


MEMORANDUM

DATE: June 6, 2017

TO: Howard S. Lazarus
City Administrator

FROM: Craig Hupy 
Public Services Area Administrator

RE: Emergency Authorization to Replace 680 Feet of 12-inch Water Main on South University Avenue under the DDA's South University Streetscape Improvement Project

In coordination with the Ann Arbor Downtown Development Authority's (DDA's) South University Streetscape project, the City was recently working to abandon an old 1890's 6-inch water main along South University. While performing the water main abandonment work, it was discovered that the existing 12-inch water main installed in 1965 from Church Street to South Forest Avenue is in very poor condition.

This section of water main did not have a prior break history and was not previously being discussed for replacement. However, it was exposed in multiple locations, and all of those locations exhibited severe corrosion. This included one location where City crews were unable to install a tap in the pipe and another location where the contractor could not install a line stop in the pipe due to the severe corrosion.

The existing 12-inch water main is located beneath the north sidewalk area, so future water main breaks would negatively impact the planned streetscape improvements. Although the water main has not yet experienced any water main breaks, observed pipe conditions and the inability to perform work on the pipe indicates the risk of near term failure is extremely high.

The City has determined that the best course of action is to expedite the replacement of the 1965 water main from Church Street to South Forest Avenue, and to complete the work as part of the DDA's project. A design was prepared by Fishbeck, Thompson, Carr and Huber and an expedited permit for water main construction was received from MDEQ on May 31, 2017.

The DDA's project requires that all hard surfaces are restored by July 19, 2017 for the Ann Arbor Street Art Fair. In order to proceed with the water main work without impacting the overall construction schedule and Art Fair, emergency authorization is required.

The DDA presented the revised water main plans to their contractor, Fonson Company, Inc. for pricing. On June 2, 2017 Fonson responded with a revised water main cost of

\$513,496.00. Including the additional required restoration work, administrative costs and work previously completed, the total proposed cost to the City is \$841,723.20. The Fonson Company, Inc. is a qualified company who has performed similar work for the City.

A previous cost sharing agreement with the DDA was approved in the amount of \$310,687.36 under Resolution R-17-113 by City Council on April 17, 2017. As provided in City Code 1:316, the Public Works Unit of the Public Services Area is seeking an emergency authorization from the City Administrator to amend the cost sharing agreement with the DDA to not exceed \$841,723.20. The additional funding need of \$531,035.84 for the work will come from the Water Supply System Capital Budget. Staff will prepare the appropriate resolution for Council adoption at the next available meeting as required by City Code.

cc: Molly Maciejewski, Public Works Manager
Nicholas Hutchinson, City Engineer
Cresson Slotten, Systems Planning Manager



Approval
Howard S. Lazarus
City Administrator



**South University 12" Water Main
Severe Corrosion**

Quote - South University Streetscape Improvement Revised Water Main REV

**FONSON
COMPANY, INC.**

Site Development
Road Builders
Sewer and Water

Fonson Company, Inc.

7644 Whitmore Lake Road
Brighton, Michigan 48116

Contact: Brendan Fons

Phone: (810) 231-5188

Fax: (810) 231-5404

Quote To: City of Ann Arbor DDA
150 S Fifth Street
Suite #301
Ann Arbor, MI, 48104
Contact: Elizabeth Rolla
Phone: 734-994-6697
Fax: 734-997-1491

Job Name: South University Streetscape Improve
Location: Ann Arbor, MI
Engineer:
Date of Plans:
Bid Date: 6/2/17
Revision Date: 6/5/17

South University Revised Water Main Work - REV

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	AMOUNT
10000	Hydrant Assembly Abandonment	3.00	EA	2,800.00	8,400.00
10005	Temporary 4 Inch Water Main Line Stop	1.00	EA	8,200.00	8,200.00
10010	Temporary 6 Inch Water Main Line Stop	1.00	EA	8,400.00	8,400.00
10020	CI 50 DIP w/Polywrap, 4 inch, TD-1 Mod	20.00	LF	1,048.00	20,960.00
10030	CI 50 DIP w/Polywrap, 6 inch, TD-1 Mod	41.00	LF	515.00	21,115.00
10040	CI 50 DIP w/Polywrap, 12 inch, TD-1 Mod	680.00	LF	294.50	200,260.00
10050	Bends & Reducers, 4 inch	4.00	EA	675.00	2,700.00
10060	Bends & Reducers, 6 inch	4.00	EA	680.00	2,720.00
10065	Bends & Reducers, 8 inch	3.00	EA	760.00	2,280.00
10070	Tees & Crosses, 12 inch	11.00	EA	1,550.00	17,050.00
10080	Fire Hydrant Assembly	3.00	EA	12,300.00	36,900.00
10083	Gate Valve-in-Box, 4 inch	1.00	EA	1,320.00	1,320.00
10086	Gate Valve-in-Box, 6 inch	1.00	EA	1,440.00	1,440.00
10090	Excavate & Backfill for Water Service Tap & Lead	92.00	LF	200.00	18,400.00
10110	4"/6" Water Main Pipe Abandonment	915.00	LF	4.00	3,660.00
10115	12" Water Main Pipe Abandonment	640.00	LF	25.50	16,320.00
10120	Gate Valve-in-Box Abandonment	6.00	EA	690.00	4,140.00
10130	Gate/Butterfly Valve-in-Well Abandonment	2.00	EA	2,115.00	4,230.00
10200	Bends & Reducers, 12 inch	18.00	EA	1,100.00	19,800.00
10210	12" Gate Valve In Box	5.00	EA	3,100.00	15,500.00
10220	Temporary 12 Inch Water Main Line Stop	3.00	EA	13,000.00	39,000.00
10230	Exploratory Excavation - 4" & 6" Leads	3.00	EA	1,900.00	5,700.00
10240	8" Water Main Connection - U-Towers	1.00	EA	10,500.00	10,500.00
10400	Mobilization - Additional Work	1.00	LS	44,500.00	44,500.00
GRAND TOTAL					\$513,495.00

NOTES:

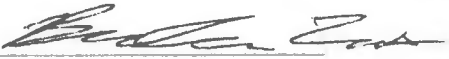
This Proposal Excludes The Following:

- I) Additional Traffic Control Devices For Road Closure and Traffic Detour
- II) Additional/Modified Storm Sewer Work

Conditions/Comments:

- I) Proposal includes work to complete the water main utility work per the plan sheets entitled "Water Main Plan - South University Avenue" & "Water Main Plan - South Forest Avenue".
- II) Work in this Proposal is included in revised contract bid items and new bid items. Original contract bid items to be deducted from the project.
- III) All other contract items still apply.
- IV) This additional/modified water main work will require an extension of time on the contract. Please see attached letter.

This proposal includes prevailing wages.

By: 
Brendan Fons

Fonson Company, Inc.
An Equal Opportunity Employer

Exhibit B - Revised City/DDA Cost Sharing Breakdown based on Fonson Quote 6/5/17
 ITB 4466 South University Streetscape Improvements

Items highlighted in blue are 100% City Funded.

Items highlighted in green are City Funded restoration items not included in Fonson's Water Main Quote

Items in red are shared at a rate of 12 percent based on the total contract portion attributable to the City's water main.

Item No.	Description	Qty.	Unit	Fonson Bid Prices		12%
				Unit Price	Total	WM Cost
101	General Conditions, Max \$40,000	1	LS	\$ 40,000.00	\$ 40,000.00	\$ 4,800.00
102	Audio Visual Tape Coverage	1	LS	\$ 850.00	\$ 850.00	\$ 102.00
120	Project Supervision, Max \$40,000	1	LS	\$ 40,000.00	\$ 40,000.00	\$ 4,800.00
203	Minor Traffic Devices, Max \$10,000	1	LS	\$ 10,000.00	\$ 10,000.00	\$ 1,200.00
205	Machine Grading, Modified	21	Sta	\$ 20,950.00	\$ 439,950.00	\$ 52,794.00
221	HMA Leveling WM	132	Ton	\$ 142.43	\$ 18,800.76	\$ 18,800.76
222	HMA Wearing WM	88	Ton	\$ 147.43	\$ 12,973.84	\$ 12,973.84
225	Recessing Pavement Markings, Longit	866	Ft	\$ 2.00	\$ 1,732.00	\$ 1,732.00
230	Remove Concrete Curb or Curb & Gutter - Any Type	270	Lf	\$ 8.00	\$ 2,160.00	\$ 2,160.00
232	Remove Concrete Sidewalk and Drive - Any Thickness	1,900	Sft	\$ 2.60	\$ 4,940.00	\$ 4,940.00
234	Concrete Curb or Curb & Gutter - Any Type WM	270	Lf	\$ 25.00	\$ 6,750.00	\$ 6,750.00
236	6-Inch Concrete Sidewalk, Ramp, or Drive	1,100	Sft	\$ 6.75	\$ 7,425.00	\$ 7,425.00
237	8-Inch Concrete Sidewalk, Ramp, or Drive	800	Sft	\$ 7.75	\$ 6,200.00	\$ 6,200.00
249	Hydrant Assembly Abandonment	2	Ea	\$ 2,800.00	\$ 5,600.00	\$ 5,600.00
254	Temporary 4 Inch Water Main Line Stop	1	Ea	\$ 8,200.00	\$ 8,200.00	\$ 8,200.00
255	Temporary 6 Inch Water Main Line Stop	2	Ea	\$ 8,400.00	\$ 16,800.00	\$ 16,800.00
256	12 Inch Insertion Valve in Box	1	Ea	\$ 7,500.00	\$ 7,500.00	\$ 7,500.00
257	Remove Light Std Shaft	2	Ea	\$ 467.00	\$ 934.00	\$ 934.00
259	Light Std Shaft, Install Salv	2	Ea	\$ 571.00	\$ 1,142.00	\$ 1,142.00
271	Sign, Portable Changeable Message, Furnish and Operate	2	Ea	\$ 2,775.00	\$ 5,550.00	\$ 666.00
272	Channelizing Device, 42 Inch - Furnish & Operate	120	Ea	\$ 17.76	\$ 2,131.20	\$ 255.74
273	Barricade Type III - Lighted - Furnish and Operate	20	Ea	\$ 99.90	\$ 1,998.00	\$ 239.76
274	Barricade Type II - Furnish and Operate	30	Ea	\$ 19.98	\$ 599.40	\$ 71.93
275	Temporary Sign - Type B	1,276	Sf	\$ 3.33	\$ 4,249.08	\$ 509.89
276	Temporary Sign - Type A	45	Sf	\$ 3.33	\$ 149.85	\$ 17.98
277	Portable Water Filled Barriers	100	Lf	\$ 28.20	\$ 2,820.00	\$ 338.40
278	Lighted Arrow, Type C, Furnish & Operate	1	Ea	\$ 555.00	\$ 555.00	\$ 66.60
287	Remove Structure	1	Cyd	\$ 170.00	\$ 170.00	\$ 170.00
368	Double Inlet	1	Ea	\$ 1,850.00	\$ 1,850.00	\$ 1,850.00
400	Class 50 DIP w/ Polyethylene Wrap, 4 inch, TD-1 Modified	20	Lf	\$ 1,048.00	\$ 20,960.00	\$ 20,960.00
401	Class 50 DIP w/ Polyethylene Wrap, 6 inch, TD-1 Modified	41	Lf	\$ 515.00	\$ 21,115.00	\$ 21,115.00
402	Class 50 DIP w/ Polyethylene Wrap, 8 inch, TD-1 Modified	0	Lf	\$ 430.00	\$ -	\$ -
403	Class 50 DIP w/ Polyethylene Wrap, 12 inch, TD-1 Modified	680	Lf	\$ 294.50	\$ 200,260.00	\$ 200,260.00
410	Bends & Reducers, 4 inch	4	Ea	\$ 675.00	\$ 2,700.00	\$ 2,700.00
411	Bends & Reducers, 6 inch	4	Ea	\$ 680.00	\$ 2,720.00	\$ 2,720.00
412	Bends & Reducers, 8 inch	3	Ea	\$ 760.00	\$ 2,280.00	\$ 2,280.00
430	Tees & Crosses, 12 inch	11	Ea	\$ 1,550.00	\$ 17,050.00	\$ 17,050.00
440	Fire Hydrant Assembly	2	Ea	\$ 12,300.00	\$ 24,600.00	\$ 24,600.00
441	Gate Valve-in-Box, 4 inch	1	Ea	\$ 1,320.00	\$ 1,320.00	\$ 1,320.00
442	Gate Valve-in-Box, 6 inch	1	Ea	\$ 1,440.00	\$ 1,440.00	\$ 1,440.00
446	Gate/Butterfly Valve-in-Well, 12 inch	1	Ea	\$ 6,000.00	\$ 6,000.00	\$ 6,000.00
453	Tapping Sleeve & Valve-in-Box, 12 inch		Ea	\$ 8,200.00	\$ -	\$ -
460	Excavate & Backfill for Water Service Tap and Lead	238	Lf	\$ 200.00	\$ 47,600.00	\$ 47,600.00
481	Water Main Pipe Abandonment	915	Lf	\$ 2.50	\$ 2,287.50	\$ 2,287.50
482	Gate Valve-in-Box Abandonment	6	Ea	\$ 690.00	\$ 4,140.00	\$ 4,140.00
483	Gate/Butterfly Valve-in-Well Abandonment	2	Ea	\$ 2,115.00	\$ 4,230.00	\$ 4,230.00
5010025	Hand Patching	60	Ton	\$ 195.00	\$ 11,700.00	\$ 11,700.00
500	Remove Bituminous Pavement WM	800	Syd	\$ 15.00	\$ 12,000.00	\$ 12,000.00
501	Remove Concrete Pavement - Any Thickness WM	800	Syd	\$ 12.00	\$ 9,600.00	\$ 9,600.00
527	Aggregate Base Course - 21AA - C.I.P.	180	Cyd	\$ 128.00	\$ 23,040.00	\$ 23,040.00
529	Sand Subbase Course, 2NS - C.I.P.	220	Cyd	\$ 77.00	\$ 16,940.00	\$ 16,940.00
540	Non-Reinforced Concrete, 8" Thickness	750	Syd	\$ 65.50	\$ 49,125.00	\$ 49,125.00
585	Reflectorized-Fast Dry Pavement Marking, 4" Yellow	94	Ft	\$ 1.00	\$ 94.00	\$ 11.28
586	Reflectorized-Fast Dry Pavement Marking, 6" White	306	Ft	\$ 2.00	\$ 612.00	\$ 73.44
587	Reflectorized-Fast Dry Pavement Marking, 24" White	460	Ft	\$ 6.00	\$ 2,760.00	\$ 331.20
588	Reflectorized-Fast Dry Pavement Marking, Symbol White	4	Ea	\$ 150.00	\$ 600.00	\$ 72.00

ITB 4466 South University Streetscape Improvements

Items highlighted in blue are 100% City Funded.

Items highlighted in green are City Funded restoration items not included in Fonson's Water Main Quote

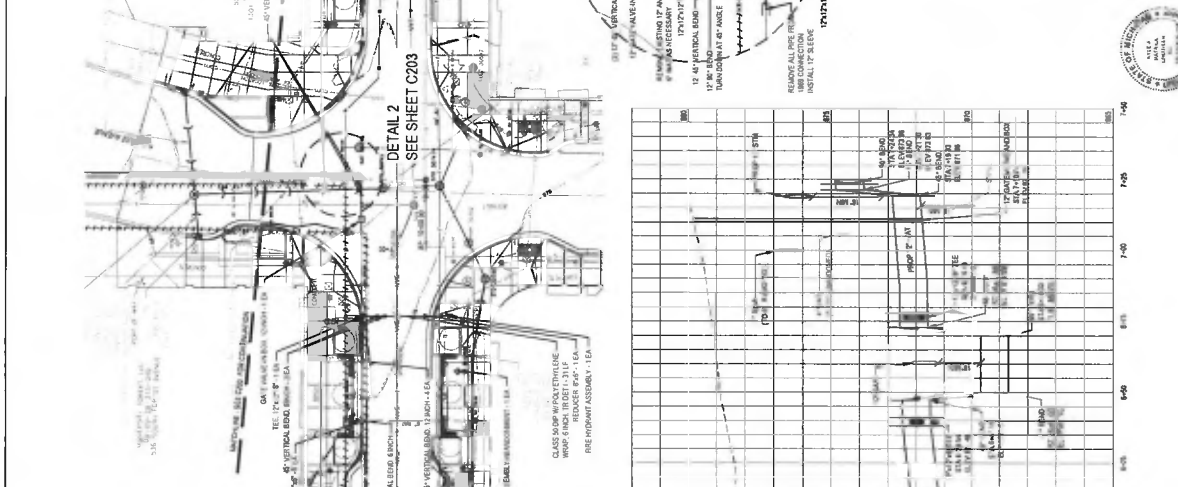
Items in red are shared at a rate of 12 percent based on the total contract portion attributable to the City's water main.

Item No.	Description	Qty.	Unit	Fonson Bid Prices		12%
				Unit Price	Total	WM Cost
563	Structure Covers	400	Lbs	\$ 2.20	\$ 880.00	\$ 880.00
580	Remove Pavement Markings	100	Lf	\$ 2.00	\$ 200.00	\$ 24.00
581	Remove Pavement Markings-Symbol or Legend	2	Ea	\$ 200.00	\$ 400.00	\$ 48.00
582	Temporary Pavement Marking (Type R)-In Place	1,000	Lf	\$ 0.35	\$ 350.00	\$ 42.00
592	Cold Plastic Pvmt Mark, Symbol White	4	Ea	\$ 250.00	\$ 1,000.00	\$ 120.00
595	Thermo Pavmt Mark, 4" Yellow	94	Lf	\$ 1.50	\$ 141.00	\$ 16.92
596	Thermo Pavmt Mark, 6" White	306	Lf	\$ 3.00	\$ 918.00	\$ 110.16
597	Thermo Pavmt Mark, 24" White	460	Lf	\$ 13.00	\$ 5,980.00	\$ 717.60
702	Inlet Filter	15	Ea	\$ 188.00	\$ 2,820.00	\$ 338.40
703	Silt Fence	200	Lf	\$ 6.95	\$ 1,390.00	\$ 166.80
891	Clean-Up and Restoration	1	LS	\$ 9,200.00	\$ 9,200.00	\$ 1,104.00
10200	Bends & Reducers, 12 inch	18	Ea	\$ 1,100.00	\$ 19,800.00	\$ 19,800.00
10210	12 inch Gate Valve in Box	7	Ea	\$ 3,100.00	\$ 21,700.00	\$ 21,700.00
10220	Temporary 12 Inch Water Main Line Stop	3	Ea	\$ 13,000.00	\$ 39,000.00	\$ 39,000.00
10230	Exploratory Excavation - 4" & 6" Leads	3	Ea	\$ 1,900.00	\$ 5,700.00	\$ 5,700.00
10240	8 inch Water Main Connection - University Tower	1	Ea	\$ 10,500.00	\$ 10,500.00	\$ 10,500.00
10400	Mobilization - Additional Work	1	LS	\$ 44,500.00	\$ 44,500.00	\$ 44,500.00
	12" Water Main Abandonment w/ Grout	640	LS	\$ 13.00	\$ 8,320.00	\$ 8,320.00
TOTAL CONSTRUCTION						\$ 803,723.20
Direct Water Main Items						\$ 546,322.50
Direct Restoration Items Attributed to WM						\$ 188,362.60
Shared Items percentage attributed to WM						\$ 69,038.10
Total Water Main Construction Cost						\$ 803,723.20
				Estimated	12% City	
				Total	Share	DDA Share
	Construction Inspection	1		\$95,000	\$11,400	\$83,600
	Construction Survey	1		\$40,000	\$4,800	\$35,200
	Construction Testing	1		\$15,000	\$1,800	\$13,200
				\$18,000		\$132,000
	Added Construction Inspection and Survey for 12" Water Main	1	\$20,000		\$20,000	\$0
Total City Water Main Construction Costs with Inspection, Survey & Testing					\$ 841,723.20	
Previous Cost Sharing Estimate					\$ 310,687.36	
Additional Funding Request					\$ 531,035.84	

NOTES

1. SHOWN DIMENSIONS FOR WATER MAIN FITTINGS AND APPURTENANCES ARE ALONG LENGTH OF PROPOSED WATER MAIN.
2. ALL WATER MAINS, INCLUDING CURB AND CONNECTION SHALL BE CONSTRUCTED TO CONFORM WITH THE CITY STANDARD SPECIFICATIONS FOR WATER MAINS AND FITTINGS. ALL FITTINGS SHALL BE APPROVED BY THE CITY ENGINEER PRIOR TO CONSTRUCTION.
3. POLYETHYLENE GLASS 50 SDR POLYETHYLENE GLASS 50 SDR PIPE SHALL BE USED FOR ALL WATER MAINS EXCEPT AT THE CONNECTIONS TO EXISTING WATER MAINS WHERE THE EXISTING WATER MAIN IS APPROVED FOR USE.
4. ALL WELDS SHALL BE MADE IN ACCORDANCE WITH THE CITY STANDARD SPECIFICATIONS FOR WATER MAINS AND FITTINGS. ALL WELDS SHALL BE INSULATED AND PROTECTED AGAINST CORROSION. ALL WELDS SHALL BE MADE IN ACCORDANCE WITH THE CITY STANDARD SPECIFICATIONS FOR WATER MAINS AND FITTINGS.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING UTILITIES AND STRUCTURES. ALL UTILITIES SHALL BE DEPTH MARKED PRIOR TO CONSTRUCTION. ALL STRUCTURES SHALL BE PROTECTED PRIOR TO CONSTRUCTION.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING UTILITIES AND STRUCTURES. ALL UTILITIES SHALL BE DEPTH MARKED PRIOR TO CONSTRUCTION. ALL STRUCTURES SHALL BE PROTECTED PRIOR TO CONSTRUCTION.
7. ALL WATER MAINS SHALL BE CLASSIFIED AS 48" VERTICAL EGOB 12-1/2 INCH CLASS 50 SDR POLYETHYLENE GLASS 50 SDR PIPE. ALL WATER MAINS SHALL BE CLASSIFIED AS 48" VERTICAL EGOB 12-1/2 INCH CLASS 50 SDR POLYETHYLENE GLASS 50 SDR PIPE.
8. ALL WATER MAINS SHALL BE CLASSIFIED AS 48" VERTICAL EGOB 12-1/2 INCH CLASS 50 SDR POLYETHYLENE GLASS 50 SDR PIPE. ALL WATER MAINS SHALL BE CLASSIFIED AS 48" VERTICAL EGOB 12-1/2 INCH CLASS 50 SDR POLYETHYLENE GLASS 50 SDR PIPE.
9. ALL WATER MAINS SHALL BE CLASSIFIED AS 48" VERTICAL EGOB 12-1/2 INCH CLASS 50 SDR POLYETHYLENE GLASS 50 SDR PIPE. ALL WATER MAINS SHALL BE CLASSIFIED AS 48" VERTICAL EGOB 12-1/2 INCH CLASS 50 SDR POLYETHYLENE GLASS 50 SDR PIPE.
10. ALL WATER MAINS SHALL BE CLASSIFIED AS 48" VERTICAL EGOB 12-1/2 INCH CLASS 50 SDR POLYETHYLENE GLASS 50 SDR PIPE. ALL WATER MAINS SHALL BE CLASSIFIED AS 48" VERTICAL EGOB 12-1/2 INCH CLASS 50 SDR POLYETHYLENE GLASS 50 SDR PIPE.
11. ALL WATER MAINS SHALL BE CLASSIFIED AS 48" VERTICAL EGOB 12-1/2 INCH CLASS 50 SDR POLYETHYLENE GLASS 50 SDR PIPE. ALL WATER MAINS SHALL BE CLASSIFIED AS 48" VERTICAL EGOB 12-1/2 INCH CLASS 50 SDR POLYETHYLENE GLASS 50 SDR PIPE.
12. ALL WATER MAINS SHALL BE CLASSIFIED AS 48" VERTICAL EGOB 12-1/2 INCH CLASS 50 SDR POLYETHYLENE GLASS 50 SDR PIPE. ALL WATER MAINS SHALL BE CLASSIFIED AS 48" VERTICAL EGOB 12-1/2 INCH CLASS 50 SDR POLYETHYLENE GLASS 50 SDR PIPE.

- SEQUENCING NOTES**
1. CONTRACTOR SHALL CONFORM WITH THE CITY STANDARD SPECIFICATIONS FOR WATER MAINS AND FITTINGS.
 2. CONTRACTOR SHALL CONFORM WITH THE CITY STANDARD SPECIFICATIONS FOR WATER MAINS AND FITTINGS.
 3. CONTRACTOR SHALL CONFORM WITH THE CITY STANDARD SPECIFICATIONS FOR WATER MAINS AND FITTINGS.
 4. CONTRACTOR SHALL CONFORM WITH THE CITY STANDARD SPECIFICATIONS FOR WATER MAINS AND FITTINGS.
 5. CONTRACTOR SHALL CONFORM WITH THE CITY STANDARD SPECIFICATIONS FOR WATER MAINS AND FITTINGS.
 6. CONTRACTOR SHALL CONFORM WITH THE CITY STANDARD SPECIFICATIONS FOR WATER MAINS AND FITTINGS.
 7. CONTRACTOR SHALL CONFORM WITH THE CITY STANDARD SPECIFICATIONS FOR WATER MAINS AND FITTINGS.
 8. CONTRACTOR SHALL CONFORM WITH THE CITY STANDARD SPECIFICATIONS FOR WATER MAINS AND FITTINGS.
 9. CONTRACTOR SHALL CONFORM WITH THE CITY STANDARD SPECIFICATIONS FOR WATER MAINS AND FITTINGS.
 10. CONTRACTOR SHALL CONFORM WITH THE CITY STANDARD SPECIFICATIONS FOR WATER MAINS AND FITTINGS.
 11. CONTRACTOR SHALL CONFORM WITH THE CITY STANDARD SPECIFICATIONS FOR WATER MAINS AND FITTINGS.
 12. CONTRACTOR SHALL CONFORM WITH THE CITY STANDARD SPECIFICATIONS FOR WATER MAINS AND FITTINGS.
 13. CONTRACTOR SHALL CONFORM WITH THE CITY STANDARD SPECIFICATIONS FOR WATER MAINS AND FITTINGS.
 14. CONTRACTOR SHALL CONFORM WITH THE CITY STANDARD SPECIFICATIONS FOR WATER MAINS AND FITTINGS.
 15. CONTRACTOR SHALL CONFORM WITH THE CITY STANDARD SPECIFICATIONS FOR WATER MAINS AND FITTINGS.
 16. CONTRACTOR SHALL CONFORM WITH THE CITY STANDARD SPECIFICATIONS FOR WATER MAINS AND FITTINGS.
 17. CONTRACTOR SHALL CONFORM WITH THE CITY STANDARD SPECIFICATIONS FOR WATER MAINS AND FITTINGS.
 18. CONTRACTOR SHALL CONFORM WITH THE CITY STANDARD SPECIFICATIONS FOR WATER MAINS AND FITTINGS.



ESTIMATED WATER MAIN CONSTRUCTION QUANTITIES

QUANTITY	UNIT	DESCRIPTION
410	LF	CLASS 50 SDR POLYETHYLENE GLASS 50 SDR PIPE, 12 INCH
17	LF	CLASS 50 SDR POLYETHYLENE GLASS 50 SDR PIPE, 18 INCH
2	EA	BEADS & REDUCERS, 12 INCH
2	EA	BEADS & REDUCERS, 18 INCH
2	EA	BEADS & REDUCERS, 24 INCH
2	EA	BEADS & REDUCERS, 30 INCH
2	EA	BEADS & REDUCERS, 36 INCH
2	EA	BEADS & REDUCERS, 42 INCH
2	EA	BEADS & REDUCERS, 48 INCH
2	EA	BEADS & REDUCERS, 54 INCH
2	EA	BEADS & REDUCERS, 60 INCH
2	EA	BEADS & REDUCERS, 66 INCH
2	EA	BEADS & REDUCERS, 72 INCH
2	EA	BEADS & REDUCERS, 78 INCH
2	EA	BEADS & REDUCERS, 84 INCH
2	EA	BEADS & REDUCERS, 90 INCH
2	EA	BEADS & REDUCERS, 96 INCH
2	EA	BEADS & REDUCERS, 102 INCH
2	EA	BEADS & REDUCERS, 108 INCH
2	EA	BEADS & REDUCERS, 114 INCH
2	EA	BEADS & REDUCERS, 120 INCH
2	EA	BEADS & REDUCERS, 126 INCH
2	EA	BEADS & REDUCERS, 132 INCH
2	EA	BEADS & REDUCERS, 138 INCH
2	EA	BEADS & REDUCERS, 144 INCH
2	EA	BEADS & REDUCERS, 150 INCH
2	EA	BEADS & REDUCERS, 156 INCH
2	EA	BEADS & REDUCERS, 162 INCH
2	EA	BEADS & REDUCERS, 168 INCH
2	EA	BEADS & REDUCERS, 174 INCH
2	EA	BEADS & REDUCERS, 180 INCH
2	EA	BEADS & REDUCERS, 186 INCH
2	EA	BEADS & REDUCERS, 192 INCH
2	EA	BEADS & REDUCERS, 198 INCH
2	EA	BEADS & REDUCERS, 204 INCH
2	EA	BEADS & REDUCERS, 210 INCH
2	EA	BEADS & REDUCERS, 216 INCH
2	EA	BEADS & REDUCERS, 222 INCH
2	EA	BEADS & REDUCERS, 228 INCH
2	EA	BEADS & REDUCERS, 234 INCH
2	EA	BEADS & REDUCERS, 240 INCH
2	EA	BEADS & REDUCERS, 246 INCH
2	EA	BEADS & REDUCERS, 252 INCH
2	EA	BEADS & REDUCERS, 258 INCH
2	EA	BEADS & REDUCERS, 264 INCH
2	EA	BEADS & REDUCERS, 270 INCH
2	EA	BEADS & REDUCERS, 276 INCH
2	EA	BEADS & REDUCERS, 282 INCH
2	EA	BEADS & REDUCERS, 288 INCH
2	EA	BEADS & REDUCERS, 294 INCH
2	EA	BEADS & REDUCERS, 300 INCH

LEGEND

- 1. WATER MAIN
- 2. VALVE
- 3. HYDRANT
- 4. FIRE HYDRANT
- 5. FLOOD GATE
- 6. REPAIR TRENCH
- 7. EXISTING WATER MAIN
- 8. EXISTING VALVE
- 9. EXISTING HYDRANT
- 10. EXISTING FIRE HYDRANT
- 11. EXISTING FLOOD GATE
- 12. EXISTING REPAIR TRENCH
- 13. EXISTING CONCRETE
- 14. EXISTING ASPHALT
- 15. EXISTING GRAVEL
- 16. EXISTING SAND
- 17. EXISTING DIRT
- 18. EXISTING VEGETATION
- 19. EXISTING STRUCTURE
- 20. EXISTING UTILITY
- 21. EXISTING SIGN
- 22. EXISTING LIGHT
- 23. EXISTING FENCE
- 24. EXISTING CURB
- 25. EXISTING DRIVEWAY
- 26. EXISTING SIDEWALK
- 27. EXISTING STREET
- 28. EXISTING PARKING
- 29. EXISTING LANDSCAPE
- 30. EXISTING TREE
- 31. EXISTING SHrub
- 32. EXISTING GRASS
- 33. EXISTING SOIL
- 34. EXISTING ROCK
- 35. EXISTING CLAY
- 36. EXISTING SANDSTONE
- 37. EXISTING LIMESTONE
- 38. EXISTING GNEISS
- 39. EXISTING QUARTZITE
- 40. EXISTING SLATE
- 41. EXISTING SCHIST
- 42. EXISTING METAMORPHIC
- 43. EXISTING IGV
- 44. EXISTING MAFIC
- 45. EXISTING FELSIC
- 46. EXISTING METABOLIC
- 47. EXISTING PLUTONIC
- 48. EXISTING SEDIMENTARY
- 49. EXISTING METAMORPHIC
- 50. EXISTING METABOLIC
- 51. EXISTING METAMORPHIC
- 52. EXISTING METABOLIC
- 53. EXISTING METAMORPHIC
- 54. EXISTING METABOLIC
- 55. EXISTING METAMORPHIC
- 56. EXISTING METABOLIC
- 57. EXISTING METAMORPHIC
- 58. EXISTING METABOLIC
- 59. EXISTING METAMORPHIC
- 60. EXISTING METABOLIC

SCALE

1" = 20'

DRAWING NO

C202

SHEET NO.

36 OF 36

DOWNTOWN DEVELOPMENT AUTHORITY - CITY OF ANN ARBOR

WATER MAIN PLAN - SOUTH UNIVERSITY AVENUE

APPROVED BY:

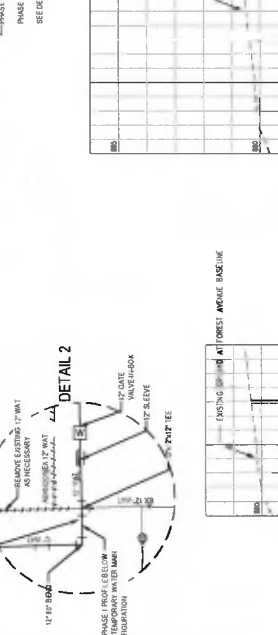
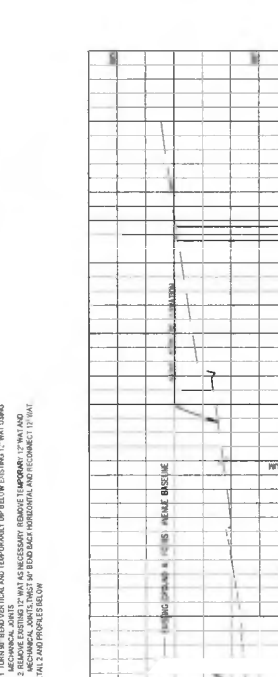
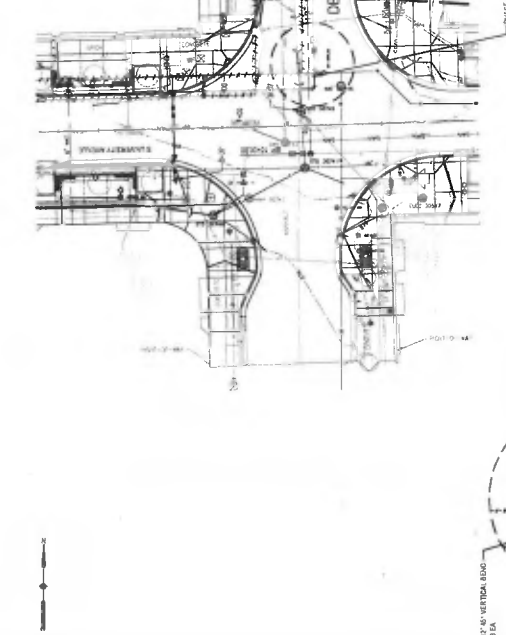
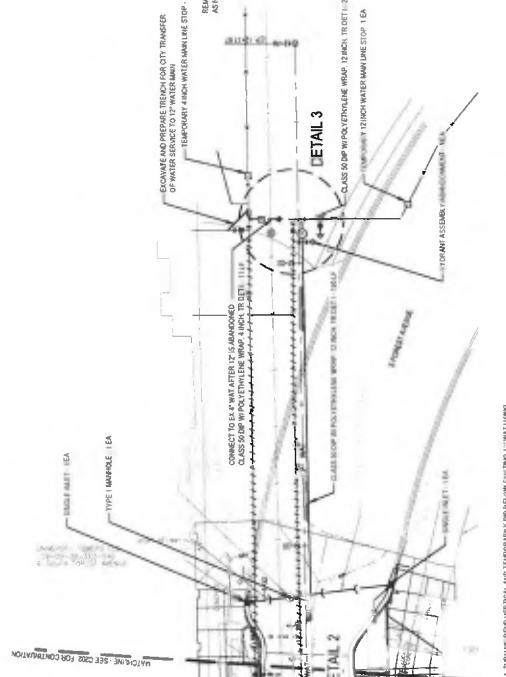
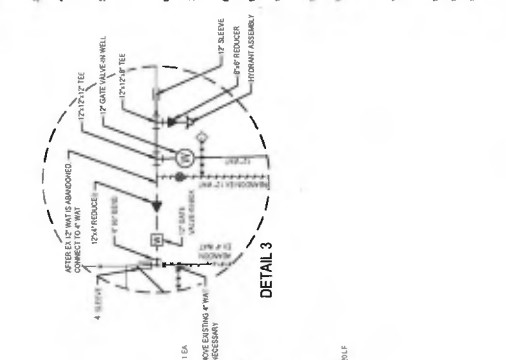
(Signature)

NOTES

1. MATERIALS, EQUIPMENT AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE CITY OF ANN ARBOR'S STANDARD SPECIFICATIONS FOR THE CONSTRUCTION OF WATER MAINS.
2. ALL WATER MAINS SHALL BE INSTALLED IN ACCORDANCE WITH THE CITY OF ANN ARBOR'S STANDARD SPECIFICATIONS FOR THE CONSTRUCTION OF WATER MAINS.
3. ALL WATER MAINS SHALL BE INSTALLED IN ACCORDANCE WITH THE CITY OF ANN ARBOR'S STANDARD SPECIFICATIONS FOR THE CONSTRUCTION OF WATER MAINS.
4. ALL WATER MAINS SHALL BE INSTALLED IN ACCORDANCE WITH THE CITY OF ANN ARBOR'S STANDARD SPECIFICATIONS FOR THE CONSTRUCTION OF WATER MAINS.
5. ALL WATER MAINS SHALL BE INSTALLED IN ACCORDANCE WITH THE CITY OF ANN ARBOR'S STANDARD SPECIFICATIONS FOR THE CONSTRUCTION OF WATER MAINS.
6. ALL WATER MAINS SHALL BE INSTALLED IN ACCORDANCE WITH THE CITY OF ANN ARBOR'S STANDARD SPECIFICATIONS FOR THE CONSTRUCTION OF WATER MAINS.
7. ALL WATER MAINS SHALL BE INSTALLED IN ACCORDANCE WITH THE CITY OF ANN ARBOR'S STANDARD SPECIFICATIONS FOR THE CONSTRUCTION OF WATER MAINS.
8. ALL WATER MAINS SHALL BE INSTALLED IN ACCORDANCE WITH THE CITY OF ANN ARBOR'S STANDARD SPECIFICATIONS FOR THE CONSTRUCTION OF WATER MAINS.
9. ALL WATER MAINS SHALL BE INSTALLED IN ACCORDANCE WITH THE CITY OF ANN ARBOR'S STANDARD SPECIFICATIONS FOR THE CONSTRUCTION OF WATER MAINS.
10. ALL WATER MAINS SHALL BE INSTALLED IN ACCORDANCE WITH THE CITY OF ANN ARBOR'S STANDARD SPECIFICATIONS FOR THE CONSTRUCTION OF WATER MAINS.
11. ALL WATER MAINS SHALL BE INSTALLED IN ACCORDANCE WITH THE CITY OF ANN ARBOR'S STANDARD SPECIFICATIONS FOR THE CONSTRUCTION OF WATER MAINS.
12. ALL WATER MAINS SHALL BE INSTALLED IN ACCORDANCE WITH THE CITY OF ANN ARBOR'S STANDARD SPECIFICATIONS FOR THE CONSTRUCTION OF WATER MAINS.
13. ALL WATER MAINS SHALL BE INSTALLED IN ACCORDANCE WITH THE CITY OF ANN ARBOR'S STANDARD SPECIFICATIONS FOR THE CONSTRUCTION OF WATER MAINS.
14. ALL WATER MAINS SHALL BE INSTALLED IN ACCORDANCE WITH THE CITY OF ANN ARBOR'S STANDARD SPECIFICATIONS FOR THE CONSTRUCTION OF WATER MAINS.
15. ALL WATER MAINS SHALL BE INSTALLED IN ACCORDANCE WITH THE CITY OF ANN ARBOR'S STANDARD SPECIFICATIONS FOR THE CONSTRUCTION OF WATER MAINS.
16. ALL WATER MAINS SHALL BE INSTALLED IN ACCORDANCE WITH THE CITY OF ANN ARBOR'S STANDARD SPECIFICATIONS FOR THE CONSTRUCTION OF WATER MAINS.
17. ALL WATER MAINS SHALL BE INSTALLED IN ACCORDANCE WITH THE CITY OF ANN ARBOR'S STANDARD SPECIFICATIONS FOR THE CONSTRUCTION OF WATER MAINS.
18. ALL WATER MAINS SHALL BE INSTALLED IN ACCORDANCE WITH THE CITY OF ANN ARBOR'S STANDARD SPECIFICATIONS FOR THE CONSTRUCTION OF WATER MAINS.
19. ALL WATER MAINS SHALL BE INSTALLED IN ACCORDANCE WITH THE CITY OF ANN ARBOR'S STANDARD SPECIFICATIONS FOR THE CONSTRUCTION OF WATER MAINS.
20. ALL WATER MAINS SHALL BE INSTALLED IN ACCORDANCE WITH THE CITY OF ANN ARBOR'S STANDARD SPECIFICATIONS FOR THE CONSTRUCTION OF WATER MAINS.

SEQUENCING NOTES

1. CONTRACTOR SHALL VERIFY THE CONNECTIONS OF EXISTING WATER MAINS TO THE PROPOSED WATER MAINS.
2. CONTRACTOR SHALL VERIFY THE CONNECTIONS OF EXISTING WATER MAINS TO THE PROPOSED WATER MAINS.
3. CONTRACTOR SHALL VERIFY THE CONNECTIONS OF EXISTING WATER MAINS TO THE PROPOSED WATER MAINS.
4. CONTRACTOR SHALL VERIFY THE CONNECTIONS OF EXISTING WATER MAINS TO THE PROPOSED WATER MAINS.
5. CONTRACTOR SHALL VERIFY THE CONNECTIONS OF EXISTING WATER MAINS TO THE PROPOSED WATER MAINS.
6. CONTRACTOR SHALL VERIFY THE CONNECTIONS OF EXISTING WATER MAINS TO THE PROPOSED WATER MAINS.
7. CONTRACTOR SHALL VERIFY THE CONNECTIONS OF EXISTING WATER MAINS TO THE PROPOSED WATER MAINS.
8. CONTRACTOR SHALL VERIFY THE CONNECTIONS OF EXISTING WATER MAINS TO THE PROPOSED WATER MAINS.
9. CONTRACTOR SHALL VERIFY THE CONNECTIONS OF EXISTING WATER MAINS TO THE PROPOSED WATER MAINS.
10. CONTRACTOR SHALL VERIFY THE CONNECTIONS OF EXISTING WATER MAINS TO THE PROPOSED WATER MAINS.
11. CONTRACTOR SHALL VERIFY THE CONNECTIONS OF EXISTING WATER MAINS TO THE PROPOSED WATER MAINS.
12. CONTRACTOR SHALL VERIFY THE CONNECTIONS OF EXISTING WATER MAINS TO THE PROPOSED WATER MAINS.
13. CONTRACTOR SHALL VERIFY THE CONNECTIONS OF EXISTING WATER MAINS TO THE PROPOSED WATER MAINS.
14. CONTRACTOR SHALL VERIFY THE CONNECTIONS OF EXISTING WATER MAINS TO THE PROPOSED WATER MAINS.
15. CONTRACTOR SHALL VERIFY THE CONNECTIONS OF EXISTING WATER MAINS TO THE PROPOSED WATER MAINS.
16. CONTRACTOR SHALL VERIFY THE CONNECTIONS OF EXISTING WATER MAINS TO THE PROPOSED WATER MAINS.
17. CONTRACTOR SHALL VERIFY THE CONNECTIONS OF EXISTING WATER MAINS TO THE PROPOSED WATER MAINS.
18. CONTRACTOR SHALL VERIFY THE CONNECTIONS OF EXISTING WATER MAINS TO THE PROPOSED WATER MAINS.
19. CONTRACTOR SHALL VERIFY THE CONNECTIONS OF EXISTING WATER MAINS TO THE PROPOSED WATER MAINS.
20. CONTRACTOR SHALL VERIFY THE CONNECTIONS OF EXISTING WATER MAINS TO THE PROPOSED WATER MAINS.



QUANTITY	UNIT	DESCRIPTION
1	LINEAL FOOT	12\"/>

QUANTITY	UNIT	DESCRIPTION
1	LINEAL FOOT	12\"/>

QUANTITY	UNIT	DESCRIPTION
1	LINEAL FOOT	12\"/>

QUANTITY	UNIT	DESCRIPTION
1	LINEAL FOOT	12\"/>

DOWNTOWN DEVELOPMENT AUTHORITY - CITY OF ANN ARBOR

WATER MAIN PLAN - SOUTH FOREST AVENUE

SCALE: 1" = 8'

DRAWING NO. C503

SHEETING: 38 OF 38

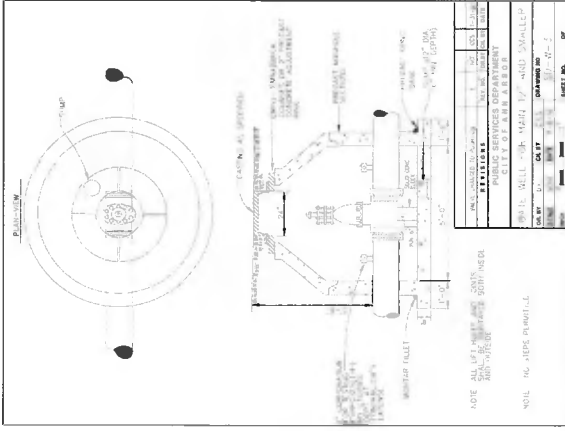
REV. NO.	DATE	DESCRIPTION	BY	CHK BY
1				

LEGEND USE WATER LINES ON BLUE FOR ALL OTHER SYMBOLS

12\"/>

LEGEND USE WATER LINES ON BLUE FOR ALL OTHER SYMBOLS

12\"/>



NOTE: ALL WELDS SHALL BE MADE TO PERFORM TO THE AMERICAN WELDED INSTITUTE (AWI) REQUIREMENTS FOR CLASS 1 FULL PENETRATING WELDS.

NOTE: ALL HYDRANT BODIES SHALL BE MANUFACTURED TO THE REQUIREMENTS OF THE AMERICAN PIPE AND FLANGE MANUFACTURERS ASSOCIATION (APFA) STANDARD SPECIFICATION FOR STEEL CAST IRON HYDRANT BODIES.

SIZE	W	H	W	H	W	H	W	H
2 1/2	1	1	1	1	1	1	1	1
4	1	1	1	1	1	1	1	1
6	2	2	2	2	2	2	2	2
8	2	2	2	2	2	2	2	2
10	3	3	3	3	3	3	3	3
12	4	4	4	4	4	4	4	4
14	4	4	4	4	4	4	4	4
16	4	4	4	4	4	4	4	4
18	4	4	4	4	4	4	4	4
20	4	4	4	4	4	4	4	4
24	4	4	4	4	4	4	4	4

NO. 10 - SEE PROJECT

DATE: 12/15/2016

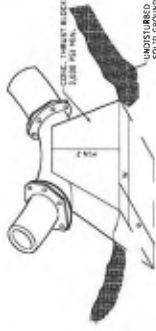
DESIGNER: [REDACTED]

CHECKED: [REDACTED]

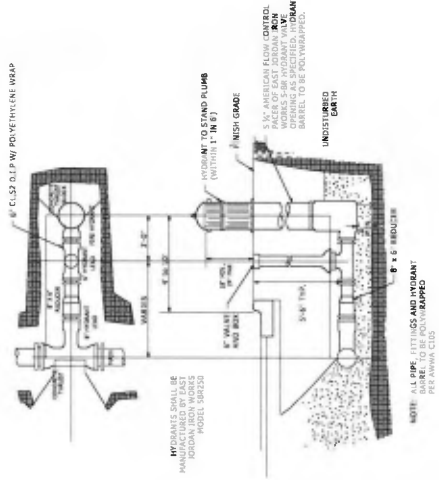
DRAWING NO. [REDACTED]

SHEET NO. 02 OF 02

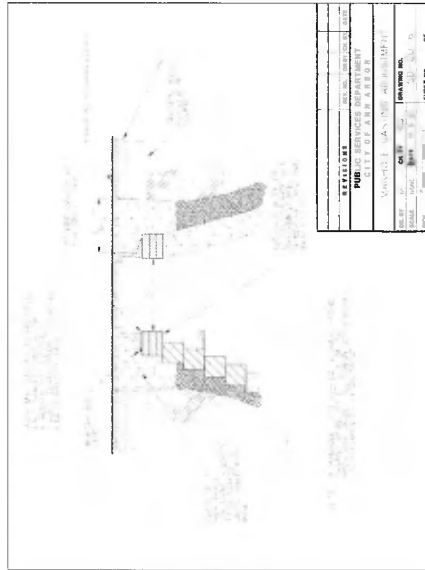
Fitting ID Inches	Plus Ten Cross		Bends								Hydrant	
	W	H	90°	45°	22 1/2°		11 1/4°		W	H		
2 1/2	1	1	1	1	1	1	1	1	1	1	1	
4	1	1	1	1	1	1	1	1	1	1	1	
6	2	2	2	2	2	2	2	2	2	2	2	
8	2	2	2	2	2	2	2	2	2	2	2	
10	3	3	3	3	3	3	3	3	3	3	3	
12	4	4	4	4	4	4	4	4	4	4	4	
14	4	4	4	4	4	4	4	4	4	4	4	
16	4	4	4	4	4	4	4	4	4	4	4	
18	4	4	4	4	4	4	4	4	4	4	4	
20	4	4	4	4	4	4	4	4	4	4	4	
24	4	4	4	4	4	4	4	4	4	4	4	



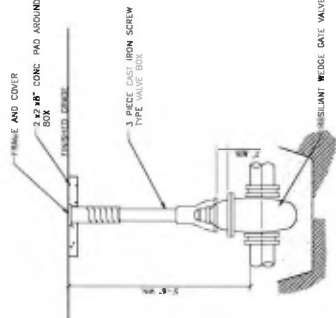
CITY OF ANN ARBOR THRUST BLOCK DETAIL



CITY OF ANN ARBOR WATER MAIN HYDRANT
NO SCALE



LEGEND (SEE WATER LEGEND ON 010) FOR ALL OTHER SYMBOLS)



VALVE AND BOX DETAIL
NO SCALE

DOWNTOWN DEVELOPMENT AUTHORITY - CITY OF ANN ARBOR

SCALE: 1" = 1' - 0"

DRAWING NO: C2004

SHEET NO: 02 OF 02

UTILITY DETAILS

DATE	BY	CHKD	APPD

REV NO.	DESCRIPTION

DATE	BY	CHKD	APPD

DATE	BY	CHKD	APPD