grade score of 1

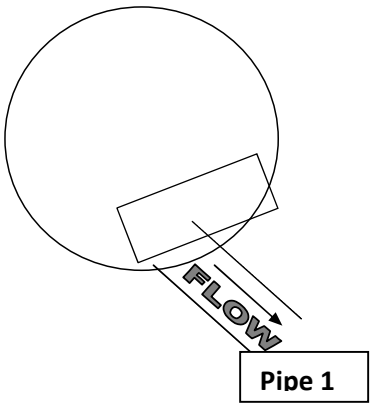
Chimney: 3-chimneys totaling 10-inches with a grade score of 1

Reducing slab: 1-6 inch with a grade score of 1

Base: 36-inch with a grade score 1

Effluent Pipe Connection: 7-inch protrusion grout grade score of 1.

Additional Comment: Manhole in good condition



MH 1630-063 looking west

MH 1630-063 looking north

MH frame

chimney and reducing slab

effluent pipe

32ND AND 33RD Avenue Upgrades

Structure Number 1630-063

Pipe Inspection Results

Location of Storm Drain Structure: Northwest corner of Eide Street and 32nd Avenue

Camera type: Quickview Camera

Quickview camera can observe from 10 to 300 feet of pipe depending on existing pipe condition, slope, and diameter.

1 Pipe viewing sequence number

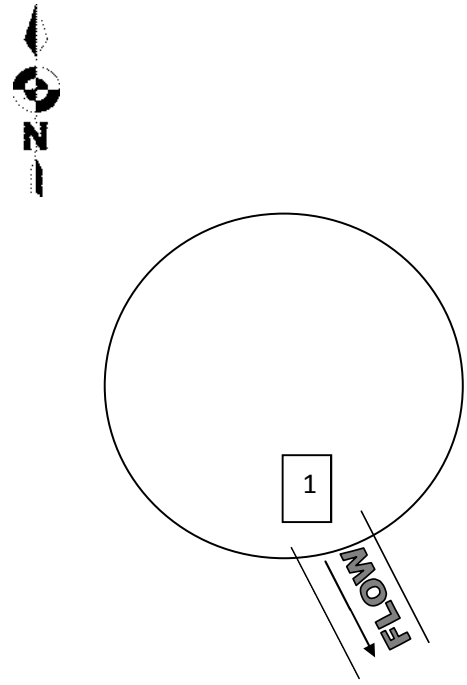
Pipe Observations:

Segment 1-

Pipe type: 10-inch CPEP

General Comments

- No defects observed



32nd and 33rd Avenue Upgrades

SEWER MANHOLE INSPECTION REPORT

Manhole # 1630-064

DATE, INSPECTOR(S), & LOCATION DATA

Date of Inspection: Tuesday, July 11, 2017 **Inspector(s):** Porter, Bailey

Atmosphere: O_2- N/A **LEL-** N/A **H_2S-** N/A **CO-** N/A

General Location Features: Southside of the intersection at 32nd Avenue and Eide Street

PIPE CHARACTERISTICS

In-Effluent Pipe Size/Type/Diameter	Rim to Invert	Depth of Flow
1. 10-inch CPEP Effluent	38”	Minimal

Depth of Sum, Depth of Debris in Sump: 18-inch sump with 4-inches of debris

MANHOLE CHARACTERISTIC

***Defect grades**: 1=No Defect, 2=Minor Defect, 3=Moderate defect, 4=Significant defect, 5=Most significant defect*

Overall Structural Condition: 1.

Material of Construction: Precast

Manhole Shape: Circular

Dimensions: 48-inch

Cover/Lid: 25x18-inch, CI, with a grade score of 1 rolled curb

Frame: 4-inch tall, CI, with a grade score of 1

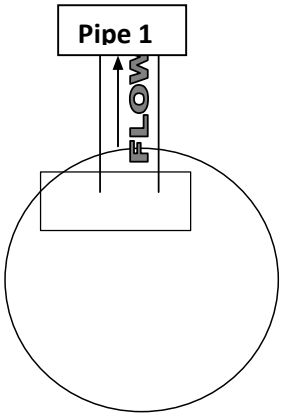
Chimney: 2-chimneys totaling 8-inches with a grade score of 1

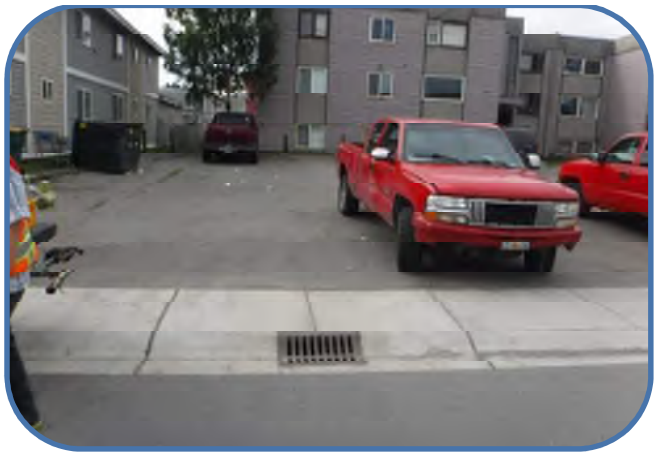
Reducing slab: 1-6 inch with a grade score of 1

Base: 36-inch with a grade score 2, small crack in base

Effluent Pipe Connection: 6-inch protrusion grout grade score of 1

Additional Comment: Manhole in good condition crack above effluent pipe is possibly in grout not base could not determine.





MH 1630-064 looking south

MH 1630-064 looking north

MH frame

small crack in base above effluent pipe

effluent pipe

32ND AND 33RD Avenue Upgrades

Structure Number 1630-064

Pipe Inspection Results

Location of Storm Drain Structure: South curbline at intersection of 32nd Avenue and Eide Street

Camera type: Quickview Camera

Quickview camera can observe from 10 to 300 feet of pipe depending on existing pipe condition, slope, and diameter.

1 Pipe viewing sequence number

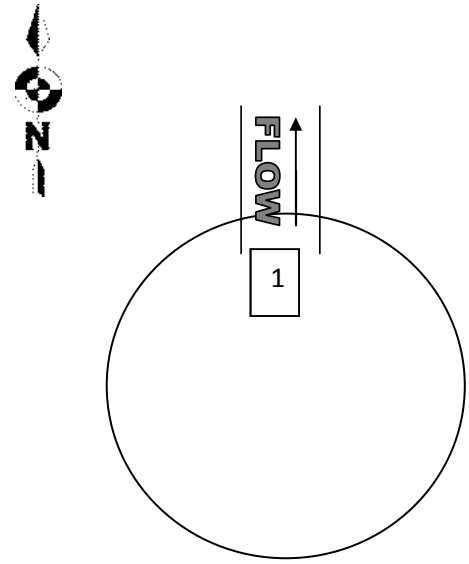
Pipe Observations:

Segment 1-

Pipe type: 10-inch CPEP

General Comments

- No defects observed



32nd and 33rd Avenue Upgrades

SEWER MANHOLE INSPECTION REPORT

Manhole # 1630-065

DATE, INSPECTOR(S), & LOCATION DATA

Date of Inspection: Wednesday, July 12, 2017 **Inspector(s):** Porter, Bailey

Atmosphere: O_2- N/A **LEL-** N/A **H_2S-** N/A **CO-** N/A

General Location Features: Center of 32nd Avenue and Eureka Street

PIPE CHARACTERISTICS

	In-Effluent Pipe Size/Type/Diameter	Rim to Invert	Depth of Flow
1.	10-inch CPEP Influent	53”	Min.
2.	18-inch CPEP Influent	69”	Min.
3.	10-inch CPEP Influent	54”	Min.
4	18-inch CPEP Effluent	69”	Min.

Depth of Sum, Depth of Debris in Sump: 18-inch sump, 2 inches of debris

MANHOLE CHARACTERISTIC

***Defect grades**: 1=No Defect, 2=Minor Defect, 3=Moderate defect, 4=Significant defect, 5=Most significant defect*

Overall Structural Condition: 1.

Material of Construction: Precast

Manhole Shape: Circular

Dimensions: 48-inch

Cover/Lid: 25-inch lid, CI, with a grade score of 1

Frame: 7-inch tall, CI, with a grade score of 1

Chimney 14-inches total of chimneys due to grout could not tell individual chimneys, with a grade score of 1

Steps: 4 poly steps with a grade score 1

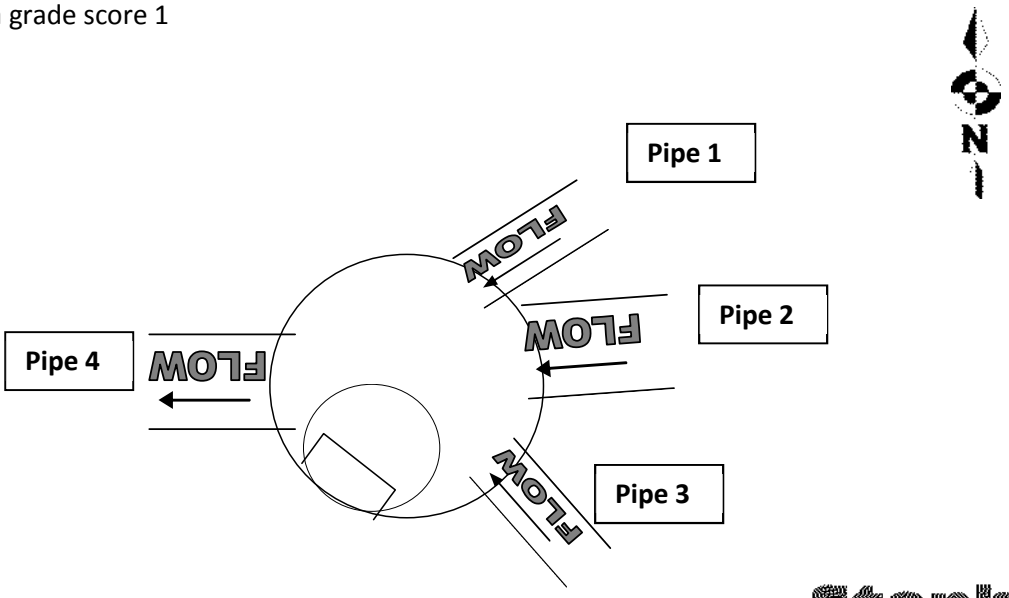
Reducing Slab: 1-6 inch with a grade score 1

Base: 64-inch base, with a grade score 1

Influent Pipe Connection: Influent pipe connection protrudes 3 inches, grade score of 1.

Effluent Pipe Connection: Effluent pipe connection protrudes 4 inches, grade score of 1.

Additional Comment: manhole appears to be newly installed.



MH 1631-065 looking south

MH frame

chimney and steps

pipe 1 influent

pipe 2 and 3 influent

effluent pipe

32ND AND 33RD Avenue Upgrades

Structure Number 1630-065

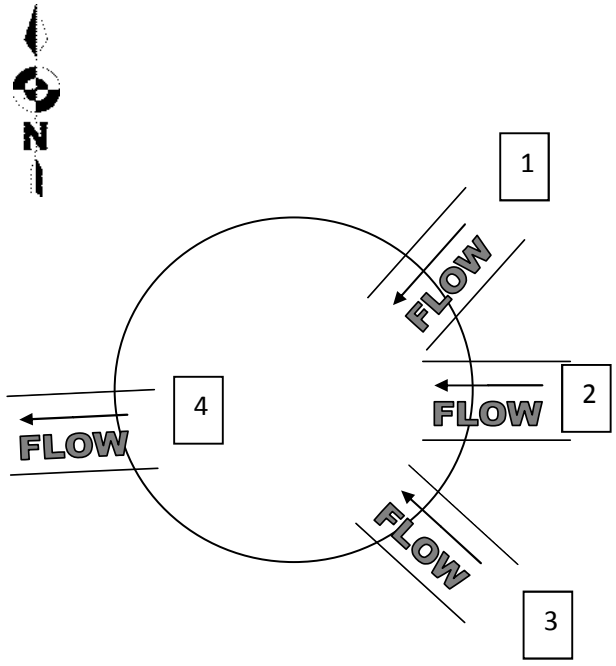
Pipe Inspection Results

Location of Storm Drain Structure: Center of Eureka and 32nd Avenue

Camera type: Quickview Camera

Quickview camera can observe from 10 to 300 feet of pipe depending on existing pipe condition, slope, and diameter.

1 Pipe viewing sequence number



Pipe Observations:

Segment 1-

Pipe type: 10-inch CPEP

General Comments

- No defects observed.

Segment 2-

Pipe type: 18-inch CPEP

General Comments

- No defects observed.

Segment 3-

Pipe type: 10-inch CPEP

General Comments

- No defects observed

Segment 4-

Pipe type: 18-inch CPEP

General Comments

- No defects observed

32nd and 33rd Avenue Upgrades

SEWER MANHOLE INSPECTION REPORT

Manhole # 1630-065A

DATE, INSPECTOR(S), & LOCATION DATA

Date of Inspection: Wednesday, July 12, 2017 **Inspector(s):** Porter, Bailey

Atmosphere: O_2- N/A **LEL-** N/A **H_2S-** N/A **CO-** N/A

General Location Features: West of manhole 1630-065 Center of 32nd Avenue and Eureka Street

PIPE CHARACTERISTICS

In-Effluent Pipe Size/Type/Diameter	Rim to Invert	Depth of Flow
1. 18-inch CPEP Influent	70"	Min.
2 18-inch CPEP Effluent	70"	Min.

Depth of Sum, Depth of Debris in Sump: 12-inch sump, 2 inches of debris

MANHOLE CHARACTERISTIC

***Defect grades**: 1=No Defect, 2=Minor Defect, 3=Moderate defect, 4=Significant defect, 5=Most significant defect*

Overall Structural Condition: 1.

Material of Construction: Precast

Manhole Shape: Circular

Dimensions: 48-inch

Cover/Lid: 25-inch lid, CI, with a grade score of 1

Frame: 7-inch tall, CI, with a grade score of 1

Chimney 10-inches total of chimneys due to grout could not tell individual chimneys, with a grade score of 1

Steps: 4 poly steps with a grade score 1

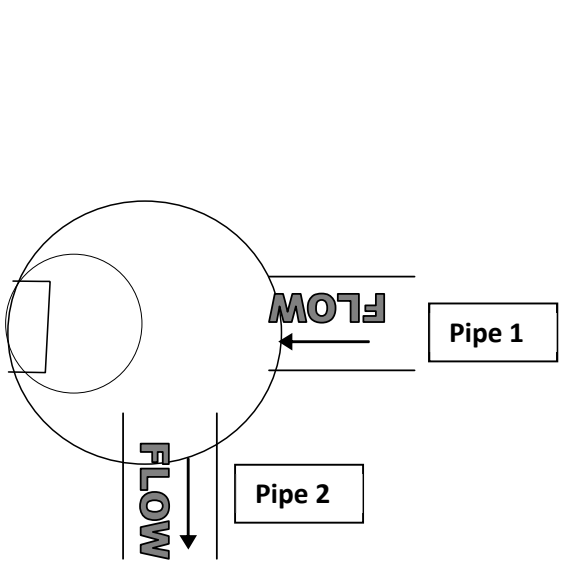
Cone: 26-inch with a grade score 1

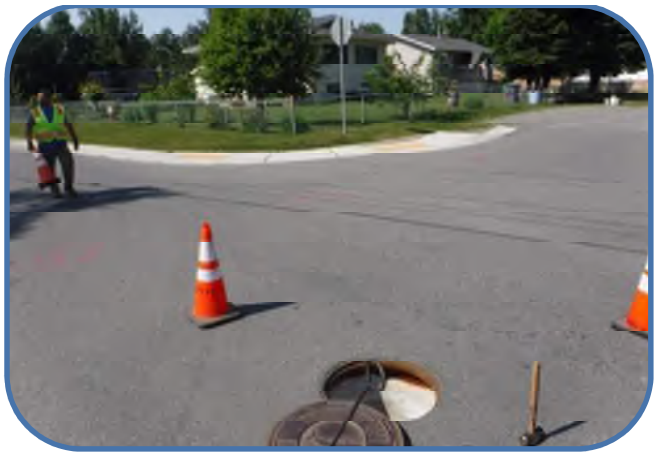
Base: 36-inch base, with a grade score 1

Influent Pipe Connection: Influent pipe connection protrudes 3 inches, grade score of 1.

Effluent Pipe Connection: Effluent pipe connection protrudes 3 inches, grade score of 1.

Additional Comment: Manhole appears to be newly installed.





MH 1631-065A looking north

MH frame and lid

chimney and steps

pipe 1 influent

pipe 2 effluent

32ND AND 33RD Avenue Upgrades

Structure Number 1630-065A

Pipe Inspection Results

Location of Storm Drain Structure: Center of Eureka and 32nd Avenue 10 feet to the west of manhole 1630-065

Camera type: Quickview Camera

Quickview camera can observe from 10 to 300 feet of pipe depending on existing pipe condition, slope, and diameter.

1 Pipe viewing sequence number

Pipe Observations:

Segment 1-

Pipe type: 18-inch CPEP

General Comments

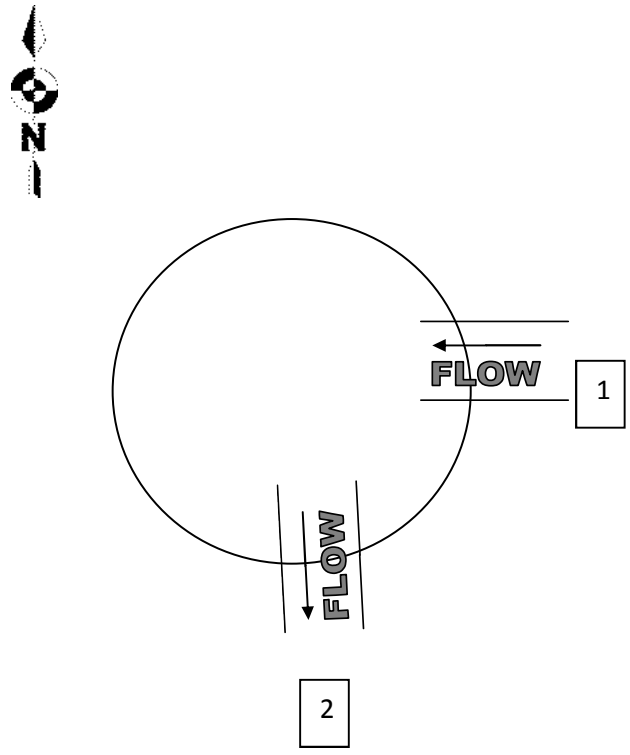
- No defects observed.

Segment 2-

Pipe type: 18-inch CPEP

General Comments

- No defects observed.



32nd and 33rd Avenue Upgrades

SEWER MANHOLE INSPECTION REPORT

Manhole # 1630-066

DATE, INSPECTOR(S), & LOCATION DATA

Date of Inspection: Monday, July 10, 2017 **Inspector(s):** Porter, Bailey

Atmosphere: O_2- N/A **LEL-** N/A **H_2S-** N/A **CO-** N/A

General Location Features: Northeast corner of 32nd and Eureka Street

PIPE CHARACTERISTICS

In-Effluent Pipe Size/Type/Diameter	Rim to Invert	Depth of Flow
1. 10-inch CPEP Effluent	38"	Minimal

Depth of Sum, Depth of Debris in Sump: 12-inch sump with 4-inches of debris

MANHOLE CHARACTERISTIC

***Defect grades**: 1=No Defect, 2=Minor Defect, 3=Moderate defect, 4=Significant defect, 5=Most significant defect*

Overall Structural Condition: 1.

Material of Construction: Precast

Manhole Shape: Circular

Dimensions: 48-inch

Cover/Lid: 25x18-inch, CI, with a grade score of 1 rolled curb

Frame: 4-inch tall, CI, with a grade score of 1

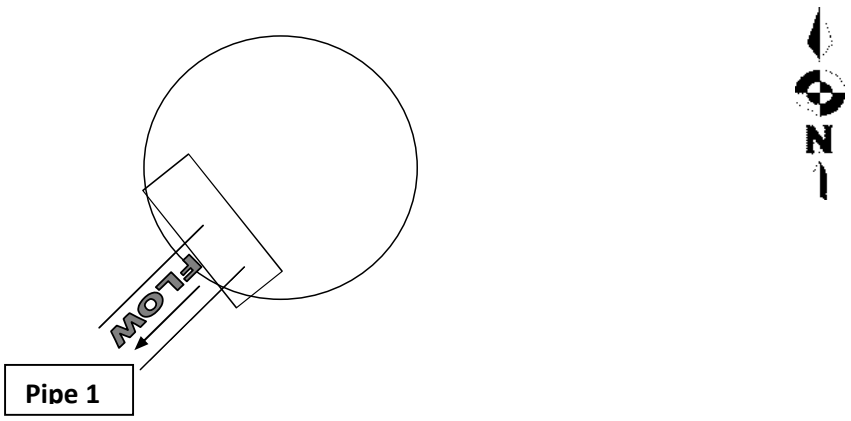
Chimney: 2-chimneys totaling 9-inches with a grade score of 1

Reducing slab: 1-6 inch with a grade score of 1

Base: 36-inch with a grade score 1

Effluent Pipe Connection: 3-inch protrusion grout grade score of 1.

Additional Comment: Manhole in good condition



MH 1630-066 looking north

MH 1630-066 looking east

MH frame

chimney and reducing slab

effluent pipe and base