ARCADIS of New York, Inc.
6723 Towpath Road
PO Box 66
Syracuse
New York 13214-0066
Tel 315 446 9120
Fax 315 449 4111
www.arcadis-us.com

ENVIRONMENT

Mr. Michael Ryan
Cortland County Health Department
County Office Building
60 Central Avenue
Cortland, New York 13045-2746

Subject:
Water Main Installation Completion Report
NYSEG Cortland-Homer Former MGP Site
Homer, New York
NYSDEC Site # 7-12-005

Date:
July 11, 2014

Contact:
John E. Morgan, P.E.

Phone:
315.671.9263

Email:
John.Morgan@arcadis-us.com

Our ref:
B0013123.0008

Dear Mr. Ryan:

This letter was prepared by ARCADIS on behalf of New York State Electric and Gas Corporation (NYSEG) to report on completion of the new replacement water main installation at the Cortland-Homer former manufactured gas plant (MGP) site (the "Site") located at 216 and 218 South Main Street (US Route 11) in Homer, New York. The installation activities were performed by Grant Street Construction, a subcontractor to NYSEG's remedial contractor, Geo-Con, in February 2013. This letter was prepared as requested by the Cortland County Health Department (CCHD) during a February 28, 2013 construction coordination meeting at the Site.

The water main installation activities were performed in accordance with the NYSDEC-approved *Remedial Design* (RD) (AECOM, June 2012) and addendum to the RD entitled, *Special Note – Owner Requirements for Water and Sewer Appurtenances.* Drawings from the RD that pertain to the water main work are provided in Attachment A, and the RD addendum document is provided as Attachment B.

The water main installation was acknowledged by the Village of Homer Mayor Genevieve A. Suits in June 21, 2012 e-mail correspondence to AECOM (See Attachment C). A Village of Homer Water Department representative was present for the water main disinfection and pressure testing activities at the site on February 14, 2013 and the CCHD was on site on February 15, 2013 to observe the remaining installation activities and review the first round of bacteriological testing results. Installation of the water main was completed on February 22, 2013 and an as-built record of the remedial activities including the water main installation was recently finalized.

The water main replacement activities are summarized below.

Existing Water Main Removal and New Fire Hydrant Installation

Approximately 370 feet of existing water main was removed from along the Site on the western side of the South Main Street to facilitate in-situ soil solidification (ISS) for soil greater than 4 feet below ground surface (bgs) impacted by historical manufactured gas plant (MGP) operations at the Site. Of the water main removed, approximately 275 feet of it was located along the 218 South Main Street property and approximately 85 feet (northern end of the water main) was located along the 216 South Main Street property. The old water main was a 6-inch nominal pipe size (NPS) ductile iron (DI) pipe. The water main removal activities included the following:

- Notifying the Village of Homer and the City of Cortland Water Department (CWD) of the anticipated water main work schedule and requesting flow meter readings for water used during the remedial activities.
- Excavating and cutting the previous water main at the southern end of the Site.
- Installing a 6-inch shut-off valve, 6-inch pipe, cap, 6-inch by 6-inch by 2-inch tee, 2-inch water service (used for the remedial activities grout batch plant), and 2-inch shut-off valve.
- Excavating and cutting the northern end of the previous water main and removing the old fire hydrant.
- Installing a 6-inch shut-off valve, 6-inch pipe, cap, 6-inch tee, 6-inch water shut-off valve, and new fire hydrant (specified by the Village of Homer) located north of the previous hydrant location.
- Backfilling both removal locations up to grade.

Removal of the water main and installation of the new fire hydrant were performed in accordance with the RD drawings and specifications which reference New York State Department of Transportation (NYSDOT) Standard Specifications, NYSDOT Standard Detail Sheets (Group 663), Village of Homer Specifications, and American Water Works Association (AWWA) *Standard C-651-Disinfecting Water Mains*. The removal activities were completed in August 2012. The approximate original alignment of the water main and location of the new fire hydrant are presented on Figure 1.

New Water Main Installation

After remedial activities were completed at the Site on the western side of South Main Street, the new water line was installed in its approximate original alignment after providing the appropriate notification to the Village of Homer and the CCHD. The new water main consisted of a 6-inch NPS DI cement-lined pipe. Photographs of

taken during the installation and testing of the new water main are provided in Attachment D. The installation activities included the following:

- Excavating an approximate 3- to 6-foot wide by 5.5-foot deep trench exposing both ends of the water main cut and capped in August 2012.

- Excavating a vertical 45-degree angle trench from approximately 5.5 feet below ground surface (bgs) up to the top of the ISS monolith (approximately 4 feet bgs) at the northern and southern limits of the ISS monolith and excavating across the ISS monolith to complete the water main trench.

- Placing approximately 3 inches of Subbase Course, Type 1, NYSDOT 304.11 in the bottom of the excavation and compacting the material with a vibratory plate tamper.

- Cutting and capping the 2-inch water service installed on the southern end of the water main for the remedial activities and leaving the capped service in place for potential future use.

- Installing the new 6-inch NPS DI cement-lined water main pipe in accordance with the RD drawings and specifications. Where the pipe was installed approximately 3 feet bgs over the ISS monolith, the pipe was wrapped with a 3-inch Pittsburg-Corning cellular glass insulation (Foamglas®) with a 125 mil waterproof flexible insulation jacket (Pittwrap®). In other areas, where the pipe was installed at depths greater than 3 feet bgs, the pipe was wrapped with a polyethylene sleeve for additional protection. The pipe was installed using the appropriate EBAA Iron, Inc. Megalug® restrained joints on the 45-degree vertical bends and fire hydrant joints. Field lock gaskets were used to restrain the joints immediately before and after the 45 degree bends on top of the ISS monolith. Cut sheets for the pipe, restrained joints, 45-degree elbows, and insulation are provided as Attachment E. Photographs of the restrained joint, insulation, and insulation jacket product labels are provided as Attachment D. The as-built water main alignment and burial depths are shown on Figure 1. The water main final installation schematic on Drawing 21 of the RD (see Attachment A) shows the new water main alignment being shifted to the west using 45-degree horizontal bends. However, because the existing water main pipe location was fond to be further west of the highway boundary than depicted on Drawing 21, it was determined in the field that the new water main pipe could be reinstalled in its approximate original alignment without the use of the 45-degree bends.

- Backfilling and compacting clean imported Subbase Course, Type 1, NYSDOT 304.11 fill around the new water main pipe. Test ports were left exposed to allow for pressure and bacteriological testing. Installation of the water main was completed on February 13, 2013.

- Disinfecting and pressure testing the water main on February 14, 2013 with onsite observation performed by the Village of Homer. The pressure test verified that there were no leaks, so the water main was then filled with a chlorine solution that same day. After 24 hours in the pipe, the chlorine solution was flushed on February 15, 2013.

- Collecting the first water sample on February 15, 2013 for laboratory analysis for total fecal coliform by Microbac Laboratories, Inc. located in Cortland, New York. A second bacteriological test was performed following the receipt of negative test results from the first test. The laboratory results for the second test were also negative for fecal coliform. The CCHD was onsite to review the first round of water testing results on February 15, 2013, which was performed in accordance with AWWA C-651. The laboratory test results are provided as Attachment F.

After receiving the second set of laboratory results on February 21, 2013, the CCHD provided verbal approval to place the new water main into service. On February 22, 2013, Grant Street Construction flushed the water main with village water for approximately 15 minutes to remove potential remaining sediment from the line and the line was subsequently placed into service. The Village of Homer Water Department representative was onsite during the final flushing of the pipe.

Please contact me or Andrew Enigk at 315.671.9548 if you have any questions or require additional information regarding the water main installation described above or other aspects of the MGP site remediation.

Sincerely,

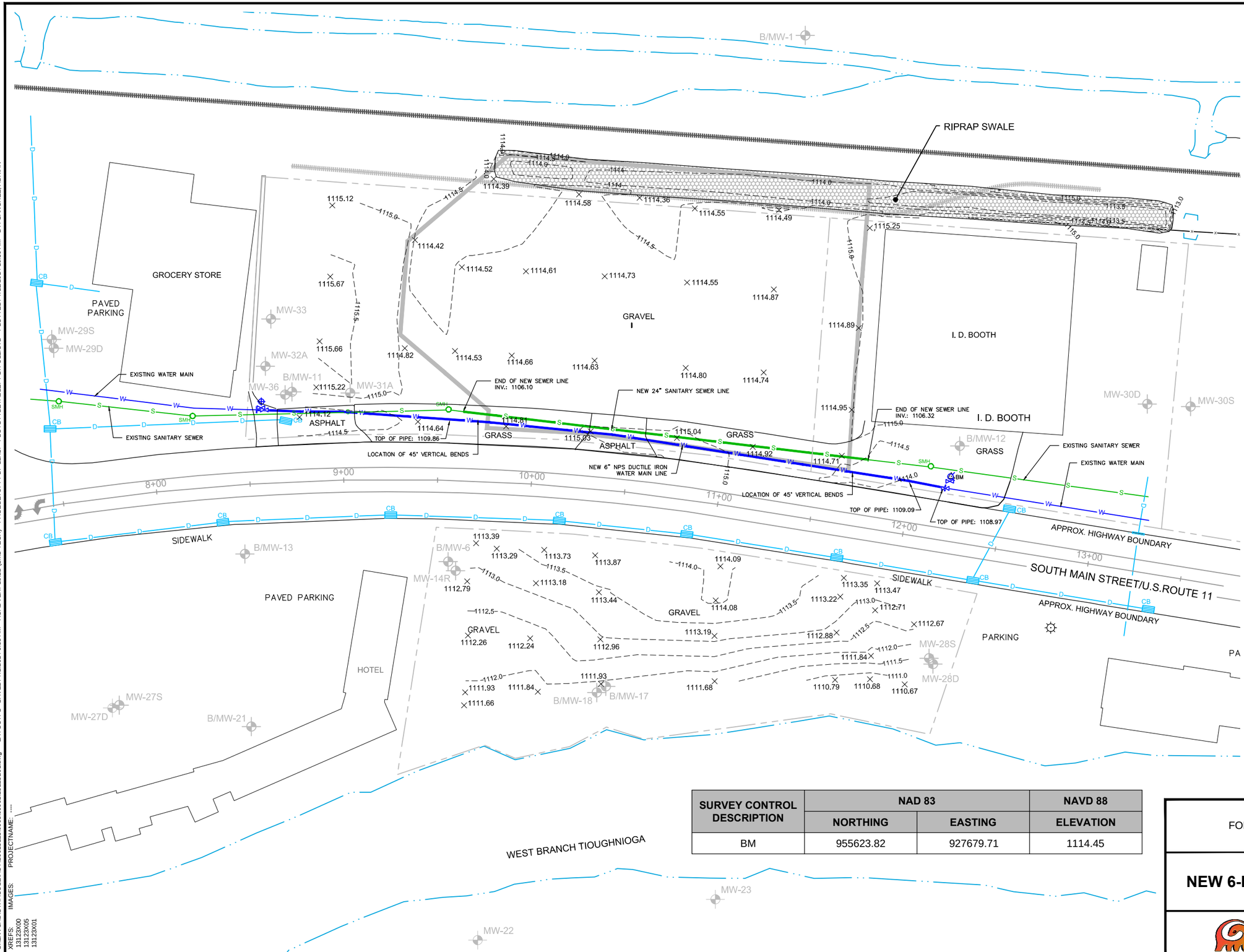
ARCADIS of New York, Inc.

John E. Morgan, P.E.
Senior Civil Engineer

Copies:
Mr. William T. Ports, NYSDEC
Mr. Tracy L. Blazicek, CHMM, NYSEG
Mr. John C. Brussel, P.E., ARCADIS
Mr. Andrew C. Enigk, ARCADIS

ARCADIS

Figure



LEGEND:

- APPROXIMATE PROPERTY BOUNDARY
- APPROXIMATE HIGHWAY BOUNDARY
- MONITORING WELL
- BENCH MARK
- FINAL GRADE SPOT ELEVATION
- FINAL GRADE CONTOUR
- ISS MONOLITH
- FIRE HYDRANT
- CURB STOP
- SHUT OFF VALVE
- EXISTING WATER MAIN
- NEW WATER MAIN
- EXISTING SANITARY SEWER AND MANHOLE
- NEW SANITARY SEWER
- EXISTING STORM DRAIN AND CATCH BASIN

NOTES:

1. BASEMAP SUPPLIED BY AECOM OF LATHAM, NEW YORK DRAWING NUMBER 3 AT A SCALE OF 1"=60', ENTITLED "NYSEG - REMEDIAL DESIGN FOR FORMER CORTLAND-HOMER MGP SITE" DATED APRIL 16, 2012.
2. BASE MAPPING COMPILED FROM VARIOUS SOURCES INCLUDING NEW YOUR STATE ELECTRIC & GAS (NYSEG) EXISTING PLANIMETRIC AND UTILITY INFORMATION, DIGITIZED INFORMATION FROM NYSDOT RECORD PLANS TITLED RECONSTRUCTION OF ROUTE 11 IN THE TOWN OF CORTLANDVILLE AND VILLAGE OF HOMER - DATED 5-17-02, DIGITIZED AERIAL IMAGERY FROM THE NEW YORK STATE GIS CLEARINGHOUSE, AND FIELD A FIELD SURVEY PERFORMED BY AECOM - DATED MAY 13, 2011.
3. ELEVATIONS ARE RELATIVE TO NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 1988).
4. HORIZONTAL COORDINATES ARE RELATIVE TO THE NEW YORK STATE PLANE COORDINATE SYSTEM, NORTH AMERICAN DATUM OF 1983 (NAD 83).
5. WHERE THE NEW WATER MAIN WAS INSTALLED 3 FEET BELOW GROUND SURFACE OVER THE ISS MONOLITH, THE PIPE WAS WRAPPED WITH 3-INCH PITTSBURGH CORNING CELLULAR GLASS INSULATION (FOAMGLASS®) WITH A 125 MIL WATERPROOF FLEXIBLE INSULATION JACKET (PITTWRAP®). THE NEW PIPE WAS WRAPPED WITH A POLYETHYLENE SLEEVE IN ALL OTHER AREAS WHERE NO INSULATION WAS USED.

0 50' 100'

GRAPHIC SCALE

SURVEY CONTROL DESCRIPTION	NAD 83		NAVD 88
	NORTHING	EASTING	ELEVATION
BM	955623.82	927679.71	1114.45

NYSEG
FORMER CORTLAND-HOMER MGP SITE
HOMER, NEW YORK

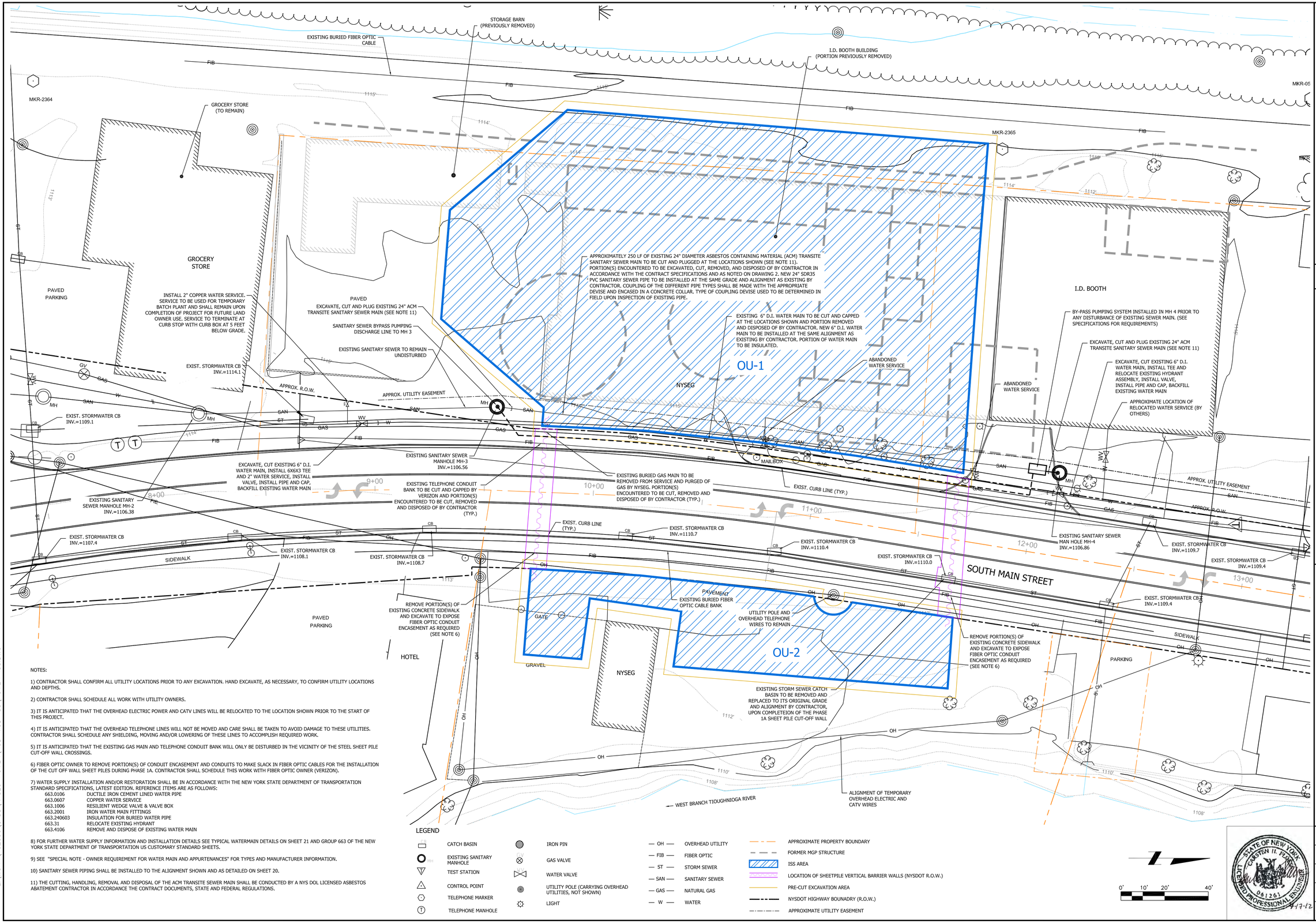
NEW 6-INCH WATER MAIN LOCATION

ARCADIS

FIGURE 1

Attachment A

Remedial Design Drawings



NOTES:

1) CONTRACTOR SHALL CONFIRM ALL UTILITY LOCATIONS PRIOR TO ANY EXCAVATION. HAND EXCAVATE, AS NECESSARY, TO CONFIRM UTILITY LOCATIONS AND DEPTHS.

2) CONTRACTOR SHALL SCHEDULE ALL WORK WITH UTILITY OWNERS.

3) IT IS ANTICIPATED THAT THE OVERHEAD ELECTRIC POWER AND CATV LINES WILL BE RELOCATED TO THE LOCATION SHOWN PRIOR TO THE START OF THIS PROJECT.

4) IT IS ANTICIPATED THAT THE OVERHEAD TELEPHONE LINES WILL NOT BE MOVED AND CARE SHALL BE TAKEN TO AVOID DAMAGE TO THESE UTILITIES. CONTRACTOR SHALL SCHEDULE ANY SHIELDING, MOVING AND/OR LOWERING OF THESE LINES TO ACCOMPLISH REQUIRED WORK.

5) IT IS ANTICIPATED THAT THE EXISTING GAS MAIN AND TELEPHONE CONDUIT BANK WILL ONLY BE DISTURBED IN THE VICINITY OF THE STEEL SHEET PILE CUT-OFF WALL CROSSINGS.

6) FIBER OPTIC OWNER TO REMOVE PORTION(S) OF CONDUIT ENCASEMENT AND CONDUITS TO MAKE SLACK IN FIBER OPTIC CABLES FOR THE INSTALLATION OF THE CUT OFF WALL SHEET PILES DURING PHASE 1A. CONTRACTOR SHALL SCHEDULE THIS WORK WITH FIBER OPTIC OWNER (VERIZON).

7) WATER SUPPLY INSTALLATION AND/OR RESTORATION SHALL BE IN ACCORDANCE WITH THE NEW YORK STATE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS, LATEST EDITION. REFERENCE ITEMS ARE AS FOLLOWS:

663.0106	DUCTILE IRON CEMENT LINED WATER PIPE
663.0607	COPPER WATER SERVICE
663.1006	RESILIENT WEDGE VALVE & VALVE BOX
663.2001	IRON WATER MAIN FITTINGS
663.240603	INSULATION FOR BURIED WATER PIPE
663.31	RELOCATE EXISTING HYDRANT
663.4106	REMOVE AND DISPOSE OF EXISTING WATER MAIN

8) FOR FURTHER WATER SUPPLY INFORMATION AND INSTALLATION DETAILS SEE TYPICAL WATERMAIN DETAILS ON SHEET 21 AND GROUP 663 OF THE NEW YORK STATE DEPARTMENT OF TRANSPORTATION US CUSTOMARY STANDARD SHEETS.

9) SEE "SPECIAL NOTE - OWNER REQUIREMENT FOR WATER MAIN AND APPURTENANCES" FOR TYPES AND MANUFACTURER INFORMATION.

10) SANITARY SEWER PIPING SHALL BE INSTALLED TO THE ALIGNMENT SHOWN AND AS DETAILED ON SHEET 20.

11) THE CUTTING, HANDLING, REMOVAL AND DISPOSAL OF THE ACM TRANSITE SEWER MAIN SHALL BE CONDUCTED BY A NYS DOL LICENSED ASBESTOS ABATEMENT CONTRACTOR IN ACCORDANCE THE CONTRACT DOCUMENTS, STATE AND FEDERAL REGULATIONS.

LEGEND

CB	CATCH BASIN		IRON PIN	OH	OVERHEAD UTILITY
MH	EXISTING SANITARY MANHOLE	GV	GAS VALVE	FIB	FIBER OPTIC
	TEST STATION	WV	WATER VALVE	ST	STORM SEWER
	CONTROL POINT		UTILITY POLE (CARRYING OVERHEAD UTILITIES, NOT SHOWN)	SAN	SANITARY SEWER
	TELEPHONE MARKER		LIGHT	GAS	NATURAL GAS
T	TELEPHONE MANHOLE			W	WATER

- APPROXIMATE PROPERTY BOUNDARY
- FORMER MGP STRUCTURE
- ISS AREA
- LOCATION OF SHEETPILE VERTICAL BARRIER WALLS (NYSDOT R.O.W.)
- PRE-CUT EXCAVATION AREA
- NYSDOT HIGHWAY BOUNADRY (R.O.W.)
- APPROXIMATE UTILITY EASEMENT

0' 10' 20' 40'

STATE OF NEW YORK · CARSTEN H. FERSCH · 081261 · LICENSED PROFESSIONAL ENGINEER

7/7/12

1 INCH — VERIFY SCALE IF PLAN SHEET IS REDUCED

DRN BY:	DES BY:	CHK BY:	APP BY:	DESCRIPTION	DRN	CHK	DATE (M/D/Y)
KAM	MTT	CHF	SAU				

REV

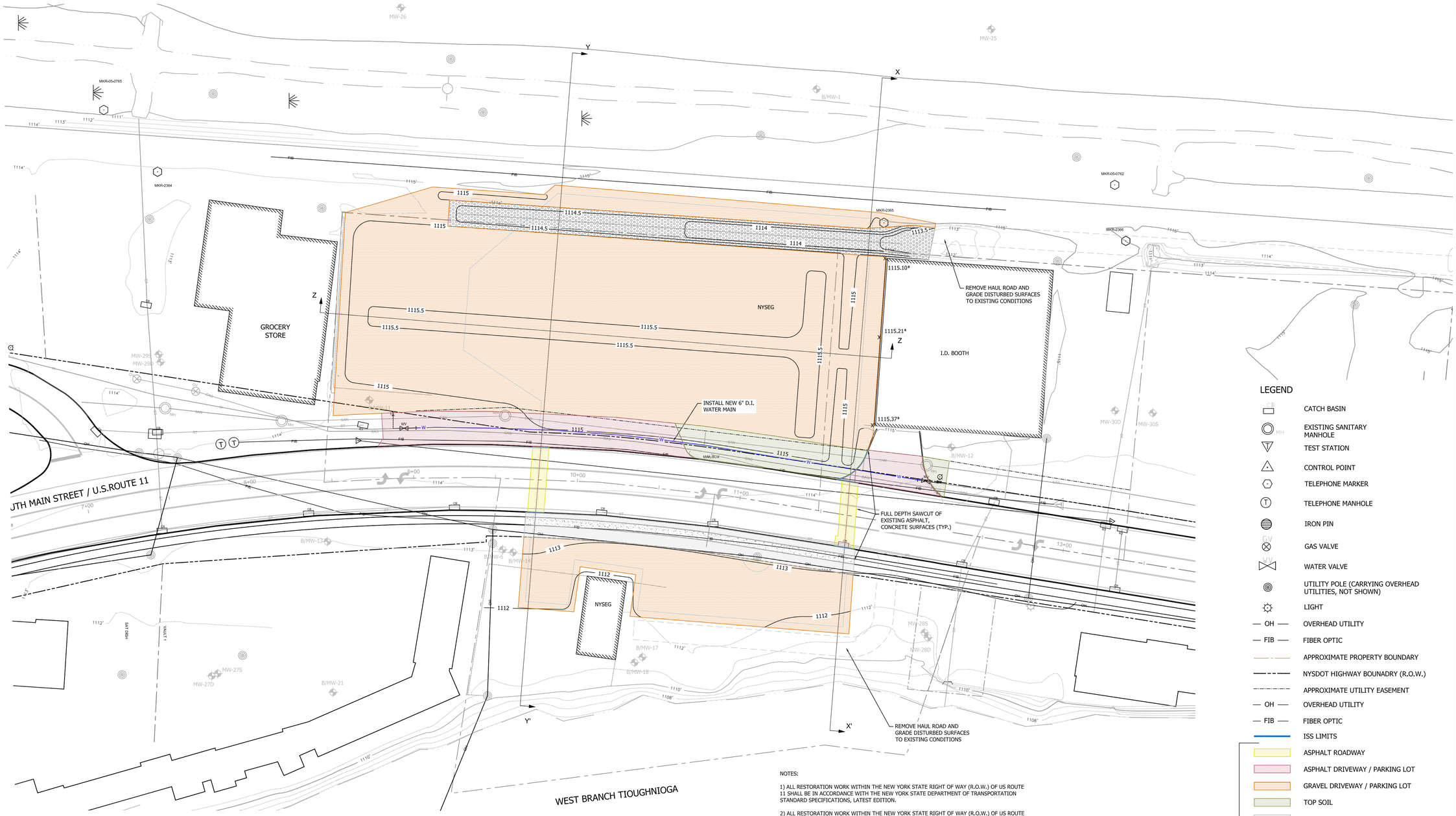
AECOM

NYSEG - REMEDIAL DESIGN FOR FORMER CORTLAND-HOMER MGP SITE
HOMER, NEW YORK

SITE UTILITY RELOCATION PLAN

PROJECT DATE (M / Y): APRIL 2012
PROJECT NO.: 102050 / 60189880
FILENAME: HOMER-ISS.dwg
SHEET NO.: 7
DRAWING NO.: 7

Plotted By: meisterk
Plot File Date Created: Apr/16/2012 2:42 PM
Layout-Sheet Name: 100%-UTILITY
Filename: L:\WORK\102050\CADD\NYSEG-HOMER\ROD-MOD-ISS\HOMER-ISS.DWG



PLAN

NOTES:

1) ALL RESTORATION WORK WITHIN THE NEW YORK STATE RIGHT OF WAY (R.O.W.) OF US ROUTE 11 SHALL BE IN ACCORDANCE WITH THE NEW YORK STATE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS, LATEST EDITION.

2) ALL RESTORATION WORK WITHIN THE NEW YORK STATE RIGHT OF WAY (R.O.W.) OF US ROUTE 11 SHALL BE LIMITED TO ONE SIDE OF THE HIGHWAY AT ONE TIME. APPROPRIATE LANE CLOSURES, AS SHOWN IN DRAWING 8-ROW & 9-ROW, SHALL BE INSTALLED AND MAINTAINED DURING THIS WORK.

3) * INDICATES EXISTING SURFACE ELEVATION

4) TYPICAL WATER MAIN INSTALLATION TO HAVE 5 FT. OF SOIL COVER. ALL WATER MAINS TO RECEIVE 3" OF RIGID FOAM INSULATION WITH WATERPROOF COVERING WHERE 5 FEET CANNOT BE ACHIEVED. WATER MAIN TO BE DEFLECTED OVER MONOLITH USING STANDARD BENDS AND RETAINING METHODS.(I.E. 45° BENDS)

5) CUT STEEL SHEET PILE TO ACHIEVE 6"(MIN.) CLEARANCE AROUND ALL WATER MAINS, SANITARY SEWER MAINS, AND CAPPING MATERIALS (GEOTEXTILE, LINER AND GEOCOMPOSITE).

6) IT IS ANTICIPATED THAT THE EXISTING GAS MAIN AND TELEPHONE CONDUIT BANK WILL ONLY BE DISTURBED IN THE VICINITY OF THE STEEL SHEET PILE CUT-OFF WALL CROSSINGS. RESTORATION OF THESE UTILITIES WILL BE MADE BY OTHERS PRIOR TO CONTRACTORS FINAL SITE RESTORATION. CONTRACTOR SHALL SCHEDULE THIS WORK WITH UTILITY OWNER.

7) FOR ADDITIONAL UTILITY INFORMATION SEE DRAWING 7 SITE UTILITY RELOCATION PLAN.

8) SEE DETAILS, DRAWING 20, FOR MATERIALS AND DEPTHS OF FILL ITEMS & SURFACE TREATMENTS.

9) SEE FINAL GRADING AND RESTORATION PLAN, DRAWING 16, FOR LIMITS OF SURFACE TREATMENTS.

10) SEE FINAL GRADING AND RESTORATION SECTIONS, DRAWING 17, FOR CROSS SECTIONS.

SEE DETAILS, DWG. 20, FOR MATERIALS AND DEPTHS OF FILL ITEMS & SURFACE TREATMENTS

LEGEND

- CB — CATCH BASIN
- MH — EXISTING SANITARY MANHOLE
- TS — TEST STATION
- CP — CONTROL POINT
- TM — TELEPHONE MARKER
- T — TELEPHONE MANHOLE
- IP — IRON PIN
- GV — GAS VALVE
- WV — WATER VALVE
- UTILITY POLE (CARRYING OVERHEAD UTILITIES, NOT SHOWN)
- LIGHT
- OH — OVERHEAD UTILITY
- FIB — FIBER OPTIC
- APPROXIMATE PROPERTY BOUNDARY
- NYSDOT HIGHWAY BOUNADRY (R.O.W.)
- APPROXIMATE UTILITY EASEMENT
- OH — OVERHEAD UTILITY
- FIB — FIBER OPTIC
- ISS LIMITS
- ASPHALT ROADWAY
- ASPHALT DRIVEWAY / PARKING LOT
- GRAVEL DRIVEWAY / PARKING LOT
- TOP SOIL
- ASPHALT SIDEWALK
- CONCRETE SIDEWALK
- CIP CONCRETE CURB
- STONE LINED DITCH
- 1114 — PROPOSED CONTOUR (0.5 FT INTERVAL)
- W — WATER MAIN

0' 15' 30' 60'

STATE OF NEW YORK — CARSTEN H. MEISTERLING — 081261 — LICENSED PROFESSIONAL ENGINEER — 4-17-12

DRN BY:	KAM
DES BY:	MTT
CHK BY:	CHF
APP BY:	SAU

REV	DESCRIPTION	DRN	CHK	DATE (M/D/Y)
	VERIFY SCALE IF PLAN SHEET IS REDUCED — 1 INCH —			

AECOM

NYSEG - REMEDIAL DESIGN FOR FORMER CORTLAND-HOMER MGP SITE HOMER, NEW YORK

PHASE 7

FINAL GRADING AND RESTORATION PLAN (OU-1 & OU-2)

PROJECT DATE (M / Y): APRIL 2012

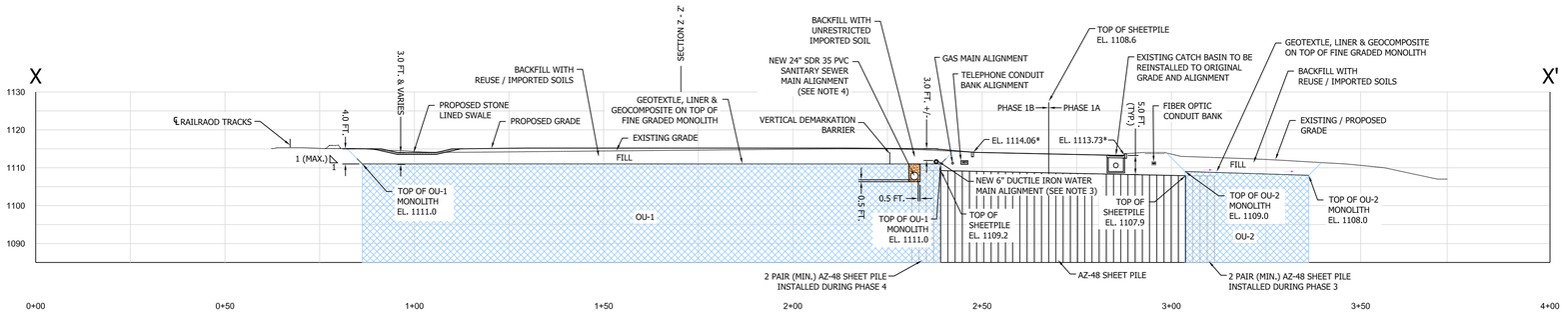
PROJECT NO.: 102050 / 60189880

FILENAME: HOMER-ISS.dwg

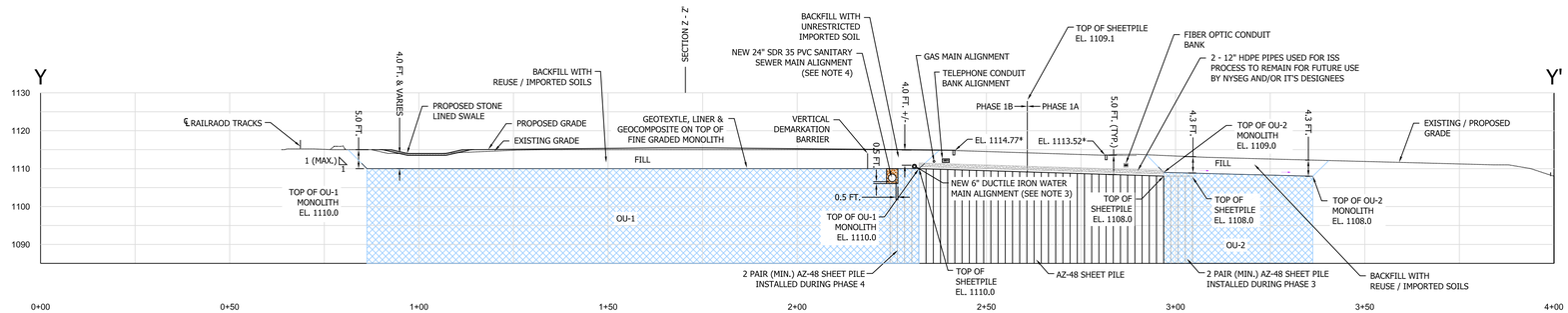
SHEET NO.: 16

DRAWING NO.: 16

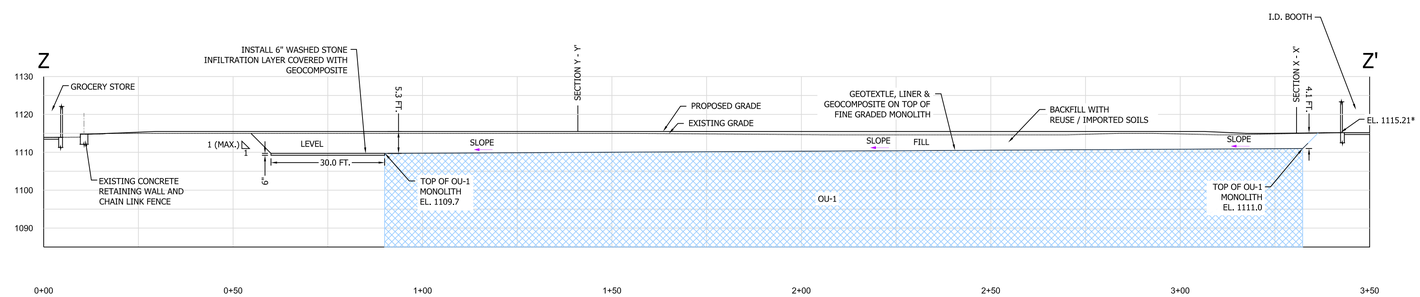
Plotted By: meisterk
Plot File Date Created: Apr/16/2012 3:20 PM
Layout-Sheet Name: 100% FINAL GRADING PLAN
Filename: L:\WORK\102050\CADD\NYSEG-HOMER\ROD-MOD-ISS\HOMER-ISS.DWG



SECTION X - X'
(NORTH CROSSING)



SECTION Y - Y'
(SOUTH CROSSING)



SECTION Z - Z'

NOTES:

1) ALL RESTORATION WORK WITHIN THE NEW YORK STATE RIGHT OF WAY (R.O.W.) OF US ROUTE 11 SHALL BE IN ACCORDANCE WITH THE NEW YORK STATE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS, LATEST EDITION.

2) ALL RESTORATION WORK WITHIN THE NEW YORK STATE RIGHT OF WAY (R.O.W.) OF US ROUTE 11 SHALL BE LIMITED TO ONE SIDE OF THE HIGHWAY AT ONE TIME. APPROPRIATE LANE CLOSURES, AS SHOWN IN DRAWING 8-ROW & 9-ROW, SHALL BE INSTALLED AND MAINTAINED DURING THIS WORK.

3) * INDICATES EXISTING SURFACE ELEVATION

4) TYPICAL WATER MAIN INSTALLATION TO HAVE 5 FT. OF SOIL COVER. ALL WATER MAINS TO RECEIVE 3" OF RIGID FOAM INSULATION WITH WATERPROOF COVERING WHERE 5 FEET CANNOT BE ACHIEVED. WATER MAIN TO BE DEFLECTED OVER MONOLITH USING STANDARD BENDS AND RETAINING METHODS.(I.E. 45° BENDS)

5) CUT STEEL SHEET PILE TO ACHIEVE 6'(MIN.) CLEARANCE AROUND ALL WATER MAINS, SANITARY SEWER MAINS, AND CAPPING MATERIALS (GEOTEXTILE, LINER AND GEOCOMPOSITE).

6) IT IS ANTICIPATED THAT THE EXISTING GAS MAIN AND TELEPHONE CONDUIT BANK WILL ONLY BE DISTURBED IN THE VICINITY OF THE STEEL SHEET PILE CUT-OFF WALL CROSSINGS. RESTORATION OF THESE UTILITIES WILL BE MADE BY OTHERS PRIOR TO CONTRACTORS FINAL SITE RESTORATION. CONTRACTOR SHALL SCHEDULE THIS WORK WITH UTILITY OWNER.

7) FOR ADDITIONAL UTILITY INFORMATION SEE DRAWING 7 SITE UTILITY RELOCATION PLAN.

8) SEE DETAILS, DRAWING 20, FOR MATERIALS AND DEPTHS OF FILL ITEMS & SURFACE TREATMENTS.

9) SEE FINAL GRADING AND RESTORATION PLAN, DRAWING 16, FOR LIMITS OF SURFACE TREATMENTS.

10) SEE FINAL GRADING AND RESTORATION PLAN, DRAWING 16, FOR CROSS SECTION LOCATIONS.

DRN BY:	DES BY:	CHK BY:	APP BY:
KAM	MTT	CHF	SAU

REV	DESCRIPTION	DRN	CHK	DATE (M/D/Y)
	VERIFY SCALE IF PLAN SHEET IS REDUCED — 1 INCH —			

AECOM

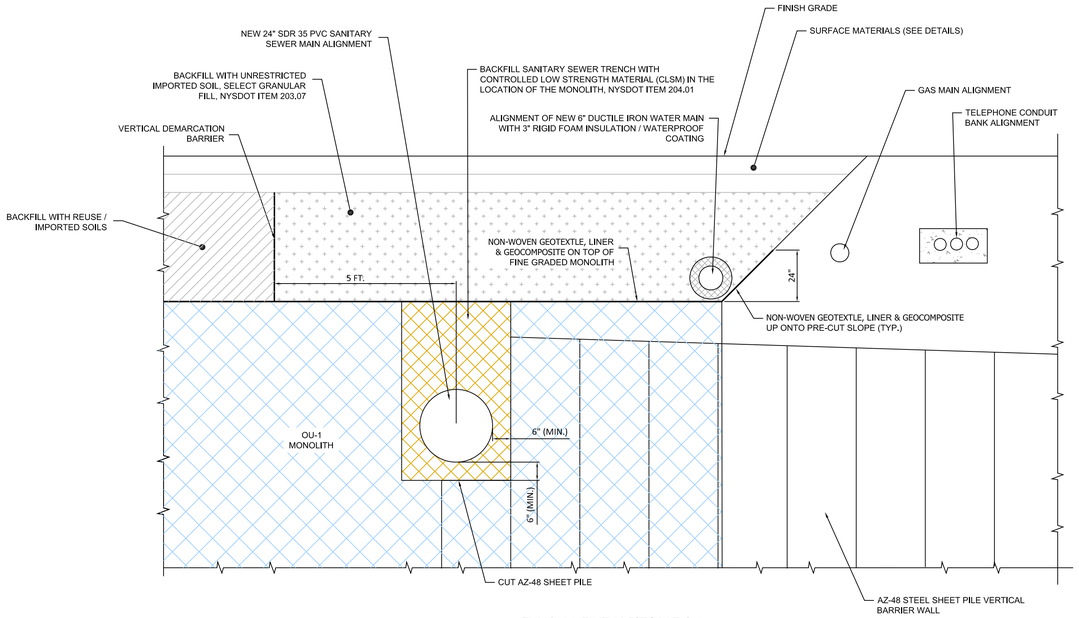
NYSEG - REMEDIAL DESIGN FOR FORMER CORTLAND-HOMER MGP SITE HOMER, NEW YORK

PHASE 7

FINAL GRADING AND RESTORATION SECTIONS (OU-1 & OU-2)

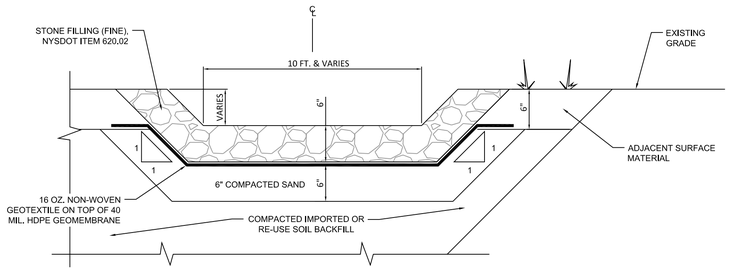
PROJECT DATE (M / Y)	APRIL 2012
PROJECT NO.	102050 / 60189880
FILENAME	HOMER-ISS.dwg
SHEET NO.	17
DRAWING NO.	17

Plotted By: meisterk
Plot File Date Created: Apr/16/2012 3:22 PM
Layout-Sheet Name: 100% FINAL-SECTIONS
Filename: L:\WORK\102050\CADD\NYSEG-HOMER\ROD-MOD-ISS\HOMER-ISS.DWG



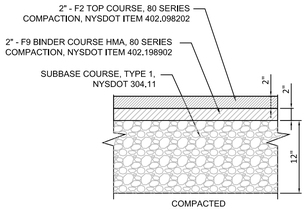
TYPICAL UTILITY RESTORATION SECTION AT MONOLITH

NOT TO SCALE



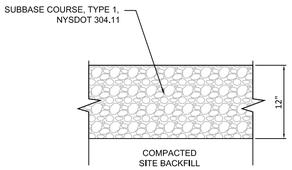
STONE LINED DRAINAGE SWALE

NOT TO SCALE



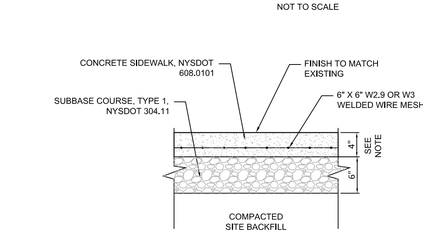
ASPHALT DRIVEWAY / PARKING LOT

NOT TO SCALE



GRAVEL DRIVEWAY / PARKING LOT

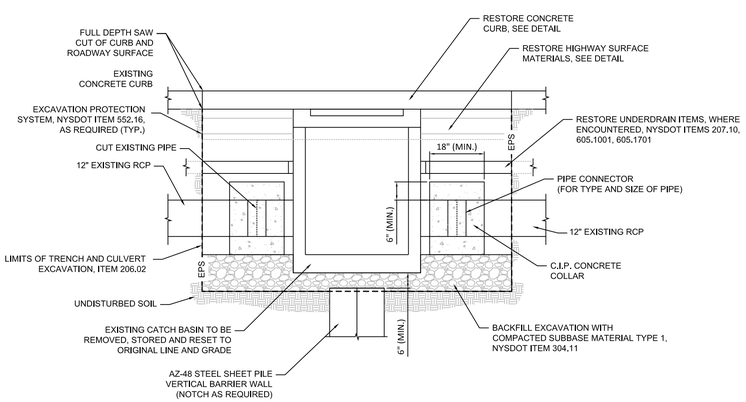
NOT TO SCALE



CONCRETE SIDEWALK

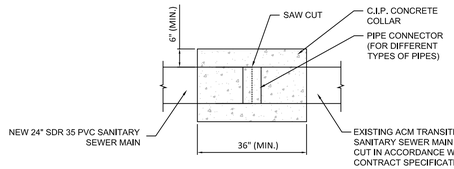
NOT TO SCALE

NOTE:
THE THICKNESS OF THE CONCRETE SIDEWALKS SHALL BE 4" IN AREAS OTHER THAN DRIVEWAYS AND 6" IN DRIVEWAYS.



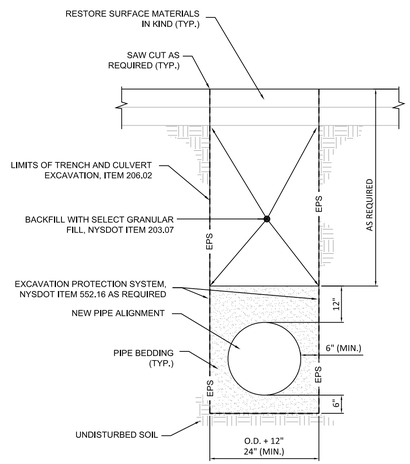
REMOVE AND RESET EXISTING CATCH BASIN DETAIL
(DR-12-30)

NOT TO SCALE



SANITARY SEWER CONNECTION DETAIL

NOT TO SCALE

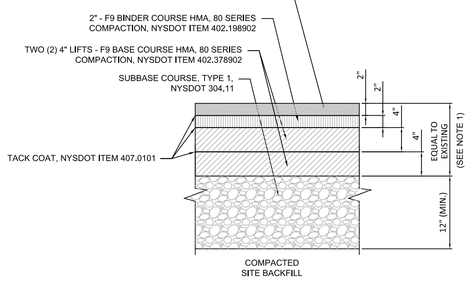


NOTE:

PIPE BEDDING FOR SANITARY SEWER PIPING SHALL BE #2 WASHED STONE

TYPICAL SANITARY SEWER PIPE TRENCH DETAIL
(NOT WITHIN ISS FOOTPRINT)

NOT TO SCALE



TYPICAL ROADWAY

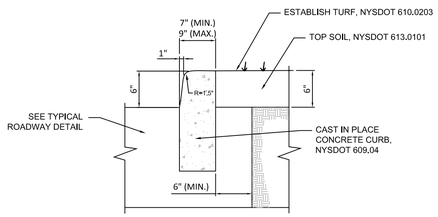
NOT TO SCALE

NOTES:

1) MINIMUM THICKENS AND TYPE OF MATERIALS SHOWN. IF EXISTING ROADWAY IS THICKER, CONTRACTOR SHALL REPLACE ACTUAL THICKNESS OF EXISTING ROADWAY BY ADDING THIRD LIFT OF ASPHALT BASE COURSE OF REQUIRED THICKNESS. (4" MAX. PER LIFT)

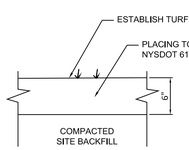
2) FULL DEPTH SAW CUT AND TACK COAT REQUIRED ON ALL EDGES.

3) ALL PAVEMENT MARKING SHALL BE RESTORED WHERE DISTURBED. NYSDOT ITEMS:
685.11 WHITE EPOXY REFLECTORIZED PAVEMENT STRIPES - 20 MILS
685.12 YELLOW EPOXY REFLECTORIZED PAVEMENT STRIPES - 20 MILS



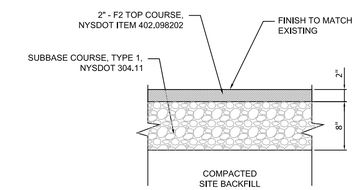
TYPICAL CIP CONCRETE CURB SECTION

NOT TO SCALE



TOP SOIL

NOT TO SCALE



ASPHALT SIDEWALK

NOT TO SCALE

VERIFY SCALE IF PLAN SHEET IS REDUCED — 1 INCH —

DESCRIPTION	DRN	CHK	DATE (M/D/Y)
REV			

DRN BY: KAM
DES BY: ---
CHK BY: ---
APP BY: ----

AECOM

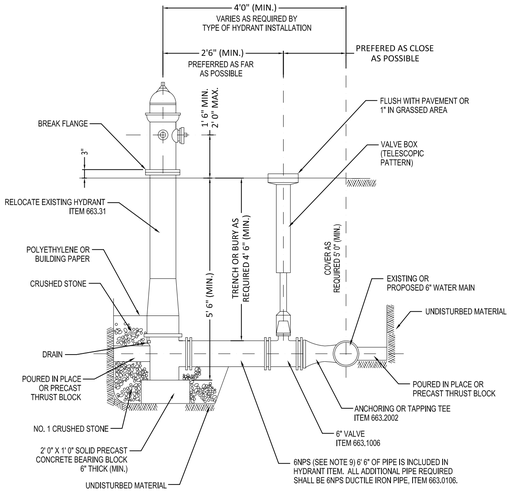
NYSEG - REMEDIAL DESIGN FOR FORMER CORTLAND-HOMER MGP SITE
HOMER, NEW YORK

DETAILS (2 OF 2)

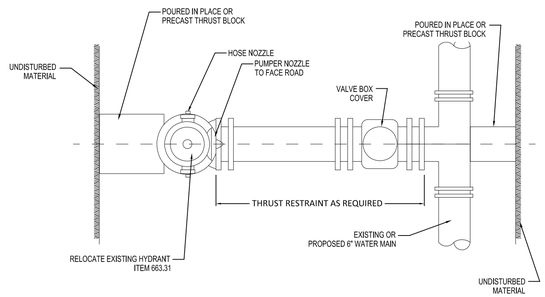
STATE OF NEW YORK — CARSTEN H. FLEMING — LICENSED PROFESSIONAL ENGINEER — 061261 — 7/7/12

PROJECT DATE (M / Y)	APRIL 2012
PROJECT NO.	102050 / 60189880
FILENAME	HOMER-ISS.dwg
SHEET NO.	20
DRAWING NO.	20

Plotted By: meisterk
Plot File Date Created: Apr/16/2012 3:23 PM
Layout-Sheet Name: DETAILS-2
Filename: L:\WORK\102050\CADD\NYSEG-HOMER\ROD-MOD-ISS\HOMER-ISS.DWG



SECTION



PLAN

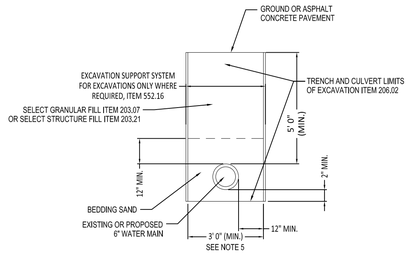
RELOCATE EXISTING HYDRANT
ITEM 663.31
NOT TO SCALE

SPECIAL HYDRANT ASSEMBLY MATERIAL NOTES:

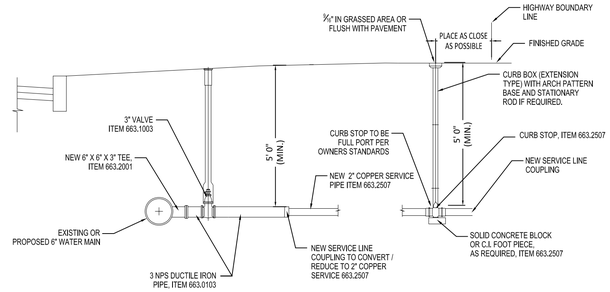
1) UNDER THE "RELOCATE EXISTING HYDRANT, ITEM 663.31" THE VILLAGE OF HOMER WILL SUPPLY ALL REQUIRED PIPING, VALVE, AND FITTINGS FOR A COMPLETE REPLACEMENT HYDRANT ASSEMBLY, AS DETAILED ABOVE, FOR THE CONTRACTOR TO INSTALL AS PART OF THIS CONTRACT. THIS COMPLETE REPLACEMENT HYDRANT ASSEMBLY WILL INCLUDE ALL RETAINER GLANDS, BOLTS AND RODDING IN ADDITION TO ANY 6 NPS PIPING REQUIRED TO INSTALL THE HYDRANT IN THE APPROXIMATE LOCATION SHOWN.

2) THE CONTRACTOR SHALL BE RESPONSIBLE FOR SUPPLYING ALL OTHER NON-FERRIS MATERIALS FOR THE INSTALLATION AND THRUST RESTRAINT OF THE HYDRANT AS DETAILED ABOVE.

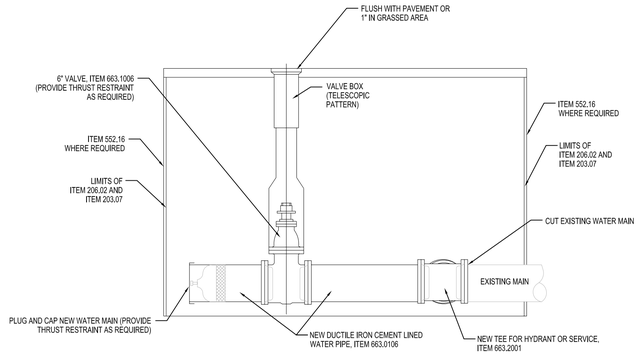
3) THE CONTRACTOR SHALL BE RESPONSIBLE UNLOADING THECOMPLETE REPLACEMENT HYDRANT ASSEMBLY ITEMS FROM VILLAGE VEHICLES AND LOADING THE OLD HYDRANT ASSEMBLY PARTS ONTO VILLAGE VEHICLES. THE CONTRACTOR SHALL COORDINATE THE DELIVERY AND PICK-UP TIMES WITH THE VILLAGE OF HOMER WATER DEPARTMENT.



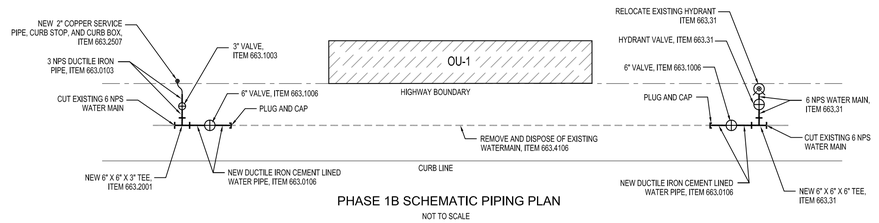
TYPICAL WATER MAIN TRENCH DETAIL
NOT TO SCALE



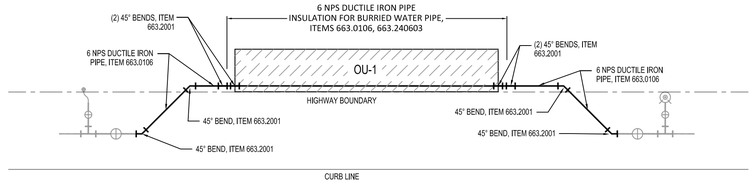
WATER SERVICE CONNECTION DETAIL
NOT TO SCALE



INSTALLATION OF VALVE AND
VALVE BOX ON NEW WATER MAIN
NOT TO SCALE



PHASE 1B SCHEMATIC PIPING PLAN
NOT TO SCALE



PHASE 7 FINAL INSTALLATION SCHEMATIC PIPING PLAN
NOT TO SCALE

NOTES:

1) PRIOR TO THE START OF PHASE 1B THE UNDERGROUND WATER MAIN ON THE WEST SIDE OF US ROUTE 11 SHALL BE REMOVED FROM SERVICE.

2) EXISTING 6 NPS DUCTILE IRON WATER MAIN TO BE EXCAVATED, CUT, TEE'S, VALVE'S, AND PIPING ADDED AS SHOWN, PLUGGED, CAPPED AND BACKFILLED AT THE APPROXIMATE LOCATIONS SHOWN ON THE PLANS.

3) WATER MAIN CAPS SHALL PROVIDE NO WATER LEAKAGE AT FULL OPERATING PRESSURE. WATER MAIN CAPS SHALL BE TESTED FOR LEAKAGE PRIOR TO BACKFILLING. CARE SHALL BE TAKEN NOT TO DISTURB THE PORTION(S) OF THE EXISTING WATER MAIN TO REMAIN.

4) VALVES AND CAPS SHALL BE RESTRAINED SEPARATELY AS TO ALLOW REMOVAL OF CAP FOR THE INSTALLATION OF THE REMAINING PORTION OF THE 6 NPS WATER MAIN DURING PHASE 7. RESTORATION OF THE PROJECT. COSTS TO BE INCLUDED IN THE WATER MAIN ITEMS

5) WATER LINES INSTALLED PARALLEL TO SEWER MAINS SHALL HAVE A MINIMUM OF 10'-0" HORIZONTAL SEPARATION (MEASURED EDGE OF PIPE TO EDGE OF PIPE) WHENEVER POSSIBLE. WHEN 10'-0" HORIZONTAL SEPARATION CANNOT BE MAINTAINED A VERTICAL SEPARATION OF AT LEAST 18" BETWEEN BOTTOM OF WATER MAIN AND TOP OF SEWER PIPE SHALL BE MAINTAINED.

6) REFER TO NYSDOT STANDARD SHEETS 663-1 THROUGH 663-7 FOR ADDITIONAL DETAILS AND NOTES.

7) THRUST BLOCKS REQUIRED FOR THE WATER MAINS SHALL BE INCLUDED UNDER THE WATER MAIN ITEMS.

8) THE COST OF FURNISHING AND INSTALLING BELL JOINT LEAK CLAMPS, IF REQUIRED, SHALL BE INCLUDED UNDER THE WATERMAIN ITEMS.

9) REFER TO NYSDOT STANDARD SHEET 663-1 FOR PAYMENT WIDTHS.

10) UPON COMPLETION OF ALL WATER SUPPLY RELATED CONSTRUCTION, ALL MAINS, VALVES, HYDRANTS AND OTHER APPURTENANCES BUILT UNDER THIS CONTRACT SHALL BE DISINFECTED, FLUSHED AND TESTED FOR BACTERIOLOGICAL QUALITY IN ACCORDANCE WITH AWWA C-651.

11) HYDROSTATIC TESTING SHALL CONFORM TO AWWA C-600 WITH THE MAINS THOROUGHLY FLUSHED PRIOR TO TESTING.

12) THE COST OF POLYETHYLENE OR BUILDING PAPER, CRUSHED STONE, THRUST BLOCKS, BEARING BLOCK OR ANY NECESSARY TIE BACKS OR STRAPPING REQUIRED TO PERFORM THE RELOCATION OF EXISTING HYDRANT SHALL BE INCLUDED UNDER ITEM 663.31.

13) ALL 6NPS CONNECTIONS EXCEPT WHERE NOTED ON THE PLANS, SHALL BE D.I.P. NO ADDITIONAL PAYMENT SHALL BE MADE FOR THIS WORK. THE COST SHALL BE INCLUDED UNDER ITEM 663.1301.

14) THE HYDRANT DRAIN HOLE SHALL BE PROVIDED AS DETAILED ON THIS SHEET.

15) THE HYDRANT DRAIN HOLE SHALL BE KEPT UNOBSTRUCTED. CARE SHOULD BE USED IN KEEPING THRUST RESTRAINTS FROM BLOCKING DRAIN HOLE.

16) THE DRAIN HOLE OPENING SHALL BE VERIFIED AFTER INSTALLATION.

17) A HYDRANT SHALL HAVE A MINIMUM 2'-0" CLEARANCE TO ANY WALL, POST, POLE OF ANY OTHER OBSTRUCTION WHICH MAY HAMPER PROPER USE OF HYDRANT.

18) WHERE A DISCREPANCY EXISTS BETWEEN NYSDOT SPECIFICATIONS AND/OR STANDARDS AND THE VILLAGE OF HOMER STANDARD WATER DETAILS, THE VILLAGE OF HOMER STANDARD WATER DETAILS SHALL GOVERN.

19) THE VILLAGE OF HOMER STANDARD WATER DETAILS ARE INCLUDED IN APPENDIX D OF THE CONTRACT SPECIFICATIONS.

20) SHOP DRAWINGS SHALL BE SUBMITTED AND APPROVED BY THE ENGINEER FOR ALL MECHANICAL JOINT SLEEVES AND COUPLINGS. ALL MATERIALS TO BE INSTALLED AS PER THE MANUFACTURER'S RECOMMENDATIONS.

21) EXCAVATION AND BACKFILL FOR THE COPPER SERVICE PIPE SHALL BE INCLUDED UNDER ITEM 206.02, TRENCH AND CULVERT EXCAVATION. TRENCH WIDTH SHALL BE 3'.0".

22) THE CONTRACTOR SHALL FURNISH AND INSTALL ANY NECESSARY NEW CURB BOX AND CURB STOPS UNDER ITEM 663.2507.

23) IF THE ENGINEER DETERMINES THAT TEMPORARY WATER SERVICES ARE NEEDED FOR WATER MAIN INSTALLATION, THE CONTRACTOR SHALL PROVIDE THE SERVICE A.O.B.E. NO ADDITIONAL PAYMENT WILL BE MADE FOR THIS ITEM.

24) REMOVAL AND DISPOSAL OF EXISTING WATER MAINS AND APPURTENANCES SHALL BE INCLUDED IN THE COST OF ITEM 206.02.

25) A COMPLETE HYDRANT ASSEMBLY WILL BE SUPPLIED BY THE VILLAGE OF HOMER FOR THE CONTRACTOR TO INSTALL. SEE SPECIAL HYDRANT ASSEMBLY MATERIAL NOTES, THIS SHEET.

26) PIPE BEDDING SHALL MEET THE REQUIREMENTS OF SUBBASE COURSE, TYPE1 NYSDOT ITEM 304.11.

27) ALL COST FOR THE CONNECTION OF THE NEW WATER MAIN TO THE EXISTING WATER MAIN, INCLUDING BUT NOT LIMITED TO ADDITIONAL SHORING, DEWATERING, MECHANICAL JOINT SLEEVES, COUPLINGS, AND ANY OTHER EQUIPMENT OR MATERIALS NECESSARY TO PERFORM THIS OPERATION SHALL BE INCLUDED IN ITEM 663.0110M DUCTILE IRON CEMENT LINED WATER PIPE.

REV	DESCRIPTION	DRN	CHK	DATE (M/D/Y)

VERIFY SCALE IF PLAN SHEET IS REDUCED — 1 INCH —

DRN BY: KAM
DES BY: ---
CHK BY: ---
APP BY: ---

AECOM

NYSEG - REMEDIAL DESIGN FOR
FORMER CORTLAND-HOMER MGP SITE
HOMER, NEW YORK

WATERLINE DETAILS

PROJECT DATE (M / Y)
APRIL 2012
PROJECT NO.
102050 / 60189880
FILENAME
HOMER-ISS.dwg
SHEET NO.
21
DRAWING NO.
21

Attachment B

Remedial Design Addendum: Special Note – Owner Requirements for Water and Sewer Appurtenances

Special Note
Owner Requirements for Water and Sewer Appurtenances

The following are the requirements of the owner of the water system for this contract. All manufacturer or proprietary material designations are the requirement of the Owner. Approval of an equal item other than that specified must be granted by the Owner.

Owner: Village of Homer, NY – Newton Water Works
Address: 31 North Main Street
City, State, Zip: 13072
Contact: Lawrence Barber
Phone #: (607)-749-2511

The Owner [~~does not~~] requires review and approval of materials and details. The estimated time required for approval by the Owner of the materials and details during construction is four weeks.

WATER MAIN:

PIPE REPLACEMENT:
Griffin slip joint CL52 with brass wedges.

VALVES:
Manufacturer: Kennedy

INSTALLATION:
6" base of Item 4 and 6" of Item 4 over top of pipe.

SEWER MAIN:

SEWER REPLACEMENT:
24" SDR 35--Metric 600--Average 24.803 O.D.-- Bell OD 27.290--L 11.125.

INSTALLATION:
6" base of #2 washed stone and 6" on top of pipe of washed #2 stone.

Attachment C

Concurrence Letter

Thorpe, Matthew

From: Genevieve Suits [mayorsuits@yahoo.com]
Sent: Thursday, June 21, 2012 11:43 AM
To: Thorpe, Matthew
Subject: proposed work

Matthew,

The Village of Homer is aware of the proposed work on the water and sewer mains as part of the remediation of the NYSEG former Manufactured Gas Plant on south main street. We are in approval of all the proposed work to be done.

Thank You,

Genevieve A. Suits

Mayor
Village of Homer, NY

Attachment D

Photograph Log

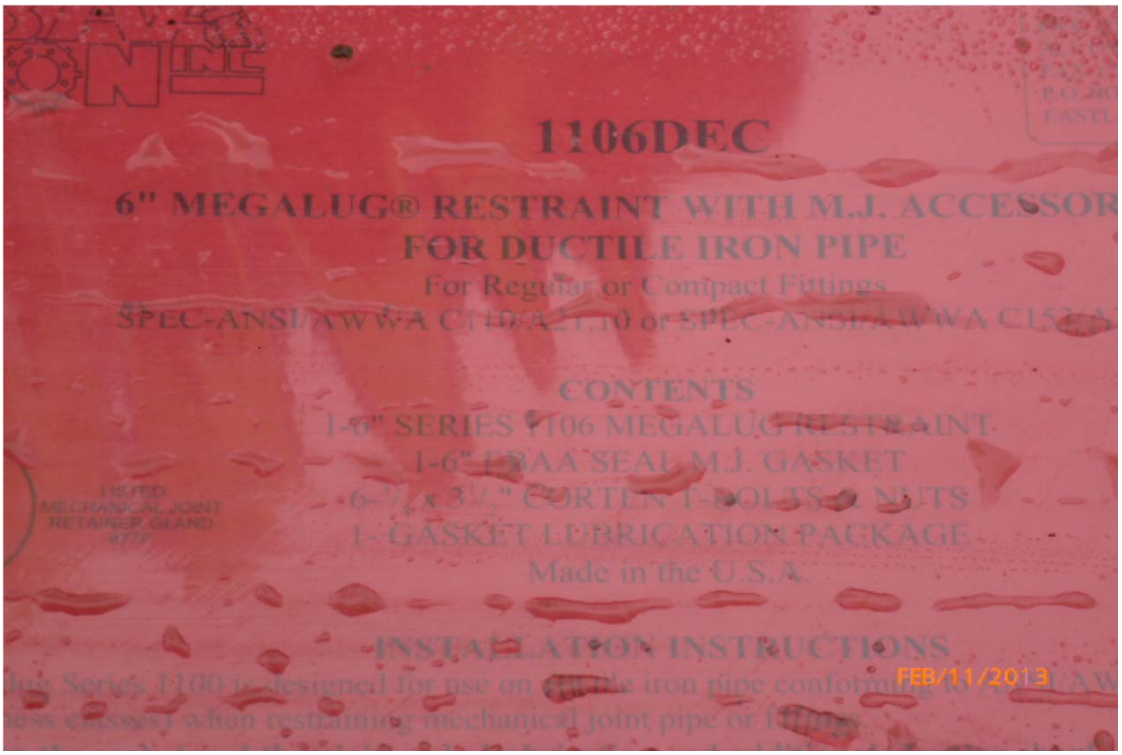


Photo #1: Joint restraint device product label.

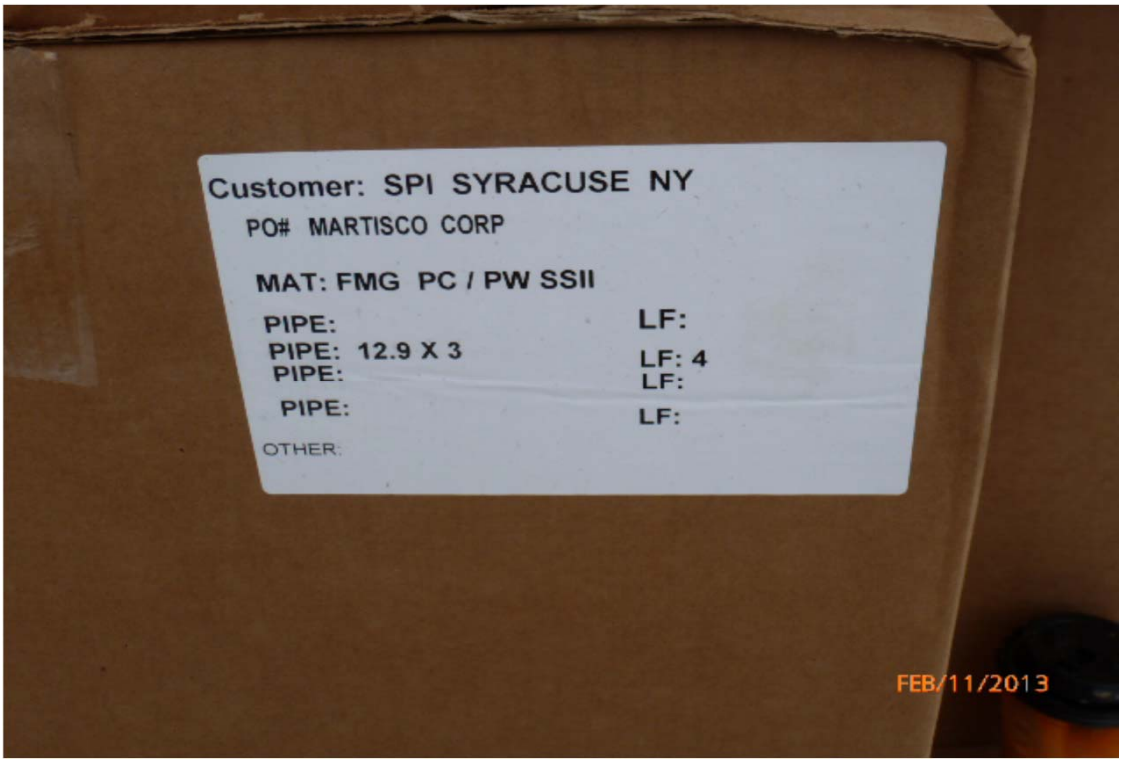


Photo #2: New water main insulation product label.

	Client: NYSEG
	Project: In-Situ Soil Solidification Project
	Site: Cortland-Homer Former MGP Site
	Site Location: Homer, New York

ARCADIS

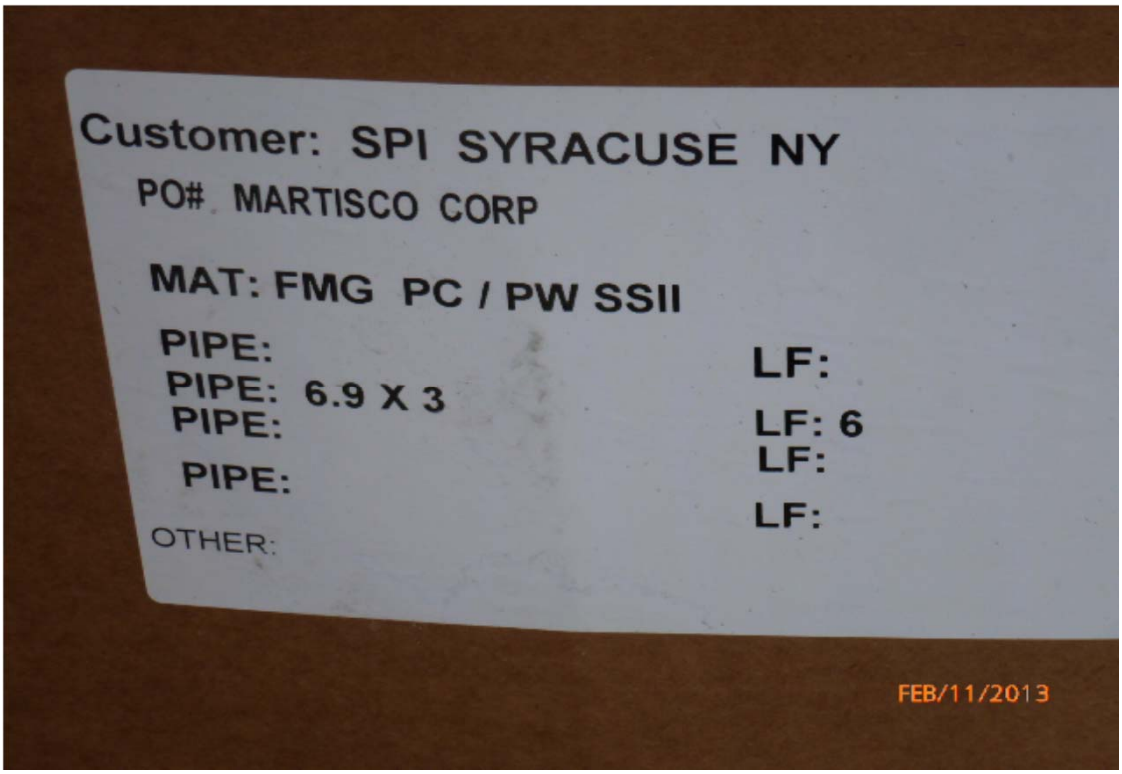


Photo #3: New water main insulation jacket product label.

Photo #4: Exposed original water main.

	Client: NYSEG
	Project: In-Situ Soil Solidification Project
	Site: Cortland-Homer Former MGP Site
	Site Location: Homer, New York

ARCADIS

Photo #5: Leak in the northern portion of the original water main.

Photo #6: New water maint "T" for water supply.

	Client: NYSEG
	Project: In-Situ Soil Solidification Project
	Site: Cortland-Homer Former MGP Site
	Site Location: Homer, New York

ARCADIS

Photo #7: Installing water main "T".

Photo #8 Water main excavation for installing new fire hydrant.

	Client: NYSEG
	Project: In-Situ Soil Solidification Project
	Site: Cortland-Homer Former MGP Site
	Site Location: Homer, New York

ARCADIS

Photo #9: Installation of the new fire hydrant.

Photo #10: Start of excavation for new water main installation at ID Booth.

	Client: NYSEG
	Project: In-Situ Soil Solidification Project
	Site: Cortland-Homer Former MGP Site
	Site Location: Homer, New York

ARCADIS

Photo #11: View of new water main to be installed and pipe wrapping.

Photo #12: View installation trench continuing south.

	Client: NYSEG
	Project: In-Situ Soil Solidification Project
	Site: Cortland-Homer Former MGP Site
	Site Location: Homer, New York

ARCADIS

Photo #13: Brass wedges installed at joints.

Photo #14: Field lock restraint used adjacent to 45-degree vertical bends.

Client:	NYSEG
Project:	In-Situ Soil Solidification Project
Site:	Cortland-Homer Former MGP Site
Site Location:	Homer, New York

ARCADIS

Photo #15: View of 45-degree fitting to bring water line above monolith.

Photo #16: Water main installation trench continuing south.

	Client: NYSEG
	Project: In-Situ Soil Solidification Project
	Site: Cortland-Homer Former MGP Site
	Site Location: Homer, New York

ARCADIS

Photo #17: Insulations used where the pipe is above the monolith.

Photo #18: Backfilling and compacting portion of water main installed over the monolith.

	Client: NYSEG
	Project: In-Situ Soil Solidification Project
	Site: Cortland-Homer Former MGP Site
	Site Location: Homer, New York

ARCADIS

Photo #19: Installation of tap to 2" line for chlorination/testing (north end).

Photo #20: View of coupling in center of monolith.

	Client: NYSEG
	Project: In-Situ Soil Solidification Project
	Site: Cortland-Homer Former MGP Site
	Site Location: Homer, New York

ARCADIS

Photo #21: Installation of insulation on 45 fitting.

Photo #22: View installation trench continuing south.

	Client: NYSEG
	Project: In-Situ Soil Solidification Project
	Site: Cortland-Homer Former MGP Site
	Site Location: Homer, New York

ARCADIS

Photo #23: View of pipe with wrapping and stone bedding.

Photo #24: Water in trench at south end near Natoli's.

	Client: NYSEG
	Project: In-Situ Soil Solidification Project
	Site: Cortland-Homer Former MGP Site
	Site Location: Homer, New York

ARCADIS

Photo #25: View of water in trench one hour after being excavated.

Photo #26: Pump used to add chlorinated water to the new water main.

	Client: NYSEG
	Project: In-Situ Soil Solidification Project
	Site: Cortland-Homer Former MGP Site
	Site Location: Homer, New York

ARCADIS

Photo #27: Grant Street collecting samples water samples.

Photo #28: Grant Street and the Village of Homer flushing the water line.

	Client: NYSEG
	Project: In-Situ Soil Solidification Project
	Site: Cortland-Homer Former MGP Site
	Site Location: Homer, New York

ARCADIS

Attachment E

Cut Sheets

Griffin Pipe Products Co.

ONE OF THE Amsted INDUSTRIES

Technical Data Sheet No. 120

9/1/93

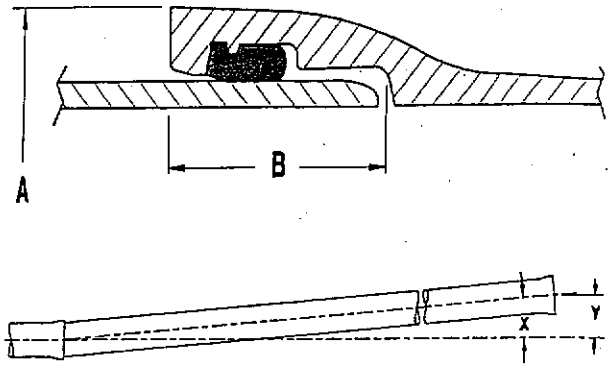
Martisco Corporation
PO 2067 Syracuse, NY
315-471-3181
Fax 315-471-4341

Ductile Iron Pipe
TYTON JOINT® Pipe
Thickness Class Designation

Specifications

Pipe shall be ductile iron manufactured in accordance with the requirements of ANSI/AWWA C151/A21.51. Push-on joints for such pipe shall be in accordance with ANSI/AWWA C111/A21.11. Pipe shall be Griffin or equal. Pipe thickness shall be designed in accordance with ANSI/AWWA C150/A21.50 and shall be based on laying conditions and internal pressure as specified in the project plans.

Pipe shall have cement mortar lining and seal coating, in accordance with ANSI/AWWA C104/A21.4.



Dimensions & Weights

Pipe Barrel							Laying Length 18 ft.		Laying Length 20 ft.	
Size	Thick. Class	Nom. Thick.	Nom. O.D.	A Bell O.D.	B Bell Depth	X Defl. Angle	Wt. Per Lgth.†	Y Max. Defl.	Wt. Per Lgth.†	Y Max. Defl.
in.		in.	in.	in.	in.	deg.	lb.	in.	lb.	in.
3	51	0.25	3.96	5.48	3.00	5	168	19		
	52	0.28	3.96	5.48	3.00	5	186	19		
	53	0.31	3.96	5.48	3.00	5	204	19		
	54	0.34	3.96	5.48	3.00	5	221	19		
	55	0.37	3.96	5.48	3.00	5	238	19		
	56	0.40	3.96	5.48	3.00	5	254	19		
4	51	0.26	4.80	6.52	3.15	5	214	19		
	52	0.29	4.80	6.52	3.15	5	236	19		
	53	0.32	4.80	6.52	3.15	5	258	19		
	54	0.35	4.80	6.52	3.15	5	280	19		
	55	0.38	4.80	6.52	3.15	5	301	19		
	56	0.41	4.80	6.52	3.15	5	321	19		
6	50	0.25	6.90	8.66	3.38	5	304	19	336	21
	51	0.28	6.90	8.66	3.38	5	337	19	372	21
	52	0.31	6.90	8.66	3.38	5	370	19	409	21
	53	0.34	6.90	8.66	3.38	5	402	19	445	21
	54	0.37	6.90	8.66	3.38	5	434	19	481	21
	55	0.40	6.90	8.66	3.38	5	466	19	516	21
	56	0.43	6.90	8.66	3.38	5	497	19	551	21
8	50	0.27	9.05	10.82	3.69	5	431	19	477	21
	51	0.30	9.05	10.82	3.69	5	475	19	526	21
	52	0.33	9.05	10.82	3.69	5	519	19	574	21
	53	0.36	9.05	10.82	3.69	5	562	19	622	21
	54	0.39	9.05	10.82	3.69	5	605	19	670	21
	55	0.42	9.05	10.82	3.69	5	648	19	718	21
	56	0.45	9.05	10.82	3.69	5	691	19	765	21
10	50	0.29	11.10	12.91	3.75	5	569	19	630	21
	51	0.32	11.10	12.91	3.75	5	624	19	690	21
	52	0.35	11.10	12.91	3.75	5	678	19	750	21
	53	0.38	11.10	12.91	3.75	5	732	19	810	21
	54	0.41	11.10	12.91	3.75	5	785	19	870	21
	55	0.44	11.10	12.91	3.75	5	839	19	929	21
	56	0.47	11.10	12.91	3.75	5	892	19	988	21

NOTE: 12" THRU 24"
continued on back.

TYTON JOINT® is a registered trademark of U.S. Pipe and Foundry Co.

MARTISCO CORPORATION
P.O. BOX 2067
SYRACUSE, NY 13220
(315) 471-3181

Suggested Specifications for Griffin Products

Ductile Iron Push-On Joint and Mechanical Joint Pipe

- Pipe shall be Griffin ductile iron with **TYTON® JOINT** or **FASTITE® JOINT** (as applicable for pipe size).
- Pipe shall be manufactured in accordance with the requirements of: ANSI/AWWA C151/A21.51 Ductile Iron Pipe, Centrifugally Cast, for Water or Other Liquids.
- Pipe shall be manufactured in accordance with the requirements of: ANSI/AWWA C111./A21.11 Rubber Gasket Joints for Ductile Iron Pressure Pipe and Fittings.
- Pipe thickness shall be designed in accordance with the requirements of: ANSI/AWWA C150/A21.50 Thickness Design of Ductile Iron Pipe and shall be based on laying conditions and internal pressure as specified in the project plans.
- Pipe shall have cement mortar lining and seal coating, unless otherwise specified, in accordance with the requirements of: ANSI/AWWA C104/A21.4 Cement Mortar Lining for Ductile Iron Pipe and Fittings for Water.

SNAP-LOK™ and BOLT-LOK™ Restrained Joint Pipe

In addition to the requirements listed above for Ductile Iron Push-On Joint and Mechanical Joint Pipe,

- Pipe shall be Griffin **SNAP-LOK™** Push-On Restrained Joint Pipe or equivalent.
- Pipe shall be in compliance with the minimum thickness requirements for the following classes:
  6" - 24" pipe sizes shall be pressure class 350 or thickness class 50 and heavier.
  30" - 36" pipe sizes shall be pressure class 250 or thickness class 50 and heavier.
  42" - 48" pipe sizes shall be pressure class 200 or 250 or thickness class 50 and heavier.
- Restrained joints for pipe shall be designed for working pressures of:
  350 psi for 6" - 24" pipe sizes.
  250 psi for 30" - 48" pipe sizes.
- **SNAP-LOK™** pipe shall be capable of being deflected, after assembly, as follows:
  4° for pipe sizes 6" - 12"
  3° for pipe sizes 14" - 24"
  2° for pipe sizes 30" - 36"
  1/2° for pipe sizes 42" - 48"
- **BOLT-LOK™** pipe shall be capable of being deflected, after assembly, as follows:
  4° for pipe sizes 4" - 12"
  3° for pipe sizes 14" - 16"
  2.5° for pipe sizes 18" - 20"
  2° for pipe size 24"

GRIFFIN PIPE PRODUCTS CO.
1100 WEST FRONT STREET • FLORENCE, NJ 08518
PHONE: (609) 499-1400 FAX (609) 499-4868

Martisco Corporation
PO Box 2067 / Syracuse, NY
315-471-3181
Fax 315-471-4341

To Whom It May Concern:

This letter serves to certify that all pipe produced by Griffin Pipe Products Company is double cement lined, unless otherwise specified when placing an order.
The Double Cement Lining thicknesses are as follows:

Pipe Size	Double Cement Lining Thickness
6" to 12"	1/8"
14" to 24"	3/16"
30" to 48"	1/4"

Each piece of pipe is stenciled "DCL" to signify Double Cement Lining thickness.

Should you need any additional information, or have any questions please feel free to call my direct extension (609) 499-7124.

Sincerely,

Steven M. Freed, P.E.
Product Engineer
Griffin Pipe Products Company

MARTISCO CORPORATION
P.O. BOX 2067
SYRACUSE, NY 13220
(315) 471-3181

The material shall also exhibit the following properties when tested under NYSDOT Test Method 701-13F:

- A minimum one hour compressive strength of 17 MPa, a 24 hour strength of 24 MPa, and a 28 day strength of 35 MPa.
- Be able to withstand 50 cycles of freeze-thaw (10% NaCl solution) with a maximum loss of 4%.

Primer. The primer shall be a two component methyl methacrylate resin system capable of enhancing the bond between the polymer concrete and the substrate. It shall have a curing time of 20 to 60 minutes at temperatures between 2°C and 40°C inclusive.

Flammability. The polymer concrete shall not support or sustain combustion within five (5) minutes after mixing.

PACKAGING. The material delivered from the manufacturer shall be in moisture proof bags and the contents shall weigh within ±3% of the labeled bag weight. The manufacturer's name, address, date of manufacture and mixing instructions shall be printed on each bag.

BASIS OF ACCEPTANCE. Application for material approval shall be submitted to the Director of the Materials Bureau accompanied by at least a 25 kg, production run, sample of material. Upon approval, the name of the product will be placed on the Department's Approved List. Products so listed will be acceptable at the work site on the basis of the brand name labeled on the container. The Department reserves the right to sample and test the material at any time.

SECTION 722 - WATER SUPPLY

722-01 DUCTILE IRON WATER PIPE, FITTINGS AND ENCASEMENT

SCOPE. This specification covers the material and quality requirements for ductile iron water pipe, miscellaneous fittings, coatings and encasement.

GENERAL. Ductile iron water pipe, fittings and encasement shall conform to the requirements of the following:

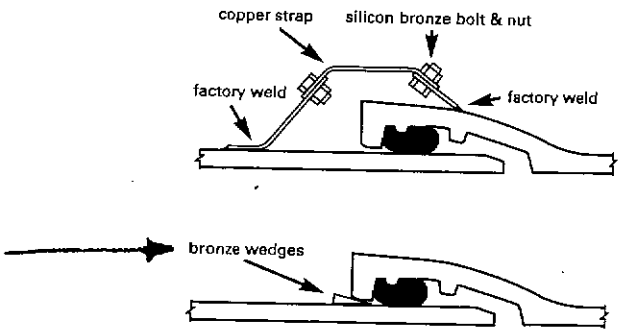
Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water	AWWA C104 / ANSI A21.4
Polyethylene Encasement for Ductile-Iron Pipe Systems	AWWA C105 / ANSI A21.5
Ductile Iron and Gray Iron Fittings, 3 NPS through 48 NPS for Water	AWWA C110 / ANSI A21.10
Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings	AWWA C111 / ANSI A21.11
Flanged Ductile-Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges	AWWA C115 / ANSI A21.15
Protective Fusion-Bonded Epoxy Coating for the Interior and Exterior Surfaces of Ductile-Iron and Gray-Iron Fittings for Water Supply Service	AWWA C116 / ANSI A21.16
Thickness Design of Ductile-Iron Pipe	AWWA C150 / ANSI A21.50
Ductile-Iron Pipe, Centrifugally Cast, for Water	AWWA C151 / ANSI A21.51
Ductile-Iron Compact Fittings, 3 NPS through 24 NPS and 54 NPS through 64 NPS, for Water Service	AWWA C153 / ANSI A21.53

BASIS OF ACCEPTANCE. Ductile iron water pipe and fittings will be accepted on the basis of the Manufacturer's certification that the material conforms to this specification. The certification for iron fittings shall list a fitting description, quantity, bare fitting weight and source, (AWWA Standard C110, C153 or Manufacturer, if fitting is not listed in either standard). The certification shall accompany the material delivered to the project site.

The Department reserves the right to sample and test this material subsequent to delivery at the project site.

Conductivity

TYTON AND FASTITE JOINT Pipe

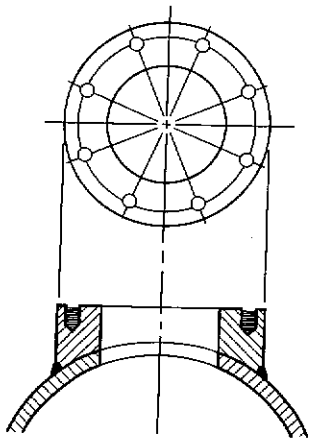


Two serrated silicon bronze wedges are inserted in the bell after joint assembly, 180° apart at three and nine o'clock.

The TYTON® gasket and Mechanical Joint gasket act as insulators. Therefore, means must be provided to conduct electricity where electrical thawing, cathodic protection or a grounding system is required. Griffin offers several methods: copper conductivity straps and bronze wedges for TYTON JOINT 6"-24" - FASTITE JOINT 30"-48" pipe; copper conductivity straps for mechanical joints.

MARTISCO CORPORATION
P.O. BOX 2067
SYRACUSE, NY 13220
(315) 471-3181

Welded-on Side Outlet Bosses



Ductile iron boss for ASA 125# flanges

Griffin's factory welded-on bosses provide economical flanged or mechanical joint outlets at any location along the pipe barrel. Special fittings can be eliminated.

Pipe Size	Side outlet Size
16"	4"
18"	4" or 6"
20"	4", 6", or 8"
24"	4", 6", 8", or 10"

Pipe thickness Class 54 or greater is required. Location of boss as specified by customer may be within the range of 1½ ft. from the bell end to 4 ft. from the spigot end of the pipe. Furnished with or without cement mortar lining. Pressure rating 250 psi maximum. Field cutting is not recommended.

NOTE: Additional configurations of welded-on side outlet bosses are available. Contact product engineer at nearest plant for more details. (See back of brochure for contact information.)

Martisco Corporation
PO Box 2067 / Syracuse, NY
315-471-3181
Fax 315-471-4341

Compact MJ Fittings

ANSI/AWWA C153/A21.53

2" - 64" DUCTILE IRON MECHANICAL JOINT COMPACT FITTINGS

GENERAL SPECIFICATIONS

MATERIAL: Ductile Iron per ASTM A536

PRESSURE: 350 PSI rating for 3" - 24" sizes, 250 PSI rating for 30" - 48" sizes and 150 PSI rating for 54" - 60" sizes

TESTING: In accordance with ANSI/AWWA C153/A21.53 and UL requirements

LAYING LENGTH: In accordance with ANSI/AWWA C153/A21.53 (fittings not listed in ANSI/AWWA have dimensions per Star design as noted in the catalog)

WEIGHTS: Are in pounds, unless noted otherwise and do not include accessories, cement lining and coating

FLANGES: Flanged ends on fittings match ANSI/AWW C115/A21.15 and ANSI B16.1 class 125 flanges

CEMENT LINING: In accordance with ANSI/AWWA C104/A21.4 -- size 2" - 3" single thickness ond sizes 4" - 64" double thickness

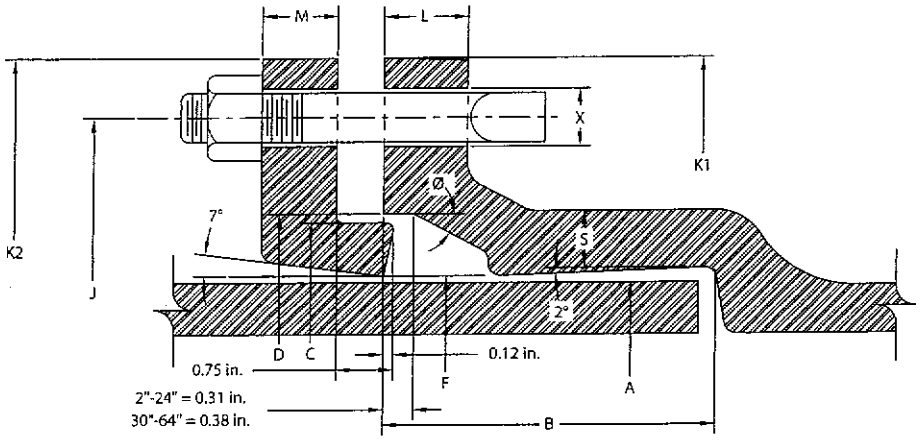
COATING: Asphaltic seal coat inside and out in accordance with ANSI/AWWA C104/A21.4

GASKETS: SBR in accordance with ANSI/AWWA C111/A21.11 (see pg. 17)

T-BOLTS/NUTS: Low alloy steel in accordance with ANSI/AWWA C111/A21.11 (see pg. 16)

APPROVALS: 4" - 12" Underwriters Laboratories Listed
3" and greater are UL/NSF-61

DIMENSIONS: All dimensions are in inches unless noted otherwise



AWWA MEMBER

CLASSIFIED UL WATER QUALITY

MECHANICALJOINT DIMENSIONS

	NOM. SIZE	A DIA.	B	C DIA.	D DIA.	F DIA.	J DIA.	K1 DIA.	K2 DIA.	L	M	S	Ø	X DIA.	BOLTS SIZE	BOLTS NO.
★	2	2.50	2.50	3.39	3.50	2.61	4.75	6.19	6.25	0.58	0.62	0.36	28°	¾	⅝ x 3	2
	3	3.96	2.50	4.84	4.94	4.06	6.19	7.62	7.69	0.58	0.62	0.39	28°	¾	⅝ x 3	4
	4	4.80	2.50	5.92	6.02	4.90	7.50	9.06	9.12	0.60	0.75	0.39	28°	⅞	¾ x 3 ½	4
	6	6.90	2.50	8.02	8.12	7.00	9.50	11.06	11.12	0.63	0.88	0.43	28°	⅞	¾ x 3 ½	6
	8	9.05	2.50	10.17	10.27	9.15	11.75	13.31	13.37	0.66	1.00	0.45	28°	⅞	¾ x 3 ½	6
	10	11.10	2.50	12.22	12.34	11.20	14.00	15.62	15.62	0.70	1.00	0.47	28°	⅞	¾ x 4	8
	12	13.20	2.50	14.32	14.44	13.30	16.25	17.88	17.88	0.73	1.00	0.49	28°	⅞	¾ x 4	8
	14	15.30	3.50	16.40	16.54	15.44	18.75	20.25	20.25	0.79	1.25	0.55	28°	⅞	¾ x 4 ½	10
	16	17.40	3.50	18.50	18.64	17.54	21.00	22.50	22.50	0.85	1.31	0.58	28°	⅞	¾ x 4 ½	12
	18	19.50	3.50	20.60	20.74	19.64	23.25	24.75	24.83	1.00	1.38	0.68	28°	⅞	¾ x 4 ½	12
	20	21.60	3.50	22.70	22.84	21.74	25.50	27.00	27.08	1.02	1.44	0.69	28°	⅞	¾ x 4 ½	14
	24	25.80	3.50	26.90	27.04	25.94	30.00	31.50	31.58	1.02	1.56	0.75	28°	⅞	¾ x 5	16
	30	32.00	4.00	33.29	33.46	32.17	36.88	39.12	39.12	1.31	2.00	0.82	20°	1 ⅛	1 x 6	20
	36	38.30	4.00	39.59	39.76	38.47	43.75	46.00	46.00	1.45	2.00	1.00	20°	1 ⅛	1 x 6	24
	42	44.50	4.00	45.79	45.96	44.67	50.62	53.12	53.12	1.45	2.00	1.25	20°	1 ⅜	1 ¼ x 6 ½	28
	48	50.80	4.00	52.09	52.26	50.97	57.50	60.00	60.00	1.45	2.00	1.35	20°	1 ⅜	1 ¼ x 6 ½	32
★	54	*{ Dimensions Available On Request }*														
★	60															
★	64															

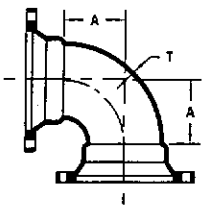
★Not Included in AWWA C153

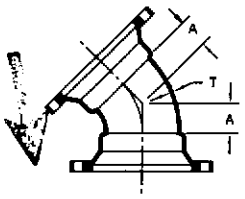
FM Approvals ISO 9001:2000

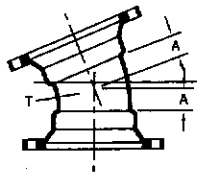
Compact MJ Fittings

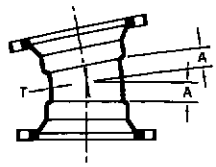
ANSI/AWWA C153/A21.53

Martisco Corporation
PO Box 2067 / Syracuse, NY
315-471-3181
Fax 315-471-4341

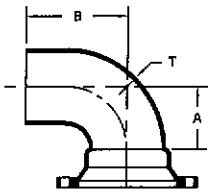


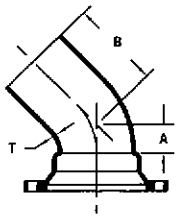


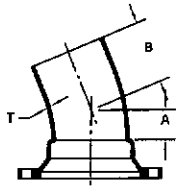


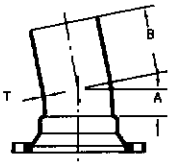


MJ x MJ BENDS		90° MJ x MJ BENDS (1/4)		45° MJ x MJ BENDS (1/8)		22 1/2° MJ x MJ BENDS (1/16)		11 1/4° MJ x MJ BENDS (1/32)	
NOM. SIZE	T	A	WT (LBS.)	A	WT (LBS.)	A	WT (LBS.)	A	WT (LBS.)
★ 2	0.30	3.25	14	1.80	13	1.00	9	1.00	8
3	0.33	3.50	23	1.50	21	1.00	16	1.00	14
4	0.34	4.00	27	2.00	23	1.50	18	1.25	16
6	0.36	5.00	39	3.00	32	2.00	32	1.50	30
8	0.38	6.50	57	3.50	46	2.50	46	1.75	42
10	0.40	7.50	89	4.50	70	3.00	64	2.00	58
12	0.42	9.00	108	5.50	86	3.50	84	2.25	74
14	0.47	11.50	180	5.00	145	3.75	140	2.50	128
16	0.50	12.50	264	5.50	202	3.75	178	2.50	148
18	0.54	14.00	335	6.00	250	4.50	255	3.00	205
20	0.57	15.00	400	7.00	305	4.50	262	3.00	245
24	0.61	17.00	565	7.50	405	4.50	412	3.00	315
30	0.66	21.50	1005	11.50	798	6.75	665	4.75	606
36	0.74	24.50	1562	11.50	1164	7.75	960	5.00	840
42	0.82	29.25	2506	14.00	1792	9.00	1350	6.00	1319
48	0.90	33.25	3045	15.00	2390	10.00	1886	6.50	1700
★ 54									
★ 60		*{ Dimensions Available On Request }*							
★ 64									









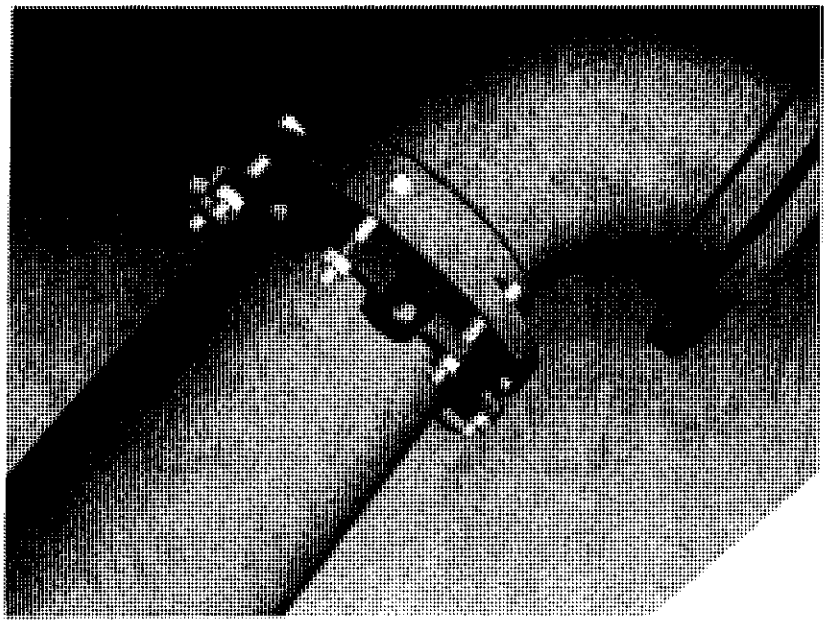
MJ x PE BENDS		90° MJ x PE BENDS (1/4)			45° MJ x PE BENDS (1/8)			22 1/2° MJ x PE BENDS (1/16)			11 1/4° MJ x PE BENDS (1/32)		
NOM. SIZE	T	A	B	WT (LBS.)	A	B	WT (LBS.)	A	B	WT (LBS.)	A	B	WT (LBS.)
3	0.33	3.50	8.50	16	1.50	7.00	13	1.00	6.50	12	1.00	6.50	12
4	0.34	4.00	9.50	22	2.00	7.50	19	1.50	7.00	18	1.25	6.25	17
6	0.36	5.00	12.00	40	3.00	8.50	31	2.00	7.50	29	1.50	7.00	27
8	0.38	6.50	12.50	61	3.50	9.00	46	2.50	8.00	43	1.75	7.25	39
10	0.40	7.50	13.00	83	4.50	10.00	68	3.00	8.50	61	2.00	7.50	52
12	0.42	9.00	14.50	114	5.50	11.00	95	3.50	9.00	81	2.25	7.75	70
14	0.47	11.50	19.50	197	5.00	13.00	148	3.75	11.25	133	2.50	10.50	122
16	0.50	12.50	20.50	248	5.50	13.50	184	3.75	11.75	166	2.50	10.50	148
18	0.54	14.00	21.00	325	6.00	13.00	235	6.00	13.00	235	6.00	13.00	235
20	0.57	15.00	22.50	390	7.00	14.00	300	7.00	14.00	300	7.00	14.00	300
24	0.61	17.00	25.00	575	7.50	14.50	390	7.50	14.50	395	7.50	14.50	400
30	0.66	22.75	31.75	865	10.50	19.50	715	6.75	15.75	600	4.75	13.75	535
36	0.74	24.50	33.50	1355	12.00	21.00	1040	7.75	16.75	865	5.00	14.00	725
42	0.82	29.25	38.25	2055	14.00	23.00	1460	9.00	18.00	1200	6.00	15.00	1030
48	0.90	33.25	4225	2805	15.00	24.00	1905	10.00	19.00	1575	6.50	15.50	1290

★Not Included in AWWA C153

EBAA IRON INC
Your Connection to the Future™

MEGALUG® Series 1100

Mechanical Joint Restraint for Ductile Iron Pipe



Nominal Pipe Size	Series Number	Shipping Weights	Post Assembly Deflection	Pressure Rating (PSI)
3	1103	6.1	3°	350
4	1104	7.7	3°	350
6	1106	11.9	3°	350
8	1108	14.8	3°	350
10	1110	23.9	3°	350
12	1112	31.2	3°	350
14	1114	48.5	2°	350
16	1116	56.4	2°	350
18	1118	63.1	1½°	250
20	1120	72.3	1½°	250
24	1124	133.1	1½°	250
30	1130	194.6	1°	250
36	1136	234.0	1°	250
42	1142	536.0	1°	250
48	1148	653.0	1°	250

NOTE: For applications or pressures other than those shown please contact EBAA for assistance.

Features and Applications:

- Sizes 3 inch through 48 inch
- Constructed of ASTM A536 Ductile Iron
- Torque Limiting Twist-Off Nuts
- MEGA-BOND®
  Restraint Coating System
  For more information on MEGA-BOND, refer to www.ebaa.com
- The Mechanical Joint Follower Gland is incorporated into the restraint
- Heavy Duty thick wall design
- Support Products Available:
  Split repair style available 3 inch through 48 inch.
  EBAA Series 1100SD

  Solid restraint harness available for push-on pipe bells.
  EBAA Series 1700

  Split restraint harness available for existing push-on bells.
  EBAA Series 1100HD
- All MEGALUG and related restraint products can be furnished as packaged accessories complete with appropriate restraint, gasket, lubrication, and bolting hardware
- For use on water or wastewater pipelines subject to hydrostatic pressure and tested in accordance with either AWWA C600 or ASTM D2774

Made In The USA

U.S. Patent Nos.
4092036, 4627774, 4779900, 4896903, 5544922

Martisco Corporation
PO Box 2067 / Syracuse, NY
315-471-3181
Fax 315-471-4341

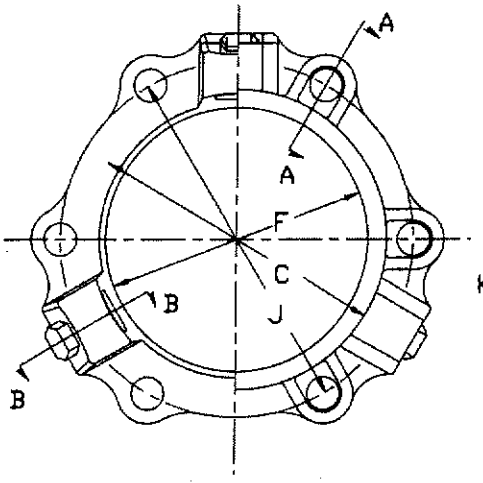
0910-5-H

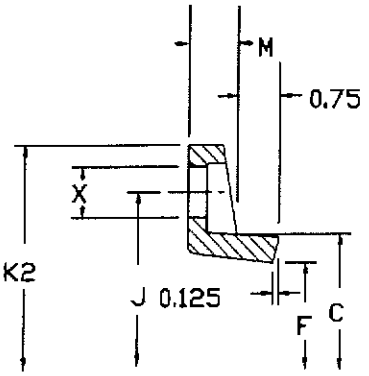
Martisco Corporation
PO Box 2067 / Syracuse, NY
315-471-3181
Fax 315-471-4341

Series 1100 Submittal Reference Drawing

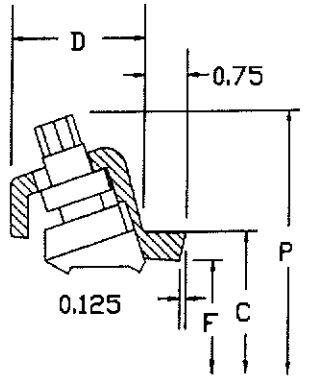
EBAA IRON

MADE IN USA





SECTION A-A



SECTION B-B

Nominal Pipe Size	Series Number	C	D	F	M	P*	X	J	K2	Wedge QTY.	Bolt QTY.	Weight (LBS.)	Pressure Rating (PSI)
3	1103	4.48	2.27	4.06	0.62	9.06	0.750	6.19	7.69	2	4	6.1	350
4	1104	5.92	2.27	4.90	0.75	9.90	0.875	7.50	9.12	2	4	7.6	350
6	1106	8.02	2.27	7.00	0.88	12.00	0.875	9.50	11.12	3	6	11.8	350
8	1108	10.17	2.31	9.15	1.00	14.15	0.875	11.75	13.37	4	6	14.9	350
10	1110	12.22	2.37	11.20	1.00	16.20	0.875	14.00	15.62	6	8	23.9	350
12	1112	14.32	2.37	13.30	1.25	18.30	0.875	16.25	17.88	8	8	31.2	350
14	1114	16.40	2.69	15.44	1.50	20.94	0.875	18.75	20.25	10	10	49.7	350
16	1116	18.50	2.69	17.54	1.56	22.90	0.875	21.00	22.50	12	12	56.4	350
18	1118	20.60	2.69	19.64	1.63	25.00	0.875	23.25	24.75	12	12	63.6	250
20	1120	22.70	2.69	21.74	1.69	27.10	0.875	25.50	27.00	14	14	71.0	250
24	1124	26.90	3.20	25.94	1.81	32.64	0.875	30.00	31.50	16	16	128.7	250
30	1130	33.29	3.20	32.17	2.25	38.87	1.125	36.88	39.12	20	20	190.7	250
36	1136	39.59	3.20	38.47	2.25	45.17	1.125	43.75	46.00	24	24	226.5	250
42	1142	45.79	4.56	44.67	3.88	55.57	1.375	50.62	53.48	28	28	518.9	250
48	1148	52.09	4.56	50.97	3.88	61.87	1.375	57.50	60.36	32	32	608.3	250

* With Twist-Off Nuts twisted off.

NOTE: Dimensions are in inches and are subject to change without notice.

Important Notes

Mechanical Joint Restraint Sample Specifications

(The text of the specifications below can be copied pasted from www.ebaa.com/download/1100Spec.DOC)

Restraint devices for mechanical joint fittings and appurtenances conforming to either ANSI/AWWA C111/A21.11 or ANSI/AWWA C153/A21.53, shall conform to the following:

Design
Restraint devices for nominal pipe sizes 3 inch through 48 inch shall consist of multiple gripping wedges incorporated into a follower gland meeting the applicable requirements of ANSI/AWWA C110/A21.10.

The devices shall have a working pressure rating of 350 psi for 3-16 inch and 250 psi for 18-48 inch. Ratings are for water pressure and must include a minimum safety factor of 2 to 1 in all sizes.

Material
Gland body, wedges and wedge actuating components shall be cast from grade 65-45-12 ductile iron material in accordance with ASTM A536.

For applications requiring restraint 30 inch and greater, an alternate grade of iron meeting the material requirements of ASTM A536 is acceptable, providing the device meets all end product performance requirements.

Ductile iron gripping wedges shall be heat treated within a range of 370 to 470 BHN.

Three (3) test bars shall be incrementally poured per production shift as per Underwriter's Laboratory (U.L.) Specifications and ASTM A536. Testing for tensile, yield and elongation shall be done in accordance with ASTM E8.

Chemical and nodularity tests shall be performed as recommended by the Ductile Iron Society, on a per ladle basis.

Traceability
An identification number consisting of year, day, plant and shift (YYDDD)(plant designation)(Shift number), shall be cast into each gland body.

All physical and chemical test results shall be recorded such that they can be accessed via the identification number on the casting. These Material Traceability Records (MTR's) are to be made available, in hard copy, to the purchaser that requests such documentation and submits his gland body identification number.

Production pieces that are too small to accommodate individual numbering, such as fasteners and wedges, shall be controlled in segregate inventory until such time as all quality control tests are passed. These component parts may then be released to a general inventory for final assembly and packaging.

All components shall be manufactured and assembled in the United States. The purchaser shall, with reasonable notice, have the right to plant visitation at his/her expense.

Installation
Mechanical joint restraint shall require conventional tools and installation procedures per AWWA C600, while retaining full mechanical joint deflection during assembly as well as allowing joint deflection after assembly.

Proper actuation of the gripping wedges shall be ensured with torque limiting twist off nuts.

Approvals
Restraint devices shall be Listed by Underwriters Laboratories (3" through 24" inch size) and Approved by Factory Mutual (3" through 12" inch size).

Mechanical joint restraint for ductile iron pipe shall be Megalug Series 1100 produced by EBAA Iron Inc. or approved equal.

MEGA-BOND® Restraint Coating System
All wedge assemblies and related parts shall be processed through a phosphate wash, rinse and drying operation prior to coating application. The coating shall consist of a minimum of two coats of liquid thermoset epoxy coating with heat cure to follow each coat.

All casting bodies shall be surface pretreated with a phosphate wash, rinse and sealer before drying. The coating shall be electrostatically applied and heat cured. The coating shall be a polyester based powder to provide corrosion, impact and UV resistance.

The coating system shall be MEGA-BOND by EBAA Iron, Inc. or approved equal. Requests for approved equal must submit coating material and process details for review prior to bid.

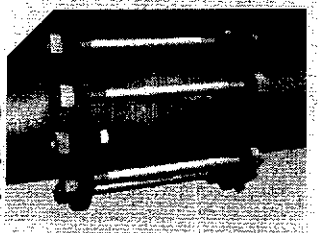
Martisco Corporation
PO Box 2067 / Syracuse, NY
315-471-3181
Fax 315-471-4341

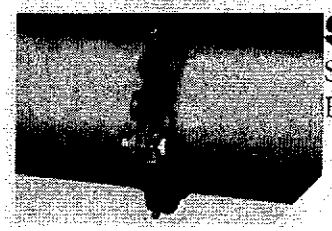
Support Products

for more information concerning these products please consult the catalog or www.ebaa.com

Series 1100SD
Split MEGALUG Restraint
For Existing Mechanical Joints

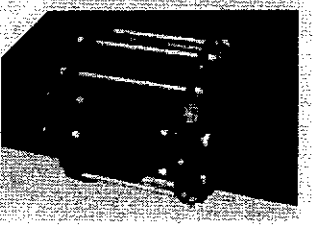
Series 1700
MEGALUG Restraint Harness
For Push-On Bell Joints





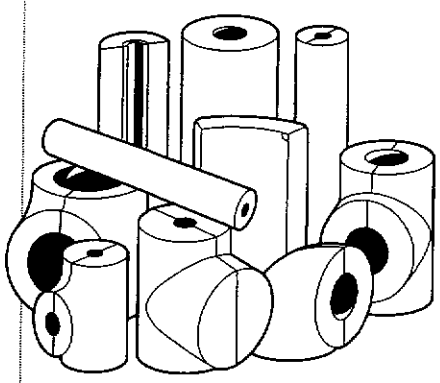
Series 1100SDB
Split MEGALUG Restraint
For Mid-Span Applications

Series 1100HD
Split MEGALUG Restraint
Harness for Existing Push-On Bells



Martisco Corporation
PO 2067 / Syracuse, NY
315-471-3181
Fax 315-471-4341

FOAMGLAS® INSULATION BY PITTSBURGH CORNING



Pittsburgh Corning Corporation has been actively involved in underground insulation systems for over 50 years. The Company manufactures FOAMGLAS® cellular glass insulation, an excellent insulating material for direct burial or underground piping systems.

Pittsburgh Corning Corporation personnel can provide installation advice and training for personnel installing our products.

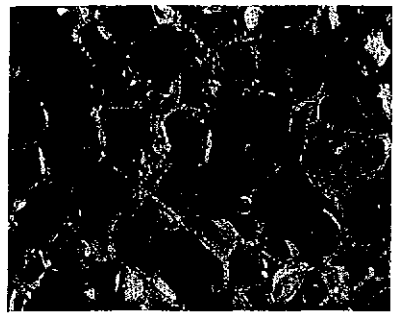
FOAMGLAS® insulation is a lightweight, rigid material composed of millions of completely sealed glass cells. Each cell is an insulating space. FOAMGLAS® insulation is all glass ... completely inorganic ... no binder, no fillers.

FOAMGLAS® insulation is an impermeable, noncombustible, cellular glass insulation that provides long life, easy installation and low maintenance in piping, vessel and equipment applications.

FOAMGLAS® insulation is successfully performing in virtually every major process industry.

FOAMGLAS® insulation is manufactured in block form, then cut, tapered or shaped as required. All products are available through, and may be fabricated by, Pittsburgh Corning authorized Industrial Distributors. It is also very simple to reshape FOAMGLAS® insulation on the job site. No special tools are required.

In addition, Pittsburgh Corning offers a full line of complementary accessory products, each laboratory- and service-proven to provide *maximum* performance specifically with FOAMGLAS® cellular glass insulation.



All-glass FOAMGLAS® insulation has a closed cell structure which gives it high resistance to moisture in liquid or vapor form.

FOAMGLAS® insulation is easy to cut and shape with normal hand tools.

CONTENTS

*FOAMGLAS® Insulation Certifications**

- ASTM C 552-00, "Specification for Cellular Glass Block and Pipe Thermal Insulation"
- Canadian Government Specifications Board, 51-GP-38
- Military Specification MIL-I-24244C, "Insulation Materials, Thermal, with Special Corrosion and Chloride Requirements"
- Nuclear Regulatory Guide 1.36
- ISO 9002 Certification

Approvals

FOAMGLAS® insulation is approved for use according to:

- General Services Administration, PBS (PCD): Public Building Service 15250, Guide Specification, "Thermal Insulation (Mechanical)"

* Written request for certificate of compliance must accompany order.

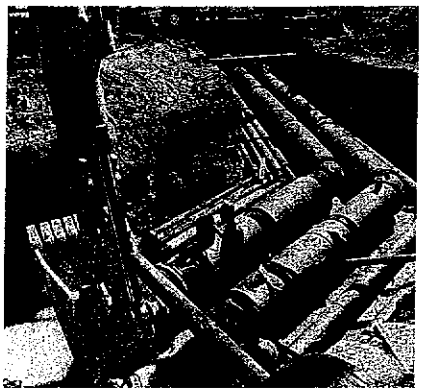
Martisco Corporation
PO 2067 / Syracuse, NY
315-471-3181
Fax 315-471-4341

THE IDEAL UNDERGROUND INSULATION SYSTEM

The ideal insulation system must be capable of meeting the mechanical and corrosion resistance requirements of direct burial while providing long-term insulation efficiency. Ignoring these basic considerations may result in problems.

The direct burial of insulated pipelines is often the most practical method of installing underground piping systems. This method eliminates the need for costly tunnels and speeds the installation of the piping system.

The FOAMGLAS® Insulation System consists of FOAMGLAS® cellular glass insulation and flexible PITTWRAP® jacketing. It is the ideal system for direct burial underground.



FOAMGLAS® insulation's excellent compressive strength permits direct underground burial.

FOAMGLAS® insulation is:

- Highly resistant to soil moisture in liquid or vapor form
- Unaffected by soil acids
- Chemically inert
- Strong enough for direct burial with no protective tunnels needed

On hot, buried systems located in a high water table area, improperly sealed systems may allow moisture entry into the system. High temperature water or steam in long-term contact with FOAMGLAS® insulation will result in chemical attack with a gradual penetration of the insulation cells.

The success of a direct burial system will depend to a great extent upon the system chosen, proper design and proper installation. Some of the key considerations which should be addressed by the design professionals prior to selecting a particular insulation system are:

- Type of system: chilled water, hot water, steam or other
- Operating temperatures of all pipes, constant or cycling
- Pipe length, diameter, spacing, burial depth, number and nature of runouts
- Soil type, bearing strength, electrical potential
- Location of water table
- Control of expansion/contraction (see Figures 1 and 2 for typical expansion/contraction values of various metals)
  - number of expansion loops and their size
  - number of ells or zees
  - number of expansion bellows, size
  - number of guides and location
  - number of anchors and location
- Manhole location, size, material, connections
- Other conditions
  - road crossing
  - depth below road
  - traffic loads
  - will any portion of line be in tunnels or above ground
  - other utilities near or crossing line

TABLE 1: Physical and Thermal Properties of FOAMGLAS® Insulation

PHYSICAL PROPERTIES	USA	METRIC	SI	ASTM TEST
Absorption of Moisture (% by volume)	0.2% Only moisture retained is that adhering to surface cells after immersion			C 240
Water-Vapor Permeability	0.0 perm-in	0.0 perm-in		E 96[1]
Acid Resistance	Impervious to common acids and their fumes except hydrofluoric acid			
Capillarity	None	None	None	
Combustibility	Noncombustible, will not burn			E 136
Composition	Pure glass, totally inorganic, contains no binder.			
Compressive strength for standard material (+/-10%)	90 psi Strength for flat surfaced capped with hot asphalt, different capping will give different values. For curved surfaces and pipe supports, contact PCC	6.3 kg/cm²	620 kPa	C 165, C 240 C 552-00
Density, Average	7.5 lb/ft³	120 kg/m³	120 kg/m³	C 303
Dimensional Stability	Excellent—does not shrink, swell or warp			
Flexural Strength, Block Average	70 psi	4.9 kg/cm²	480 kPa	C 203, C 240
Hygroscopicity	No increase in weight at 90% relative humidity			
Linear Coefficient of Thermal Expansion (25° to 300°C)	5.0 X 10^{-6}/°F	9.0 X 10^{-6}/°C	9.0 X 10^{-6}/°K	E 228
Maximum Service Temperature	+900°F	+482°C	755°K	
Modulus of Elasticity, Approx.	1.3 x 10^5 psi	9,300 kg/cm²	900 MPa	C 623
Shear Strength	No reliable recognized test method for determination of the shear strength for cellular glass exists at this time. Where shear strength is a design criterion, PCC should be contacted for recommendations.			
Thermal Conductivity	Btu-in/hr-ft²-°F	kcal/m-h-°C	W/mK	C 177, C 518
	0.29 @ 75°F	0.033 @ 0°C	0.039 @ 0°C	
	0.28 @ 50°F	0.034 @ 10°C	0.040 @ 10°C	
Specific Heat	0.20 Btu/lb-°F	0.20 kcal/kg-°C	0.84 kJ/kg-K	
Thermal Diffusivity	0.016 ft²/hr	0.0042 cm²/sec	4.2 x 10^{-7}m²/sec	

NOTE: Properties at 75°F unless otherwise specified. Properties may vary with temperature.
These values are average or typical values recommended for design purposes, and are not intended as specification or limit values
[1]E 96 Wet Cup Method/Procedure B

Martisco Corporation
PO 2067 / Syracuse, NY
315-471-3181
Fax 315-471-4341

FLEXIBLE PITTWRAP® INSULATION JACKETING

The insulation system consists of FOAMGLAS® cellular glass insulation and flexible PITTWRAP® jacketing.

FOAMGLAS® insulation is impermeable to moisture, unaffected by soil acids, chemically inert and strong enough for direct burial with no protective tunnels needed.

PITTWRAP® jacketing provides a waterproof membrane against most soil and water conditions, and has the resiliency to perform in direct burial applications.

FOAMGLAS® insulation systems do not require cathodic protection.

Jacketing

PITTWRAP® jacketing is a 125 mil (3.2 mm) thick heat-sealable, multiply laminate for protecting underground FOAMGLAS® systems with outer surface temperatures below 190°F (87.7°C).

PITTWRAP® jacketing consists of three layers of a polymer-modified, bituminous compound separated by glass reinforcement and aluminum foil. An outer layer of polyester film is laminated to the bituminous compound. Release paper prevents sticking in the roll before use. PITTWRAP® jacketing may also be factory-applied on the insulation.

PITTWRAP® SS jacketing is a 70 mil (1.8 mm) thick self-sealing, modified bituminous membrane for protecting underground FOAMGLAS® insulation systems with outer surface temperatures below 170°F (76.7°C). Manual pressure seals the jacketing without the use of a torch or heater. PITTWRAP® SS jacketing may also be factory-applied on the insulation.

PITTWRAP® SS jacketing consists of a polymer-modified, bituminous compound reinforced with a woven glass fabric and a 1 mil (0.03 mm) aluminum top film and release paper backing.

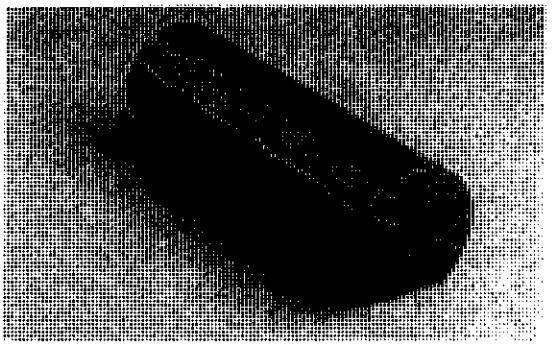
PITTWRAP® CW Plus jacketing is a 50 mil (1.3 mm) thick self-sealing, modified bituminous membrane for protecting underground FOAMGLAS® insulation systems on chilled water and hot service pipelines. Manual pressure seals the jacketing without the use of a torch or heater. PITTWRAP® CW Plus jacketing may also be factory-applied on the insulation.

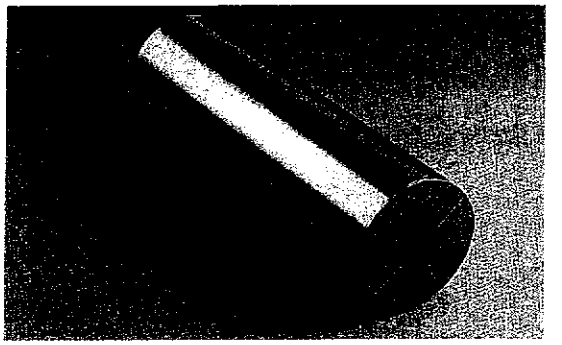
PITTWRAP® CW Plus jacketing consists of a polymer-modified, bituminous compound reinforced with a glass fabric and a 1 mil (0.03 mm) aluminum top film and release paper backing.

Top: FOAMGLAS® insulation and PITTWRAP® jacketing.

Middle: FOAMGLAS® insulation and PITTWRAP® SS jacketing.

Bottom: FOAMGLAS® insulation and PITTWRAP® CW Plus jacketing.





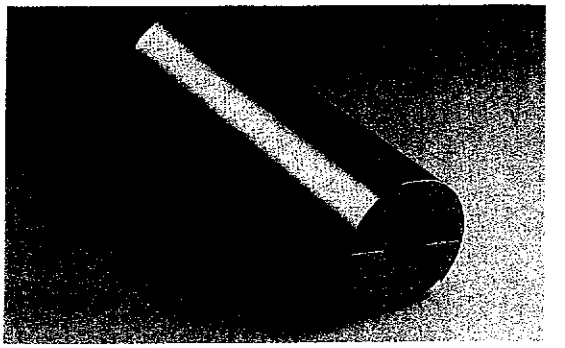


TABLE 2: Physical Properties of PITTWRAP® Jacketing

Physical Properties	PITTWRAP® Jacketing	PITTWRAP® SS Jacketing	PITTWRAP® CW Plus Jacketing
Thickness (mils)	125	70	50
Tensile Strength, 20°F (lb/in width)	165	120	–
Tensile Strength, 78°F (lb/in width)	105	100	50
Weight (lb/100 sq ft)	66	39	32
Jacketing Temperature Limits (°F)	20 to 190	0 to 170	-25 to 100
Application Temperature, Minimum (°F)			
Without primer	20	50	50
With primer	N/A	20	20
Resistance to Soil Acids	Good	Good	Good
Permeability (ASTM E 96) (perm-inch)	0.002	0.002	0.002

Attachment F

Laboratory Results

Microbac Laboratories, Inc.
New York Division
3821 Buck Drive
Cortland, New York 13045
Phone: 607-753-3403

Work Order Number: 1306153

Certificate of Results

Grant Street Construction, Inc.
Richard Compagni
48 Grant Street
Cortland, NY 13045-2138

Contact: Richard Compagni
Project Name: ID Booth, Route 11
Date Received: February 15, 2013
Time Received: 1:05 pm

Analytical Testing Parameters

Client Sample ID: **6 Inch Water Main**
Lab Sample ID: **1306153-01**

Collection Date: **2/15/2013**
Collection Time: **12:45 pm**
Collected By: JM-Client

MICROBIOLOGY

Parameter	CAS	DF	Result	Units	PQL	Qualifier	Method	Analyzed	Analyst
Total Coliform		1	Negative	CFU/100 ml	1.0		SM 9223B	2/15/2013 1628	SP

Analytical Testing Parameters

Client Sample ID: **6 Inch Water Main**
Lab Sample ID: **1306153-02**

Collection Date: **2/15/2013**
Collection Time: **12:45 pm**
Collected By: JM-Client

MICROBIOLOGY

Parameter	CAS	DF	Result	Units	PQL	Qualifier	Method	Analyzed	Analyst
Total Coliform		1	Negative	CFU/100 ml	1.0		SM 9223B	2/15/2013 1628	SP

Analytical Testing Parameters

Client Sample ID: **6 Inch Water Main**
Lab Sample ID: **1306153-03**

Collection Date: **2/15/2013**
Collection Time: **12:45 pm**
Collected By: JM-Client

MICROBIOLOGY

Parameter	CAS	DF	Result	Units	PQL	Qualifier	Method	Analyzed	Analyst
Total Coliform		1	Negative	CFU/100 ml	1.0		SM 9223B	2/15/2013 1628	SP

Laboratory Certifications:

Below is a list of certifications maintained by Microbac Laboratories, Inc. New York Division. All data included in this report has been reviewed for and meets all project specific and quality control requirements of the applicable accreditation, unless otherwise noted. A complete list of individual analytes pursuant to each certification below is available upon request.

- NYELAP # 10795
- EPA # NY00935
- PADEP # 68-01385
- Connecticut #PH-0331
- Maryland #327
- New Hampshire #2985
- NYS Ag & Markets #36-142

Microbac Laboratories, Inc.
New York Division
3821 Buck Drive
Cortland, New York 13045
Phone: 607-753-3403

Work Order Number: 1306153

Certificate of Results

Qualifiers and Definitions:

- **CAS:** Chemical Abstract Series identification for the analyte.
- **DF:** "1" indicates that there was no dilution. Any other number indicates that the sample was diluted by that factor.
- **PQL:** The **Practical Quantitation Limit**, which is defined as the lowest quantitation level of an analyte that can be readily achived within the specified limits of precision and accuracy of an alaytical method during routine laboratory operating conditions. The value may be raised depending on the characteristics or behavior of the target analyte.
- **Units:** The units of measure for the analysis. Ug/L (ppb) and mg/L (ppm) are for liquid samples. Ug/kg (ppb) and mg/kg (ppm) are for solid wet-based results while ug/kg-dry and mg/kg-dry are for solid-dry-based results.

Report Comments:

The analytical results for your samples are presented on the enclosed laboratory report(s). The data and information on this report and other accompanying documents represent on the sample(s) analyzed. In accordance with NYSDOH-ELAP and NELAC regulations, we are required to notify you of any aspects of the analysis that did not comply with these regulations. Any data qualifiers are noted directly on the laboratory report. The Laboratory also maintains a "Sample Receipt Checklist" and the submitted "Chain of Custody" form in its files that are available on request.

The pagination at the bottom of the narrative and reports indicates the total number of pages in the client submittal. No duplication of this report should be done without duplication of the entire package, including cover letter and narrative if present.

Thank you for the opportunity to provide these analytical services. Please contact Pamela Davis, Client Services Manager, with questions on the analysis.

Reviewed and Approved By: **Date Reviewed and Approved:**

Pamela Davis

2/20/2013

Pamela Davis
Project Manager

For any feedback concerning our services, please contact Peter Indick, the Managing Director at 607.753.3403. You may also contact both James Nokes, President at president@microbac.com and Sean Hyde, Chief Operating Officer at sean.hyde@microbac.com.

Please help us in meeting our Go Green initiative by selecting to have reports and invoices submitted via email only. Please contact nyresults@microbac.com to set up email reporting and invoicing options.

3821 Buck Drive
Cortland NY 13045
Phone:(607)753-3403 Fax:(607)753-3415
NY #10795, EPA #NY00935

Microbac Laboratories, Inc.
CHAIN OF CUSTODY

Samples must be returned on ice

MNY Workorder # _____

Client Information	Billing/Invoice:
Name: Grant St Const	
Address: 48 Grant St Cortland NY 13045	
Contact: Richard Company	
Phone: 607 753 1650	
Project: Geo Com	
Quote ID:	PO#:

Rush TAT Bus. Days: <2 2-5 5-7 7-10 Date Req.:

Carbon Copy: Yes

Email Results: Yes

Fax Results: Yes

Analysis Requested: PA

Receiving Info (Lab Use Only)

Ice:	(YES) NO
Cooler:	(YES) NO
Sample Temp:	4
Cooler Seal:	YES NO
Pickup:	YES NO
Dropoff:	(C) W
Accepted?	(YES) NO

Plastic	Container Material
120mls	Container Size(in Ml)
Na2S203	Preservative

Sample Information

	Description/Location	Date	Time	Initial	Matrix Type	Number of Containers for Analysis Requested	Comments/Field Data
1	ID Booth 6" water main Rt 11 Cortland	15Feb13	12:45	JFM	Grab	1	
2	ID Booth 6" water main Rt 11 Cortland	15Feb13	12:45	JFM	Grab	1	
3	ID Booth 6" water main Rt 11 Cortland	15Feb13	12:45	JFM	Grab	1	
4							
5							
6							
7							
8							

1306153

Print Name and Company	Signature	Date/Time	Comments
Sampled:			
Received:	Jolene - Mychal Eaton	2/15/13 1305	
Received:			
Received:			

Microbac Laboratories (MNY) may be unable to perform a portion of the requested testing in which case we will subcontract the analysis to another accredited laboratory.
By signing this document you are attesting that you have been informed by MNY of the intent to subcontract and are in agreement with this action.

Microbac Laboratories, Inc.
New York Division
3821 Buck Drive
Cortland, New York 13045
Phone: 607-753-3403

Work Order Number: 1306275

Certificate of Results

Grant Street Construction, Inc.
Richard Compagni
48 Grant Street
Cortland, NY 13045-2138

Contact: Richard Compagni
Project Name: GEO-CON 182
Date Received: February 19, 2013
Time Received: 10:40 am

Analytical Testing Parameters

Client Sample ID: **218 South Main St., Homer, NY**
Lab Sample ID: **1306275-01**

Collection Date: **2/19/2013**
Collection Time: **9:50 am**
Collected By: RL-Client

MICROBIOLOGY

Parameter	CAS	DF	Result	Units	PQL	Qualifier	Method	Analyzed	Analyst
Total Coliform		1	Negative	CFU/100 ml	1.0		SM 9223B	2/19/2013 1620	JME

Analytical Testing Parameters

Client Sample ID: **218 South Main St., Homer, NY**
Lab Sample ID: **1306275-02**

Collection Date: **2/19/2013**
Collection Time: **9:50 am**
Collected By: RL-Client

MICROBIOLOGY

Parameter	CAS	DF	Result	Units	PQL	Qualifier	Method	Analyzed	Analyst
Total Coliform		1	Negative	CFU/100 ml	1.0		SM 9223B	2/19/2013 1620	JME

Analytical Testing Parameters

Client Sample ID: **218 South Main St., Homer, NY**
Lab Sample ID: **1306275-03**

Collection Date: **2/19/2013**
Collection Time: **9:50 am**
Collected By: RL-Client

MICROBIOLOGY

Parameter	CAS	DF	Result	Units	PQL	Qualifier	Method	Analyzed	Analyst
Total Coliform		1	Negative	CFU/100 ml	1.0		SM 9223B	2/19/2013 1620	JME

Laboratory Certifications:

Below is a list of certifications maintained by Microbac Laboratories, Inc. New York Division. All data included in this report has been reviewed for and meets all project specific and quality control requirements of the applicable accreditation, unless otherwise noted. A complete list of individual analytes pursuant to each certification below is available upon request.

- NYELAP # 10795
- EPA # NY00935
- PADEP # 68-01385
- Connecticut #PH-0331
- Maryland #327
- New Hampshire #2985
- NYS Ag & Markets #36-142

Microbac Laboratories, Inc.
New York Division
3821 Buck Drive
Cortland, New York 13045
Phone: 607-753-3403

Work Order Number: 1306275

Certificate of Results

Qualifiers and Definitions:

- **CAS:** Chemical Abstract Series identification for the analyte.
- **DF:** "1" indicates that there was no dilution. Any other number indicates that the sample was diluted by that factor.
- **PQL:** The **Practical Quantitation Limit**, which is defined as the lowest quantitation level of an analyte that can be readily achived within the specified limits of precision and accuracy of an alaytical method during routine laboratory operating conditions. The value may be raised depending on the characteristics or behavior of the target analyte.
- **Units:** The units of measure for the analysis. Ug/L (ppb) and mg/L (ppm) are for liquid samples. Ug/kg (ppb) and mg/kg (ppm) are for solid wet-based results while ug/kg-dry and mg/kg-dry are for solid-dry-based results.

Report Comments:

The analytical results for your samples are presented on the enclosed laboratory report(s). The data and information on this report and other accompanying documents represent on the sample(s) analyzed. In accordance with NYSDOH-ELAP and NELAC regulations, we are required to notify you of any aspects of the analysis that did not comply with these regulations. Any data qualifiers are noted directly on the laboratory report. The Laboratory also maintains a "Sample Receipt Checklist" and the submitted "Chain of Custody" form in its files that are available on request.

The pagination at the bottom of the narrative and reports indicates the total number of pages in the client submittal. No duplication of this report should be done without duplication of the entire package, including cover letter and narrative if present.

Thank you for the opportunity to provide these analytical services. Please contact Pamela Davis, Client Services Manager, with questions on the analysis.

Reviewed and Approved By: **Date Reviewed and Approved:**

2/21/2013

Pamela Davis
Project Manager

For any feedback concerning our services, please contact Peter Indick, the Managing Director at 607.753.3403. You may also contact both James Nokes, President at president@microbac.com and Sean Hyde, Chief Operating Officer at sean.hyde@microbac.com.

Please help us in meeting our Go Green initiative by selecting to have reports and invoices submitted via email only. Please contact nyresults@microbac.com to set up email reporting and invoicing options.

3821 Buck Drive
Cortland NY 13045
Phone:(607)753-3403 Fax:(607)753-3415
NY #10795, EPA #NY00935

Microbac Laboratories, Inc.
CHAIN OF CUSTODY

Samples must be returned on ice

MNY Workorder # _____

Client Information

Name: GRANT STREET CONSTRUCTION
Address: 48 GRANT ST
CORTLAND NY 13045
Contact: RICHARD COMPAGNI
Phone: 607 753-1690
Project: GEO-CON 182
Quote ID: PO#:

Billing/Invoice:

Rush TAT Bus. Days: <2 2-5 5-7 7-10 Date Req.: ASAP
Carbon Copy: Yes
Email Results: Yes grant+st+const@yahoo.com
Fax Results: Yes 607-753-7002

Analysis Requested

PA

Receiving Info (Lab Use Only)

Ice:	YES	NO
Cooler:	YES	NO
Sample Temp:	1.0	
Cooler Seal:	YES	NO
Pickup:	YES	NO
Dropoff:	C	W
Accepted?	YES	NO

Sample Information

	Description/Location	Date	Time	Initial	Matrix Type	Plastic	120mls	Na2S2O3	Container Material	Container Size(in Ml)	Preservative	Number of Containers for Analysis Requested	Comments/Field Data
1	219 SOUTH MAIN ST HOMER, NY 13077	2/19/13	9:50 a.m	RAC	GW DW							1	
2	" "	2/19/13	9:50	" "	GW DW							1	
3	" "	2/19/13	9:50	" "	GW DW							1	
4													
5													
6													
7													
8													

1306275

Print Name and Company	Signature	Date/Time	Comments
Sampled:			
Received:	Richard Compagni		
Received:	Jolene-Mychal Eaton	2/19/13	1040
Received:			

Microbac Laboratories (MNY) may be unable to perform a portion of the requested testing in which case we will subcontract the analysis to another accredited laboratory.
By signing this document you are attesting that you have been informed by MNY of the intent to subcontract and are in agreement with this action.