



Gloria B. Nelson Public Service Building • 688 Route 15, Mangilao, Guam 96913 • Tel. (671) 300-6035

Invitation To Bid: IFB-06-ENG-2020
Asan-Adelup-Hagatna, Route 1 Sewer Rehabilitation and Replacement-
Phase II
GWA Project No. S15-002-EPA

Addendum No.: Addendum 02

Date: July 17, 2020

All Qualified Bidders:

This addendum is issued to modify the previously issued bid documents and/or given for informational purposes, and is hereby made a part of the bid documents. Failure to acknowledge receipt of this addendum shall be grounds for the bidder's disqualification and rejection of the bidder's proposal.

1. Part A – GWA Request for Information Response No. 1 to Contractor Inquiries

GWA's response No. 1 to contractor RFI inquiries is attached to this Addendum.

2. Part B – Modifications to Contract Bid Documents

a. Division 00410 - Bid Form

Remove and Replace in its entirety Section 00410 Bid Form with Section 00410 Bid Form – Addendum 2 as attached to this Addendum.

b. Drawing Sheet G-005 – SCHEDULE OF WORK SUMMARY

Remove and Replace in its entirety Sheet G-005

c. Drawing Sheet C-002 – PLAN AND PROFILE – SEWER LINE “B” STA 0+00 – STA 5+00

Remove and Replace in its entirety Sheet C-002

d. Drawing Sheet C-021 – BYPASS PLAN – SEWER LINE “B” STA 10+00 – STA 20+00

Remove and Replace in its entirety Sheet C-021

- e. Specification 31 23 33 – TRENCHING, BACKFILLING, AND COMPACTING FOR UTILITIES

Remove and Replace in its entirety Page 4 of Specification 31 32 33.

- f. Specification 33 01 30.72

Remove and Replace in its entirety Specification 33 01 30.72 – WATER CURED IN PLACE PIPE LINING with Specification 33 01 30.72 – WATER AND STEAM CURED IN PLACE PIPE LINING as attached to this Addendum.

3. Part C – Reference Documents

- a. The following documentation is provided for reference information:

- 1) Drawing – AGANA PUMP STATION INLET MODIFICATIONS
- 2) Photo of SMH 325Haga Top View

Bidders are also notified to visit GWA website: www.guamwaterworks.org to ensure that addenda to the bid, answers to questions, and reminders are communicated to all bidders throughout the solicitation process.



MIGUEL C. BORDALLO, P.E.
General Manager

Attachment(s):

MCB;gb

Part B

Modifications to Contract Bid Documents

BID FORM

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BID FORM

ARTICLE 1 - BID RECIPIENT

1.01 This Bid is submitted to:

Guam Waterworks Authority
Gloria B. Nelson Public Service Building
688 Route 15, Mangilao, Guam 96913

1.02 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into a Contract with Buyer in the form included in the Bidding Documents to furnish the Goods and Special Services as specified or indicated in the Bidding Documents, for the prices and within the times indicated in this Bid, and in accordance with the other terms and conditions of the Bidding Documents.

ARTICLE 2 - BIDDER'S ACKNOWLEDGMENTS

2.01 Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for 60 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Buyer.

ARTICLE 3 - BIDDER'S REPRESENTATIONS

3.01 In submitting this Bid, Bidder represents that:

A. Bidder has examined and carefully studied the Bidding Documents, the related data identified in the Bidding Documents, and the following Addenda, receipt of which is hereby acknowledged:

Addendum No.	Addendum Date

B. Bidder has visited the Point of Destination and site where the Goods are to be installed or Special Services will be provided and become familiar with and is satisfied as to the observable local conditions that may affect cost, progress, or the furnishing of Goods and Special Services, if required to do so by the Bidding Documents, or if, in Bidder's judgment, any local condition may affect cost, progress, or the furnishing of Goods and Special Services.

C. Bidder is familiar with and is satisfied as to all Laws and Regulations in effect as of the date of the Bid that may affect cost, progress, and the furnishing of Goods and Special Services.

- D. Bidder has carefully studied, considered, and correlated the information known to Bidder; information commonly known to sellers of similar goods doing business in the locality of the Point of Destination and the site where the Goods will be installed or where Special Services will be provided; information and observations obtained from Bidder's visits, if any, to the Point of Destination and the site where the Goods will be installed or where Special Services will be provided; and any reports and drawings identified in the Bidding Documents regarding the Point of Destination and the site where the Goods will be installed or where Special Services will be provided, with respect to the effect of such information, observations, and documents on the cost, progress, and performance of Seller's obligations under the Bidding Documents.
- E. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, and discrepancies that Bidder has discovered in the Bidding Documents, and the written resolution (if any) thereof by Engineer is acceptable to Bidder.
- F. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for furnishing the Goods and Special Services for which this Bid is submitted.

ARTICLE 4 - BIDDER'S CERTIFICATIONS

4.01 Bidder certifies that:

- A. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation;
- B. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;
- C. Bidder has not solicited or induced any individual or entity to refrain from bidding; and
- D. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 4.01.D:
 - 1. "corrupt practice" means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process;
 - 2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Buyer, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Buyer of the benefits of free and open competition;
 - 3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Buyer, a purpose of which is to establish bid prices at artificial, non-competitive levels; and
 - 4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process.

ARTICLE 5 - BASIS OF BID

- 5.01 Bidder will furnish the Goods and Special Services in accordance with the Contract Documents for the following price(s):

GUAM WATERWORKS AUTHORITY
ASAN-ADELUP-HAGATNA, ROUTE 1 SEWER REHABILITATION AND
REPLACEMENT – PHASE II
GWA Project No. S15-002-EPA

UNIT PRICE BID FORM

Base Bid Description: Line B Work (SMH 13Asan to SMH 350AHaga and SMH 350BHaga to SMH339Haga)

Work consists of cleaning and rehabilitating existing 16-inch, 24-inch and 27-inch diameter gravity sewer lines with cured-in-place pipe (CIPP) liner, reinstating sewer laterals after CIPP rehabilitation is complete, replacing sewer manhole concrete collars, and providing temporary bypassing and traffic control as necessary to complete the rehabilitation work.

Item No.	Description	Unit	Unit Price	Qty	Bid Amount
1	Mobilization and Demobilization	Lump Sum	\$ _____	1	\$ _____
2	Light Sewer Line Cleaning of existing 16-inch Asbestos Cement Pipe (ACP) and 16-inch Polyvinyl Chloride (PVC) pipe sewer lines, including removal and disposal of debris, and other items as necessary to complete the inspection and rehabilitation work.	Lin. Ft.	\$ _____	2,648	\$ _____
3	Light Sewer Line Cleaning of existing 24-inch Asbestos Cement Pipe (ACP) sewer lines, including removal and disposal of debris, and other items as necessary to complete the inspection and rehabilitation work.	Lin. Ft.	\$ _____	3,628	\$ _____
4	Light Sewer Line Cleaning of existing 27-inch Asbestos Cement Pipe (ACP) sewer lines, including removal and disposal of debris, and other items as necessary to complete the inspection and rehabilitation work.	Lin. Ft.	\$ _____	3,706	\$ _____

Item No.	Description	Unit	Unit Price	Qty	Bid Amount
5	Heavy Sewer Line Cleaning of existing 16-inch Asbestos Cement Pipe (ACP) and 16-inch Polyvinyl Chloride (PVC) pipe sewer lines, including removal and disposal of debris, and other items as necessary to complete the inspection and rehabilitation work.	Lin. Ft.	\$ _____	559	\$ _____
6	Heavy Sewer Line Cleaning of existing 24-inch Asbestos Cement Pipe (ACP) sewer lines, including removal and disposal of debris, and other items as necessary to complete the inspection and rehabilitation work.	Lin. Ft.	\$ _____	127	\$ _____
7	Heavy Sewer Line Cleaning of existing 27-inch Asbestos Cement Pipe (ACP) sewer lines, including removal and disposal of debris, and other items as necessary to complete the inspection and rehabilitation work.	Lin. Ft.	\$ _____	249	\$ _____
8	Specialty Cleaning of all pipe size sewer lines, including removal and disposal of debris, and other items as necessary to complete the inspection and rehabilitation work.	Hour	\$ _____	40	\$ _____
9	Closed-Circuit Television (CCTV) inspections for initial assessment of existing 16" sewer line and sewer manholes, including reports, documentation, and other items as necessary to complete the work.	Lin. Ft.	\$ _____	646	\$ _____
10	Closed-Circuit Television (CCTV) inspections for initial assessment of existing 24" sewer line and sewer manholes, including reports, documentation, and other items as necessary to complete the work.	Lin. Ft.	\$ _____	1,814	\$ _____
11	Closed-Circuit Television (CCTV) inspections for initial assessment of existing 27" sewer line and sewer manholes, including reports, documentation, and other items as necessary to complete the work.	Lin. Ft.	\$ _____	1,853	\$ _____

Item No.	Description	Unit	Unit Price	Qty	Bid Amount
12	Closed-Circuit Television (CCTV) inspections for pre- and post-rehabilitation of existing 16" sewer line and sewer manholes, including reports, documentation, and other items as necessary to complete the work.	Lin. Ft.	\$ _____	1,292	\$ _____
13	Closed-Circuit Television (CCTV) inspections for pre- and post-rehabilitation of existing 24" sewer line and sewer manholes, including reports, documentation, and other items as necessary to complete the work.	Lin. Ft.	\$ _____	3,628	\$ _____
14	Closed-Circuit Television (CCTV) inspections for pre- and post-rehabilitation of existing 27" sewer line and sewer manholes, including reports, documentation, and other items as necessary to complete the work.	Lin. Ft.	\$ _____	3,706	\$ _____
15	Installation of cured-in-place pipe (CIPP) lining in existing 16-inch sewer line, including wet out, preparation, testing of installed liner, sealing at manholes, reconstructing manhole transition sections and benches, and other items as necessary to complete the work.	Lin. Ft.	\$ _____	646	\$ _____
16	Installation of cured-in-place pipe (CIPP) lining in existing 24-inch sewer line, including wet out, preparation, testing of installed liner, sealing at manholes, reconstructing manhole transition sections and benches, and other items as necessary to complete the work.	Lin. Ft.	\$ _____	1,814	\$ _____

Item No.	Description	Unit	Unit Price	Qty	Bid Amount
17	Installation of cured-in-place pipe (CIPP) lining in existing 27-inch sewer line, including wet out, preparation, testing of installed liner, sealing at manholes, reconstructing manhole transition sections and benches, and other items as necessary to complete the work.	Lin. Ft.	\$_____	1,853	\$_____
18	Reinstatement of existing sewer laterals upon completion of CIPP lining installation, and all incidentals, in place complete.	Ea.	\$_____	16	\$_____
19	Sewer manhole concrete collar, including reinforcing steel, borrow material, where required, and all other items as necessary to complete the work.	Ea.	\$_____	3	\$_____
20	Sewer Flow Control for Sewer Rehabilitation, including diversion and bypass pumping plan, temporary bypass piping and pumps, pipe plugs, bypassing at sewer laterals (including locating and exposing cleanouts), temporary trenches (including pavement demolition, excavation, backfill, trench covers, temporary and permanent AC pavement and concrete pavement), electrical and standby power/pumps, monitoring, spill containment/mitigation, additional traffic control, all related restoration work, in place complete.	Lump Sum	\$_____	1	\$_____
21	Traffic Control Work, including obtaining approvals, redesign/modification of traffic control plans for the contractor's convenience, traffic control work, all traffic control devices, placement and removal of devices and detours, cleanup, restoration, and incidentals.	Lump Sum	\$_____	1	\$_____

Item No.	Description	Unit	Unit Price	Qty	Bid Amount
22	Point Repair for 16-inch diameter PVC sewer pipe, including pavement demolition, shoring, or bracing, underpinning, positive groundwater control, protection and support of structures and utilities, removal of trench support, select fill, flowable fill, traffic covers, and all incidentals required to complete the work. (4 LF pipe section or less, per line segment)	Ea.	\$ _____	2	\$ _____
23	Extra Length Point Repair for 16-inch diameter PVC sewer pipe, all depths; in excess of 4 LF (Typ.)	Lin. Ft.	\$ _____	40	\$ _____
24	Point Repair for 24-inch diameter PVC sewer pipe, including pavement demolition, shoring, or bracing, underpinning, positive groundwater control, protection and support of structures and utilities, removal of trench support, select fill, flowable fill, traffic covers, and all incidentals required to complete the work. (4 LF pipe section or less, per line segment)	Ea.	\$ _____	1	\$ _____
25	Extra Length Point Repair for 24-inch diameter PVC sewer pipe, all depths; in excess of 4 LF (Typ.)	Lin. Ft.	\$ _____	20	\$ _____
26	Point Repair for 27-inch diameter PVC sewer pipe, including pavement demolition, shoring, or bracing, underpinning, positive groundwater control, protection and support of structures and utilities, removal of trench support, select fill, flowable fill, traffic covers, and all incidentals required to complete the work. (4 LF pipe section or less, per line segment)	Ea.	\$ _____	1	\$ _____
27	Extra Length Point Repair for 27-inch diameter PVC sewer pipe, all depths; in excess of 4 LF (Typ.)	Lin. Ft.	\$ _____	20	\$ _____

Item No.	Description	Unit	Unit Price	Qty	Bid Amount
28	Sewer Flow Control for Point Repairs of 16-inch, 18-inch, 24-inch, and 27-inch for every 4 LF of point repair, including diversion and bypass pumping plan, temporary bypass piping and pumps, pipe plugs, bypassing at sewer laterals (including locating and exposing cleanouts), temporary trenches (including pavement demolition, excavation, backfill, trench covers, temporary and permanent AC pavement and concrete pavement), electrical and standby power/pumps, monitoring, spill containment/mitigation, additional traffic control, all related restoration work, in place complete.	Ea.	\$ _____	4	\$ _____
29	Traffic Control Work for each Point Repair, including traffic control work, all traffic control devices, placement and removal of devices and detours, cleanup, restoration, and incidentals.	Ea.	\$ _____	4	\$ _____
<u>BASE BID (TOTAL Items 1 through 29, inclusive)</u>					\$ _____
<u>(Please write out total bid amount in words below)</u>					
\$ _____					

GUAM WATERWORKS AUTHORITY
ASAN-ADELUP-HAGATNA, ROUTE 1 SEWER REHABILITATION AND
REPLACEMENT – PHASE II
GWA Project No. S15-002-EPA

UNIT PRICE BID FORM

Additive Bid #1 Description: Line B Work (SMH 339Haga to SMH 335Haga)

Work consists of cleaning and rehabilitating existing 27-inch diameter gravity sewer lines with cured-in-place pipe (CIPP) liner, reinstating sewer laterals after CIPP rehabilitation is complete, replacing sewer manhole frame and covers, sewer manhole concrete collars, and providing temporary bypassing and traffic control as necessary to complete the rehabilitation work.

Item No.	Description	Unit	Unit Price	Qty	Bid Amount
1	Mobilization (For costs associated with bonding, insurance and permits)	Lump Sum	\$ _____	1	\$ _____
2	Light Sewer Line Cleaning of existing 27-inch Asbestos Cement Pipe (ACP) sewer lines, including removal and disposal of debris, and other items as necessary to complete the inspection and rehabilitation work.	Lin. Ft.	\$ _____	2,118	\$ _____
3	Specialty Cleaning of all pipe size sewer lines, including removal and disposal of debris, and other items as necessary to complete the inspection and rehabilitation work.	Hour	\$ _____	40	\$ _____

Item No.	Description	Unit	Unit Price	Qty	Bid Amount
4	Closed-Circuit Television (CCTV) inspections for initial assessment of existing 27" sewer line and sewer manholes, including reports, documentation, and other items as necessary to complete the work.	Lin. Ft.	\$ _____	1,059	\$ _____
5	Closed-Circuit Television (CCTV) inspections for pre- and post-rehabilitation of existing 27" sewer line and sewer manholes, including reports, documentation, and other items as necessary to complete the work.	Lin. Ft.	\$ _____	2,118	\$ _____
6	Installation of cured-in-place pipe (CIPP) lining in existing 27-inch sewer line, including wet out, preparation, testing of installed liner, sealing at manholes, reconstructing manhole transition sections and benches, and other items as necessary to complete the work.	Lin. Ft.	\$ _____	1,059	\$ _____
7	Reinstatement of existing sewer laterals upon completion of CIPP lining installation, and all incidentals, in place complete.	Ea.	\$ _____	8	\$ _____
8	Cast iron manhole frame and cover, 25-inch diameter, including grade adjustment rings where required, and other items as necessary to complete the work.	Ea.	\$ _____	1	\$ _____
9	Sewer manhole concrete collar, including reinforcing steel, borrow material, where required, and all other items as necessary to complete the work.	Ea.	\$ _____	1	\$ _____

Item No.	Description	Unit	Unit Price	Qty	Bid Amount
10	Sewer Flow Control for Sewer Rehabilitation, including diversion and bypass pumping plan, temporary bypass piping and pumps, pipe plugs, bypassing at sewer laterals (including locating and exposing cleanouts), temporary trenches (including pavement demolition, excavation, backfill, trench covers, temporary and permanent AC pavement and concrete pavement), electrical and standby power/pumps, monitoring, spill containment/mitigation, additional traffic control, all related restoration work, in place complete.	Lump Sum	\$ _____	1	\$ _____
11	Traffic Control Work, including obtaining approvals, redesign/modification of traffic control plans for the contractor's convenience, traffic control work, all traffic control devices, placement and removal of devices and detours, cleanup, restoration, and incidentals.	Lump Sum	\$ _____	1	\$ _____
<u>ADDITIVE BID #1 (TOTAL Items 1 through 11, inclusive)</u>					\$ _____
<u>(Please write out total bid amount in words below)</u>					
\$ _____					

GUAM WATERWORKS AUTHORITY
ASAN-ADELUP-HAGATNA, ROUTE 1 SEWER REHABILITATION AND
REPLACEMENT – PHASE II
GWA Project No. S15-002-EPA

UNIT PRICE BID FORM

Additive Bid #2 Description: Line B Work (SMH 335Haga to SMH 327Haga)

Work consists of cleaning and rehabilitating existing 27-inch diameter gravity sewer lines with cured-in-place pipe (CIPP) liner, replacing sewer manhole concrete collars, and providing temporary bypassing and traffic control as necessary to complete the rehabilitation work.

Item No.	Description	Unit	Unit Price	Qty	Bid Amount
1	Mobilization (For costs associated with bonding, insurance and permits)	Lump Sum	\$ _____	1	\$ _____
2	Light Sewer Line Cleaning of existing 27-inch Asbestos Cement Pipe (ACP) sewer lines, including removal and disposal of debris, and other items as necessary to complete the inspection and rehabilitation work.	Lin. Ft.	\$ _____	2,192	\$ _____
3	Specialty Cleaning of all pipe size sewer lines, including removal and disposal of debris, and other items as necessary to complete the inspection and rehabilitation work.	Hour	\$ _____	40	\$ _____
4	Closed-Circuit Television (CCTV) inspections for initial assessment of existing 27" sewer line and sewer manholes, including reports, documentation, and other items as necessary to complete the work.	Lin. Ft.	\$ _____	1,096	\$ _____

Item No.	Description	Unit	Unit Price	Qty	Bid Amount
5	Closed-Circuit Television (CCTV) inspections for pre- and post-rehabilitation of existing 27" sewer line and sewer manholes, including reports, documentation, and other items as necessary to complete the work.	Lin. Ft.	\$ _____	2,192	\$ _____
6	Installation of cured-in-place pipe (CIPP) lining in existing 27-inch sewer line, including wet out, preparation, testing of installed liner, sealing at manholes, reconstructing manhole transition sections and benches, and other items as necessary to complete the work.	Lin. Ft.	\$ _____	1,096	\$ _____
7	Sewer manhole concrete collar, including reinforcing steel, borrow material, where required, and all other items as necessary to complete the work.	Ea.	\$ _____	1	\$ _____
8	Sewer Flow Control for Sewer Rehabilitation, including diversion and bypass pumping plan, temporary bypass piping and pumps, pipe plugs, bypassing at sewer laterals (including locating and exposing cleanouts), temporary trenches (including pavement demolition, excavation, backfill, trench covers, temporary and permanent AC pavement and concrete pavement), electrical and standby power/pumps, monitoring, spill containment/mitigation, additional traffic control, all related restoration work, in place complete.	Lump Sum	\$ _____	1	\$ _____

Item No.	Description	Unit	Unit Price	Qty	Bid Amount
9	Traffic Control Work, including obtaining approvals, redesign/modification of traffic control plans for the contractor's convenience, traffic control work, all traffic control devices, placement and removal of devices and detours, cleanup, restoration, and incidentals.	Lump Sum	\$ _____	1	\$ _____
<u>ADDITIVE BID #2 (TOTAL Items 1 through 9, inclusive)</u>					\$ _____
<u>(Please write out total bid amount in words below)</u>					
\$ _____					

GUAM WATERWORKS AUTHORITY
ASAN-ADELUP-HAGATNA, ROUTE 1 SEWER REHABILITATION AND
REPLACEMENT – PHASE II
GWA Project No. S15-002-EPA

UNIT PRICE BID FORM

Additive Bid #3 Description: Line B Work (SMH 327Haga to SMH 323Haga)

Work consists of rehabilitating existing 27-inch diameter gravity sewer lines with cured-in-place pipe (CIPP) liner, replacing sewer manhole concrete collars, and providing temporary bypassing and traffic control as necessary to complete the rehabilitation work.

Item No.	Description	Unit	Unit Price	Qty	Bid Amount
1	Mobilization (For costs associated with bonding, insurance and permits)	Lump Sum	\$ _____	1	\$ _____
2	Light Sewer Line Cleaning of existing 27-inch Asbestos Cement Pipe (ACP) sewer lines, including removal and disposal of debris, and other items as necessary to complete the inspection and rehabilitation work.	Lin. Ft.	\$ _____	2,184	\$ _____
3	Specialty Cleaning of all pipe size sewer lines, including removal and disposal of debris, and other items as necessary to complete the inspection and rehabilitation work.	Hour	\$ _____	40	\$ _____

Item No.	Description	Unit	Unit Price	Qty	Bid Amount
4	Closed-Circuit Television (CCTV) inspections for initial assessment of existing 27" sewer line and sewer manholes, including reports, documentation, and other items as necessary to complete the work.	Lin. Ft.	\$ _____	1,092	\$ _____
5	Closed-Circuit Television (CCTV) inspections for pre- and post-rehabilitation of existing 27" sewer line and sewer manholes, including reports, documentation, and other items as necessary to complete the work.	Lin. Ft.	\$ _____	2,184	\$ _____
6	Installation of cured-in-place pipe (CIPP) lining in existing 27-inch sewer line, including wet out, preparation, testing of installed liner, sealing at manholes, reconstructing manhole transition sections and benches, and other items as necessary to complete the work.	Lin. Ft.	\$ _____	1,092	\$ _____
7	Sewer manhole concrete collar, including reinforcing steel, borrow material, where required, and all other items as necessary to complete the work.	Ea.	\$ _____	3	\$ _____
8	Sewer Flow Control for Sewer Rehabilitation, including diversion and bypass pumping plan, temporary bypass piping and pumps, pipe plugs, bypassing at sewer laterals (including locating and exposing cleanouts), temporary trenches (including pavement demolition, excavation, backfill, trench	Lump Sum	\$ _____	1	\$ _____

Item No.	Description	Unit	Unit Price	Qty	Bid Amount
	covers, temporary and permanent AC pavement and concrete pavement), electrical and standby power/pumps, monitoring, spill containment/mitigation, additional traffic control, all related restoration work, in place complete.				
9	Traffic Control Work, including obtaining approvals, redesign/modification of traffic control plans for the contractor's convenience, traffic control work, all traffic control devices, placement and removal of devices and detours, cleanup, restoration, and incidentals.	Lump Sum	\$ _____	1	\$ _____
<u>ADDITIVE BID #3 (TOTAL Items 1 through 9, inclusive)</u>					\$ _____
<u>(Please write out total bid amount in words below)</u>					
\$ _____					

GUAM WATERWORKS AUTHORITY
ASAN-ADELUP-HAGATNA, ROUTE 1 SEWER REHABILITATION AND
REPLACEMENT – PHASE II
GWA Project No. S15-002-EPA

UNIT PRICE BID FORM

Additive Bid #4 Description: "Line B Work (SMH 323Haga to Hagatna Pump Station Wetwell)

Work consists of rehabilitating existing 27-inch diameter gravity sewer lines with cured-in-place pipe (CIPP) liner, replacing sewer manhole concrete collars, and providing temporary bypassing and traffic control as necessary to complete the rehabilitation work.

Item No.	Description	Unit	Unit Price	Qty	Bid Amount
1	Mobilization (For costs associated with bonding, insurance and permits)	Lump Sum	\$ _____	1	\$ _____
2	Light Sewer Line Cleaning of existing 27-inch Asbestos Cement Pipe (ACP) sewer lines, including removal and disposal of debris, and other items as necessary to complete the inspection and rehabilitation work.	Lin. Ft.	\$ _____	820	\$ _____
3	Specialty Cleaning of all pipe size sewer lines, including removal and disposal of debris, and other items as necessary to complete the inspection and rehabilitation work.	Hour	\$ _____	40	\$ _____

Item No.	Description	Unit	Unit Price	Qty	Bid Amount
4	Closed-Circuit Television (CCTV) inspections for initial assessment of existing 27" sewer line and sewer manholes, including reports, documentation, and other items as necessary to complete the work.	Lin. Ft.	\$ _____	410	\$ _____
5	Closed-Circuit Television (CCTV) inspections for pre- and post-rehabilitation of existing 27" sewer line and sewer manholes, including reports, documentation, and other items as necessary to complete the work.	Lin. Ft.	\$ _____	820	\$ _____
6	Installation of cured-in-place pipe (CIPP) lining in existing 27-inch sewer line, including wet out, preparation, testing of installed liner, sealing at manholes, reconstructing manhole transition sections and benches, and other items as necessary to complete the work.	Lin. Ft.	\$ _____	820	\$ _____
7	Cast iron manhole frame and cover, 30-inch diameter, including replacement of manhole cone section, grade adjustment rings where required, replacement of concrete sidewalk, curb and other items as necessary to complete the work.	Ea.	\$ _____	1	\$ _____

Item No.	Description	Unit	Unit Price	Qty	Bid Amount
8	Sewer Flow Control for Sewer Rehabilitation, including diversion and bypass pumping plan, temporary bypass piping and pumps, pipe plugs, bypassing at sewer laterals (including locating and exposing cleanouts), temporary trenches (including pavement demolition, excavation, backfill, trench covers, temporary and permanent AC pavement and concrete pavement), electrical and standby power/pumps, monitoring, spill containment/mitigation, additional traffic control, all related restoration work, in place complete.	Lump Sum	\$ _____	1	\$ _____
9	Traffic Control Work, including obtaining approvals, redesign/modification of traffic control plans for the contractor's convenience, traffic control work, all traffic control devices, placement and removal of devices and detours, cleanup, restoration, and incidentals.	Lump Sum	\$ _____	1	\$ _____
<u>ADDITIVE BID #4 (TOTAL Items 1 through 9, inclusive)</u>					\$ _____
<u>(Please write out total bid amount in words below)</u>					
\$ _____					

GUAM WATERWORKS AUTHORITY
ASAN-ADELUP-HAGATNA, ROUTE 1 SEWER REHABILITATION AND
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UNIT PRICE BID FORM

Additive Bid #5 Description: Line C Work (SMH 398Asan to 355AAsan)

Work consists of abandoning an existing 12-inch ACP sewer line, installing a new 12-inch diameter polyvinyl chloride (PVC) sewer line, and providing temporary bypassing and traffic control as necessary to complete the work.

Item No.	Description	Unit	Unit Price	Qty	Bid Amount
1	Mobilization (For costs associated with bonding, insurance and permits)	Lump Sum	\$ _____	1	\$ _____
2	Abandonment of 12-inch diameter ACP pipe, and all incidentals required to complete the work.	Lin. Ft.	\$ _____	123	\$ _____
3	New Pipe install new 12" PVC pipe (AWWA C-900, DR 25) by open trenching, including pavement demolition, unclassified trench excavation, shoring, underpinning, crushed rock bedding material, piping, fittings, select fill, compaction, testing, warning/identification tape, and all incidentals, in place complete. (10'-20' Depth)	Lin. Ft.	\$ _____	80	\$ _____

Item No.	Description	Unit	Unit Price	Qty	Bid Amount
4	A.C. Pavement Resurfacing, including pavement transitions, prime coat, tack coat, traffic striping, miscellaneous restoration, and all necessary labor, materials and equipment, in place complete.	Sq. Yds.	\$ _____	74	\$ _____
5	Milling Asphalt Friction Course, including all necessary labor, materials and equipment, in place complete.	Sq. Yds.	\$ _____	109	\$ _____
6	Asphalt Friction Course, including pavement transitions and all necessary labor, materials and equipment, in place complete.	Sq. Yds.	\$ _____	183	\$ _____
7	Sewer manhole concrete collar, including reinforcing steel, borrow material where required, and other items as necessary to complete the work.	Ea.	\$ _____	1	\$ _____
8	Install new Plain Precast Concrete Manhole, including plugging or bypass pumping, excavation and backfill, crushed rock base, reinforced concrete base, precast concrete riser(s) and cone, flexible pipe seals and connectors, grade adjustment ring(s), Type "SA" frame and cover, channelized invert, testing, incidentals, and all necessary labor, materials, and equipment, in place complete.	Ea.	\$ _____	1	\$ _____

Item No.	Description	Unit	Unit Price	Qty	Bid Amount
9	Sewer Flow Control for Sewer Rehabilitation, including diversion and bypass pumping plan, temporary bypass piping and pumps, pipe plugs, bypassing at sewer laterals (including locating and exposing cleanouts), temporary trenches (including pavement demolition, excavation, backfill, trench covers, temporary and permanent AC pavement and concrete pavement), electrical and standby power/pumps, monitoring, spill containment/mitigation, additional traffic control, all related restoration work, in place complete.	Lump Sum	\$ _____	1	\$ _____
10	Traffic Control Work, including obtaining approvals, redesign/modification of traffic control plans for the contractor's convenience, traffic control work, all traffic control devices, placement and removal of devices and detours, cleanup, restoration, and incidentals.	Lump Sum	\$ _____	1	\$ _____
<u>ADDITIVE BID #5 (TOTAL Items 1 through 10, inclusive)</u>					\$ _____
<u>(Please write out total bid amount in words below)</u>					
\$ _____					

GUAM WATERWORKS AUTHORITY
ASAN-ADELUP-HAGATNA, ROUTE 1 SEWER REHABILITATION AND
REPLACEMENT – PHASE II
GWA Project No. S15-002-EPA

UNIT PRICE BID FORM

Additive Bid #6 Description: Line B Work (SMH 350AHAGA to SMH 350BHAGA)

Work consists of rehabilitating one siphon consisting of two (2) - 18-inch barrels and providing temporary bypassing and traffic control as necessary to complete the rehabilitation work.

Item No.	Description	Unit	Unit Price	Qty	Bid Amount
1	Mobilization (For costs associated with bonding, insurance and permits)	Lump Sum	\$ _____	1	\$ _____
2	Sewer Line Cleaning of Inverted Siphon (2 - 18" Cast Iron Barrels, approximately 124 linear feet each, 22.5 degree bends), including removal and disposal of debris, and all incidentals necessary to complete work.	Lump Sum	\$ _____	1	\$ _____
3	Closed-Circuit Television (CCTV) inspections for pre- and post rehabilitation of existing inverted siphon (2 - 18" Cast Iron Barrels, approximately 124 linear feet each, 22.5 degree bends) and sewer manholes, including reports, documentation, and other items as necessary to complete the work.	Lin. Ft.	\$ _____	248	\$ _____

Item No.	Description	Unit	Unit Price	Qty	Bid Amount
4	Installation of cured-in-place pipe (CIPP) lining in existing 18-inch sewer line, including wet out, preparation, testing of installed liner, sealing at manholes, reconstructing manhole transition sections and benches, and other items as necessary to complete the work.	Lin. Ft.	\$ _____	248	\$ _____
5	Sewer Flow Control for siphon inspection and cleaning, including diversion and bypass pumping plan, temporary bypass piping and pumps, pipe plugs, bypassing at sewer laterals (including locating and exposing cleanouts), temporary trenches (including pavement demolition, excavation, backfill, trench covers, temporary and permanent AC pavement and concrete pavement), electrical and standby power/pumps, monitoring, spill containment/mitigation, additional traffic control, all related restoration work, in place complete.	Lump Sum	\$ _____	1	\$ _____
6	Traffic Control Work, including obtaining approvals, redesign/modification of traffic control plans for the contractor's convenience, traffic control work, all traffic control devices, placement and removal of devices and detours, cleanup, restoration, and incidentals.	Lump Sum	\$ _____	1	\$ _____

Item No.	Description	Unit	Unit Price	Qty	Bid Amount
<u>ADDITIVE BID #6 (TOTAL Items 1 through 6, inclusive)</u>					\$ _____
<u>(Please write out total bid amount in words below)</u>					
\$ _____					

SUMMARY OF BIDS	
<u>BASE BID (TOTAL Items 1 through 29, inclusive)</u>	\$ _____
<u>ADDITIVE BID #1 (TOTAL Items 1 through 11, inclusive)</u>	\$ _____
<u>ADDITIVE BID #2 (TOTAL Items 1 through 9, inclusive)</u>	\$ _____
<u>ADDITIVE BID #3 (TOTAL Items 1 through 9, inclusive)</u>	\$ _____
<u>ADDITIVE BID #4 (TOTAL Items 1 through 9, inclusive)</u>	\$ _____
<u>ADDITIVE BID #5 (TOTAL Items 1 through 10, inclusive)</u>	\$ _____
<u>ADDITIVE BID #6 (TOTAL Items 1 through 6, inclusive)</u>	\$ _____
<u>GRAND TOTAL BASE BID + ADDITIVE BID #1 TO ADDITIVE BID #6</u>	\$ _____
<u>(Please write out grand total bid amount in words below)</u>	
\$ _____	

Bidder acknowledges that estimated quantities are not guaranteed, and are solely for the purpose of comparison of Bids, and final payment for all unit price Bid items will be based on actual quantities, determined as provided in the Contract Documents. Bidder also acknowledges that each unit price includes an amount considered by Bidder to be adequate to cover Bidder's overhead and profit for each separately identified item.

ARTICLE 6 - TIME OF COMPLETION

6.01 Bidder agrees that the furnishing of Goods and Special Services will conform to the schedule set forth in Article 5 of the Agreement.

6.02 Bidder accepts the provisions of the Agreement as to liquidated damages.

ARTICLE 7 - ATTACHMENTS TO THIS BID

7.01 The following documents are attached to and made a condition of this Bid:

- A. Required Bid security in the form of _____.
- B. List of Proposed Major Suppliers;
- C. Required Bidder Qualification Statement with Supporting Data; and

ARTICLE 8 - DEFINED TERMS

8.01 The terms used in this Bid with initial capital letters have the meanings stated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.

ARTICLE 9 - BID SUBMITTAL

9.01 This Bid submitted by:

If Bidder is:

An Individual

Name (typed or printed): _____

By: _____
(Individual's signature)

Doing business as: _____

Business address: _____

Phone: _____ Facsimile: _____

E-mail address: _____

A Partnership

Partnership Name: _____ (SEAL)

By: _____
(Signature of general partner - attach evidence of authority to sign)

Name (typed or printed): _____

Business address: _____

Phone: _____ Facsimile: _____

E-mail address: _____

A Corporation

Corporation Name: _____

State of Incorporation: _____

Type (General Business, Professional, Service, other): _____

By: _____
(Signature - attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

(CORPORATE SEAL)

Attest _____
(Signature of Corporate Secretary)

Business address: _____

Phone: _____ Facsimile: _____

E-mail address: _____

A Limited Liability Company (LLC)

LLC Name: _____

State in which organized: _____

By: _____
(Signature - attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

Business address: _____

Phone: _____ Facsimile: _____

E-mail address: _____

A Joint Venture

First Joint Venturer Name: _____ (SEAL)

By: _____
(Signature - attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

Business address: _____

Phone: _____ Facsimile: _____

E-mail address: _____

Second Joint Venturer Name: _____ (SEAL)

By: _____
(Signature - attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

Business address: _____

Phone: _____ Facsimile: _____

E-mail address: _____

Phone and Facsimile Number, and Address for receipt of official communications to Joint Venture: _____

(Each joint venturer must sign. The manner of signing for each individual, partnership, corporation, and limited liability company that is a party to the joint venture should be in the manner indicated above.)

3.2 EXCAVATION

- A. Unclassified Excavation: Remove rock excavation, clay, silt, gravel, hard pan, loose shale, and loose stone as directed by GWA.
- B. Excavation for Appurtenances:
 - 1. 12 IN (minimum) clear distance between outer surface and embankment.
- C. Groundwater Dewatering:
 - 1. See Specification 31 23 19 - Dewatering
- D. Trench Excavation:
 - 1. Excavate trenches by open cut method to depth shown on Drawings and necessary to accommodate work.
 - a. Support existing utility lines where proposed work crosses at a lower elevation.
 - 1) Stabilize excavation to prevent undermining of existing utility.
 - b. Where connections of new utilities to existing utilities are proposed and utility crossings are known or found to be known at these locations, the Contractor shall expose these utility crossings to verify depth and that no conflicts exist, prior to the Contractor continuing further excavation for the new utilities.
 - 2. Open trench outside buildings, units, and structures:
 - a. No more than the distance between two manholes, structures, units, or 300 LF, whichever is less.
 - b. Field adjust limitations as weather conditions dictate.
 - 3. Any trench or portion of trench, which is opened and remains idle for seven (7) calendar days, or longer, as determined by GWA, may be directed to be immediately refilled, without completion of work, at no additional cost to GWA.
 - a. Said trench may not be reopened until GWA is satisfied that work associated with trench will be prosecuted with dispatch.
 - 4. Observe following trenching criteria:
 - a. Trench size:
 - 1) Excavate width to accommodate free working space.
 - 2) Maximum trench width at top of pipe or conduit may not exceed outside diameter of utility service by more than the following dimensions:

OVERALL DIAMETER OF UTILITY SERVICE	EXCESS DIMENSION
33 IN and less	18 IN

- 3) Cut trench walls vertically from bottom of trench to 1 FT above top of pipe, conduit, or utility service.
 - b. Excavation shall be conducted with care around the existing asbestos concrete pipe in accordance with Specification 02 82 33 – Removal and Disposal of Asbestos Containing Material.
 - c. Keep trenches free of surface water runoff.
 - 1) Include cost in Bid.
 - 2) No separate payment for surface water runoff pumping will be made.
 - d. Trench shall be free of any standing water during pipe bedding, pipe and backfill installation.
 - e. Trench pipe bedding installation shall properly haunch the pipe for the full length of the pipe being installed.

~~E. Sheet Piling:~~

- ~~1. Sheet Piling shall be installed per Section 31 62 17 – Driven Steel Sheet Piling~~

~~F.E.~~ Flowable Fill:

- 1. Flowable fill shall be:
 - a. Placed per FHWA FP-03, Section 614 and as amended by GWA Section C-1.

SECTION 33 01 30.72
WATER OR STEAM CURED-IN-PLACE PIPE LINING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. The rehabilitation of existing sewer line by the installation of water or steam cured-in-place pipe (CIPP).
- B. Related Specification Sections include but are not necessarily limited to:
 - 1. GWA Bid Submission Requirements
 - 2. GWA Standard General Conditions of the Construction Contract
 - 3. GWA Supplementary Conditions
 - 4. Division 01 - General Requirements.
 - 5. Section 33 01 30.11 Television Inspection of Sewers.
 - 6. Section 33 01 30.41 Cleaning of Sewers.

1.2 QUALITY ASSURANCE

- A. Referenced Standards:
 - 1. American Society for Testing and Materials (ASTM):
 - a. ASTM C109, Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. Cube Specimens).
 - b. ASTM C293, Standard Test Method for Flexural Strength of Concrete (Using Simple Beam with Center-Point Loading).
 - c. ASTM C307, Standard Test Method for Tensile Strength of Chemical-Resistant Mortar, Grouts, and Monolithic Surfacing.
 - d. ASTM C496, Standard Test Method for Splitting Tensile Strength of Cylindrical Concrete Specimens.
 - e. ASTM C580, Standard Test Method for Flexural Strength and Modulus of Elasticity of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes.
 - f. ASTM C881, Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete.
 - g. ASTM C882, Standard Test Method for Bond Strength of Epoxy-Resin Systems Used With Concrete by Slant Shear.
 - h. ASTM D2990, Standard Test Methods for Tensile, Compressive, and Flexural Creep and Creep-Rupture of Plastics.
 - i. ASTM D5813, Standard Specification for Cured-In-Place Thermosetting Resin Sewer Piping Systems.
 - j. ASTM F1216, Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin Impregnated Tube.
 - k. ASTM F1417-11a, Standard Practice for Installation Acceptance of Plastic Non-pressure Sewer Lines Using Low-Pressure Air.
 - l. ASTM F1743, Standard Practice for Rehabilitation of Existing Pipelines and Conduits by Pulled-in-Place Installation of Cured-in-Place Thermosetting resin Pipe (CIPP)
 - 2. National Association of Sewer Service Companies (NASSCO):
 - a. NASSCO standards, latest edition and revision thereof.

1.3 SYSTEM DESCRIPTION

- A. The CIPP shall be formed by inserting a resin-impregnated flexible felt tube into an existing sewer line, expanding the tube to fit against the existing sewer line walls, and then curing the resin as required using heated water. The finished product within the lined pipe section shall be a continuous, jointless, structural pipe that is formed to the existing sewer line and, unless

otherwise indicated, shall provide a minimum of 100% of the existing sewer line's original structural and hydraulic design capacities.

1.4 CLOSED-CIRCUIT TELEVISION INSPECTIONS OF PIPE

- A. The Contractor is advised that closed-circuit television (CCTV) inspections were performed on the sewer segments to be rehabilitated from May 2015 to June 2015 and from February 2016 to May 2016. Additional limited amounts of CCTV inspections were performed in 2018 on line segments from SMH 329Haga to the Hagatna Pump Station. Viewing of the video recordings is mandatory.
- B. Some of the sewer lines have incomplete CCTV inspections because the camera was not able to traverse the entire pipe segment from manhole to manhole. As shown on the Contract drawings, for those sewer lines that has incomplete CCTV inspections, the resulting rehabilitation or replacement for the sewer pipe will be determined after the Contractor's initial CCTV work is completed.
- C. Conditions in the sewer are likely to have changed since the date when CCTV information was collected and conditions as depicted therein is not guaranteed to be current.
- D. Bidders shall provide a portable hard drive for the downloading of the files. Obtaining a copy of the video recording files shall be coordinated with Ms. Gloria Bensan of the Guam Waterworks Authority (GWA) at telephone number (671) 300-6042. The portable hard drive shall be dropped off at GWA's office, located at:

Gloria B. Nelson Public Service Building
688 Rt. 15
Mangilao, Guam 96913

A transmittal letter and label on the hard drive indicating the Bidder's name and phone number shall be included. The portable hard drive shall have a minimum capacity of 500 GB. The Bidder shall allow for a minimum of five days for copying of the files.

1.5 SUBMITTALS

- A. Contractor Qualification:
 - 1. The Contractor shall submit documentation that the Contractor is qualified to properly install the proposed product. The following minimum experience requirements shall be met and provided on the documentation:
 - a. CIPP Contractor workforce is to have at least one (1) qualified CIPP work supervisor, one (1) CIPP work crew member, and one (1) lateral reinstatement remote cutter operator. Qualified work crew members must directly provide the specific work for which they have been qualified until such work has been completed and accepted by the Owner.
 - b. Successfully completed projects completed by the Contractor shall have involved the successful installation of a cumulative total of 100,000 linear feet and/or 300 line segments of CIPP liner into sewer main host pipes of 18-inch or larger diameter.
- B. Contractor Personnel Qualifications:
 - 1. The Contractor shall submit documentation that the Contractor's personnel are qualified to properly install the proposed product. The following minimum experience requirements shall be met and provided on the documentation:
 - a. All phases of the CIPP work shall be performed under the direct supervision of an experienced supervisor who has field experience on at least three (3) successfully completed projects performed in the United States or its Territories and in which the supervisor had direct supervision over CIPP lining installation work.
 - b. Successfully completed projects completed by the CIPP supervisor shall have involved the successful installation of a cumulative total of 30,000 linear feet and/or 100 line segments of CIPP liner into sewer main host pipes of 18-inch or larger diameter.

- c. Besides the CIPP work supervisor, at least one other CIPP work crew member shall have direct experience installing CIPP liner for sewer mains. The work crew member shall have field experience on a minimum of two (2) successfully completed CIPP liner projects performed in the United States or its Territories. The two (2) successfully completed projects shall each have involved the successful installation of a minimum of 10,000 linear feet of CIPP liner into sewer host pipes of 18-inch or larger diameter. The work crew member shall have directly participated in liner wet-out and insertion on the two (2) qualifying projects.
 - d. The remote cutter operator shall have directly performed a minimum of 50 successful sewer lateral connection reinstatement by remote cutter on CIPP liner projects performed in the United States or its Territories.
 - 2. If the Contractor desires to reassign or replace personnel who have been qualified by the Owner, a written request to the Owner naming the replacement personnel shall be made. The request shall include documentation of replacement personnel work qualification and experiences which demonstrates that the minimum qualification of this section are met. Written favorable review from the Owner of the replacement personnel's qualifications shall be obtained prior to employing such personnel on the Project.
 - 3. If qualified personnel leave the Contractor's or Specialty Subcontractor's employment during the Contract, the Contractor shall provide replacement personnel that meet the minimum qualifications established by the Owner.
- C. Design Analysis:
- 1. Provide sufficient detail to allow the Owner to judge whether or not the proposed materials, equipment, forms, and procedures will meet the Contract requirements.
 - 2. All design calculations and shop drawings shall be prepared and stamped by a Civil Engineer licensed in Guam, unless otherwise approved by the Owner.
 - 3. No materials shall be manufactured prior to approval of the submittals by the Owner.
 - 4. The CIPP shall be designed per ASTM F1216. The design used for the product shall be submitted in a report for review and approval. The report shall document the design criteria and assumptions for a fully deteriorated pipe section. Physical properties used in design equations shall be validated by independent testing.
- D. Manufacturing and Quality Control:
- 1. Engineering design guides and detailed quality control procedures for rehabilitation materials, manufacturing, shipping, handling and storage, and installation shall be submitted for review. This shall include inspection requirements, product sampling procedures, testing procedures, material safety data sheets (MSDS) for materials and allowable manufacturing tolerance levels.
 - 2. The Contractor shall submit certification provided by the product Manufacturer as to the country of manufacture of all major components to be used to produce the final installed work.
- E. Installation Qualification
- 1. The Contractor shall submit documentation provided by the Manufacturer that the Contractor is qualified to properly install the proposed product. The documentation shall consist of evidence of Contractor training, testing and/or certification of being trained to install the Manufacturer's product.
 - 2. The above documentation of Contractor's training shall be delivered to the Owner within fourteen (14) calendar days after the Notice to Proceed date.
- F. Product Qualification
- 1. The Contractor shall submit documentation that the proposed product meets the minimum linear footage and years of service requirements indicated in Paragraph 2.1 Materials. The documentation shall include for each project the name, address and reference telephone numbers of the owner of the pipe line system that was CIPP lined; date of owner acceptance of the completed product installation; length of CIPP installed; diameter of host pipe; and installer name, address and reference telephone numbers. In addition, the Contractor shall

submit documentation in the form of a notarized letter(s) from the manufacturer(s) verifying that the proposed resin and tube materials have been manufactured for a minimum of three (3) years or the project's linear footage does not exceed three percent (3%) of the total footage of the product (at time of bid) that has been successfully installed in the United States.

2. The above documentation of product qualification and notarized Manufacturer's letter(s) shall be mailed or faxed to the Owner within fourteen (14) calendar days after the Notice to Proceed date.

G. Product Manufacturing

1. The Contractor shall submit documentation in the form of a notarized letter(s) from the manufacturer(s) verifying that the proposed resin and tube materials have been manufactured for a minimum of three years or the project's linear footage does not exceed three percent (3%) of the total footage of the product (at time of bid) that has been successfully installed in the U.S.

H. Product Compatibility

1. The Contractor shall submit documentation certifying that the resin, tube, and outside layer of tube are compatible.

I. Installation Procedures

1. List of Installation Procedures
 - a. An itemized list detailing the installation procedures to be used shall be submitted. This shall include estimated times for each task, the number of required excavations, resin curing method, and any other items unique to each process.
2. Cure Schedule
 - a. A cure schedule shall be included that provides the resin manufacturer's recommended cure and cool down times and cure temperature for each diameter and thickness.
3. Wrinkle Reducing or Removing Methods
 - a. Procedures to be submitted shall include proposed methods of removing or reducing the height of protruding wrinkles in the liner.
4. Required Standards
 - a. All related ASTM standards or any nationally recognized standards for installation of the product shall be submitted.
5. Product Repair
 - a. Detailed procedures shall be submitted for repairing the product in the event of failure or future damage. These procedures should not require specialized training and/or equipment for the Owner's maintenance crews.
6. Future Tapping of Service Connections
 - a. Where applicable, detailed procedures shall be submitted for future tapping of service connections into the product. The procedures should not require specialized training and/or equipment for the Owner's maintenance crews.
7. Installation Lubricant
 - a. Detailed description and physical properties of the lubricant to be used during installation shall be submitted for the Owner's approval.
8. Construction of Manhole Transition Sections
 - a. Detailed procedures for the construction of manhole transition sections along with description and physical properties of the concrete bonding agent to be used shall be submitted for the Owner's approval.
9. Forms and Quality Control Records
 - a. Examples of forms and quality control records to be used throughout the installation and curing process to demonstrate effective application and verification checks shall be provided. These forms and quality control records are subject to approval by the Owner.

J. Product Test Data

1. General Requirements:

- a. No product shall be allowed to be installed without submittal of test data supporting the product performance requirements listed below.
 - b. Materials tested in order to provide the required test data shall be similar to those proposed for use in the Project.
 - c. Unless test data is required below to be obtained from field samples, all test samples shall be prepared so as to simulate the conditions and procedures the product will experience during the Project.
 - d. All testing shall have been performed by an independent third party qualified to perform such testing.
2. Chemical Resistance:
- a. Tests shall be conducted for standard domestic sewage application in accordance with ASTM F1216, Appendix X2, or F1743, Section 7.2, and meet the minimum requirements listed therein.
3. Hydraulic Capacity:
- a. Calculations shall be submitted which support that the finished in-place flexible tube shall be able to provide a minimum of one-hundred percent (100%) of the existing sewer line's original design capacity. (Original design capacity of the existing sewer line shall be calculated using a roughness coefficient "n" of 0.015.).
 - a. The typical roughness coefficient "n" to be used in calculations for the proposed flexible tube shall be verified by independent third party (hired by the product Manufacturer) test data, but shall not be less than 0.011, unless otherwise approved by the Owner.
4. Flexural Modulus and Strength:
- a. In order to verify the proposed product's past performance, the Contractor shall submit detailed test results from a minimum of ten (10) previous successful installations of the proposed CIPP liner.
 - a. The test results of field samples from each of the previous installations shall verify that the minimum requirements for short-term flexural modulus and flexural strength specified in this specification had been achieved.
- K. Wet-Out Product Data
- 1. The following items pertaining to the resin shall be submitted prior to wet-out of the liner:
 - a. The proper quantity (volume or weight plus the specific gravity of the resin) needed to fill all of the felt voids plus the targeted additional resin quantity to compensate for polymerization shrinkage and migration, in a unit length of each diameter and thickness of installed and cured CIPP to be supplied on this project for each line installed.
 - a. Resin colorant type or brand name.
 - b. Colorant information.
 - c. Colorant level (proportion) to be used, based on the percent of resin weight.
 - d. A procedure for adding the colorant to the resin.
 - 2. At time of lining, a signed copy of the wet-out sheet (batch ticket) for each liner delivered to the site and installed.
 - a. The wet-out sheets shall certify that for each length of a diameter and thickness, the information is truthful and accurate.
 - a. The information on the wet-out sheet shall include, but shall not be limited to: liner number, liner diameter, liner thickness, wet out time (prep, mixing and filling, conveyer, clean up, total), resin identification, quantity of resin placed and retained in the felt, a nominal yield calculation, catalyst and promoters used and their proportions, fabric tube identifier, fabric tube length (measured, dry, wet out, total) and the roller gap dimension.

1.6 DELIVERY, STORAGE, AND HANDLING

- 1. CIPP and appurtenances shall be handled, stored, protected, transported, and installed as recommended by the manufacturer. CIPP shall be stored and handled such that the CIPP, including the CIPP tube layers and coatings, is protected from physical damage or other

deterioration. CIPP and appurtenances susceptible to sun and light deterioration (i.e., ultraviolet radiation) and heat damage shall be adequately protected.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Product Qualifications:

1. In order for a CIPP product (combination of tube and resin) to qualify for use in the Project, a history of successful commercial viability shall be shown.
2. Products not meeting the minimum requirements established by the Engineer for successful commercial viability shall be rejected.
3. The Engineer shall be the sole judge as to whether the requirements have been met. For a proposed CIPP product to qualify as a commercially acceptable product for the Project, the following requirements must be met:
 - a. A minimum of 50,000 linear feet of successful wastewater collection system installations in the United States shall be documented. The proposed tube and resin shall have been used together as one product, to assure commercial viability of the materials and the process. In addition, the CIPP product shall have been in service within wastewater collection facilities in the United States for a minimum of three (3) years, unless otherwise approved by the Owner. Installations of the proposed resin and tube used independently from each other may not be used to qualify the product for the linear footage and years of service requirements.
 - a. The manufacturer(s) for both proposed resin and tube shall have successfully produced the material in the United States continuously for a minimum of three (3) years, unless otherwise approved by the Owner. If the manufacturer(s) does not have this minimum three years commercial experience in the United States, the number of linear feet of product proposed to be installed under this Project shall not exceed three percent (3%) of the total footage (at time of bid) of the product that has been successfully installed in the United States.

B. Product Manufacturing

1. The manufacturer(s) for both proposed resin and tube shall have successfully produced the material in the U.S. continuously for a minimum of three years, unless otherwise approved by the Owner. If the manufacturer(s) does not have this minimum three years commercial experience in the U.S., the number of linear feet of product proposed to be installed under this Project shall not exceed three percent (3%) of the total footage (at time of bid) of the product that has been successfully installed in the U.S.

C. Product Requirements

1. Bonding to Existing Pipe Wall
 - a. Pipeline rehabilitation products that require bonding to the existing pipe wall for structural strength will not be allowed since the present structural conditions of the existing pipe walls are unknown and may vary considerably.
2. Resin Impregnation
 - a. No CIPP lining product shall be accepted unless vacuum resin impregnation techniques are used.
3. CIPP Wall
 - a. The finished CIPP wall shall be homogenous throughout, except for the exterior coating (i.e., no intermediate impermeable layers).

2.2 DESIGN REQUIREMENTS

A. General Requirements:

1. All materials and components, including resin, tube, and outside layer of tube, shall be compatible and suitable for providing a finished CIPP product which meets the requirements of the Contract Documents.

B. Design Parameters:

1. The design thickness of the CIPP wall is a function of multiple factors including, but not limited to, product materials and the condition of the existing sewer line. The materials used shall have the capability to vary wall thicknesses in order to address variations in existing pipe conditions (i.e., circumferences, deterioration, and alignment due to pipe bends) and design considerations for a fully deteriorated host pipe.
2. The installed CIPP liner design parameters shall meet or exceed the following minimum CIPP Resin Requirements:
 - a. Flexural Modulus (short term): 300,000 psi
 - a. Flexural Modulus (long term): 150,000 psi
(The long term flexural modulus is defined as fifty years as determined by ASTM D2990 Test Method)
 - a. Flexural Strength: 4,500 psi
3. The installed CIPP liner design parameters shall meet or exceed the following Minimum Finished (cured) CIPP Wall Thickness Requirement (regardless of calculated thicknesses based on ASTM standards identified in this Specification):
 - a. 14-inch Diameter Host Pipe: 0.26-inch (6.6 mm)
 - a. 16-inch Diameter Host Pipe: 0.30-inch (7.6 mm)
 - b. 18-inch Diameter Host Pipe: 0.37-inch (9.4 mm)
 - c. 20-inch Diameter Host Pipe: 0.41-inch (10.4 mm)
 - d. 24-inch Diameter Host Pipe: 0.43-inch (10.9 mm)
 - e. 27-inch Diameter Host Pipe: 0.48-inch (12.2 mm)
4. Other Design Parameters to be used in determining minimum finished liner thickness:
 - a. Fully deteriorated host pipe.
 - a. H-20 truck live load: 16,000 lbs
 - b. Groundwater depth above the bottom of the pipe = depth to ground surface (to reflect saturated soil conditions after a heavy rain).
 - c. Pipe ovality: 3 percent
 - d. Soil density: 120 lbs/cu. ft.
 - e. Soil modulus without live load: 700 psi
 - f. Safety factor: 2.0

C. Structural Requirements:

1. The flexible tube for full-length liners shall be designed as per ASTM F1216, Appendix X1, with the following additional requirements:
 - a. The tube design shall assume no bonding to the existing pipe wall.
 - b. With regards to external buckling and because the structural conditions of the existing sewer pipe walls are unknown, the flexible tube shall be designed to act as a stand-alone pipe within the existing pipe.
 - c. Acceptable third party testing and verification of the design analysis techniques (ASTM F1216, Appendix X1.2.2 for all installation methods) shall be submitted for the Owner review prior to installation of the liner.
 - d. The bond between the flexible tube layers shall be strong and uniform. All layers shall form one homogeneous structural pipe wall with no part of the flexible tube left unsaturated by the resin after curing.

D. Tube:

1. The material shall meet the requirements of ASTM F1216, Section 5.1, or F1743, Section 5.2.1. The tube shall be compatible with the resin system used. The tube shall be fabricated to a size that, when installed, will fit the internal circumference and the length of the existing pipe. Allowance shall be made for circumferential and longitudinal stretch during installation. The tube shall be capable of conforming to offset joints, bells and disfigured pipe sections. The minimum length of each section shall be the distance from the manhole to the next manhole.
2. The Contractor shall verify the section lengths and inside dimensions of the existing sewer section before tube fabrication. Sewing or connecting tubes in order to attain the required length is prohibited.

3. The outside layer of the flexible tube (before inversion) shall be plastic coated with a transparent flexible material that is compatible with the resin system used. The plastic coating shall not delaminate after the flexible tube has cured.
 4. The flexible tube shall contain no intermediate or encapsulated elastomeric layers. No material shall be included in the tube that can be subject to delamination in the cured flexible tube.
- E. Resin:
1. The resin system shall meet the requirements of ASTM F1216, Section 5.2, F1743, Section 5.2.3, or these specifications, whichever is more stringent.
 2. The resin shall be of suitable, visible color to show that the felt liner is completely and uniformly impregnated. The color used shall not interfere with visual and/ or closed circuit television (CCTV) inspection of the liner or its required properties.
 3. The resin shall be a chemically resistant water cured isophthalic polyester or vinyl ester thermoset resin. When cured the CIPP shall meet the structural and chemical resistance requirements of ASTM F1216 and ASTM F1743.

PART 3 - EXECUTION

3.1 PRELIMINARY INVESTIGATION OF HOST SEWER PIPE

- A. Prior to ordering rehabilitation materials, the Contractor shall be responsible for inspecting and confirming the inside diameter, pipe material, and alignment of the host sewer pipe, and determining the condition of each segment to be lined.
- B. The Contractor shall use the data and information collected from this inspection to finalize the liner size, refine the liner design, and refine the installation techniques.
- C. If unknown physical conditions in the work area are encountered during the investigation that materially differ from those ordinarily encountered, the Contractor shall notify the Owner.

3.2 PROCEDURE

- A. General Requirements
 1. Basic procedure for the sewer rehabilitation shall include an access shaft which may involve the temporary removal of the upper portion of a manhole, sewer flow control and bypass pumping (see Specification Section 33 37 23) where necessary, cleaning (see Specification Section 30 01 30.41), pre-rehabilitation television inspection (see Specification Section 33 01 30.11), liner installation, testing, post-rehabilitation television inspection (see Specification Section 33 01 30.11), and any required manhole reconstruction and surface restoration (see Specification Section 33 01 30.81). After completion of the rehabilitation, the CIPP liner shall provide a continuous, watertight, corrosion resistant conduit within the existing sewer line.
 2. The Contractor shall be responsible for performing all CIPP and related work, including video inspection, excavations, and cleaning in accordance with applicable Federal and local safety regulations, including current OSHA safety standards.
 3. Prior to entering manholes and other confined spaces to perform sewer rehabilitation work, the Contractor shall evaluate the atmosphere in and near the sewer to determine the presence of toxic or flammable vapors and shall ventilate the rehabilitation work area as necessary to render it safe, in accordance with OSHA 1910.146, "Permit Required Confined Spaces."
 4. The Contractor shall be responsible for odor and noise mitigation on this Project in accordance with applicable Federal and local regulations. The Contractor shall monitor the surrounding area and minimize any odors and noise that may occur due to his work activities.

3.3 INSTALLATION OF LINER

- A. Liner installation shall be in accordance with ASTM F1216, Section 7, or F1743, Section 6, and with the following requirements:

1. Cleaning and Inspection
 - a. The sewer line shall be cleaned and video inspected per Section 33 01 30.41, "Cleaning of Sewers and Manholes," and Section 33 01 30.11, "Television Inspection of Sewers" prior to CIPP installation. Cleaning and video inspection shall be approved by the Owner before beginning the CIPP installation work.
 2. Protruding Laterals
 - a. Protruding laterals shall be grinded down to the pipe wall surface or as necessary to prevent any damage to the liner and ensure proper installation of the CIPP liner. The Contractor shall CCTV the pipe after the lateral has been grinded down and obtain approval by the Owner before beginning the CIPP installation work.
 3. Access
 - a. The Contractor shall locate and designate all manhole access points that will be used for liner installation and sewer bypassing. The Contractor shall verify that all access points are open and accessible for work and identify any obstacles that may prevent proper installation of the CIPP liner.
 4. Resin Impregnation
 - a. The tube shall be free of any tears and frayed sections. The tube shall be impregnated with resin (wet-out) in accordance with ASTM F1216, Section 7.2, or F1743, Section 6.2. A vacuum impregnation process shall be used. A roller system shall be used to uniformly distribute the resin throughout the tube. All air in the tube shall be removed by vacuum allowing the resin to thoroughly impregnate the tube. All resin shall be contained to ensure no public property or persons are exposed to the liquid resin.
 - a. The Owner or his representative shall be present during the wet out operation.
 - b. The installer shall arrange for a location where the liner will be vacuum-impregnated prior to installation. The installer shall allow the Owner to inspect the materials and procedures used to vacuum-impregnate the tube.
 - c. Should the liner material (felt layers and interior plastic coating) be cut to pump/vacuum resin into the liner, all cut layers of the felt shall be sewn closed and the plastic coating sealed watertight, per manufacturer's recommended procedures.
 5. Bypassing
 - a. If bypassing of sewage flows is required around the sections of pipe designated for rehabilitation, the bypass shall be constructed in accordance with Section 33 37 23, "Sewer Flow Control."
 - a. Public advisory services shall be required to notify all parties whose service laterals will be affected and all connected residents to advise minimum water usage.
 - b. The Contractor shall provide written notification of work activities to all local users fourteen (14) calendar days before interruption of service and provide interim sewer service. This notification shall include a description of the project, the method of construction, and the approximate date and duration that disruption of sewer service will occur. The notification shall also note the potential inconvenience from resin odor, noise, and lights. The Contractor shall maintain a notification log which will include the date and time of the notification, the contact person's name, and if no contact was made, a notation that the information was left at the person's door. The notification shall be submitted to the Owner for approval at least fourteen (14) calendar days prior to being mailed to affected parties.
 - c. If authorized by the Owner, in-person verbal notification shall be acceptable in lieu of the above written notifications.
- B. Insertion of Liner
1. Before the insertion begins, the tube manufacturer shall provide values for the minimum pressure required to hold the tube tight against the existing conduit and the maximum allowable pressure so as not to damage the tube. Once the insertion has started, the pressure shall be maintained between the minimum and maximum pressures until cool down has been completed. Should the pressure deviate from the required, the installed tube shall be removed from the host conduit at the Contractor's expense. The Contractor shall provide the Owner with a continuous log of pressure during cure.

2. Prior to installation, remote temperature gauges (typically thermocouple probes) shall be placed inside the host pipe at the invert level of each end to monitor the temperatures during the cure cycle.
3. Insertion shall be in accordance with ASTM F1216, Section 7.4, or F1743, Section 6.4. If the tube is being pulled into the pipe, no resin shall be lost by contact with manhole walls or the pipe. The resin should not be contaminated or diluted by exposure to dirt, debris, or water during the pull. The resin that provides a structural seal shall not contact the pipe until positioned at the point of repair.
4. The Owner or his representative shall be present during the entire liner insertion procedure. The Contractor shall provide a written notice to the Owner a minimum of 24 hours prior to insertion of the liner.
5. Tube insertion forces or pressures shall be limited so as not to stretch the tube longitudinally by more than five (5%) of the original length.
6. Segments of liner that have been resin impregnated and placed in the host conduit and then are found to be too short, shall be removed without curing and properly discarded at the Contractor's expense. Removal of the uncured, resin impregnated liner shall be accomplished in such a way as to minimize the amount of resin allowed to escape. The Contractor shall be responsible for cleanup of all escaped resin and any odors that may result. The Contractor shall submit a plan to remove any odors and resin impregnated, uncured liner from the host conduit including protection of the host system from escaping resin to the Owner for approval a minimum of three (3) weeks prior to the first installation process.
7. The use of a lubricant during inversion is recommended to reduce friction. This lubricant should be poured into the water in the downtube or applied directly to the tube. Lubricant shall not be used in processes where impregnated coatings are performed prior to tube installation. The lubricant used shall be a non-toxic, oil-based product that has no detrimental effects on the tube or roller and pump system, and will not support bacterial growth or adversely affect sewage treatment processes.
8. The tube shall not be exposed to ultraviolet light.
9. The tube shall not experience excessive bubbling or wrinkling during insertion.

C. Curing

1. Heat Source for Circulation of Water
 - a. After insertion of the wetted out tube is complete, the Contractor shall use a suitable heat source and distribution equipment to circulate heated water uniformly throughout the section for a consistent cure of the resin. The curing temperatures shall comply with submittals and manufacturer's recommendations.
 - b. The heat source shall be fitted with suitable monitors to gauge the temperature of the incoming and outgoing water supply. Another such gauge shall be placed between the impregnated liner tube and the invert of the host pipe at the termination manhole, and any intermediate manholes, to determine the temperatures during the resin cure process. Temperatures at all gauges shall be monitored and logged during curing and cool down. The Contractor shall provide the Owner with a continuous log of temperatures at all gauges during curing.
 - c. Contractor shall provide a temperature measuring sensor throughout the entire length of rehabilitated CIPP to ensure uniform and complete curing. The thermocouple sensors and cable shall allow for temperature to be measured at least every three (3) inches along liner during the curing process. Contractor shall submit documentation that records the continuously monitored temperature during the curing process.
2. CIPP Curing Requirements
 - a. Curing shall be in accordance with ASTM F1216, Section 7.6, or F1743, Section 6.6.
 - a. Initial cure may be considered completed when the exposed portions of the felt tube appear to be hard and the termination manhole temperature sensor indicates the temperature to be adequate to realize an exotherm or cure in the resin as recommended by the resin manufacturer and approved by the Owner. Curing temperatures and duration shall comply with previously submitted data and information.

- b. Any hot water used during the curing process shall be free of any pollutants and shall be properly disposed of at ambient temperatures in an environmentally safe manner in accordance with applicable Federal and local rules and regulations. Contractor shall be responsible for obtaining the applicable permits.

D. Cool-Down

1. Cool-down shall be in accordance with ASTM F1216, Section 7.7, or F1743, Section 6.7.
2. The Contractor shall cool the hardened pipe to a temperature below 100 degrees F before relieving the water column (pressure) or 113 degrees F before relieving the internal pressure.
3. Cool-down may be accomplished by the introduction of cool water into the inversion standpipe to replace water or mixture of air being drained from a small hole made at the downstream end.
4. Care shall be taken in the release of the water column or air pressure so that a vacuum will not be developed that could damage the newly installed CIPP.
5. Coupon samples shall be obtained for testing.

E. Workmanship

1. The finished CIPP shall be continuous over the entire length of each installation run and be free of such defects not limited to holidays, foreign inclusions, dry spots, lifts, delamination, buckling, creases, and seepage of groundwater through the liner material.
2. Wrinkles in the finished CIPP liner shall be repaired as indicated in the following table.

Location of Wrinkle	Height of Wrinkle	Repair Method and Tolerance
Below springline or depth of flow, whichever is higher	Greater than 2 percent of the pipe diameter or 1/4", whichever is greater	Grind to 2 percent of the pipe diameter or 1/4", whichever is greater
Above springline or depth of flow, whichever is higher	Greater than 4 percent of the pipe diameter or 1/2", whichever is greater	Grind to 4 percent of the pipe diameter or 1/2", whichever is greater

3. The Owner shall determine if repairing the wrinkle is necessary.
4. Should the liner be inadvertently perforated during the grinding procedure, the Contractor shall repair or replace the liner by a method approved by the Owner.
5. If other critical defects are present, the Contractor shall remove and replace the liner in these areas, using a method approved by the Owner, at the Contractor's sole expense.

3.4 REINSTATEMENT OF LATERAL CONNECTIONS

A. Lateral Connection Verification

1. The Contractor shall verify the location and number of lateral connections shown on the Plans during his pre-rehabilitation television inspection (see Section 33 01 30.11) or from other methods approved by the Owner. The verification methods utilized by the Contractor shall not require any excavation or removal of existing pipe.

B. Lateral Connection Reinstatement

1. After the CIPP has been cured in place, the existing lateral connections shall be reinstated as required. This shall be done without excavation, from the interior of the pipeline by means of a television camera and remote-control cutting device. The reinstated opening shall be neat, and its edges smooth and without any hanging fibers, or loose or abraded materials. The invert of the reinstated opening shall match the invert of the original connection. Additionally, the opening shall be reinstated to a minimum of 90% and a maximum of 95%

of the original connection opening. The Contractor shall be responsible for restoring/correcting without delay all missed or faulty reconnections as well as for any damages, which may have resulted. A minimum of one (1) standby remote-control cutting device shall be on site during lateral reinstatement operations.

2. All lateral connections shall be reinstated within 10 hours after the completion of the curing process to minimize disturbance to private residents. If connections cannot be reinstated within this period of time, the Contractor shall obtain approval from the Owner prior to any extension to allow additional bypass/diversion pumping. Added bypass/diversion pumping services shall be incidental to the project and at the Contractor's expense.
3. The Contractor shall be responsible for maintaining an emergency crew capable of cutting taps and readily available to respond to sewer service customer problems after normal working hours unless otherwise determined by the Owner. Contractor's emergency crew shall be qualified and fully equipped to perform lateral connection reinstatement operations and provide temporary bypassing if required to maintain sewer service. Costs related to the emergency response will be incidental to the Contract and not measured for payment.

3.5 TRANSITION SECTIONS

A. Design

1. Transition sections shall be constructed to channel sewage flow and minimize entrance and exit losses as the flow passes through the existing manhole structures affected by CIPP work. Construction of the transition grout within the channel shall be determined as follows. For situations where:
 - a. A CIPP liner terminates at both upstream and downstream manhole pipe openings, and the cured liner I.D. is 18" nominal or greater, the transition grout within the channel shall have a uniform thickness equal to the liner thickness throughout the length of the channel.
 - b. A CIPP liner terminates one manhole pipe opening, and the cured liner I.D. is greater than 18" nominal, the transition grout shall be equal to the liner thickness at the manhole wall and taper towards the center of the manhole at a ratio of 1:10 (V:H).
 - c. A cured liner I.D. is equal to or less than 18" nominal, the transition grout shall be equal to the liner thickness at the manhole wall and taper towards the center of the manhole at a ratio of 1:10 (V:H).

Transition Grout Construction		
	Nominal Diameter \geq 18"	Nominal Diameter < 18"
Liner Terminates at Both Manhole Openings	Uniform thickness equal to liner thickness throughout channel length.	Equal to liner thickness at the manhole wall and taper towards channel center at 1:10 (V:H) ratio.
Liner Terminates at One Manhole Opening	Equal to liner thickness at the manhole wall and taper towards channel center at 1:10 (V:H) ratio.	Equal to liner thickness at the manhole wall and taper towards channel center at 1:10 (V:H) ratio.

- d. When the pipe liner is placed through manholes, the Contractor shall cut away the top of the pipe liner to conform to the existing manhole walls.

- e. Existing benches and channels shall be built up with grout as needed to match the CIPP liner elevations. Smooth transitions shall be formed between the existing surfaces and the CIPP.
2. Surface Preparation
 - a. Prior to applying new concrete, the existing surfaces shall be adequately cleaned, scraped of loose concrete, and roughened. An approved concrete bonding agent shall be applied prior to the construction of any new channels, benches and/or transition sections. The bonding agent shall meet ASTM C881 requirements for Type 1, Grade 3, epoxy resin adhesive. The bonding agent shall be Sikadur 31 Hi-Mod Gel or an approved equal.
3. Material Requirements
 - a. Any new channels, benches, and transition sections shall be formed using a quick setting, high strength Portland cement based repair mortar. The mortar shall be SikaTop 122 Plus, Sauereisen Substrate Resurfacer No. F-121, or an approved equal. The mortar shall have the following minimum properties:

	Sika Top 122 Plus	Sauereisen Substrate Resurfacer No. F-121
Flexural Strength	1,500 psi 28 days (ASTM C293)	1,500 psi 7 days (ASTM C580)
Tensile Strength	500 psi 28 days (ASTM C496)	822 psi 7 days (ASTM C307)
Bond Strength	2,000 psi 28 days (ASTM C882)	2,200 psi 7 days (ASTM C882)
Compressive Strength	7,000 psi 28 days (ASTM C109)	7,000 psi 28 days (ASTM C109)

4. Sealing of Annular Space
 - a. At all manholes apply Sikadur 31 Hi-Mod Gel or an approved equal between the CIPP liner and the existing pipe. The material shall be applied around the entire circumference of the pipe to fully seal the annular space to prevent infiltration of groundwater and exfiltration of sewage and sewer gases.
 - a. Where CIPP liner is placed through the manholes, the material shall be applied where the top of the liner has been cut away.
 - b. Install continuous or properly trimmed hydrophilic waterstop end seals at each manhole opening in accordance with the waterstop end seal manufacturer's recommendations. The seals shall be bands that are 20 mm wide and 5 mm high. The hydrophilic water stop end seal shall be Hydrotite Model RS-0520-3.51, or an approved equal, and shall be compatible with the CIPP liner.
5. Liner Termination at Manhole
 - a. The liner section above the bench shall extend approximately two inches into the manhole to mechanically lock the liner in place.

3.6 GENERAL TESTING

- A. General CIPP Liner Testing Requirements
 1. For each inversion length of CIPP full-length liner installed, the Contractor shall perform the tests identified in Section 3.7 CIPP Tests.
 2. Where testing is performed on CIPP samples, the Contractor shall be responsible for providing the necessary samples and for hiring a qualified, independent third party to perform the required tests. The report shall outline test procedures, present data, provide

diagrams as required, and summarize test results for each length of CIPP installed. The report shall provide all information labeled on the samples. Sample labeling requirements are provided in the following paragraph. Copies of the report shall be sent from the laboratory simultaneously to both the Contractor and the Owner immediately upon completion of the sample testing. Two (2) copies of the detailed report on the testing shall be sent to the Owner.

3. The Owner shall be responsible for filling out and maintaining a Cured Sample Testing Record for all samples which the Owner takes possession of. The Contractor shall not destroy any Cured Sample Testing Records and will transfer all Cured Sample Testing Records to the Owner immediately after final acceptance of the project.
4. Lengths of CIPP which fail any of the required tests may be required by the Owner to be removed and replaced at the Contractor's cost.

B. CIPP Samples

1. General Procedures

- a. Cured CIPP samples shall be taken and labeled in the presence of the Owner. The labeling on the sample shall consist of the sample number, Project Name, the Owner Job Number, Contractor company name, name(s) of Contractor's personnel that extracted the sample, the date/time that the sample was taken and the name of the Owner personnel present during sampling. The labeling shall be made with a permanent marking device that will not smudge or fade on the sample.
- b. In addition, the Contractor shall maintain a Cured Sample Testing Record. The Cured Sample Testing Record shall be current and shall be available for immediate review by the Owner upon the Owner's request. A copy of the Cured Sample Testing Record is provided at the end of this Specification. The Contractor may obtain a copy of the Cured Sample Testing Record from the Owner.
- c. The Owner may take possession of a sample or samples at any time prior to the samples being shipped to the third party testing laboratory. The number of samples taken are at the discretion of the Owner. If samples are taken, the Contractor is relieved of responsibility of testing the samples. The samples taken by the Owner may be tested by a laboratory selected by the Owner. In this situation, costs for testing and shipping these samples will be paid for by the Owner. Two copies of the test reports from the laboratory selected by the Owner will be sent to the Contractor.

2. Pipes of 18-Inch Diameter or Less

- a. The sample shall be cut from a section of cured CIPP at the termination point that has been inverted through a pipe with the same inside diameter as the existing pipe and has been held in place by a suitable heat sink, such as sandbags. The sample shall be large enough to provide for all of the tests indicated below.
- a. If a length of CIPP is installed through intermediate manholes, samples shall be taken at each intermediate manhole as well as at the termination point.

3. Pipes Greater Than 18-Inch Diameter

- a. The sample shall be fabricated from material taken from the tube and the resin/catalyst system used and cured in a clamped mold placed in the downtube when circulating the heated water. The sample shall be large enough to provide for all tests indicated below.
- a. Prior to obtaining any sample, the Contractor shall mark the limits of the sample on the CIPP and obtain the approval of the Owner. The Owner has the discretion to adjust the sample location.

3.7 CIPP TESTS

A. CIPP Wall Thickness Test

1. Pipes of 18-Inch Diameter or Less

- a. For host pipes with a nominal diameter 18-inches or less, testing shall be in accordance with ASTM F1743, Section 8.1.6.
- b. The Contractor shall read and follow ASTM F1743 in its entirety.
- c. As a summary, Section 8.1.6 indicated a minimum of eight measurements at evenly spaced intervals around the circumference of the sample shall be taken to ensure that

minimum and maximum thicknesses are determined. Deduct from the measured values the thickness of any plastic coatings of CIPP layers not included in the structural design of the CIPP. The average thickness shall be calculated using the measured values and shall meet or exceed the minimum finished thickness indicated in Section 2.2.B, Design Parameters. The minimum wall thickness at any point shall not be less than 87.5% of the minimum finished thickness indicated in Section 2.2.B, Design Parameters.

- d. Ultrasonic testing of wall thickness is not allowed.
- 2. Pipes Greater than 18-Inch Diameter
 - a. For host pipes with a nominal diameter greater than 18-inches, a 1-inch diameter cored sample shall be taken at the crown of the CIPP, approximately two feet into the pipe at the upstream and downstream manholes of the inversion section.
 - a. An epoxy resin filler approved by the Owner shall be used to fill the cored areas.
- B. Short-Term Flexural Test
 - 1. CIPP samples shall be tested for short-term flexural (bending) properties. Testing shall be in accordance with ASTM F1216, Section 8.1.3.1, or F1743, Section 8.1.4. Five specimens shall be tested.
- C. Delamination Test
 - 1. Testing shall be in accordance with ASTM F1216, Section 8.4, or ASTM F1743, Section 8.4. Five specimens shall be tested.
- D. Peel or Stripping Strength Test
 - 1. Testing shall be in accordance with ASTM F1216, Section 8.5. The peel or stripping strength between any nonhomogeneous layers of CIPP laminate shall be a minimum of 10 lb/in. of width.

3.8 PIPE LEAKAGE TEST

- A. Testing shall be in accordance with ASTM F1216 as summarized below. The Contractor shall review and follow ASTM F1216 in its entirety.
- B. The cured liner material shall be impervious and not allow for any infiltration or exfiltration. Unless otherwise directed by the Owner, the Contractor shall conduct either an exfiltration, infiltration, or air test for each CIPP inversion for pipes with a nominal diameter of 36-inches or less.
- C. Laterals shall be reinstated after the leakage test is completed.
- D. The Contractor shall notify the Owner as to the type of testing to be conducted prior to the testing.
- E. It shall be noted that the allowable leakage amounts indicated in the following paragraphs are to allow for imperfections that may be associated with the leakage test setup (Ex. slight leakage at the plugs, seepage through the downtube material, volumetric changes in the water or air inside the liner due to temperature changes, etc.). Leakage as a result of a pervious finished liner will not be accepted and will be considered defective requiring repair or replacement.
 - 1. Exfiltration Test
 - a. An exfiltration test may be conducted after the CIPP has cooled to ambient temperature. The Contractor shall submit testing procedures for approval.
 - b. The maximum amount of leakage for any section of CIPP being tested shall not exceed 50 gallons per day per inch of internal diameter per mile of pipe. During the exfiltration testing, the maximum internal pipe pressure at the lowest end shall not exceed 10 feet of water and the water level inside the inversion standpipe shall be two feet higher than the top of the pipe or two feet higher than the groundwater level, whichever is greater. The test should be conducted for a minimum of one hour and may be performed during the liner cool down period.
 - c. The exfiltration test shall be conducted at the completion of the curing process while the CIPP is under hydrostatic pressure.
 - d. Laterals shall be reinstated after the leakage test is completed.

2. Infiltration Test
 - a. An infiltration test may be conducted if the groundwater is more than 2 feet above top of pipe for the entire section of sewer line. The Contractor shall submit testing procedures for approval.
 - a. The maximum amount of infiltration for any CIPP section being tested shall not exceed the rate of 50 gallons per day per inch of internal diameter per mile of pipe at a minimum test head of 2 feet above the existing groundwater level, whichever is greater.
3. Air Test
 - a. Testing shall be conducted after the CIPP has cooled to ambient temperature and prior to reinstating any laterals. Low pressure air test shall be in accordance with ASTM F1417-11a, except for testing times, which shall follow the minimum testing times as listed in the table below. The Time-Pressure Drop Method, using 1.0 psig pressure drop, shall be used.

Pipe Diameter	Minimum Time	Length for Minimum Time	Time for Longer Length
Inches	Seconds	Feet	Seconds/Ft
12	680	199	3.419
15	850	159	5.342
18	1,020	133	7.693
21	1,190	114	10.471
24	1,360	100	13.676
27	1,530	88	17.309

- b. The low pressure air test may be dangerous to personnel. It is extremely important that the various plugs be properly installed to prevent sudden expulsion of a poorly installed or partially inflated plug. The Contractor shall be responsible for providing all safety measures necessary to protect personnel from injury. No one shall be allowed in the manholes during testing.
- c. For products in which the pipe wall is cured while not in direct contact with the pressurizing fluid (e.g. a removable inflation bladder is used), the pipe shall be leakage tested after the cure process is completed and the pressurizing fluid and apparatus have been removed.

3.9 INSPECTION AND ACCEPTANCE

- A. The finished installation shall be inspected by the Contractor by closed-circuit television camera as specified in Section 33 01 30.11, "Television Inspection of Sewers," in the presence of the Owner, unless otherwise directed by the Owner.
- B. Variations from true line and grade will only be acceptable if proven by the Contractor that the variations existed under the original conditions of the existing sewer lines.
- C. The CIPP work will be deemed unacceptable if infiltration of groundwater is detected. All lateral connections and entrances must be accounted for and shall be unobstructed.

3.10 CLEANING

- A. Upon acceptance of the CIPP installation, the Contractor shall restore the Project area to its original conditions or better.

PART 4 - MEASUREMENT AND PAYMENT

4.1 CIPP LINING

- A. The quantity for which payment will be made for sewer line rehabilitation shall be the actual length of CIPP liner installed, measured in linear feet.

- B. Payment for sewer line CIPP rehabilitation work shall be based on the unit price bid per linear foot for CIPP lining as scheduled in the Bid Schedule. This payment shall include full compensation for all labor, materials, supplies, equipment, tools, and incidentals for the complete installation of the liner, transition sections, removal and restoration of sewer manhole cones (if required for access), removal of protruding laterals, sealing at manholes, reworking manhole inverts and benches, patching, grout work, testing of installed liner, and for all other related work covered by this specification. CIPP samples submitted to the testing lab by the Owner shall be paid for by the Owner.
- C. Payment for CIPP lining will not be made until all testing and post-construction CCTV work have been approved by the Owner.

4.2 LATERAL REINSTATEMENT

- A. Measurement for payment for sewer lateral connection reinstatements upon completion of CIPP lining installation shall be per each sewer lateral connection reinstated.
- B. Payment for sewer lateral opening reinstatement shall be based on the unit price per each as scheduled in the Bid Schedule and shall include full compensation for all labor, materials, supplies, equipment, tools and incidentals for the complete reinstatement of sewer lateral connections openings.

Page: _____

CURED SAMPLE TESTING RECORD

Project Name: _____
 City Job Number: _____
 Contractor: _____

Tel. _____ E-mail _____

Sample No.	Date(D)/Time(T) sample removal from pipe/plate	Sewer ID(s) of Host Pipe Segment in which CIPP was installed	Sewer ID of Manhole from which sample taken	Name(s) of Contractor's personnel taking sample	Officer-in-Charge or designated representative present during sample taking: Name & Initial. Initial shall be written with pen and ink.	Date shipped to Third Party Testing laboratory	Party responsible for shipping sample: Contractor (C), City and County of Honolulu (CCH)	Shipping Carrier	Shipping Carrier's Tracking number	Officer-in-Charge or designated representative receiving test results: Name & Initial. Initial shall be written with pen and ink.	Date test results received	Sample test results meets minimum requirements	Sample test results doesn't meet minimum requirements
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LINE B - ADELUP-HAGATNA TRUNK SEWER

Line B - Adelup-Hagatna Trunk Sewer												
SEWER AND MANHOLE IDENTIFICATION				SCHEDULE OF WORK								
Pipe Sewer ID	Upstream MH Sewer ID	Downstream MH Sewer ID	Existing Pipe Diameter (in)	Rehabilitation Work	Description of Action							Laterals
					CIPP Length (ft)	Upsize Length (ft)	New or Replace Length (ft)	No. of Point Repairs	Point Repair Length (ft)	Abandon Length (ft)	Clean Sewer Length (ft)	
1137	325Haga	Agana P/S Wetwell	27	CIPP rehabilitation	29							0
1136	324Haga	325Haga	27	CIPP rehabilitation	21							0
647	323Haga	324Haga	27	CIPP rehabilitation	360							0
1141	329Haga	323Haga	27	CIPP rehabilitation	367							0
1140	328Haga	329Haga	27	CIPP rehabilitation	347							0
1139	327Haga	328Haga	27	CIPP rehabilitation	378							
1138	326AHaga	327Haga	27	CIPP rehabilitation	235							
1720A	326Haga	326AHaga	27	CIPP rehabilitation	130							
1720	333Haga	326Haga	27	CIPP rehabilitation	358							
1143	332Haga	333Haga	27	CIPP rehabilitation	72							
2268	335Haga	332Haga	27	CIPP rehabilitation	301							
966	331Haga	335Haga	27	CIPP rehabilitation	298							
2269	336Haga	331Haga	27	CIPP rehabilitation	239							2
2273	340Haga	336Haga	27	CIPP rehabilitation	248							2
2272	339Haga	340Haga	27	CIPP rehabilitation	274							4
2271	338Haga	339Haga	27	CIPP rehabilitation	218							1
2270	337Haga	338Haga	27	CIPP rehabilitation	346							2
2274	341Haga	337Haga	27	CIPP rehabilitation	249							2
2280	347Haga	341Haga	27	CIPP rehabilitation	271							2
2279	346Haga	347Haga	27	CIPP rehabilitation	247							0
2278	345Haga	346Haga	27	CIPP rehabilitation	250							2
2277	344Haga	345Haga	27	CIPP rehabilitation	272							0
2276	343Haga	344Haga	24	CIPP rehabilitation	205							0
2275	342Haga	343Haga	24	CIPP rehabilitation	205							3
1834	353Haga	342Haga	24	CIPP rehabilitation	285							0
2285	352Haga	353Haga	24	CIPP rehabilitation	247							0
2284	351Haga	352Haga	24	CIPP rehabilitation	33							0
2283	350Haga	351Haga	24	CIPP rehabilitation	272							1
2282	350CHaga	350Haga	24	CIPP rehabilitation	141							0
2282D	350BHaga	350CHaga	24	CIPP rehabilitation	18							0
2282C	350AHaga	350BHaga	18	CIPP rehabilitation	124							0
2282B	350AHaga	350BHaga	18	CIPP rehabilitation	124							0
2282A	349Asan	350AHaga	24	CIPP rehabilitation	17							0
2281	348Asan	349Asan	24	CIPP rehabilitation	127							0
196	356Asan	348Asan	24	CIPP rehabilitation	264							1
195	355Asan	356Asan	16	CIPP rehabilitation	245							0
427	17Asan	355Asan	16	CIPP rehabilitation	40							0
166	16Asan	17Asan	16	CIPP rehabilitation	315							2
165	15Asan	16Asan	16	Clean Existing Sewer							346	3
164	14Asan	15Asan	16	Clean Existing Sewer							332	2
163	13Asan	14Asan	16	CIPP rehabilitation	46							0

LINE B - ADELUP-HAGATNA TRUNK SEWER

Line B - Adelup-Hagatna Trunk Sewer									
Manhole No.	GENERAL		SCHEDULE OF WORK						
	Depth of Invert to Grade (ft)	Cover/Frame Dia (in)	1	2	3	4		5	6
			Replace Frame and Cover? (Y/N)	Reconstruct Concrete Collar (Y/N)	Clean Existing Manhole (Y/N)	Rehabilitate Cone and Riser With Epoxy Coating (Y/N)	Rehabilitation Vertical Feet	Patch Surface Defect (Y/N)	Rehabilitate Bench/Ch annel? (Y/N)
325Haga	14.47	Unk.	N	N	N	N	-	N	N
324Haga	12.70	25	Y	Y (SEE NOTE 2)	N	N	-	N	N
323Haga	13.00	25	N	N	N	N	-	N	N
329Haga	12.30	25	N	N	N	N	-	N	N
328Haga	11.90	25	N	Y	N	N	-	N	N
327Haga	11.40	25	N	N	N	N	-	N	N
326AHaga	10.70	24	N	N	N	N	-	N	N
326Haga	10.50	25	N	N	N	N	-	N	N
333Haga	10.00	25	N	Y	N	N	-	N	N
332Haga	9.90	25	N	N	N	N	-	N	N
335Haga	9.90	25	Y	Y	N	N	-	N	N
331Haga	10.00	25	N	N	N	N	-	N	N
336Haga	9.80	25	N	N	N	N	-	N	N
340Haga	9.30	25	N	N	N	N	-	N	N
339Haga	9.50	25	N	N	N	N	-	N	N
338Haga	9.50	25	N	N	N	N	-	N	N
337Haga	9.40	25	N	N	N	N	-	N	N
341Haga	9.10	25	N	N	N	N	-	N	N
347Haga	9.10	25	N	N	N	N	-	N	N
346Haga	8.90	25	N	N	N	N	-	N	N
345Haga	8.60	25	N	N	N	N	-	N	N
344Haga	8.70	25.5	N	N	N	N	-	N	N
343Haga	9.40	25	N	N	N	N	-	N	N
342Haga	9.50	25	N	N	N	N	-	N	N
353Haga	10.11	Unk.	N	N	N	N	-	N	N
352Haga	10.20	25	N	N	N	N	-	N	N
351Haga	10.00	25.5	N	N	N	N	-	N	N
350Haga	9.90	25.5	N	N	N	N	-	N	N
350CHaga	10.10	25	N	N	N	N	-	N	N
350BHaga	10.30	25	N	N	N	N	-	N	N
350AHaga	10.50	25	N	N	N	N	-	N	N
349Asan	9.60	25	N	N	N	N	-	N	N
348Asan	9.50	25.5	N	N	N	N	-	N	N
356Asan	9.20	25.5	N	N	N	N	-	N	N
355Asan	7.60	25.5	N	Y	N	N	-	N	N
17Asan	7.60	25.5	N	N	N	N	-	N	N
16Asan	7.40	25	N	Y	N	N	-	N	N
15Asan	7.50	25.5	N	Y	N	N	-	N	N
14Asan	7.10	25.5	N	N	N	N	-	N	N
13Asan	5.50	25	N	N	N	N	-	N	N

NOTES:

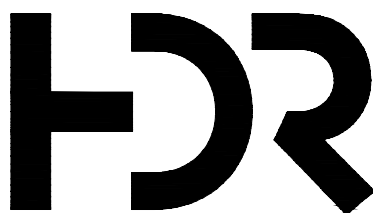
1. ADDITIONAL LINE REPLACEMENT AND POINT REPAIRS MAY BE REQUIRED FOLLOWING CLEANING AND CCTV BY THE CONTRACTOR.
2. CONCRETE COLLAR CONSISTS OF MANHOLE FRAME AND COVER INSTALLED WITHIN A CONCRETE SIDEWALK. SEE REPLACEMENT DETAILS ON SHEET C-036.

LINE C - ADELUP-HAGATNA TRUNK SEWER

Line C - Adelup-Hagatna Trunk Sewer												
SEWER AND MANHOLE IDENTIFICATION				Schedule of Work								
Pipe Sewer ID	Upstream MH Sewer ID	Downstream MH Sewer ID	Existing Pipe Diameter (in)	Rehabilitation Work	Description of Action							Laterals
					CIPP Length (ft)	Upsize Length (ft)	New or Replace Length (ft)	No. of Point Repairs	Point Repair Length (ft)	Abandon Length (ft)	Clean Sewer Length (ft)	
-	849Asan	355AAsan	–	New 12" Line			80					0
488	849Asan	17Asan	12	Abandon						123		0

LINE C - ADELUP-HAGATNA TRUNK SEWER

Line C - Adelup-Hagatna Trunk Sewer									
ManholeNo.	General		Schedule of Work						
	Depth of Invert to Grade (ft)	Cover/Frame Dia (in)	1	2	3	4		5	6
			Replace Frame and Cover? (Y/N)	Reconstruct Concrete Collar (Y/N)	Clean Existing Manhole (Y/N)	Rehabilitate Cone and Riser With Epoxy Coating (Y/N)	Rehabilitation Vertical Feet	Patch Surface Defect (Y/N)	Rehabilitate Bench/Channel? (Y/N)
849Asan	10.30'	25	N	N	N	N	-	N	N



ADDENDUM #2

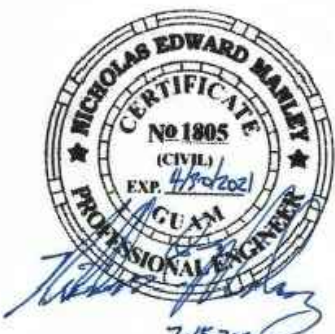
7/15/2020

ISSUE


DATE

DESCRIPTION

PROJECT MANAGER	N MANLEY
DESIGNED BY	E OKAMURA
DESIGNED BY	M CHOI
CHECKED BY	R ABE
DRAWN BY	F ISIDRO
DRAWN BY	B YAMASAKI
DRAWN BY	Y BRION
DATE	MAY 2020
PROJECT NUMBER	10026963



THIS WORK WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION.



GUAM WATERWORKS AUTHORITY

ROUTE 1 SANITARY SEWER LINE
REHABILITATION AND REPLACEMENT
(ASAN-ADELUP-HAGATNA) - PHASE II

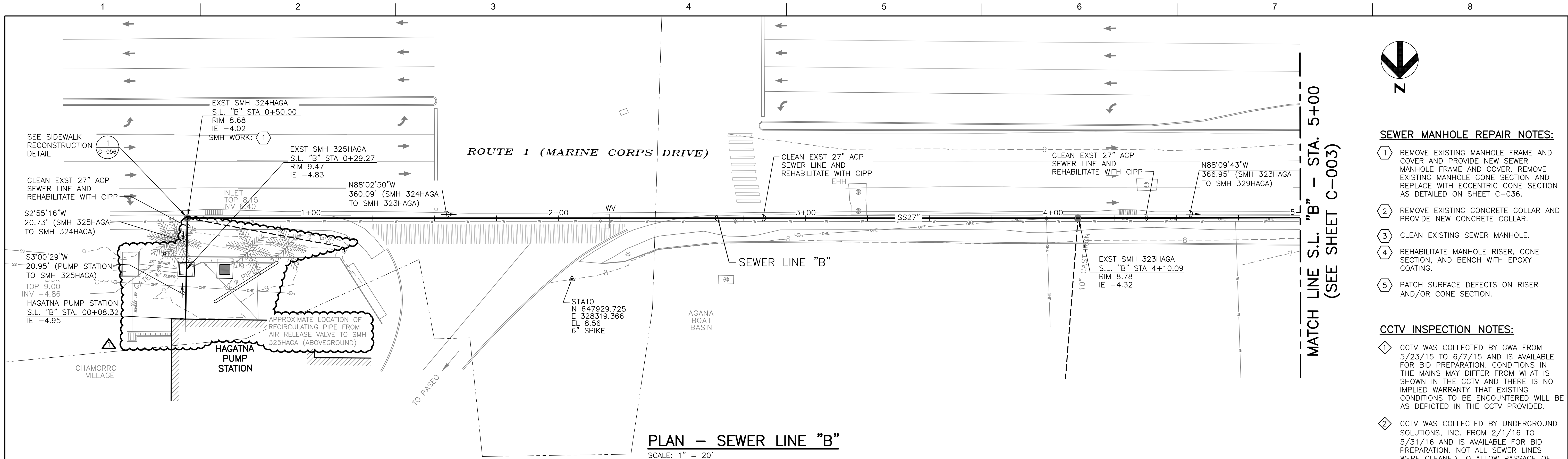
SCHEDULE OF WORK SUMMARY

FILENAME01G-005.dwg

SCALEAS SHOWN

SHEET

G-005



SEWER MANHOLE REPAIR NOTES:

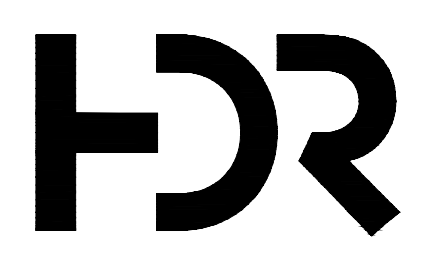
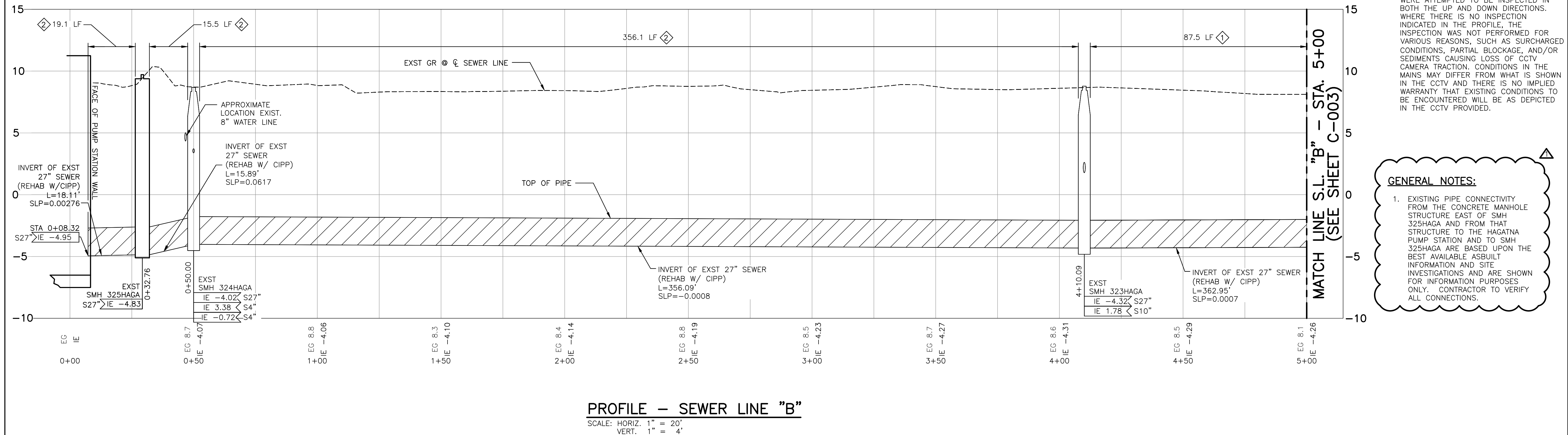
- 1 REMOVE EXISTING MANHOLE FRAME AND COVER AND PROVIDE NEW SEWER MANHOLE FRAME AND COVER. REMOVE EXISTING MANHOLE CONE SECTION AND REPLACE WITH ECCENTRIC CONE SECTION AS DETAILED ON SHEET C-036.
- 2 REMOVE EXISTING CONCRETE COLLAR AND PROVIDE NEW CONCRETE COLLAR.
- 3 CLEAN EXISTING SEWER MANHOLE.
- 4 REHABILITATE MANHOLE RISER, CONE SECTION, AND BENCH WITH EPOXY COATING.
- 5 PATCH SURFACE DEFECTS ON RISER AND/OR CONE SECTION.

CCTV INSPECTION NOTES:

- 1 CCTV WAS COLLECTED BY GWA FROM 5/23/15 TO 6/7/15 AND IS AVAILABLE FOR BID PREPARATION. CONDITIONS IN THE MAINS MAY DIFFER FROM WHAT IS SHOWN IN THE CCTV AND THERE IS NO IMPLIED WARRANTY THAT EXISTING CONDITIONS TO BE ENCOUNTERED WILL BE AS DEPICTED IN THE CCTV PROVIDED.
- 2 CCTV WAS COLLECTED BY UNDERGROUND SOLUTIONS, INC. FROM 2/1/16 TO 5/31/16 AND IS AVAILABLE FOR BID PREPARATION. NOT ALL SEWER LINES WERE CLEANED TO ALLOW PASSAGE OF THE CCTV CAMERA. ALL SEWER LINES WERE ATTEMPTED TO BE INSPECTED IN BOTH THE UP AND DOWN DIRECTIONS. WHERE THERE IS NO INSPECTION INDICATED IN THE PROFILE, THE INSPECTION WAS NOT PERFORMED FOR VARIOUS REASONS, SUCH AS SURCHARGED CONDITIONS, PARTIAL BLOCKAGE, AND/OR SEDIMENTS CAUSING LOSS OF CCTV CAMERA TRACTION. CONDITIONS IN THE MAINS MAY DIFFER FROM WHAT IS SHOWN IN THE CCTV AND THERE IS NO IMPLIED WARRANTY THAT EXISTING CONDITIONS TO BE ENCOUNTERED WILL BE AS DEPICTED IN THE CCTV PROVIDED.

GENERAL NOTES:

1. EXISTING PIPE CONNECTIVITY FROM THE CONCRETE MANHOLE STRUCTURE EAST OF SMH 325HAGA AND FROM THAT STRUCTURE TO THE HAGATNA PUMP STATION AND TO SMH 325HAGA ARE BASED UPON THE BEST AVAILABLE ASBUILT INFORMATION AND SITE INVESTIGATIONS AND ARE SHOWN FOR INFORMATION PURPOSES ONLY. CONTRACTOR TO VERIFY ALL CONNECTIONS.



ISSUE	DATE	DESCRIPTION
ADDENDUM #2	7/15/2020	

PROJECT MANAGER	N MANLEY
DESIGNED BY	E OKAMURA
DESIGNED BY	M CHOI
CHECKED BY	R ABE
DRAWN BY	F ISIDRO
DRAWN BY	B YAMASAKI
DRAWN BY	Y BRION
DATE	MAY 2020
PROJECT NUMBER	10026963



THIS WORK WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION.

GUAM WATERWORKS AUTHORITY

**ROUTE 1 SANITARY SEWER LINE
REHABILITATION AND REPLACEMENT
(ASAN-ADELUP-HAGATNA) - PHASE II**

**PLAN AND PROFILE - SEWER LINE "B"
STA 0+00 - STA 5+00**

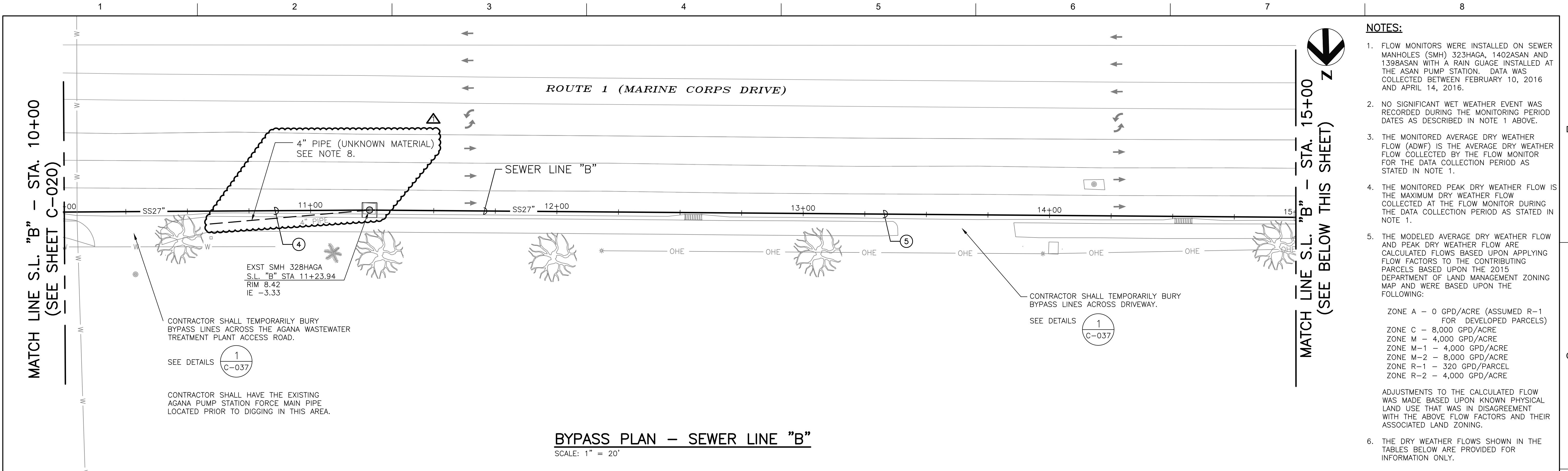
0' 2' 4' 8'

0' 10' 20' 40'

FILENAME 03C-002.dwg

SCALE H: 1" = 20'; V: 1" = 4'

SHEET C-002



NOTES:

1. FLOW MONITORS WERE INSTALLED ON SEWER MANHOLES (SMH) 323HAGA, 1402ASAN AND 1398ASAN WITH A RAIN GUAGE INSTALLED AT THE ASAN PUMP STATION. DATA WAS COLLECTED BETWEEN FEBRUARY 10, 2016 AND APRIL 14, 2016.
2. NO SIGNIFICANT WET WEATHER EVENT WAS RECORDED DURING THE MONITORING PERIOD DATES AS DESCRIBED IN NOTE 1 ABOVE.
3. THE MONITORED AVERAGE DRY WEATHER FLOW (ADWF) IS THE AVERAGE DRY WEATHER FLOW COLLECTED BY THE FLOW MONITOR FOR THE DATA COLLECTION PERIOD AS STATED IN NOTE 1.
4. THE MONITORED PEAK DRY WEATHER FLOW IS THE MAXIMUM DRY WEATHER FLOW COLLECTED AT THE FLOW MONITOR DURING THE DATA COLLECTION PERIOD AS STATED IN NOTE 1.
5. THE MODELED AVERAGE DRY WEATHER FLOW AND PEAK DRY WEATHER FLOW ARE CALCULATED FLOWS BASED UPON APPLYING FLOW FACTORS TO THE CONTRIBUTING PARCELS BASED UPON THE 2015 DEPARTMENT OF LAND MANAGEMENT ZONING MAP AND WERE BASED UPON THE FOLLOWING:

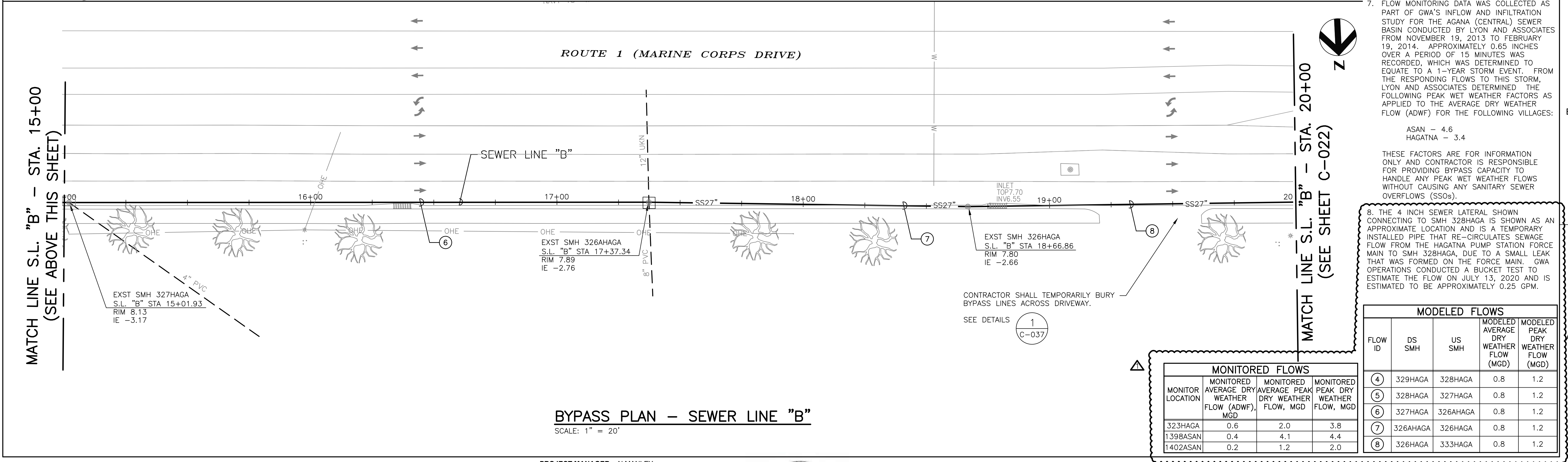
ZONE A - 0 GPD/ACRE (ASSUMED R-1 FOR DEVELOPED PARCELS)
ZONE C - 8,000 GPD/ACRE
ZONE M - 4,000 GPD/ACRE
ZONE M-1 - 4,000 GPD/ACRE
ZONE M-2 - 8,000 GPD/ACRE
ZONE R-1 - 320 GPD/PARCEL
ZONE R-2 - 4,000 GPD/ACRE

ADJUSTMENTS TO THE CALCULATED FLOW WAS MADE BASED UPON KNOWN PHYSICAL LAND USE THAT WAS IN DISAGREEMENT WITH THE ABOVE FLOW FACTORS AND THEIR ASSOCIATED LAND ZONING.
6. THE DRY WEATHER FLOWS SHOWN IN THE TABLES BELOW ARE PROVIDED FOR INFORMATION ONLY.
7. FLOW MONITORING DATA WAS COLLECTED AS PART OF GWA'S INFLOW AND INFILTRATION STUDY FOR THE AGANA (CENTRAL) SEWER BASIN CONDUCTED BY LYON AND ASSOCIATES FROM NOVEMBER 19, 2013 TO FEBRUARY 19, 2014. APPROXIMATELY 0.65 INCHES OVER A PERIOD OF 15 MINUTES WAS RECORDED, WHICH WAS DETERMINED TO EQUATE TO A 1-YEAR STORM EVENT. FROM THE RESPONDING FLOWS TO THIS STORM, LYON AND ASSOCIATES DETERMINED THE FOLLOWING PEAK WET WEATHER FACTORS AS APPLIED TO THE AVERAGE DRY WEATHER FLOW (ADWF) FOR THE FOLLOWING VILLAGES:

ASAN - 4.6
HAGATNA - 3.4

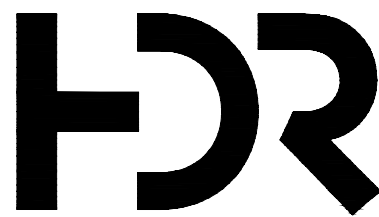
THESE FACTORS ARE FOR INFORMATION ONLY AND CONTRACTOR IS RESPONSIBLE FOR PROVIDING BYPASS CAPACITY TO HANDLE ANY PEAK WET WEATHER FLOWS WITHOUT CAUSING ANY SANITARY SEWER OVERFLOWS (SSOs).

8. THE 4 INCH SEWER LATERAL SHOWN CONNECTING TO SMH 328HAGA IS SHOWN AS AN APPROXIMATE LOCATION AND IS A TEMPORARY INSTALLED PIPE THAT RE-CIRCULATES SEWAGE FLOW FROM THE HAGATNA PUMP STATION FORCE MAIN TO SMH 328HAGA, DUE TO A SMALL LEAK THAT WAS FORMED ON THE FORCE MAIN. GWA OPERATIONS CONDUCTED A BUCKET TEST TO ESTIMATE THE FLOW ON JULY 13, 2020 AND IS ESTIMATED TO BE APPROXIMATELY 0.25 GPM.



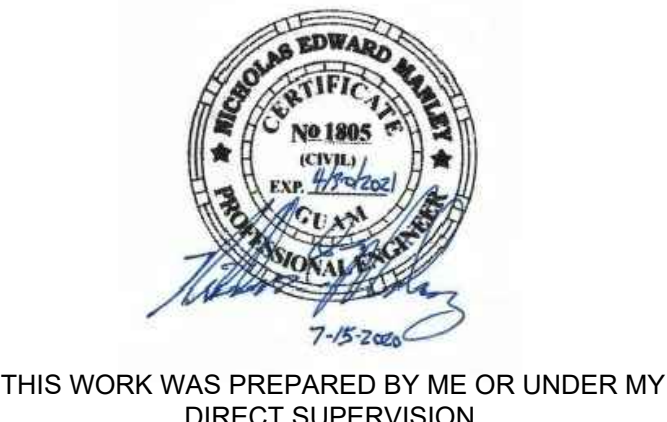
MONITORED FLOWS				
MONITOR LOCATION	MONITORED AVERAGE DRY WEATHER FLOW (ADWF), MGD	MONITORED AVERAGE PEAK DRY WEATHER FLOW, MGD	MONITORED PEAK DRY WEATHER FLOW, MGD	
323HAGA	0.6	2.0	3.8	
1398ASAN	0.4	4.1	4.4	
1402ASAN	0.2	1.2	2.0	

MODELED FLOWS				
FLOW ID	DS SMH	US SMH	MODELED AVERAGE DRY WEATHER FLOW (MGD)	MODELED PEAK DRY WEATHER FLOW (MGD)
④	329HAGA	328HAGA	0.8	1.2
⑤	328HAGA	327HAGA	0.8	1.2
⑥	327HAGA	326AHAGA	0.8	1.2
⑦	326AHAGA	326HAGA	0.8	1.2
⑧	326HAGA	333HAGA	0.8	1.2



ISSUE	DATE	DESCRIPTION
ADDENDUM #2	7/15/2020	

PROJECT MANAGER	N MANLEY
DESIGNED BY	E OKAMURA
DESIGNED BY	M CHOI
CHECKED BY	R ABE
DRAWN BY	F ISIDRO
DRAWN BY	B YAMASAKI
DRAWN BY	Y BRION
DATE	MAY 2020
PROJECT NUMBER	10026963



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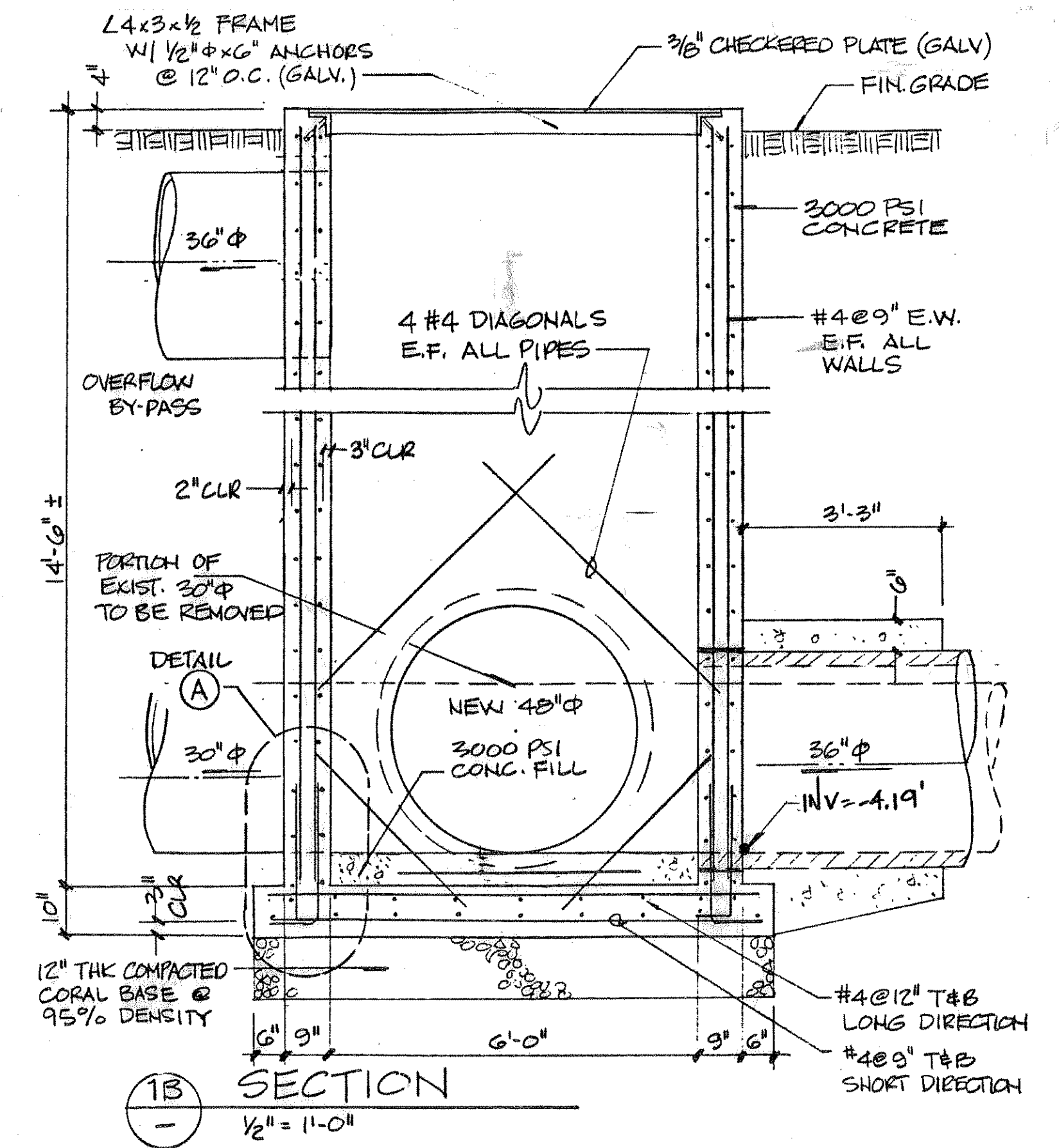
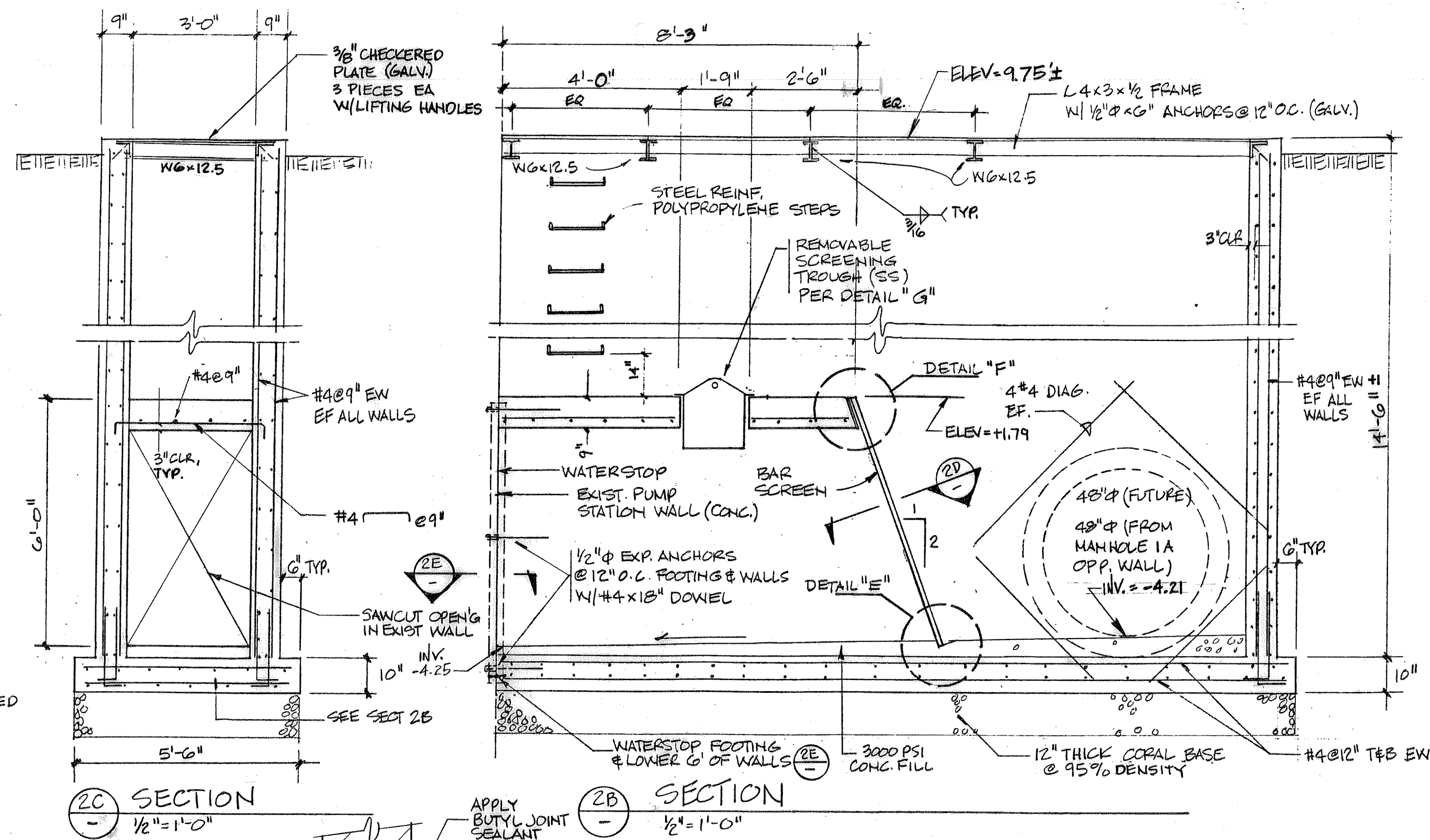
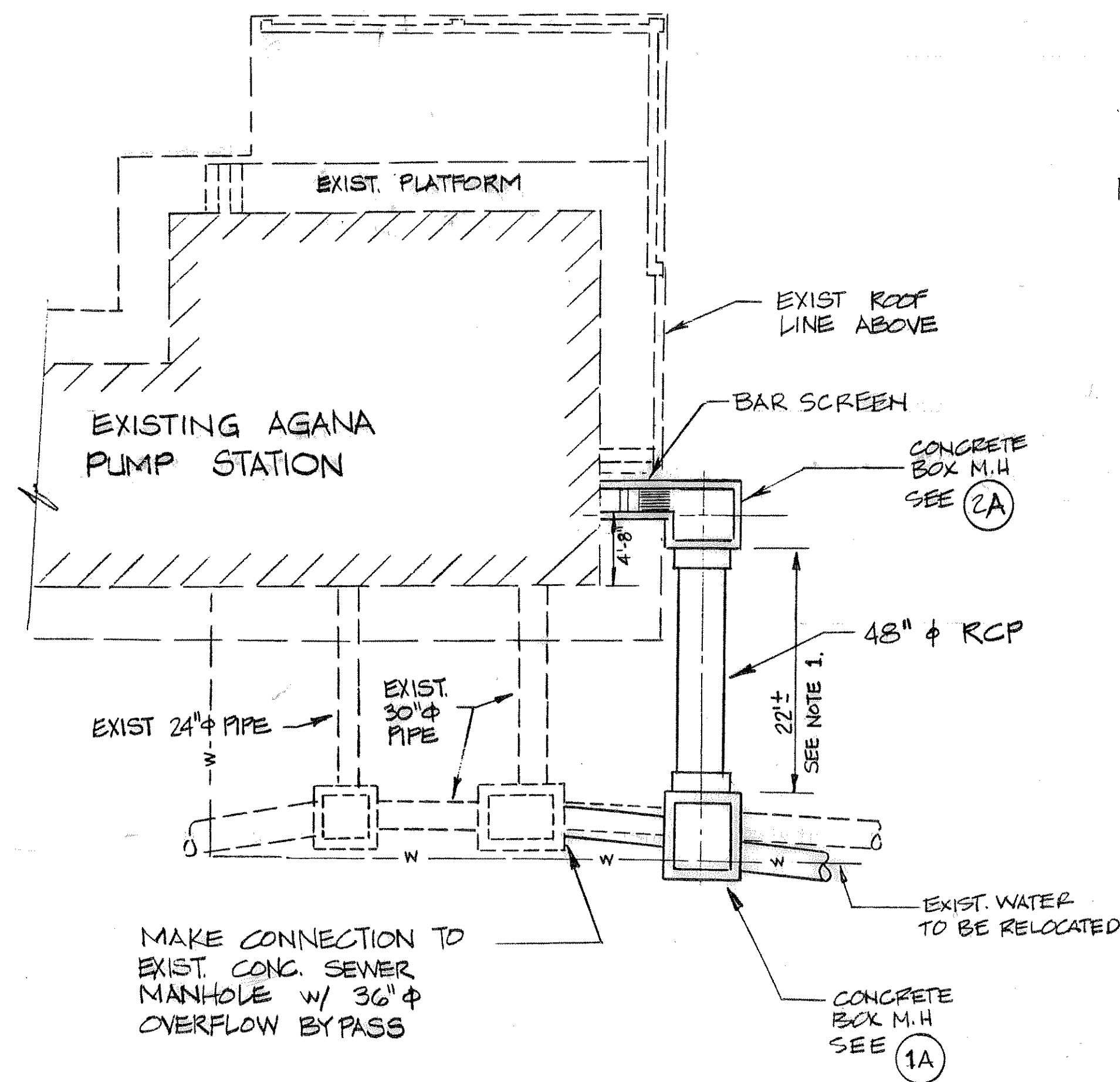
BYPASS PLAN - SEWER LINE "B"
STA 10+00 - STA 20+00

0' 10' 20' 40'

FILENAME | 03C-021.dwg
SCALE | 1" = 20'

SHEET
C-021

Part C
Reference Documents



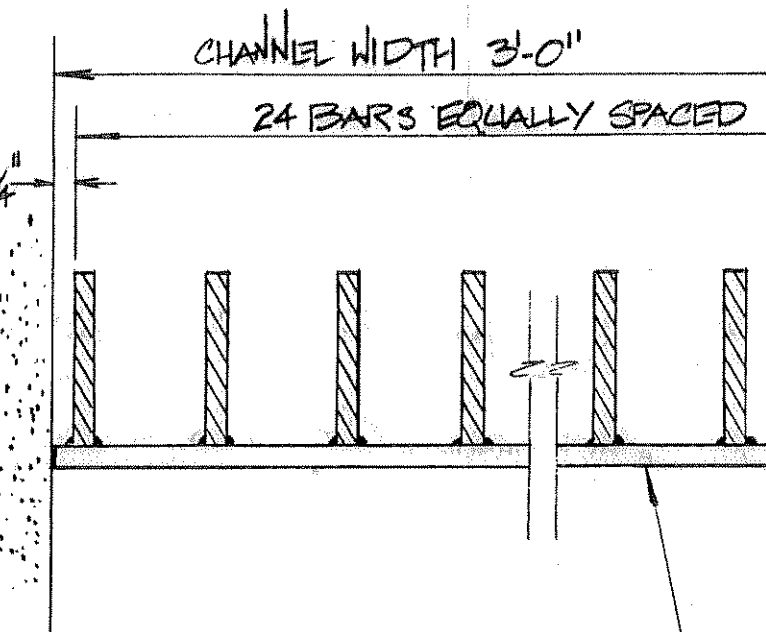
1 INLET MODIFICATIONS SITE PLAN NOT TO SCALE

EXIST. AGANA PUMP STATION - SCOPE OF WORK:

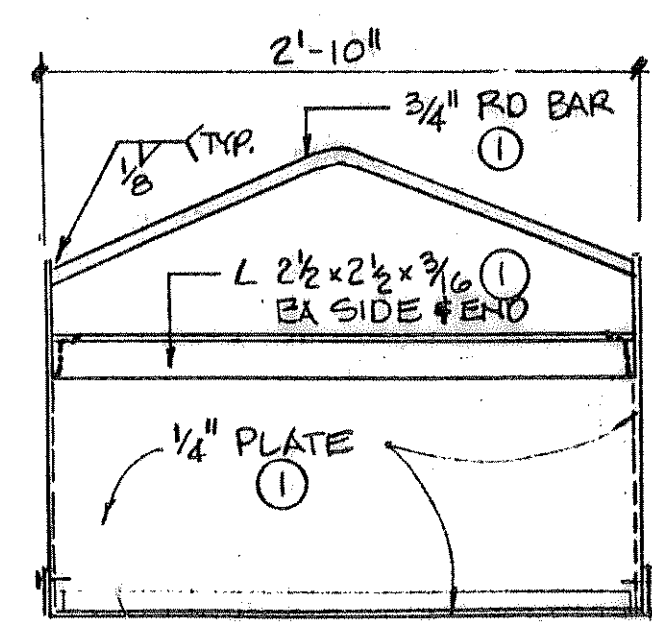
1. PROVIDE:
A. SLUICE GATE
B. OPENING ON EXIST. PUMP STATION WALL WHERE EXIST. INACTIVE CHANNELIZED CONCRETE BOX MANHOLE IS LOCATED
2. REMOVE EXIST. 30\"/>

NOTES:

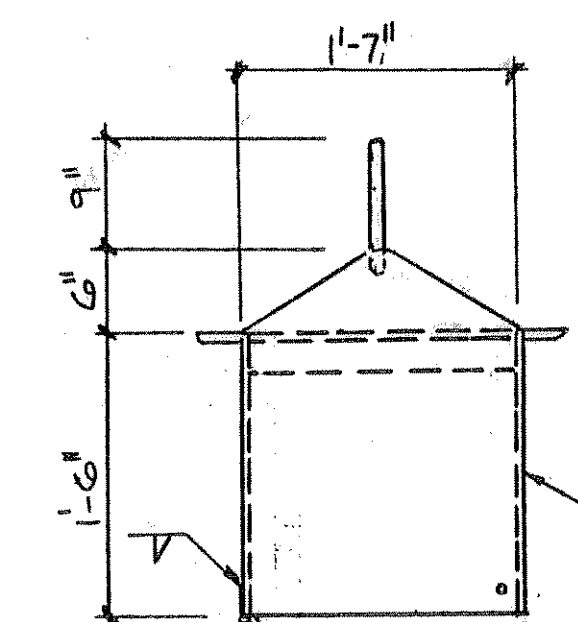
1. CONTRACTOR SHALL VERIFY DISTANCE PRIOR TO STARTING CONSTRUCTION.
2. CONTRACTOR SHALL IDENTIFY LOCATION OF ALL FACILITIES, WHETHER SHOWN ON DRAWING OR NOT, PRIOR TO START OF CONSTRUCTION.
3. ALL INTERIOR SURFACES OF CONCRETE STRUCTURES AND RCP PIPE SHALL BE COATED WITH EPOXY PHENOLIC COATING SYSTEM, AS SPECIFIED
4. CONTRACTOR SHALL PROVIDE CONCRETE CHANNELIZATION AT NEW CONCRETE BOX MANHOLES TO PROVIDE SMOOTH WASTEWATER FLOW.
5. THIS DRAWING IS ONLY INTENDED TO SHOW PROPOSED MODIFICATIONS TO INLET PIPING. CONTRACTOR SHALL REFER TO OTHER PUAG IMPROVEMENT DRAWINGS FOR OTHER REQUIRED IMPROVEMENTS
6. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR INSTALLATION OF JIB CRANE, INCLUDING DESIGN CALCULATIONS AND METHOD OF ATTACHMENT TO EXIST. WALL.



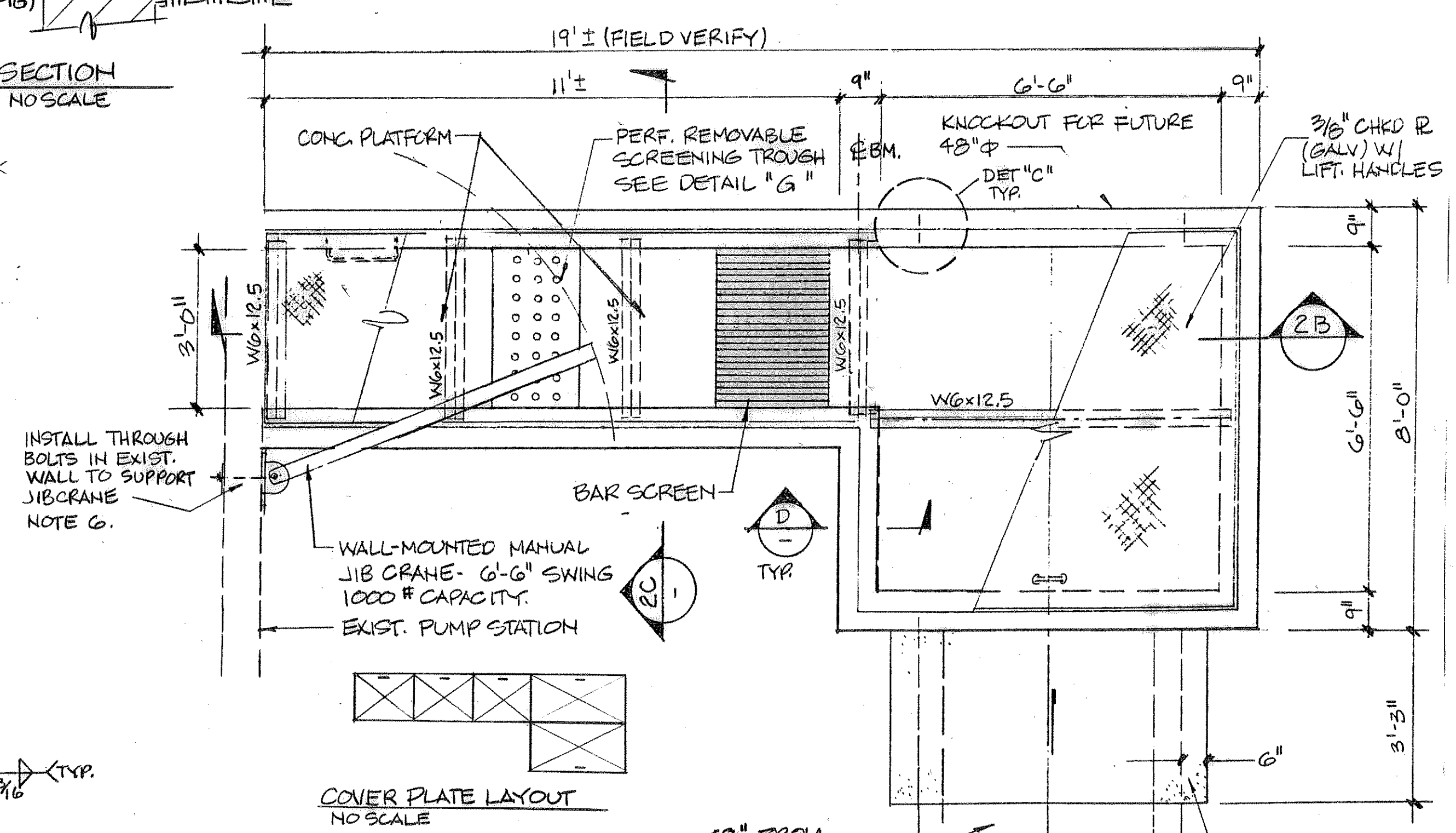
2D SECTION
NO SCALE



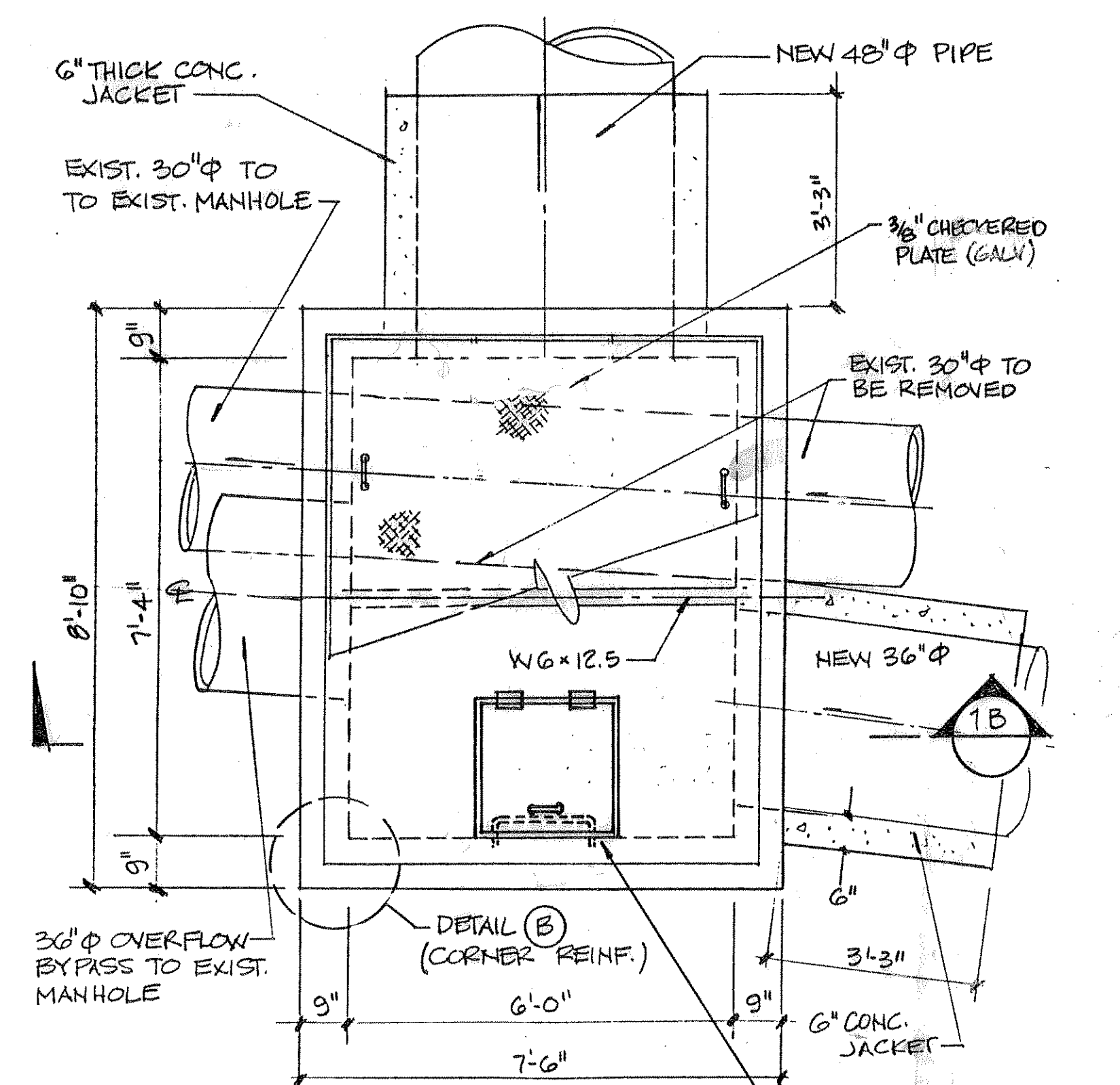
2E SECTION
NO SCALE



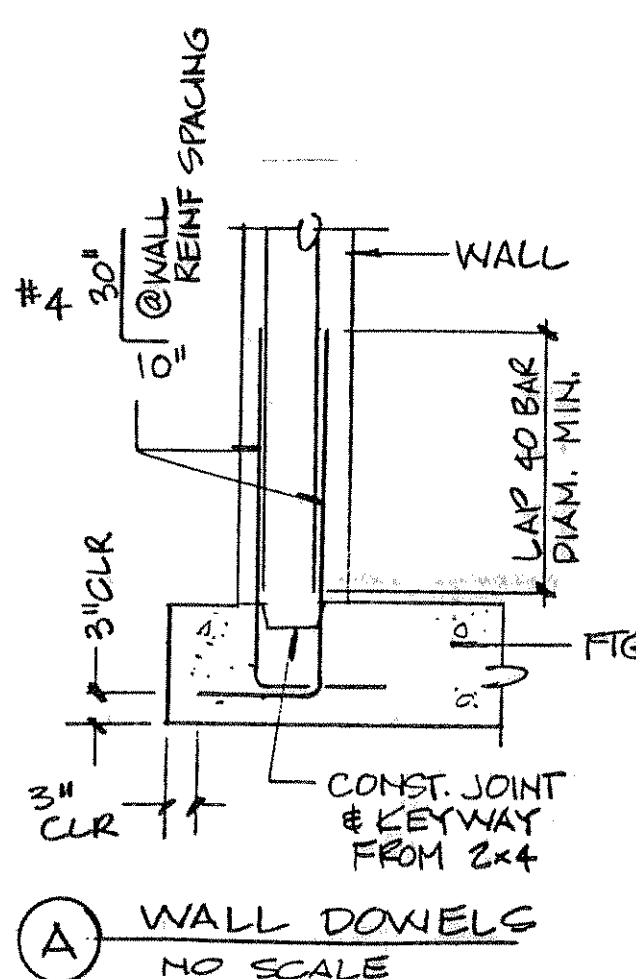
2F SECTION
NO SCALE



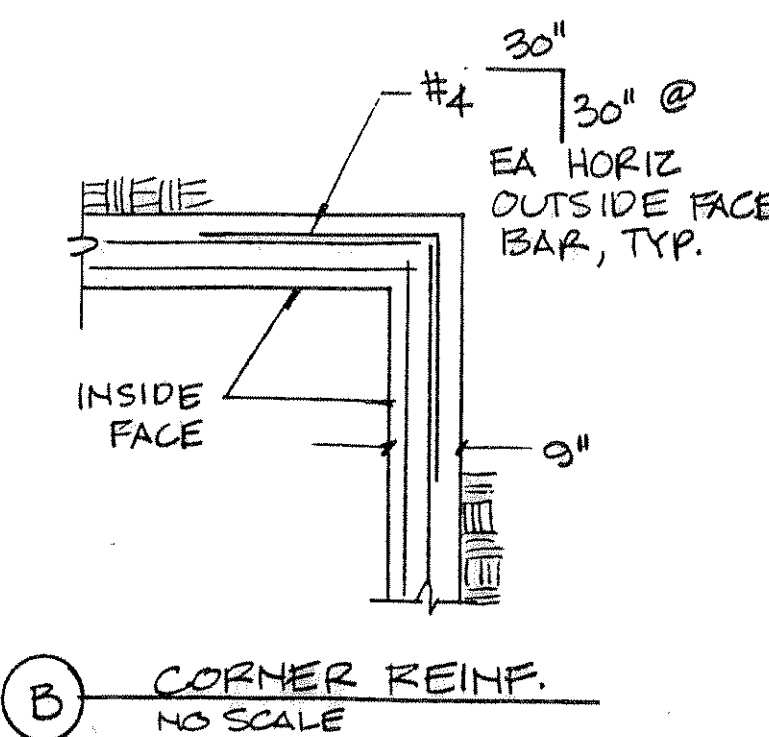
2A PLAN
1/2\"/>



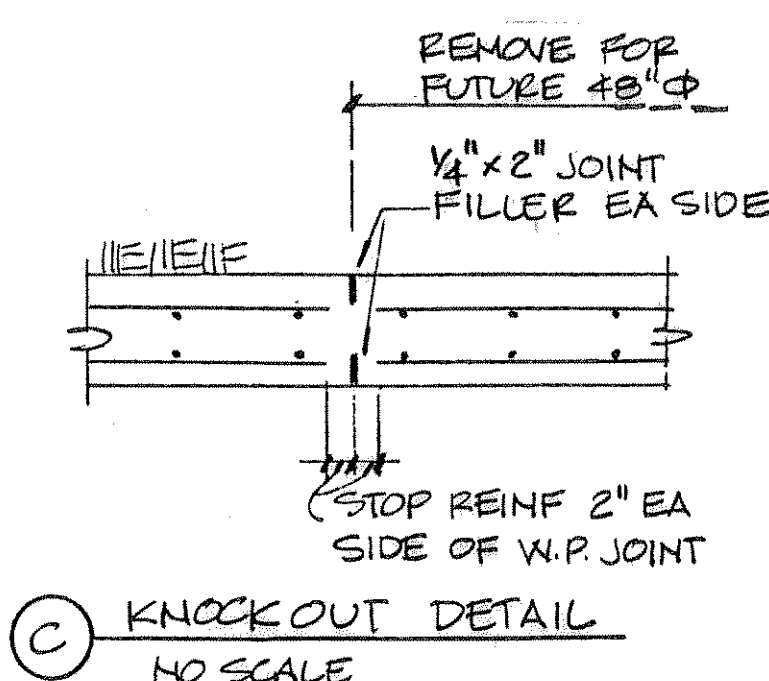
1A PLAN
1/2\"/>



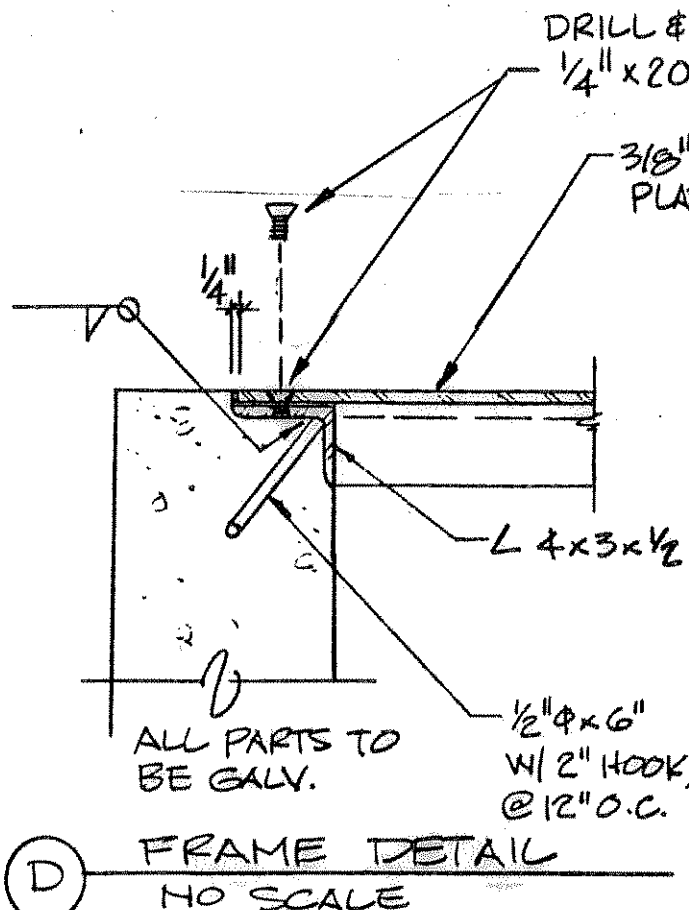
A WALL DOWELS
NO SCALE



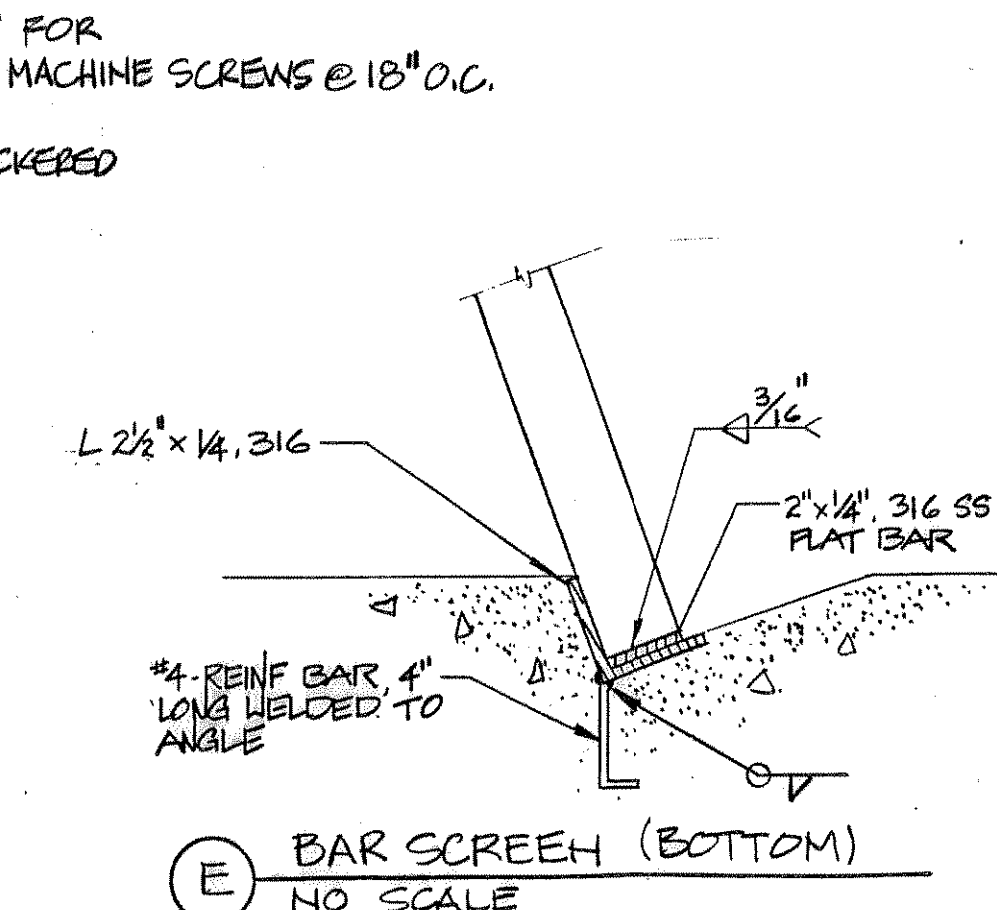
B CORNER REIN.
NO SCALE



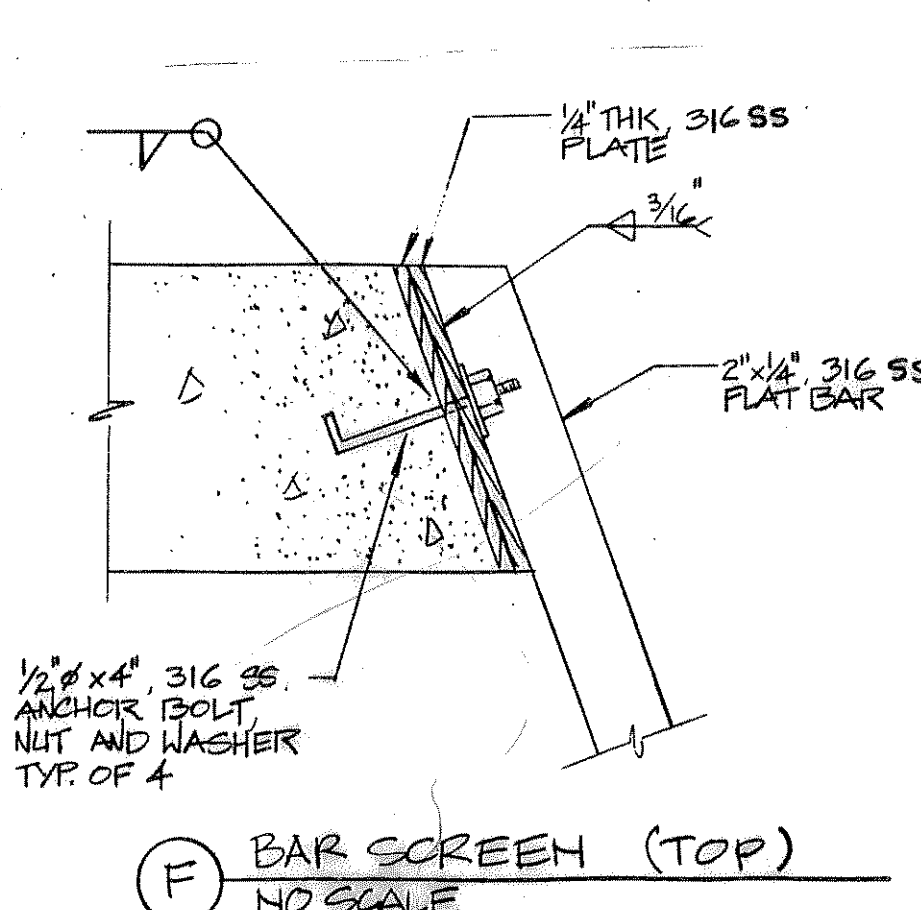
C KNOCKOUT DETAIL
NO SCALE



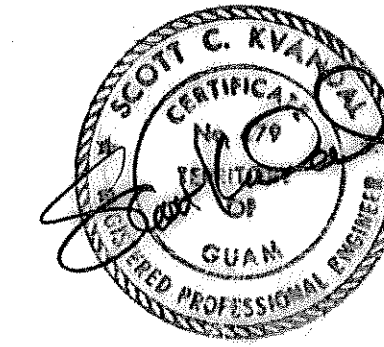
D FRAME DETAIL
NO SCALE



E BAR SCREEN (BOTTOM)
NO SCALE



F BAR SCREEN (TOP)
NO SCALE



REVISION	DATE	BY	DESCRIPTION	APPROVED
1	4-1-91	RA	HATCH DIMENSION OF OPENING	MLD
<div> <div> <p>BARRETT CONSULTING GROUP CONSULTING ENGINEERS AGANA, GUAM</p> </div> <div> <p>DESIGN: KAG DRAWN: KAG CHECKED: SKK SUPERVISED: SKK</p> </div> </div>				
<div> <div> <p>GOVERNMENT OF GUAM PUBLIC UTILITY AGENCY OF GUAM</p> </div> <div> <p>MARINE DRIVE RELIEF SEWER AGANA PUMP STATION INLET MODIFICATIONS</p> </div> </div>				
<p>APPROVED BY: _____</p>			<p>RECOMMENDED BY: _____</p>	
<p>PROJECT ENGINEER: _____</p>			<p>DATE: _____</p>	
<p>PROJECT MANAGER: _____</p>			<p>SCALE: _____</p>	
			<p>JOB ORDER NO. _____</p>	
			<p>DRAWING NUMBER _____</p>	
			<p>SHEET _____ OF _____</p>	

SMH 325Haga Top View

PIPE (OUT)
TO
UNKNOWN
LOCATION

36" (IN)
OVERFLOW
PIPE FROM
ROUTE
1/ROUTE 4
JUNCTION
MANHOLE
LOCATED
SLIGHTLY
TO THE
EAST

27" ACP
(OUT) TO
HAGATNA
PS

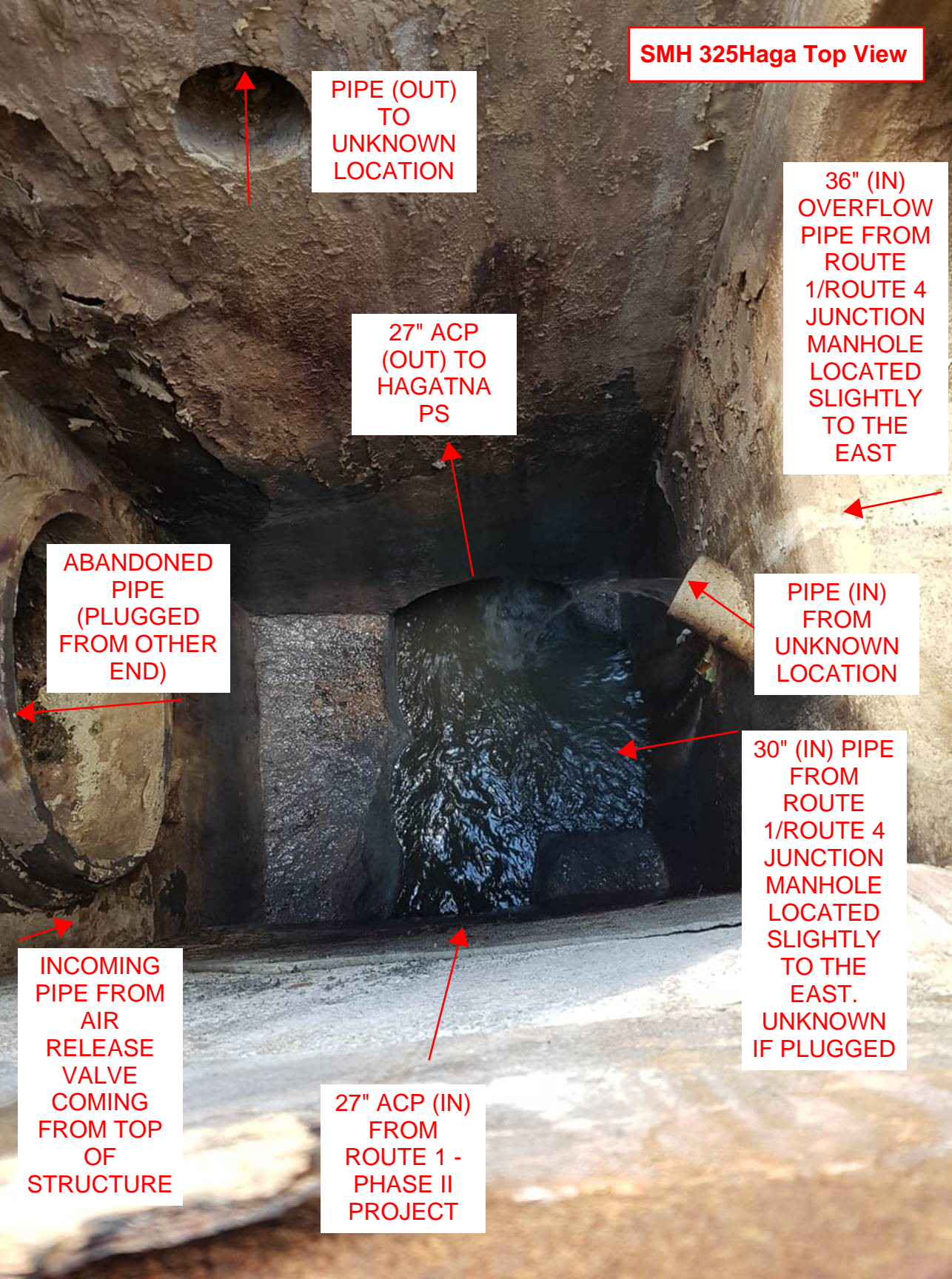
ABANDONED
PIPE
(PLUGGED
FROM OTHER
END)

PIPE (IN)
FROM
UNKNOWN
LOCATION

30" (IN) PIPE
FROM
ROUTE
1/ROUTE 4
JUNCTION
MANHOLE
LOCATED
SLIGHTLY
TO THE
EAST.
UNKNOWN
IF PLUGGED

INCOMING
PIPE FROM
AIR
RELEASE
VALVE
COMING
FROM TOP
OF
STRUCTURE

27" ACP (IN)
FROM
ROUTE 1 -
PHASE II
PROJECT





Asan-Adelup-Hagatna, Route 1 Sewerline Rehabilitation and Replacement – Phase II
GWA Project No. S15-002-EPA
IFB-06-ENG-2020
RFI Response No. 1 to Contractor Inquiries

This Addendum and/or Response to Request for Information (RFI) is issued to modify the previously issued bid documents and/or given for informational purposes and to the extent the responses below modify the bid documents, please treat them as an amendment to the Bid. The following responses are in response to RFIs received.

	REFERENCE	QUESTION/INQUIRY AS SUBMITTED:	GWA RESPONSE:
Questions from July 1, 2020			
1		In the Water Cured-in-Place Pipe Lining spec under resin it says we can use isophthalic polyester or vinyl ester thermoset resin. The line below that says from manhole 20AAsan to Manhole 1368Asan we must use vinyl ester thermoset resin. I can't find where we are CIPP lining this section. If I missed it can you tell me why we have to use this resin?	The reference for the sewer line from manhole 20AAsan to Manhole 1368Asan and the use of vinyl ester thermoset resin has been removed. Please see attached revised specification.
2		The spec reads that steam curing is not allowed but UV curing is. Can you tell me why? I imagine it is because of possible infiltration but not sure why UV would be allowed as it would be the same as steam cured. If we could make a suggestion, why not allow steam cure but add a temperature measuring sensor thru out the entire length of CIPP? Below is an example of a spec for this. We used it on the Route 4 project and everyone thought it was great. Spec. example: Thermocouple sensors and cable that will allow for temperature to be measured at least every	Steam curing will be allowed, subject to the requirements of the revised specification 33 01 30.72 that has been included within this addendum.

	REFERENCE	QUESTION/INQUIRY AS SUBMITTED:	GWA RESPONSE:
		three (3) inches along liner during the curing process. Also submit information on software that will be used to record temperature continuously during the curing process.	
3		It was discussed in the pre-bid meeting that the bidder is responsible for obtaining permits from DPW. Will there be any reimbursement for the \$25,000 permit charge or can we get that charge waived since it is a GWA project? Also DPW would not give us a permit on the last project because there were issues between them and GWA. Will we get assistance from GWA if this happens again?	Contractor is responsible for obtaining and paying for all permit fees in relation to this project. GWA will assist the Contractor, as appropriate and needed, to ensure there are no issues between DPW and GWA that would hold up any permitting, however the Contractor is solely responsible for providing all required documents that are necessary for the permit to be reviewed and approved.
Questions from July 5, 2020			
4		It appears like all underground facilities may not be shown in the plans. If contractor runs into underground facilities during construction, how GWA will compensate the Contractor?	Contractor shall reference, at a minimum, notes 4 to 7 found on sheet G-003 for information related to this statement and question. No additional compensation will be provided to the Contractor for the utilities that fall into the categories covered by these notes.
5		Since, the location of the sewer line is in densed areas, will GWA allow the Contractor to dewater the trenches into the forward SMH?	Dewatering of trenches shall follow the requirements of Specification 31 23 19 and shall be properly disposed of.
6		There is no shoulder space available for the Contractor to maintain a minimum of 2-lanes in each direction. Is the Contractor allowed to narrow the traffic into one lane any of the directions or both if required based on the field conditions?	Typical traffic control plans have been provided for various lane closure schemes. Final authority on approval of the traffic control to be deployed resides with the Department of Public Works (DPW), Highway Encroachment Permit office, therefore any closure to just one lane in any one direction, at a given time, will be subject to the DPW requirements. It is anticipated that a closure scheme that allows at least 2 lanes open in the direction of highest traffic and 1 lane in the direction of least traffic will be allowed, given that the scheme may be changed throughout the day and/or required to be temporarily removed

	REFERENCE	QUESTION/INQUIRY AS SUBMITTED:	GWA RESPONSE:
			allowing full 2 lane openings in each direction.
7		Bid Form has different types of sewer line cleaning pay items. What is the basis to differentiate which item is applicable for billing purposes?	Contractor shall reference Specification 33 01 30.41 for the requirements of each pay item, required documentation and the measurement and payment clauses for each bid pay item.
8		CCTV data is not available for a portion of existing sewer line between SMHs 326AHAGA and 326HAGA. Will GWA pay for the cleaning inside the sewer line after excavating for point repair under any of the sewer line cleaning?	<p>CCTV data was not collected for a small section of this pipe; however CCTV collection was made both from the upstream and downstream manholes and as of the data collected and the coverage collected, there does not appear to be a requirement for a point repair.</p> <p>Contractor will be required to perform an initial CCTV assessment of all sewer lines, which includes allowance for sewer cleaning to be measured and paid for. Additional allowance for sewer cleaning will be measured and paid for to conduct the pre-CIPP lining CCTV.</p> <p>Any sewer cleaning required outside of these allowances are considered incidental to the work they are a part of and will not be paid separately.</p>
9		Unit Price Bid Forms has 15 each laterals. As per our computation, we came up 16 each. Please clarify.	There are 16 laterals, please see revised drawing G-005 and revised bid form included herein.
10		During the site visit we noticed two concrete manholes on both sides of SMH 325HAGA. In the plan given on sheet C-002, these concrete manholes are not connected to SMH 325HAGA. Please clarify whether they are connected or not. This information is critical in computing the bypass pump size.	<p>The concrete box located to the west of SMH 325Haga is an abandoned junction box. The concrete box located to the east of SMH 325Haga is active and is connected to SMH 325Haga by two pipes. One pipe is a 30 inch sewer line and another is a 36 inch sewer line. The 30 inch sewer line is located at the bottom of SMH 325Haga and the 36 inch sewer line is an emergency overflow pipe, and is located at a higher elevation within the manhole.</p> <p>See revised sheet C-002, attached photo of SMH 325Haga and</p>

	REFERENCE	QUESTION/INQUIRY AS SUBMITTED:	GWA RESPONSE:
			other as-built documents of the Hagatna Pump Station that have been provided to this addendum.
11		In case bypass pump operations extend beyond the contractual requirements, will Contractor be paid for the bypass pump materials and labor used for bypass operations?	Any bypass operations that are not part of the contract requirements, are subject to the procedures as outlined in Article 13 of the General Conditions.
		Item No. 6 in the Unit Price Bid Form has a quantity of 1,096 Lin. Ft. but we came up with 410 Lin. Ft. Please clarify.	Please see revised bid form that has corrected value.
Questions from July 14, 2020			
12		Please confirm 425 calendar days is contract duration for the Base Bid.	425 calendar days is the correct contract duration for the Base Bid. Please see Article 4.02 of the Agreement for this duration.
13		For Additive Bids #1 to #6 are there additional contract durations over the Base Bid? If so, how many days?	Please see Article 4.02 of the Agreement for these durations.
14		Who will pay for Government inspector? If owner is paying, will this includes night works?	GWA has a separate contract in place for construction management services which includes inspection services to be provided. These services will be provided during normal business hours as defined in 00800 Supplementary Conditions, Section 7.02.B. Contractor shall review 00800 Supplementary Conditions, Section 7.02.C for requirements for any services that would be required outside of the normal business hours as defined in Section 7.02.B.
15		Who will pay for Archaeological monitoring services?	Contractor to review Spec 01 30 00, Item 1.8B for these requirements and payment clauses.
16		What is the regular or normal working hours?	Contractor to review Spec 01 13 00, Item 3.6.

	REFERENCE	QUESTION/INQUIRY AS SUBMITTED:	GWA RESPONSE:
17		This project requires a lot of work outside regular/normal working hours, once you start the work you will need to continue at night or even overnight. In order to avoid hassle between owner and contractor may we request all times to be allowed as working hours, or allow this project to be 24/7 works.	<p>Contractor is expected to perform as much work within the normal business hours as defined in 00800 Supplementary Conditions, Section 7.02.B, however it is understood that work associated with the Cured in Place Pipe, may have to extend past these hours.</p> <p>The requirements outlined in 00800 Supplementary Conditions, Section 7.02.C will still apply and Contractor shall plan to use \$180/hr. as a cost to provide additional Construction Management services for any times outside the normal business hours.</p>
18		Refer to Unit Price Bid Form, for Point Repairs please indicate in plans locations of each point repairs?	Design plans are based upon the condition of the sewer line at the time that CCTV was conducted for the design. Based upon those conditions, there are no identifiable point repair locations that are needed; however these unit price bid items are an allowance for if conditions have changed and the Contractor discovers the need for a point repair prior to CIPP lining. Work sequence procedures have been outlined in Spec. 01 11 00, Item 1.3C.
19		Refer to Units Price Bid Form, for point repairs with unit in Lin. Ft. will the whole indicated quantity be in one location only? Also indicate locations in plans?	Contractor to review Part 4 of Spec. 33 01 30.74 for the measurement for payment requirements. See response to Question 18, above, for locations of these point repairs.
Questions from July 15, 2020			
20		There are two line items for cleaning. One is light sewer line cleaning and the other is heavy sewer line cleaning. Is the heavy sewer line cleaning meant to cover anything over light cleaning? For example, on the Route 4 project there was a manhole lid, large boulders, excessive concrete, and sometimes up to ¾ pipe of debris. Is the heavy cleaning supposed to	Contractor shall reference Specification 33 01 30.41 for the definitions, requirements of each pay item, required documentation, and the measurement and payment clauses for each bid pay item.

	REFERENCE	QUESTION/INQUIRY AS SUBMITTED:	GWA RESPONSE:
		cover that or is this still a change condition that can be remedied by change order?	

Bidders are also notified to visit GWA website: www.guamwaterworks.org to ensure that addenda to the bid, answers to questions, and reminders are communicated to all bidders throughout the solicitation process.



Miguel C. Bordallo, P.E.
General Manager

MCB;gb