Bid No. 16-7080
American Infrastructure
Technologies

SECTION 00300 – PROPOSAL

TO THE MAYOR AND COMMISSIONERS
CITY OF HOLLYWOOD, FLORIDA

SUBMITTED 11-15-16

Dear Mayor and Commissioners:

The undersigned, as BIDDER, hereby declares that the only person or persons interested in the Proposal as principal or principals is or are named herein and that no other person than herein mentioned has any interest in this Proposal or in the Contract to be entered into; that this Proposal is made without connection with any other person, company or parties making a Bid or Proposal; and that it is in all respects fair and in good faith without collusion or fraud.

The BIDDER further declares that he has examined the site of the Work and informed himself fully in regard to all conditions pertaining to the place where the Work is to be done; that he has examined the Drawings and Specifications for the Work and contractual documents relative thereto, including the Notice to Bidders, Instructions to Bidders, Proposal Bid Form, Form of Bid Bond, Form of Contract and Form of Performance Bond, General, Supplementary and Technical Specifications, Addenda, Drawings, and MBE/WBE Program, Exhibit A-D, and has read all of the Provisions furnished prior to the opening of bids; and that he has satisfied himself relative to the work to be performed.

The undersigned BIDDER has not divulged to, discussed or compared his bid with other bidders and has not colluded with any other BIDDER of parties to this bid whatever.

If this Proposal is accepted, the undersigned BIDDER proposes and agrees to enter into and execute the Contract with the City of Hollywood, Florida, in the form of Contract specified; of which this Proposal, Instructions to Bidders, General Specifications, Supplementary Conditions and Drawings shall be made a part for the performance of Work described therein; to furnish the necessary bond equal to one hundred (100) percent of the total Contract base bid, the said bond being in the form of a Cash Bond or Surety Bond prepared on the applicable approved bond form furnished by the CITY; to furnish all necessary materials, equipment, machinery, tools, apparatus, transportation, supervision, labor and all means necessary to construct and complete the work specified in the Proposal and Contract and called for in the Drawings and in the manner specified; to commence Work on the effective date established in the "Notice to Proceed" from the ENGINEER; and to substantially complete all Contract Work as per Project Schedule of Section 00800, and stated in the "Notice to Proceed" or pay liquidated damages for each calendar day in excess thereof, or such actual and consequential damages as may result therefrom, and to abide by the MBE/WBE Program.

The BIDDER acknowledges receipt of the following addenda:

No. 1 Dated 11-2-16
No. 2 Dated 11-10-16
No. _____ Dated _____

And the undersigned agrees that in case of failure on his part to execute the said Contract and the Bond within ten (10) days after being presented with the prescribed Contract forms, the check or Bid Bond accompanying his bid, and the money payable thereon, shall be paid into the funds of the City of Hollywood, Florida, otherwise, the check or Bid Bond accompanying this Proposal shall be returned to the undersigned.

Attached hereto is a certified check on the

_____ Bank of _____

or approved Bid Bond for the sum of

five hundred eighty thousand Dollars ($580K) according to the conditions under the Instructions to Bidders and provisions therein.

NOTE: If a Bidder is a corporation, the legal name of the corporation shall be set forth below, together with signature(s) of the officer or officers authorized to sign Contracts on behalf of the corporation and corporate seal; if Bidder is a partnership, the true name of the firm shall be set forth below with the signature(s) of the partner or partners authorized to sign Contracts in behalf of the partnership; and if the Bidder is an individual, his signature shall be placed below; if a partnership, the names of the general partners.

WHEN THE BIDDER IS AN INDIVIDUAL:

_____
(Signature of Individual)

_____
(Printed Name of Individual)

_____
(Address)

****

WHEN THE BIDDER IS A SOLE PROPRIETORSHIP OR OPERATES UNDER A TRADE NAME:

_____
(Name of Firm)

_____
(Address)

_____(SEAL)
(Signature of Individual)

****

WHEN THE BIDDER IS A PARTNERSHIP:

_____
(Name of Firm) A Partnership

_____
(Address)

By: _____
(SEAL)
(Partner)

Name and Address of all Partners:

_____

_____

****

WHEN THE BIDDER IS A JOINT VENTURE:

_____
(Correct Name of Corporation

By: _____
(SEAL)
(Address)

_____
(Official Title)

As Joint Venture
(Corporate Seal)

Organized under the laws of the State of _____, and authorized by the law to make this bid and perform all Work and furnish materials and equipment required under the Contract Documents.

****

WHEN THE BIDDER IS A CORPORATION: American Infrastructure Technologies Corporation
(Correct Name of Corporation)

By: _____
(SEAL)

CEO - Kenneth Giddens
(Official Title)

8799 US Hwy 31 Hanceville AL 35077
(Address of Corporation)

Organized under the laws of the State of Florida, and authorized by the law to make this bid and perform all Work and furnish materials and equipment required under the Contract Documents.

CERTIFIED COPY OF RESOLUTION OF
BOARD OF DIRECTORS

American Infrastructure Technologies Corporation
(Name of Corporation)

RESOLVED that Kenneth Giddens
(Person Authorized to Sign)

CEO of American Infrastructure Technologies Corp.
(Title) (Name of Corporation)

be authorized to sign and submit the Bid or Proposal of this corporation for the following project:

CITY OF HOLLYWOOD, FLORIDA

GRAVITY SEWER SYSTEM CONDITION ASSESSMENT AND RENEWAL AND REPLACEMENT (INFLOW/INFILTRATION I/I) CURE-IN –PLACE PIPE (CIPP) LINING AND NEW MANHOLE INSTALLATION

PROJECT NO. 16-7080

The foregoing is a true and correct copy of the Resolution adopted by

American Infrastructure Technologies Corporation
(Name of Corporation)

at a meeting of its Board of Directors held on the 27th day of March, 2007.

By: Kenneth Giddens

Title: CEO

(SEAL)

The above Resolution MUST BE COMPLETED if the Bidder is a Corporation.

- END OF SECTION -

SECTION 00301

CITY OF HOLLYWOOD
DEPARTMENT OF PUBLIC UTILITIES
ENGINEERING & CONSTRUCTION SERVICES DIVISION

PROPOSAL BID FORM (ADDENDUM 1)

Project Name: Cured-In-Place-Pipe (CIPP) Lining and Manhole Installation
Project No.: 16-7080

If this Proposal is accepted, the undersigned Bidder agrees to complete all work under this contract within **730** calendar days following the issuance of the Notice to Proceed. All entries on this form must be typed or written in block form in ink.

BASE BID:

No.	Description	Qty.	Unit	Unit Price	Total
1	Install CIPP liner, 6 inch diameter gravity mains and reinstate laterals (up to 8 feet in depth)	2,000	L.F.	28.00	56,000.00
2	Install CIPP liner, 8 inch diameter gravity mains and reinstate laterals (up to 8 feet in depth)	70,000	L.F.	27.00	1,890,000.00
3	Install CIPP liner, 8 inch diameter gravity mains and reinstate laterals (8 to 12 feet in depth)	34,000	L.F.	27.00	918,000.00
4	Install CIPP liner, 8 inch diameter gravity mains and reinstate laterals (12 to 16 feet in depth)	15,000	L.F.	28.50	427,500.00
5	Install CIPP liner, 10 inch to 12 inch diameter gravity mains and reinstate laterals (up to 8 feet in depth)	2,000	L.F.	30.00	60,000.00
6	Install CIPP liner, 10 inch to 12 inch diameter gravity mains and reinstate laterals (8 to 12 feet in depth)	2,000	L.F.	31.00	62,000.00
7	Install CIPP liner, 10 inch to 12 inch diameter gravity mains and reinstate laterals (12 to 16 feet in depth)	2,000	L.F.	31.00	62,000.00
8	Grout lateral annular space	442	EA	215.00	95,030.00
9	Recut lateral insufficiently reinstated by others	10	EA	135.00	1,350.00
10	Grout annular space following recut of lateral insufficiently reinstated by others	10	EA	265.00	2,650.00
11	Install T-liner in 8 inch to 12 inch mains with 4 inch to 6 inch laterals, all depths (includes 25 feet of lateral)	40	EA	4,100.00	164,000.00
12	Install T-liner in 4 inch to 6 inch laterals, all depths (per linear foot beyond 25 feet of lateral)	100	L.F.	45.00	4,500.00
13	Transitional liner 6 inch to 4 inch	10	EA	295.00	2,950.00

SECTION 00301

CITY OF HOLLYWOOD

DEPARTMENT OF PUBLIC UTILITIES

ENGINEERING & CONSTRUCTION SERVICES DIVISION

PROPOSAL BID FORM (ADDENDUM 1)

14	Sewer main cleaning and TV inspection (6 inch through 12 inch)	97,000	L.F.	5.80	562,600.00
15	Sewer lateral cleaning and TV inspection from main (up to 30 feet)	10	EA	225.00	2,250.00
16	Sewer lateral cleaning and TV inspection from cleanout (up to 30 feet)	10	EA	225.00	2,250.00
17	Mechanical root or grease removal (12 inch and smaller)	500	L.F.	9.00	4,500.00
18	Mechanical tuberculation/concrete removal (12 inch and smaller)	100	L.F.	11.00	1,100.00
19	Protruding service connection removal by internal means	80	EA	180.00	14,400.00
20	Cleanout installation in grass area (up to 5 feet in depth)	20	EA	525.00	10,500.00
21	Cleanout installation in asphalt area (up to 5 feet in depth)	5	EA	750.00	3,750.00
22	Cleanout installation in concrete area (up to 5 feet in depth)	5	EA	750.00	3,750.00
23	Cleanout installation (open trench)	5	EA	500.00	2,500.00
24	Install new standard precast concrete 48 inch diameter sewer manhole (up to 6 feet in depth)	17	EA	3,800.00	64,600.00
25	Install new standard precast concrete 48 inch diameter sewer manhole and dewatering (6 to 8 feet in depth)	18	EA	6,700.00	120,600.00
26	Install new standard precast concrete 48 inch diameter sewer manhole and dewatering (8 to 10 feet in depth)	24	EA	8,400.00	201,600.00
27	Install new standard precast concrete 48 inch diameter sewer manhole and dewatering (8 to 10 feet in depth)	2	EA	8,400.00	16,800.00
28	Work in rear-yard easement (where required for items 1 through 7)	25	EA	525.00	13,125.00
29	Bypass pumping (6 inch through 12 inch sewer)	25	DAY	265.00	6,625.00
30	4,000 gallons tanker truck bypass system	1,800	HR	11.00	19,800.00
31	Asphalt roadway replacement (2 inch thick)	12,000	S.F.	1.80	21,600.00
32	Asphalt pavement overlay (1 inch thick)	5,000	S.F.	1.40	7,000.00

SECTION 00301

CITY OF HOLLYWOOD
DEPARTMENT OF PUBLIC UTILITIES
ENGINEERING & CONSTRUCTION SERVICES DIVISION

PROPOSAL BID FORM (ADDENDUM 1)

33	Concrete sidewalk replacement (4 inch thick)	200	S.F.	8.50	1,700.00
34	Concrete curb and gutter replacement	100	L.F.	37.50	3,750.00
35	Asphalt driveway replacement	200	S.F.	4.00	800.00
36	Concrete driveway replacement (6 inch thick)	200	S.F.	10.50	2,100.00
37	Replace concrete slabs and/or aprons	200	S.F.	10.50	2,100.00
38	Sod replacement (Type: St. Augustine)	5,000	S.F.	1.00	5,000.00
39	Traffic control - flagman, each	48	HR	40.00	1,920.00
40	Traffic control - arrow board, each	71	DAY	50.00	3,550.00
41	Traffic control - barricade, each	71	DAY	6.00	426.00
42	Work in rear-yard easement (items 20 through 23)	15	EA	450.00	6,750.00
43	Expedited mobilization	1	EA	500.00	500.00
44	Undefined Allowance, cost allowance for work as directed by Engineer and upon authorization by the City of Hollywood Director of Public Utilities due to undefined conditions.	1	EA	**$500,000.00**	**$500,000.00**

BASE BID TOTAL FOR COMPLETE PROJECT 5,353,926.00

TOTAL BASE BID IN WRITING five million, three-hundred fifty-three thousand, nine hundred twenty-six

NOTES:

1 **REFER TO SECTION 01025 FOR ADDITIONAL DESCRIPTION OF ITEMS.**

2 **SUBSTANTIAL COMPLETION SHALL BE AS DEFINED IN THE PROJECT SCHEDULE IN THE SUPPLEMENTARY GENERAL CONDITIONS (SGC'S).**

3 **CLOSEOUT SHALL BE COMPLETED WITHIN 730 DAYS FROM THE "NOTICE TO PROCEED".**

SECTION 00410 - APPROVED BID BOND

(Construction)

STATE OF FLORIDA

KNOW ALL MEN BY THESE PRESENTS:
That we American Infrastructure Technologies Corporation, as Principal, and The Hanover Insurance Company, as Surety, are held and firmly bound unto the City of Hollywood in the sum of

Ten Percent of Amount Bid Dollars ($ 10%) lawful money of the United States, amounting to 10% of the total Bid Price, for the payment of said sum, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the principal has submitted the accompanying bid, dated November 17 2016 for

CITY OF HOLLYWOOD

GRAVITY SEWER SYSTEM CONDITION ASSESSMENT AND RENEWAL AND REPLACEMENT (INFLOW/INFILTRATION I/I) PROGRAM – CURED-IN-PLACE PIPE (CIPP) LINING AND NEW SEWER MANHOLE INSTALLATION

CITY PROJECT NO. 16-7080

NOW, THEREFORE, if the principal shall not withdraw said bid within 90 days after date of the same and shall within ten days after the prescribed forms are presented to him for signature, enter into a written contract with the CITY, in accordance with the bid as accepted, and give bond with good and sufficient surety or sureties, and provide the necessary Insurance Certificates as may be required for the faithful performance and proper fulfillment of such Contract, then this obligation shall be null and void.

In the event of the withdrawal of said bid within the specified period, or the failure to enter into such contract and give such bond and insurance within the specified time, the principal and the surety shall pay to the City of Hollywood the difference between the amount specified in said bid and such larger amount for which the City of Hollywood may in good faith contract with another party to perform the work and/or supply the materials covered by said bid.

IN WITNESS WHEREOF, the above bound parties have executed this statement under their several seals this 11th day of November, 2016, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

WHEN THE PRINCIPAL IS AN INDIVIDUAL:

Signed, sealed and delivered in the presence of:

Witness

Signature of Individual

8799 US Hwy 31

Address

Harvville, AL 35077

Kenneth Giddens

Printed Name of Individual

Witness

Address

WHEN THE PRINCIPAL IS A CORPORATION:

Attest:

Debra Quinn
Secretary

American Infrastructure Technologies Corporation
Name of Corporation

8799 U.S. Hwy. 31
Business Address

Hanceville, AL 35077

By: [signature]
(Affix Corporate Seal)

Kenneth Giddens
Printed Name

CEO
Official Title

CERTIFICATE AS TO CORPORATE PRINCIPAL

I, Debra Quinn, certify that I am the secretary of the Corporation named as Principal in the attached bond; that Kenneth Giddens who signed the said bond on behalf of the Principal, was then CEO of said Corporation; that I know his signature, and his signature thereto is genuine and that said bond was duly signed, sealed and attested for and on behalf of said Corporation by authority of its governing body.

Debra Quinn (SEAL)
Secretary

Approved Bid Bond

TO BE EXECUTED BY CORPORATE SURETY:

Attest:

Asleigh McKenney
Secretary

The Hanover Insurance Company
Corporate Surety
440 Lincoln Street
Business Address
Worcester, MA 01653

BY: Jeffrey M. Wilson
(Affix Corporate Seal) Jeffrey M. Wilson, Attorney-in-Fact

Lloyd Dale Waldorff
~~Attorney-in-Fact~~ Lloyd Dale Waldorff, FL Resident Agent
Waldorff Insurance & Bonding
Name of Local Agency
45 Eglin Parkway, NE, Suite 202
Business Address
Fort Walton Beach, FL 32548

STATE OF ~~FLORIDA~~ Alabama

Before me, a Notary Public, duly commissioned, qualified and acting, personally appeared, Jeffrey M. Wilson to me well known, who being by me first duly sworn upon oath says that he is the attorney-in-fact for the The Hanover Insurance Company and that the has been authorized by The Hanover Insurance Companyto execute the forgoing bond on behalf of the CONTRACTOR named therein in favor of the City of Hollywood, Florida.

Subscribed and sworn to before me this 11th day of November, 2016

Julie Johnson Scott
Notary Public, State of ~~Florida~~ Alabama
Julie Johnson Scott

My Commission Expires: April 8, 2018

- END OF SECTION -

THE HANOVER INSURANCE COMPANY
MASSACHUSETTS BAY INSURANCE COMPANY
CITIZENS INSURANCE COMPANY OF AMERICA

POWERS OF ATTORNEY
CERTIFIED COPY

KNOW ALL MEN BY THESE PRESENTS: That THE HANOVER INSURANCE COMPANY and MASSACHUSETTS BAY INSURANCE COMPANY, both being corporations organized and existing under the laws of the State of New Hampshire, and CITIZENS INSURANCE COMPANY OF AMERICA, a corporation organized and existing under the laws of the State of Michigan, do hereby constitute and appoint

Mark W. Edwards, II, Ronald B. Giadrosich, Jeffrey M. Wilson, Robert R. Freel and/or Evondia H. Woessner

of **Birmingham, AL** and each is a true and lawful Attorney(s)-in-fact to sign, execute, seal, acknowledge and deliver for, and on its behalf, and as its act and deed any place within the United States, or, if the following line be filled in, only within the area therein designated

any and all bonds, recognizances, undertakings, contracts of indemnity or other writings obligatory in the nature thereof, as follows:

Any such obligations in the United States, not to exceed Forty Million and No/100 ($40,000,000) in any single instance

and said companies hereby ratify and confirm all and whatsoever said Attorney(s)-in-fact may lawfully do in the premises by virtue of these presents. These appointments are made under and by authority of the following Resolution passed by the Board of Directors of said Companies which resolutions are still in effect:

"RESOLVED, That the President or any Vice President, in conjunction with any Vice President, be and they are hereby authorized and empowered to appoint Attorneys-in-fact of the Company, in its name and as its acts, to execute and acknowledge for and on its behalf as Surety any and all bonds, recognizances, contracts of indemnity, waivers of citation and all other writings obligatory in the nature thereof, with power to attach thereto the seal of the Company. Any such writings so executed by such Attorneys-in-fact shall be as binding upon the Company as if they had been duly executed and acknowledged by the regularly elected officers of the Company in their own proper persons." (Adopted October 7, 1981 - The Hanover Insurance Company; Adopted April 14, 1982 - Massachusetts Bay Insurance Company; Adopted September 7, 2001 - Citizens Insurance Company of America)

IN WITNESS WHEREOF, THE HANOVER INSURANCE COMPANY, MASSACHUSETTS BAY INSURANCE COMPANY and CITIZENS INSURANCE COMPANY OF AMERICA have caused these presents to be sealed with their respective corporate seals, duly attested by two Vice Presidents, this **27th** day of **October 2011**.

THE HANOVER INSURANCE COMPANY
MASSACHUSETTS BAY INSURANCE COMPANY
CITIZENS INSURANCE COMPANY OF AMERICA

Robert Thomas, Vice President

Mark Fitzgerald, Vice President

THE COMMONWEALTH OF MASSACHUSETTS)
COUNTY OF WORCESTER) ss.

On this **27th** day of **October 2011** before me came the above named Vice Presidents of The Hanover Insurance Company, Massachusetts Bay Insurance Company and Citizens Insurance Company of America, to me personally known to be the individuals and officers described herein, and acknowledged that the seals affixed to the preceding instrument are the corporate seals of The Hanover Insurance Company, Massachusetts Bay Insurance Company and Citizens Insurance Company of America, respectively, and that the said corporate seals and their signatures as officers were duly affixed and subscribed to said instrument by the authority and direction of said Corporations.

BARBARA A. GARLICK
Notary Public
Commonwealth of Massachusetts
My Commission Expires Sept. 21, 2018

Barbara A. Garlick, Notary Public
My Commission Expires September 21, 2018

I, the undersigned Vice President of The Hanover Insurance Company, Massachusetts Bay Insurance Company and Citizens Insurance Company of America, hereby certify that the above and foregoing is a full, true and correct copy of the Original Power of Attorney issued by said Companies, and do hereby further certify that the said Powers of Attorney are still in force and effect.

This Certificate may be signed by facsimile under and by authority of the following resolution of the Board of Directors of The Hanover Insurance Company, Massachusetts Bay Insurance Company and Citizens Insurance Company of America.

"RESOLVED, That any and all Powers of Attorney and Certified Copies of such Powers of Attorney and certification in respect thereto, granted and executed by the President or any Vice President in conjunction with any Vice President of the Company, shall be binding on the Company to the same extent as if all signatures therein were manually affixed, even though one or more of any such signatures thereon may be facsimile." (Adopted October 7, 1981 - The Hanover Insurance Company; Adopted April 14, 1982 - Massachusetts Bay Insurance Company; Adopted September 7, 2001 - Citizens Insurance Company of America)

GIVEN under my hand and the seals of said Companies, at Worcester, Massachusetts, this 11th day of November, 2016

THE HANOVER INSURANCE COMPANY
MASSACHUSETTS BAY INSURANCE COMPANY
CITIZENS INSURANCE COMPANY OF AMERICA

Glenn Margosian, Vice President

SECTION 00495

TRENCH SAFETY FORM

This form must be completed and signed by the Bidder.

Failure to complete this form may result in the bid being declared non-responsive.

Bidder acknowledges that the Florida Trench Safety Act, Section 553.60 et. seq., which became effective October 1, 1990, shall be in effect during the period of construction of the project. The Bidder by signing and submitting the bid is, in writing, assuring that it will perform any trench excavation in accordance with applicable trench safety standards. The Bidder further identifies the following separate item of cost of compliance with the applicable trench safety standards as well as the method of compliance:

Method of Compliance Trench Box Cost

Total $ 5000.00

Bidder acknowledges that this cost is included in the applicable items of the Proposal and in the Grand Total Bid Price. Failure to complete the above will result in the bid being declared non-responsive.

The Bidder is, and the Owner and Engineer are not, responsible to review or assess Bidder's safety precautions, programs or costs, or the means, methods, techniques or technique adequacy, reasonableness of cost, sequences or procedures of any safety precaution, program or cost, including but not limited to, compliance with any and all requirements of Florida Statute Section 553.60 et. seq. cited as the "Trench Safety Act". Bidder is, and the owner and Engineer are not, responsible to determine if any safety related standards apply to the project, including but not limited to, the "Trench Safety Act".

Debra Quinn
Witness Signature

Debra Quinn
Witness Printed Name

8799 US Hwy 31 Hanceville, AL 35077
Witness Address

11/14/16
Date

Contractor's Signature

Kenneth Giddens
Printed Name

CEO
Title

11/14/16
Date

- END OF SECTION -

ACTION BY UNANIMOUS CONSENT IN WRITING BY THE
BOARD OF DIRECTORS
OF
AMERICAN INFRASTRUCTURE TECHNOLOGIES, CORP.

The undersigned, constituting the Board of Directors of **AMERICAN INFRASTRUCTURE TECHNOLOGIES CORPORATION**, a Florida corporation, by Unanimous Consent in Writing pursuant to the authority contained in the Florida Business Corporation Act, Section 607.0821, without the formality of convening a meeting, do hereby severally and collectively consent to the following action of this corporation:

1. RESOLVED, that Kenneth Giddens or Tim Bixler are hereby authorized to sign such documents and contracts as are reasonably required to carry out the corporation's ordinary course of business without obtaining Board approval.

DATED: March 27, 2007

Kenneth E. Giddens
Shareholder/Director

Timothy Bixler
Shareholder/Director

SECTION 00420

INFORMATION REQUIRED FROM BIDDERS

GENERAL INFORMATION

The Bidder shall furnish the following information. Failure to comply with this requirement may cause its rejection. Additional sheets shall be attached as required.

1. Contractor's Name/Address: American Infrastructure Technologies Corporation - 8799 US Hwy 31 Hanceville, AL

2. Contractor's Telephone Number: 256-739-4747 x105
and e-mail address: aitc@aitechcorp.com

3. Contractor's License (attach copy): CUC 1224556
Primary Classification: Cert Underground & Excav CNTR
Broward County License Number (attach copy): _____

4. Number of years as a Contractor in construction work of the type involved in this Contract: 11 years

5. List the names and titles of all officers of Contractor's firm:
Kenneth Giddens - CEO
Tim Bixler - President
Debra Quinn - secretary

6. Name of person who inspected site or proposed work for your firm:
Name: Tim Bixler
Date of Inspection: 11-2-16

7. What is the last project of this nature you have completed?

City of Dudley - Dudley Wastewater Collection System Improvements

8. Have you ever failed to complete work awarded to you; if so, where and why?

No

9. Name three individuals or corporations for which you have performed work and to which you refer:

City of Ocala - Eric Gianning - (352) 427-9362
FGUA - Pradeep Sethi - (407) 629-6900
City of Northport - Anna Duffey - (941) 240-8003

10. List the following information concerning all contracts on hand as of the date of submission of this proposal (in case of co-venture, list the information for all coventures).

Name of Project	City	Total Contract Value	Contracted Date of Completion	% Completion to Date
Sewer System Rehab Phase I	Cochran, GA	$1.6M	1/15/17	90%
Cowan Riverside Drive Rehab	Nashville, TN	$5.1M	12/12/16	85%
Sewer + Manhole Rehab	Mt. Pleasant, SC	$5.3M	3/19/17	75%

(Continue list on inset sheet, if necessary)

11. What equipment do you own that is available for the work?

Boiler Truck x 3
TV Truck x 2
Tool Truck x 1
Refridgerated Trailer + Tractor x 3
Misc. tools, bypass pumps, small equipment + pickup trucks.

12. What equipment will you purchase for the proposed work?

Will determine.

NOTE:
If requested by CITY, the Bidder shall furnish a notarized financial statement, references and other information, sufficiently comprehensive to permit an appraisal of its current financial condition.

N/A

LIST OF SUBCONTRACTORS

The Bidder shall list below the name and address of each Subcontractor who will perform work under this Contract in excess of one-half percent of the total bid price, and shall also list the portion of the work which will be done by such Subcontractor. After the opening of Proposals, changes or substitutions will be allowed with written approval of the City of Hollywood. Subcontractors must be properly licensed and hold a valid Hollywood Certificate of Competency.

	Work to be Performed	**Subcontractor's Name / Address**
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

NOTE: Attach additional sheets if required.

- END OF SECTION -

STATE OF FLORIDA
DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION

CONSTRUCTION INDUSTRY LICENSING BOARD (850) 487-1395
1940 NORTH MONROE STREET
TALLAHASSEE FL 32399-0783

BIXLER, TIMOTHY RICHARD
AMERICAN INFRASTRUCTURE TECHNOLOGIES CORPORATION
13896 SALSBURY CREEK DRIVE
CARMEL IN 46032

Congratulations! With this license you become one of the nearly one million Floridians licensed by the Department of Business and Professional Regulation. Our professionals and businesses range from architects to yacht brokers, from boxers to barbeque restaurants, and they keep Florida's economy strong.

Every day we work to improve the way we do business in order to serve you better. For information about our services, please log onto **www.myfloridalicense.com**. There you can find more information about our divisions and the regulations that impact you, subscribe to department newsletters and learn more about the Department's initiatives.

Our mission at the Department is: License Efficiently, Regulate Fairly. We constantly strive to serve you better so that you can serve your customers. Thank you for doing business in Florida, and congratulations on your new license!

STATE OF FLORIDA
DEPARTMENT OF BUSINESS AND
PROFESSIONAL REGULATION

CUC1224556 ISSUED: 06/13/2016

CERT UNDERGROUND & EXCAV CNTR
BIXLER, TIMOTHY RICHARD
AMERICAN INFRASTRUCTURE TECHNOLOGI

IS CERTIFIED under the provisions of Ch.489 FS.
Expiration date : AUG 31, 2018 L1606130000903

DETACH HERE

RICK SCOTT, GOVERNOR KEN LAWSON, SECRETARY

STATE OF FLORIDA
DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION
CONSTRUCTION INDUSTRY LICENSING BOARD

LICENSE NUMBER	
CUC1224556	

The UNDERGROUND UTILITY & EXCAVATION CO
Named below IS CERTIFIED
Under the provisions of Chapter 489 FS.
Expiration date: AUG 31, 2018

BIXLER, TIMOTHY RICHARD
AMERICAN INFRASTRUCTURE TECHNOLOGIES CORPORATION
13896 SALSBURY CREEK DRIVE
CARMEL IN 46032

ISSUED: 06/13/2016 DISPLAY AS REQUIRED BY LAW SEQ # L1606130000903

Current Contracts

Description	Owner/Location	Contract Date	Contract Amount	Date of Completion	YTD Completed Amount
Sewer System Rehabilitation Phase I	City of Cochran	6/1/2016	1,697,750.00	12/1/2016	55,521.55
Cowan Riverside Drive Rehab Area 3	City of Nashville	10/26/2015	5,130,815	12/8/2016	2,890,334.95
Sewer & Manhole Rehab	City of Mt. Pleasant	4/20/2016	5,365,355	3/19/2017	2,091,750.51
Sanitary Sewer Rehab	City of Northport, FL	1/8/15 (3yr annual)	100,000		no work started yet

ACTION BY UNANIMOUS CONSENT IN WRITING BY THE
BOARD OF DIRECTORS
OF
AMERICAN INFRASTRUCTURE TECHNOLOGIES, CORP.

The undersigned, constituting the Board of Directors of **AMERICAN INFRASTRUCTURE TECHNOLOGIES CORPORATION**, a Florida corporation, by Unanimous Consent in Writing pursuant to the authority contained in the Florida Business Corporation Act, Section 607.0821, without the formality of convening a meeting, do hereby severally and collectively consent to the following action of this corporation:

1. RESOLVED, that Jared Giddens be appointed as Vice-President and Debra Quinn be appointed as Secretary of the corporation; and

2. RESOLVED, that Jared Giddens is hereby authorized to sign such documents and contracts as are reasonably required to carry out the corporation's ordinary course of business without obtaining Board approval.

DATED: February 22, 2016

Kenneth E. Giddens
Shareholder/Director

Timothy Bixler
Shareholder/Director

American Infrastructure Technologies Corporation
Shall implement the highest standards of the construction industry

AMERICAN INFRASTRUCTURE TECHNOLOGIES CORPORATION
8799 U.S. HWY. 31
HANCEVILLE, AL 35077
Ph: 256-739-4747
Fax: 256-737-1871
aitc@aitechcorp.com

INCORPORATED 2/01/05
STATE OF FLORIDA

TABLE OF CONTENTS

American Infrastructure
Technologies Corporation
Shall implement the highest standards
of the construction industry

Corporate Headquarters

8799 Highway 31
Hanceville, AL 35077

Phone : (256) 739-4747
Fax : (256)-737-1871
E-Mail: aitc@aitechcorp.com
Website: www.aitechcorp.com

INSURANCE COVERAGE

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 7/30/2016

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER S.S. Nesbitt & Co., Inc. 3500 Blue Lake Drive, Ste. 120 Birmingham AL 35243	CONTACT NAME: Teresa Coats PHONE (A/C, No, Ext): (205) 262-2700 FAX (A/C, No): (205) 262-2701 E-MAIL ADDRESS: tcoats@ssnesbitt.com
INSURED American Infrastructure Technolgies Corporation 8799 Highway 31 Hanceville AL 35077	INSURER(S) AFFORDING COVERAGE — NAIC # INSURER A: Liberty Mutual Fire Insurance — 23035 INSURER B: Atlantic Specialty Company — 27154 INSURER C: INSURER D: INSURER E: INSURER F:

COVERAGES **CERTIFICATE NUMBER:2016-2017** **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	X COMMERCIAL GENERAL LIABILITY CLAIMS-MADE [X] OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: POLICY [X] PRO-JECT [ ] LOC OTHER:			TB2Z9146620116	7/31/2016	7/31/2017	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG	$ 1,000,000 $ 300,000 $ 5,000 $ 1,000,000 $ 2,000,000 $ 2,000,000
A	AUTOMOBILE LIABILITY X ANY AUTO ALL OWNED AUTOS HIRED AUTOS SCHEDULED AUTOS NON-OWNED AUTOS			AS2Z91466201016	7/31/2016	7/31/2017	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident) Medical payments	$ 1,000,000 $ $ $ $ 5,000
A	X UMBRELLA LIAB X OCCUR EXCESS LIAB CLAIMS-MADE DED X RETENTION $ 10,000			TH7291466201056	7/31/2016	7/31/2017	EACH OCCURRENCE AGGREGATE	$ 5,000,000 $ 5,000,000 $
A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) Y/N [ ] N/A If yes, describe under DESCRIPTION OF OPERATIONS below			WC2Z91466201056	7/31/2016	7/31/2017	PER STATUTE [ ] OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	$ 1,000,000 $ 1,000,000 $ 1,000,000
B	Equipment Floater			790020171000	7/31/2016	7/31/2017	Blkt Leased & Rented Equipment	$250,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

This is a sample certificate for informational purposes only. If you would like an original certificate please email your request to Jan Wright at janw@palomarins.com and include your certificate holder information

CERTIFICATE HOLDER

Sample Certificate

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

Teresa Coats/KLM

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Corporate Headquarters

8799 Highway 31
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Phone : (256) 739-4747
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E-Mail: aitc@aitechcorp.com
Website: www.aitechcorp.com

RESUMES

Kenneth Giddens
2911 Carlisle Road
Birmingham, AL 35213
256-739-4747
SS #423-62-4266

Objective: To establish a sewer lining company in the southeastern United States.

Experience:

American Infrastructure Tech. Corp., Hanceville, AL 2005 – Present
President

- Manage day to day operations for sewer rehabilitation firm.
- 2007 annual sales were $6 million.

S&D Excavating, Inc., Cullman, AL 1984 – 1997
Owner

- Increased sales from $500 thousand to $10 million.
- Purchased 50% partner in 1997.
- Closed company in 1997 to pursue sewer lining.

SIS Inc., Cullman, AL 1994 – 1999
Owner

- Expanded sales from $250,000 to $7 million.
- Sold company in October 1999 and worked with the purchaser until October 2000.
- Installed 300,000 LF.

CIPP Corp., Hudson, IA 1994 – Present
Principle

- Developer of cured in place pipe marketed as CIPP Liner.
- Annual sales of $6 million dollars in materials.
- Eight licensed installers.
- Third largest in the United States.
- 2000 – 2005 active in day to day operations including training and development of licensed installers. Assisted with development of new equipment and products as a principle of CIPP Corp.

Education: **Bryant University**, Lincoln, RI 1972 - 1977
Business Management and Finance

Interests: Golf, church mission and travel.

Timothy R. Bixler
3752 Trewithen Lane
Carmel, IN 46032
SS #313-86-5761

Professional Experience:

12/05 - Current **AMERICAN INFRASTRUCTURE TECHNOLOGIES, Hanceville, AL**
Owner/Vice President
Responsibilities include overseeing business and operations management of entire company. Other responsibilities include project management, bidding/estimating, and subcontractor overseeing.

2001 – 12/05 **MILLER PIPELINE CORPORATION, Indianapolis, IN**
Manager of Construction Services
Responsibilities for operations management of Miller Pipeline Corporations many products including Cured-In-Place Pipe, Pipe bursting, EX PVC liners, WEKO Seals, manhole rehabilitation, line cleaning services, televising services, point repairs or full replacement, service reinstatement and reconnections.

1998 – 2001 **BOLDEN PIPE CONSTRUCTION COMPANY, INC.**, Nashville, TN
Business Group Manager
Responsible for business and operations management of $5.0 million sewer system rehabilitation group, including Cured-In-Place Pipe Lining system manufacturing and installation, service lateral reinstatement/ rehabilitation, manhole rehabilitation, point repairs, cleaning and televising.

1997 – 1998 **W. L. HAILEY AND COMPANY, INC.**, Nashville, TN
Division Manager/Project Manager
Responsible for supervision of self-performing crews and subcontractors, safety and quality control, project planning and scheduling, cost analysis, and preparation of monthly pay estimates, record documents, and shop drawings. Sewer system rehabilitation projects included Cured-In-Place Pipe Lining, Deform/Reform Pipe Lining, manhole rehabilitation, service lateral reinstatement/rehabilitation, cleaning and televising, and point repairs.

1991 – 1997 **GREAT LAKES DREDGE & DOCK COMPANY**, Oak Brook, IL
Engineering/Operations
Responsible for monitoring and evaluating performance maximize production, developing and maintaining quality control programs, coordinating and supervising subcontractors for performance and compliance, project planning and scheduling, field surveying, estimating and bidding, and monthly pay estimate documentation. Projects included major projects in Bilbao, Spain and in Copenhagen, Denmark, as well as domestic projects along the Atlantic, Pacific, Gulf Coasts and the Great Lakes.

Education:

Purdue University, West Lafayette, Indiana
BS - Construction Management, 1991 Minor - Economics

780-996-8787

POST OFFICE BOX 949 ALABASTER, ALABAMA 35007
205-329-5570 • ANDREHAN2010@HOTMAIL.COM

RAMON HANSON

OBJECTIVE

I am seeking employment with a respectable company for a long-term career. One that I can share my experiences with as well as gain insight from your company. I believe in doing what ever it takes to get the job done, and I am willing to go the extra mile to see that it happens.

SUMMARY OF QUALIFICATIONS

I began my career in the CIP industry in 1993 with Reynolds Inliner. Since that time I have become well versed in all facets of the cured-in-place pipe (CIPP) rehabilitation. My experience includes CIPP inversion installation per ASTM 1216 and Pull in installation per ASTM 1743, pipeline cleaning and preparation, closed circuit television inspection, traffic control implementation, bypass pumping, lateral reinstatement with robotic and manual cutters and equipment maintenance. I have exceedingly installed CIPP in diameters up to 48- inch and have directly overseen installation of more than 300,000 feet of Inliner product.

As well as all my duties toward the Lining Department, I also performed service line point repairs, mainline point repairs, new manholes and manhole replacements.

For five years as Inliner Superintendent, I was responsible for the overall installation of the (CIPP) division and the manhole rehabilitation sector in Birmingham, Alabama including managing / supervising several running jobs. I maintained 3 manhole spray crews, 4 prep crews and 5 lining crews. I was responsible for the division handling all of the Jefferson County Sewer Rehabilitation Contracts: Turkey Creek II, 10 West, Village Creek West End I and II- 26 East, Jefferson County Annual Contract I and II, 2 East, Cahaba 4, Cahaba 6 and other various Jefferson County Contracts.

I was also responsible for all new hire training and instructing new and younger crewmembers on the task required to complete a wide variety of rehabilitation measures.

RAMON HANSON

WORK OF EXPERIENCE

October 2011 - Present DFI Corporation Edmonton, Alberta, Canada
Superintendent

- The CIPP Division of DFI has been in operation for 2 years without turning any profit due to lack of field experience. I was hired and given one year to make any and all necessary changes to turn this company around. For the first three months, I serviced multiple incomplete jobs and made all repairs/ correction. I chose to fire/ rehire the employees and train/ retrain them to meet company expectations from their field teams in a timely, cost effective yet safely manner. As of January 31 the company is currently receiving the profit that I assured DFI was capable of producing and five months ahead of schedule. I am confident that with the proper training and skills I have given them they are ready to complete their future projects successfully. I have been given the opportunity to continue working for DFI but it was understood from the beginning that after I completed our agreement that I would return to the USA.

March 2011 - October 2011 Richards & Sons Construction Bessemer, AL
Supervisor/ Foreman

- Overall responsibilities for complete daily activities, which include: water, sewer, storm and grading. Responsible for my crew. Reporting their daily work performed and turning in payroll and equipment used on jobsite.

June 2010 - February 2011 Insituform Technologies Bessemer, AL
Superintendent

- Overall responsibilities for maintaining and scheduling daily activities.

January 2007 - May 2010 Richards & Sons Construction Bessemer, AL
Supervisor/ Foreman

- Overall responsibilities for complete daily activities, which include: water, sewer, storm and grading.
- Responsible for my crew. Reporting their daily work performed and turning in payroll and equipment used on jobsite.

June 1993 - July 2006 Reynolds Inc. Orleans, IN
Supervisor / Foreman / Superintendent

- Overall responsible for complete daily and weekly activities. Production and scheduling of local and out of town crews in Birmingham, AL.

RAMON HANSON

CONTINUED WORK OF EXPERIENCE

January 1991 - April 1993 Multi-Temps Mobile, AL
Carpenter / Laborer
- Assist carpenters in daily activities.

August 1988 - January 1991 Mobile Carbonics Mobile, AL
Serviceman / Helper/ Delivery
- Perform service work on fountain equipment in restaurants. All work was subcontracted through Coca Cola USA.

EDUCATION

General Education Diploma

PROFESSIONAL AFFILIATES / CONTINUING EDUCATION

Confined Space Entry Training
40 Hour OSHA Health and Safety Training
CPR Training Course
Competent Person Training
First Aid Training Course
PAC Certification # 4-206-2829
MSHA 8 Hour Update Training

DRIVERS LICENSE

Type: Commercial Class A
Endorsements: Tank

REFERENCES

Wendell Hunt	(205) 601-1293	Superintendent
Lenn Nail	(205) 613-1474	General Superintendent
Ken Thompson	(205) 902-9385	Operations Manager
Mikah Williams	(678) 735-0033	Operations Manager
Philip Skinner	(205) 821-6824	Jefferson County
Dennis Coghlan	(281) 728-2266	Superintendent
Doug Booth	(306) 537-1949	City Inspector for Regina, CA

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Website: www.aitechcorp.com

BIDDER QUALIFICATIONS

Bidder Qualification

American Infrastructure Technologies Corporation has been providing our customers with experience and an admirable list of core capabilities and customer solutions. **American Infrastructure Technologies Corporation** is a Florida Corporation with administrative headquarters in Hanceville, AL, and has additional jobsites and field offices throughout the Southeast.

As a recognized leader in the industry we attribute much of our success and longevity to the quality of work we provide to our customers and the professional and stable leadership at all levels within the company. The values and principals, on which the company was originally founded, remain today as the cornerstone of our commitment to quality and value-added service. It is in this way our Company stays on the leading edge and achieve maximum efficiencies to provide greater value.

At **American Infrastructure Technologies Corporation** we are committed to outstanding performance as well as exceeding client expectations. The core capabilities of **American Infrastructure Technologies Corporation** include:

Storm and Sewer Wastewater

- Cured-In-Place Pipe mainline as well as laterals
- Pipe Bursting mainline and laterals
- Excavation including full line replacement, laterals and point repairs
- CCTV and Cleaning with assessment
- Manhole Rehabilitation utilizing grout, cementitious products, poly urea or eopxy
- Internal and external joint sealing utilizing grout or nitrile rubber with stainless steel bands

Water

- Cured-In-Place Pipe NSP Approved
- Excavation including full line replacement, laterals and repairs
- Internal joint sealing utilizing nitrile rubber with stainless steel bands

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Website: www.aitechcorp.com

REFERENCES:

- **EXPERIENCE**
- **BANK**

Current Contracts

Description	Owner/Location	Contract Date	Contract Amount	Date of Completion	YTD Completed Amount	Subcontractor Amount
Sewer System Rehabilitation Phase I	City of Cochran	6/1/2016	1,697,750.00	2/1/2016	55,521.55	n/a
Cowan Riverside Drive Rehab Area 3	City of Nashville	10/26/2015	5,130,815	11/8/2016	2,890,334.95	3,150,000
Sewer & Manhole Rehab	City of Mt. Pleasant	4/20/2016	5,365,355	3/19/2017	2,091,750.51	2,100,000
Sanitary Sewer Rehab	City of Northport, FL	1/8/15 (3yr annual)	100,000		no work started yet	n/a
	Coweta County, GA					
	Savannah, GA					
	Cleveland, TN					

American Infrastructure Technologies Corporation

Cured-In-Place Rehabilitation Experience Through 12/31/2014

Description	Year	Owner/Location	Contract Amount	To Date Footage	Dia	Engineer
2013 Cleveland Rehabilitation Contract	2015 In Progress	Cleveland Utilities 2450 Guthrie Ave NW Cleveland, TN 37311 Mr Greg Clark (423)478-9377	$4,817,100.00	16,237.50	8 10 12 15 18	Cleveland Utilities 2450 Guthrie Ave NW Cleveland, TN 37311 Mr Greg Clark (423)478-9377
Greenville TN Sewer Rehab 2014	2015 In Progress	Greenville Water Commission P.O. Box 368 Greenville, TN 37743-0368 Mr Eric Fry (423)638-3148	$776,460.00	2,891.80 684.90 0.00 978.70 4,395.00	8 10 12 15 18	Greenville Water Commission P.O. Box 368 Greenville, TN 37743-0368 Mr Eric Fry (423)638-3148
Springfield, TN	2014 Completed	City of Springfield 405 North Main Street Springfield, TN 37172	$1,298,575.00	8,071.00	8	Gresham, Smith and Partners 1400 Nashville City Center Nashville, TN 37219 Mr. Michael Burgett (615)770-8448
Valdosta, GA Sewer Rehab	2014 Completed	City of Valdosta 1016 Myrtle Street Valdosta, GA 31603 Mr. David Frost (229)259-3592	$113,767.00	2,541.80	8	City of Valdosta 1016 Myrtle Street Valdosta, GA 31603 Mr. David Frost (229)259-3592
2014 CDBG Sewer System Improvements	Completed 11/1/2014	Town of Chatom 27 Cochran Avenue Chatom, AL 36518	$337,100.00	7,963.60	6 8 10 12	Constaintine Engineering 2414 Airport Road West Ft Payne, AL 35968 Mr. Jim Smith (256) 997-9199
City of Cochran	2014 Completed	City of Cochran P.O. Box 8 Cochran, GA 31014	$103,136.00	2,114.00	8	G. Ben Turnipseed Engineers 2255 Cumberland PKWY. Bld. 400 Atlanta, GA 30339 Mr. Chris Poje (770)333-0700
Town of Alapaha, GA	2014 Completed	Town of Alapaha, GA P.O. 385 Alapaha, GA 31622	$427,130.00	7,028.00	8	G. Ben Turnipseed Engineers 2255 Cumberland PKWY. Bld. 400 Atlanta, GA 30339 Mr. Chris Poje (770)333-0700
Sewer Rehabilitation Project - FY 2013	11/30/2014 Completed	City of Panama City Beach 110 South Arnold Road Panama City Beach, FL 32413 Ms. Kelly Jenkins (850)233-5100	$604,000.00	9,706.10 892.10 2,391.00	8 10 21	City of Panama City Beach 110 South Arnold Road Panama City Beach, FL 32413 Ms. Kelly Jenkins (850)233-5100

Cured-In-Place Rehabilitation Experience Through 12/31/2014

Description	Year	Owner/Location	Contract Amount	To Date Footage	Dia	Engineer
Dothan, AL Contract 3 - Sewer Rehabilitation on St Andrews	2014 Completed	City of Dothan, AL 126 North St. Andrews Street Dothan, AL 36303	$527,100.00	2,300.00 3,900.00 60.00	6 8 12	Polyengineering, Inc. 1935 Headland Avenue Dothan, AL 36303 Mr. Glenn Stephens (334)793-4700
North Carrolton, MS	2014 Completed	Town of North Carrolton, MS 114 East Main Street North Carrolton, MS 38947	$300,998.10	6,604.00 370.00	8 10	Willis Engineering, Inc. 133 South Mound Street Grenada, MS 38902 Mr. Mike Carver (662)809-4482
Sewer Rehabilitation Project 2012 CDBG I&I Sewer Improvements	2013 Completed	City of Baconton, GA 333 East Walton Street Baconton, GA 31716	$431,351.50	11,825.00	8	Stephenson & Palmer Engineering, Inc. 1501 Highway 19 South Leesburg, GA 31763 Mr. Robert Ramsdell (229)883-0332
Sewer Rehabilitation Project	2013 Completed	City of St. Cloud, FL 1300 9th Street St. Cloud, FL 34769 Mr. Rick Mauro (407) 957-7212	$195,000.00	5,803.70	8	City of St. Cloud, FL 1300 9th Street St Cloud, FL 34769 Mr. Rick Mauro (407) 957-7212
Sevier County Project No. PRA-FOOT 15A32 AITC is Subcontractor	5/1/2013 Completed	Charles Blalock & Sons P.O. Box 4750 Sevierville, TN 37864-4750 (865)453-2808	$175,700.90	439.00 949.00 644.00	18 24 30	Federal Highway Admin.
Waste Water Sytem Improvements Sewer Rehabilitation Project - WWTP PH I	6/1/2013 Completed	City of Morristown P.O. Box 1499 Morristown, TN 37816	$567,100.00	500.00	8	Lamar Dunn & Associates, Inc. 3305 Maloney Road Knoxville, TN 37920 Mr. Greg Jones (865) 573-7672
Sewer Main Rehab Phase IV City of Ocala, FL Annual Project	2012-2013 In Process	City of Ocala, FL 405 S.E. Osceola Avenue Ocala, FL 34478-1270 Mr. Ed Earnest (352)629-8521	$953,000.00	644.10 32,328.70 34.00 429.70	6 8 10 12	City of Ocala, FL Water & Sewer Engineer 2100 N.E. 30th Ave. Bldg. H Ocala, FL 34478 Mr. Ed Earnest (352)351-6772
Waste Water Sytem Improvements Sewer Rehabilitation Project - Spring Creek PH I	Completed 5/1/2013	City of Morristown P.O. Box 1499 Morristown, TN 37816	$2,949,100.00	6,772.00 20,553.00 1,406.00	6 8 10 12	Lamar Dunn & Associates, Inc. 3305 Maloney Road Knoxville, TN 37920 Mr. Greg Jones

Cured-In-Place Rehabilitation Experience Through 12/31/2014

Description	Year	Owner/Location	Contract Amount	To Date Footage	Dia	Engineer
2012-01 Sewer System Rehabilitation	Completed 6/30/2013	City of Lewisburg 100 Water Street Lewisburg, TN 37091	$397,712.00	7,962.30 808.00	6 8 10 12	(865) 573-7672 JR Wauford S Company 2835 Lebanon Road Nashville, TN 37214 Mr. Robert Qualman (615) 883-3243
Altamont Sewer Rehabilitation	Completed 10/31/2013	City of Chattanooga 101 East 11th Street, Suite G13 Chattanooga, Tn 37402	$2,237,100.00	11,364.00	6 8 10 12	Lamar Dunn & Associates, Inc. 5726 Marlin Road Suite 516 Chattanooga, TN 37411 Mr. Edward Ward (423) 855-0400
2011 CDBG Sewer System Improvements	Completed 6/1/2013	Town of Chatom 27 Cochran Avenue Chatom, AL 36518	$287,100.00	6,688.00	6 8 10 12	Constaintine Engineering 2414 Airport Road West Ft Payne, AL 35968 Mr. Jim Smith (256) 997-9199
Sanitary Sewer Rehabilitation Echeconnee Basin	Completed 4/1/2013	Macon Water Authority 790 Second Street, P.O. Box 108 Macon, GA 31202 Mr. Randy Smith (478) 464-5620	$1,868,497.05	13,042.50 1,801.00 57.00	8 10 12	Macon Water Authority 790 Second Street, P.O. Box 108 Macon, GA 31202 Mr. Randy Smith (478) 464-5620
Town of Cadwell, GA Sewer Rehabilitation	Completed 10/1/2013	Town of Cadwell, GA 1006 Coleman Street Cadwell, GA	$656,938.00	1,716.10	8	Carter and Sloope, Inc. 113 Mountanbrook Drive, Suite 208 Canton, GA 30115 Mr. Matt Smith (770)479-8782
Tydall Air Force Base Rehabilitation	Completed	Sub to: Peaden Companies 620 West Baldwin Road Panama City Beach, FL 32405-3369 Mr. Chris Infinger (850) 258-1722	$150,000.00	1,640.00 1,090.00 979.00	8 10 12	Sub to: Peaden Companies 620 West Baldwin Road Panama City Beach, FL 32405-3369 Mr. Chris Infinger (850) 258-1722
Forcemain Rehabilitation	Completed	City of Sanford 300 N. Park Avenue, Room 236 Sanford, FL 32772 Mr. Cedric Coleman (407)688-5000 x 5517	$350,000.00	3,500.00	8	City of Sanford 300 N. Park Avenue, Room 236 Sanford, FL 32772 Mr. Cedric Coleman (407)688-5000 x 5517
Sewer Lining 2012	Completed	City of Winter Haven 401 6th Street SW Winter Haven, FL 33880 Mr. Steve Reiner (863) 287-7263	$300,000.00	5,790.00	8	City of Winter Haven 401 6th Street SW Winter Haven, FL 33880 Mr. Steve Reiner (863) 287-7263

Cured-In-Place Rehabilitation Experience Through 12/31/2014

Description	Year	Owner/Location	Contract Amount	To Date Footage	Dia	Engineer
City of Savannah, GA 08.154.06.24 5-YR Annual Project	2012-2015 Annual	City of Savannah, GA 230 Argonic Road Savannah, GA 31406 Mr. Bill Steinhauser (912)351-3834	$8,750,000.00	41,527.90 2,296.00 2,978.00 551.00 147.30 2557.00	8 10 12 15 18 24 36	City of Savannah, GA 230 Argonic Road Savannah, GA 31406 Mr. Bill Steinhauser (912)351-3834
Sewer Rehabilitation Project	2012 Completed	City of St. Cloud, FL 1300 9th Street St. Cloud, FL 34769 Mr. Rick Mauro (407) 957-7212	$210,000.00	3,452.00 576.00 1,900.00	8 10 12	City of St. Cloud, FL 1300 9th Street St. Cloud, FL 34769 Mr. Rick Mauro (407) 957-7212
Mulberry I&I Improvements	Completed	City of Mulberry P.O Box 707 Mulberry, FL 33860 Mr. John Wright (863) 425-5492	$394,771.80	6,349.00 1,008.00	6 8 10 12 15	Rayl Engineering & Surveying LLC 695 Church Street Bartow, FL 33830 Mr. Alan Rayl (813) 857-6921
Central Tallassee Sewer Improvements	Completed	City of Tallassee 3 Freeman Avenue Tallassee, AL 36078	$1,379,575.00	3,000.00 6,500.00 700.00 3,500.00 4,000.00	6 8 10 12 15	AME Engineers Inc 6013-A East Shirley Lane Montgomery, AL 36117 Mr. Russ Robinson (334)277-2866
Sewer Lining	Completed 10/30/2011	City of Winter Haven 401 6th Street SW Winter Haven, FL 33880 Mr. Steve Reiner (863) 287-7263	$394,771.80	15,811.20	8	City of Winter Haven 401 6th Street SW Winter Haven, FL 33880 Mr. Steve Reiner (863) 287-7263
IFB 07/08-07 Restoration of Underground Pipe and Manhole Rehabilitation	Annual In Progress	City of Sanford 300 N. Park Avenue, Room 236 Sanford, FL 32772 Mr. Cedric Coleman (407)688-5000 x 5517	$100,000.00	3,770.80 1,688.80	8 10 12 15	City of Sanford 300 N. Park Avenue, Room 236 Sanford, FL 32772 Mr. Cedric Coleman (407)688-5000 x 5517
City of Edison, GA 2011	Completed	City of Edison, GA 2011 101 E. Hartsford Street Edison, GA 39846 Mr. Reeves Lane, Major (229)835-2279	$450,000.00	5,923.30	8	Stephenson & Palmer Engineering, Inc. 1501 Highway 19 South Leesburg, GA 31763 Mr. Robert Ramsdell (229)883-0332
City of Orlando FL IFB10-0399	2011 In Progress Annual	City of Orlando Public Works Department 5100 L.B. Mc Leod Road Orlando, FL 32811 Mr. Chuck Shultz, P.E.	$600,000	21,678	8 10 12 18	City of Orlando Public Works Department 5100 L.B. Mc Leod Road Orlando, FL 32811 Mr. Chuck Shultz, P.E.

Cured-In-Place Rehabilitation Experience Through 12/31/2014

Description	Year	Owner/Location	Contract Amount	To Date Footage	Dia	Engineer
City of Tampa, FL Annual Wastewater Gravity Sewer Rehabilitation by Cured in Place Pipe (CIPP) FY 11	Completed	(407-246-2658 City of Tampa 3808 East 26th Street Tampa, FL 33605 Mr Jeffrey Taylor (813) 630-3911	$728,300	14258.40 1352.00 1835.00 1691.00	8 10 12 18	(407-246-2658 City of Tampa 3808 East 26th Street Tampa, FL 33605 Mr Jeffrey Taylor (813) 630-3911
Town of Loxley, AL	Completed	Town of Loxley, AL PO Box 9 Loxley, AL 36551	$229,600	7,630	8	Godwin, Mills, and Caywood, Inc. 41 West I-65 Service Rd North, ste 430 Mobile, AL 36608 Mr. Chad Jordan (251)460-4006
Bartow, Fl Municipal Airport Sub to CenState Construction	Completed	CenState Contractors, Inc. PO Box 552 Winter Haven, FL 33882 Mr. Ronnie Blackwell (863) 324-3882	$310,937	9,909	8	Chastain Skillman 4705 Old Highway 37 Lakeland, FL 33807 Mr. Michael Leffler (863) 646-1402
Sewer Rehabilitation Project - FY 2011	11/30/2011 Completed	City of Panama City Beach 110 South Arnold Road Panama City Beach, FL 32413 Ms. Kelly Jenkins (850)233-5100	$604,000.00	11,924.90 802.10 2,235.70 506.80 714.10 240.00 1,136.30 219.00	8 10 12 15 18 21 24 27 30	City of Panama City Beach 110 South Arnold Road Panama City Beach, FL 32413 Ms. Kelly Jenkins (850)233-5100
Sewer System Rehabilitation 2009 CDBG Contract No: 1-10	2010 Completed	Town of Bruceton 209 Cheatham Street Bruceton, TN 38317 Mr. Brian Edwards (731)586-2401	$337,100.00	896.00 3,770.00 710.00	8 10 12	Gresham, Smith & Partners 511 Union Street, Suite 1400 Nashville, TN 37219 Mr. Michael Burgett (615)770-8100
Ford/Blackwell and Highland Outfall Sanitary Sewer Rehabilitation	2010 Completed	City of Covington 2194 Emory Street Covington, GA 30015 Mr. Tim Tohnson (770) 385-2035	$132,620.00	2,837.00 682.00	8 10	PGS&J 1800 Parkway Place, Suite 1200 Marietta, GA 30067 Mr Bill Livingston (770)422-1902
Sewer Rehabilitation Project	2010 Completed	City of St. Cloud, FL 1300 9th Street St. Cloud, FL 34769 Mr. Rick Mauro (407) 957-7212	$97,169.00	924.00 1,635.50 151.80	8 10 12	City of St. Cloud, FL 1300 9th Street St. Cloud, FL 34769 Mr. Rick Mauro (407) 957-7212
Trenchless Gravity Line Repairs	2010 Completed	City of Greenwood 101 West Church Street	$181,581.00	271.00	8	V. Johnson - McAdams Firm 108 West Market Street

Cured-In-Place Rehabilitation Experience Through 12/31/2014

Description	Year	Owner/Location	Contract Amount	To Date Footage	Dia	Engineer
		Greenwood, MS 38930		608.00 4,931.00	10 12	Greenwood, MS 38930 Mr. Tom Tollison (662) 455-3943
Wastewater Collection System Rehab 2010 Cedar Key Redevelopment Agency	2010 Completed	Cedar Key Redevelopment Agency 490 Second Street Cedar Key, FL 32625	$162,379.00	3,553.00 787.00	8 10	Mittauer & Associates, Inc. 580-1 Wells Road Orange Park, FL 32073 Mr. Monte Hafez (904) 278-0030
Clingman's Dome AITC is Subcontractor	4/15/2010 Completed	Charles Blalock & Sons P.O. Box 4750 Sevierville, TN 37864-4750 (865)453-2808	$222,000.00	143.00 124.00	18 24	Federal Highway Admin.
Sewer Rehabilitation Project Town of Johnston, SC	10/30/2011 Completed	Edgefield County Water and Sewer Auth 100 Waterworks Way Edgefield, SC 29824	$283,453.50	5,500.00	8	Genensis Consulting Group 1330 Lady Street, Suite 205 Columbia, SC 29201 Mr. Bill Knowles (803)744-4500
Sewer Rehabilitation Phase III and Manhole Rehabilitation	2010 Completed	City of Brooksville 201 Howell Avenue Brooksville, FL 34601-2041	$1,348,764.00	4,075.00 36,226.00 1,611.00	6 8 10 12	Cardno/TBE 20205 Cortez Blvd. Brooksville, FL 34601 Mr. Alan Schaffer (352)754-4551
IFB 07/08-07 Restoration of Underground Pipe and Manhole Rehabilitation	Completed Jan 2011	City of Sanford 300 N. Park Avenue, Room 236 Sanford, FL 32772 Mr. Cedric Coleman (407)688-5000 x 5517	$2,300,000.00	47,833.00 19,588.00 3,276.00	8 10 12	City of Sanford 300 N. Park Avenue, Room 236 Sanford, FL 32772 Mr. Cedric Coleman (407)688-5000 x 5517
Henry County Water and Sewerage Authority Contract 2009-0331 Sanitary Sewer Rehabilitation	Jan 2010 Completed	Henry County Water and Sewerage Authority 100 Westridge Industrial Blvd. McDonough, GA 30253 Mr. Pat Hembry (678)583-3811	$639,171.00	952.00 8,505.00 2,814.00 1,785.00 0.00 355.00	6 8 10 12 15 36	Henry County Water and Sewerage Authority 100 Westridge Industrial Blvd. McDonough, GA 30253 Mr. Pat Hembry (678)583-3811
City of Edison, GA	Jan 2010 Completed	City of Edison, GA 101 E. Hartsford Street Edison, GA 39846 Mr. Reeves Lane, Major (229)835-2279	$484,719.00	14,380.40 310.00	8 10	Stephenson & Palmer Engineering, Inc. 1501 Highway 19 South Leesburg, GA 31763 Mr. Shane Cox (229)883-0332
Sewer Main Rehab Phase III City of Ocala, FL	2009-2014 In Process	City of Ocala, FL 405 S.E. Osceola Avenue	$953,000.00	52.00 47,397.70	6 8	City of Ocala, FL Water & Sewer Engineer

Cured-In-Place Rehabilitation Experience Through 12/31/2014

Description	Year	Owner/Location	Contract Amount	To Date Footage	Dia	Engineer
Annual Project - 5 Years	5-YR Annual	Ocala, FL 34478-1270 Mr. Ed Earnest (352)629-8521		3,155.20 70.00	10 12	2100 N.E. 30th Ave. Bldg. H Ocala, FL 34478 Mr. Ed Earnest (352)351-6772
Hilton Head Island, SC	3/29/2009 Completed	Hilton Head Island, SC 21 Oakpark Drive Hilton Head, SC 29925 Mr. Jim Hewitt (843) 681-5052	$55,199.10	0.00 358.00	8 24	Hilton Head Island, SC 21 Oakpark Drive Hilton Head, SC 29925 Mr. Jim Hewitt (843) 681-5052
City of Altamonte Springs, FL	1/30/2009 Completed	City of Altamonte Springs, FL 225 Newburyport Avenue Altamonte Springs, FL 32701 Mr. James Wickert (407)571-8078	$54,994.44	372.00 350.00	8 24	City of Altamonte Springs, FL 225 Newburyport Avenue Altamonte Springs, FL 32701 Mr. James Wickert (407)571-8078
City of Altamonte Springs, FL La Floresta Project	1/30/2009 Completed	Parthenon Construction - AIT SUB 105 W 7th Street Orlando FL 32824 Mr. Medhi Shayestea (407)948-2373	$118,257.50	4,098.00	8	City of Altamonte Springs, FL 225 Newburyport Avenue Altamonte Springs, FL 32701 Mr. George Graves (407)571-8335
City of Arcadia, FL	1/30/2009 Completed	City of Arcadia, FL 645 Turner Road Arcadia, FL 34266 Mr. Fred Lewis (863)494-1789	$250,000.00	6,404.00 788.00	8 12	AECOM 10210 Highland Manor Drive, Suite 350 Tampa, FL 33610 Mr. Todd Bosso, PE (813)630-2500
City of Savannah, GA 08.154.06.24 4-YR Annual Project	2008-2011 Annual	City of Savannah, GA 230 Argonic Road Savannah, GA 31406 Mr. Bill Steinhauser (912)351-3834	$5,500,000.00	163,211.17 7,232.40 14,849.20 3,578.00 6,718.00 6,975.00 3214.00	8 10 12 15 18 24 36	City of Savannah, GA 230 Argonic Road Savannah, GA 31406 Mr. Bill Steinhauser (912)351-3834
City of Hartselle, AL Utilities Sanitary Sewer Rehab, Basins 7, 11, 12, and 13	4/30/2009 Completed	City of Harselle, AL - Hartselle Utilities 1010 Sparkman Street NW Hartselle, AL 35640 Mr. Wayne Roberson (256) 773-3340	$668,604.00	1,818.00 3,489.00	6 8	City of Harselle, AL - Hartselle Utilities 1010 Sparkman Street NW Hartselle, AL 35640 Mr. Wayne Roberson (256) 773-3340
City of Ripley, TN Wastewater Sewer Line Rehabilitation	2/30/09 Completed	City of Ripley - Ripley Sewer, Gas and Water 116 Church Street Ripley, TN 38063	$439,412.00	13,341.00 3,132.00	8 10	A2H Engineers 3009 Davis Plantation Road Lakeland, TN 38002 Mr. Ed Hargraves (901)372-0404
Sewerage System Improvements Phase II	2009	City of Lincolnton, GA	$228,816.00	3,697.00	8	G. Ben Turnipseed Engineers

Cured-In-Place Rehabilitation Experience Through 12/31/2014

Description	Year	Owner/Location	Contract Amount	To Date Footage	Dia	Engineer
Lincolnton, GA	Completed	125 North Peachtree Street Lincolnton, GA 30817 (706)359-3239				4210 Columbia Road, Bld #3 Augusta, GA 30907 Mr. Kennith Greene, P.E. (706)863-8800
City of Cleveland, TN Sanitary Sewer Rehabilitation	6/30/2009 Completed	City of Cleveland, TN 2450 Guthie Drive NW Cleveland, TN 37320-2730 Mr. Philip Luce (423) 472-4521	$368,166.00	7,542.00 622.00	8 12	City of Cleveland, TN 2450 Guthie Drive NW Cleveland, TN 37320-2730 Mr. Philip Luce (423) 472-4521
IFB 07/08-07 Restoration of Underground Pipe and Manhole Rehabilitation	2008 Completed	City of Sanford 300 N. Park Avenue, Room 236 Sanford, FL 32772 Mr. Cedric Coleman (407) 302-1025	$815,000.00	20,663.00 1,040.00 401.00 1,146.00 500.00	8 10 12 15 18	City of Sanford 300 N. Park Avenue, Room 236 Sanford, FL 32772 Mr. Cedric Coleman (407) 302-1025
Roberts Road and Sewell Road Culvert Repairs Newnan, Georgia	4/30/2008 Completed	City of Newnan, Georgia 25 LaGrange Street Newnan, GA 30263 (770) 253-2682	$297,100.00	64.00 110.00	60 96	Keck & Wood, Inc. 2425 Commerce Avenue Building 2100 Suite 300 Duluth, GA 30096 Mr. Rick Gurney (678) 417-4000
Sevier County Project No. PRA-FOOT 15A32 AITC is Subcontractor	1/1/2008 Completed	Charles Blalock & Sons P.O. Box 4750 Sevierville, TN 37864-4750 (865)453-2808	$175,700.90	439.00 949.00 644.00	18 24 30	Federal Highway Admin.
Sewerage System Improvements Collection System Rehabilitation Project No. 260387	4/30/2008 Completed	City of Crawfordville, GA P.O. Box 8 Crawfordville, GA 30631 (706)456-2605	$393,100.00	5,721.00	8	G. Ben Turnipseed Engineers 4210 Columbia Road, Bldg. 3 Augusta, GA 30907 Mr. John McClellan (706)863-8800
Sanitary Sewer Rehabilitation 2006 Cured-In-Place Pipe Installation Project #CS-010307-11-07	10/1/2008 Completed	City of Huntsville, AL 320 Fountain Circle Huntsville, AL 35801 (256)427-5300	$937,100.00	7,174.00 1,200.00 1,621.00 5,509.00 3,640.00	8 10 12 15 18	Tetra Tech, Inc. 101 Chruch Street, Suite 201 Hunstville, AL 35801 Mr. Houston Mattews (256)551-0222
Leisure Beach Wastewater Collection System Pasco County, FL	3/01/2008 Completed	Pasco County County Commission 7530 Little Road New Port Richey, FL 34654 (727)847-8145	$376,322.00	1,200.00 1,700.00	8 18	Parsons, Water & Infrastructure, Inc. 3450 Buschwood Park Drive, Suite 345 Tampa, FL 33618-4447 Mr. Trevor Ibbeson (813)933-4650
South Bay Sewer Rehabilitation	10/1/2008	Florida Governmental Utility Authority	$1,000,000.00	28,571.00	8	Government Services Group, Inc.

Cured-In-Place Rehabilitation Experience Through 12/31/2014

Description	Year	Owner/Location	Contract Amount	To Date Footage	Dia	Engineer
Resolution 33-2007 South Bay, FL	Completed	280 Wekiva Springs Road Longwood, FL 32779 Mr. Pradeep Sethi (407)629-6900				1500 Mahan Drive, Suite 250 Tallahasee, FL 32308 Mr. Charles Sweat (850)224-7206
Sanitary Sewer Rehabilitation and Years II Amended Garden City, GA	2007 Completed	City of Garden City, GA 100 Main Street Garden City, GA 31418-7548 Mr. Brian Johnson (912)966-7777	$311,000.00	5,100.00	8	Hussey, Gay, Bell & DeYoung, Inc. P.O. Box 14247 Savannah, GA 31416 Mr. Ben Gay, P.E. (912)354-4626
Sewerage System Improvements Chatsworth, GA	10/1/2008 Completed	City of Chatsworth, GA 101 West Market Street Chatsworth, GA 30705 (706)695-9496	$1,197,100.00	38,100.00	8	G. Ben Turnipseed Engineers 2255 Cumberland Pkwy, Bld 400 Atlanta, GA 30339 Mr. Ben Turnipseed (770)333-0700
Sewer Collection System Repairs City of Key Colony Beach, FL	7/1/2007 Completed	City of Key Colony Beach, FL P.O. Box 510141 Key Colony Beach, FL 33051-0141 (305)289-1212	$298,345.00	3,600.00	8	Weiler Engineering Corporation 5800 Overseas Highway, Suite 36 Marathon, FL 30907 Ms. Nancy Brooking (305)289-4161
Sewerage System Improvements Phase II Lincolnton, GA	2007 Completed	City of Lincolnton, GA 125 North Peachtree Street Lincolnton, GA 30817 (706)359-3239	$287,100.00	7,600.00	8	G. Ben Turnipseed Engineers 4210 Columbia Road, Bld #3 Augusta, GA 30907 Mr. Kennith Greene, P.E. (706)863-8800
Sewerage System Improvements Phase II Harlem, GA	2007 Completed	City of Harlem, GA P.O. Box 99 Harlem, GA 30814 (706)556-3448	$617,100.00	7,600.00	8	G. Ben Turnipseed Engineers 4210 Columbia Road, Bld #3 Augusta, GA 30907 Mr. John McClellan, P.E. (706)863-8800
Sanitary Sewer Replacement/Rehab 2007 Phase I Clyde Ave., Canterbury Lane Kissimmee, FL	7/1/2008 Completed	Tohopekaliga Water Authority 101 North Church Street Kissimmee, FL 34741 Mr. George Eversol (407)518-2161	$1,117,100.00	6,000.00	8	Tohopekaliga Water Authority 101 North Church Street Kissimmee, FL 34741 Mr. George Eversol (407)518-2161
North Collier Blvd. Rose Ct to Jolley Bridge Contract #06-062 Marco Island, FL	6/2008 Completed	City of Marco Island, FL 50 Bald Eagle Drive Marco Island, FL 34145 Mr. Tim Pinter, P.E. (239)389-5018	$565,450.00	7,700.00	8	City of Marco Island, FL 50 Bald Eagle Drive Marco Island, FL 34145 Mr. Tim Pinter, P.E. (239)389-5018
Sewer Main Rehab Phase II City of Ocala, FL	2006-09 1/2010	City of Ocala, FL 405 S.E. Osceola Avenue	$3,100,000.00	319.00 54,454.00	6 8	City of Ocala, FL 405 S.E. Osceola Avenue

Cured-In-Place Rehabilitation Experience Through 12/31/2014

Description	Year	Owner/Location	Contract Amount	To Date Footage	Dia	Engineer
Annual Project	Completed	Ocala, FL 34478-1270 Mr. Ed Earnest (352)629-8521		1,926.00 1,257.00 337.00 87.00 210.00 340.00	10 12 15 18 24 36	Ocala, FL 34478-1270 Mr. Ed Earnest (352)629-8521
06-05 Sewerage System Improvements Project #230207 Warrenton, GA	2006 Completed	City of Warrenton, GA P.O. Box 109 Warrenton, GA 30828-0109 (706)465-3282	$434,125.00	7,700.00	8	G. Ben Turnipseed Engineers 4210 Columbia Road, Bld #3 Augusta, GA 30907 Mr. Kennith Green, P.E. (706)863-8800
Lehigh Acres Sewage Collection System I & I Rehabilitation Program Lehigh Acres, FL	2007 Completed	Florida Governmental Utility Authority 280 Wekiva Springs Road Longwood, FL 32779 Mr. Pradeep Sethi (407)629-6900	$1,827,100.00	55,318.00	8	URS Corporation 7650 W. Courtney Campbell Causeway, Ste. 700 Tampa, Fl 33607 Mr. J. David Burgstiner, P.E. (813)286-1711
Crystal River Sewer Rehabilitation Crystal River, FL	2006 Completed	Advanced Underground Imaging 222 West Spring Street Cookeville, TN 38501 (931)372-8500	$270,800.00	8,700.00	8	City of Crystal River, Fl

BREAKDOWN BY STATE

AL	70,692.60
FL	543,570.00
TN	108,897.20
GA	410,196.07
SC	5,858.00
NC	0.00
MS	12,784.00
Total	1,151,997.87

BREAKDOWN BY DIAMETER

6"	19,288.00
8"	966,113.07
10"	63,111.20
12"	44,436.40
15"	16,099.70
18"	20,406.10
21"	3,105.10
24"	10,155.00
27"	1,136.30
30"	1,507.00
36"	6,466.00
42"	0.00
48"	0.00
60"	64.00
96"	110.00
LF	1,151,997.87

Total of All Jobs LF **1,151,997.87**

222 W. Spring St.
Cookeville, TN 38501
931.372.8500 phone
931.372.2500 fax

7540 103rd St., Suite 116
Jacksonville, FL 32210
904.778.1119 phone
904.778.1027 fax

18 April 2007

RE: Reference for American Infrastructure Technologies Corp.

I have served as the project manager for two different deployments of AITC forces in Florida.

In St. Petersburg, Florida, AITC crews performed post-CIPP chemical sealing of service laterals across many difficult-to-reach stretches of line. These line segments were located in politically sensitive neighborhoods, on high-value and high-visibility properties, and the AITC crews performed above and beyond the specifications on each deployment.

In Crystal River, Florida, AITC crews performed air-inverted CIPP lining work on small diameter sanitary sewer lines. Their installation crews were prompt, professional, and performed above and beyond the specifications. Their work was effective, efficient, and so quick I had to rewrite my schedule – it's one of the few issues a manager enjoys to have. They deployed on schedule, worked with my team to coordinate permitting and public involvement, and never missed a beat, despite the presence of a tropical storm on site the first day!

I'd gladly work with American Infrastructure Technologies on any project. It was my pleasure. AIT crews keep me involved in their process, and perform their work with precision.

Best regards,

Rob Gray
Project Manager
AUI, LLC
931.267.7503 mobile
Rgray2@auillc.biz

KECK & WOOD, INC.

2425 Commerce Avenue
Building 2100, Suite 300
Duluth, Georgia 30096
Office: (678) 417-4000
Fax: (678) 417-8783
www.keckwood.com

February 10, 2009

To Whom It May Concern:

American Infrastructure Technologies Corporation installed cured-in-place-pipe liners in two large CMP pipes on a project last year in Newnan, Georgia. They were responsive to all questions and concerns during the construction of the project. The project was completed on time and the finished product was excellent. We highly recommend their services as a CIPP installer.

Sincerely,

KECK & WOOD, INC.

Richard D. Gurney, P.E.
Vice President

April 13, 2007

FLORIDA GOVERNMENTAL UTILITY AUTHORITY

TO WHOM SO EVER IT MAY CONCERN

This is to certify that

American Infrastructure Technologies Corp was awarded a contract for the prevention and reduction of inflow and infiltration in the wastewater collection system at Lehigh Acres FY 2006 project # LE 015. The scope included lining the gravity sewers, carrying out Point of repairs, Manhole repairs and manhole lid repair/replacement and raising the manholes to the current grade.

AITC completed the project within budget and in a timely manner. AITC was very responsive and professional in their approach to the project and its execution.

Keeping in view the good services rendered by American Infrastructure Technologies Corp FGUA has extended their contract for the current FY 2007 also.

American Infrastructure Technologies Corp (AITC)
8799 Highway 31
Hanceville, AL 35077

Florida Governmental Utility Authority

Pradeep Sethi
Project Manager

FGUA OPERATIONS OFFICE

Government Services Group, Inc.
Protegrity Plaza, Suite 203
280 Wekiva Springs Road
Longwood FL 32779

877/852-3482 Toll Free
407/629-8900 Tel
407/629-8963 Fax

From: Ed Earnest [EEarnest@Ocalafl.org]
Sent: Monday, April 16, 2007 10:09 AM
To: TimBixler@aol.com
Subject: RE: Letter of Reference

To Whom It May Concern:

American Infrastructure Technologies Corporation is currently under contract with the City of Ocala for rehab of our sewer system.
They are lining existing clay mains and brick manholes. The contract is currently at $ 1,246,622.

American Infrastructure Technologies Corporation is doing good on the project, completing the work in a timely manner. Given the
option we would use them again.

Edward T. Earnest, P.E.
Deputy City Engineer
Utilities & Construction
352-629-8521

American Infrastructure
Technologies Corporation
Shall implement the highest standards
of the construction industry

Corporate Headquarters

8799 Highway 31
Hanceville, AL 35077

Phone : (256) 739-4747
Fax : (256)-737-1871
E-Mail: aitc@aitechcorp.com
Website: www.aitechcorp.com

BANK REFERENCE

Regions Bank
711 2nd Ave. S.W.
Cullman, AL 35055

Ph: 256-734-1040
Fx: 256-734-8613

Loan Officer: Clayton Ingram

Line of Credit: $12,000,000.00

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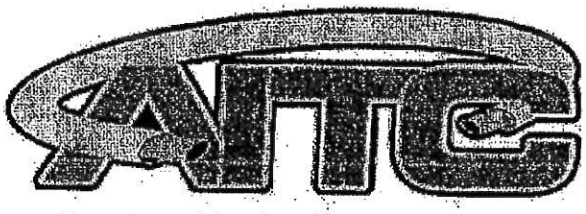
Hanceville, AL 35077

Phone : (256) 739-4747
Fax : (256)-737-1871
E-Mail: aitc@aitechcorp.com
Website: www.aitechcorp.com

EQUIPMENT LIST



American Infrastructure Technologies Corporation

Shall implement the highest standards of the construction industry

American Infrastructure Technologies Corporation

Equipment List-Lining

1. **Boiler Truck - Steam process unit 100 Horsepower**
2. **TV Truck - Cues video lateral reinstatement unit**
3. **Tool Truck - 26 Ft. tool truck**
4. **Refrigerated Truck - 26 Ft. refrigerated truck**
5. **Vactor Truck - Sewer jet vacuum truck**
6. **Refrigerated Trailer and Tractor**
7. **Miscellaneous tools, bypass pumps, small equipment and pickup trucks**

****Other equipment available through rental companies if needed.**

*****All equipment is in excellent working condition.**

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Corporate Headquarters

8799 Highway 31
Hanceville, AL 35077

Phone : (256) 739-4747
Fax : (256)-737-1871
E-Mail: aitc@aitechcorp.com
Website: www.aitechcorp.com

COMPANY PROFILE

American Infrastructure
Technologies Corporation
Shall implement the highest standards
of the construction industry

AMERICAN INFRASTRUCTURE TECHNOLOGIES CORPORATION
8799 U.S. HWY. 31
HANCEVILLE, AL 35077
PH: 256-729-4747
FAX: 256-737-1871
aitc@aitechcorp.com
AITECHCORP.com

BONDING INFORMATION

Surety Company: The Hanover Insurance Company
440 Lincoln Street
Worcester, MA 01653

Agent: McGriff, Seibels & Williams, Inc.
2211 7th Avenue South
Birmingham, AL 35233

Contact: Jeffrey M. Wilson
PH: 205-581-9131
FAX: 205-581-9463

Total Aggregate Bonding Capacity: $30,000,000.00

Single Project Bonding Capacity: $15,000,000.00

Current Bonded Ongoing Projects: $6,408,160.00

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Corporate Headquarters

8799 Highway 31
Hanceville, AL 35077

Phone : (256) 739-4747
Fax : (256)-737-1871
E-Mail: aitc@aitechcorp.com
Website: www.aitechcorp.com

PRESIDENT: Kenneth E. Giddens, manages day to day operations for company.
VICE PRESIDENT: Timothy R. Bixler, oversees operations management including bidding/estimating/subcontractors.

American Infrastructure Technologies Corporation was formed by Ken Giddens and Tim Bixler who both have extensive backgrounds in the sewer, pipeline and heavy construction industry.

AITC CONTRACTOR LICENSES

STATE	NUMBER	EXPIRATION
AL	39829	12/31/16
FL	CUC1224556	8/31/18
GA	UC301560	4/30/17
MS	17704-SC	7/10/17
SC	G113302	10/31/18
TN	00055266	9/30/17

NAICS CODE: 238910

D&B # 189408367

CATEGORIES OF CONSTRUCTION: UTILITY SEWER

American Infrastructure
Technologies Corporation
Shall implement the highest standards
of the construction industry

Corporate Headquarters

8799 Highway 31
Hanceville, AL 35077

Phone : (256) 739-4747
Fax : (256)-737-1871
E-Mail: aitc@aitechcorp.com
Website: www.aitechcorp.com

TESTING REFERENCE

HTS CONSULTANTS, INC.
416 Pickering Street
Houston, TX 77091

Ph: 713-692-8373
Fx: 713-692-8502

Manager: Mr. John Territo

HTS Pipe Consultants, Inc.
420 Pickering Street, Houston, TX 77091
www.htspipeconsultants.com

Phone 713-692-8373
Fax 713-692-8502
Toll Free 1-800-692-TEST

FLEXURAL PROPERTIES OF PLASTICS (ASTM D790)

SUPPORT SPAN = 3.5".

Flexural 3 point bend

Instron Corporation
Series IX Automated Materials Testing System 6.05
Test Date: 30 Sep 2010

Operator name: . CARRILLO

Sample Identification: F019-125
Interface Type: 42/43/4400 Series
Machine Parameters of test:
Sample Rate (pts/sec): 10.000
Crosshead Speed (in/min): .0930

Sample Type: ASTM

Humidity (%): 55
Temperature (deg. F): 71

Dimensions:

	Spec. 1	Spec. 2	Spec. 3	Spec. 4	Spec. 5
Width (in)	.54500	.55000	.55000	.54800	.55600
Depth (in)	.22900	.23300	.23300	.23900	.23900
Span (in)	3.5000	3.5000	3.5000	3.5000	3.5000

Out of 5 specimens, 0 excluded.
Sample comments: 9/17/10, SECTION# 763078

Specimen Number	Disploment at Yield (in)	Strain at Yield (in/in)	Load at Yield (lbs)	Stress at Yield (psi)	Modulus Of Elasticity (psi)
1	.4544	.0510	36.9	6785.6	429733
2	.3899	.0445	40.4	7103.4	429612
3	.4473	.0510	41.1	7235.3	454878
4	.4076	.0477	44.9	7523.9	449264
5	.3946	.0462	41.5	6851.9	418088
Mean:	.4188	.0481	41.0	7100.0	436315.
Standard Deviation:	.0301	.0029	2.8	299.3	15270.
Minimum:	.3899	.0445	36.9	6785.6	418088.
Maximum:	.4544	.0510	44.9	7523.9	454878.

HTS Pipe Consultants, Inc.
420 Pickering Street, Houston, TX 77091
www.htspipeconsultants.com

Phone 713-692-8373
Fax 713-692-8502
Toll Free 1-800-692-TEST

FLEXURAL PROPERTIES OF PLASTICS (ASTM D790)

SUPPORT SPAN = 3"

Flexural 3 point bend

Instron Corporation
Series IX Automated Materials Testing System 8.05
Test Date: 30 Sep 2010

Operator name: E. CARRILLO

Sample Identification: F019-124
Interface Type: 42/43/4400 Series
Machine Parameters of test:
Sample Rate (pts/sec): 10.000
Crosshead Speed (in/min): .0800

Sample Type: ASTM

Humidity (%): 55
Temperature (deg. F): 71

Dimensions:

	Spec. 1	Spec. 2	Spec. 3	Spec. 4	Spec. 5
Width (in)	.55100	.54300	.55200	.54700	.55200
Depth (in)	.20100	.20900	.21000	.21200	.21900
Span (in)	3.0000	3.0000	3.0000	3.0000	3.0000

Out of 5 specimens, 0 excluded.
Sample comments: 9/20/10, SECTION# 76304

Specimen Number	Displcment at Yield (in)	Strain at Yield (in/in)	Load at Yield (lbs)	Stress at Yield (psi)	Modulus Of Elasticity (psi)
1	.3809	.0510	35.5	7160.3	475107
2	.3626	.0505	36.7	6966.6	445952
3	.3358	.0470	39.0	7215.0	476212
4	.3311	.0468	39.0	7135.0	475061
5	.3430	.0501	40.5	6885.7	447933
Mean:	.3507	.0491	38.2	7076.5	464053.
Standard Deviation:	.0207	.0020	2.0	143.0	15642.
Minimum:	.3311	.0468	35.5	6885.7	445952.
Maximum:	.3809	.0510	40.5	7215.0	476212.

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420 Pickering Street, Houston, TX 77091
www.htspipeconsultants.com

Phone 713-692-8373
Fax 713-692-8502
Toll Free 1-800-692-TEST

FLEXURAL PROPERTIES OF PLASTICS (ASTM D790)

SUPPORT SPAN = 3.5"

Flexural 3 point bend

Instron Corporation
Series IX Automated Materials Testing System 6.05
Test Date: 10 Sep 2010

Operator name: E. CARRILLO

Sample Identification: P019-129
Interface Type: 42/43/4400 Series
Machine Parameters of test:
Sample Rate (pts/sec): 10.000
Crosshead Speed (in/min): .0930

Sample Type: ASTM

Humidity (%): 55
Temperature (deg. F): 71

Dimensions:

	Spec. 1	Spec. 2	Spec. 3	Spec. 4	Spec. 5
Width (in)	.54200	.53600	.55000	.54900	.55000
Depth (in)	.23800	.24000	.24800	.24900	.24900
Span (in)	3.5000	3.5000	3.5000	3.5000	3.5000

Out of 5 specimens, 0 excluded.
Sample comments: 9/14/10, SECTION# 132519

Specimen Number	Displcment at Yield (in)	Strain at Yield (in/in)	Load at Yield (lbs)	Stress at Yield (psi)	Modulus Of Elasticity (psi)
1	.3676	.0429	39.8	6804.2	409992
2	.4187	.0492	41.0	5966.9	402490
3	.3767	.0458	44.5	6903.3	448424
4	.3958	.0483	46.1	7105.7	428221
5	.3873	.0472	43.8	6744.8	405122
Mean:	.3892	.0467	43.0	6905.0	418850.
Standard Deviation:	.0196	.0025	2.6	141.3	19346.
Minimum:	.3676	.0429	39.8	6744.8	402490.
Maximum:	.4187	.0492	46.1	7105.7	448424.

HTS Pipe Consultants, Inc.
420 Pickering Street, Houston, TX 77091
www.htspipeconsultants.com

Phone 713-692-8378
Fax 713-692-8502
Toll Free 1-800-692-TEST

FLEXURAL PROPERTIES OF PLASTICS (ASTM D790)

SUPPORT SPAN = 3.5".

Flexural 3 point bend

Instron Corporation
Series IX Automated Materials Testing System 6.05

Operator name: K. PHOUANGSAVANH

Test Date: 30 Sep 2010

Sample Identification: F0191210

Sample Type: ASTM

Interface Type: 42/43/4400 Series
Machine Parameters of test:
Sample Rate (pts/sec): 10.000
Crosshead Speed (in/min): .0930

Humidity (%): 55
Temperature (deg. F): 71

Dimensions:

	Spec. 1	Spec. 2	Spec. 3	Spec. 4	Spec. 5
Width (in)	.55000	.55500	.54800	.55000	.54000
Depth (in)	.22300	.24000	.22700	.22700	.23300
Span (in)	3.5000	3.5000	3.5000	3.5000	3.5000

Out of 5 specimens, 0 excluded.
Sample comments: 9/14/10, SECTION# 132473

Specimen Number	Displcment at Yield (in)	Strain at Yield (in/in)	Load at Yield (lbs)	Stress at Yield (psi)	Modulus Of Elasticity (psi)
1	.3847	.0420	34.9	6704.8	437352
2	.4336	.0510	41.1	6754.6	437961
3	.3635	.0404	35.3	6553.7	437095
4	.4385	.0488	37.1	6867.0	446979
5	.4476	.0511	35.8	6409.4	412074
Mean:	.4136	.0466	36.8	6657.9	434292.
Standard Deviation:	.0371	.0051	2.5	178.8	13089.
Minimum:	.3635	.0404	34.9	6409.4	412074.
Maximum:	.4476	.0511	41.1	6867.0	446979.

AIT COMPANY OVERVIEW

American Infrastructure Technologies Corporation's complete understanding of this project scope is significant. It is understood that we will be performing mainline rehabilitation to existing sewers as well as televising and cleaning as well as service lateral rehabilitation.

American Infrastructure Technologies Corporation has demonstrated our ability on many similar projects throughout the Southeastern United States.

We have compiled the best and most capable construction team for execution of the contract. We are prepared for a rapid commencement as well as a planned execution.

American Infrastructure Technology, Inc. shall implement the highest standards of construction in the industry with proven solutions to reducing inflow/infiltration (I/I) and reducing or eliminating sewer system overflows.

American Infrastructure Technologies Corporation plan of approach is very simple and straightforward:

- We will provide one direct contact person
- Execute the project diligently throughout contract term
- Provide an extremely high level of professionalism to the City of the project as well as any residence within the affected work areas.

Ensure that the overall project is a success including managing vendors, administration, contract progress and time of completion, quality, safety and all aspects of the overall project. This project shall be divided into work phases with each phase having four primary components. By breaking the project into distinct phases allows **American Infrastructure Technologies Corporation** to be better organized with control of all project activities. The four primary components of each phase will be as follows:

- **Initial**
- **Component Inspection and Data Acquisition Phase**
- **Component Construction Phase**
- **Component Closeout**

The phases are prioritized by areas resulting in the best solution for the course of the project.

Scope of work

The **American Infrastructure Technologies Corporation team** shall begin performance within 30 days upon a written notice to proceed. **American Infrastructure Technologies Corporation** shall implement the highest standards of construction in the industry with proven solutions to reducing inflow/infiltration (I/I) and reducing or eliminating sewer system overflows.

American Infrastructure Technologies Corporation will begin the project and work within a given area and complete each area before moving on to other worksites. The reason for this approach is that it only disrupts residence for a limited time. The second reason is that for an overall project management approach all interested parties are fully aware of work site locations and current project schedules.

The overall project shall be divided into project phases having four distinct work phases. By breaking the project into phases, allows **American Infrastructure Technologies Corporation** to provide organization and control over the project and the project activities. The four work phases that will occur with each of the two project phases are as follows:

- **Initial Phase**
- **Inspection and Data Acquisition Phase**
- **Construction Phase**
- **Project Closeout Phase**

Documentation

A **daily report of operations** shall be utilized to monitor project progress. The **daily report of operations** will highlight all activities on a particular day, to include weather and other issues concerning the project on each particular day.

It is **American Infrastructure Technologies Corporation's** intent to manage a well-organized and successful project. The organization of the project begins from the date the Notice to Proceed is issued and is carried out throughout the entire project until completion.

Initial Phase

The initial phase will consist of **Resident Notifications (Door Knockers), Pre-Job Planning and Administration** as well as mobilizing all necessary equipment and materials for the **Inspection and Data Acquisition Phase.**

Prior to going to the **Inspection and Data Acquisition Phase** all resident notifications shall be distributed in the area to notify them of the work that will be soon commencing in the area.

Inspection and Data Acquisition Phase

CCTV shall be the primary activity of this phase from a data acquisition standpoint. In addition to the CCTV the other activities that will be occurring during this phase are as follows:

- Cleaning
- Installation Layouts

Construction Phase

The construction phase shall begin by mobilizing all equipment necessary to perform the work order. The primary items that will be occurring during the construction phase are as follows:

- **Mainline Pipe Rehabilitation**
  - TV and Cleaning
  - Cured-In-Place
  - Bypass Setups for all necessary work items
- **Service Line Rehabilitation**
  - Cured-in-place Laterals

Project Closeout Phase

The **Project Closeout Phase** will be the handing over of all information gathered on the project. This is the step were we will provide and furnish the computerized maintenance management system and final drawings. At roughly 90% of the completion of the project a "Project Finalization Meeting" shall be held to discuss the following:

1. Demobilization
2. Project Turnover
3. Final Release
4. Project Performance (Safety, Quality, Cost and Time)

The primary focus of **American Infrastructure Technologies Corporation** is to satisfy our customer's needs. We can improve our process and adapt our behavior by soliciting feedback on every project. The strength and success of this Quality Management Program lies with **American Infrastructure Technologies Corporation's** employees. It is vital to satisfy our customer's needs and to implement programs that will allow us to maintain our position as one our nation's premier contractors.

It is American Infrastructure Technologies Corporation's intent to provide your City the best products and technologies coupled with an extremely knowledgeable construction team.

Customer Service

- We will provide your department with a list of office, mobile, and home numbers for the **American Infrastructure Technologies Corporation's** project team. We understand that we must be prepared to react at a moment's notice to restore any property disrupted during the course during the performance of this project or address any public safety concerns.
- We understand the public relations concerns of the City – we will be disrupting, however briefly, the flow of sewers from customers who expect an uninterrupted service, and we will be inconveniencing the motoring and pedestrian public with lane closures, and by-pass piping.
- We understand that the City must treat each and every customer complaint/concern with the highest regard and, therefore, all concerns must be addressed immediately.
- We are fully prepared to address any concerns and/or problems, which may arise, at whatever hour.

American Infrastructure
Technologies Corporation
Shall implement the highest standards
of the construction Industry

Corporate Headquarters

8799 Highway 31
Hanceville, AL 35077

Phone : (256) 739-4747
Fax : (256)-737-1871
E-Mail: aitc@aitechcorp.com
Website: www.aitechcorp.com

To Whom It May Concern:

The Board of Directors of American Infrastructure Technologies Corporation have authorized Kenneth Giddens and Timothy Bixler to execute any documents and contracts for American Infrastructure Technologies Corporation, at the annual meeting of January 3, 2007.

Chairman of the Board

Kenneth Giddens

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GUARANTEE FORMS

Service Quality Plan

American Infrastructure Technologies Corporation ensures the highest construction standards and practices in the industry. **American Infrastructure Technologies Corporation** is able to obtain this by numerous quality control processes.

Our quality control begins with our well-trained personnel familiar with the work. This provides for a quality end product to the owner as well as preventing problems throughout the project. Jobsite personnel are well informed on project specifications as well as industry standards.

The second step is to select the proper equipment for the project that works within any jobsite constraints. This step ensures that our project construction schedule will maintain on track. The equipment selection may change during the course of a project.

The next step is to provide the best products for construction. **American Infrastructure Technologies Corporation** associates ourselves with only the highest quality material suppliers. Materials supplied for projects are inspected, stored properly and handled carefully to ensure a no defect project. All materials are also stored to ensure safety to pedestrians or residence in the proximity of the construction site.

Proper supervision is critical to the service quality plan. Direct supervision is necessary to ensure quality, maintain schedule and to oversee entire project. Formal weekly meetings with foreman and superintendents are also held to ensure that this process works to provide a quality project.

Specifically, **American Infrastructure Technologies Corporation** performs and has quality control measures in the manufacturing and installation of all materials. Products are stored at proper temperatures and the First-In/First-Out (FIFO) manufacturing rule is applied. This eliminates long storage times on all materials. To further ensure quality, third party testing labs are regularly used to test for product strengths and product consistency.

In addition to standard quality control measures, **American Infrastructure Technologies Corporation** provides all residence in the proposed work area with a 24-hour notice letter stating when work will be commencing. A copy of the 24-hour notice letter is attached for your review. This notice not only helps to introduce our customers to a professional, efficient, well managed, and a quality project while minimizing disruption to existing residence it keeps the property owner in the vicinity informed on current progress.

C.I.P.P. Corp. is guided by introspective understanding of our customer's essential needs tempered with an understanding of the construction industry.

American Infrastructure Technologies Corporation
Shall implement the highest standards of the construction industry

Corporate Headquarters

8799 Highway 31
Hanceville, AL 35077

Phone : (256) 739-4747
Fax : (256)-737-1871
E-Mail: aitc@aitechcorp.com
Website: www.aitechcorp.com

PRODUCT AND INSTALLER SUBMITTALS

- APPLIED FELTS SPECIFICATIONS
- INTERPLASTICS CORPORATION (RESIN)
- C.I.P.P. DESIGN CONSIDERATIONS
- C.I.P.P. PIPE SPECIFICATIONS
- INSTALLATION PROCESS
- STEAM CURE PROCESS

CIPP CORPORATION ®

July 30th, 2009

To whom it may concern,

American Infrastructure Technologies Corporation has been affiliated with CIPP Corporation for over ten years. CIPP Corporation is the provider of materials and technology for its member contractors in the Cured In Place Pipe Industry. All of our products are manufactured in the USA and have been for more than ten years.

Sincerely,

Stephen Gearhart
Chairman

Hudson, IA — Cullman, AL — Chesapeake, VA — Helena, MT — Frederickstown, OH
Rogers, MN — Peoria, IL — West Chicago, IL - Winnepeg, MB

515 Fifth Street — Hudson, IA 50643 — http://www.usa-cipp.com — 1-888-485-CIPP — PH 1-319-988-4573 FAX 1-319-988-3508

C. I. P. P. CORPORATION
515 FIFTH STREET – PO BOX 398 – HUDSON, IA 50643
Phone: 319-988-4573 Toll Free: 1-888-485-2477 Fax: 319-988-3506

January 17, 2007

This letter is to certify that CIPP licensee's, as provided by C.I.P.P. Corporation, have successfully installed in excess of 1,000,000 linear feet of cured-in-place-pipe across the United States and Canada in the past 9 years.

In addition, American Infrastructure Technology is a certified installer of CIPP liner.

Steve Gearhart, Chairman
C.I.P.P. Corporation

American Infrastructure
Technologies Corporation
Shall implement the highest standards of the construction industry

Corporate Headquarters

8799 Highway 31
Hanceville, AL 35077

Phone : (256) 739-4747
Fax : (256)-737-1871
E-Mail: aitc@aitechcorp.com
Website: www.aitechcorp.com

APPLIED FELTS

A WORLD OF FIBRES

APPLIED FELTS

Applied Felts, Inc. 450 College Drive, Martinsville, Virginia 24112
Telephone (276) 656-1904 Fax: (276) 656-1909
office@appliedfelts.com

May 22, 2013

To Whom It May Concern:

This letter certifies that Applied Felts manufactured tubes meet the material requirements of ASTM F1216-09 (paragraph 5.1) and ASTM F 1743-08(section 6) as well as meet the minimum strength requirements of ASTM-D5813-04 (paragraph 6.1). All our materials and finished products are tested to ensure suitability to the application. Each liner is typically tested in 28 different ways and traceable test data is available for any particular liner.

Applied Felts has provided polymer coated felt tubes for use in Cured In Place Pipe (CIPP) lining for more than sixteen years, and supplied materials for the CIPP industry for more than twenty years. Over 72 million feet of our liner has been successfully installed worldwide, of which over 60 million feet has been installed in the United States. Our liners are assembled in Martinsville, VA, using only components made in the USA.

American Infrastructure Technologies Corporation has been installing Applied Felts liners for over seven (7) years and is a customer in good standing.

Applied Felts is a registered ISO 9001:2008 company.

Sincerely,

W. Mark Sanders
General Manager

Certificate of Registration

COPY

QUALITY MANAGEMENT SYSTEM - ISO 9001:2008

This is to certify that:

Applied Felts Inc.
480 College Drive
Martinsville
Virginia
24112
USA

Holds Certificate No: **FM 55735**
and operates a Quality Management System which complies with the requirements of ISO 9001:2008 for the following scope:

Manufacture of textile products used in pipeline rehabilitation.

For and on behalf of BSI:

Gary Fenton, Global Assurance Director

Originally Registered: **08/15/2000** Latest Issue: **05/14/2012** Expiry Date: **05/31/2015**

APPLIED FELTS
450 College Drive - Martinsville, Virginia 24112
Telephone: 276-656-1904 Fax: 276-656-1909

TECHNICAL INFORMATION

Product: Eversion Liner for Hot Water Cure Installation
(Process Quality Control)

1. Raw Materials

Each supplier is assessed against Quality Assurance criteria. If the supplier meets the criteria set out, then they may be included in our "Approved Supplier List". Periodic reviews take place of all of our approved suppliers to ensure that they continue to meet our criteria.

Inspection and test of raw materials, when received, also enables us to assess the supplier as well as each batch of delivered raw material. Details are shown in Table 1.1.

Table 1.1

Raw Material	Characteristic Tested
Polyester fiber (Several specifications)	Staple length Crimp level Denier Shade Supplier Certification
Polyurethane granules (Several specifications)	Granularity Blocking Yellowness Supplier Certification
Tetrahydrofuran	Supplier Certification
Polyurethane film, sealing tape	Gauge Density Strength of weld - Heat Strength of weld - Chemical Opacity

2. Production of Felt

The sole raw material used in the production of felt is polyester staple fiber. The most suitable fiber specification for the customer's particular end-use is selected (on the basis of resin type, impregnation equipment, installation conditions, and cure regime)/

The process utilizes state of the art equipment and technology to ensure that the product is fully suited to the customer's requirements.

Continual operator inspection at each stage of the process and product, combined with the use of standard machine parameters and computerized machine monitoring ensures that the process is repeatable and consistent.

Each product is tailored to the specific customer's requirements, and a production specification is produced by the Technical Department. The felt produced is tested against the requirements of this document to concur suitable.

Process controls are described in Table 2.1.

Table 2.1

Process	Control	Characteristic
Opening fiber	Operator inspection, set parameters	Even density and thickness
Carding	Operator inspection, set parameters, computer feedback	Even fiber distribution
Tacker needling	Operator inspection, set parameters, computer feedback, orientation of fibers	Permits controlled
Reorientation of fibers	Operator inspection, set parameters, computer feedback	Controls relative elongation modulii in length and cross directions
Needling	Operator inspection, set parameters, computer feedback	Density, strength, ability to weld.

3. Polyurethane Coating of Felt

The sole consumable is granular polyurethane. The polyurethane specification is selected to ensure that the coating has the correct properties to meet the requirements of the customer.

Each roll of coated felt receives a minimum of two coats of polyurethane. This ensures that no pin-holes are present.

Process controls are described in Table 3.1.

Table 3.1

Process	Control	Characteristic
Extrusion of polymer into Melt Coat machine	Fully automatic temperature, pressure control	Homogeneity of extrudate
Formation of molten polymer film	Operator control of machine temperatures, pressures, speeds	Coating uniformity
Transfer of molten film onto felt	Operator control of machine temperatures, pressures, speeds. Continual monitoring of product coating weight for each pass.	Coating mass per unit area Weight distribution over entire roll area.

4. Testing of Plain and Coated Felts

Each roll of plain felt and felt for coating is sampled and destructively tested against the requirements of the Production Specification as shown in Table 4.1. Each coated roll undergoes testing as per Table 4.2.

Table 4.1

Characteristic	Test
Density and density distribution at various applied pressures	Compression measurement at increasing pressure
Load at break in machine and cross directions	Tensile testing - Maximum Resistive Force
Secant Modulus in machine and cross directions (resistance to stretch)	Tensile testing - Maximum Resistive Force vs Extension %

Table 4.2

Characteristic	Test
Density and density distribution at various applied pressures	Compression measurement at increasing pressure
Load at break in machine and cross directions	Tensile testing - Maximum Resistive Force
Secant Modulus in machine and cross directions (resistance to stretch)	Tensile testing - Maximum Resistive Force vs Extension %
Coating weight and distribution	Samples weighed to determine distribution of coating in cross direction of roll
Coating adhesion and ability to weld	Peel strength of welded tape (Standard specification)
Coating surface finish	Visual inspection

5. Production of Liners

Liner requirements are collected by way of the Customer Order and customer liaison, and are confirmed to the customer on our Order Acknowledgement form.

Once all requirements are known, a liner is designed which will fulfill all the requirements.

The design is detailed to the Production department as a Manufacturing Specification. This is entered onto the Production Schedule.

The liner may be produced by one of a number of production techniques, depending on the requirements.

6. Testing the Finished Liner

The control and test of the liner properties are detailed in Table 6.1.

From each liner produced, a sample is cut from one end for QC inspection and test. This sample is destructively tested to ensure that all of the liner properties are within the Manufacturing Specification.

Table 6.1

Property	Control	Test
Circumference of liner	Monitored at each production stage against Manufacturing Specification	Destructive test of sample. All layers are measured.
Density, Gauge of liner under various applied pressures	Selection of felt layers in order that finished density and gauge are within Manufacturing Specification	Compression test of sample of all layers
Length of liner	Monitored at each production stage against Manufacturing Specification	Inspection regime includes measurement of a sample of liners against Manufacturing Specifications
Coating integrity	Continually monitored by state-of-the-art gauge	Inspected after coating, monitored throughout liner manufacture
Metal Free	Needling process is continually monitored for alignment to prevent needle damage	Each roll passes through metal detection equipment
Felt Weld Strength	All welding equipment operates to set parameters	Each weld is sampled and destructively tested. Results are compared to the Manufacturing Specification
Sealing Tape Weld Strengths	All welding equipment operates to set parameters	Each weld is sampled, specially conditioned, and destructively tested under conditions simulating the "worst case" for that liner

TECHNICAL INFORMATION

Product: Polyurethane Coated Liner for Hot Cure Eversion

Specification

Felt:

The fiber is PET Polyester staple fiber.

The denier of the fiber for a standard hot cure eversion liner for vacuum impregnation with a polyester resin is usually selected as nominally 6 denier (±10%)(dependent on specific liner and installation details).

The felt is manufactured to a thickness specification of ±3% when measured at a compressive pressure of 0.5 bar (7.4 psi)(16 ft. water head). Standard thickness of 1.5mm, 3mm, 4.5mm, 6mm, exist.

Coating:

The coating is a thermoplastic polyester polyurethane. The nominal weight may be 400-500, 500-600, or 600-700 grams per square meter. It is usual for the 400-500 gsm spec to be used. This affords an average coating thickness of 0.33mm for 400 gsm, 0.41mm for 500 gsm.

All coating weights are applied in a minimum of two passes to ensure that pin holes are avoided.

Liner:

The liner is assembled from layers of plain felt and an outer layer of coated felt. Each inner plain layer is overlapped approximately 50mm (2") at each joint and welded by hot fusion techniques to give the requisite weld strength to support the installation pressure (with a safety factor included). The safety factor is in excess of 2.

The outer coated layer has a high strength felt strip fusion welded across the inside of the joint and a sealing tape of polyurethane welded over the coating to give a seal and a barrier of comparable thickness to the coating.

The finished liner thickness is measured at the installation head and is toleranced at -0+5% on nominal ordered thickness.

July 10, 2009

Ken Giddens
8799 U.S. Hwy. 31
Hanceville, AL 35077

To Whom It May Concern:

This letter certifies that Applied Felts manufactured tubes meet the material requirements of ASTM F1216-03 and ASTM F 1743-96 as well as meet the minimum strength requirements of ASTM-D5035-95. All our materials are tested to ensure suitability to the application. Each liner is typically tested in 28 different ways and traceable test data is available for any particular liner. In-house engineering support is provided.

Applied Felts has provided polymer coated felt tubes for use in Cured In Place Pipe (CIPP) lining for more than twelve years, and supplied materials for the CIPP industry for more than twenty years. Over 35 million feet of our liner has been successfully installed world wide, of which 25 million feet has been installed in the North America. Over 400,000 feet of our liner has been installed in the state of Florida.

The country of manufacture of all components is the United States.

Applied Felts is a registered ISO 9001:2000 company.

Sincerely,

Walter C. Mattox,
General Manager

Applied Felts, Inc., 450 College Drive, Martinsville, VA 24112; Tel. (276)656-1904; Fax (276)656-1909 E-mail: office@appliedfelts.com

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of the construction industry

Corporate Headquarters

8799 Highway 31
Hanceville, AL 35077

Phone : (256) 739-4747
Fax : (256)-737-1871
E-Mail: aitc@aitechcorp.com
Website: www.aitechcorp.com

INTERPLASTICS CORPORATION
(RESIN)

SAFETY DATA SHEET

CIPP ISO RESIN

INTERPLASTIC

Section 1. Identification

GHS product identifier : CIPP ISO RESIN

Product code : COR72-AT-470HT

Other means of identification : Unsaturated Polyester Resin

Product type : Liquid.

Material uses

Product use : Industrial applications.

Supplier's details : INTERPLASTIC CORPORATION
1225 Willow Lake Boulevard
St. Paul, MN 55110-5145
651.481.6860

Emergency telephone number (with hours of operation) : CHEMTREC 24-Hour Emergency Telephone 800.424.9300

Section 2. Hazards identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture : FLAMMABLE LIQUIDS - Category 3
ACUTE TOXICITY: INHALATION - Category 4
SKIN CORROSION/IRRITATION - Category 2
SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2A
CARCINOGENICITY - Category 2

Percentage of the mixture consisting of ingredient(s) of unknown toxicity: 65.7%

GHS label elements

Hazard pictograms :

Signal word : Warning

Hazard statements : Flammable liquid and vapor.
Harmful if inhaled.
Causes serious eye irritation.
Causes skin irritation.
Suspected of causing cancer.

Precautionary statements

Section 2. Hazards identification

Prevention : Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Use personal protective equipment as required. Wear protective gloves. Wear eye or face protection. Keep away from heat, sparks, open flames and hot surfaces. - No smoking. Use explosion-proof electrical, ventilating, lighting and all material-handling equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Keep container tightly closed. Use only outdoors or in a well-ventilated area. Avoid breathing vapor. Wash hands thoroughly after handling.

Response : IF exposed or concerned: Get medical attention. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or physician if you feel unwell. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. IF ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing. If skin irritation occurs: Get medical attention. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention.

Storage : Store containers in a safe place. Store in a well-ventilated place. Keep cool.

Disposal : Dispose of contents and container in accordance with all local, regional, national and international regulations.

Hazards not otherwise classified : None known.

Section 3. Composition/information on ingredients

Substance/mixture : Mixture

Other means of identification : Unsaturated Polyester Resin

CAS number/other identifiers

CAS number : Not applicable.

Product code : COR72-AT-470HT

Ingredient name	%	CAS number
Styrene	30.0 - 33.0	100-42-5

Any concentration shown as a range is to protect confidentiality or is due to batch variation. Any concentration shown as exact is based on formula.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention.

Section 4. First aid measures

Inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If necessary, call a poison center or physician. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Skin contact : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Continue to rinse for at least 10 minutes. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : Causes serious eye irritation.

Inhalation : Harmful if inhaled.

Skin contact : Causes skin irritation.

Ingestion : Irritating to mouth, throat and stomach.

Over-exposure signs/symptoms

Eye contact : Adverse symptoms may include the following:
pain or irritation
watering
redness

Inhalation : No specific data.

Skin contact : Adverse symptoms may include the following:
irritation
redness

Ingestion : No specific data.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments : No specific treatment.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media : Use dry chemical, CO_2, water spray (fog) or foam.

Unsuitable extinguishing media : Do not use water jet.

Specific hazards arising from the chemical : Flammable liquid and vapor. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. The vapor/gas is heavier than air and will spread along the ground. Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back. Runoff to sewer may create fire or explosion hazard.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
metal oxide/oxides

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Section 6. Accidental release measures

Large spill : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Avoid exposure - obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not ingest. Avoid breathing vapor or mist. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Take precautionary measures against electrostatic discharges. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities : Do not store above the following temperature: 38°C (100.4°F). Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
Styrene	**ACGIH TLV (United States, 4/2014).** TWA: 20 ppm 8 hours. TWA: 85 mg/m³ 8 hours. STEL: 40 ppm 15 minutes. STEL: 170 mg/m³ 15 minutes. **OSHA PEL 1989 (United States, 3/1989).** TWA: 50 ppm 8 hours. TWA: 215 mg/m³ 8 hours. STEL: 100 ppm 15 minutes. STEL: 425 mg/m³ 15 minutes.

Section 8. Exposure controls/personal protection

	OSHA PEL Z2 (United States, 2/2013). TWA: 100 ppm 8 hours. CEIL: 200 ppm AMP: 600 ppm 5 minutes. **NIOSH REL (United States, 10/2013).** TWA: 50 ppm 10 hours. TWA: 215 mg/m³ 10 hours. STEL: 100 ppm 15 minutes. STEL: 425 mg/m³ 15 minutes.

Appropriate engineering controls : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles.

Skin protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. When there is a risk of ignition from static electricity, wear anti-static protective clothing. For the greatest protection from static discharges, clothing should include anti-static overalls, boots and gloves.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

Appearance

Physical state	: Liquid.
Color	: Various
Odor	: Characteristic. Aromatic.
Odor threshold	: 0.1 ppm
pH	: Not applicable.
Melting point	: Not available.
Boiling point	: 145.2°C (293.4°F)
Flash point	: Closed cup: 31.1°C (88°F)
Burning time	: Not applicable.
Burning rate	: Not applicable.
Evaporation rate	: >1 (ether (anhydrous) = 1)
Flammability (solid, gas)	: Not available.
Lower and upper explosive (flammable) limits	: Lower: 1.1% Upper: 6.1%
Vapor pressure	: 0.57 kPa (4.3 mm Hg) [room temperature]
Vapor density	: 3.6 [Air = 1]
Relative density	: 1.24 to 1.27
Solubility	: Not available.
Solubility in water	: Not applicable.
Partition coefficient: n-octanol/water	: Not available.
Auto-ignition temperature	: Not available.
Decomposition temperature	: Not available.
SADT	: Not applicable.
Viscosity	: Not available.

Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Hazardous reactions or instability may occur under certain conditions of storage or use.

Conditions to avoid : Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Do not allow vapor to accumulate in low or confined areas.

Incompatible materials : Reactive or incompatible with the following materials:
oxidizing materials

Reactive or incompatible with the following materials: acids and alkalis.
Keep away from oxidizing agents. Incompatible with alkali metals. Incompatible with some strong acids.

Section 10. Stability and reactivity

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Styrene	LC50 Inhalation Gas. LC50 Inhalation Vapor LD50 Oral	Rat Rat Rat	2770 ppm 11800 mg/m³ 2650 mg/kg	4 hours 4 hours -

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
Styrene	Eyes - Mild irritant	Human	-	50 parts per million	-
	Eyes - Moderate irritant	Rabbit	-	24 hours 100 milligrams	-
	Eyes - Severe irritant	Rabbit	-	100 milligrams	-
	Skin - Mild irritant	Rabbit	-	500 milligrams	-
	Skin - Moderate irritant	Rabbit	-	100 Percent	-

Sensitization

Not available.

Mutagenicity

Not available.

Carcinogenicity

Not available.

Conclusion/Summary : Styrene manufacturers vary on their determination that the GHS hazard classification criteria for carcinogenicity has been met.

Styrene is listed by IARC as a possible carcinogen to humans (Group 2B) based on "limited evidence" in humans, "limited evidence" in animals and "other relevant data". The United States NTP listed styrene as reasonably anticipated to be a human carcinogen based on "limited evidence" from studies in humans, "sufficient evidence" from studies in experimental animals, and supporting data on mechanisms of carcinogenesis. The significance of these results for humans has not been established through risk assessment.

Classification

Product/ingredient name	OSHA	IARC	NTP
Styrene	-	2B	Reasonably anticipated to be a human carcinogen.

Reproductive toxicity

Not available.

Teratogenicity

Not available.

Specific target organ toxicity (single exposure)

Section 11. Toxicological information

Not available.

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on the likely routes of exposure : Not available.

Potential acute health effects

Eye contact : Causes serious eye irritation.

Inhalation : Harmful if inhaled.

Skin contact : Causes skin irritation.

Ingestion : Irritating to mouth, throat and stomach.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : Adverse symptoms may include the following:
pain or irritation
watering
redness

Inhalation : No specific data.

Skin contact : Adverse symptoms may include the following:
irritation
redness

Ingestion : No specific data.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

Not available.

General : No known significant effects or critical hazards.

Carcinogenicity : Suspected of causing cancer. Risk of cancer depends on duration and level of exposure.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Section 11. Toxicological information

Numerical measures of toxicity

Acute toxicity estimates

Route	ATE value
Oral	2705.8 mg/kg
Inhalation (gases)	2923.2 ppm
Inhalation (vapors)	12.45 mg/l

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
Styrene	Acute EC50 1400 µg/l Fresh water	Algae - Pseudokirchneriella subcapitata	72 hours
	Acute EC50 720 µg/l Fresh water	Algae - Pseudokirchneriella subcapitata	96 hours
	Acute EC50 4700 µg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 52000 µg/l Marine water	Crustaceans - Artemia salina - Nauplii	48 hours
	Acute LC50 4020 µg/l Fresh water	Fish - Pimephales promelas	96 hours
	Chronic NOEC 63 µg/l Fresh water	Algae - Pseudokirchneriella subcapitata	96 hours

Persistence and degradability

Not available.

Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
Styrene	0.35	13.49	low

Mobility in soil

Soil/water partition coefficient (K_{OC}) : Not available.

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapor from product residues may create a highly flammable or explosive atmosphere

Section 13. Disposal considerations

inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

	DOT Classification	Mexico Classification	IMDG	IATA
UN number	UN1866	UN1866	UN1866	UN1866
UN proper shipping name	RESIN SOLUTION (styrene)	RESIN SOLUTION (styrene)	RESIN SOLUTION (styrene)	RESIN SOLUTION (styrene)
Transport hazard class(es)	3 	3 	3 	3 
Packing group	III	III	III	III
Environmental hazards	Yes.	Yes.	Yes.	No.
Additional information	**Reportable quantity** 3078.7 lbs / 1397.7 kg [294.22 gal / 1113.7 L] Package sizes shipped in quantities less than the product reportable quantity are not subject to the RQ (reportable quantity) transportation requirements.	-	-	-

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code : Not available.

Section 15. Regulatory information

U.S. Federal regulations : **TSCA 8(a) PAIR**: 4-tert-butylpyrocatechol
TSCA 8(a) CDR Exempt/Partial exemption: Not determined
United States inventory (TSCA 8b): All components are listed or exempted.
Clean Water Act (CWA) 307: Naphthenic acids, copper salts
Clean Water Act (CWA) 311: styrene; styrene

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs) : Listed

Clean Air Act Section 602 Class I Substances : Not listed

Clean Air Act Section 602 Class II Substances : Not listed

SARA 302/304

Composition/information on ingredients

No products were found.

SARA 304 RQ : Not applicable.

SARA 311/312

Classification : Fire hazard
Immediate (acute) health hazard
Delayed (chronic) health hazard

SARA 313

	Product name	CAS number	%
Form R - Reporting requirements	styrene	100-42-5	32.48
Supplier notification	styrene	100-42-5	32.48

State regulations

Massachusetts : The following components are listed: STYRENE MONOMER; STYRENE MONOMER

New York : The following components are listed: Styrene; Styrene

New Jersey : The following components are listed: STYRENE MONOMER; BENZENE, ETHENYL-; STYRENE MONOMER; BENZENE, ETHENYL-

Pennsylvania : The following components are listed: BENZENE, ETHENYL-; BENZENE, ETHENYL-

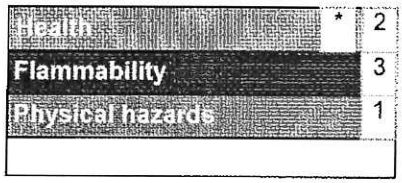
International regulations

International lists : **Australia inventory (AICS)**: All components are listed or exempted.
China inventory (IECSC): All components are listed or exempted.
Japan inventory: Not determined.
Korea inventory: All components are listed or exempted.
Malaysia Inventory (EHS Register): Not determined.
New Zealand Inventory of Chemicals (NZIoC): All components are listed or exempted.
Philippines inventory (PICCS): Not determined.
Taiwan inventory (CSNN): All components are listed or exempted.

Canada inventory : All components are listed or exempted.

Section 16. Other information

Hazardous Material Information System (U.S.A.)



Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks Although HMIS® ratings are not required on SDSs under 29 CFR 1910. 1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.)

Reprinted with permission from NFPA 704-2001, Identification of the Hazards of Materials for Emergency Response Copyright ©1997, National Fire Protection Association, Quincy, MA 02269. This reprinted material is not the complete and official position of the National Fire Protection Association, on the referenced subject which is represented only by the standard in its entirety.

Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

History

Date of printing	:	6/5/2015.
Date of issue/Date of revision	:	6/5/2015.
Date of previous issue	:	6/1/2015.
Version	:	5
Prepared by		Health, Safety and Environmental Department
Email	:	For questions regarding the SDS contact: iasafety@ip-corporation.com
Key to abbreviations	:	ATE = Acute Toxicity Estimate BCF = Bioconcentration Factor GHS = Globally Harmonized System of Classification and Labelling of Chemicals IATA = International Air Transport Association IBC = Intermediate Bulk Container IMDG = International Maritime Dangerous Goods LogPow = logarithm of the octanol/water partition coefficient MARPOL 73/78 = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution) UN = United Nations
References	:	OSHA Hazard Communication Standard, March 2012 (29 CFR 1910.1200)

Indicates information that has changed from previously issued version.

Notice to reader

Section 16. Other information

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

To whom it may concern,

CIPP Corporation along with **Interplastics Corporation** have established a proprietary Isopthalic Polyester resin formula in conjuction with an adjusted catalyst system for use with a steam cure Cured in Place Pipelining. This has been tested extensively in combination with **Applied Felts** fabric pipelining material and has yielded physical properties that far exceed the parameters of **ASTM F1216-98.**

The procedure for cure is as delineated in **ASTM F1216-98 section 7.6.2 through 7.7.** Cool down is accomplished while under pressure with air, water or a combination of the two.

Initial pressure is equivalent to Ideal Inversion Water Column Head divided by 2.3 (PSI), as pressure is induced, the liner takes on the shape of the pipeline and forms dimples at service laterals, once the liner is up to predetermined pressure a combination of steam and compressed air is introduced at approximately 195 – 210 degrees Fahrenheit on a continuous basis until a cure is effected evidenced by an exothermic reaction monitored on the opposite end of the pipeline being rehabilitated. This must be measured between the liner and the host pipe approximately 2 feet in and on the bottom. Once an exotherm is realized the heat being delivered is raised to a level of approximately 230 degrees F for a 15 minute period to act as a post cure.

This process is approved for laminates from 4.5mm thickness to 12mm thickness.

Kaleel Rahim
Interplastics Corporation

INTERPLASTIC CORPORATION
Thermoset Resins Division

Scholarships

Interplastic Thermoset Resins Division

Interplastic's Thermoset Resins Division is the leading manufacturer of unsaturated polyester, vinyl ester and specialty resins, gel coats, and colorants under the CoREZYN® and Silmar® brand names for the composites, cast polymer, and solid surface industries. All CoREZYN and Silmar products are sold direct and through our extensive network of Distributors in North America and around the world.

All Thermoset Resins Division manufacturing facilities and research and development laboratories are ISO 9001:2000 certified.

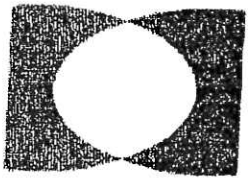
To find out more about CoREZYN, click here.

CoREZYN™ INTERPLASTIC CORPORATION Thermoset Resins Division

To find out more about Silmar, click here.

SILMAR® INTERPLASTIC CORPORATION Thermoset Resins Division

Interplastic Corporation • 1225 Willow Lake Blvd., St. Paul, MN 55110 • 651.481.6860 • 1.800.736.5497 • Fax: 651.481.9836 • info@interplastic.com



INTERPLASTIC CORPORATION
Thermoset Resins Division

1225 Willow Lake Boulevard
Saint Paul, Minnesota 55110-5145
(651) 481-6860 Fax (651) 481-9836

October 23, 2009

CERTIFICATE OF COMPLIANCE

To Whom It May Concern:

Interplastic Corporation manufactures a line of cured-in-place pipe (CIPP) resins for the pipeline renovation industry. We have been manufacturing this line of products for over twenty five (25) years. Interplastic Corporation is currently an ISO 9001 and an ISO 14001 certified resin manufacturer.

CIPP resins produced by Interplastic Corporation and used by American Infrastructure Technologies Corporation in their pipeline renovation business meet the parameters found in ASTM F1216, ASTM D5813, and ASTM F1743.

Sincerely,

Kaleel Rahaim

Kaleel Rahaim
Business Manager Remediation Polymers
Thermoset Resins Division

ABS Quality Evaluations

Certificate Of Conformance

This is to certify that the Quality Management System of:

Interplastic Corporation
2015 NE Broadway St
Minneapolis, MN 55447
U.S.A.

has been assessed by ABS Quality Evaluations, Inc. and found to be in conformance with the requirements set forth by:

ISO 9001:2008

The Quality Management System is applicable to:

THE DESIGN AND MANUFACTURE OF UNSATURATED POLYESTER RESINS INCLUDING CORPORATE HEADQUARTERS SALES, PURCHASING, CUSTOMER SERVICE, HUMAN RESOURCES AND MANAGEMENT INFORMATION SYSTEMS FUNCTIONS

Activity: HQs, sales, purchasing, customer service, human resources and management

Location:
2015 NE Broadway St
Minneapolis, MN 55413
U.S.A.

Certificate No: 46734
Effective Date: 10 October 2011
Expiration Date: 25 June 2014
Issue date: 10 October 2011

Alex Weisselberg, President

Validity of this certificate is based on the periodic audits of the management system defined by the above scope and is contingent upon prompt, written notification to ABS Quality Evaluations, Inc. of significant changes to the management system or components thereof.

ABS Quality Evaluations, Inc. 16855 Northchase Drive, Houston, TX 77060, U.S.A.
Validity of this certificate may be confirmed at www.abs-qe.com/cert_validation.

ABS Quality Evaluations

Certificate Of Conformance

This is to certify that the Quality Management System of:

Interplastic Corporation

5019 Hunt Street Mid America Industrial Park

Pryor, OK 74361

U.S.A.

has been assessed by ABS Quality Evaluations, Inc. and found to be in conformance with the requirements set forth by:

ISO 9001:2008

The Quality Management System is applicable to:

DESIGN AND MANUFACTURE OF UNSATURATED POLYESTER RESINS, VINYL RESINS, GEL COAT RESINS AND COLORANTS

Certificate No: 46173

Effective Date: 12 December 2011

Expiration Date: 11 December 2014

Issue date: 12 December 2011

Alex Weisselberg, President

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U.S.A.

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ISO 9001:2008

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THE DESIGN AND MANUFACTURE OF UNSATURATED POLYESTER RESINS, INCLUDING [illegible]

Certificate No: 46087
Effective Date: 27 June 2011
Expiration Date: 26 June 2014
Issue date: 27 June 2011

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The Quality Management System is applicable to:

DESIGN AND MANUFACTURE OF UNSATURATED POLYESTER RESINS, RESINS, GEL COAT AND COLORANT

Certificate No: 47049

Effective Date: 06 March 2012

Expiration Date: 05 March 2015

Issue date: 06 March 2012

Alex Weisselberg, President

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Certificate Of Conformance

This is to certify that the Quality Management System of:

Interplastic Corporation
Vadnais Plant
1219 Willow Lake Blvd
Vadnais Heights, MN 55110
U.S.A.

has been assessed by ABS Quality Evaluations, Inc. and found to be in conformance with the requirements set forth by:

ISO 9001:2008

The Quality Management System is applicable to:

THE DESIGN AND MANUFACTURE OF GEL COATS AND COLORANTS INCLUDING CORPORATE HEADQUARTERS SALES, PURCHASING, CUSTOMER SERVICE, HUMAN RESOURCES AND MANAGEMENT INFORMATION SYSTEMS FUNCTIONS

Activity:

Location(s):

1219 Willow Lake Blvd
Vadnais Heights, MN 55110
U.S.A.

Certificate No:	46737
Certification Date:	11 October 2011
Effective Date:	09 November 2011
Expiration Date:	08 November 2014
Issue date:	09 November 2011

Alex Weisselberg, President

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The Quality Management System is applicable to:

MANUFACTURE OF RESINS INCLUDING THE BLENDING OF UNSATURATED POLYESTER THERMOSET RESINS FOR STRUCTURAL APPLICATIONS

Certificate No:	46090
Certification Date:	15 August 2011
Effective Date:	14 May 2012
Expiration Date:	21 May 2015
Issue date:	14 May 2012

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1545 S. Olive St.
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U.S.A.

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ISO 9001:2008

The Quality Management System is applicable to:

THE DESIGN AND MANUFACTURE OF POLYESTER AND VINYLESTER SHEET MOLDING COMPOUND

Certificate No:	46242
Certification Date:	19 July 2011
Effective Date:	30 May 2012
Expiration Date:	31 May 2015
Issue date:	30 May 2012

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C.I.P.P. DESIGN CONSIDERATIONS

C.I.P.P. Corporation
Engineering

DESIGN CONSIDERATIONS

1. Terminology

1.1. Partially deteriorated pipe

1.1.1. The original pipe can support the soil and surcharge loads throughout the design life of the rehabilitated pipe.

1.1.2. The soil adjacent to the existing pipe must provide adequate side support.

1.1.3. The pipe may have longitudinal cracks and up to 10.0% distortion of the diameter. If the distortion of the diameter is greater than 10.0%, alternative design methods are required.

1.2. Fully deteriorated pipe

1.2.1. The original pipe is not structurally sound and cannot support soil and live loads nor is expected to reach this condition over the design life of the rehabilitated pipe.

1.2.2. This condition is evident when sections of the original pipe are missing, the pipe has lost its original shape, or the pipe has corroded due to the effects of the fluid, atmosphere, soil, or applied loads.

2. Gravity Pipe

2.1. Partially Deteriorated Gravity Pipe Condition

2.1.1. The CIPP is designed to support the hydraulic loads due to groundwater, since the soil and surcharge loads can be supported by the original pipe. The groundwater level should be determined by the purchaser and the thickness of the CIPP should be sufficient to withstand this hydrostatic pressure without collapsing. The following equation may be used to determine the thickness required:

$$P = \frac{2KE_L}{(1-v^2)} \times \frac{1}{(SDR-1)^3} \times \frac{C}{N} \qquad \text{(eq\#1)}$$

where:

P	=	groundwater load, psi (MPa),
K	=	enhancement factor of the soil and existing pipe adjacent to the new pipe (a minimum value of 7.0 is recommended where there is full support of the existing pipe)
E_L	=	long-term (time corrected) modulus of elasticity for CIPP, psi (MPa) (see note #1)
v	=	Poisson's ratio (0.3 average)
SDR	=	standard dimension ratio of CIPP
C	=	Ovality Reduction Factor = $\left\{ \frac{(1-q/100)}{(1+q/100)^2} \right\}^3$ (eq #2)
Q	=	Percentage ovality of original pipe
	=	100 x (Mean Inside Diameter - Minimum Inside Diameter) / Mean Inside Diameter
	or	
	=	100 x (Maximum Inside Diameter - Mean Inside Diameter) / Mean Inside Diameter
N	=	factor of safety

note #1 The choice of value (from manufacturer's literature) of E_L will depend on the estimated duration of the application of the load, P, in relation to the design life of the structure. For example, if the total duration of the load, P, is estimated to be 50 years, either continuously applied, or the sum of intermittent periods of loading, the appropriately conservative choice of value for E_L will be that given for 50 years of continuous loading at the maximum ground or fluid temperature expected to be reached over the life of the structure.

note #2 If there is no groundwater above the pipe invert, the CIPP should typically have a maximum SDR of 100, dependent upon design conditions.

2.1.2. If the original pipe is oval, the CIPP design from equation #1 shall have a minimum thickness as calculated by the following formula:

$$1.5\ q/100(1+q/100)SDR^2-0.5(1+q/100)SDR = \sigma_L/PN \qquad \text{(eq \#3)}$$

where:

σ_L = long-term (time corrected) flexural strength for CIPP, psi (MPa) (see note #5)

2.1.3. See Table A for typical design calculations

2.2. Fully Deteriorated Gravity Pipe Conditions

2.2.1. The CIPP is designed to supoort hydraulic, soil, and live loads. The ground water level, soil type and depth, and live load should be determined by the purchaser, and the following equation should be used to calculate the CIPP thickness required to withstand these loads without collapsing:

$$q_t = C/N[32R_wB'E'_s(E_LI/D^3)]^{1/2} \qquad \text{(eq \#4)}$$

where:

q_t	=	total external pressure on pipe, psi (MPa)
R_w	=	water buoyancy factor (0.67 min) = 1-0.33 (H_w/H)
H_w	=	height of water above top of pipe, ft(m)
H	=	height of soil above tope of pipe, ft(in)
B'	=	coefficient of elastic support = $1/(1 + 4e^{-0.065H})$ inch-pound units, $(1/(1+4e^{-0.213H})$ SI units)
I	=	moment of inertia of CIPP, $in.^4/in.$ (mm^1/mm) - $t^3/12$
t	=	thickness of CIPP, in.(mm)
C	=	ovality reduction factor (see 2.1.1.)
N	=	factor of safety
E'_s	=	modulus of soil reduction, psi (MPa) (see Note #4)
E_L	=	long-term modulus of elasticity for CIPP, psi (MPa)
D	=	mean inside diamter of original pipe, in.(mm)

2.2.1.1. The CIPP design from equation #4 should have a minimum thickness as calculated by the following formula:

$$EI/D^3 = E/12(SDR)^3 \geq 0.093 \text{ (inch-pound units)} \qquad \text{(eq \#5)}$$

or

$$E/12(SDR)^3 \geq 0.00064 \text{ (SI units)} \qquad \text{(eq \#6)}$$

where:

E = Initial modulus of elasticity, psi (MPa)

note #3 Finite element analysis is an alternative design method for non-circular pipes.

note #4 For definition of modulus of soil reaction, see Practice D 3839.

2.2.2. The minimum CIPP design thickness for a fully deteriorated condition should also meet the requirements of eq #1 and eq #3.

3. Pressure Pipe

3.1. Partially Deteriorated Pressure Condition

3.1.1. A CIPP installed in an existing underground pipe is designed to support external hydrostatic loads due to groundwater as well as withstand the internal pressure in spanning across any holes in the original pipe wall. The results of eq #1 are compared to those from eq #8 or eq #9, as directed by eq #7, and the largest of the thicknesses is selected. In an above-ground design condition, the CIPP is designed to withstand the internal pressure only by using eq #7, eq #8, and eq #9 as applicable.

3.1.1.1. If the ratio of the hole in the original pipe wall to the pipe diamter does not exceed the quantity shown in eq #7, then the CIPP is assumed to be a circular flat plate fixed at the edge and subjected to transverse pressure only. In this case, eq #8 is used for design. For holes larger than the d/D value in eq #7, the liner cannot be considered in flat plate loading, but rather in ring tension or hoop stress, and eq #9 is used.

$$d/D \leq 1.83\,(t/D)^{1/2} \qquad \text{(eq \#7)}$$

where:

d	=	diameter of hole or opening in original pipe wall, in.(mm)
D	=	mean inside diamter of original pipe, in.(mm)
t	=	thickness of CIPP, in.(mm)

$$P=5.33/(sdr-1)^2\,(D/d)^2\,\sigma_L/N \qquad \text{(eq \#8)}$$

where:

SDR	=	standard dimension ratio of CIPP
D	=	mean inside diameter of original pipe, in. (mm)
d	=	diameter of hole or opening in original pipe wall, in. (mm)
σ_L	=	long-term (time corrected) flexural strength for CIPP, psi (MPa) (see note #5)
N	=	factor of safety

note #5 The choice of value (from manufacturer's literature) of σ_L will depend on the estimated duration of the application of the load, P, in relation to the design life of the structure. For example, if the total duration of the load, P, is estimated to be 50 years, either continuously applied, or the sum of intermittent periods of loading, the appropriately conservative choice of value of σ_L will be that given for 50 years of continuous loading at the maximum ground or fluid temperature expected to be reached over the life of the structure.

3.2. Fully Deteriorated Pressure Pipe Condition

3.2.1. A CIPP to be installed in an underground condition is designed to withstand all external loads and the full internal pressure. The design thicknesses are calculated from eq #1, #4, #5, and #9, and the largest thickness is selected. If the pipe is above ground, the CIPP is designed to withstand internal pressure only by using eq #9.

$$P=2\sigma_{TL}/(SDR-2)N \qquad \text{(eq \#9)}$$

where:

P	=	internal pressure, psi (MPa)
σ_{TL}	=	long-term (time corrected) tensile strength for CIPP, psi (MPa) (see note #6)
SDR	=	standard dimension ratio of CIPP
N	=	factor of safety

note #6 The choice of value (from manufacturer's literature) of σ_{TL} will depend on the estimated duration of the applicaiton of the load, P, in relation to the design life of the structure. For example, if the total duraion of the load, P, is estimated to be 50 years, either continuously applied or the sum of intermittent periods of loading, the appropriately conservative choice of value of σ_{TL} will be that given for 50 years of continuous loading at the maximum ground or fluid temperature expected to be reached over the life of the structure.

3.3. Negative Pressure

3.3.1. Where the pipe is subject to a vacuum, the CIPP should be designed as a gravity pipe with the external hydrostatic pressure increased by an amount equal to the negative pressure.

3.4. Table A

3.4.1. presents maximum groundwater loads for partially deteriorated pipes for selected typical nominal pipe sizes. CIPP is custom made to fit the original pipe and can be fabricated to a variety of sizes from 4 to 96-in. diameter which would be impractical to list here.

TABLE A
Maximum Groundwater Loads for Partially Deteriorated Gravity Pipe Condition

Diameter (Inside Dia. of Original Pipe)	Nominal CIPP Thickness	CIPP Thickness	Maximum Allowable Groundwater Load[A] (above invert)	
in.	mm	t, in.	ft.	m
8	6	0.236	40.00	12.2
10	6	0.236	20.10	6.1
12	6	0.236	11.50	3.5
15	9	0.354	20.10	6.1
18	9	0.354	11.50	3.5
18	12	0.472	27.60	8.5
24	12	0.472	11.50	3.5
24	15	0.591	22.80	6.9
30	15	0.591	11.50	3.5
30	18	0.709	20.10	6.1

[A] Assumes X = 7.0, θ = 125,000 psi (862 MPa)(50-year strength), μ = 0.30, C = 0.64 (5% ovality), and N = 2.0

4. CHEMICAL RESISTANCE TESTS

4.1. Scope

4.1.1. This appendix covers the test procedures for chemical-resistance properties of CIPP. Minimum standards are presented for standard domestic sewer applications.

4.2. Procedure for Chemical-Resistance Testing

4.2.1. Chemical resistance tests should be completed in accordance with Test Method D 543. Exposure should be for a minimum of one month at 73.4°F (230C). During this period, the CIPP test specimens should lose no more that 20% of their initial flexural strength and flexural modulus when tested in accordance with Tests Methods D 790.

4.3. Table B

4.3.1. Table B presents a list of chemical solutions that serve as a recommended minimum requirement for the chemical-resistant properties of CIPP in standard domestic sanitary sewer applications.

TABLE B
Minimum Chemical Resistance Requirements for Domestic Sanitary Sewer Applications

Tap Water (pH 6-9)	100
Nitric Acid	5
Phosphoric Acid	10
Sulfuric Acid	10
Gasoline	100
Vegetable Oil	100
Detergent	0.1
Soap	0.1

4.3.2. For applications other than standard domestic sewage, it is recommended that chemical-resistance tests be conducted with actual samples of the fluid flowing in the pipe. These tests can also be accomplished by depositing CIPP test specimens in the active pipe.

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C.I.P.P. PIPE SPECIFICATIONS

C.I.P.P. Corporation
Specifications

CIPP PIPE SPECIFICATIONS

I. Scope

A. This practice describes the procedures for the reconstruction of pipelines and conduits (4 to 96-in. diameter) by the installation of a resin-impregnated, flexible tube which is inverted into the existing conduit by use of a hydrostatic head or air pressure or a combination of each. The resin is cured by circulating hot water within the tube or by the calibrated introduction of steam. When cured, the finished pipe will be continuous and tight-fitting. This reconstruction process can be used in a variety of gravity and pressure applications such as sanitary sewers, storm sewers, process piping, electrical conduits, and ventilation systems.

B. The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

C. This standard does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

II. Referenced Documents

A. ASTM Standards:

1. D 543 Test Method for Resistance of Plastics to Chemical Reagents
2. D 638 Rest Method for Tensile Properties of Plastics
3. D 790 Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Material
4. D 903 Test Method for Peel or Stripping Strength of Adhesive Bonds
5. D 1600 Terminology for Abbreviated Terms Relating to Plastics
6. D 3839 Practice of Underground Installation of Fiberglass (Glass-Fiber-Reinforced Thermosetting Resin) Pipe
7. F 1216 Terminology Relating to Plastic Piping Systems

B. AWWA Standard

1. Manual on Cleaning and Lining Water Mains, M28

C. NASSCO Standard

1. Recommended Specifications for Sewer Collection Systems

III. Terminology

A. Definitions

1. Definitions are in accordance with Terminology ASTM F1216 and abbreviations are in accordance with Terminology ASTM D1600, unless otherwise specified.

B. Cured-In-place pipe (CIPP)

1. A hollow cylinder containing a non woven or a woven material, or a combination of non woven and woven material surrounded by a cured thermosetting resin.
   (a) Plastic coatings may be included. This pipe is formed within an existing pipe. Therefore, it takes the shape of and fits tightly to the existing pipe.

C. Inversion

1. The process of turning the resin-impregnated tube inside out by the use of water pressure or air pressure.

D. Lift

1. A portion of the CIPP that has cured in a position such that it has pulled away from the existing pipe wall.

IV. Significance and Use

A. This practice is for use by designers and specifiers, regulatory agencies, owners and inspection organizations who are involved in the rehabilitation of conduits through the use of resin-impregnated tube inverted through the existing conduit. As for any practice, modifications may be required for specific job conditions.

V. Materials

A. Tube

1. The tube should consist of one or more layers of flexible needled felt or an equivalent non woven material, or a combination of non woven and woven materials, capable of carrying resin, withstanding installation pressures and curing temperatures.
   (a) The tube should be compatible with the resin system used.
   (b) The material should be able to stretch to fit irregular pipe sections and negotiate bends.
   (c) The outside layer of the tube should be plastic coated with a material that is compatible with the resin system used.
2. The tube should be fabricated to a size that, when installed, will tightly fit the internal circumference and the length of the original conduit.
   (a) Allowance should be made for circumferential stretching during inversion.
3. The tube thickness shall be specified by the owner utilizing pipe conditions and engineering formulas listed in ASTM F 1216-03.

TABLE I
CIPP Initial Structural Properties

Property	Test Method	Minimum Value psi	(Mpa)
Flexural Strength	D 790	4,500	(31)
Flexural Modulus	D 790	400,000	(2,755)
Tensile Strength (for pressure pipes only)	D 638	3,000	(21)

B. Resin

1. A general purpose, unsaturated, styrene based, thermoset resin and catalyst system that is compatible with the inversion process should be used.
2. The resin must be able to cure in the presence of water and the initiation temperature for cure should be less than 180°F (82.2°C).
3. The CIPP system can be expected to have as a minimum the initial structural properties given in Table 1.

VI. Installation

A. Cleaning and Inspection

1. Confined Space Entry
   (a) Prior to entering access areas such as manholes, and performing inspection or cleaning operations, an evaluation of the atmosphere to determine the presence of toxic or flammable vapors or lack of oxygen must be undertaken in accordance with local, state, or federal safety regulations.
2. Cleaning of Pipeline
   (a) All internal debris should be removed from original pipeline.
   (b) Gravity pipes should be cleaned with hydraulically powered equipment, high-velocity jet cleaners, or mechanically powered equipment (see NASSCO Recommended Specifications for Sewer Collection System Rehabilitation).
   (c) Pressure pipelines should be cleaned with cable-attached devices or fluid-propelled devices as shown in AWWA Manual on Cleaning and Lining Water Mains, M28.
3. Inspection of Pipelines
   (a) Inspection of pipelines should be performed by experienced personnel trained in locating breaks, obstacles, and service connections by closed circuit television or man entry.
   (b) The interior of the pipeline should be carefully inspected to determine the location of any conditions that may prevent proper installation of the impregnated tube, such as protruding service taps, collapsed or crushed pipe, and reductions in the cross-sectional area of more than 40%. These conditions should be noted so that they can be corrected.

4. Line Obstructions
   (a) The original pipeline should be clear of obstructions such as solids, dropped joints, protruding connections, crushed or collapsed pipe, and reductions in the cross-sectional area of more than 40% that will prevent the insertion of the resin-impregnated tube.
   (b) If inspection reveals an obstruction that cannot be removed by conventional sewer cleaning equipment, then a point repair excavation should be made to uncover and remove or repair the obstruction. The owner should be notified so that appropriate action may take place. Point repairs are not included in this contract.

B. Resin Impregnation

1. The tube should be vacuum impregnated with resin (wet-out) under controlled conditions.
2. The volume of resin used should be sufficient to fill all voids in the tube material at nominal thickness and diameter.
   (a) The volume should be adjusted by adding 5 to 10% excess resin for the change in resin volume due to polymerization and to allow for any migration of resin into the cracks and joints in the original pipe.

C. Bypassing

1. If bypassing of the flow is required around the sections of pipe designated for reconstruction, the bypass should be made by plugging the line at a point upstream or the pipe to be reconstructed and pumping the flow to a downstream point or adjacent system.
2. The pump and bypass lines should be of adequate capacity and size to handle the flow. Bypass systems should be redundant in case of pump failure and monitored at all times.
3. Services within this reach will be temporarily out of service.
   (a) Public advisory services will required to notify all parties whose service laterals will be out of commission and to advise against water usage until the mainline is back in service.

D. Inversion

1. Using Hydrostatic Head
   (a) The wet-out tube should be inserted through an existing manhole or other approved access by means of an inversion process and the application of hydrostatic head sufficient to fully extend it to the next designated manhole of termination point.
   (b) The tube should be inserted into the vertical inversion standpipe with the impermeable plastic membrane side out.
   (c) At the lower end of the inversion standpipe, the tube should be turned inside out and attached to the standpipe so that a leak proof seal is created.
   (d) The inversion head should be adjusted to be of sufficient height to cause the impregnated tube to invert from point of inversion to point of termination and hold the tube tight to the pipe wall, producing dimples at side connections.
   (e) Care should be taken during inversion to not over-stress the felt fiber.
2. Top Inversion
   (a) An alternative method of installation is a top inversion. In this case, the tube is attached to a top ring and is inverted to form a standpipe from the tube itself or another method accepted by the engineer.

3. Using Air Pressure
   (a) The wet-out tube should be inserted through an existing manhole or other approved access by means of an inversion process and the application of air pressure sufficient to fully extend it to the next designated manhole or termination point.
   (b) The tube should be connected by an attachment at the upper end of the guide chute so that a leakproof seal is created and with the impermeable plastic membranes side out.
   (c) As the tube enters the guide chute, the tube should be turned inside out.
   (d) The inversion air pressure should be adjusted to be of sufficient pressure to cause the impregnated lube to invert from point of inversion to point of termination and hold the tube tight to the pipe wall, producing dimples at side connections.
   (e) Care should be taken during the inversion so as not to overstress the woven and non woven materials.

Note - Suitable precautions should be taken to eliminate hazards to personnel in the proximity of the construction when pressured air is being used.

4. Required Pressures
   (a) Before the inversion begins, the tube manufacturer shall provide 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.
   (b) Once the inversion has started, the pressure shall be maintained between the minimum and maximum pressures until the inversion has been completed.
   (c) Should the pressure deviate from within the range of the minimum and maximum pressures, the installed tube shall be removed from the existing conduit.

E. Lubricant

1. The use of a lubricant during inversion is recommended to reduce friction during inversion.
2. This lubricant should be poured into the inversion water in the down tube or applied directly to the tube.
3. The lubricant used should be a nontoxic, oil-based product that has no detrimental effects on the tube or boiler and pump system, will not support the growth of bacteria, and will not adversely affect the fluid to be transported.

Note - The tube manufacturer should provide information on the maximum allowable tensile stress for the tube.

F. Curing

1. Using Circulated Heated Water
   - (a) After inversion is completed, a suitable heat source and water re-circulation equipment are required to circulate heated water throughout the pipe.
     - (i) The equipment should be capable of delivering hot water throughout the section to uniformly raise the water temperature above the temperature required to effect a cure of the resin.
     - (ii) The heat source should be fitted with suitable monitors to gauge the temperature of the incoming and outgoing water supply. Another such gauge should be placed between the impregnated tube and the pipe invert at both ends to determine the temperatures during cure.
   - (b). Water temperature in the line during the cure period should be as recommended by the resin manufacturer.
   - (c). Initial cure will occur during temperature heat-up and is completed when exposed portions of the new pipe appear to be hard and sound and the remote temperature sensor indicates that the temperature is of a magnitude to realize an exotherm or cure in the resin.
   - (d). After initial cure is reached, the temperature should be raised to the post-cure temperature recommended by the resin manufacturer.
     - (i) The post-cure temperature should be held for a period as recommended by the resin manufacturer, during which time the re-circulation of the water and cycling of the boiler to maintain temperature continues.
     - (ii) The curing of the CIPP must take into account the existing pipe material, the resin system, and ground conditions (temperature, moisture level, and thermal conductivity of soil).
   - (e). Required Pressures
     - (i) Before the curing begins, the pressure required to hold the flexible tube tight against the existing conduit shall be provided by the tube manufacturer.
     - (ii) Once the cure has started and dimpling for laterals is completed, the required pressure shall be maintained until the cure has been completed.
     - (iii) Should the pressure deviate more than 2.3 ft. of water (1 psi) from the required pressure, the installed tube shall be removed from the existing conduit.
     - (iv) If required by the owner, a continuous log of pressure during cure shall be maintained.

2. Using Steam
   (a) After inversion is completed, suitable steam-generating equipment is required to distribute steam throughout the pipe.
      (i) The equipment should be capable of delivering steam throughout the section to uniformly raise the temperature within the pipe above the temperature required to effect a cure of the resin.
      (ii) The temperature in the line during the cure period should be as recommended by the resin manufacturer.
   (b) The steam-generating equipment should be fitted with a suitable monitor to gauge the temperature of the outgoing steam.
      (i) The temperature of the resin being cured should be monitored by placing a gauge between the impregnated tube and the existing pipe at the termination end to determine the temperature during cure.
   (c) Initial cure will occur during temperature heat-up and is completed when exposed portions of the new pipe appear to be hard and sound and the remote temperature sensor indicates that the temperature is of a magnitude to realize an exotherm or cure in the resin.
      (i) After initial cure is reached, the temperature should be raised to post-cure temperatures recommended by the resin manufacturer.
      (ii) The post-cure temperature should be held for a period as recommended by the resin manufacturer, during which time the distribution and control of steam to maintain the temperature continues.
      (iii) The curing of the CIPP must take into account the existing pipe material, the resin system, and ground conditions (temperature, moisture level, and thermal conductivity of soil).

G. Cool-Down

1. Using Cool Water After Heated Water Cure
   (a) The new pipe should be cooled to a temperature below 100°F(38°C) before relieving the static head or air pressure in the inversion standpipe.
   (b) Cool-down may be accomplished by the introduction of cool water into the inversion standpipe water being drained from a small hole made in the down-stream end.
   (d) Care should be taken in the release of head so that a vacuum will not be developed that could damage the newly installed pipe.
2. Using Cool Water After Steam Cure
   (a) The new pipe should be cooled to a temperature below 113°F(45°C) before relieving the internal pressure within the section.
   (b) Cool-down may be accomplished by the introduction of cool water into the section to replace the mixture of air and steam being drained from a small hole made in the downstream end.
   (c) Care should be taken in the release of the air pressure so that a vacuum will not be developed that could damage the newly installed pipe.

H. **Workmanship**

1. The finished pipe should be continuous over the entire length of an inversion run.
2. If the CIPP does not fit tightly against the original pipe at its termination point(s), the space between the pipes should be sealed by filling with a resin mixture compatible with the CIPP.

VII. Service Connections

A. **Reinstatement**

1. After the new pipe has been cured in place, the existing active service connections should be reconnected.
   (a) This should generally be done without excavation, and in the case of non-man entry pipes, from the interior of the pipeline by means of a television camera and a remote-control cutting device.
   (b) Reinstatements will be to 95% of the original size of lateral connection.

VIII. Inspection and Acceptance

A. **Final Inspection**

1. The installation may be inspected visually if appropriate, or by closed-circuit television if visual inspection cannot be accomplished.
2. Variations from true line and grade may be inherent because of the conditions of the original piping.
3. No infiltration of groundwater should be observed.
4. All service entrances should be accounted for and be unobstructed.

American Infrastructure
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Shall implement the highest standards of the construction industry

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INSTALLATION PROCESS

INSTALLATION PROCEDURES

A. Cleaning and Inspection

1. Confined Space Entry

(a) Prior to entering access areas such as manholes, and performing inspection or cleaning operations, an evaluation of the atmosphere to determine the presence of toxic or flammable vapors or lack of oxygen must be undertaken in accordance with local, state, or federal safety regulations.

2. Cleaning of Pipeline

(a) All internal debris should be removed from the original pipeline.

(b) Gravity pipes should be cleaned with hydraulically powered equipment (see NASSCO Recommended Specifications for Sewer Collection System Rehabilitation).

(c) Pressure pipelines should be cleaned with cable-attached devices or fluid-propelled devices as shown in AWWA Manual on Cleaning and Lining Water Mains, M28.

3. Inspection of Pipelines

(a) Inspection of pipelines should be performed by experienced personnel trained in locating breaks, obstacles, and service connections by closed circuit television or man entry.

(b) The interior of the pipeline should be carefully inspected to determine the location of any conditions that may prevent proper installation of the impregnated tube, such as protruding service taps, collapsed or crushed pipe, and reductions in the cross-sectional area of more than 40%. These conditions should be noted so that they can be corrected.

4. Line Obstructions

(a) The original pipeline should be clear of obstructions such as solids, dropped joints, protruding service connections, crushed or collapsed pipe, and reduction in the cross-sectional area of more than 40% that will prevent the insertion of the resin-impregnated tube.

(b) If inspection reveals an obstruction that cannot be removed by conventional sewer cleaning equipment, then a point repair excavation should be made to uncover and remove or repair the obstruction.

B. Resin Impregnation

1. The tube should be vacuum impregnated with resin (wet-out) under controlled conditions.
2. The volume of resin used should be sufficient to fill all voids in the tube material at

nominal thickness and diameter.

(a) The volume should be adjusted by adding 5-10% excess resin for the change in resin volume due to polymerization and to allow for any migration of resin into the cracks and joints in the original pipe.

C. Bypassing

1. If bypassing of the flow is required around the sections of pipe designated for reconstruction, the bypass should be made by plugging the line at a point upstream of the pipe to be reconstructed and pumping the flow to a downstream point or adjacent system.
2. The pump and bypass lines should be of adequate capacity and size to handle the flow.
3. Services within this reach will be temporarily out of service.
   (a) Public advisory services will be required to notify all parties whose service laterals will be out of commission and to advise against water usage until the mainline is back in service.

D. Inversion

1. Using Hydrostatic Head

(a) The wet-out tube should be inserted through an existing manhole or other approved access by means of an inversion process and the application of hydrostatic head sufficient to fully extend it to the next designated manhole or termination point.

(b) The tube should be inserted into the vertical inversion standpipe with the impermeable plastic membrane side out.

(c) At the lower end of the inversion standpipe, the tube should be turned inside out and attached to the standpipe so that a leak proof seal is created.

(d) The inversion head should be adjusted to be of sufficient height to cause the impregnated tube to invert from point of inversion to point of termination and hold the tube tight to the pipe wall, producing dimples at side connections.

(e) Care should be taken during the inversion so as not to over-stress the felt fiber.

2. Top Inversion

(a) An alternative method of installation is a top inversion. In this case, the tube is attached to a top ring and is inverted to form a standpipe from the tube itself or another method accepted by the engineer.

3. Required Pressures

(a) Before the inversion begins, the tube manufacturer shall provide 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.

(b) Once the inversion has started, the pressure shall be maintained between the minimum and maximum pressures until the inversion has been completed.

(c) Should the pressure deviate from within the range of the minimum and maximum

pressures, the installed tube shall be removed from the existing conduit.

E. Lubricant

1. The use of a lubricant during inversion is recommended to reduce friction during inversion.
2. This lubricant should be poured into the inversion water in the down tube or applied directly to the tube.
3. The lubricant used should be a nontoxic, oil-based product that has no detrimental effects on the tube or boiler and pump system, will not support the growth of bacteria, and will not adversely affect the fluid to be transported.

F. Curing

1. After inversion is completed, a suitable heat source and water re-circulation equipment are required to circulate heated water throughout the pipe.
   (a) The equipment should be capable of delivering hot water throughout the section to uniformly raise the water temperature above the temperature required to effect a cure of the resin.
   (b) The heat source should be fitted with suitable monitors to gauge the temperature of the incoming and outgoing water supply. Another such gauge should be placed between the impregnated tube and the pipe invert at the termination to determine the temperatures during cure.
2. Water temperature in the line during the cure period should be as recommended by the resin manufacturer.
3. Initial cure will occur during temperature heat-up and is completed when exposed portions of the new pipe appear to be hard and sound and the remote temperature sensor indicates that the temperature is of a magnitude to realize an exotherm or cure in the resin.
4. After initial cure is reached, the temperature should be raised to the post-cure temperature recommended by the resin manufacturer.
   (a) The post-cure temperature should be held for a period as recommended by the resin manufacturer, during which time the re-circulation of the water and cycling of the boiler to maintain temperature continues.
   (b) The curing of the CIPP must take into account the existing pipe material, the resin system, and ground conditions (temperature, moisture level, and thermal conductivity of soil).
5. Required Pressures
   (a) Before the curing begins, the pressure required to hold the flexible tube tight against the existing conduit shall be provided by the tube manufacturer.
   (b) Once the cure has started and dimpling for laterals is completed, the required pressure shall be maintained until the cure has been completed.
   (c) Should the pressure deviate more than 2.3 ft. of water (1 psi) from the required pressure, the installed tube shall be removed from the existing conduit.
   (d) If required by the owner, a continuous log of pressure during cure shall be maintained.

G. Cool-Down

1. Using Cool Water After Heated Water Cure
   (a) The new pipe should be cooled to a temperature below 100°F(38°C) before relieving the static head in the inversion standpipe.
   (b) Cool-down may be accomplished by the introduction of cool water into the inversion standpipe water being drained from a small hole made in the down-stream end.
   (c) Care should be taken in the release of head so that a vacuum will not be developed that could damage the newly installed pipe.

H. Service Connections

1. Reinstatement
   (a) After the new pipe has been cured in place, the existing active service connections should be reconnected. This should generally be done without excavation, and in the case of non-man entry pipes, from the interior of the pipeline by means of a television camera and a remote-control cutting device.

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STEAM CURE PROCESS

CIPP Corporation
Steam Cure Procedures

The steam cure process and the amount of heat that can be delivered to a pipeline during the curing process is directly proportional to the amount of air that is being introduced simultaneously. Thickness and Diameter of the pipe also make a difference, as the resin during exotherm may approach styrene boiling temperature (293 F) due to mass in the thicker laminates causing blisters in the coating of the pipeliner. This is also effected by the type of pipe that is being lined. PVC pipe is quite insulative and requires great caution with large amounts of air as well as a lower heating rate and temperature. Different times of the year also make a difference as the ground temperature may change during a spring thaw, or pipelines exposed to extreme temperatures. If there is excessive infiltration a preliner of polyethylene must be used in advance of inverting the wet out liner. This not only protects the wet out liner from the water but also helps in containing the heat necessary to overcome the cooling effects of the running water.

The amount of air that is utilized determines the amount of time a pipe can be cured without the danger of blisters in the coating. The air serves two functions, one being the delivery of the heat to the uncured pipe and cooling of the resin as it begins heating itself exothermically.

A calculation of the speed in which the heated air travels through the pipeline is an important consideration. See attached excel spread sheet. As you can see, as long as you have enough Boiler horsepower as well as a high volume of air, cure speed is limitless. If the speed of the air is less than 2 MPH the potential for blistering will occur therefore the temperature must be lowered. This air is crucial in removing the chemical energy heat created to avoid boils. The more air you have the faster you can cure a liner.

There is far more energy in Hot water than there is in Steam, so consideration to the amount of energy needed is important, especially if there are sags or areas where water lies in the bottom of the pipeline. However pipeliners can be processed very successfully achieving peak physical properties unattainable through hot water processing. CIPP Corporation certifies successful liners from 4" to 42" in thicknesses from 3 mm to 12 mm.

A close log of temperatures and times must be kept with each liner. A **Steam Cure Record** sheet is also attached.

While curing a liner it should be compared to building a bridge, 1 foot at a time, the further out you build the less time it takes because the degradation of the Catalyst system is taking place as the temperature rises in direct proportion to time heating. Because of this time lag, through extensive temperature reporting, the less reactive the resin is near the "B" station.

Although some have cured liners by blowing steam upstream to the "B" station, best results will be obtained by shooting the steam downstream. Steam gives off its energy when it condenses, if steam has to be blown through water such as is the case with blowing it upstream, this is constantly cooling and condensing the steam as well as adding a tremendous amount of time to the cure. Blowing upstream also provides for a very uncontrollable pressure surge within the pipeline due to water purging which occurs near the end of the cure cycle. **Peak temperatures necessary for complete cure and top physical properties is not attainable in this manner.**

With all this in mind the process begins as below:

1. Once bulkheads and hose connections are installed at each end of the liner and a temperature probe is placed under the liner at the B station. The liner is inflated carefully to the pressure as listed below the maximum amount of air deliverable should be used. All control of pressure should take place at the B station as this will allow the maximum amount of air flow to be utilized in the curing process. A water purging hole or a liner bleeder is installed to remove condensate and excess water at the lower end. This will allow all water to be purged during the curing process, if water exists in the bottom of the liner an inadequate cure or the possibility of lifts will occur. The **CIPP Steam Process Sheet** should be filled out with the appropriate data and updated every 5 minutes.

6" x 4.5 mm	11 PSI
8" x 5 mm	10 PSI
8" x 6 mm	9 PSI
10" x 6 mm	8 PSI
10" x 7.5 mm	9 PSI
12" x 6 mm	7.5 PSI
12" x 7.5 mm	8 PSI
15" x 6 mm	7 PSI
15" x 7.5 mm	7.5 PSI
15" x 9 mm	10 PSI
15" x 12 mm	11 PSI

Any other size and thickness use the cold head chart and divide the number by 2.31 to get PSI and then subtract 1 PSI.

The formula is as follows:

(Finished thickness mm/ Diameter mm) x 308 x 3.28 = Maximum cold head in Feet

Curing Pressures and Temperatures

4" – 12" x 6 mm or less at 185 CFM Use 200 degrees F Lining PVC use 185 degrees F
4" - 18 x 6 mm or less at 310 CFM Use 212 degrees F Lining PVC use 195 degrees F

12" – 18" x 6 mm at 185 CFM Use 190 degrees F
12" – 18" x 6 mm at 310 CFM Use 212 degrees F

12" – 18" x 7.5 mm at 185 CFM use 185 degrees F
12" – 18" x 7.5 mm at 310 CFM use 200 degrees F

18" – 24" x 9 mm at 185 CFM use 180 degrees F
18" x 24" x 9 mm at 310 CFM use 190 degrees F

For larger liners and thicknesses contact the CIPP corporation offices
Steve Gearhart
1-888-485-2477

2. Temperature should be brought up to the predetermined heat as indicated by the chart below, by allowing steam to enter the air flow. This temperature should be held until a temperature at the B Station reaches 105 F under the liner. This indicates that the liner has expended the Perkadox 16 and is should now be brought up in temperature in order to utilize the Triganox 42S for final and **Post Cure.**

3. Once the liner temperature has reached 105 F, the attendant at the B Station should be aware that there will be pressure changes and should be informed that the pressure should be maintained as well as possible. This stage of curing is called **Post Cure** or **Superheat** stage. This change in temperature should be noted on the report sheet. All the air should be discontinued as pure steam is increased to full wide open valve and pressure is maintained and controlled at the B Station. This in essence converts the entire pipeline to being part of the boiler vessel. This stage should be held until the B Station temperature air is equal to the steam temperature at the boiler. If it is not the same temperature, it indicates that there are either sags or water standing in the liner. Once the temperature reaches the same at the B Station as the **Air Temp A** on the **Steam Cure Record** means that all water has been evaporated and a complete cure has been initiated. Remember that water above 212 F is vapor and that this means the entire line is vapor. Saturated steam temperature at from 5 to 10 PSI should be in the range of 225 F to 240 F respectively. At this point the **Liner Temp B** should be somewhere in the range of 140 F or greater.

4. Cool down should be initiated at this time. Slowly start to add air while reducing the steam. The attendant at Station B should be notified in advance of this change and informed to maintain pressure. Once all steam has been elimininated, full volume air should be added. Cool down is complete when **Liner Temp B** is below 100F. Large diameters as well as thicker laminates 9 – 12 mm, cool down must be taken in slow steps, as shrinkage will occur if done too rapidly. We have seen as much as 8" shrinkage occur on thick liners that have been cooled too quickly. For thicker laminates 9 – 12 mm, start cooling with 200 degree air/steam for 15 minutes and reduce temperature 5 degrees every 10 minutes. This should slow the process of cooling sufficiently to eliminate shrinkage.