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PROJECT: TOP Trails OHV Park Improvements
Public Park Authority of the Cities of Lincoln and Talladega
RTP Project #18-RT-55-01

ADDENDUM NO. Nine (9)

DATE: October 7, 2020

TO: All Record Holding Contract Documents

This Addendum is issued to all registered plan holders pursuant to the Conditions of the Contract.

This Addendum serves to clarify, revise, and supersede information in the Project Manual, Drawings, and previously issued Addenda. This addendum and its attachments shall become a part of the plans and specifications and shall apply to the bid proposals for the above named project.

The bidder(s) shall notify all affected subcontractors, material suppliers, and others to incorporate necessary cost and schedule updates, to the bid proposal and the work changes affected by this Addendum.

The Bidder shall acknowledge receipt of this Addendum in the appropriate space on the Bid Form. Bidders must also acknowledge receipt by email to jessica@kelleynetwork.com.

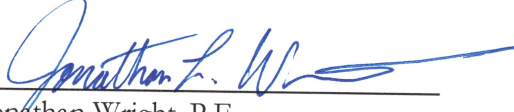
In the event of conflict between plans and specifications and this addendum, the addendum shall take precedence. Any modifications necessary to incorporate the revisions shall be included in the appropriate bid prices. The bid documents are hereby corrected, modified, and/or amended in the following manner:

Specifications

- 1. Section 00 41 43 Bid Form shall be replaced with Section 00 41 43 Bid Form attached herein.**
- 2. Section 01 11 13 Summary of Work shall be replaced with Section 01 11 13 Summary of Work attached herein.**
- 3. Section 33 30 00 Sanitary Sewerage shall be replaced with Section 33 30 00 Sanitary Sewerage attached herein.**

This Addendum No. 9 shall be attached to the front of your set of Specifications and made a part of the Specifications and Contract Documents. Acknowledgment of receipt of Addendum No. 9 shall be noted on Page 00 41 43-1 of the Bid Form.

THE KELLEY GROUP, LLC.

By: 
Jonathan Wright, P.E.

Addendum #9 is 35 total pages.
This concludes Addendum #9.

**SECTION 00 41 43
BID FORM**

Project Identification:

The project consists of improvements to the TOP Trails ATV Park including the installation of prefabricated restrooms and showers, an ATV wash station, approximately 1,060 L.F. of roadway, site lighting, and material bid of various landscaping and electrical materials.

This Bid is Submitted to:

**The Public Park Authority of the Cities of Lincoln and Talladega
550 Welch Avenue, Talladega, Alabama 35160**

- 1.01 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with OWNER in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.
- 2.01 The declares that he understands that when quantities of Work for which unit price bids are requested, are shown in the Advertisement Invitation for Bids, and in the Proposal , such quantities are approximate only and are subject to either increase or decrease, that, should the quantities of any of the Work items increase, the Bidder proposed to perform the additional Work at the unit prices bid by him, that should the quantities of any of the Work items be decreased, payment will be made only for the actual quantities of Work performed and such payment will be based upon the unit prices bid by him, and that he shall make no claim for profits anticipated on the decrease in quantities of Work. Actual quantities will be paid for as the Work progresses, in accordance with the provisions of the Contract Agreement, and such quantities shall be subject to final measurements and determinations made upon completion of the Work.
- 3.01 Bidder accepts all of the terms and conditions of the Advertisement or Invitation to Bid and Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. The Bid will remain subject to acceptance for 60 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of OWNER.
- 4.01 In submitting this Bid, Bidder represents, as set forth in the Agreement, that:
 - A. Bidder has examined and carefully studied the Bidding Documents, the other related data identified in the Bidding Documents, and the following Addenda, receipt of all which is hereby acknowledged.

<u>Addendum No.</u>	<u>Addendum Date</u>
_____	_____

- B. Bidder has visited the Site and become familiar with and is satisfied as to the general, local and Site conditions that may affect cost, progress, and performance of the Work.
 - C. Bidder is familiar with and is satisfied as to all federal, state and local Laws and Regulations that may affect cost, progress and performance of the Work.
 - D. Bidder has carefully studied all the following if supplied: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) which have been identified in the Supplementary Conditions as provided in paragraph 4.02 of the General Conditions, and (2) reports and drawings of a Hazardous Environmental Condition, if any, which has been identified in the Supplementary Conditions as provided in paragraph 4.06 of the General Conditions.
 - E. Bidder has obtained and carefully studied (or assumes responsibility for having done so) all additional or supplementary examinations, investigations, explorations, tests, studies and data concerning conditions (surface, subsurface and Underground Facilities) at or contiguous to the Site which may affect cost, progress, or performance of the Work or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, including applying the specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents to be employed by Bidder, and safety precautions and programs incident thereto.
 - F. Bidder does not consider that any further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price(s) bid and within the times and in accordance with the other terms and conditions of the Bidding Documents.
 - G. Bidder is aware of the general nature of work to be performed by OWNER and others at the Site that relates to the Work as indicated in the Bidding Documents.
 - H. Bidder has correlated the information known to Bidder, information and observations obtained from visits to the Site, reports and drawings identified in the Bidding Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Bidding Documents.
 - I. Bidder has given ENGINEER written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and the written resolution thereof by ENGINEER is acceptable to Bidder.
 - J. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work for which this Bid is submitted.
- 5.01 Bidder further represents that this Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation; Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid; Bidder has not

solicited or induced any individual or entity to refrain from bidding; and Bidder has not sought by collusion to obtain for itself any advantage over any other Bidder or over OWNER.

6.01 The Owner will purchase and provide the following equipment for contractor installation. The contractor shall coordinate with the manufacturer for delivery, receiving, and unloading as per the manufacturer instructions.

- a. 40' Restroom Conex Unit and 40' Shower Conex Unit
- b. Wash Station Sprayer Units
- c. Propane Tank
- d. Material for Stream Restoration

7.01 Bidder will complete the Work in accordance with the Contract Documents for the following price(s):

BASE BID A: CAMPGROUND AND ENVIRONMENTAL CENTER ROAD PAVING

The Contractor has the option to bid on each Base Bid section individually (i.e. Base Bid 'A', Base Bid 'B', etc.) without being required to bid on every Base Bid section. The Owner has the right to select any combination of Base Bid sections at their discretion from multiple contractors which may result in multiple successful bidders. Additive Alternate bids will be awarded in the order they appear in the bid form as funding is available after acceptance of Base Bids.

Item #	ITEM	UNIT	QTY	Unit Price	Total Price
1	Unsuitable Material Removal, Disposal On-Site, & Backfilled with 57 Stone in 12" Maximum Lifts	C.Y.I.P	50		
2	Bituminous Concrete Binder Layer, ALDOT 424, 3/4" Max. Aggregate Size, ESAL Range A (2 1/2" Thick), Furnish & Install	TONS	560		
3	Bituminous Concrete Wearing Surface, ALDOT 424, 1/2" Max. Aggregate Size, ESAL Range A (1" Thick), Furnish & Install	TONS	610		
4	Bituminous Treatment A, Furnish & Install	GAL	800		
5	Tack Coat, Furnish & Install	GAL	390		
6	Aggregate Surfacing (Flush Shoulders of Camp Ground Road) (Crushed Aggregate Base, Type B), Furnish & Install	C.Y.I.P	60		
7	Single Solid Yellow Traffic Stripe ALDOT Class I, Type A (4" Width), Furnish & Install	LF	1375		
8	White Stop Bar ALDOT Class I, Type A (24" Width), Furnish & Install	LF	50		
9	Traffic Control Signage, Furnish & Install	LS	1		
10	Manhole Pressure Testing	LS	1		
Total Campground & Environmental Center Road Paving Base Bid A					

BASE BID B: SHOWER AND RESTROOM FACILITIES

The Contractor has the option to bid on each Base Bid section individually (i.e. Base Bid ‘A’, Base Bid ‘B’, etc.) without being required to bid on every Base Bid section. The Owner has the right to select any combination of Base Bid sections at their discretion from multiple contractors which may result in multiple successful bidders. Additive Alternate bids will be awarded in the order they appear in the bid form as funding is available after acceptance of Base Bids.

Item #	ITEM	UNIT	QTY	Unit Price	Total Price
11	Clearing and Grubbing	LS	1		
12	Earthwork (Entire Project) (Includes Off-Site Borrow)	LS	1		
13	Installation of Shower & Restroom 40' units Purchased by Owner (Includes but not limited to, foundation, placement, & connection of utilities)	LS	1		
14	Rip-Rap C.L. II, Furnish & Install	SY	360		
15	Electrical Service to Shower and Restroom Facilities (Includes but not limited to, all equipment & appurtenances needed for service to make a complete connection), Furnish & Install	LS	1		
16	Aggregate Surfacing (8" Thick) (Crushed Aggregate Base, Type B), Furnish & Install	C.Y.I.P	300		
17	6" Concrete Bollards, Furnish & Install	EACH	23		
18	6" Compacted Subgrade, Furnish & Install	SY	875		
19	6" PVC SDR 26 Sewer Pipe, Furnish & Install	LF	160		
20	6" Cleanout in travel way, Furnish & Install	EACH	6		
21	6" Cleanout outside of travel way, Furnish & Install	EACH	16		
22	Connection to Existing Sanitary Sewer Stub, Furnish & Install	LS	1		
23	Sanitary Sewer Testing	LS	1		
24	2" Connection to Existing Main (Includes but not limited to, Service Saddle, Corporation Stop, and Meter Box & Lid), Furnish & Install	LS	1		
25	2" PVC Pressure Class 250 Water Main, Furnish & Install	LF	40		
26	3" Pressure Reducing Valve, Furnish & Install	EACH	2		

27	2" Pressure Reducing Valve, Furnish & Install	EACH	2		
28	Connection of Water Service to Container, Furnish & Install	EACH	2		
29	Connection of Propane Service to Shower and Restrooms, Furnish & Install	EACH	2		
30	12" RCP CL III Storm Drain, Furnish & Install	LF	98		
31	Slope Paved Headwall (For 12" RCP), Furnish & Install	EACH	2		
Total Shower & Restroom Facilities Base Bid B					

BASE BID C: ATV WASH STATION

The Contractor has the option to bid on each Base Bid section individually (i.e. Base Bid ‘A’, Base Bid ‘B’, etc.) without being required to bid on every Base Bid section. The Owner has the right to select any combination of Base Bid sections at their discretion from multiple contractors which may result in multiple successful bidders. Additive Alternate bids will be awarded in the order they appear in the bid form as funding is available after acceptance of Base Bids.

Item #	ITEM	UNIT	QTY	Unit Price	Total Price
32	Earthwork (Entire Project) (Includes Off-Site Borrow)	LS	1		
33	Unsuitable Material Removal, Disposal On-Site, & Backfilled with 57 Stone in 12" Maximum Lifts	C.Y.I.P	50		
34	Installation of ATV Sprayer Units Purchased by Owner	EACH	4		
35	Concrete Slab and House Keeping Pads at Wash Station Unit, Furnish & Install	LS	1		
36	7' Bay Walls for ATV Wash Station, Furnish & Install	EACH	3		
37	Class II Riprap, Furnish & Install	TONS	50		
38	Electrical Service (Includes but not limited to, all equipment & appurtenances needed for service), Furnish & Install	LS	1		
39	Electrical Meter, Furnish & Install	EACH	1		
40	Connect to Existing Electrical Pole Mounted Transformer, Furnish & Install	EACH	1		
41	4" Steel Casing Pipe, Std. Wall (Includes but not limited to, End Seals & Spacers), Furnish & Install	LF	22		

42	6" Connection to Existing Main (Includes but not limited to, Tapping Sleeve & Valve, Valve Box, and Valve Marker), Furnish & Install	LS	1		
43	6" PVC Pressure Class 250 Water Main, Furnish & Install	LF	74		
44	2" PVC Pressure Class 350 Water Main, Furnish & Install	LF	45		
45	Fire Hydrant Assembly with 100 L.F. 2 Inch Hose, Furnish & Install	EACH	1		
46	Connection to Sprayer Units with 1" Service (Includes Service Saddle & Corporations Stop), Furnish & Install	EACH	4		
47	12" Steel Casing Pipe, Std. Wall (Includes Spacers and End Seals) (Excludes Carrier Pipe) (Installed by Open Cut), Furnish & Install	LF	22		
48	6" Concrete Bollards, Furnish & Install	EACH	16		
Total ATV Wash Station Base Bid C					

ADDITIVE ALTERNATE NO. 1 - POND IMPROVEMENTS

The Contractor has the option to bid on each Base Bid section individually (i.e. Base Bid ‘A’, Base Bid ‘B’, etc.) without being required to bid on every Base Bid section. The Owner has the right to select any combination of Base Bid sections at their discretion from multiple contractors which may result in multiple successful bidders. Additive Alternate bids will be awarded in the order they appear in the bid form as funding is available after acceptance of Base Bids.

Item #	ITEM	UNIT	QTY	Unit Price	Total Price
A1-1	Clearing and Grubbing	LS	1		
A1-2	Earthwork (Entire Project) (Includes Off-Site Borrow)	LS	1		
A1-3	42" Aluminum Fencing (Around Pond), Furnish & Install	LF	470		
A1-4	6" A-2000 HDPE Storm Drain, Furnish & Install	LF	12		
A1-5	Slope Paved Headwall (For 29" x 18" RCAP), Furnish & Install	EACH	2		
A1-6	Slope Paved Headwall (For 6" HDPE), Furnish & Install	EACH	2		

A1-7	29" x 18" RCAP CL III Storm Drain, Furnish & Install	LF	19		
A1-8	Water Fountain and Light Kit (Includes Control Panel), Furnish & Install	LS	1		
A1-9	Water Fountain and Light Kit Electrical Service (Includes all equipment & appurtenances needed for service), Furnish & Install	LS	1		
A1-10	4' Sidewalk, Furnish & Install	S.Y.I.P.	250		
Total Additive Alternate No. 1					

ADDITIVE ALTERNATE NO. 2 - SITE LIGHTING

The Contractor has the option to bid on each Base Bid section individually (i.e. Base Bid 'A', Base Bid 'B', etc.) without being required to bid on every Base Bid section. The Owner has the right to select any combination of Base Bid sections at their discretion from multiple contractors which may result in multiple successful bidders. Additive Alternate bids will be awarded in the order they appear in the bid form as funding is available after acceptance of Base Bids.

Item #	ITEM	UNIT	QTY	Unit Price	Total Price
A2-1	Type A Fixture (Includes Sitelink Pole, Pole Appurtenances, and All Pole Base Materials), Furnish & Install	EACH	15		
A2-2	Type B Fixture (Includes Sitelink Pole, Pole Appurtenances, and All Pole Base Materials), Furnish & Install	EACH	8		
A2-3	Banner Arms, 36"x1" with Round Finial, Furnish & Install	EACH	26		
A2-4	Electrical Service (Includes all equipment & appurtenances needed for service), Furnish & Install	LS	1		
Total Additive Alternate No. 2					

ADDITIVE ALTERNATE NO. 3 - RIVER ROCK SLOPE STABILIZATION

The Contractor has the option to bid on each Base Bid section individually (i.e. Base Bid 'A', Base Bid 'B', etc.) without being required to bid on every Base Bid section. The Owner has the right to select any combination of Base Bid sections at their discretion from multiple contractors which may result in multiple successful bidders. Additive Alternate bids will be awarded in the order they appear in the bid form as funding is available after acceptance of Base Bids.

Item #	ITEM	UNIT	QTY	Unit Price	Total Price
A3-1	River Rock Slope Stabilization (Takes place of RipRap Stabilization in Showers & Restroom Facilities Base Bid), Furnish & Install	SY	360		
Total Additive Alternate No. 3					

Unit Prices have been computed in accordance with paragraph 11.03.B of the General Conditions.

- 8.01 Bidder acknowledges that estimated quantities are not guaranteed and are solely for the purpose of comparison of Bids, and final payment for all Unit Price Bid items will be based on actual quantities provided, determined as provided in the Contract Documents.
- 9.01 Bidder agrees that the Work will be substantially complete within **90** calendar days after the date when the Contract Times commence to run as provided in paragraph 2.03 of the General Conditions, and completed and ready for final payment in accordance with paragraph 14.07.B of the General Conditions within **120** calendar days after the date when the Contract Times commence to run.
- 10.01 Bidder accepts the provisions of the Agreement as to liquidated damages in the event of failure to complete the Work within the times specified above, which shall be stated in the Agreement.
- 11.01 **Bidder will submit with his bid package references stating his qualifications to perform the work required. A minimum of three (3) references and validation of performing site development work of similar size and type of construction.**
- 12.01 The following documents are attached to and made a condition of this Bid:
- A. Required Bid security in the amount of 5% of the bid price or the form of the bid bond provided in this Project Manual.
 - B. A tabulation of Subcontractors, Suppliers and other individuals and entities required to be identified in this Bid;
 - C. Required bidder qualifications statement with supporting data as detailed in the Instruction to Bidders.
- 13.01 The terms used in this Bid with initial capital letters have the meanings indicated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.

SUBMITTED on _____, 20_____.

If Bidder is:

An Individual

Name (typed or printed): _____

By: _____ (SEAL)
(Individual's signature)

Doing business as: _____

Business address: _____

Phone No.: _____ FAX No.: _____

Email: _____

A Partnership

Partnership Name: _____ (SEAL)

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

Name (typed or printed): _____

Business address: _____

Phone No.: _____ FAX No.: _____

Email: _____

A Corporation

Corporation Name: _____ (SEAL)

State of Incorporation: _____

Type (General Business, Professional, Service, Limited Liability): _____

By: _____

(Signature -- attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

(CORPORATE SEAL)

Attest _____

(Signature of Corporate Secretary)

Business address: _____

Phone No.: _____ FAX No.: _____

Email: _____

Date of Qualification to do business is _____.

A Joint Venture

Joint Venturer Name: _____ (SEAL)

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

Name (typed or printed): _____

Title: _____

Business address: _____

Phone No.: _____ FAX No.: _____

Joint Venturer Name: _____ (SEAL)

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

Name (typed or printed): _____

Title: _____

Business address: _____

Phone No.: _____ FAX No.: _____

Email: _____

Phone and FAX Number, and Address for receipt of official communications:

**SECTION 01 11 13
SUMMARY OF WORK**

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Contract Description.
- B. Project Background.
- C. Work under this Contract.
- D. Owner supplied Products.
- E. Stored Materials
- F. Contractor's use of Site.
- G. Work Sequence.
- H. Licenses and Permits
- I. Protection of the Workmen, Owner and Public
- J. Rock Excavation and Disposal
- K. Maintenance and Restoration of Roads – Traffic Plan
- L. Lines and Grades
- M. Agreements made by Contractor with Private Property Owners

1.02 CONTRACT DESCRIPTION

- A. Contract Type: Unit Price as described in Agreement – EJCDC
- B. The contract award, if made, will be made to the low responsive bidder. A “responsive” bid shall be evidenced by: (1) A Proposal form complete in accordance with the Instructions to Bidders and with instruction and/or requests contained in any other sections of the Contract Documents; (2) A PROPOSAL Form not evidencing any apparent unbalanced pricing for performance of the Items of Work; (3) a proposal Form without excisions, special conditions or qualifications made by the Bidder; and (4) a Proposal Form containing no alternative bids or offerings for any items unless such

alternative bids or offerings are requested in the Technical Specifications or Contract Documents.

- C. The successful bidder must furnish a Performance bond for one hundred (100%) percent of the bid amount and a Payment Bond for one hundred (100%) percent of the bid amount, and must secure his bond from a bonding company's representative or agent in the State of Alabama.
- D. The attention of bidders is called to provisions of State Law Governing General Conditions, as set forth in Chapter 4 (Section 65 to 82, inclusive) of Title 46 of the Code of Alabama of 1940, as amended; and bidders shall be governed by law insofar as it is applicable. The above mentioned provisions of the Code make it illegal for the OWNER to consider a Bid from anyone who is not properly licensed under such code provisions. The OWNER, therefore, will not consider any bid unless the bidder produces evidence that he is so licensed. Neither will the OWNER enter into a Contract with a foreign corporation which is not qualified under State Law to do business in the State of Alabama.
- E. Unit Price

- 1. Bidders shall submit a Bid on a unit price basis for each item of Work listed in the Bid schedule.
- 2. The total of all estimated prices will be determined as the sum of the products of the estimated quantity of each item and the unit price Bid for the item. The final quantities and Contract Price will be determined in accordance with paragraph 11.03 of the General Conditions.
- 3. Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum. Discrepancies between words and figures will be resolved in favor of the words.

1.03 WORK UNDER THIS CONTRACT

- A. The Public Park Authority of the Cities of Lincoln and Talladega has obtained funding through the Alabama Department of Economic and Community Affairs (ADECA) Recreational Trails Program (RTP).
- B. The project consists of improvements to the TOP Trails ATV Park including the installation of prefabricated restrooms and showers, an ATV wash station, approximately 1,060 L.F. of roadway, site lighting, and material bid of various landscaping and electrical materials.

- C. Work to be performed, but not limited to, shall be in accordance with contract drawings and specifications prepared by The Kelley Group, LLC.
- D. Vegetation shall be removed from the site as indicated within the project plans. Burning on site will not be permitted.
- E. Unsuitable material in the location of the alignment shall be excavated and removed from the site. Before any work is to be conducted on the campground drive, the CONTRACTOR shall perform a proof roll along the existing Campground Drive in the presence of the client's representative. The ENGINEER has the option to request additional material to be removed at the unit bid prices. A second proof roll shall be conducted in areas where material has been replaced and along the entire alignment once 2" of stone has been removed in preparation for the asphalt paving.
- F. CONTRACTOR shall exercise all caution in working within the roadways and maintain traffic flow where possible. Mud will be removed from public roadways on a daily basis or additionally as directed by local agencies having control over the public roadways used.
- G. The CONTRACTOR will notify the ENGINEER daily of the intended day's operation and promptly notify the ENGINEER of any work stoppages due to weather or other conditions preventing work, partial or complete days.
- H. Control elevation will be supplied by the ENGINEER. The CONTRACTOR will be responsible for using this control elevation to establish the correct elevation of all portions of the project including but not limited to roadway elevations, storm drainage pipe entrance and exits, and well site pad grades.
- I. The CONTRACTOR will be required to attend a weekly meeting at TOP Trails Environmental Center each week, or as scheduled otherwise, after the start of construction to apprise the OWNER and ENGINEER of the status of the project, upcoming activities, and discuss any relevant issues. Date and time TBD when construction begins.
- J. Campground Road Paving
 - 1. Subgrade compaction and proof roll shall be considered subsidiary to asphalt cost.
 - 2. Adjust existing sanitary sewer manhole (8 total) to asphalt finished grade, subsidiary to asphalt paving cost.
 - 3. Shoulder aggregate surfacing should be considered incidental to the asphalt line item.
 - 4. Should the contractor encounter unsuitable material, whether encountered along the Campground Drive or at the Restroom and Shower facilities, it shall be

removed and disposed of on-site in a location determined by the OWNER and back filled with No. 57 consolidated in 12” lifts. No on-site fill will be allowed due to the nature of the site. Unsuitable material removal and backfill shall be paid for by the “Unsuitable Material Removal” line item on the bid form.

5. Manhole Testing - any existing manholes which are raised or otherwise modified in the execution of the work in Base Bid A shall be pre and post pressure tested. The Contractor will be responsible for meeting the pre-tested pressure loss after work is completed.
6. Work for this section should only be performed after the completion of the restroom and shower facilities.

K. Environmental Center Road Paving

1. The contractor shall pave the existing asphalt with a 1” thick wearing layer, all milling and tapering of asphalt shall be subsidiary to the wearing layer line item.
2. Shoulder aggregate surfacing shall be subsidiary to the wearing layer asphalt paving line item in the bid form.
3. Shoulder fill for the Environmental Center paving to be paid for by the earthwork line item in the bid form.
4. Prior to paving the Contractor shall clean the existing asphalt surface before applying tack coat in preparation for paving. This shall be done to the satisfaction of the engineer.
5. Work for this section should only be performed after the completion of the restroom and shower facilities.

L. Shower and Restroom Facilities

1. The OWNER will purchase two 40’ shipping containers which have been modified into showers and restrooms. The CONTRACTOR will be responsible for the coordination of delivery, receiving, offloading, placing, and connecting utilities to the restroom and shower shipping containers per the manufacturer’s instructions. The contractor will be held responsible for any damage caused to the restroom and shower containers from the time that they are received until the completion of the project. Any damages sustained by said containers will be repaired at the cost of contractor to the satisfaction of the engineer.
2. The gravel propane tank pad shall be paid for with the aggregate surfacing line item. The tank and service line will be provided and installed by the Owner. The

contractor will be responsible for coordination of delivery and connecting the installed service line to the container units.

3. Proposed sanitary sewer for the shower and restroom facilities will be quality tested in accordance with the specifications, in the presence of the engineer.

M. ATV Wash Station

1. The OWNER will purchase four (4) NorthStar Wash-N-Box (Also known as the Splash-N-Dash) for CONTRACTOR installation. The CONTRACTOR will be responsible for the coordination of delivery, receiving, offloading, placing, and connecting utilities to each unit per the manufacturer's instructions.
2. The CONTRACTOR should not limit their selection to NorthStar brand but shall provide a product with the same features as indicated on the project plans and from a company with more than 2 years' experience in standalone vehicle sprayers.
3. Manufacturer shall be approved by the ENGINEER.
4. Electrical service at the ATV wash station shall include all wire, conduit, meter, transformer, and other appurtenances needed to install and operate the pond fountain and should be considered subsidiary to the pond fountain.
5. It is up to the CONTRACTOR to determine if a meter and transformer will be needed at the ATV wash station location. These items shall be considered subsidiary to the "ATV Sprayer Units" line item.

N. Material for Stream Restoration

1. The OWNER will purchase the needed materials for the stream restoration portion of the project and the contractor will be responsible for the coordination of delivery, receiving, offloading, and stockpiling of said materials at the direction of the OWNER.

O. Pond Improvements

1. Kasco Pond Fountain Model 8400JF is specified on the project plans to set a product standard and is not intended as a sole source. See the pond improvements plan for fountain details. Any changes to the pond fountain and light kit being implemented shall be approved by the ENGINEER. All equipment or appurtenances needed to install and operate the pond fountain shall be considered subsidiary to the fountain.

2. A manufacturer supplied control panel for the fountain and a RGB light kit shall be considered subsidiary to the price of the fountain and control both the fountain and light operations. A remote to operate the lighting options shall also be included in the price of the fountain.
3. The pond fountain and control panel are to be paid for as "L.S." as indicated on the bid form.
4. Electrical service for the pond fountain shall include all wire, conduit, and other appurtenances to install and operate the pond fountain and should be considered subsidiary to the pond fountain.
5. The fountain itself shall be installed per the manufacturer's recommendations
6. The sidewalk around the pond has an average width of 4 feet by 450 linear feet long, this does not include the ramps to access said sidewalk, and is to be paid for by "S.Y." as indicated on the bid form
7. Steps for the sidewalk around the pond to be considered subsidiary to the sidewalk line item.

P. Electrical

1. Electrical items such as conduit, wiring, hand holes, and other accessories and appurtenances, integral to the implementation of the site lighting, shower and restroom facilities, pond fountain, ATV wash, and other major items, shall be considered subsidiary to each of these line items.
2. The awarded CONTRACTOR shall provide a stamped plan set by an electrical engineer registered and active in the State of Alabama during the submittal process.
3. The CONTRACTOR'S bid shall include any materials needed, not mentioned on the project plans, to completely install and operate the above-mentioned items by all NEC codes and standards. The bid shall include any changes made by the electrical engineer.

Q. Site Lighting

1. Electrical service to the sight lighting shall be considered subsidiary to the "Type A Fixture" and "Type B Fixture" line items.
2. All Site Lighting shall be wired to the existing panels at the Environmental Center. It is up to the CONTRACTOR to determine the location of panels and availability of the breaker slots.

R. Pond Fencing

1. The fencing shall be of the raking type and include all equipment and appurtenances needed to install the fencing and shall be considered subsidiary to the 42” “Aluminum Fencing” line item.
- S. Project items shall be paid for by their appropriate line item in the bid form if not specifically mentioned above.

1.04 GENERAL PROCEDURE – OMITTED

1.05 OWNER SUPPLIED SERVICES AND PRODUCTS

A. OWNER’s Responsibilities

1. Review shop drawings and submittal data following approval by CONTRACTOR within ten (10) days following receipt.
2. Arrange for and deliver OWNER reviewed Shop Drawings, Product Data, and Samples to CONTRACTOR.
3. Provide necessary easements for the installation of the water main and accessories excluding temporary easements deemed necessary by the CONTRACTOR.
4. Make payments on properly submitted and approved payment request within 30 days of ENGINEER’s review of the submitted invoice.

B. CONTRACTOR’s Responsibilities

1. Provide all construction staking and allow for added cost in estimate.
2. Provide for a comprehensive construction testing program to assist in determining that the geotechnical related aspects of the construction are carried out in general conformance with the plans and specifications. Construction testing includes testing of construction materials such as compacted fill and performing observations and testing during the earthwork.
3. Provide detailed instructions for the construction process/timetable.
4. Receive and unload Products at site; inspect for completeness or damage.
5. Handle, store, and install finished products.

6. Acquire location for material storage.
7. Review OWNER reviewed Shop Drawings, Product Data, and Samples.
8. Provide equipment and water for testing in accordance with specifications.
9. Provide ENGINEER with CONTRACTOR's invoice by the Friday nearest the 25th of each month.

1.06 STORED MATERIALS

- A. The quantities contained in the Proposal are approximate, and actual installed work may differ from the quantities shown. The CONTRACTOR shall be responsible for inventory control, and shall take special care not to order any excess materials.
- B. The OWNER will not be responsible for any stored or left over materials ordered by the CONTRACTOR. CONTRACTOR shall submit a final invoice for materials that is identical to the quantities installed.
- C. In the event the excess materials exist, the OWNER's cost including shipment will be deducted from the CONTRACTOR's final estimate, at which time the excess material will become the property and responsibility of the CONTRACTOR.

1.07 CONTRACTOR'S USE OF SITE

- A. Cooperate with Property Owners and adjacent property owners to minimize conflict.
- B. All attempts shall be made to keep all public roads and private drives open during construction. In the event a road closing is unavoidable, the road shall be open within a reasonable time approved by the OWNER and an alternate route shall be provided during the interruption. All public services, i.e., police and fire, shall be notified by CONTRACTOR prior to any road closing.

1.08 WORK SEQUENCE

- A. Coordinate construction schedule and operations with the OWNER and ENGINEER.

1.09 LICENSES AND PERMITS

- A. The CONTRACTOR shall be responsible for securing from the Local Municipalities all permits, licenses and for paying all taxes required to perform the Contract Work.
- B. The CONTRACTOR shall be responsible for compliance with all Federal, State and local laws and ordinances regarding licenses and permits.

1.10 PROTECTION OF THE OWNER, WORKMEN, AND THE PUBLIC

- A. The CONTRACTOR is responsible for the safe execution and precaution of the work.
- B. The ENGINEER and the OWNER shall not be required to act as Safety Engineers or Safety Supervisors.
- C. The CONTRACTOR is solely responsible for the safe prosecution of the work. The site is a historical army ammo depot and buried munitions have been found on-site in the past. The CONTRACTOR should develop a response plan to uncover munitions and should remind employees of this during safety briefings, especially when in the grading phase of the project.
- D. The CONTRACTOR should take special precautions to protect park attendees including but not limited to the consolidation of tools and materials in predetermined areas, backfilling any pits or trenches once they have served their purpose, and delineation of all work areas using cones, drums, and 4' orange safety fencing.
- E. It is the CONTRACTOR's responsibility to secure advice from the Safety officer from his insurance company.

1.11 ROCK EXCAVATION AND DISPOSAL

- A. The OWNER and ENGINEER have not prepared for or conducted subsurface investigations.
- B. The CONTRACTOR shall have sole responsibility for his own subsurface investigations and shall include the cost of any investigations required into the cost for the work to be performed.
- C. The cost for rock excavation or removal and disposal shall be included in the unit cost to perform installation of new pipe or entrance drive.
- D. No extra payment will be made for rock excavation, removal, or disposal

1.12 MAINTENANCE AND RESTORATION OF ROADS – TRAFFIC PLANS

- A. The CONTRACTOR shall meet with representatives of the local authorities who have jurisdiction over the roads and highways and determine the preferred roads to be used during construction, and obtain traffic plans as required. Cost of traffic plans is incidental to the construction.

- B. The CONTRACTOR shall maintain traffic flow or re-direct traffic flow in accordance with approved traffic plans having jurisdiction over the area.
- C. CONTRACTOR shall notify all local regulatory departments of road closings. This shall include but not be limited to emergency units, fire departments, rescue units, police departments, and ambulance companies.
- D. The Contract requires the movement of heavy trucks along roadways. The State, County and local roadways shall be restored to their original condition by repairing the base and wear course. The CONTRACTOR is advised to take photographic evidence prior to the start of work for any roadway to be traveled by CONTRACTOR equipment.

1.13 LINES AND GRADES

- A. The ENGINEER has provided vertical control points for use by the CONTRACTOR.
- B. The CONTRACTOR shall develop and make surveys as required to prosecute the work on a daily basis.
- C. The CONTRACTOR shall be responsible for control of the work through daily maintenance of bench marks and control lines.
- D. All work shall remain within the existing right-of-way, terminating at the edge of the road right-of-way and any service connections within the private property of those being serviced.

1.14 AGREEMENTS MADE BY CONTRACTOR WITH PRIVATE PROPERTY OWNERS

- A. Agreements made by the CONTRACTOR between the private property owners, utilities or other entities shall be in writing and presented to the OWNER and ENGINEER.
- B. The CONTRACTOR shall satisfy the terms of the written agreements and acquire written approval for work performed on the private property, utilities or other entities prior to final payment being made.
- C. The CONTRACTOR shall provide written approvals at the final inspection.
- D. Should the CONTRACTOR not produce the written agreements, a sum equal to the work required to satisfy the agreement shall be retained until written agreement may be provided.

1.15 LOCATION OF UNDERGROUND OBSTRUCTIONS.

- A. When crossing under or over or along adjacent utilities and storm drains, exact locations shall be made by hand excavation prior to installation of new water mains.
- B. The CONTRACTOR shall be responsible for carefully protecting utilities and storm drains during the execution of the work.
- C. Utilities that are damaged due to activities of the CONTRACTOR shall be repaired at no expense to the property Owner.
- D. Natural gas mains, petroleum pipelines and fiber optic cables are in the vicinity of the construction to be performed under this contract. Consult the appropriate utilities to determine size, type and location prior to construction. Before construction begins, have on hand the proper equipment to make repairs to any damaged lines.

1.16 REGULATORY REQUIREMENTS

- A. Secure from the office of the Inspection Services, Division of the Public Works Department of the Local Municipalities, Information for regulatory licenses, and permits required.
- B. Obtain permits and licenses from each Municipality.
- C. Requirements contained in each individual authority's permit shall become the provisions and requirement for completion of the work.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

**SECTION 33 30 00
SANITARY SEWERAGE**

PART 1 – GENERAL

1.01 SUMMARY

- A. This Section includes sanitary sewerage system piping and appurtenances from a point 5 feet outside the building to the point of disposal.
- B. The extent of sanitary sewerage system is indicated on the Drawings and as otherwise required by authorities having jurisdiction.
- C. All fees and charges for sanitary sewerage service, taps, connections, permits, impact fees, etc., shall be paid by the CONTRACTOR from his/her contract amount.

1.02 RELATED SECTIONS

- A. Section Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Related work specified elsewhere includes:
 - 1. SECTION 31 23 00 - Earthwork.
 - 2. SECTION 31 37 16 - Rip-Rap and Crushed Stone.
 - 3. SECTION 03 30 00 - Cast-in-Place Concrete.

1.03 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
 - 1. Product data for drainage piping and specialties.
 - 2. Shop drawings for precast concrete sanitary manholes, including frames and covers.
 - a. Shop drawings for cast-in-place concrete or field-erected masonry sanitary manholes, if any, including frames and covers.

1.04 QUALITY ASSURANCE

- A. Environmental Compliance: Comply with applicable portions of local environmental agency regulations pertaining to sanitary sewerage systems.

- B. Utility Compliance: Comply with local utility regulations and standards pertaining to sanitary sewerage systems.
- C. Comply with requirements of authorities having jurisdiction, when more stringent than specified or otherwise indicated.

1.05 PROJECT CONDITIONS

- A. Site Information: Perform site survey, research public utility records, and verify existing utility locations. Verify that sanitary sewerage system piping may be installed in compliance with original design and referenced standards.

1.06 SEQUENCING AND SCHEDULING

- A. Coordinate connection to public sewer with utility company.
- B. Coordinate with interior building sanitary drainage piping.
- C. Coordinate with other utility work.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Cleanouts:
 - a. Ancon, Inc
 - b. Josam Co
 - c. Smith (Jay R.) Mfg. Co.
 - d. Wade Div.; Tyler Pipe.
 - e. Zurn Industries, Inc.; Hydromechanics Div.
 - f. Or Equal.
 - 2. Underground Warning Tapes:
 - a. Allen Systems, Inc.; Reef Industries, Inc.
 - b. Brady (W.H.) Co.; Signmark Div.
 - c. Calpico, Inc.

- d. Carlton Industries, Inc.
- e. EMED Co., Inc.
- f. Seton Name Plate Co.
- g. Or Equal.

2.02 PIPE & FITTINGS

- A. General: Provide pipe and pipe fitting materials compatible with each other. Where more than one type of materials or products is indicated below, refer to drawings for locations of each one, or if not indicated, selection is Installer's option.
- B. Pipe 6-inches and smaller, unless indicated otherwise:
 - 1. PVC (Polyvinyl Chloride) Sewer Pipe and Fittings: ASTM D 3034, SDR 26, for solvent cement or elastomeric gasket joints; Truss pipe where indicated on the Drawings.
 - 2. Solvent Cement: ASTM D 2564, for pipe 4-inches and smaller.
 - 3. Gaskets: ASTM F 477, elastomeric seal, for pipe larger than 4-inches.
- C. Couplings: Rubber or elastomeric sleeve and stainless steel band assembly fabricated to match outside diameters of pipes to be joined.
 - 1. Sleeves: ASTM C 425, rubber for vitrified clay pipe; ASTM C 443, rubber for concrete pipe; ASTM C 564, rubber for cast-iron soil pipe; and ASTM F 477, elastomeric seal for plastic pipe. Sleeves for dissimilar or other pipe materials shall be compatible with pipe materials being joined.
 - 2. Bands: Stainless steel, one at each pipe insert.
- D. Couplings: Rubber or elastomeric compression gasket, made to match pipe inside diameter or hub, and adjoining pipe outside diameter.

2.03 MANHOLES

- A. Precast Concrete Manholes: ASTM C 478, precast reinforced concrete, of depth indicated with provision for rubber gasket joints. All manhole covers shall be round.
 - 1. Base Section: 6-inch minimum thickness for floor slab and 4-inch minimum thickness for walls and base riser section and having a separate base slab or base section with integral floor.

2. Riser Sections: 4-inch minimum thickness; 48-inch diameter, and lengths to provide depth indicated.
 3. Top Section: Eccentric cone type, unless concentric cone or flat-slab-top type is indicated. Top of cone to match grade rings.
 4. Grade Rings: Provide 2 or 3 reinforced concrete rings, of 6 to 9 inches total thickness and match 24-inch diameter frame and cover.
 5. Gaskets: ASTM C 443, rubber.
 6. Steps: Cast into base, riser, and top sections sidewall at 12-to 16-inch equally spaced intervals.
 7. Pipe Connectors: ASTM C 923, resilient, of size required, for each pipe connecting to base section.
 8. Channel and Bench: Concrete.
- B. Cast-in-Place Manholes (if any): Reinforced concrete of dimensions and with appurtenances indicated. All manhole covers shall be round.
1. Bottom, Walls, and Top: Reinforced concrete.
 2. Channel and Bench: Concrete.
 3. Steps: Cast into sidewall at 12- to 16-inch intervals.

2.04 MANHOLE STEPS

- A. General: Wide enough for a man to place both feet on one step and designed to prevent lateral slippage off the step.
1. Material: Ductile iron or cast aluminum.

2.05 CLEANOUTS

- A. General: Provide cast-iron ferrule and countersunk brass cleanout plug, with round cast-iron access frame and heavy-duty, secured, scoriated cast-iron cover.

2.06 IDENTIFICATION

- A. Plastic Underground Warning Tapes: Polyethylene plastic tape with metallic core, 6 inches wide by 4 mils thick, solid green in color with continuously printed caption in black letters "CAUTION - SEWER LINE BURIED BELOW."

PART 3 – EXECUTION

3.01 PREPARATION OF FOUNDATION FOR BURIED SANITARY SEWERAGE SYSTEMS

- A. Grade trench bottom to provide a smooth, firm, stable, and rock-free foundation, throughout the length of the pipe.
- B. Remove unstable, soft, and unsuitable materials at the surface upon which pipes are to be laid and backfill with clean sand or pea gravel to indicated level.
- C. Shape bottom of trench to fit bottom of pipe. Fill unevenness with tamped sand backfill. Dig bell holes at each pipe joint to relieve the bells of all loads and to ensure continuous bearing of the pipe barrel on the foundation.

3.02 PIPE APPLICATIONS FOR UNDERGROUND SANITARY SEWERS

- A. Refer to Paragraph 2.2 above.

3.03 INSTALLATION, GENERAL

- A. General Locations and Arrangements: Drawings (plans and details) indicate the general location and arrangement of the underground sanitary sewerage system piping. Location and arrangement of piping layout take into account many design considerations. Install the piping as indicated, to the extent practical.
- B. Install piping beginning at low point of systems, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings in accordance with manufacturer's recommendations for use of lubricants, cements, and other installation requirements. Maintain swab or drag in line and pull past each joint as it is completed.
- C. Use manholes for changes in direction, except where a fitting is indicated. Use fittings for branch connections, except where direct tap into existing sewer is indicated.
- D. Use proper size increasers, reducers, and couplings, where different size or material of pipes and fittings are connected. Reduction of the size of piping in the direction of flow is prohibited.
- E. Install piping pitched down in direction of flow, at minimum slope of 2 percent, except where indicated otherwise.
- F. Extend sanitary sewerage system piping to connect to building sanitary drains, of sizes and in locations indicated.
- G. Tunneling: Install pipe under streets or other obstructions that cannot be disturbed, by tunneling, jacking, or a combination of both.

3.04 PIPE JOINT CONSTRUCTION AND INSTALLATION

- A. Join and install PVC pipe as follows:

1. Solvent cement joint pipe and fittings, joining with solvent cement in accordance with ASTM D 2855 and ASTM F 402.
2. Pipe and gasketed fittings, joining with elastomeric seals in accordance with ASTM D 3212, and for truss pipe ASTM D 2680, Appendix XI.
3. Installation in accordance with ASTM D 2321.

3.05 MANHOLES

- A. General: Install manholes complete with accessories as indicated, or if not indicated, in compliance with project requirements and authorities having jurisdiction. Form continuous concrete or split pipe section channels and benches between inlets and outlet. Set tops of frames and covers flush with finish surface where manholes occur in pavements. Elsewhere, set tops 3 inches above finish surface, unless otherwise indicated.
1. Place precast concrete manhole sections as indicated and install in accordance with ASTM C 891.
 2. Construct brick manholes as indicated.
 3. Construct cast-in-place manholes as indicated.
 4. Provide rubber joint gasket complying with ASTM C 443 at joints of sections.
 5. Install manhole steps as indicated.

3.06 CLEANOUTS

- A. Install cleanouts and extension from sewer pipe to clean out at grade as indicated. Set cleanout frame and cover in concrete block 18 by 18 by 12 inches deep, except where location is in concrete paving. Set top of cleanout 1 inch above surrounding earth grade or flush with grade when installed in paving.

3.07 TAP CONNECTIONS

- A. Make connections to existing piping and underground structures so that finished work will conform as nearly as practicable to the requirements specified for new work.
- B. Use commercially manufactured wye fittings for piping branch connections. Remove section of existing pipe, install wye fitting into existing piping, and encase entire wye fitting plus 6-inch overlap, with not less than 6 inches of 3000-psi 28-day compressive-strength concrete.
- C. Make branch connections from side into existing 4- to 21-inch piping by removing section of existing pipe and installing wye fitting, into existing piping. Encase entire wye with not less than 6 inches of 3000-psi 28-day compressive-strength concrete.

1. Provide concrete that will attain minimum 28-day compressive strength of 3000 psi, unless otherwise indicated.
 2. Use epoxy bonding compound as interface between new and existing concrete and piping materials.
- D. Protect existing piping and structures to prevent concrete or debris from entering while making tap connections. Remove debris, concrete, or other extraneous material that may accumulate

3.08 INSTALLATION OF IDENTIFICATION

- A. Install continuous plastic underground warning tape during back-filling of trench for underground water service piping. Locate 6 to 8 inches below finished grade, directly over piping.

3.09 FIELD QUALITY CONTROL

Testing: Perform testing of completed piping in accordance with local authorities having jurisdiction.

A. Low Pressure Air Testing

1. All sewer lines shall be air tested in accordance with ASTM C828.
2. The CONTRACTOR shall conduct Low Pressure Air Tests of all pipes before putting the new sewers into service. Tests shall be made from manhole to manhole at an average pressure of 3.0 psi greater than the average back pressure of any ground water present and shall be conducted in accordance with the test procedure outlined below. The maximum allowance for air loss during testing shall be determined from tables of minimum holding time for a pressure drop of 1.0 psi for the particular pipe size and length being tested. These tables are prepared by and may be obtained from the Uni-Bell Plastic Pipe Associated, and at least two copies shall be furnished to OWNER or OWNER's Representative by the CONTRACTOR.
3. Test Equipment
 - a. The CONTRACTOR shall be responsible for acquiring an approved independent testing firm with all necessary equipment and personnel required to conduct the tests. The equipment used shall be identical or equal to the Air-Loc system as manufactured by Cherne Industrial, Inc., Hopkins, Minnesota.
 - b. Equipment used shall meet the following minimum requirements:
 - (i) Pneumatic plugs shall have a sealing length equal to or greater than the diameter of the pipe to be tested. The air supply line will contain an on/off valve and a pressure gauge with a range from 0 to 10 psi. The gauge shall

have minimum divisions of 0.10 psi and shall have an accuracy of +/- 0.04 psi.

- (ii) Pneumatic plugs shall resist internal test pressures without requiring bracing or blocking.
- (iii) All air used shall pass through a single control panel.
- (iv) Three individual hoses shall be used for the following connections
 - (v) From control panel to pneumatic plugs for inflation.
 - (i) From control panel to sealed line for introducing the low-pressure air.
 - (vi) From sealed line to control panel for continually monitoring the air pressure rise in the sealed line.

4. Test Procedure

- a. The sewer line to be tested shall be flushed and cleaned prior to the test (a wetted pipe surface will produce more consistent results).
- b. All pneumatic plugs shall be seal-tested before being used in the actual test installation. One length of pipe shall be laid on the ground and sealed at both ends with the pneumatic plugs to be checked. Air shall be introduced into the plugs to 25 psig. The sealed pipe shall be pressured to 5.0 psig. The plugs shall hold against this pressure without movement of the plugs out of the pipe.
- c. Plug all pipe outlets with suitable test plugs. It is advisable to restrain gasketed caps, plugs, or short pipe lengths with bracing stakes, clamps and tie-rods, or wire harnesses over the pipe bells.
- d. If the sewer line to be tested is submerged in ground water, insert a pipe probe (by boring or jetting) into the backfill material adjacent to the center of the pipe, determine the pressure in the probe when air passes slowly through it. This is the back pressure due to ground water submergence over the end of the probe. All gauge pressures in the test shall be increased by this amount.
- e. Add air slowly to the portion of the sewer line installation under test until the internal pressure is raised to 4.0 psig.
- f. After an internal pressure of 4.0 psig is obtained, allow at least two (2) minutes for the air temperature to stabilize, adding only the amount of air required to maintain pressure.
- g. When the pressure decreases to 3.5 psig, start timing with a stopwatch. Determine the time, in seconds, that is required for the internal air pressure to reach 2.5 psig (a drop of 1.0 psig). Minimum permissible pressure holding

times for 100 ft runs of single pipe diameter and for systems of 4-inch laterals in combination with trunk lines are indicated in the following table.

**Table 6-1
Air Leakage Minimum Permissible
Holding Times**

Size of Pipe (inches)	Minutes: Seconds per 100 ft.
4	1:00
6	1:00
8	1:30
10	2:00
12	2:30
18	3:00
21	3:30
24	4:00
27	4:30
30	5:00
36	6:00

- h. When the sewer section to be tested contains more than one size of pipe, the minimum allowable time shall be based on the largest diameter pipe in the section and shall be the time shown in the table reduced by 0.5 minutes.
- i. If the pressure drops 1.0 psig before the appropriate time shown on the table has elapsed, the air loss rate shall be considered excessive and the section of pipe has failed the test.
- j. If the section fails to meet these requirements, the CONTRACTOR shall determine at his own expense, the sources of leakage, and he shall repair or replace all defective materials and/or workmanship to the satisfaction of the OWNER. The completed pipe installation shall then be re-tested and required to meet the requirements of this test.
- k. It is recommended that inspection and testing of the sewer lines and manholes be conducted prior to backfilling. All documentation should be retained and presented to the OWNER at time of the final testing which is required after all other utilities are installed, roadway sub-grade is laid, and backfill is complete.

5. Safety Precautions

- a. The air test may be dangerous if because of ignorance or carelessness a line is improperly prepared. It is extremely important that the various plugs be installed and braced in such a way as to prevent blowouts. Since an internal pressure of 5 psi exerts a force of 250 pounds on an 8-inch plug, it should be

realized that the sudden expulsion of a poorly installed plug or of a plug that is partially deflated before the pipe pressure is released can be very dangerous.

- b. No one shall be allowed in the manholes of the section being tested at the time of the test or until after the lines have been depressurized.
- c. Pressurizing equipment shall include a regulator set at 10 psi to avoid over pressurizing and damaging an otherwise acceptable line.

B. Manhole Testing:

1. OWNER requires testing of all new manholes. Manhole testing shall be scheduled with the OWNER's representative a minimum of two (2) working days in advance. All manholes shall be tested by one (1) of the following methods:

2. Manhole Exfiltration Test

- a. All manholes constructed shall be watertight and show no visible sign of infiltration and shall be tested in accordance with this Specification. The test shall be conducted by the CONTRACTOR in coordination with and at the direction of the ENGINEER. All incoming and outgoing sewer lines shall be plugged, and the manhole filled with water to a level above the highest section joint. If the water level drop exceeds 1/8" per vertical foot of manhole depth in 5 minutes, the manhole shall have failed the test.

3. Manhole Vacuum Test

- a. The test shall be conducted by the CONTRACTOR in coordination with and at the direction of the ENGINEER. The manhole shall be tested, after assembly, as follows: All pipe opening shall be sealed by installing suitable plugs that completely isolate the manhole structure; any other openings, such as lifting holes, shall be permanently sealed. A suitable vacuum pump shall be connected to the manhole, and a vacuum of 10" of Hg drawn. The pump shall then be isolated from the manhole by valving, and the test period begun. The test shall be successful if the vacuum remains at 9" of Hg or greater according to the following table:

Table 6-2
Manhole Vacuum Test Minimum Time

Manhole	Time, minimum
48"	60
60"	75
72"	90

- b. All manholes which fail the test or that have visible leaks, even if they pass the test, shall be repaired or replaced at the expense of the CONTRACTOR until the manholes pass the test, to the complete satisfaction of the ENGINEER. Manholes which have any visible leaks will not be accepted. If the manhole fails the test a second time, the CONTRACTOR will be responsible for supplying and installing a brand-new manhole. In addition, the CONTRACTOR will retest the new manhole as well as all pipe segments connected to the new manhole.
- C. Cleaning: Clear interior of piping and structures of dirt and other superfluous material as work progresses. Maintain swab or drag in piping and pull past each joint as it is completed.
1. In large, accessible piping, brushes and brooms may be used for cleaning.
 2. Place plugs in ends of uncompleted pipe at end of day or whenever work stops.
 3. Flush piping between manholes, if required by local authority, to remove collected debris.
- D. Interior Inspection: Inspect piping to determine whether line displacement or other damage has occurred.
1. Make inspections after pipe between manholes and manhole locations has been installed and approximately 2 feet of backfill is in place, and again at completion of project.
 2. If inspection indicates poor alignment, debris, displaced pipe, infiltration or other defects correct such defects, and reinspect.

END OF SECTION