



a member of the GLYNN GROUP

Civil • Structural • Geotechnical • Materials Testing • Consulting

Appendix H

72nd Street Repaving Contract Drawings – 15 Sheets

Frozen Waterline Investigation Report

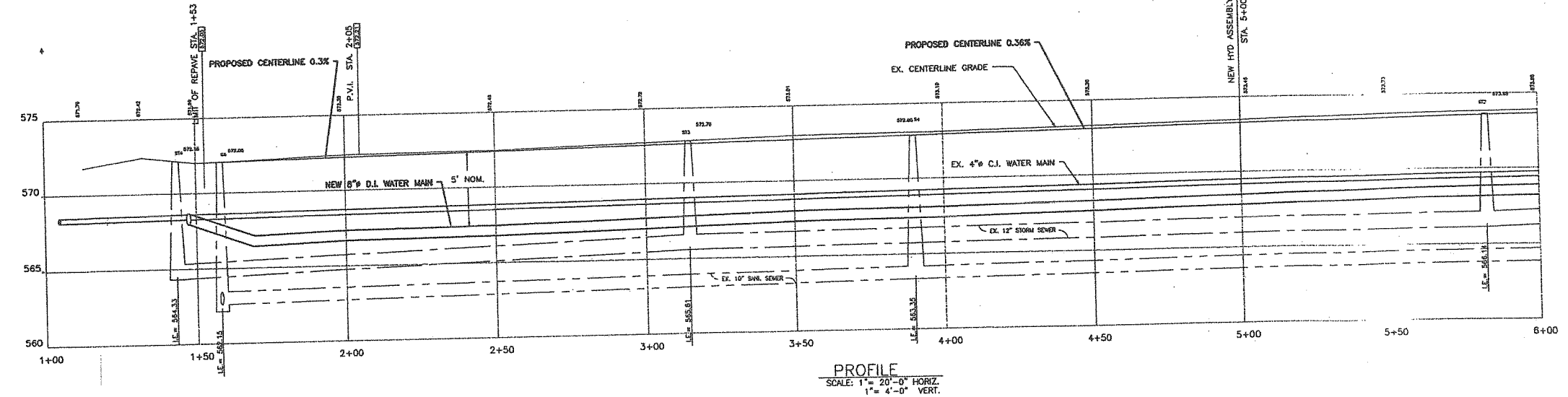
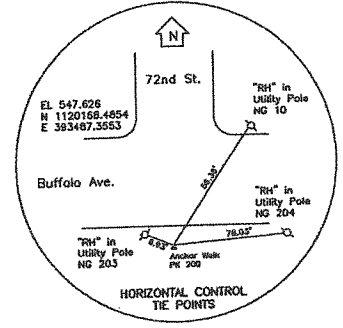
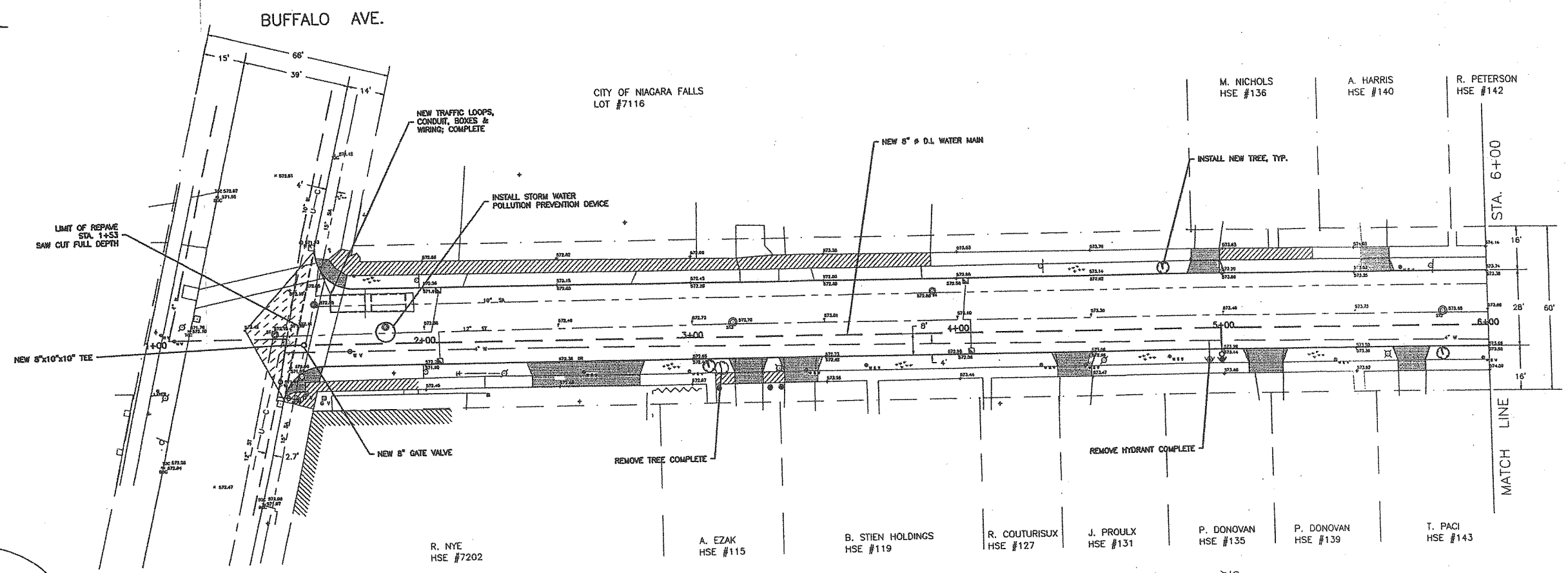
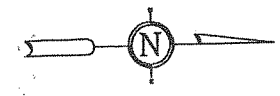
The Niagara Falls Water Board

GGE 15-1032

September 2, 2015

GLYNN GEOTECHNICAL ENGINEERING

415 South Transit Street, Lockport, New York 14094
voice 716.625.6933 / fax 716.625.6983
www.glynngroup.com



- NOTES:
1. BENCH MARKS -
RAILROAD SPIKE IN N. GRID POLE, 72nd ST.,
ELEV. = 573.57
RAILROAD SPIKE IN N.Y.T. POLE #15, 72nd ST.,
ELEV. = 575.91
STEAMER NOZZLE, NORTH EAST CORNER, 72nd ST. & BUFFALO AVE.,
ELEV. = 574.26
RAILROAD SPIKE IN N.GRID POLE S.E. CORNER, 72nd ST. & NI. FALLS BLVD.,
ELEV. = 574.62
CITY MON. N.E. CORNER, 72nd ST. & GIRARD AVE.,
ELEV. = 574.71
CITY MON. N.E. CORNER, 72nd ST. & LINDBERGH AVE.,
ELEV. = 573.24
HYDRANT, BOLT @ ARROW LOCATED AT 447-72nd ST.,
ELEV. = 574.71
 2. PRIVATE UTILITY'S LOCATIONS SHOWN ARE APPROXIMATE AND IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO FIELD LOCATE UTILITIES.
 3. ALL NEW LEAD IN SIDEWALK TO BE 4'-0" WIDE UNLESS OTHERWISE SHOWN
 4. REMOVE COMPLETE, AND RESTORE SUBGRADE FOR PAVEMENT WHERE C.B.'S ARE REMOVED, AND NOT REPLACED, ALL ABANDONED LATERALS ARE TO BE CAPPED AND EX. MANHOLES PLUGGED, A.O.B.E.
 5. THE CONTRACTOR IS TO INCLUDE ANY AND ALL REMOVALS NECESSARY FOR THE INSTALLATION OF TOP SOIL AND SOD
 6. CONTRACTOR SHALL NOTE THAT EACH PROPERTY SHOULD HAVE (3) UTILITY CONNECTIONS, SANITARY AND STORM SEWERS AND WATER SERVICE. CONTRACTOR SHALL LOCATE/ PROTECT ALL CONNECTIONS PRIOR TO STARTING CONSTRUCTION
 7. INTERSECTING STREET CURB

* LEGEND *

	WATERLINE		SIGN
	SEWER STORM		WATER SERVICE VALVE
	SEWER SANI.		NEW GRANITE CURB
	COMBINED SEWER		NEW WATER MAIN
	MANHOLE		NEW TOPSOIL & SOD
	WATER VALVE		NEW HYDRANT ASSEMBLY
	GAS VALVE		EXISTING ELEVATION
	HYDRANT		PROPOSED ELEVATION
	UTILITY POLE		EXISTING EDGE ROW
	CATCH BASIN		EXISTING SIDE
	MAIL BOX		NEW
	GAS VALVE BOX		

R.O.W. / PROPERTY LINE
NEW 6" THK. CONCRETE
NEW 4" THK. CONCRETE
FENCE
GRASS
SEWER CLEAN OUT
TREE
GAS MAIN
UNDERGROUND CABLE
UTILITY & OVERLAY AREA
PAVING OUTLINE
TRAFFIC SIGNAL BOX

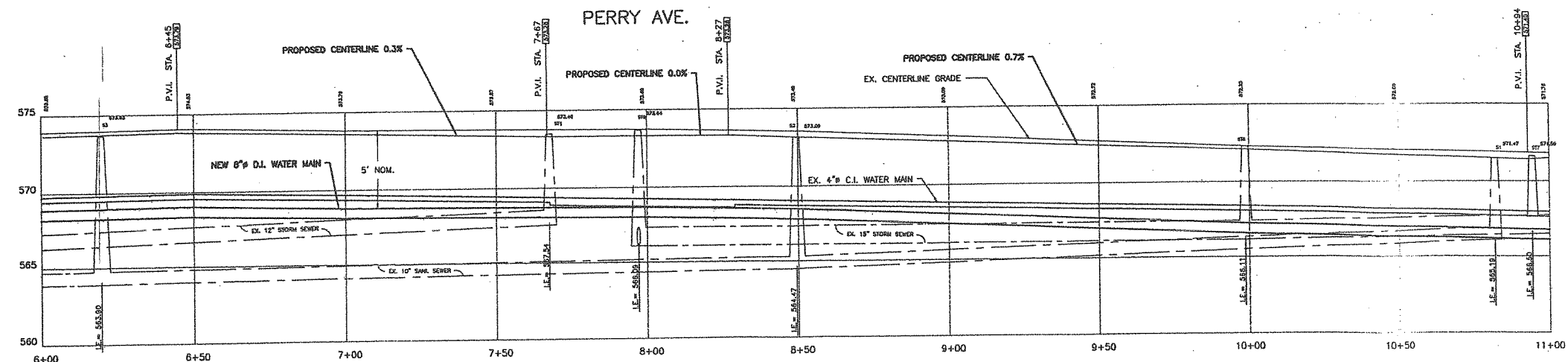
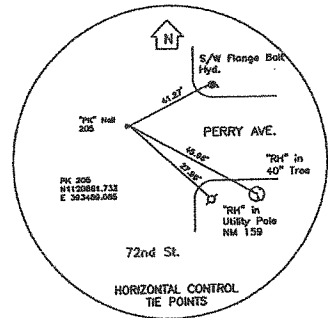
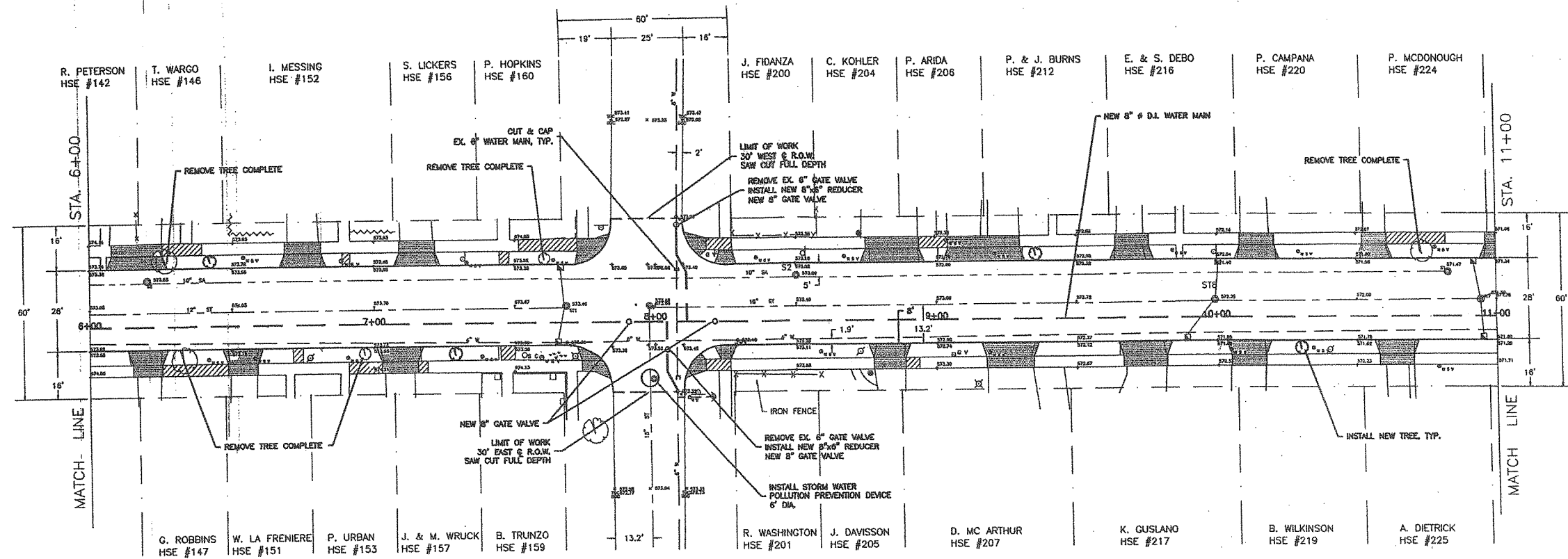
SURVEY MONUMENT NOTE:
THE CONTRACTOR SHALL PROTECT ALL EXISTING MONUMENTS IN THE R.O.W. FROM DAMAGE OR MISALIGNMENT DURING CONSTRUCTION. ANY MONUMENTS DISTURBED, DAMAGED OR MISALIGNED SHALL BE RESET OR REPLACED BY A LICENSED LAND SURVEYOR AT THE CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE CITY ENGINEER



REPAVING CONTRACT NO. R.P. 166
WATER CONTRACT NO. W.C. 882
72nd STREET
from Buffalo Ave. to Niagara Falls Blvd.
CITY of NIAGARA FALLS
DEPARTMENT OF ENGINEERING

NOTE: UNAUTHORIZED ALTERATION OR ADDITION TO ANY PLAN, DRAWING, DESIGN SPECIFICATION OR REPORT IS A VIOLATION OF SECTION 7209, PROVISION 2, OF THE NEW YORK STATE EDUCATION LAW.

checked:	checked:	APPROVED:	Thomas Radwin, P.E.
SCALE:	1" = 20'-0" HORIZ. 1" = 4'-0" VERT.	PROJ. OFF.	



PROFILE
SCALE: 1" = 20'-0" HORIZ.
1" = 4'-0" VERT.

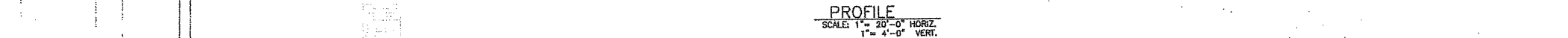
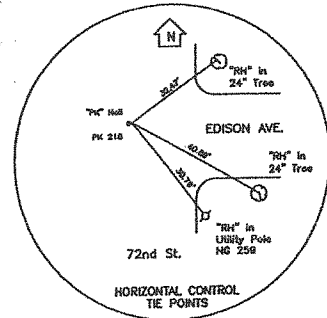
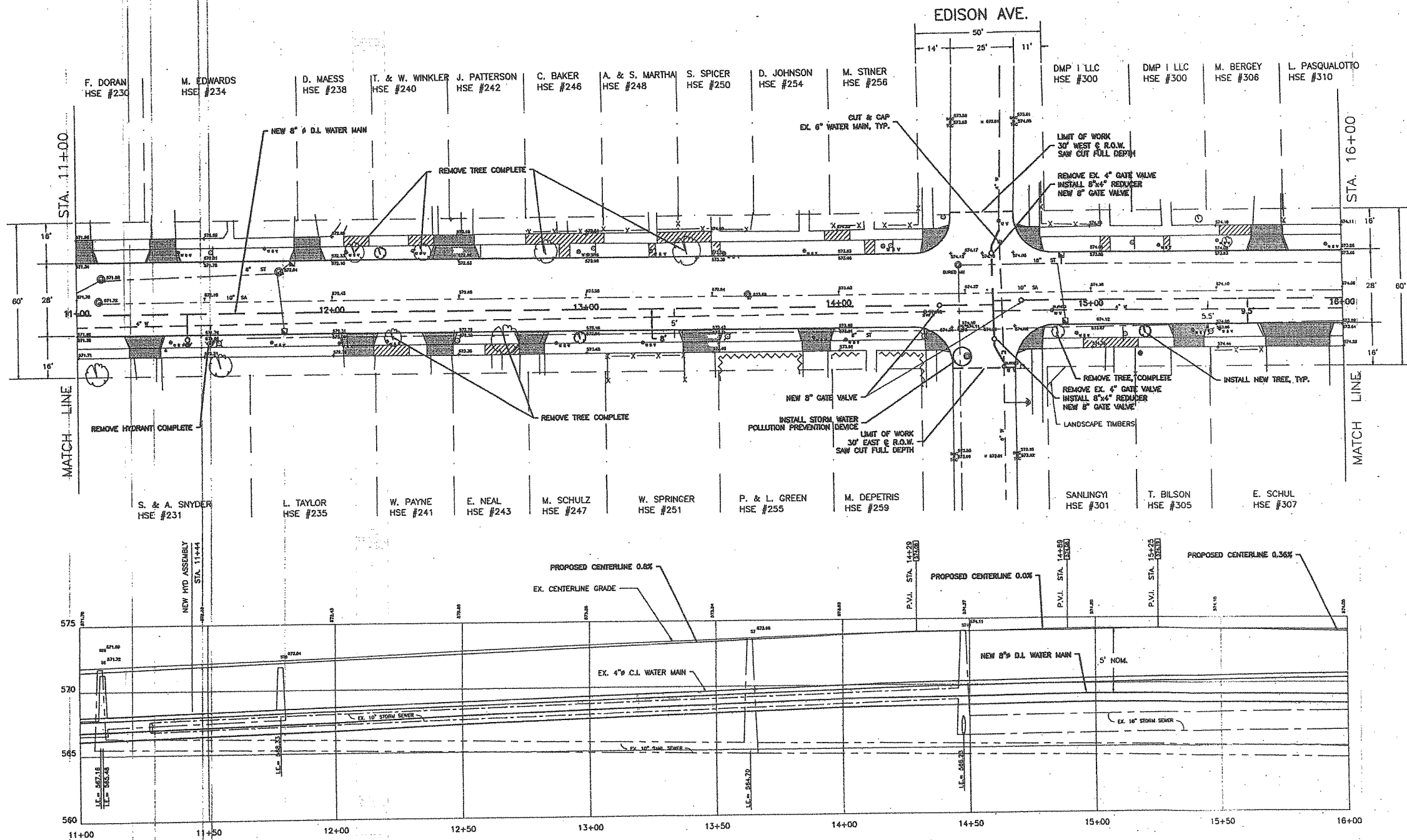
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 7. INTERSECTING STREET CURB SHALL TO BE 15' UNLESS OTHERWISE NOTED.

* LEGEND *

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|--|----------------|--|----------------------|--|------------------------|
| | WATERLINE | | SIGN | | R.O.W. / PROPERTY LINE |
| | SEWER STORM | | WATER SERVICE VALVE | | NEW 6" THK. CONCRETE |
| | SEWER SANI | | NEW GRANITE CURB | | NEW 4" THK. CONCRETE |
| | COMBINED SEWER | | NEW WATER MAIN | | FENCE |
| | MANHOLE | | NEW TOPSOIL & SOD | | GRASS |
| | WATER VALVE | | NEW CATCH BASIN | | SEWER CLEAN OUT |
| | GAS VALVE | | NEW HYDRANT ASSEMBLY | | TREE |
| | HYDRANT | | EXISTING ELEVATION | | GAS MAIN |
| | UTILITY POLE | | PROPOSED ELEVATION | | UNDERGROUND CABLE |
| | CATCH BASIN | | EXISTING HEDGE ROW | | MILL & OVERLAY AREA |
| | MAIL BOX | | EXISTING SIDEWALK | | BUILDING OUTLINE |
| | GAS VALVE BOX | | NEW TREE | | TRAFFIC SIGNAL BOX |



REPAVING CONTRACT NO. R.P. 166 WATER CONTRACT NO. W.C. 882 72nd STREET from Buffalo Ave. to Niagara Falls Blvd.			
CITY of NIAGARA FALLS DEPARTMENT OF ENGINEERING			
APPROVED:	DATE: 4/14/10	SHEET 2 OF 15	
SCALE: 1" = 20'-0" HORIZ. 1" = 4'-0" VERT.	PROJ. DES. M. DeSantis		



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LOCATION: WEST SIDE HOUSE #	WIDTH OF APRON ● SIDEWALK
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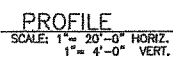
7116		20'
136		11'
142		12'
146		9'
140		11'
152		12'
156		12'
204		25'
208	212	20'
216		11'
220		12'
224		9'
230		9.5'
234		10'
238		10'
240	242	17'
306		12'
310		12'
312		11'
320		11'
326		24'
330	334	28'
336		9'
344		13'
348		11'
352	356	24'
358		20'
372		11'

LOCATION: EAST SIDE WIDTH OF APRON
HOUSE # @ SIDEWALK

115		11'
119		12'
131		13'
135	/ 138	12.5'
143		Shared
147		11'
151		11'
153	/ 157	11'
205		Shared
207		17'
217		17'
219		12'
225		12'
231		12'
235		13'
241		11'
243	/247	10'
251		Shared
255		12'
305		13'
307		24'
313		10'
319		15'
325		11'
329		11'
331		11'
337		11'
343		16'
347		9'

NOTE:

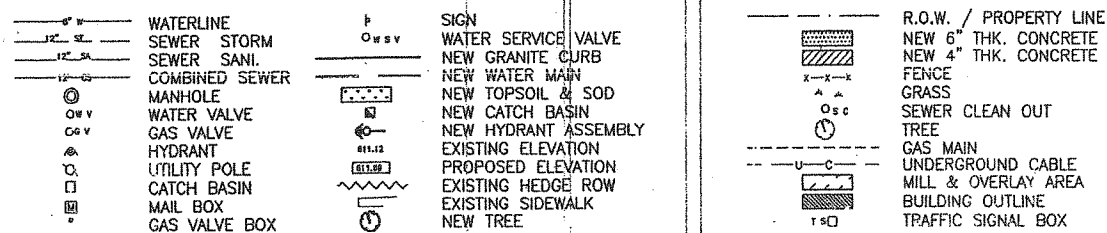
1. WIDTH OF APRON AS MEASURED AT FRONT OF SIDEWALK
2. NEW APRON TO BE CENTERED UPON EX. DRIVEWAY
OR AS DIRECTED BY CITY ENGINEER
3. DRIVEWAY APRON LOCATIONS CONTINUE ON SHEET 11



NOTES:

1. BENCH MARKS -
RAILROAD SPIKE IN N. GRID POLE, 72nd ST.,
ELEV. = 573.57
RAILROAD SPIKE IN N.Y.T. POLE #15, 72nd ST.,
ELEV. = 575.91
STEAMER NOZZLE, NORTH EAST CORNER, 72nd ST. & BUFFALO AVE.,
ELEV. = 574.28
RAILROAD SPIKE IN N.GRID POLE S.E. CORNER, 72nd ST. & NIA. FALLS BLVD.
ELEV. = 574.62
CITY MON. N.E. CORNER, 72nd ST. & GIRDAR AVE.
ELEV. = 574.71
CITY MON. N.E. CORNER, 72nd ST. & LINDBERGH AVE.
ELEV. = 573.24
HYDRANT, BOLT @ ARROW LOCATED AT 447-72nd ST.
ELEV. = 574.71
2. PRIVATE UTILITIES' LOCATIONS SHOWN ARE APPROXIMATE AND IT IS THE
SOLE RESPONSIBILITY OF THE CONTRACTOR TO FIELD LOCATE UTILITIES.
3. ALL NEW LEAD IN SIDEWALK TO BE 4'-0" WIDE UNLESS OTHERWISE SHOWN
4. REMOVE COMPLETE, AND RESTORE SUBGRADE FOR PAVEMENT WHERE C.B.'s
REMOVED AND REPLACED. ALL ABANDONED LATERALS ARE TO BE CAPPED
EX. MANHOLES PLUGGED, A.O.B.E.
5. THE CONTRACTOR IS TO INCLUDE ANY AND ALL REMOVALS NECESSARY FOR
THE INSTALLATION OF TOP SOIL AND SEED
6. CONTRACTOR SHALL NOTE THAT EACH PROPERTY SHOULD HAVE (3) UTILITY
CONNECTIONS: SEWARY SEWER, STORM SEWER AND WATER SERVICE. CONTRACTOR
SHALL LOCATE/PROTECT ALL CONNECTIONS.
7. INTERSECTING STREET CURB RADII TO BE 15' UNLESS OTHERWISE NOTED.

* LEGEND *



REPAVING CONTRACT NO. R.P. 166
WATER CONTRACT NO. W.C. 882
72nd STREET
from Buffalo Ave. to Niagara Falls Blvd.

CITY of NIAGARA FALLS
DEPARTMENT OF ENGINEERING

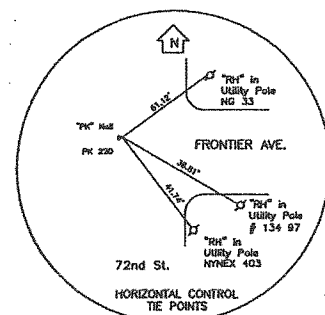
APPROVED:

SCALE:
1" = 20'-0" HORI
1" = 4'-0" VERT

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DATE: 4/14/10

DATE:	
SHEET	4 of 4



- NOTE:
UNAUTHORIZED ALTERATION OR ADDITION TO ANY PLAN, DRAWING,
DESIGN SPECIFICATION OR REPORT IS A VIOLATION OF SECTION 7201
PROVISION 2, OF THE NEW YORK STATE EDUCATION LAW.

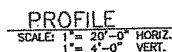
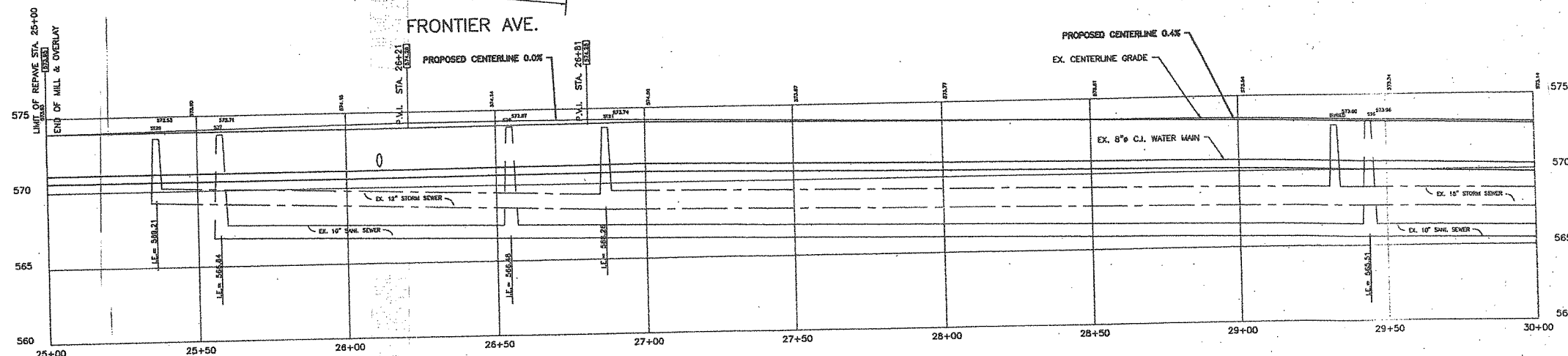
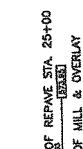
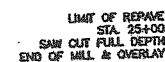


CITY of NIAGARA FALLS

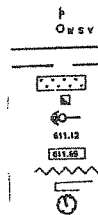
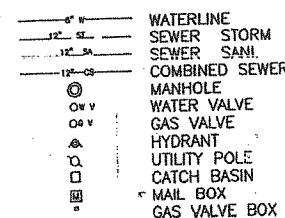
DEPARTMENT OF ENGINEERING

APPROVED: <u>Thomas Radomski</u> P.E. City Engineer		DATE: <u>2/20/08</u>	
SCALE: 1" = 20'-0" HORIZ 1" = 4'-0" VERT	PROJ. DES. M. DeSantis	DATE: 4/14/10	SHEET 5 OF 15

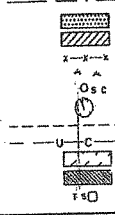
5 OF 15



- NOTES:
1. BENCH MARKS -
RAILROAD SPIKE IN N. GRID POLE, 72nd ST.,
ELEV. = 573.67
RAILROAD SPIKE IN N.Y.T. POLE #15, 72nd ST.,
ELEV. = 575.91
STEAMER NOZZLE, NORTH EAST CORNER, 72nd ST. & BUFFALO AVE.,
ELEV. = 574.28
RAILROAD SPIKE IN N.GRID POLE S.E. CORNER, 72nd ST. & NIA. FALLS BLVD.
ELEV. = 574.62
CITY MON. N.E. CORNER, 72nd ST. & GIRARD AVE.
ELEV. = 574.71
CITY MON. N.E. CORNER, 72nd ST. & LINDENBERG AVE.
ELEV. = 574.21
HYDRANT, BOLT @ ARROW LOCATED AT 447-72nd ST.
ELEV. = 574.71
 2. PRIVATE UTILITIES' LOCATIONS SHOWN ARE APPROXIMATE AND IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO FIELD LOCATE UTILITIES.
 3. ALL NEW LEAD IN SIDEWALK TO BE 4'-8" WIDE UNLESS OTHERWISE SHOWN
 4. REMOVE COMPLETE, AND RESTORE SURGRADE FOR PAVEMENT WHERE C&N ARE REMOVED, AND NOT REPLACED ALL ABANDONED LATERALS ARE TO BE CAPPED AND EX. MANHOLES PLUGGED, A.O.B.E.
 5. THE CONTRACTOR IS TO INCLUDE ANY AND ALL REMOVALS NECESSARY FOR THE INSTALLATION OF TOP SOIL AND SEED
 6. CONTRACTOR SHALL NOTE THAT EACH PROPERTY SHOULD HAVE (3) UTILITY CONNECTIONS: SANITARY SEWER, STORM SEWER AND WATER SERVICE. CONTRACTOR SHALL LOCATE/PROJECT ALL CONNECTIONS.
 7. INTERSECTING STREET CURB RADI TO BE 15' UNLESS OTHERWISE NOTED.

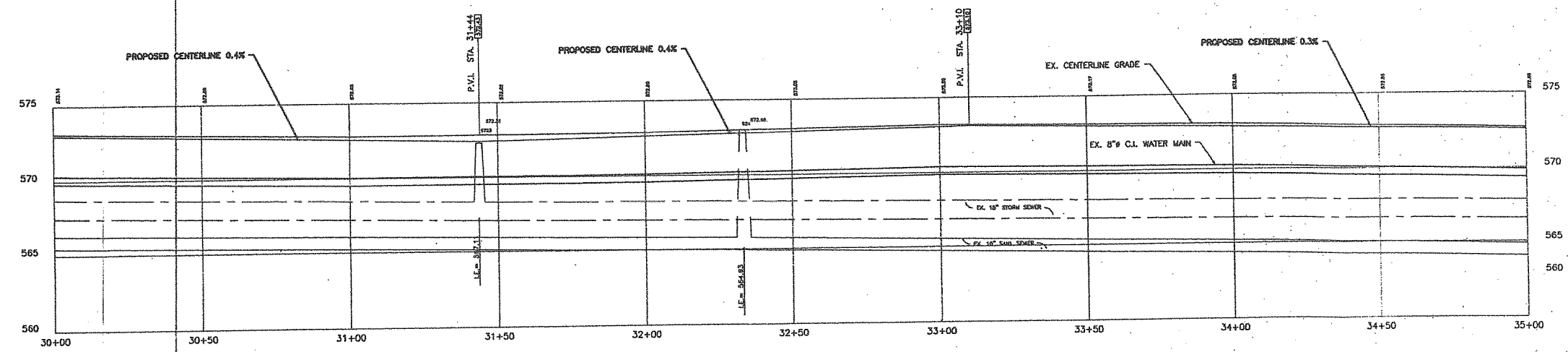
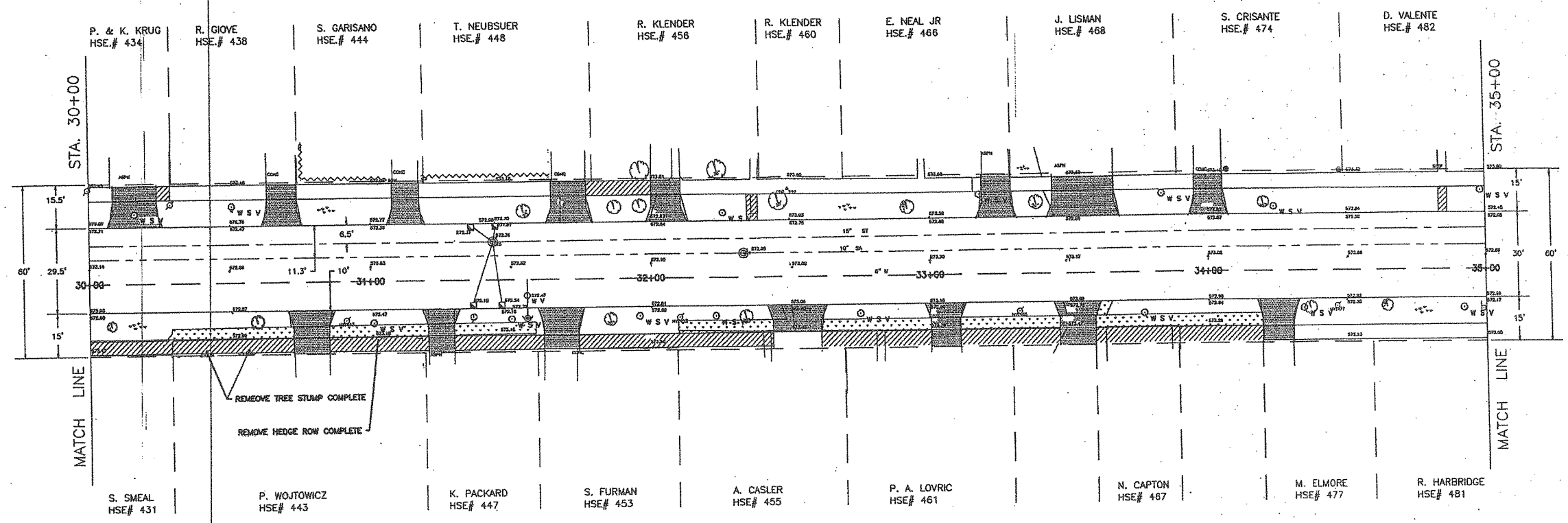
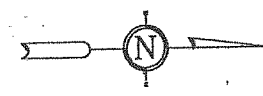


SIGN
WATER SERVICE VALVE
NEW GRANITE CURB
NEW WATER MAIN
NEW TOPSOIL & SOD
NEW CATCH BASIN
NEW HYDRANT ASSEMBLY
EXISTING ELEVATION
PROPOSED ELEVATION
EXISTING HEDGE ROW
EXISTING SIDEWALK
NEW TREE



R.O.W. / PROPERTY LINE
NEW 6" THK. CONCRETE
NEW 4" THK. CONCRETE
FENCE
GRASS
SEWER CLEAN OUT
TREE
GAS MAIN
UNDERGROUND CABLE
MILL & OVERLAY AREA
BUILDING OUTLINE
TRAFFIC SIGNAL BOX

	REPAIRING CONTRACT NO. W.C. 166 WATER CONTRACT NO. W.C. 882 72nd STREET from Buffalo Ave. to Niagara Falls Blvd.			
	CITY OF NIAGARA FALLS DEPARTMENT OF ENGINEERING			
	APPROVED: <i>Thomas Radosinski</i> Thomas Radosinski P.E. City Engineer		DATE: <i>4/14/10</i> 4/14/10	
IN ADDITION TO ANY PLAN, DRAWING, REPORT IS A VIOLATION OF SECTION 7209, OF THE STATE EDUCATION LAW.	SCALE: 1" = 20'-0" HORIZ 1" = 4'-0" VERT	PROJ. DES. M. DeSantis	DATE:	SHEET 6 OF 1



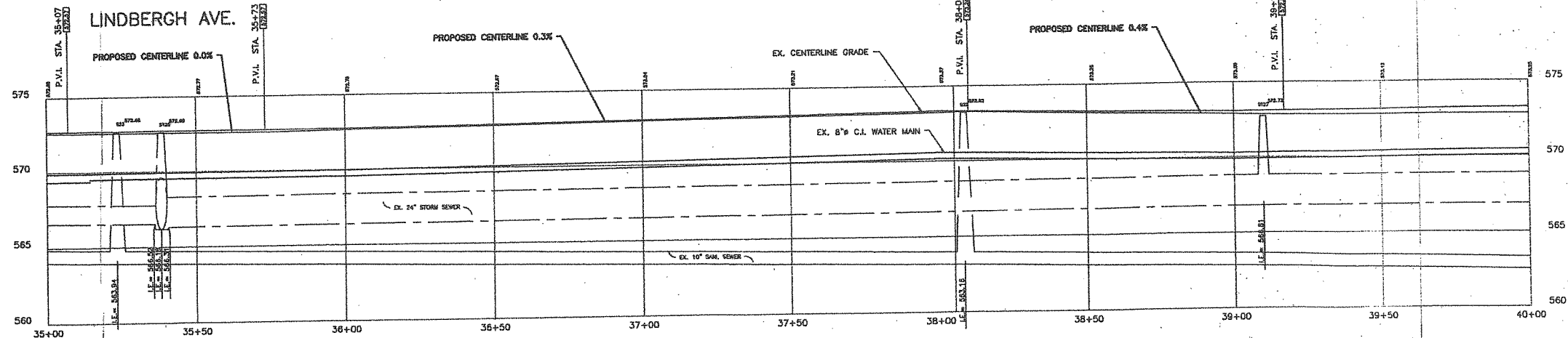
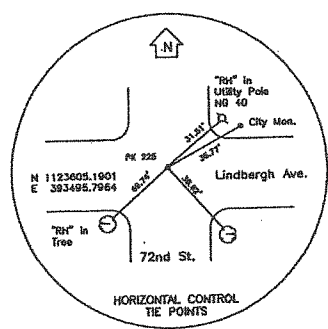
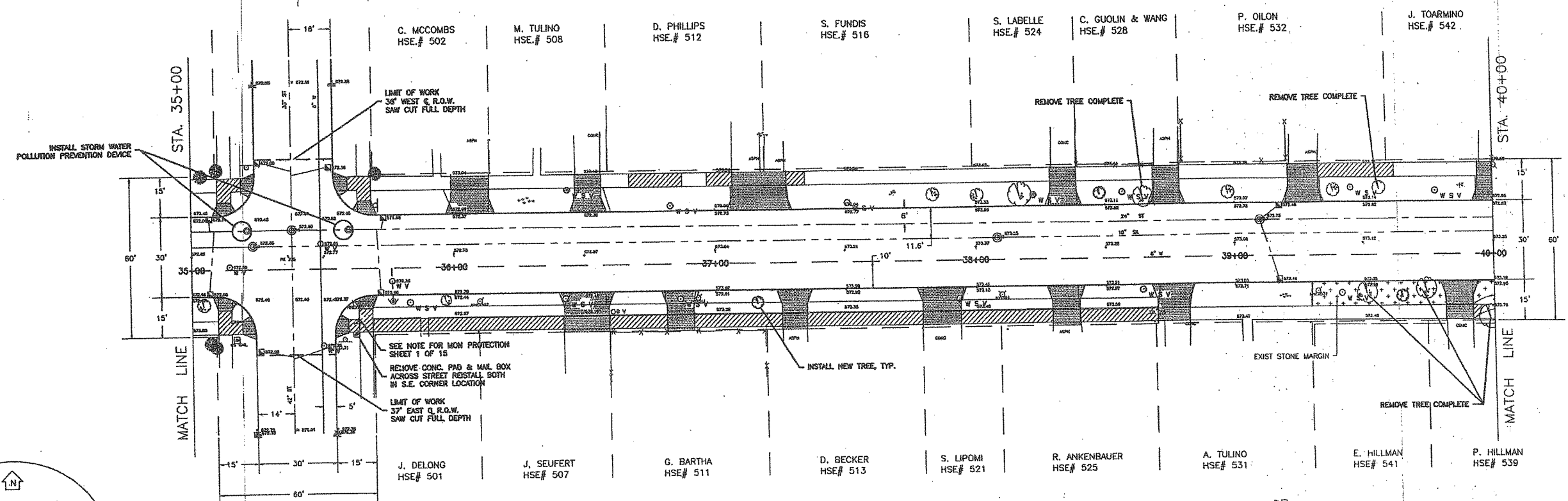
PROFILE
SCALE: 1" = 20'-0" HORIZ.
1" = 4'-0" VERT.

- NOTES:
1. BENCH MARKS -
RAILROAD SPIKE IN N. GRID POLE, 72nd ST.,
ELEV. = 573.57
RAILROAD SPIKE IN N.Y.T. POLE #15, 72nd ST.,
ELEV. = 575.91
STEAMER NOZZLE, NORTH EAST CORNER, 72nd ST. & BUFFALO AVE.,
ELEV. = 574.28
RAILROAD SPIKE IN N.GRID POLE S.E. CORNER, 72nd ST. & NIA. FALLS BLVD.,
ELEV. = 574.82
CITY MON. N.E. CORNER, 72nd ST. & GIRARD AVE.,
ELEV. = 574.71
CITY MON. N.E. CORNER, 72nd ST. & LINDBERGH AVE.,
ELEV. = 573.24
HYDRANT, BOLT @ ARROW LOCATED AT 447-72nd ST.,
ELEV. = 574.71
 2. PRIVATE UTILITIES' LOCATIONS SHOWN ARE APPROXIMATE AND IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO FIELD LOCATE UTILITIES.
 3. ALL NEW LEAD IN SIDEWALK TO BE 4'-0" WIDE UNLESS OTHERWISE SHOWN.
 4. REMOVE COMPLETE, AND RESTORE SUBGRADE FOR PAVEMENT WHERE C.B.'s ARE REMOVED, AND NOT REPLACED, ALL ABANDONED LATERALS ARE TO BE CAPPED AND EX. MANHOLES PLUGGED, A.O.B.E.
 5. THE CONTRACTOR IS TO INCLUDE ANY AND ALL REMOVALS NECESSARY FOR THE INSTALLATION OF TOP SOIL AND SEED
 6. CONTRACTOR SHALL NOTE THAT EACH PROPERTY SHOULD HAVE (3) UTILITY CONNECTIONS: SANITARY SEWER, STORM SEWER AND WATER SERVICE. CONTRACTOR SHALL LOCATE/PROTECT ALL CONNECTIONS.
 7. INTERSECTING STREET CURB RADI TO BE 15' UNLESS OTHERWISE NOTED.

LEGEND

- | | | | |
|------------|------------------------|--------------------------------|----------------------------|
|
6" W | WATERLINE |
SIGN | SIGN |
|
12" S | SEWER |
W S V | WATER SERVICE VALVE |
|
12" SA | SEWER SANI. |
NEW W M | NEW WATER MAIN |
|
C S M | COMBINED SEWER MANHOLE |
NEW T S & S | NEW TOPSOIL & SOD |
|
W V | WATER VALVE |
NEW C B | NEW CATCH BASIN |
|
G V | GAS VALVE |
NEW H A | NEW HYDRANT ASSEMBLY |
|
H | HYDRANT |
EXIST. ELEV | EXISTING ELEVATION |
|
U P | UTILITY POLE |
PROPOSED ELEV | PROPOSED ELEVATION |
|
C B | CATCH BASIN |
EXIST. H R | EXISTING HEDGE ROW |
|
M B | MAIL BOX |
EXIST. S W | EXISTING SIDEWALK |
|
G V B | GAS VALVE BOX |
NEW T | NEW TREE |
| | |
R.O.W. / P.L. | R.O.W. / PROPERTY LINE |
| | |
NEW 6" THK. CONCRETE FENCE | NEW 6" THK. CONCRETE FENCE |
| | |
GRASS | GRASS |
| | |
S C O | SEWER CLEAN OUT |
| | |
T | TREE |
| | |
G M | GAS MAIN |
| | |
U C | UNDERGROUND CABLE |
| | |
M & O | MILL & OVERLAY AREA |
| | |
B O | BUILDING OUTLINE |
| | |
T S B | TRAFFIC SIGNAL BOX |

REPAVING CONTRACT NO. R.P. 166 WATER CONTRACT NO. W.C. 882 72nd STREET from Buffalo Ave. to Niagara Falls Blvd.			
CITY of NIAGARA FALLS DEPARTMENT OF ENGINEERING			
APPROVED: Thomas Rodomski P.E. City Engineer		DATE: 4/14/10	
checked: _____	checked: _____	SCALE: 1" = 20'-0" HORIZ. 1" = 4'-0" VERT.	SHEET 7 OF 15



PROFILE
SCALE: 1" = 20'-0" HORIZ.
1" = 4'-0" VERT.

- NOTES:
- BENCH MARKS -
RAILROAD SPIKE IN N. GRID POLE, 72nd ST.,
ELEV. = 573.57
RAILROAD SPIKE IN N.Y.T. POLE #15, 72nd ST.,
ELEV. = 575.91
STEAMER NOZZLE, NORTH EAST CORNER, 72nd ST. & BUFFALO AVE.,
ELEV. = 574.26
RAILROAD SPIKE IN N.GRID POLE S.E. CORNER, 72nd ST. & NIA. FALLS BLVD.,
ELEV. = 574.82
CITY MON. N.E. CORNER, 72nd ST. & GIRARD AVE.,
ELEV. = 573.24
CITY MON. N.E. CORNER, 72nd ST. & LINDBERGH AVE.,
ELEV. = 574.71
HYDRANT, BOLT @ ARROW LOCATED AT 447-72nd ST.,
ELEV. = 574.71
 - PRIVATE UTILITIES' LOCATIONS SHOWN ARE APPROXIMATE AND IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO FIELD LOCATE UTILITIES.
 - ALL NEW LEAD IN SIDEWALK TO BE 4'-0" WIDE UNLESS OTHERWISE SHOWN
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 - THE CONTRACTOR IS TO INCLUDE ANY AND ALL REMOVALS NECESSARY FOR THE INSTALLATION OF TOP SOIL AND SEED
 - CONTRACTOR SHALL NOTE THAT EACH PROPERTY SHOULD HAVE (3) UTILITY CONNECTIONS: SANITARY SEWER, STORM SEWER AND WATER SERVICE. CONTRACTOR SHALL LOCATE/PROTECT ALL CONNECTIONS.
 - INTERSECTING STREET CURB RADI TO BE 15' UNLESS OTHERWISE NOTED.

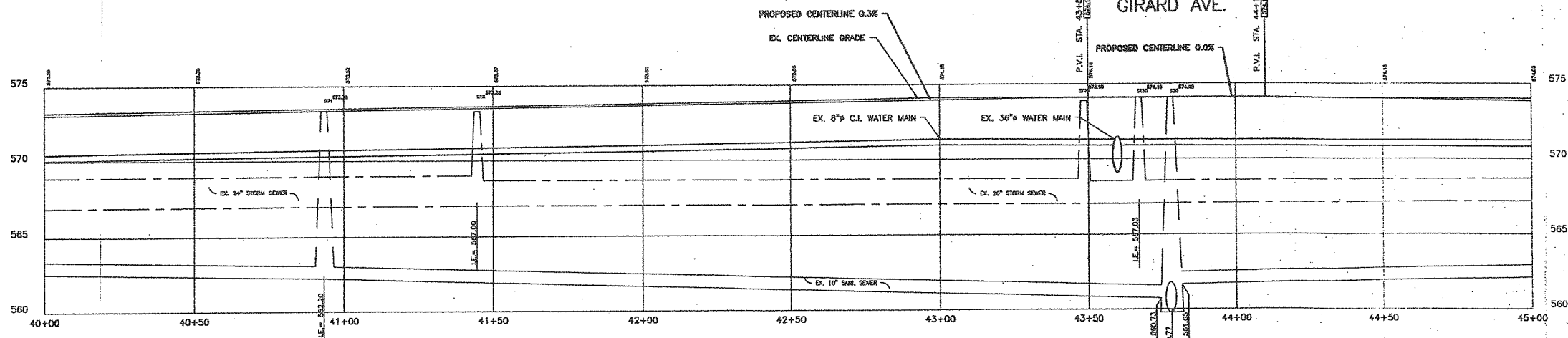
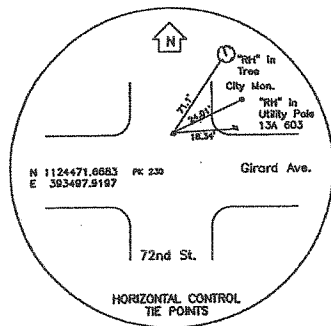
* LEGEND *

	WATERLINE		SIGN
	SEWER STORM		WATER SERVICE VALVE
	SEWER SANIL		NEW GRANITE CURB
	COMBINED SEWER		NEW TOPSOIL & SOD
	MANHOLE		NEW WATER MAIN
	WATER VALVE		NEW CATCH BASIN
	GAS VALVE		NEW HYDRANT ASSEMBLY
	HYDRANT		EXISTING ELEVATION
	UTILITY POLE		EXISTING HEDGE ROW
	CATCH BASIN		EXISTING SIDEWALK
	MAIL BOX		NEW TREE
	GAS VALVE BOX		

	R.O.W. / PROPERTY LINE
	NEW 6" THK. CONCRETE
	NEW 4" THK. CONCRETE
	FENCE
	GRASS
	SEWER CLEAN OUT
	TREE
	GAS MAIN
	UNDERGROUND CABLE
	MILL & OVERLAY AREA
	BUILDING OUTLINE
	TRAFFIC SIGNAL BOX







REPAVING CONTRACT NO. R.P. 166
WATER CONTRACT NO. W.C. 882
72nd STREET
from Buffalo Ave. to Niagara Falls Blvd.
CITY of NIAGARA FALLS
DEPARTMENT OF ENGINEERING



APPROVED:		DATE: 4/14/10	
checked:	checked:	SCALE: 1" = 20'-0" HORIZ. 1" = 4'-0" VERT.	SHEET 8 OF 15





PROFILE
SCALE: 1" = 20'-0" HORIZ.
1" = 4'-0" VERT.


* LEGEND *


8" W	WATERLINE
12" ST	SEWER STORM
12" SA	SEWER SANI.
12" CS	COMBINED SEWER
	MANHOLE
CV	WATER VALVE
GV	GAS VALVE
	HYDRANT
	UTILITY POLE
	CATCH BASIN
	MAIL BOX
	GAS VALVE BOX





















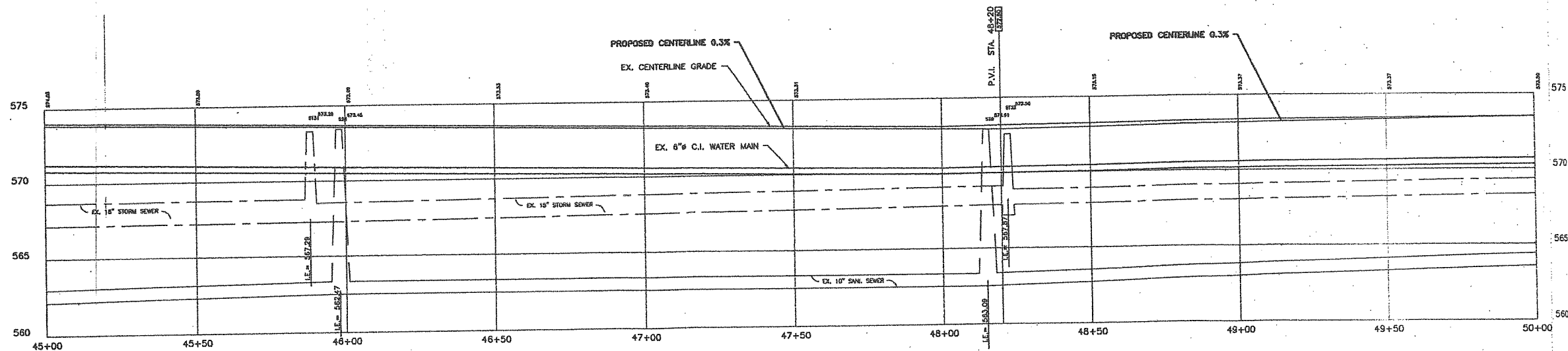
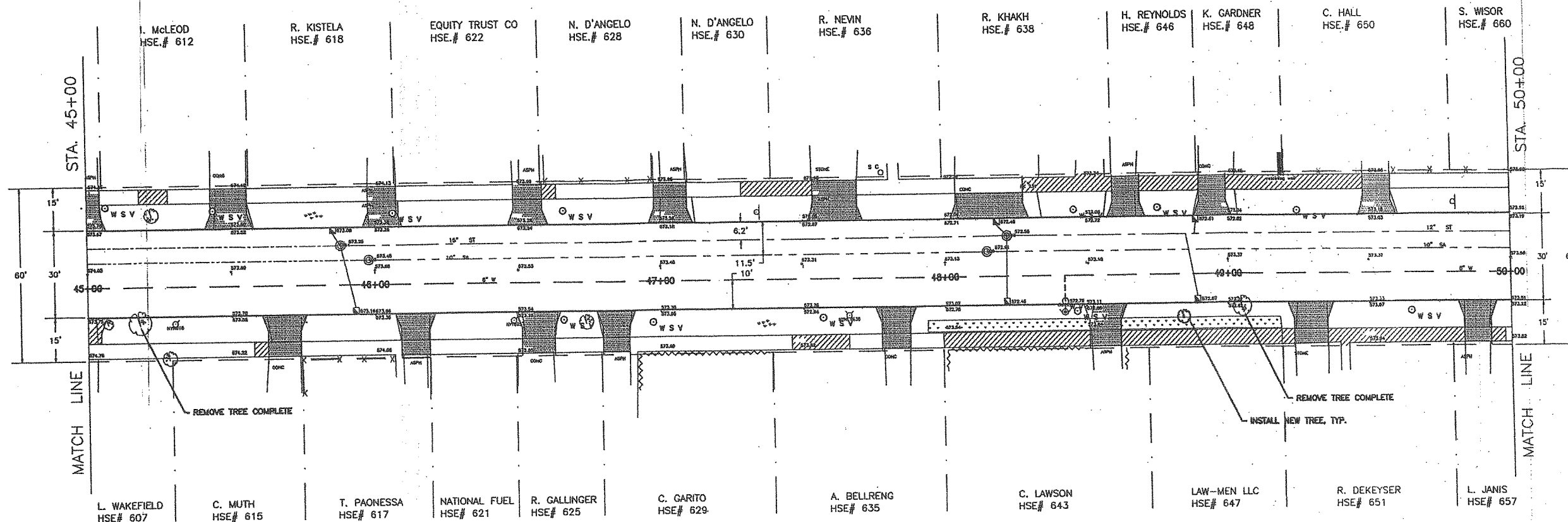
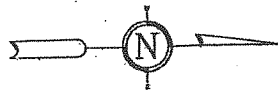
SIGN
 WATER SERVICE VALVE
 NEW GRANITE CURB
 NEW WATER MAIN
 NEW TOPSOIL & SOD
 NEW CATCH BASIN
 NEW HYDRANT ASSEMBLY
 EXISTING ELEVATION
 PROPOSED ELEVATION
 EXISTING HEDGE ROW
 EXISTING SIDEWALK
 NEW TREE

R.O.W. / PROPERTY LINE
 NEW 6" THK. CONCRETE
 NEW 4" THK. CONCRETE
 FENCE
 GRASS
 SEWER CLEAN OUT
 TREE
 GAS MAIN
 UNDERGROUND CABLE
 MILL & OVERLAY AREA
 BUILDING OUTLINE
 TRAFFIC SIGNAL BOX

REPAVING CONTRACT NO. R.P. 166
WATER CONTRACT NO. W.C. 882
72nd STREET
from Buffalo Ave. to Niagara Falls Blvd.

CITY of NIAGARA FALLS
DEPARTMENT OF ENGINEERING

APPROVED: Thomas Radomaki P.E. City Engineer		DATE:	
SCALE: 1" = 20'-0" HORIZ 1" = 4'-0" VERT	PROJ. DES. M. DeSantis	DATE: 4/14/10	SHEET 9 OF 15



PROFILE
SCALE: 1" = 20'-0" HORIZ.
1" = 4'-0" VERT.

- NOTES:
1. BENCH MARKS -
RAILROAD SPIKE IN N. GRID POLE, 72nd ST.,
ELEV. = 573.57
RAILROAD SPIKE IN N.Y.T. POLE #15, 72nd ST.,
ELEV. = 575.91
STEAMER NOZZLE, NORTH EAST CORNER, 72nd ST. & BUFFALO AVE.,
ELEV. = 574.26
RAILROAD SPIKE IN N.GRID POLE S.E. CORNER, 72nd ST. & NIA. FALLS BLVD.
ELEV. = 574.82
CITY MON. N.E. CORNER, 72nd ST. & GIRARD AVE.
ELEV. = 574.71
CITY MON. N.E. CORNER, 72nd ST. & LINDBERGH AVE.
ELEV. = 573.24
HYDRANT, BOLT @ ARROW LOCATED AT 447-72nd ST.
ELEV. = 574.71
 2. PRIVATE UTILITIES' LOCATIONS SHOWN ARE APPROXIMATE AND IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO FIELD LOCATE UTILITIES.
 3. ALL NEW LEAD IN SIDEWALK TO BE 4'-0" WIDE UNLESS OTHERWISE SHOWN
 4. REMOVE COMPLETE, AND RESTORE SUBGRADE FOR PAVEMENT WHERE C.B.'s ARE REMOVED, AND NOT REPLACED, ALL ABANDONED LATERALS ARE TO BE CAPPED AND EX. MANHOLES PLUGGED, A.O.B.E.
 5. THE CONTRACTOR IS TO INCLUDE ANY AND ALL REMOVALS NECESSARY FOR THE INSTALLATION OF TOP SOIL AND SEED
 6. CONTRACTOR SHALL NOTE THAT EACH PROPERTY SHOULD HAVE (3) UTILITY CONNECTIONS: SANITARY SEWER, STORM SEWER AND WATER SERVICE. CONTRACTOR SHALL LOCATE EXISTING ALL CONNECTIONS

* LEGEND *

	WATERLINE		SIGN
	SEWER STORM		WATER SERVICE VALVE
	SEWER SANI.		NEW GRANITE CURB
	COMBINED SEWER		NEW WATER MAIN
	MANHOLE		NEW TOPSOIL & SOD
	WATER VALVE		NEW CATCH BASIN
	GAS VALVE		NEW HYDRANT ASSEMBLY
	HYDRANT		EXISTING ELEVATION
	UTILITY POLE		PROPOSED ELEVATION
			EXISTING FENCE ROW
			R.O.W. / PROPERTY LINE
			NEW 6" THK. CONCRETE
			NEW 4" THK. CONCRETE
			FENCE
			GRASS
			SEWER CLEAN OUT
			TREE
			GAS MAIN
			UNDERGROUND CABLE
			MILL & OVERLAY AREA

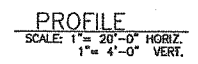
REPAVING CONTRACT NO. R.P. 166 WATER CONTRACT NO. W.C. 882 72nd STREET from Buffalo Ave. to Niagara Falls Blvd.	
CITY of NIAGARA FALLS DEPARTMENT OF ENGINEERING	
APPROVED:	DATE: 2010/04/21
checked: _____	checked: _____
SCALE: _____	PROJ. DES. _____
DATE: _____	SHEET _____



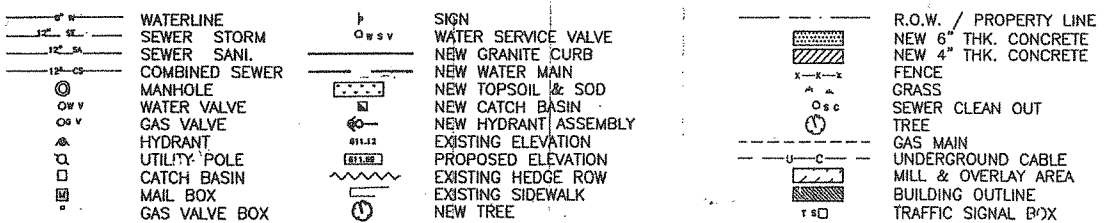
LOCATION: EAST SIDE	WIDTH OF APRON
HOUSE #	© SIDEWALK


NOTE:

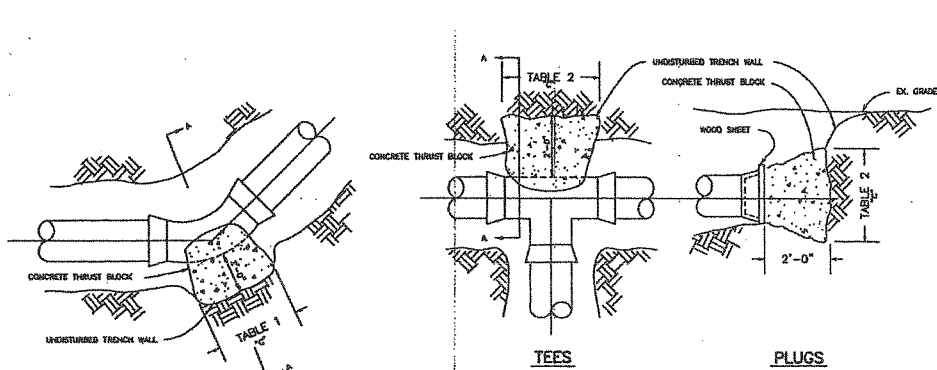
1. WIDTH OF APRON AS MEASURED AT FRONT OF SIDEWALK
2. NEW APRON TO BE CENTERED UPON EX. DRIVEWAY
OR AS DIRECTED BY CITY ENGINEER
3. DRIVEWAY APRON LOCATIONS CONTINUE FROM SHEET 4 OF 15



* LEGEND *



	REPAIRING CONTRACT NO. R.P. 166 WATER CONTRACT NO. W.C. 882 72nd STREET from Buffalo Ave. to Niagara Falls Blvd.			
	CITY OF NIAGARA FALLS DEPARTMENT OF ENGINEERING			
ADDITION TO ANY PLAN, DRAWING, OR SPECIFICATION IS A VIOLATION OF SECTION 7208, N.Y. STATE EDUCATION LAW.	APPROVED:  Thomas Rodonakis P.E.	City Engineer	DATE: <u>10/10/10</u>	
checked:	SCALE: 1"= 20'-0" HORIZ 1"= 4'-0" VERT	PROJ. DES. M. DeSantis	DATE: 4/14/10	SHEET 11 OF 15



BENDS
11-1/4" TO 90"

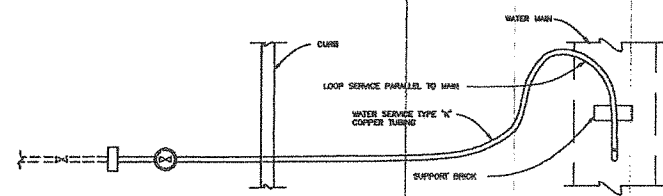
NOTE: THRUST BLOCK TO BE PLACED SO AS TO ALLOW REMOVAL OF MECHANICAL JOINT BOLTS OR SLIP-ON PIPE.
CLASS "A" CONCRETE 5 DAY CURE BEFORE PRESSURE TEST
HIGH EARLY CLASS "F" 2 DAY CURE BEFORE PRESSURE TEST

SECTION "A-A"

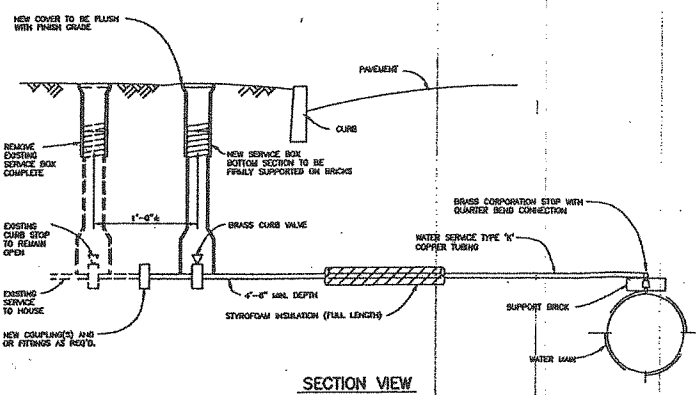
TABLE 1									
PIPE DIA. INCHES	11 1/4" - 22 1/2" CONC. FT-IN CU-YD	22 1/2" - 45" CONC. FT-IN CU-YD	45" - 67 1/2" CONC. FT-IN CU-YD	67 1/2" - 90" CONC. FT-IN CU-YD	11 1/4" - 22 1/2" CONC. FT-IN CU-YD	22 1/2" - 45" CONC. FT-IN CU-YD	45" - 67 1/2" CONC. FT-IN CU-YD	67 1/2" - 90" CONC. FT-IN CU-YD	11 1/4" - 22 1/2" CONC. FT-IN CU-YD
6	0-4 0.03	0-8 0.07	1-0 0.10	1-3 0.14	0-4 0.03	0-8 0.07	1-0 0.10	1-3 0.14	0-4 0.03
8	0-6 0.07	0-11 0.14	1-3 0.21	1-10 0.28	0-6 0.07	0-11 0.14	1-3 0.21	1-10 0.28	0-6 0.07
10	0-8 0.11	1-4 0.22	1-11 0.33	2-9 0.44	0-8 0.11	1-4 0.22	1-11 0.33	2-9 0.44	0-8 0.11
12	0-11 0.16	1-10 0.32	2-6 0.43	3-7 0.64	0-11 0.16	1-10 0.32	2-6 0.43	3-7 0.64	0-11 0.16
14	1-2 0.20	2-3 0.40	3-2 0.60	4-8 0.80	1-2 0.20	2-3 0.40	3-2 0.60	4-8 0.80	1-2 0.20
16	1-4 0.25	2-9 0.50	3-9 0.75	5-5 1.00	1-4 0.25	2-9 0.50	3-9 0.75	5-5 1.00	1-4 0.25
18	1-7 0.33	3-2 0.67	4-5 1.00	6-4 1.33	1-7 0.33	3-2 0.67	4-5 1.00	6-4 1.33	1-7 0.33

TABLE 2				
PIPE DIA. INCHES	"C" FT-IN	CONCRETE CU TEES & PLUGS	CU YD WYES	YD WYES
6	0-9	0.08	0.13	1-3
8	1-2	0.18	0.25	1-10
10	1-9	0.30	0.42	2-9
12	2-2	0.39	0.55	3-7
14	2-9	0.55	0.77	4-8
16	3-3	0.70	0.98	5-5
18	3-10	0.89	1.24	6-4

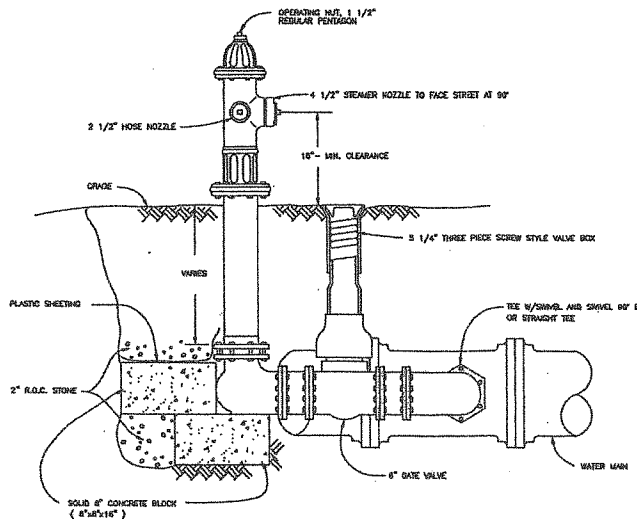
THRUST BLOCK DETAILS



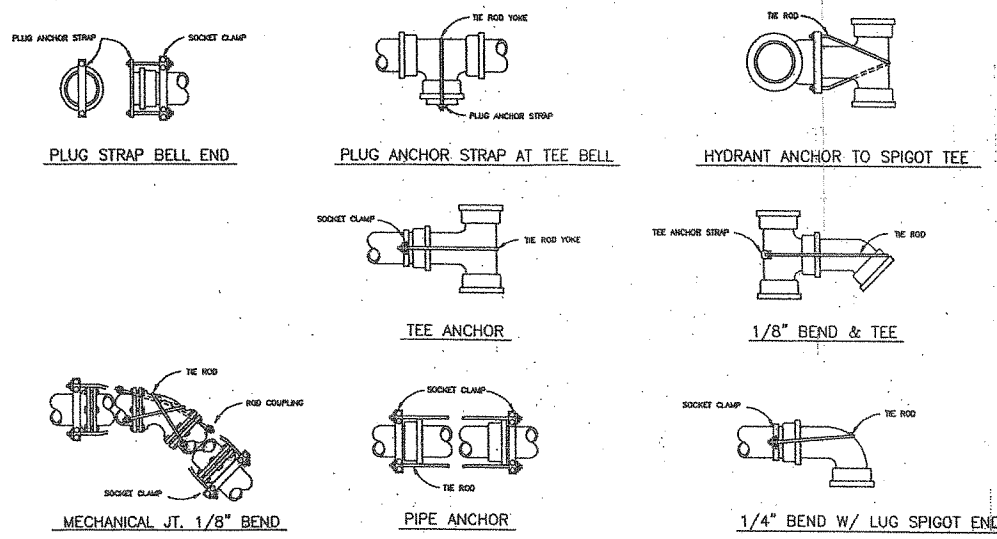
PLAN VIEW



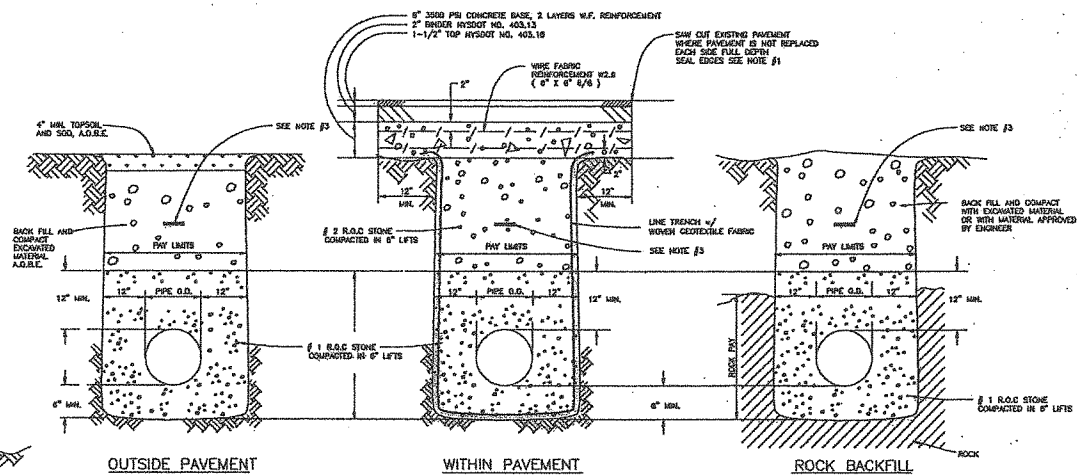
NEW INSTALLATION/REPLACEMENT OF EXISTING WATER SERVICE LINES



HYDRANT & VALVE ASSEMBLY



SOCKET CLAMPS WITH TIE RODS
NO SCALE



- PROJECT AREA
- EX. TRAFFIC FLOW
- PROPOSED TRAFFIC FLOW
- NYS - MUTCD TYPE III BARRICADES, FULL ROADWAY WIDTH
- NYS - MUTCD TYPE III BARRICADES, HALF ROADWAY WIDTH
- TRAFFIC CONES
- TRAFFIC DELINEATOR

ROAD CLOSED
LOCAL TRAFFIC ONLY

A NYS-MUTCD (R8-4C)

ROAD CLOSED

B NYS-MUTCD (R8-1C)

C NYS-MUTCD (W2-18C)

D NYS-MUTCD (W8-18C)

E NYS-MUTCD (R3-15C)

F NYS-MUTCD (R1-1C)

G NYS-MUTCD (W8-1C)

H NYS-MUTCD (W8-8C)

ROAD CLOSED

I NYS-MUTCD (W3-3C)

LEFT LANE CLOSED 500 FT

J NYS-MUTCD (W8-7C)

K NYS-MUTCD (W3-9C)

L NYS-MUTCD (W3-10C)

M NYS-MUTCD (G11-4C)

N NYS-MUTCD (G11-8C)

O NYS-MUTCD (G11-7C)

P NYS-MUTCD (R3-12C)

ROAD CLOSED

Q NYS-MUTCD (R8-1C) MODIFIED

END DETOUR

R NYS-MUTCD (G11-4C)

S NYS-MUTCD (R11-4C)

T NYS-MUTCD (P4-2C)

U NYS-MUTCD (R3-23C)

V NYS-MUTCD (G11-4C)

W NYS-MUTCD (M13-13)

NOTES:

- TRAFFIC CONTROL SIGNAGE LAYOUT IS SCHEMATIC ONLY. THE CONTRACTOR IS RESPONSIBLE FOR PROPER PLACEMENT OF TRAFFIC CONTROL SIGNAGE AND DEVICES.
- ALL TYPE III BARRICADES SHALL BE FITTED WITH WORKING SAFETY FLASHERS AT ALL TIMES DURING THE CONSTRUCTION PROJECT.

TRAFFIC CONTROL PLAN - PHASE I
BUFFALO AVENUE TO FRONTIER AVENUE

REPAVING CONTRACT NO. R.P. 166
WATER CONTRACT NO. W.C. 882
72nd STREET
from Buffalo Ave. to Niagara Falls Blvd.

CITY of NIAGARA FALLS
DEPARTMENT OF ENGINEERING

APPROVED: P.E. City Engineer DATE: 3/25/10

checked: NONE

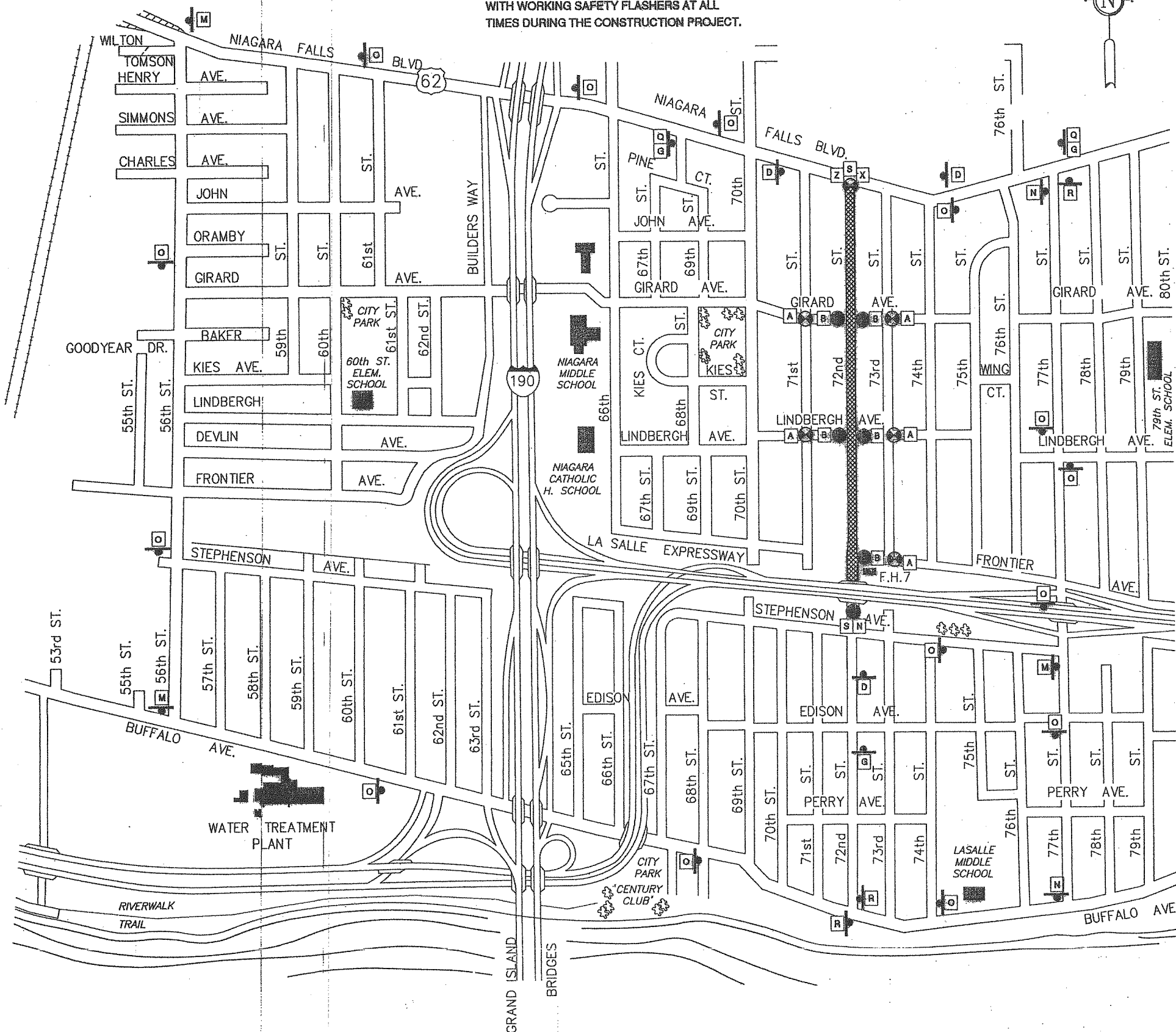
checked: 3/25/10

SHEET 14 OF 15

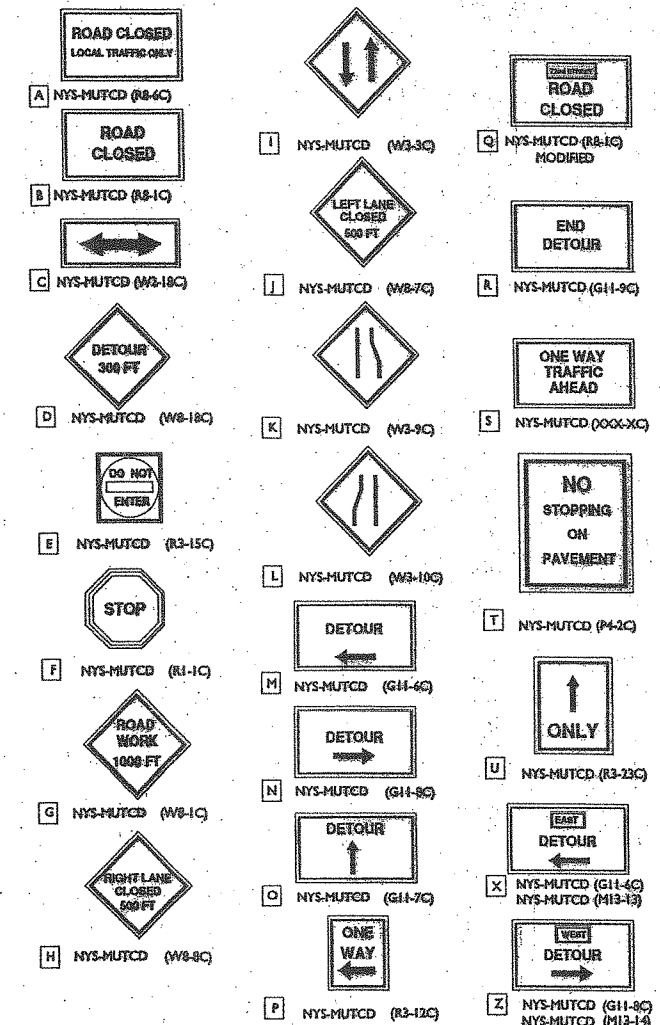
NOTES:

1. TRAFFIC CONTROL SIGNAGE LAYOUT IS SCHEMATIC ONLY. THE CONTRACTOR IS RESPONSIBLE FOR PROPER PLACEMENT OF TRAFFIC CONTROL SIGNAGE AND DEVICES.

2. ALL TYPE III BARRICADES SHALL BE FITTED WITH WORKING SAFETY FLASHERS AT ALL TIMES DURING THE CONSTRUCTION PROJECT.



- : PROJECT AREA
- : EX. TRAFFIC FLOW
- : PROPOSED TRAFFIC FLOW
- : NYS - MUTCD TYPE III BARRICADES, FULL ROADWAY WIDTH
- : NYS - MUTCD TYPE III BARRICADES, HALF ROADWAY WIDTH
- : TRAFFIC CONES
- : TRAFFIC DELINEATOR



TRAFFIC CONTROL PLAN - PHASE II
FRONTIER AVENUE - NIAGARA FALLS BOULEVARD

REPAVING CONTRACT NO. R.P. 166
 WATER CONTRACT NO. W.C. 882
72nd STREET
 from Buffalo Ave. to Niagara Falls Blvd.

CITY of NIAGARA FALLS
 DEPARTMENT OF ENGINEERING

NOTE:
 UNAUTHORIZED ALTERATION OR ADDITION TO ANY PLAN, DRAWING,
 DESIGN SPECIFICATION OR REPORT IS A VIOLATION OF SECTION 7209,
 PROVISION 2, OF THE NEW YORK STATE EDUCATION LAW.

APPROVED: P.E. City Engineer DATE: 3/25/10
 checked: checked: SCALE: NONE SHEET 15 OF 15



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Civil • Structural • Geotechnical • Materials Testing • Consulting

Appendix I

GGE Lab Test Results

Frozen Waterline Investigation Report

The Niagara Falls Water Board

GGE 15-1032

September 2, 2015

GLYNN GEOTECHNICAL ENGINEERING

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GRAIN SIZE ANALYSIS ASTM D-422

Project: Frozen Waterline Investigation and Report

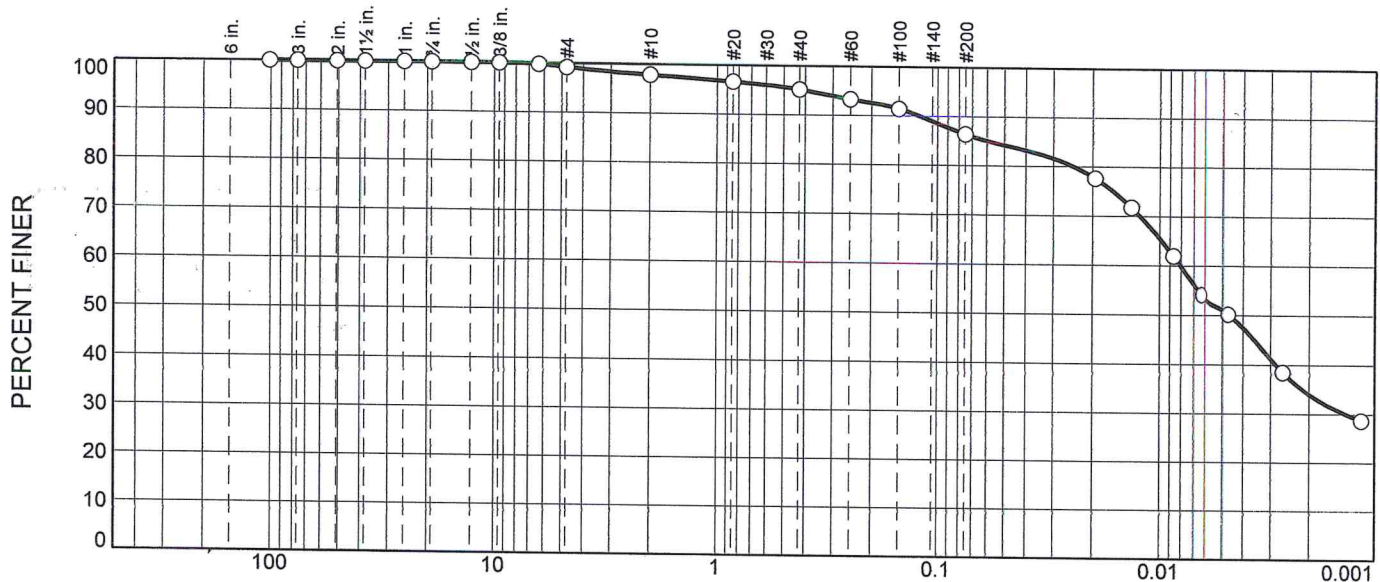
Project No.: 15-1032

Client: Niagara Falls Water Board

Location: 490 77th Street
Sample Number: 15-01

Depth: 36 inches

Date: 08.28.15



GRAIN SIZE - mm.

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.8	1.4	2.6	8.8	35.3	51.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
4"	100.0		
3"	100.0		
2"	100.0		
1-1/2"	100.0		
1-0"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
1/4"	99.8		
#4	99.2		
#10	97.8		
#20	96.6		
#40	95.2		
#60	93.3		
#100	91.5		
#200	86.4		

* (no specification provided)

Material Description

lean clay

Atterberg Limits

PL= 19

LL= 33

PI= 14

Coefficients

D₈₅= 0.0587

D₆₀= 0.0081

D₅₀= 0.0046

D₃₀= 0.0014

D₁₅=

D₁₀=

C_u=

C_c=

Classification

USCS= CL

AASHTO= A-6(11)

Remarks

Natural Moisture Content = 23.1 %

Figure

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voice 716.625.6933 / fax 716.625.6983

www.glynnngroup.com

[Signature] / *[Signature]*
Reported/Reviewed by



Reported/Reviewed by



Project No.: 15-1032

Client: Niagara Falls Water Board

Sample Number: 15-03

Depth: 32 inches

Date: 08.28.15



SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
4"	100.0		
3"	100.0		
2"	100.0		
1-1/2"	100.0		
1-0"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
1/4"	100.0		
#4	100.0		
#10	99.0		
#20	97.6		
#40	95.9		
#60	94.3		
#100	92.6		
#200	90.6		

* (no specification provided)

lean clay

PL= 18

Atterberg Limits

LL= 29

$$P| = 11$$

Coefficients

$$D_{85} = 0.0103$$
 $D_{60} = 0.0061$
$$D_{50} = 0.0047$$
$$D_{30} = 0.0017$$
$$D_{15} =$$
$$D_{50} =$$
 $C_{U=0}$ C_{11}

Classification

USCS= CL

AASHTO= A-6(9)

Remarks

Natural Moisture Content = 24.3 %

Figure

Civil • Structural • Geotechnical • Materials Testing • Consulting

Reported/Reviewed by



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Appendix J

Field Observation Reports

Frozen Waterline Investigation Report

The Niagara Falls Water Board

GGE 15-1032

September 2, 2015

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FIELD OBSERVATION REPORT

PROJECT NO.:	15-1032	REPORT NO.:	15-01	DATE:	05.27.15	PAGE:	1	OF	2
PROJECT:	Niagara Falls Water Line			DAY:	Wednesday				
SUBJECT:	602 72 nd Street Water Service Invest.			PROJECT TIME:	7:30am – 3:00pm				
CLIENT:	Niagara Falls Water Board			SITE TIME:	8:30am – 2:30pm				
WEATHER:	Partly Cloudy, 70° F			PHOTOS:	YES	X	NO		

- GGE arrived at 602 72nd street in Niagara Fall at approximately 8:30am.
- The road was saw-cut by Swanson Plumbing prior to GGE's arrival, all necessary road signs were in place and all through traffic was restricted.
- Swanson began punching through the pavement at approx. 8:45am.
- The lawn area in front of the water box was excavated first. The pipe was exposed at the connection to the water box and all the way back to the curb. Measurements were taken from top of grade on the sidewalk to the top of service. A soil sample was bagged from this area.
- Swanson then excavated the street from the front of the curb (curb was left intact) to the center line of the water main (opposite side of the street). Swanson removed the first layer of ROC under the 6" pavement down to a layer of biaxial geo-grid. GGE recorded incremental measurements from the top of pavement to the geo-grid. A sample of ROC was taken with a sample of the geogrid.
- Swanson continued excavation down to a layer of geo-fabric. The layer between the geo-grid and fabric was stone with large cobbles (2"-8"). GGE recorded incremental measurements from the top of pavement to the geo-fabric. A sample of the stone and cobble was taken with a sample of the fabric.
- Swanson then dug down to the top of the service pipe by hand in specific locations as chosen by GGE to correlate with the incremental measurements taken at the other layers. The service was a ¾" lead pipe. GGE took measurements from the top of pavement to the top of the service pipe and to the top of the water main. A sample of the native soil was taken from around the level of the service pipe.
- The service tapped into the top of the main line.
- Swanson backfilled the street excavation with new 2 inch stone, compacted it and set a road plate over top.
- Swanson replaced the soil that was excavated from the lawn area.
- Photographs were taken throughout the investigation and are located in the project file in the "Photos" folder and dated the same day as this document.
- Multiple City and local officials were on hand to discuss the test pit program with the local media.

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FIELD OBSERVATION REPORT

PROJECT NO.: 15-1032 REPORT NO.: 15-01 DATE: 05.27.15 PAGE: 2 OF 2



PERSONNEL ON SITE / CONTACTED:

Mark Glynn & Nick Fetterman - GGE

Bob Hubler – Swanson Plumbing (w/ 3 man crew)

George Kalkowsky – Clark Patterson Lee

DISTRIBUTION:

DAILY MANHOURS: 7.5

Nick Fetterman

Nick Fetterman

Mark Glynn



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FIELD OBSERVATION REPORT

PROJECT NO.:	15-1032	REPORT NO.:	15-02	DATE:	05.28.15	PAGE:	1	OF	2
PROJECT:	Niagara Falls Water Line			DAY:	Thursday				
SUBJECT:	511 72 nd Street Water Service Invest.			PROJECT TIME:	8:30am – 12:30pm				
CLIENT:	Niagara Falls Water Board			SITE TIME:	9:00am – 12:00pm				
WEATHER:	Sunny, 70° F			PHOTOS:	YES	X	NO		

- GGE arrived at 511 72nd street in Niagara Fall at approximately 9:00am.
- Swanson Plumbing began saw-cutting the pavement at approximately 9:15am. All necessary road signs were in place and all through traffic was restricted.
- Swanson began punching through the pavement at approx. 9:40am.
- Swanson excavated the street from the front of the curb to the center line of the water main (approx. 11.5'). Swanson removed the first layer of ROC under the 6" thick pavement, down to a layer of biaxial geo-grid. GGE recorded incremental measurements from the top of pavement to the geo-grid. A sample of ROC was taken with a sample of the geogrid.
- The valve box was located in driveway apron. The driveway was left intact and the investigation only uncovered the service through the street. A measurement was taken to the top of the nut through the service box.
- Swanson continued excavation down to a layer of geo-fabric. The layer between the geo-grid and fabric was stone with large cobbles (2"-8"). GGE recorded incremental measurements from the top of pavement to the geo-fabric. A sample of the stone and cobble was taken with a sample of the fabric.
- Swanson then dug down to the top of the service pipe by hand exposing the whole service from the curb to the main. The service was a ¾" copper pipe. GGE took measurements from the top of pavement to the top of the service pipe and to the top of the water main. A sample of the native soil was taken from around the level of the service pipe. The service was bedded in pea stone, and a sample of the pea stone was taken.
- The service tapped into the top of the main line.
- Swanson backfilled the excavation with new 2 inch ROC stone, compacted it, and set a road plate over top.
- It was noted that this site was one that Swanson had dug up two years ago and thawed at the connection of the service to the main. After thawing the pipe, they wrapped it in insulation and backfilled with sand. Sample Bag #5 is of the sand backfill they used.
- Because it was previously excavated, only the first 5ft coming off the front of the curb was "native".

GLYNN GEOTECHNICAL ENGINEERING

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FIELD OBSERVATION REPORT

PROJECT NO.: 15-1032 REPORT NO.: 15-02 DATE: 05.28.15 PAGE: 2 OF 2

- Photographs were taken throughout the investigation and are located in the project file in the "Photos" folder and dated the same day as this document.



PERSONNEL ON SITE / CONTACTED:

Nick Fetterman - GGE

Bob Hubler – Swanson Plumbing (w/ 3 man crew)

George Kalkowsky – Clark Patterson Lee

Nick Fetterman

DISTRIBUTION:

DAILY MANHOURS: 4.0



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FIELD OBSERVATION REPORT

PROJECT NO.: 15-1032 REPORT NO.: 15-03 DATE: 07.13.15 PAGE: 1 OF 2
PROJECT: Niagara Falls Water Line DAY: Monday
SUBJECT: 490 77th Street Water Service Invest. PROJECT TIME: 7:00 am – 3:00 pm
CLIENT: Niagara Falls Water Board SITE TIME: 8:45 am – 1:30 pm
WEATHER: Sunny, 85° F PHOTOS: YES X NO


- GGE arrived at 490 77th Street in Niagara Falls at approximately 8:45 am.
- Swanson Plumbing began saw-cutting the pavement at approximately 9:00 am. All necessary road signs were in place and all through traffic was restricted.
- Swanson began punching through the pavement at approximately 9:30 am.
- The waterline main was identified to be on the east side of the street, resulting in excavation across the entire width of 77th Street to expose the lateral to the residence at address 490. The valve box for the residence was located 5 inches west of the concrete curb.
- Swanson advanced the excavation through the sub pavement materials using a Kubota U55 excavator to a depth of approximately 1.0 foot above the waterline. Hand excavation was performed using a shovel to expose the waterline. Excavation initiated on the west side of the roadway and was advanced eastward.
- Due to the close proximity of the valve box to the curb, the connection of the waterline to the valve box was exposed from the roadway excavation. The waterline was found to be covered by cohesive soil material west of the curb.
- A large diameter (estimated > 12 inches) green PVC storm sewer pipe runs along the west side of the street centered approximately 14 inches east of the west curb. Cover over the water line at this location was recorded as follows: 0 – 9" asphalt pavement, 9 – 15" 2" ROC stone, geogrid, 15 – 34" 4" ROC stone, 34 – 37" #1 bedding stone. The top of the 1 inch diameter copper waterline was encountered at a depth of 37 inches. The waterline was placed directly over the PVC storm sewer pipe and covered entirely by stone.

PERSONNEL ON SITE / CONTACTED:

Nick Fetterman - GGE

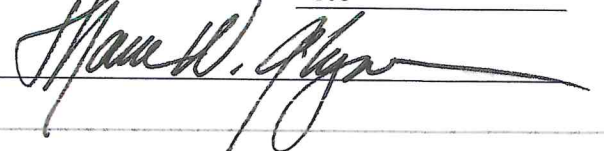
Bob Hubler – Swanson Plumbing)

Rich Rotella – NFWB


Edward Lover

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DAILY MANHOURS: 8.0



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FIELD OBSERVATION REPORT

PROJECT NO.: 15-1032 REPORT NO.: 15-03 DATE: 07.13.15 PAGE: 2 OF 2

- Several couplers were encountered within 5 feet of the west curb, resulting in a 1 inch copper line from the valve box to approximately 24 inches beyond the curb, followed by two 10 inch sections of ¾ inch copper lines which were then connected to a 1 inch lead line.
- GGE gathered samples where applicable and recorded vertical profiles at approximate 5 foot horizontal intervals across the excavation. A profile of the roadway surface was recorded using a laser level.
- At a horizontal distance of 21 feet from the west curb, the waterline was found to rise to an elevation of 29 inches below the top of pavement. Only 4 inches of clay cover was encountered at this location.
- Overall, the waterline depth was found to range from 29 to 45 inches below surface grade.
- The water main was encountered at a depth of 43 inches from the top of pavement and found to be bedded and covered in poorly graded utility sand. The lateral was found to tap at a 90° angle from the top of the main at a depth of 37 inches from the top of pavement.



Photo 1. Waterline directly over storm sewer.

- Swanson insulated the pipe with foam prior to backfilling. Swanson plans to backfill the excavation with compacted run of crusher stone to an elevation of 2 inches below the bottom of pavement. Compaction will be performed using a jumping jack compactor. Approximately 2 inches of compacted asphalt cold patch will be placed to match the roadway elevation.




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FIELD OBSERVATION REPORT

PROJECT NO.: 15-1032 REPORT NO.: 15-04 DATE: 07.14.15 PAGE: 1 OF 2
PROJECT: Niagara Falls Water Line DAY: Tuesday
SUBJECT: 619 26th Street Water Service Invest. PROJECT TIME: 7:45 am – 2:15 pm
CLIENT: Niagara Falls Water Board SITE TIME: 8:45 am – 1:00 pm
WEATHER: Sunny, 85° F PHOTOS: YES ☒ NO ☐

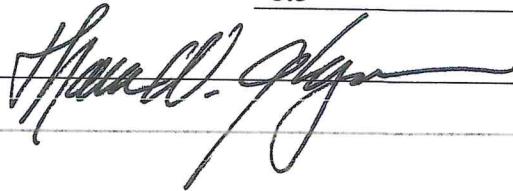
- Excavation was planned for 565 77th Street, however the address does not exist and a new address must be selected. Efforts were focused on 1906 Welch Avenue instead.
- GGE arrived at 1906 Welch Avenue at approximately 8:45 am. A car was parked over the lateral to 1906. Although there were occupants inside the house, the owner of the car was reportedly at work. The occupants made several attempts to contact the car owner at work. After waiting approximately minutes, GGE decided to move to 619 26th Street.
- Swanson Plumbing began saw-cutting the pavement at 619 26th Street at approximately 10:00 am. All necessary road signs were in place and all through traffic was restricted.
- Swanson began punching through the pavement at approximately 10:30 am.
- The waterline main was identified to be on the west side of the street, resulting in excavation across the majority of the width of 26th Street to expose the lateral to the residence at address 619. The valve box for the residence was located in the grass approximately 24 inches east of the concrete curb.
- Swanson advanced the excavation through the sub pavement materials using a Kubota U55 excavator to a depth of approximately 6 inches above the waterline. Hand excavation was performed using a shovel to expose the waterline. Excavation initiated on the east side of the roadway at the curb and was advanced westward.
- The depth to the waterline was measured at 36 inches below grade at the valve box. Excavation was not performed between the valve box and the curb due to the close proximity of the valve box to the curb.

PERSONNEL ON SITE / CONTACTED:
James Hunt – Clark Patterson & Lee
Bob Hubler – Swanson Plumbing


Edward Lover

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DAILY MANHOURS: 6.5



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FIELD OBSERVATION REPORT

PROJECT NO.: 15-1032 REPORT NO.: 15-04 DATE: 07.14.15 PAGE: 2 OF 2

- The waterline was found to be composed of 1 inch diameter copper throughout the length of the exposed lateral. Depth was found to range from 30.5 to 41.5 inches below the top of pavement. The lateral was found to be backfilled primarily with 2 inch ROC stone, however a few inches of clay cover was encountered directly over the pipe as the excavation was advanced westward toward the main.
- The water main was encountered at a horizontal distance of 25 feet west of the east curb at a vertical distance of 45 inches below the top of pavement. The lateral was found to tap at a 90° angle from the top of the main, which is typical for Niagara Falls.
- GGE gathered samples where applicable and recorded vertical profiles at approximate 5 foot horizontal intervals across the excavation. The south wall of the excavation was observed to be composed primarily of clay, while the north wall was composed primarily of ROC stone.
- Pavement thickness was found to range from 2.5 inches at the east curb to 12 inches at the center. Geotextile and geogrid were not encountered.
- The homeowner was present for a portion of the excavation and stated that his house was the only house to freeze on the street.



Photo 1. Waterline at east curb 30.5 inches below top of pavement.




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FIELD OBSERVATION REPORT

PROJECT NO.: 15-1032 REPORT NO.: 15-05 DATE: 07.15.15 PAGE: 1 OF 2
 PROJECT: Niagara Falls Water Line DAY: Wednesday
 SUBJECT: 1906 Welch Ave. Water Service Invest. PROJECT TIME: 7:45 am – 1:30 pm
 CLIENT: Niagara Falls Water Board SITE TIME: 8:30 am – 12:15 pm
 WEATHER: Sunny, 65° F PHOTOS: YES ☒ NO ☐

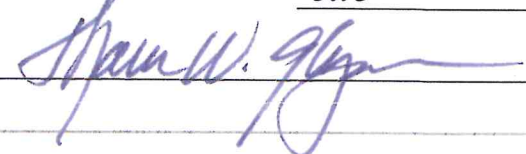
- GGE arrived at 1906 Welch Avenue in Niagara Falls at approximately 8:30 am.
- Swanson Plumbing began saw-cutting the pavement at approximately 9:00 am. Cones were placed in the roadway to isolate the area of excavation.
- The water main was identified to be on the north side of the street approximately 5 feet south of the curb. The valve box was identified in the grass approximately 4 feet north of the curb.
- Swanson advanced the excavation through the sub pavement materials using a Kubota U35 excavator to a depth of approximately 8 inches above the waterline. Hand excavation was performed using a shovel to expose the waterline. Excavation initiated at the valve box and was advanced southward.
- Excavation at the valve box exposed a 1 inch diameter lead water lateral at a depth of 42 inches below the ground surface. Existing fill materials were found to consist of reddish brown, moist, stiff, faintly mottled, lean clay (CL) from the waterline to within a few inches of the ground surface. This continues laterally from the valve box to the curb.
- On the street side of the curb the roadway profile to the water lateral was observed as follows: 0 – 4.5" asphalt pavement, 4.5 – 7.0" brick, 7 – 14" tan, moist, sandy bank run gravel, 14 – 27" brown, moist, lean clay (CL), 27 – 34.5" reddish brown, moist, faintly mottled, lean clay (CL). The top of a 1 inch diameter lead water lateral was encountered at a depth of 34.5 inches.

PERSONNEL ON SITE / CONTACTED:
James Hunt – Clark Patterson & Lee
Ryan Lucas, Mike Forbes – Swanson Plumbing


 Edward Lover

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FIELD OBSERVATION REPORT

PROJECT NO.: 15-1032 REPORT NO.: 15-05 DATE: 07.15.15 PAGE: 2 OF 2

- The water main was encountered at a distance of 5.5 feet south of the north curb. The profile was observed as follows: 0 – 4" asphalt pavement, 4 – 7" brick, 7 – 15" tan, moist, sandy bank run gravel, 15 – 32.5" reddish brown, moist, mottled, lean clay (CL). The water main was estimated to be 8 inches in diameter and encountered at a depth of 38 inches below the roadway surface. The 1 inch diameter lead lateral was observed to be tapped at 90° to the top of the main at a depth of 32.5 inches from the roadway surface.
- The waterline was found to be composed of 1 inch diameter lead throughout the length of the exposed lateral. Depth was found to range from 32.5 to 42 inches below the top of pavement/grass.
- GGE gathered samples where applicable.
- The excavation was backfilled with clay to a depth of approximately 10 inches above the lateral. The remainder of the excavation was backfilled with compacted 2" ROC stone and cold patch at the pavement surface.



Photo 1. Lateral at connection to main 32.5 inches below pavement.




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FIELD OBSERVATION REPORT

PROJECT NO.: 15-1032 REPORT NO.: 15-06 DATE: 07.16.15 PAGE: 1 OF 2
PROJECT: Niagara Falls Water Line DAY: Thursday
SUBJECT: 1224 13th St. Water Service Invest. PROJECT TIME: 8:15 am – 1:45 pm
CLIENT: Niagara Falls Water Board SITE TIME: 9:00 am – 12:30 pm
WEATHER: Sunny, 75° F PHOTOS: YES ☒ NO ☐

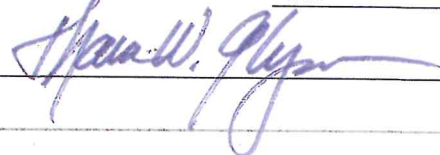
- GGE arrived at 1224 13th Street in Niagara Falls at approximately 9:00 am.
- The address is part of a multiunit apartment building at the southwest corner of 13th Street and Whitney Avenue. The water service to 1224 13th Street actually comes from the main on Whitney Avenue.
- Three of the units out of an estimated six total were condemned. A city code official commented that several units within the building are frequently condemned.
- Swanson Plumbing began saw-cutting the pavement prior to GGE's arrival. Swanson blocked off Whitney Avenue between 13th Street and 11th Street.
- The water main was identified to be on the north side of the street approximately 5 feet south of the north curb. The valve box was identified in the concrete sidewalk approximately 4 feet south of the south curb.
- Swanson advanced the excavation through the sub pavement materials using a Kubota U35 excavator to a depth of approximately 12 inches above the waterline. Hand excavation was performed using a shovel to expose the waterline. Excavation initiated at the south curb and was advanced northward.
- Excavation was not performed from the curb to the valve box due to the close proximity of the valve box to the curb and the concrete sidewalk.
- The excavation from the south curb to the water main revealed a profile as follows: 0 – 2.5" asphalt pavement, 2.5 – 6" brick, 6 – 15" concrete, 15 – 24" brown, very moist to wet, lean clay (CL), 24 – 43" reddish brown, faintly mottled, moist, hard, lean clay (CL).

PERSONNEL ON SITE / CONTACTED:
James Hunt – Clark Patterson & Lee
Ryan Lucas, Mike Forbes – Swanson Plumbing


Edward Lover

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FIELD OBSERVATION REPORT

PROJECT NO.: 15-1032 REPORT NO.: 15-06 DATE: 07.16.15 PAGE: 2 OF 2

- The excavation revealed the water lateral to be composed of 1 inch diameter lead at a depth ranging from 43 to 45.75 inches below grade. However, the lateral rose to a depth of 37.5 inches at the connection to the main.
- The main was encountered at a horizontal distance of 22 feet north of the south curb and a vertical distance of 43.5 inches below grade. The lateral tapped at 90° on the top of the main.
- GGE gathered samples where applicable and recorded vertical profiles at approximate 5 foot horizontal intervals across the excavation. A profile of the roadway surface was recorded using a laser level.
- The excavation was backfilled with clay to a depth of approximately 10 inches above the lateral. The remainder of the excavation was backfilled with compacted 2" ROC stone and cold patch at the pavement surface.



Photo 1. Lateral at south curb 43 inches below pavement.



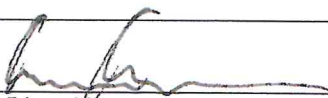
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FIELD OBSERVATION REPORT

PROJECT NO.: 15-1032 REPORT NO.: 15-07 DATE: 07.17.15 PAGE: 1 OF 2
PROJECT: Niagara Falls Water Line DAY: Friday
SUBJECT: 1358 Michigan Water Service Invest. PROJECT TIME: 8:15 am – 12:45 pm
CLIENT: Niagara Falls Water Board SITE TIME: 9:00 am – 11:45 am
WEATHER: Overcast, 70° F PHOTOS: YES X NO

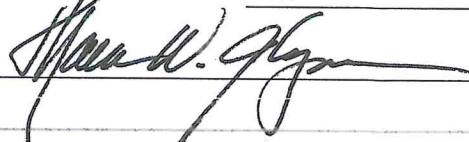
- GGE arrived at 1358 Michigan Avenue in Niagara Falls at approximately 9:00 am.
- Swanson Plumbing began saw-cutting the pavement prior to GGE's arrival. Cones were placed around the work area to divert traffic. The road was not closed due to the close proximity of the excavation to the sidewalk.
- The water main was identified to be on the north side of the street approximately 5 feet south of the north curb. The valve box was identified in the concrete sidewalk approximately 22 inches north of the north curb.
- Swanson advanced the excavation through the sub pavement materials using a Kubota U35 excavator to a depth of approximately 12 inches above the waterline. Hand excavation was performed using a shovel to expose the waterline. Excavation initiated at the north curb and was advanced southward.
- Excavation was not performed from the curb to the valve box due to the close proximity of the valve box to the curb and the concrete sidewalk.
- The excavation from the north curb to the water main revealed a profile as follows: 0 – 6" asphalt pavement, 6 – 12" concrete, 12 – 27" brown, moist to very moist, firm, lean clay (CL), 27 – 47" reddish brown, moist, stiff, lean clay (CL).
- The excavation revealed the water lateral to be composed of 1 inch diameter lead at a depth ranging from 47 to 49 inches below grade.
- GGE gathered a sample of the clay soil and established a profile of the roadway surface using a laser level.

PERSONNEL ON SITE / CONTACTED:
James Hunt – Clark Patterson & Lee
Ryan Lucas, Mike Forbes – Swanson Plumbing


Edward Yover

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DAILY MANHOURS: 4.5



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FIELD OBSERVATION REPORT

PROJECT NO.: 15-1032 REPORT NO.: 15-07 DATE: 07.17.15 PAGE: 2 OF 2

- The main was encountered at a horizontal distance of 80 inches south of the north curb and a vertical distance of greater than 51 inches below grade. The lateral is presumed to tap the top of the main at 90°. The main was not exposed due to the depth and excavation geometry.
- The excavation was backfilled with clay to a depth of approximately 10 inches above the lateral. The remainder of the excavation was backfilled with compacted 2" ROC stone and cold patch at the pavement surface.



Photo 1. Lateral at north curb 47 inches below pavement.



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FIELD OBSERVATION REPORT

PROJECT NO.: 15-1032 REPORT NO.: 15-08 DATE: 07.20.15 PAGE: 1 OF 2
PROJECT: Niagara Falls Water Line DAY: Monday
SUBJECT: 2926 Ontario Water Service Invest. PROJECT TIME: 8:00 am – 12:45 pm
CLIENT: Niagara Falls Water Board SITE TIME: 8:45 am – 11:15 am
WEATHER: Sun, 75° F PHOTOS: YES ☒ NO ☐

- GGE arrived at 2926 Ontario Avenue in Niagara Falls at approximately 8:45 am.
- Swanson Plumbing began saw-cutting the pavement prior to GGE's arrival. Cones were placed around the work area to divert traffic. The road was not closed due to the close proximity of the excavation to the sidewalk.
- The water main was identified to be on the north side of the street approximately 5 feet south of the north curb. The valve box was identified in the grass right of way approximately 62 inches north of the north curb.
- Swanson initiated excavation at the valve box and proceeded southward. The lateral was found to be composed of 1 inch diameter lead pipe. The lateral was found to exit the valve box at a depth of 32 inches and descend to a depth of 40 inches below the ground surface at a horizontal distance of 41 inches north of the north curb. The pipe was found to be covered by clay soil capped by topsoil and grass.
- Swanson advanced the excavation through the sub pavement materials within the roadway using a Kubota U35 excavator to a depth of approximately 12 inches above the waterline. Hand excavation was performed using a shovel to expose the waterline. Excavation initiated at the north curb and was advanced southward.
- The excavation at 20 inches south of the north curb revealed a profile as follows: 0 – 4.25" asphalt pavement, 4.25 – 9.5" concrete, 9.5 – 18" brown, moist to very moist, soft, lean clay (CL), 18 – 32" reddish brown, moist, stiff, lean clay (CL). The lateral was encountered at a depth of 32 inches below the pavement surface.

PERSONNEL ON SITE / CONTACTED:

James Hunt – Clark Patterson & Lee

Ryan Lucas – Swanson Plumbing

DISTRIBUTION:

DAILY MANHOURS: 4.75

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FIELD OBSERVATION REPORT

PROJECT NO.: 15-1032 REPORT NO.: 15-08 DATE: 07.20.15 PAGE: 2 OF 2

- The water main was encountered at a horizontal distance of 57 inches south of the north curb and a vertical distance of 38 inches below the roadway surface. The profile at the main was observed as follows: 0 – 4.5" asphalt pavement, 4.5 – 15" concrete, 15 – 33.5" 3 inch ROC stone. The lateral was encountered at a depth of 33.5 inches below the pavement surface and was found to tap into the top of the main at 90°.
- GGE gathered samples where applicable and established a profile of the roadway surface using a laser level.

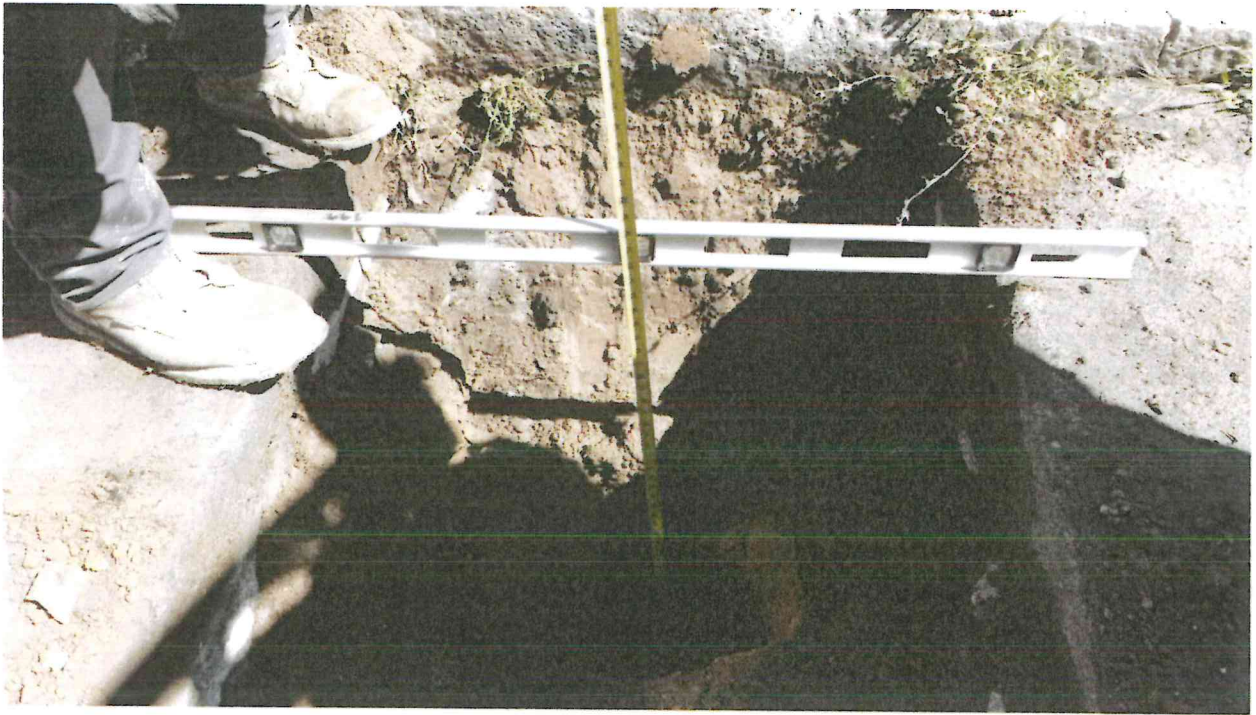


Photo 1. Lateral at north curb 32 inches below pavement.



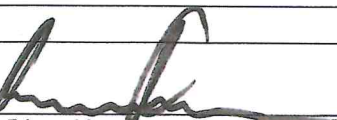
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FIELD OBSERVATION REPORT

PROJECT NO.: 15-1032 REPORT NO.: 15-09 DATE: 07.21.15 PAGE: 1 OF 2
PROJECT: Niagara Falls Water Line DAY: Tuesday
SUBJECT: 2929 20th St. Water Service Invest. PROJECT TIME: 8:30 am – 3:30 pm
CLIENT: Niagara Falls Water Board SITE TIME: 9:30 am – 2:00 pm
WEATHER: Sun, 75° F PHOTOS: YES ☒ NO ☐

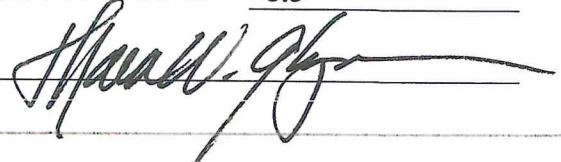
- GGE arrived at 2929 20th Street in Niagara Falls at approximately 9:30 am.
- Swanson Plumbing began saw-cutting the pavement prior to GGE's arrival. Cones were placed around the work area to divert traffic. The road was not closed because it was on a "T" intersection that allowed a car to drive through around the cones.
- The water main was identified to be on the west side of the street approximately 26 feet west of the east curb. The valve box was identified in the grass right of way approximately 7 feet east of the east curb.
- It was decided that Swanson would not dig up the valve box in the terrace area because of the proximity of a 6" gas main. The cap on the water box was removed and the valve was measured at 5ft below grade.
- Swanson began breaking the pavement with the hydraulic hammer at about 9:40. A few minutes later a hydraulic hose on the hammer broke. Work stopped while a new hammer was brought to the site.
- When the new hammer arrived it was realized that it was too small to fit on the boom of the excavator. So work was delayed again until Swanson could get a smaller excavator to the site so that they could attach the small hammer and finish breaking up the pavement.
- By 1:00pm all of the asphalt was removed and Swanson began excavating down to the water service line. They used the machine to excavate down to approximately 4ft below grade and then hand dug the remaining depth to expose the pipe, in specific locations chosen by GGE.

PERSONNEL ON SITE / CONTACTED:
James Hunt – Clark Patterson & Lee
Bob Hubler – Swanson Plumbing


Edward Lover

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FIELD OBSERVATION REPORT

PROJECT NO.: 15-1032 REPORT NO.: 15-09 DATE: 07.21.15 PAGE: 2 OF 2

- The service pipe was $\frac{3}{4}$ " lead and it's top was measured to be 61" below grade at 3ft west of the curb, to 43" below grade over top of the water main. It was deepest at about 9.5ft from the curb where it was 65" below grade.
- The water main was encountered at a horizontal distance of 26ft west of the east curb and a vertical distance of 50 inches below the roadway surface. The general profile of the excavation along its length was observed as follows: 0 – 6" asphalt pavement, 6 – 13" pavement base, 13 – 24" 3 inch ROC stone, and native red-brown clay thereafter. The lateral was found to tap into the top of the main at 90°.
- The lateral coming off the main was $\frac{3}{4}$ " copper pipe for approximately 4ft of length before coupling with the lead pipe that presumably connect to the house.
- GGE gathered samples where applicable and established a profile of the roadway surface using a laser level.

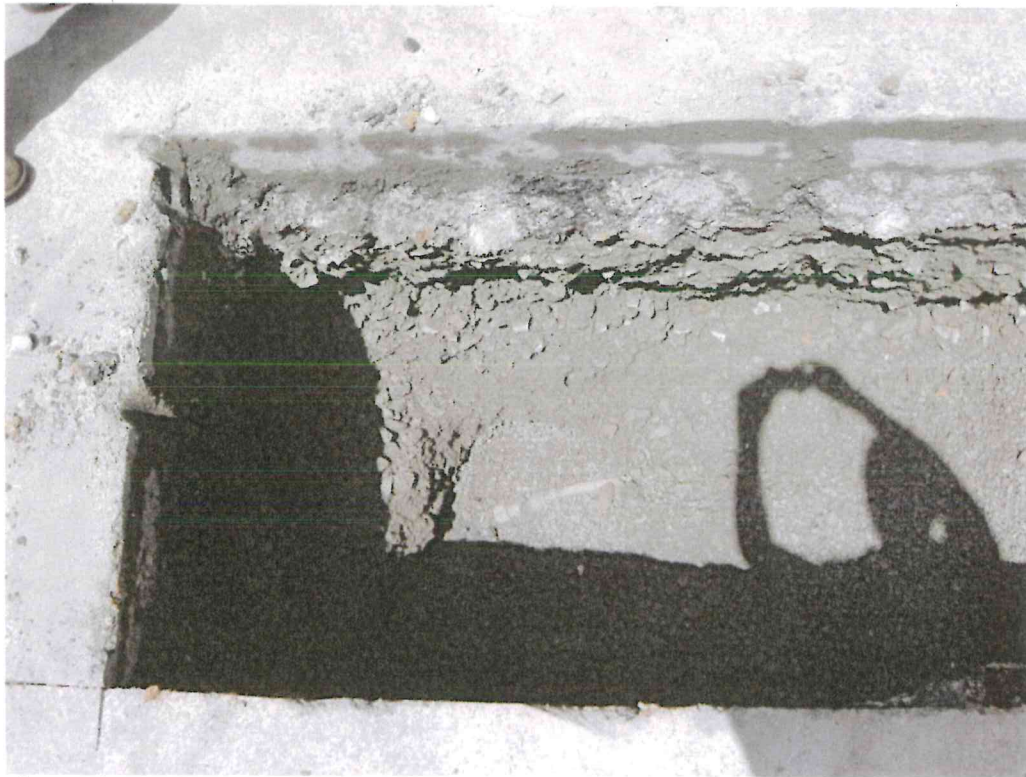


Photo 1. Lateral tapping into the top of the water main approximately 26ft west of east curb.



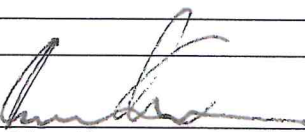
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FIELD OBSERVATION REPORT

PROJECT NO.: 15-1032 REPORT NO.: 15-10 DATE: 07.22.15 PAGE: 1 OF 2
PROJECT: Niagara Falls Water Line DAY: Wednesday
SUBJECT: 571 77th St. Water Service Invest. PROJECT TIME: 8:30 am – 12:00 pm
CLIENT: Niagara Falls Water Board SITE TIME: 9:30 am – 11:00 am
WEATHER: Sun, 75° F PHOTOS: YES X NO

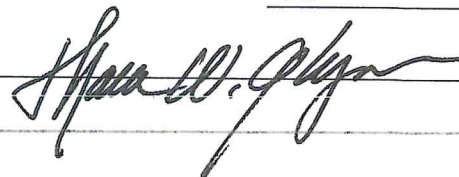
- GGE arrived at 571 77th Street in Niagara Falls at approximately 9:30 am.
- Swanson Plumbing began saw-cutting the pavement prior to GGE's arrival. Cones were placed around the work area to divert traffic.
- The water main was identified to be on the east side of the street in close proximity to the east curb. The valve box was identified in the grass right of way approximately 3.5 feet east of the east curb.
- Swanson did not excavate from the curb to the valve box due to the close proximity to the curb.
- Swanson removed the pavement by means of an hydraulic breaker and excavated the underlying material using a standard excavation bucket.
- The lateral was measured at a depth of 38 inches below the bottom of the valve box.
- The excavation in the street revealed ROC stone to a depth of 27 inches, followed by moist clay to a depth of 36 inches, where a 1 inch diameter lead lateral was encountered. The main was encountered at a depth of 41.5 inches. The connection was at the top of the main via 1 inch diameter copper, which was coupled to the lead lateral.
- GGE gathered samples where applicable and established a profile of the roadway surface using a laser level.

PERSONNEL ON SITE / CONTACTED:
James Hunt – Clark Patterson & Lee
Bob Hubler – Swanson Plumbing


Edward Lover

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PROJECT NO.: 15-1032 REPORT NO.: 15-10 DATE: 07.22.15 PAGE: 2 OF 2



Photo 1. Lateral tapping into the top of the water main adjacent to east curb.