INDIAN CREEK VILLAGE, FLORIDA

REQUEST FOR PROPOSALS

RFP # 2020-01

ROADWAY REDEVELOPMENT PROJECT

December, 2020

VILLAGE COUNCIL

Bernard Klepach
Javier Holtz
Robert Diener
Irma Braman
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INDIAN CREEK VILLAGE, FLORIDA

VILLAGE ATTORNEY

Weiss Serota Helfman Cole & Bierman, P.L.

OFFICE OF THE VILLAGE CLERK

Marilane Lima, MMC

ADMINISTRATION

Jennifer Medina, Village Manager

NOTICE OF BID INVITATION

INDIAN CREEK VILLAGE
REQUEST FOR PROPOSALS #2020-01

The Village of Indian Creek, Florida (the "Village") will receive sealed proposals until 2:00 P.M. local time, **Thursday, February 4th, 2021** at the Village Clerk's office, 9080 Bay Drive, Indian Creek, Florida 33154, for the following project:

ROADWAY REDEVELOPMENT PROJECT

The project consists of rebuilding an entire roadway of 1.6 miles of right-of-way, which traverses the Island located within the Village. That work includes, but is not limited to, realignment of the existing roadway, all paving, drainage, storm water, potable water services and a new sanitary sewer system. The work also includes lighting, landscaping, irrigation and a pedestrian pathway.

Please submit six (6) signed responses, which will include one (1) original and five (5) bound copies plus one (1) flash drive to be submitted in one sealed package, clearly marked on the outside as follows: Response to Indian Creek Village RFQ #2020-01 for "Roadway Redevelopment Project". Address your proposals to Marilane Lima, MMC, Village Clerk, 9080 Bay Drive, Indian Creek Village, Florida 33154. The outside of the sealed envelope shall also show the name of the respondent.

The Village's tentative schedule for this RFP is as follows:

Issue Date: December 22nd, 2020
Pre-Bid Conference: January 11th, 2021 at 11:00 am
Submission Deadline: February 4th, 2021 at 2:00 pm
Selection Date: February 16th, 2021

The Village reserves the right to delay or modify scheduled dates and will notify potential Proposers of all changes in scheduled dates.

MANDATORY PRE-BID CONFERENCE

A mandatory pre-bid conference will be held in person at Village Hall 9080 Bay Drive, Indian Creek, Florida 33154 on January 11th, 2021 at 11:00 am, firms interested in participating may obtain meeting instructions by contacting Village Clerk Marilane Lima, at mlima@icvps.org or calling 305-865-4121. Firms are requested to have the RFP document at the pre-bid conference. Copies of this RFP document may be obtained by contacting Marilane Lima at mlima@icvps.org or calling 305-865-4121 and request Document No. 2020-01. Copies may also be obtained from the Village's website at www.indiancreekvillage.org.

The Village reserves the right to reject any or all submittals with or without cause; to waive any and all irregularities and to make awards in the best interest of the Village. We look forward to your active participation in this competitive selection process.

Sincerely,

Jennifer Medina, Village Manager

TABLE OF CONTENTS

APPENDICES

SECTION 00200

INSTRUCTIONS TO BIDDERS

1. BID FORM

All bids must be submitted in conformity with the requirements of the Scope of Services and on the Bid Form included herewith (Section 00300) including non-collusion affidavit and certification regarding debarment. Also include the Contractor's Questionnaire (Section 00350, with copies of applicable licenses and certifications, latest financial statement, and a list of similar projects completed), and Bid Bond (Section 00410). The bids shall be placed in sealed envelopes, marked on the outside with the Contractor's name, address, phone number and Project Name, with the works 'SEALED BID" clearly marked on the outside. Bidders must provide bids for the base bid and additive bid alternates. Bids which contain irregularities of any kind, or incomplete bids, may be rejected.

2. BID GUARANTY

The bid must be accompanied by a Bid Guaranty which shall be for an amount equal to five percent (5%) of the proposal (base bid plus both additive alternates), and at the option of the bidder may be a certified check, cashier's check, or bid bond. Cash deposits will not be accepted. The Guaranty shall be forfeited if the successful bidder fails to enter into a contract in the form shown within ten (10) working days of the Notice of Award of the Contract. The checks and bid bonds of all except the three lowest bidders will be returned immediately after the opening of bids, and the remaining checks or Bid Bonds will be returned within ten (10) working days after the signing of the contract by the successful bidder.

3. TIME FOR RECEIVING BIDS

Bids received prior to the time of opening shall be securely kept, unopened. All bids shall be delivered to the Village Clerk's office, Indian Creek Village, 9080 Bay Drive, Indian Creek, Florida, 33154. No bids will be received after 2:00 P.M. on date of bid opening.

4. QUESTIONS' DEADLINE

Deadline for submitting questions is **Thursday, January 14th, 2021, 5:00 p.m**. All questions shall be submitted via email to the Engineer, Sean Compel at sean.compel@Stantec.com. Questions must be submitted in writing and will be responded to by **January 19th, 2021**.

5. WITHDRAWAL OF BIDS

Bids may not be withdrawn for a period of sixty (60) days from the opening thereof.

6. BIDDERS PRESENT

At or shortly after **2:05 P.M. on Thursday, February 4th, 2021**, the bids will be opened and their contents will be made public for the information of the bidders and others properly interested, who may be present either in person or by representative.

7. AWARD OF CONTRACT

The contract will be awarded no later than **sixty (60) days from the bid opening date** to the lowest responsible, responsive bidder, complying with the conditions of the Notice of Bid Invitation, provided the bid is reasonable, and it is in the best interest of the Village to accept it. The Village however, reserves the right to reject any or all bids.

8. BASIS OF AWARD

The award of bid will be made to the lowest responsible responsive bidder.

9. QUALIFICATIONS OF BIDDERS

The nature of this roadway redevelopment project is such, that it is essential that the contractor or sub-contractor(s) actually providing the construction services be highly qualified and experienced in this type of work. Lack of experience in this type of construction shall be grounds for consideration of a bid as non-responsive.

Consequently, whichever firms contemplated to do this type of construction must be able to demonstrate that they have successfully done so in the past. In the event that portions of the work called for in the specifications are to be installed, constructed, or assembled by a sub-contractor(s), the bidder must fill-in the information requested in this section for themselves as well as the sub-contractors that will actually be doing the work. The specific qualification requirements for this project must be described in the proposal, and at a minimum are as follows:

A. Contractor/Sub-contractor shall demonstrate successful municipal project experience in the construction of roadway/streetscape improvements including utilities and stormwater on at least 2 projects in the last 5 years.

B. Contractor/Sub-contractor shall demonstrate successful project experience in the construction of decorative roadway streetscape features with including decorative concrete and landscaping on at least 2 projects in the last 5 years.

C. Contractor/Sub-contractor shall provide a complete project approach to demonstrate specifically how all work will be adequately completed within the allotted contract time and within the maintenance of traffic measures outlined in the Construction Documents. The approach shall include proposed phasing and crew allocation for the Village's review.

Failure to meet the minimum qualifications of the section will result in a bidder being deemed not responsible.

11. INSURANCE

The bidder to whom a Contract is awarded shall take out and maintain Worker's Compensation Insurance to cover all his/her employees as well as maintain public liability and property damage insurance during the term of this contract and until the last day of furnishing work, labor, services and materials for the project described herein. Refer to Certificate of Insurance (Section 00650), and Supplementary Conditions (Section 00800). Indian Creek Village, Stantec Consulting Services Inc., shall be named as additionally insured in all policies required under this contract.

12. ELIGIBLE BIDDERS

The Village reserves the right, before awarding a Contract, to require a Bidder to submit evidence of his/her qualifications, as may be deemed necessary, and consider any evidence available to it of the financial, technical, and other qualifications and abilities of the bidder.

The Contract will be awarded only to a Bidder fully qualified to undertake the proposed work. All material or services must meet all applicable Federal, State and Local specifications and permit requirements.

13. SAFETY PRECAUTIONS

The Contractor shall maintain suitable and sufficient guards and barriers, and, at night, suitable and sufficient safety standards required by Municipal, County, State and Federal ordinances and laws.

14. PRE-BID INSPECTION

The Bidder, before submitting a Proposal, is required to visit and examine the site of the work and satisfy himself/herself about the character of the work, any possible difficulties, and all conditions and circumstances which do and may affect the work. To coordinate a pre-bid inspection contact Village Clerk Marilane Lima at mlima@icvps.org or call 305-865-4121.

15. PERFORMANCE AND PAYMENT BONDS

Within ten (10) working days of the award of the Contract, the successful bidder shall furnish a Performance and a Payment Bond in the form shown on Sections 00610 and 00620 guaranteeing the faithful performance of his contract and for the payment of all persons performing labor or furnishing materials in connection therewith. Each bond shall be in the amount of one hundred percent (100%) of the Contract price.

16. PERMITS

The successful bidder will be required to obtain the necessary permits from Indian Creek Village. Indian Creek Village's permit fee(s) will be waived by the Village. The contractor is responsible for all necessary end of construction clearance, certification or release fees required by local agencies, if applicable.

17. CONTRACTOR'S QUESTIONNAIRE

Section 00350 contains the form entitled "Contractor's Questionnaire." This form must be completed and submitted as an integral part of the bid package.

18. QUALIFICATION OF SURETIES

A. General: The following requirements shall be met by all surety companies furnishing bid, performance payment or other type of bonds:

B. Qualifications: As to companies being rated acceptable:

1. The Surety shall be rated as "A" or better as to General Policyholders Rating and Class V or better as to Financial Category by Best's Key Rating Guide, published by Alfred M. Best Company, Inc., of 75 Fulton Street, New York, New York, 10038.

2. The Surety shall be listed on the U.S. Department of the Treasury, Fiscal Service, Bureau of Government Financial Operations, Circular 570, (1982 Revision) entitled, "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies."

3. All Surety Companies are subject to approval and may be rejected by the Owner without cause, in the same manner that bids may be rejected.

C. Limitations: Bonding Limits or Bonding Caps the Village refers to the limit or amount of Bond acceptable on any one risk.

1. The bonding limit of the Surety shall not exceed ten percent (10%) of the policyholder surplus (capital and surplus) as listed by the aforementioned Best's Key Rating Guide, on anyone risk (penalty or amount of any one bond).

D. Requirements:

1. Policy Holders Surplus is required to be 5 times the amount of any one bond.

2. The Agent countersigning the bond shall be a resident of Dade County.

END OF SECTION

SECTION 00300

PROPOSAL
ROADWAY REDEVELOPMENT PROJECT
INDIAN CREEK VILLAGE, FLORIDA

Village Clerk's Office
Indian Creek Village
9080 Bay Drive
Indian Creek, Florida 33154

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 the Proposal of the Contract to which the work pertains; that this Proposal is made without connection or arrangement with any other person, company, or parties making a bid or proposal and that the Proposal is in all respects fair and made in good faith without collusion or fraud.

The Bidder further declares that he has examined the site of the work and that from personal knowledge and experience, or that he has made sufficient observations of the conditions of the proposed Project Site to satisfy himself that such site is a correct and suitable one for this work and he assumes full responsibility therefore, that he has examined the Drawings and Specifications for the work and from his own experience or from professional advice that the Drawings, including bid item quantities, and Specifications are sufficient for the work to be done and he has examined the other Contractual Documents relating thereto, including the Notice of Bid Invitation, Instructions to Bidders, Proposal, Contract, General Conditions, Supplementary Conditions, Special Conditions, Technical Specifications, Drawings and has read all addenda prior to the receipt of bids, and that he has satisfied himself fully, relative to all matters and conditions with respect to the work to which this Proposal pertains.

The Bidder proposes and agrees, if this Proposal is accepted, to contract with the Indian Creek Village (Owner), in the form of contract specified, to furnish all necessary materials, all equipment, all necessary machinery, tools, apparatus, means of transportation, and labor necessary to complete the work specified in the Proposal and the Contract, and called for by the Drawings and Specifications and in the manner specified.

The Bidder further proposes and agrees to comply in all respects with the time limits for commencement and completion of the work as stated in the Contract Form.

The Bidder further agrees that the deductions for liquidated damages, as stated in the Contract Form, constitute fixed, agreed, and liquidated damages to reimburse the Owner for additional costs to the Owner resulting from the work not being completed within the time limit stated in the Contract Form.

Payment Bonds each in the amount of one-hundred percent of the Contract price, within ten (10) consecutive calendar days after written notice being given by the Owner of the award of the Contract, and the undersigned agrees that in case of failure on his part to execute the said Contract and Performance and Payment Bonds within the ten (10) consecutive calendar days after the award of the Contract, the cashier's check or Bid Bond accompanying his bid and the money payable thereon shall be paid to the Owner as liquidation of damages sustained by the Owner; otherwise, the check accompanying the Proposal shall be returned to the undersigned after the Contract is

signed and the Performance and Payment Bonds are filed.

The undersigned agrees to accept in full compensation therefore the total of the lump sum prices for the items named in the following schedule, based on the plan quantities contained within this bid form. Furthermore, the undersigned has checked these quantities and agrees that bid quantities are correct and adequate to complete the job in its entirety, as described in the contract document.

Bidders Certificate of Competency No. _____

Bidders Occupational License No. _____

Acknowledgment is hereby made of the following Addenda received since issuance of the Project Manual:

Addendum No. ____ Dated: _____ Addendum No._____ Dated:_____

Addendum No._____ Dated: _____ Addendum No._____ Dated:_____

Addendum No._____ Dated: _____ Addendum No._____ Dated:_____

Attached hereto is a cashier's check on the _____

_____ Bank of _____

_____ or Bid Bond for the sum of _____

_____ Dollars

($_____), made payable to the Indian Creek Village, Florida.

_____ L.S.
(Name of Bidder) (Affix Seal)

_____ L.S.
Signature of Officer

_____ L.S.
(Title of Officer)

Address: _____

City: _____ State: _____

The full names and residences of persons and firms interested in the foregoing bid, as principals, are as follows:

_____

_____

_____

Name of the executive who will give personal attention to the work:

_____

_____

LIST OF MAJOR SUB-CONTRACTORS

Bidders are required to list with the Proposal, on this sheet all major sub-contractors included for the prosecution of the work. Failure to complete the list may be cause for declaring the Proposal irregular.

The successful bidder shall employ the sub-contractors listed hereunder for the class of work indicated, which list shall not be modified in any way without the written consent of the Indian Creek Village.

The Bidder expressly agrees that:

1. If awarded a contract as a result of this proposal, the major sub-contractors used in the prosecution of the work will be those listed below.

2. The Bidder represents that the sub-contractors listed below are financially responsible and are qualified to do the work required.

CATEGORY OR CLASS	NAME OF SUB-CONTRACTOR	ADDRESS OF WORK

ROADWAY REDEVELOPMENT PROJECT
Indian Creek Village, Florida

BID FORM

Bid unit prices stated in this proposal include all costs and expenses for labor, equipment, materials, contractor's overhead and profit. Unit prices for the various work items are intended to establish a total price for completing the project in its entirety. The Contractor shall include in the Bid price any work item and materials for which a separate pay item has not been included in the Bid Form. All work and incidental costs shall be included for payment under the several scheduled items of the overall contract, and no separate payment will be made therefore.

BASE BID

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	AMOUNT
Island - Roadway (RD) Items					
RD-1	Standard clearing & grubbing, including tree removals	1	L.S.	$_____	$_____
RD-2	Demolition, removal & disposal of existing asphalt pavement and base	29,470	S.Y.	$_____	$_____
RD-3	Demolition, removal & disposal of existing concrete curb and gutter, curb, or valley gutter	10,502	L.F.	$_____	$_____
RD-4	Adjustment of existing utility and drainage manhole covers, valves, inlets, etc. to finish grade	1	L.S.	$_____	$_____
RD-5	12" Stabilized subgrade (shall include testing lab for tests every 100', each lane)	23,306	S.Y.	$_____	$_____
RD-6	10" Limerock base including BX1100 Geogrid (shall include testing lab for tests every 100', each lane)	23,306	S.Y.	$_____	$_____
RD-7	1" Thick Asphaltic Concrete Friction Course Type FC-9.5	23,306	S.Y.	$_____	$_____
RD-8	2" Thick Asphaltic Concrete Structural Course Type SP-9.5	23,306	S.Y.	$_____	$_____
RD-9	Embankment/fill material	1	L.S.	$_____	$_____
RD-10	Harmonization and restoration of existing landscaping and driveways behind new trail and curbs	1	L.S.	$_____	$_____

_____ _____
Name of Bidder Signature of Bidder

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	AMOUNT
RD-11	Relocation/rotation of existing mailboxes (all mailboxes currently facing the street will need to be moved to face the existing driveway at location determined in the field)	30	EA.	$_____	$_____
RD-12	Pavered concrete crosswalk including 12" wide concrete bands and concrete base	275	S.F.	$_____	$_____
RD-13	Concrete driveway approach (between gutter and new trail) colored with Scofield Chromix G and L Admixtures (or approved equal)	17,885	S.F.	$_____	$_____
RD-14	Provide all pavement markings and rpms as indicated on plans. Includes removal of all existing signage.	1	L.S.	$_____	$_____
RD-15	New signage including sign, decorative frame, pole, base cover and concrete footing	22	EA.	$_____	$_____
RD-16	Fully Engineering Segmental Retaining wall along view lot (including signed and sealed calculations)	700	L.F.	$_____	$_____
RD-17	Temporary road construction for vehicular traffic through work zone	1	AL.	$300,000	$300,000
				Sub-total Island-RD Items	**$_____**
Island - Electrical (E) Items					
E-1	Furnish and install new complete street/sidewalk light pole including fixture, base, ballast, wiring, bulb, etc.	100	EA.	$_____	$_____
E-2	Furnish and install electrical conduit, including fittings, wiring, grounding, pullboxes, restoration, etc.	10,005	L.F..	$_____	$_____
E-3	Furnish and install electrical service points including all panels, disconnects, wiring, frame, concrete slabs and foundations, coordination and service run to FPL connection point, etc.	5	EA.	$_____	$_____
				Sub-total Island - E items	**$_____**

Name of Bidder _____ Signature of Bidder _____

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	AMOUNT
Island - Stormwater (SW) Items					
SW-1	Type "A" concrete curb and gutter, colored with Scofield Chromix G and L Admixtures (or approved equal)	9,409	L.F.	$_____	$_____
SW-2	12" wide concrete gutter, colored with Scofield Chromix G and L Admixtures (or approved equal)	8,922	L.F.	$_____	$_____
SW-3	16" wide concrete gutter, colored with Scofield Chromix G and L Admixtures (or approved equal)	570	L.F.	$_____	$_____
SW-4	Type "D" concrete curb, colored with Scofield Chromix G and L Admixtures (or approved equal)	1,309	L.F.	$_____	$_____
SW-5	5' wide Trail (Rubberway Rubberrock Evolution Multi 6000 Flexible Pervious Pavement or approved equal) including all edging and subsurface material as shown in detail. Shall include testing lab for compaction tests every 100'.	43,601	L.F.	$_____	$_____
SW-6	Type 'P' manhole or Catch Basin, including structure, inlet, frame, cover, and baffle where required.	7	E.A.	$_____	$_____
SW-7	Type 9 Catch Basin, including structure, inlet, frame, cover, and baffle where required.	48	E.A.	$_____	$_____
SW-8	Type 10 Catch Basin, including structure, inlet, frame, cover, and baffle where required.	35	E.A.	$_____	$_____
SW-9	8'x8' Outfall control structure including weir wall, frame, cover, etc.	12	E.A.	$_____	$_____
SW-10	12" Nyloplast ADS yard drain or approved equal	5	E.A.	$_____	$_____
SW-11	18" diameter HDPE solid pipe	673	L.F.	$_____	$_____
SW-12	24" diameter HDPE solid pipe	285	L.F.	$_____	$_____
SW-13	30" diameter HDPE solid pipe	220	L.F.	$_____	$_____
SW-14	30" diameter, 4-ft wide exfiltration trench	7,850	L.F.	$_____	$_____
SW-15	Manatee Grate per the latest edition of FDOT standard index	12	E.A.	$_____	$_____

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	AMOUNT
SW-16	8" Inline check valve	1	E.A.	$_____	$_____
SW-17	10" Inline check valve	2	E.A.	$_____	$_____
SW-18	12" Inline check valve	3	E.A.	$_____	$_____
SW-19	18" Inline check valve	2	E.A.	$_____	$_____
SW-20	24" Inline check valve	2	E.A.	$_____	$_____
		Sub-total Island – SW Items			**$_____**
Island - Landscaping/Irrigation (LI) Items					
LI-1	Landscaping - Complete	1	L.S.	$_____	$_____
LI-2	Zoysia Sod from front of trail to back of curb including grading and soil preparation	46,640	S.F.	$_____	$_____
LI-3	Protection of existing trees and landscaping	1	L.S.	$_____	$_____
LI-4	Irrigation System Complete including connections to service points and restoration of existing - Allowance	1	AL.	$225,000	$225,000
		Sub-total Island - LI Items			**$_____**
Island – Water & Sewer (WS) Items					
WS-1	Furnish and Install Duplex Grinder Pump Station Package (Including Electrical and Fittings)	42	EA.	$_____	$_____
WS-2	Furnish and Install Quadplex Grinder Pump Station Package (Including Electrical and Fittings)	1	EA.	$_____	$_____
WS-3	Furnish and Install SDR11 HDPE forcemain (Including all fittings & valves for all pipe sizes and termination point)	10,735	L.F.	$_____	$_____
WS-4	Relocation of existing fire hydrants including those required to move to construct temporary pavement within work zone	19	EA.	$_____	$_____
WS-5	Replacement of existing 2" water service line and meter box (meter to be provided by	71	EA.	$_____	$_____

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	AMOUNT
	the Village, installed by contractor)				
WS-6	New 2" Irrigation meter, including service line, meter box, backflow prevention, etc.	3	EA.	$_____	$_____
			Sub-total Island - WS Items		**$_____**
General (G) Items					
G-1	Mobilization	1	L.S.	$_____	$_____
G-2	Stormwater pollution prevention measures including erosion, sedimentation and dust control and turbidity barriers (to be divided equally for each month of construction).	1	L.S.	$_____	$_____
G-3	Maintenance of traffic, including traffic control, pedestrian and vehicular access, signs, barricades, flaggers, and variable message boards (to be divided equally for each month of construction).	1	L.S.	$_____	$_____
G-4	Performance & Payment Bond	1	L.S.	$_____	$_____
G-5	General Conditions including bonds, insurance, management, supervision, etc. (to be divided equally for each month of construction)	1	L.S.	$_____	$_____
G-6	Compliance with Safety Act	1	L.S.	$_____	$_____
G-7	Advance exploration of existing utilities	1	L.S.	$_____	$_____
G-8	Record As-built drawings	1	L.S.	$_____	$_____
G-9	Contingency – Allowance	1	AL.	$750,000	$750,000
G-10	Police – Allowance	1	AL.	$50,000	$50,000
			Sub-total G Items		**$_____**

GRAND TOTAL (BASE BID) IN FIGURES (LUMP SUM): $_____

GRAND TOTAL (BASE BID) WRITTEN: _____

_____

BIDDER: _____

By: _____

Title:_____

Telephone: _____ Fax: _____

_____ _____

Name of Bidder Signature of Bidder

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	AMOUNT

By signing below, the bidder confirms their ability to meet the overall project schedule which requires all work to be substantially complete within five-hundred and forty (540) calendar days from the date authorized to proceed.

BIDDER: _____

By: _____

Title:_____

Telephone: _____ Fax: _____

_____ _____

Name of Bidder Signature of Bidder

INDIAN CREEK VILLAGE, FLORIDA

NOTICE TO BIDDERS

All bidders are notified that the Village intends to implement a “sales tax savings” accounting procedure to avoid the collection of State and Local sales tax on the project.

All bidders are to **INCLUDE** all applicable sales tax in their bid.

The successful, awarded contractor will cooperate with the Village accounting department to implement to implement a purchase order system which will allow the Village to pay directly for all materials purchased for the direct execution and incorporation into the project. The overall contract amount will subsequently be reduced by formal change order for all material directly paid for and sales tax saved with the implementation of this procedure.

Acknowledgment:

_____
Contractor

Attest: _____ By: _____

Attest: _____ _____
Date

NON-COLLUSION AFFIDAVIT

STATE OF _____
COUNTY OF_____

_____ ("Affiant"), being first duly sworn, deposes and says that:

1. Affiant is _____ of _____, (the "Bidder") and has submitted the attached Bid;

2. Affiant has personal knowledge of the matters set forth herein and is competent to testify:

3. Affiant is fully informed respecting the preparation and contents of the attached Bid and all pertinent circumstances respecting the Bid;

4. The Bid is genuine and is not a collusive or sham Bid;

5. Neither the Bidder nor any of its officers, partners, owners, agents, representatives, employees, or parties in interest, including Affiant, has in any way colluded, conspired, connived, or agreed, directly or indirectly with any other Bidder, firm, or person to submit a collusive or sham Bid, or has in any manner, directly or indirectly, sought by agreement or collusion or communication or conference with any other Bidder, firm, or person to fix the price or prices in the attached Bid or of any other Bidder, or to fix any overhead, profit, or cost element of the Bid price or the Bid price of any other Bidder, or to secure through any collusion, conspiracy, connivance or unlawful agreement any advantage against Indian Creek Village or any person interested in the proposed Contract.

By: _____

(Corporate Seal)

Title: _____

Subscribed and sworn before me this ___ day of _____, 20__, by _____, who is personally known to me or has produced _____ as identification.

_____
Notary Public

_____
Print Name
My commission expires:

CERTIFICATION REGARDING
DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION
LOWER TIER COVERED TRANSACTIONS

This certification is required by the regulations implementing Executive Order 12549, Debarment and Suspension, 45 CFR 1183.35, Participants' responsibilities. The regulations were published as Part VII of the May 26, 1988 Federal Register (pages 19160-19211). Copies of the regulations may be obtained by contacting the person to which this proposal is submitted.

(BEFORE COMPLETING CERTIFICATION, READ INSTRUCTIONS ON REVERSE)

(1) The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals are presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any federal department or agency.

(2) Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

_____
Organization Name

_____
Name and Title of Authorized Representative

_____
Signature Date

INSTRUCTIONS FOR CERTIFICATION

1. By signing and submitting this proposal, the prospective lower tier participant is providing the certification set out below.
2. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the federal government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.
3. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.
4. The terms "covered transaction," "debarred," "suspended," "ineligible," "lower tier covered transaction," "participant," "person," "primary covered transaction," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations.
5. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.
6. The prospective lower tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility, and Voluntary Exclusion-Lower Tier Covered Transactions," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.
7. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that it is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the Nonprocurement List (Telephone Number).
8. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of a participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.
9. Except for transactions authorized under paragraph 5 of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntary excluded from participation in this transaction, in addition to other remedies available to the federal government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

SECTION 00350

CONTRACTOR'S QUESTIONNAIRE

Submitted to: The Mayor and Village Council of the Indian Creek Village, Florida:

By_____

Principal Office_____

How many years has your organization been in business as a General Contractor under your present business name?_____

Does your organization have current occupational licenses entitling it to do the work contemplated in this Contract? _____

State of Florida Occupational License (State type and number):

_____

Federal I.D. No: _____

Dade County Certificate of Competency (State type and number):

_____

Indian Creek Village Occupational License (State type and number):

_____

Please include copies of above licenses and certifications with proposal.

How many years experience in similar work has your organization had?

(A) As a General Contractor_____
(B) As a Sub-Contractor_____
(C) What contracts has your organization completed? State below:

Contract Amount	**Class of Work**	**When Completed**	**Name & Address of Owner**

How many years has your organization, or your concrete curb and sidewalk sub-contractor had in the actual construction of municipal, decorative sidewalks and streetscapes?

_____ years

Name & tel. number of Owner	Project Name	Date completed

Have you ever failed to complete any work awarded to you? _____

If so, where and why? _____

_____

Has any officer or partner of your organization ever failed to complete a contract handled in his own name? _____

If so, state name of individual, name of owner, and reason thereof:

_____

_____

_____

In what other lines of business are you financially interested or engaged?

_____

_____

_____

Give references as to experience, ability and financial standing.

_____

_____

_____

What equipment do you own that is available for the proposed work and where is it located?

_____

_____

_____

Financial Statement: _____

_____

_____

What Bank or Banks have you arranged to do business with during the course of the Contract should it be awarded to you?

_____

_____

_____

_____

_____

I hereby certify that the above answers are true and correct.

Name of Bidder: _____(Affix Seal)

Signature of Officer: _____

Title of Officer: _____

END OF SECTION

SECTION 00410

BID BOND

STATE OF FLORIDA)
ss
COUNTY OF)

KNOW ALL MEN BY THESE PRESENTS, that _____

_____ as Principal, and

____ _____, as Surety,

a Corporation chartered and existing under the laws of the State of _____, with its principal offices in the City of _____, and authorized to do business in the State of Florida are held and firmly bound unto the Owner, _____ in the penal sum of _____

_____ Dollars ($_____) lawful money of the United States, for the payment of which sum will and truly to be made, 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_____, 20___, for:

ROADWAY REDEVELOPMENT PROJECT
Indian Creek Village, Florida

NOW, THEREFORE:

A. If the principal shall not withdraw said bid within sixty (60) days after date of opening of the same, and shall within ten (10) days after the prescribed forms are presented to him for signature, enter into a written contract with the Owner in accordance with the bid as accepted, and give bonds with good and sufficient surety or sureties, as may be required, for the faithful performance and proper fulfillment of such contract, then the above obligations shall be void and of no effect, otherwise to remain in full force and effect.

B. In the event of the withdrawal of said bid within the period specified, or the failure to enter into such contract and give such bonds within the time specified, if the principal shall pay the Owner the difference between the amount specified in said bid and the amount for which the Owner may procure the required work and supplies, if the latter amount be in excess of the former, then the above obligations shall be void and of no effect, otherwise to remain in full force and effect.

IN WITNESS WHEREOF, the above bounded parties have executed this instrument under their several seals, this ____ day of _____, A.D., 20 ___, 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.

WITNESSES: (If Sole Ownership or Partnership, two (2) witnesses required).
(If Corporation, Secretary Only will attest and affix seal).

WITNESSES:

_____

_____

PRINCIPAL:

_____
Name of Firm

_____
Signature of Authorized (Affix Seal)

_____
Title

_____
Business Address

_____
City, State & Zip Code

WITNESSES:

_____

_____

SURETY:

_____
Corporate Surety

_____
Attorney-in-Fact (Affix Seal)

_____
Business Address

_____
City, State & Zip Code

_____
Name of Local Insurance Agency

CERTIFICATES AS TO CORPORATE PRINCIPAL

I, _____, certify that I am the Secretary of the Corporation named as Principal in the within bond; that_____ who signed said bond on behalf of the principal, was then _____ of said corporation; that I know his signature, and his signature hereto is genuine; and that said bond was duly signed, sealed, and attested for and in behalf of said corporation by authority of its governing body.

_____
Secretary (Corporate Seal)

STATE OF FLORIDA)
ss
COUNTY OF)

Before me, a Notary Public duly commissioned, qualified and acting, personally appeared _____, to be well known, who being by me first duly sworn upon oath, says that he is the Attorney-in-Fact, for the _____ and that he has been authorized by _____ to execute the foregoing bond on behalf of the Contractor named therein in favor of the Owner, the _____.

Sworn and Subscribed to before me this _____day of _____,20___, A.D.

(Attach Power of Attorney
to original Bid Bond)

_____
Notary Public State of Florida at Large
My Commission Expires:

END OF SECTION

CONTRACT FOR CONSTRUCTION

THIS IS A CONTRACT, by and between INDIAN CREEK VILLAGE, FLORIDA, a municipal corporation of the State of Florida, (hereinafter referred to as "Village"), and _____, a corporation, _____ (hereinafter referred to as "Contractor")

W I T N E S S E T H, that Contractor and Village, for the considerations hereinafter named, agree as follows:

ARTICLE 1

SCOPE OF WORK

1.1 Contractor hereby agrees to furnish all of the labor, materials, equipment, services and incidentals necessary to perform all of the Work described in the Contract Documents including Plans, Specifications and Addenda thereto for the following Project:

ROADWAY REDEVELOPMENT PROJECT
Indian Creek Village, Florida

as described in the Plans prepared by STANTEC CONSULITNG SERVICES INC. ("STANTEC") (the "Village's Project Engineer").

ARTICLE 2

CONTRACT TIME

2.1 Contractor shall be instructed to commence the Work by written instructions in the form of a Notice to Proceed issued by the Village Manager. The Notice to Proceed will not be issued until Contractor's submission to Village of all required documents and after execution of this Contract.

2.2 Time is of the essence throughout this Contract. The Contractor shall prosecute the work with faithfulness and diligence and the Base Bid Work shall be substantially completed within Five Hundred Forty (540) calendar days from the date specified in the Notice to Proceed. The Work shall be completed and ready for final payment in accordance with Article 3 within sixty (60) calendar days from the date certified by Village's Project Engineer as the date of Substantial Completion.

2.3 Upon failure of Contractor to substantially complete the Contract within the specified period of time, Contractor shall pay to Village the sum of One Thousand Dollars ($1,000.00) for each calendar day after the time specified in Section 2.2 above for Substantial Completion. After Substantial Completion, should Contractor fail to complete the remaining Work within the time

specified in Section 2.2 above for completion and readiness for final payment, Contractor shall pay to Village the sum of Five Hundred Dollars ($500.00) for each calendar day after the time specified in Section 2.2 for completion and readiness for final payment. These amounts are not penalties but are liquidated damages to Village for its inability to obtain full beneficial occupancy and use of the Project. Liquidated damages are hereby fixed and agreed upon between the parties, recognizing the impossibility of precisely ascertaining the amount of damages that will be sustained by Village as a consequence of such delay, and both parties desiring to obviate any question or dispute concerning the amount of said damages and the cost and effect of the failure of Contractor to complete the Contract on time. The above-stated liquidated damages shall apply separately to each phase of the Project for which a time for substantial and/or final completion is given.

2.4 Village is authorized to deduct the liquidated damages from monies due to Contractor for the Work under this Contract.

ARTICLE 3

CONTRACT PRICE

_____

_____

_____

3.1 Village shall pay to Contractor for the performance of the Contract, the total lump sum of ($ _____), subject to the conditions, limitations and restrictions of Sections 3.4 and 3.5 herein. This price shall be full compensation for all costs, including overhead and profit, associated with completion of all the Work in full conformity with the requirements as stated or shown, or both, in the Plans and Specifications.

3.2 The sum set forth in Paragraph 3.1 shall constitute the Contract Price which shall not be modified except by any Change Order issued by Village or as otherwise specified herein.

3.3 The Contract Price may be adjusted by Village pursuant to Article 12 of the General Conditions.

ARTICLE 4

CONTRACT DOCUMENTS

4.1 The Contract Documents which comprise the entire agreement between the Village and the Contractor concerning the Work consist of this Contract for Construction, the Drawings, Plans and Specifications, the Invitation for Bids, the Addenda, the Bid, Instructions to Bidders, the General and Supplementary Conditions, the Performance Bond and Payment Bond, Insurance Certificates, the Notice of Award, the Notice to Proceed, any Change Orders and any other Contract Documents, not specifically listed herein which shall be considered incorporated into and made a part of this Contract by this reference and shall govern this Project. Contractor is reminded and hereby recognizes that all Work under this contract must comply with

applicable governmental regulations. Any mandatory clauses which are required by such regulations shall be deemed to be incorporated herein immediately upon Village's written request.

4.2 This document incorporates and includes all prior negotiations, correspondence, conversations, agreements, or understandings applicable to the matters contained herein and the parties agree that there are no commitments, agreements, or understandings concerning the subject matter of these Contract Documents that are not contained herein. Accordingly it is agreed that no deviation from the terms hereof shall be predicated upon any prior representations or agreements, whether oral or written.

4.3 The Contract Documents shall remain the property of the Village. The Contractor shall have the right to keep one record set of the Contract Documents upon completion of the Project; provided; however, that in no event shall the Contractor use, or permit to be used, any or all of such Contract Documents on other Projects without the Village's prior written authorization.

ARTICLE 5

WAIVER OF JURY TRIAL

Village and Contractor knowingly, irrevocably, voluntarily and intentionally waive any right either may have to a trial by jury in State and or Federal court proceedings in respect to any action, proceeding, lawsuit or counterclaim based upon the Contract for Construction, arising out of, under, or in connection with the Construction of the Work, or any course of conduct, course of dealing, statements or actions or inactions of any party.

ARTICLE 6

ASSIGNMENT

Neither party shall assign the Contract or any sub-contract in whole or in part without the written consent of the other, nor shall Contractor assign any monies due or to become due to it hereunder, without the previous written consent of the Village Manager.

ARTICLE 7

MISCELLANEOUS

Insurance Requirements

7.1 Contractor shall provide and maintain in force until all the Work to be performed under this Contract has been completed and accepted by Village (or for such duration as is otherwise specified hereinafter), the insurance coverages set forth in the Contract Documents.

7.2 **Village's Right To Terminate Contract**

7.2.1 If Contractor fails to timely begin the Work, or fails to perform the Work with sufficient workers and equipment or with sufficient materials to insure the prompt completion of the Work, or shall perform the Work unsuitably, or cause it to be rejected as defective and unsuitable, or shall discontinue the prosecution of the Work pursuant to the accepted schedule or if the Contractor shall fail to perform any material term set forth in the Contract Documents or if Contractor shall become insolvent or be declared bankrupt, or commit any act of bankruptcy or insolvency, or shall make an assignment for the benefit of creditors, or from any other cause whatsoever shall not carry on the Work in an acceptable manner, Village may, upon seven (7) days written Notice of Termination, terminate the services of Contractor, exclude Contractor from the Project site and take the prosecution of the Work out of the hands of Contractor, and use any or all materials on the Project site which have been paid for by the Village, as may be suitable and acceptable and may finish the Work by whatever methods it may deem expedient. In such case Contractor shall not be entitled to receive any further payment until the Project is completed. All damages, costs and charges incurred by Village, together with the costs of completing the Project, shall be deducted from any monies due or which may become due to Contractor. In case the damages and expenses so incurred by Village shall exceed the unpaid balance, then Contractor shall be liable and shall pay to Village the amount of said excess.

7.3 **Contractor to Check Plans, Specifications and Data:**

Contractor shall verify all dimensions, quantities and details shown on the plans, specifications or other data received from Village's Project Engineer, and shall notify Village's Project Engineer in writing of all errors, omissions and discrepancies found therein within three (3) calendar days of discovery and Village's Project Engineer will promptly review the same. Any Work done after such discovery, but prior to written authorization of the Village's Project Engineer, will be done at the Contractor's sole risk.

7.4 **Contractor's Responsibility for Damages and Accidents:**

7.4.1 Contractor shall accept full responsibility for the Work against all loss or damage of any nature sustained until final acceptance by Village and shall promptly repair any damage done from any cause.

7.4.2 Contractor shall be responsible for all materials, equipment and supplies pertaining to the Project. In the event any such materials, equipment and supplies are lost, stolen, damaged or destroyed prior to final acceptance by Village, Contractor shall replace same without cost to Village.

7.5 **Defective Work/Guarantee:**

7.5.1 Village shall have the authority to reject or disapprove Work which the Village finds to be defective. If required by the Village, Contractor shall promptly either correct all defective Work or remove such defective Work and replace it with non-defective Work. Contractor shall bear all direct, indirect and consequential costs of such removal or corrections including cost of testing laboratories and personnel.

7.5.2 Should Contractor fail or refuse to remove or correct any defective Work or to make any necessary repairs in accordance with the requirements of the Contract Documents within the time indicated in writing by Village's Project Consultant, Village shall have the authority to cause the defective Work to be removed or corrected, or make such repairs as may be necessary at Contractor's expense. Any expense incurred by Village in making such removals, corrections or repairs, shall be paid for out of any monies due or which may become due to Contractor. In the event of failure of Contractor to make all necessary repairs promptly and fully, Village may declare Contractor in default.

7.5.3 The Contractor shall unconditionally guarantee all materials and equipment furnished and Work performed for a period of one (1) year from the date of substantial completion. If, within one (1) year after the date of substantial completion, any of the Work is found to be defective or not in accordance with the Contract Documents, Contractor, after receipt of written notice from Village, shall promptly correct such defective or nonconforming Work within the time specified by Village without cost to Village. Nothing contained herein shall be construed to establish a period of limitation with respect to any other obligation which Contractor might have under the Contract Documents including but not limited to any claim regarding latent defects.

7.5.4 Failure to reject any defective Work or material shall not in any way prevent later rejection when such defect is discovered.

7.6 **Legal Restrictions and Traffic Provisions:**

Contractor shall conform to and obey all applicable laws, regulations, or ordinances with regard to labor employed, hours of Work and Contractor's general operations. Contractor shall conduct its operations so as not to interfere with or close any thoroughfare, except as provided for in the Contract Documents, without the written consent of the proper authorities.

7.7 **Examination and Retention of Contractor's Records**

7.7.1 The Village or any of their duly authorized representatives shall, until 3 years after final payment under this contract, have access to and the right to examine any of the Contractor's books, ledgers, documents, papers, or other records involving transactions related to this contract for the purpose of making audit, examination, excerpts, and transcriptions.

7.7.2 The Contractor agrees to include in first-tier subcontracts under this contract a clause substantially the same as subparagraph 7.7.1 above. "Subcontract," as used in this clause, excludes purchase orders not exceeding $10,000.

7.7.3 The right to access and examination of records in subparagraph 7.7.1 shall continue until disposition of any mediation, claims, litigation or appeals.

7.7.4 IF THE CONTRACTOR HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO THE CONTRACTOR'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS CONTRACT, CONTACT THE CUSTODIAN OF PUBLIC RECORDS AT 305-865-4121, mlima@icvps.org, 9080 Drive, Indian Creek FL, 33154.

The contractor shall:

1. Keep and maintain public records required by the public agency to perform the service.
2. Upon request from the Village custodian of public records, provide the Village with a copy of the requested records or allow the records to be inspected or copied within a reasonable time at a cost that does not exceed the cost provided in Chapter 119.0701 of The Florida Statutes or as otherwise provided by law.
3. Ensure that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law for the duration of the contract term and following completion of the contract if the contractor does not transfer the records to the public agency.
4. Upon completion of the contract, transfer, at no cost, to the public agency all public records in possession of the contractor or keep and maintain public records required by the public agency to perform the service. If the contractor transfers all public records to the public agency upon completion of the contract, the contractor shall destroy any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements. If the contractor keeps and maintains public records upon completion of the contract, the contractor shall meet all applicable requirements for retaining public records. All records stored electronically must be provided to the public agency, upon request from the public agency's custodian of public records, in a format that is compatible with the information technology systems of the public agency.

7.8 **No Damages for Delay:**

No claim for damages or any claim, other than for an extension of time shall be made or asserted against Village by reason of any delays. Contractor shall not be entitled to an increase in the Contract Price or payment or compensation of any kind from Village for direct, indirect, consequential, impact or other costs, expenses or damages, including but not limited to, costs of acceleration or inefficiency, arising because of delay, disruption, interference or hindrance from any cause whatsoever, whether such delay, disruption, interference or hindrance be reasonable or unreasonable, foreseeable or unforeseeable, or avoidable or unavoidable. Contractor shall be entitled only to extensions of the Contract Time as the sole and exclusive remedy for such resulting delay. Notwithstanding the above,

and in accordance with the requirements of Article 12 of the General Conditions, the Contractor shall be granted an extension of time and suspension of liquidated damages for any delay beyond the control of the Contractor. Should any delay, disruption, interference or hindrance be caused by the Village, for a continuous period or cumulative period of thirty (30) days, the Contractor may terminate the Contract upon seven days written notice to the Village.

7.9 **Public Entity Crimes Affidavit**

Contractor shall comply with Section 287.133, Florida Statutes, (Public Entity Crimes Statute) notification of which is hereby incorporated herein by reference, including execution of any required affidavit.

7.10 **Indemnification**

Contractor shall indemnify and hold harmless Village, Village's officers and employees and Village's Project Engineer and its officers and employees, from liabilities, damages, losses and costs, including, but not limited to, reasonable attorney's fees, to the extent caused by the negligence, recklessness or intentional wrongful conduct of Contractor and persons employed or utilized by Contractor in the performance of the Agreement.

7.11 **Capitalized Terms**

Capitalized terms shall have their plain meaning as indicated herein.

7.12 **Independent Contractor**

The Contractor is an independent contractor under the Contract. Services provided by the Contractor shall be by employees of the Contractor and subject to supervision by the Contractor, and not as officers, employees, or agents of the Village. Personnel policies, tax responsibilities, social security and health insurance, employee benefits, purchasing policies and other similar administrative procedures, applicable to services rendered under the Contract shall be those of the Contractor.

7.13 **Payment to Sub-Contractors**

Certification of Payment to Subcontractors: The term “subcontractor”, as used herein, includes persons or firms furnishing materials or equipment incorporated into the work or stockpiled for which the Village made partial payment and firms working under equipment-rental agreements. The Contractor is required to pay all subcontractors for satisfactory performance of their Contracts before the Village will make a further progress (partial) payment. The Contractor shall also return all retainage withheld to the subcontractors within 30 days after the subcontractor’s work is satisfactorily complete, as

determined by the Village. Prior to receipt of any progress (partial) payment, the prime contractor shall certify that all subcontractors having an interest in the Contract were paid for satisfactory performance of their Contracts and that the retainage is returned to subcontractors within 30 days after satisfactory completion of the subcontractor's work. Contractor shall provide this certification in the form designated by the Village.

The Village will not make any progress payments after the initial partial payment until the Contractor completes the Equal Opportunity monthly report, unless the Contractor demonstrates good cause for not making any required payment and furnishes written notification of any such good cause to both the Village and the affected subcontractors and suppliers.

Within 30 days of the Contractor's receipt of the final progress payment or any other payments thereafter, except the final payment, the Contractor shall pay all subcontractors and suppliers having an interest in the Contract for all work completed and materials furnished. The Village will honor an exception to the above when the Contractor demonstrates good cause for not making any required payment and furnishes suppliers within said 30-day period.

IN WITNESS WHEREOF, the parties hereto have made and executed this Agreement on the respective dates under each signature: INDIAN CREEK VILLAGE, FLORIDA, signing by and through its Village Manager authorized to execute same by Council action on the_____ Day_____of_____2020, and signing by and through_____, duly authorized to execute same.

ATTEST:

_____
Village Clerk

INDIAN CREEK VILLAGE, FLORIDA

By: _____
Village Manager

APPROVED AS TO FORM
AND LEGAL SUFFICIENCY:

By:_____
Village Attorney

This_____day of_____,2020.

CONTRACTOR MUST EXECUTE THIS CONTRACT AS INDICATED BELOW. USE CORPORATION FORMAT, AS APPLICABLE.

CONTRACTOR

ATTEST:

_____

_____ By:_____
(Secretary) (Signature and Title)

(Corporate Seal)

_____
(Type Name/Title signed above)

This_____day of_____, 2020 .

SECTION 00610

PERFORMANCE BOND

STATE OF FLORIDA)
ss
COUNTY OF)

KNOW ALL MEN BY THESE PRESENTS, that _____ as Principal, hereinafter called Contractor, and _____as Surety, hereinafter called Surety, are held and firmly bound unto the Indian Creek Village , as Obligee, hereinafter called Owner, in the amount of _____ Dollars ($_____) for the payment whereof Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, contractor has by written agreement dated_____, 20_____, entered into a Contract with Owner for:

ROADWAY REDEVELOPMENT PROJECT
Indian Creek Village, Florida

in accordance with Drawings and Specifications prepared by Stantec Consulting Services Inc. which Contract is by reference made a part hereof and is hereinafter referred to as the Contract.

NOW, THEREFORE, THE CONDITIONS OF THIS OBLIGATION ARE SUCH, that, if the Principal shall in all respects promptly and faithfully perform and comply with the terms and conditions of said Contract and his obligations thereunder and shall indemnify the Owner and the Consulting Engineer and save either or all of them harmless against and from all costs, expenses and damages arising from the performance of said Contract or the repair of any work thereunder, then this obligation shall be void; otherwise, this Bond shall remain in full force and effect, in accordance with the following terms and conditions:

A. The Principal and Surety jointly and severally agree to pay the Owner any difference between the sum to which the said Principal would be entitled on the completion of the Contract, and that sum which the Owner may be obliged to pay for the completion of said work by Contract or otherwise, and any damages, direct or indirect or consequential, which the said Owner may sustain on account of such

work, or on account of the failure of said Contractor to properly and in all things, keep and execute all of the provision of said Contract.

B. And this Bond shall remain in full force and effect for a period of one (1) year from the date of acceptance of the project by the Owner and shall provide that the Contractor guarantees to repair or replace for said period of one (1) year all work performed and materials and equipment furnished that were not performed or furnished according to the terms of the Contract, and shall make good, defects thereof which have become apparent before the expiration of said period of one (1) year. If any part of the project, in the judgment of the Owner, for the reasons above stated needs to be replaced, repaired or made good during that time, the Owner shall so notify the Contractor in writing. If the Contractor refuses or neglects to do such work within five (5) days from the date of service of such Notice, the Owner shall have the work done by others and the cost thereof shall be paid by the Contractor or his Surety.

C. And the said Surety, for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract or to the work to be performed thereunder or the specifications accompanying the same shall in any way affect its obligations on this bond, and it does hereby waive Notice of any change, extension of time, alteration or addition to the terms of the Contract or to the work or to the Specifications.

D. The surety represents and warrants to the Owner that they have a Best's Key Rating Guide General Policyholder's Rating of "_____" and Financial Category of "Class _____".

IN WITNESS WHEREOF, the above bounded parties executed this instrument under their several seals, this_____ day of _____20____, A.D., 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.

WITNESS: (If Sole Ownership or Partnership, two (2) Witnesses Required).
(If Corporation, Secretary Only will attest and affix seal).

WITNESSES:

_____

_____

PRINCIPAL:

_____
Signature of Authorized Officer
(Affix Seal)

_____
Title

_____
Business Address

_____
City, State & Zip Code

WITNESSES:

_____

_____

SURETY:

_____
Corporate Surety

_____
Title

_____
Business Address

_____
City, State & Zip Code

_____
Name of Local Insurance Agency

CERTIFICATES AS TO CORPORATE PRINCIPAL

I, _____, certify that I am the Secretary of the Corporation names as Principal in the within Bond; that _____who signed the said bond on behalf of the Principal, was the _____of said Corporation; that I know his signature, and his signature hereto is genuine; and that said bond was duly signed, sealed, and attested for and in behalf of said Corporation by authority of its governing body.

_____
Secretary (Corporate Seal)

STATE OF FLORIDA)
ss
COUNTY OF)

Before me, a Notary Public, duly commissioned, qualified and acting, personally appeared _____ to me well known, who being by me first duly sworn upon oath, says that he is the Attorney-in-Fact, for the _____

_____and that he has been authorized by _____ to execute the foregoing bond on behalf of the Contractor named therein in favor of the Indian Creek Village, Florida.

Sworn and subscribed to before me this___day of_____,20__A.D.

(Attach Power of Attorney)

_____
Notary Public - State of Florida
at Large
My Commission Expires:

END OF SECTION

SECTION 00620

PAYMENT BOND

STATE OF FLORIDA)
ss
COUNTY OF)

KNOW ALL MEN BY THESE PRESENTS, that _____ as Principal, hereinafter called Contractor, and _____ as Surety, hereinafter called Surety, are held and firmly bound unto Indian Creek Village, as Obligee, hereinafter called Owner, in the amount of _____ _____ Dollars ($_____) for the payment whereof Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, Contractor has by written agreement dated _____, 20__, entered into a Contract with Owner for:

ROADWAY REDEVELOPMENT PROJECT
Indian Creek Village, Florida

in accordance with Drawings and Specifications prepared by Stantec Inc. which Contract is by reference made a part hereof and is hereinafter referred to as the Contract.

NOW, THEREFORE, THE CONDITIONS OF THIS OBLIGATION ARE SUCH, that if the Principal shall promptly make payment to all claimants, as herein below defined, then this obligation shall be void; otherwise, this Bond shall remain in full force and effect, subject to the following terms and conditions:

A. A claimant is defined as any person supplying the Principal with labor, material and supplies, used directly or indirectly by the said Principal or any subcontractor in the prosecution of the work provided for in said Contract, and is further defined in Section 255.05(1) of the Florida Statutes.

B. The above named Principal and Surety hereby jointly and severally agree with the Owner that every claimant as herein defined, who has not been paid in full before the expiration of a period of ninety (90) days after performance of the labor or after complete delivery of materials and supplies by such claimant, may sue on this Bond for the use of such claimant, prosecute the suit to final judgment for such sum or sums as may be justly due claimant, and have execution thereon. The Owner shall not be liable for the payment of any costs or expenses of any such suit.

C. No suit or action shall be commenced hereunder by any claimant.

1. Unless claimant, other than one having a direct contract with the Principal, shall within forty-five (45) days after beginning to furnish labor, materials or supplies for the prosecution of the work, furnish the Principal with a notice that he intends to look to this bond for protection.

2. Unless claimant, other than one having a direct contract with the Principal, shall within ninety (90) days after such claimant's performance of the labor or complete delivery of materials and supplies, deliver to the Principal written notice of the performance of such labor or delivery of such material and supplies and the nonpayment therefore.

3. After the expiration of one (1) year from the performance of the labor or completion of delivery of the materials and supplies; it being understood, however, that if any limitation embodied in this Bond is prohibited by any law controlling the construction hereof such limitations shall be deemed to be amended so as to be equal to the minimum period of limitation permitted by such law.

4. Other than in a state court of competent jurisdiction in and for the county or other political subdivision of the state in which the project, or any part thereof, is situated, or in the United States District Court for the district in which the project, or any part thereof, is situated, and not elsewhere.

D. The Principal and the Surety jointly and severally, shall repay the Owner any sum which the Owner may be compelled to pay because of any lien for labor or materials furnished for any work included in or provided by said Contract.

E. The Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration of or addition to the terms of the Contract or to the work to be performed thereunder or the Specifications applicable thereto shall in any way affect its obligations on this Bond, and the Surety hereby waives notice of any such change, extension of time, alterations of or addition to the terms of the Contract, or to the work or to the Specifications.

F. The Surety represents and warrants to the Owner that they have a Best's Key Rating Guide General Policyholder's rating of "_____" and Financial Category of "Class _____".

IN WITNESS WHEREOF, the above bounded parties executed this instrument under their several seals, this_____ day of _____ 20____, A.D., 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.

WITNESS: (If Sole Ownership or Partnership, two (2) Witnesses Required).
(If Corporation, Secretary Only will attest and affix seal).

WITNESSES:

_____

_____

PRINCIPAL:

_____
Signature of Authorized Officer
(Affix Seal)

_____
Title

_____
Business Address

_____
City, State & Zip Code

WITNESSES:

_____

_____

SURETY:

_____
Corporate Surety

_____
Title

_____
Business Address

_____
City, State & Zip Code

_____
Name of Local Insurance Agency

CERTIFICATES AS TO CORPORATE PRINCIPAL

I, _____, certify that I am the Secretary of the Corporation named as Principal in the within Bond; that _____ who signed the said bond on behalf of the Principal, was then _____ of said Corporation; that I know his signature, and his signature hereto is genuine; and that said bond was duly signed, sealed, and attested for and in behalf of said Corporation by authority of its governing body.

_____

Corporate Seal

Secretary

STATE OF FLORIDA)
ss
COUNTY OF)

Before me, a Notary Public, duly commissioned, qualified and acting, personally appeared _____ to be well known, who being by me first duly sworn upon oath, says that he is the Attorney-in-Fact, for the _____ and that he has been authorized by _____to execute the foregoing bond on behalf of the Contractor named therein in favor of the Indian Creek Village, Florida.

Sworn and Subscribed to before me this ___ day of _____,20__ A.D.

(Attach Power of Attorney)

_____
Notary Public - State of Florida
at Large
My Commission Expires:

END OF SECTION

SECTION 00650

CERTIFICATE OF INSURANCE

THIS IS TO CERTIFY THAT THE _____
(Insurance Company)

Address _____

of _____

has issued policies of insurance, as described below and identified by a policy number, to the insured named below; and to certify that such policies are in full force and effect at this time. It is agreed that none of these policies will be canceled or changed so as to affect the interest(s) of the Indian Creek Village (hereinafter sometimes called the Owner) until thirty (30) days after written notice of such cancellation or change has been delivered to the Engineer; Sean Compel, Stantec, Inc.

Insured _____

Address _____

Status of Insured: _____ Corporation _____ Partnership _____ Individual

Location of Operations Insured _____

Description of Work:

ROADWAY REDEVELOPMENT PROJECT
Indian Creek Village, Florida

INSURANCE POLICIES IN FORCE:

Forms of Coverage	**Policy Number**	**Exp. Date**
*Workers Comp./Employers Liability	_____	_____
+Comprehensive Automobile Liability	_____	_____
oComprehensive General Liability	_____	_____
+Excess Liability	_____	_____
Other (Please specify type:_____)	_____	_____

_____

POLICY INCLUDES COVERAGE FOR:		YES	NO
1.	Additional Insured: Owner & Engineer	____	____
2.	*Liability under the United States Longshoremen's and Harbor Workers' Compensation Act.	____	____
3.	+All owned, hired, or nonowned automotive equipment used in connection with work done for the Owner.	____	____
4.	oContractual Liability	____	____
5.	oDamage caused by explosion, collapse or structural injury, and damage to underground utilities.	____	____
6.	oProducts/Completed Operations	____	____
7.	oOwners and Contractors Protective Liability	____	____
8.	oPersonal Injury Liability ____		____
9.	+Excess Liability applies excess of:	____	____
	(a) Employers Liability ____		____
	(b) Comprehensive General Liability	____	____
	(c) Comprehensive Automobile Liability	____	____

TYPES OF POLICY	FORMS OF COVERAGE	LIMITS OF LIABILITY	
Workers' Compensation	Bodily Injury	$	Statutory
Employers Liability	Bodily Injury	$_____	Each Accident
	Disease	$_____	Each Person
	Disease	$_____	Policy Limit
Comprehensive Auto Liability	Combined Single Limit BI/PD	$_____	Each Accident

Comprehensive General Liability	Bodily Injury	$_____ Each Occurrence $_____ Aggregate
	Property Damage	$_____ Each Occurrence $_____ Aggregate
	OR	
	Combined Single Limit BI/PD Occurrence	$_____ Each $_____ Aggregate
Excess Liability	Combined Single Limit BI/PD	$_____ Aggregate
Other		

The Insurance Company hereby agrees to deliver, within ten (10) days, two (2) copies of the above policies to the Engineer when so requested.

NOTE: Entries on this certificate are limited to the Authorized Agent or Insurance Company Representative.

Date_____ (SEAL)_____
Insurance Company

Issued at_____ _____
Authorized Representative

Insurance Agent or Company
-Send original and one copy to:

Stantec Consulting Services Inc.
901 Ponce De Leon Boulevard, Suite 900
Coral Gables, Florida 33134
Attention: Sean Compel, P.E., Principal in Charge

Send two (2) copies to:

Indian Creek Village
9080 Bay Drive
Indian Creek Village , Florida 33154

Attention: Jennifer Medina, Village Manager

END OF SECTION

SECTION 00660

ACKNOWLEDGEMENT OF CONFORMANCE

WITH O.S.H.A. STANDARDS

TO THE INDIAN CREEK VILLAGE:

We, _____, hereby acknowledge and agree that as Contractors for the construction of ROADWAY REDEVELOPMENT PROJECT, INDIAN CREEK VILLAGE, FLORIDA, that we have the sole responsibility for compliance with all requirements of the Federal Occupational Safety and Health Act of 1970, and all State and Local Safety and Health regulations, and agree to indemnify and hold harmless Indian Creek Village, and its Engineers, Architects and Landscape Architects against any and all legal liability or loss the Village, or the Engineer, Architect or Landscape Architect may incur due to _____ _____ failure to comply with such act.

_____ _____

ATTEST CONTRACTOR

_____ BY: _____

ATTEST NAME

_____

DATE

END OF SECTION

SECTION 00665

TRENCH SAFETY ACT COMPLIANCE

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 bids, 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 costs of compliance with the applicable trench safety standards as well as the methods of compliance:

Methods of Compliance

(fill in methods)

Total $_____

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 or safety related standards apply to the project, including but not limited to, the "Trench Safety Act."

Signature of Authorized Representative (Manual)

Name of Authorized Representative (Typed or Printed)

Sworn to and subscribed before me in the State and County first mentioned above on the day of _____, 20___.

_____ (affix seal)
Notary Public

My Commission Expires:

END OF SECTION

This document has important legal consequences; consultation with an attorney is encouraged with respect to its use or modification. This document should be adapted to the particular circumstances of the contemplated Project and the Controlling Law.

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by

ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

and

Issued and Published Jointly By

ACEC
American Council of Engineering Companies

National Society of Professional Engineers
Professional Engineers in Private Practice

ASCE American Society of Civil Engineers

PROFESSIONAL ENGINEERS IN PRIVATE PRACTICE
a practice division of the
NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS

AMERICAN COUNCIL OF ENGINEERING COMPANIES

AMERICAN SOCIETY OF CIVIL ENGINEERS

This document has been approved and endorsed by

The Associated General Contractors of America

Knowledge for Creating and Sustaining the Built Environment

Construction Specifications Institute

National Society of Professional Engineers
1420 King Street, Alexandria, VA 22314

American Council of Engineering Companies
1015 15th Street, N.W., Washington, DC 20005

American Society of Civil Engineers
1801 Alexander Bell Drive, Reston, VA 20191-4400

These General Conditions have been prepared for use with the Suggested Forms of Agreement Between Owner and Contractor Nos. C-520 or C-525 (2002 Editions). Their provisions are interrelated and a change in one may necessitate a change in the other. Comments concerning their usage are contained in the EJCDC Construction Documents, General and Instructions (No. C-001) (2002 Edition). For guidance in the preparation of Supplementary Conditions, see Guide to the Preparation of Supplementary Conditions (No. C-800) (2002 Edition).

TABLE OF CONTENTS

GENERAL CONDITIONS

ARTICLE 1 - DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

A. Wherever used in the Bidding Requirements or Contract Documents and printed with initial capital letters, the terms listed below will have the meanings indicated which are applicable to both the singular and plural thereof. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.

1. *Addenda*--Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.

2. *Agreement*--The written instrument which is evidence of the agreement between Owner and Contractor covering the Work.

3. *Application for Payment*--The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

4. *Asbestos*--Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.

5. *Bid*--The offer or proposal of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

6. *Bidder*--The individual or entity who submits a Bid directly to Owner.

7. *Bidding Documents*--The Bidding Requirements and the proposed Contract Documents (including all Addenda).

8. *Bidding Requirements*--The Advertisement or Invitation to Bid, Instructions to Bidders, bid security of acceptable form, if any, and the Bid Form with any supplements.

9. *Change Order*--A document recommended by Engineer which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Agreement.

10. *Claim*--A demand or assertion by Owner or Contractor seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.

11. *Contract*--The entire and integrated written agreement between the Owner and Contractor concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.

12. *Contract Documents*-- Those items so designated in the Agreement. Only printed or hard copies of the items listed in the Agreement are Contract Documents. Approved Shop Drawings, other Contractor's submittals, and the reports and drawings of subsurface and physical conditions are not Contract Documents.

13. *Contract Price*--The moneys payable by Owner to Contractor for completion of the Work in accordance with the Contract Documents as stated in the Agreement (subject to the provisions of Paragraph 11.03 in the case of Unit Price Work).

14. *Contract Times*--The number of days or the dates stated in the Agreement to: (i) achieve Milestones, if any, (ii) achieve Substantial Completion; and (iii) complete the Work so that it is ready for final payment as evidenced by Engineer's written recommendation of final payment.

15. *Contractor*--The individual or entity with whom Owner has entered into the Agreement.

16. *Cost of the Work*--See Paragraph 11.01.A for definition.

17. *Drawings*--That part of the Contract Documents prepared or approved by Engineer which graphically shows the scope, extent, and character of the Work to be performed by Contractor. Shop Drawings and other Contractor submittals are not Drawings as so defined.

18. *Effective Date of the Agreement*--The date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.

19. *Engineer*--The individual or entity named as such in the Agreement.

20. *Field Order*--A written order issued by Engineer which requires minor changes in the Work but which does not involve a change in the Contract Price or the Contract Times.

21. *General Requirements*--Sections of Division 1 of the Specifications. The General Requirements pertain to all sections of the Specifications.

22. *Hazardous Environmental Condition*--The presence at the Site of Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto in connection with the Work.

23. *Hazardous Waste*--The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.

24. *Laws and Regulations; Laws or Regulations*--Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

25. *Liens*--Charges, security interests, or encumbrances upon Project funds, real property, or personal property.

26. *Milestone*--A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.

27. *Notice of Award*--The written notice by Owner to the Successful Bidder stating that upon timely compliance by the Successful Bidder with the conditions precedent listed therein, Owner will sign and deliver the Agreement.

28. *Notice to Proceed*--A written notice given by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work under the Contract Documents.

29. *Owner*--The individual or entity with whom Contractor has entered into the Agreement and for whom the Work is to be performed.

30. *PCBs*--Polychlorinated biphenyls.

31. *Petroleum*--Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Waste and crude oils.

32. *Progress Schedule*--A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor's plan to accomplish the Work within the Contract Times.

33. *Project*--The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part.

34. *Project Manual*--The bound documentary information prepared for bidding and constructing the Work. A listing of the contents of the Project Manual, which may be bound in one or more volumes, is contained in the table(s) of contents.

35. *Radioactive Material*--Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.

36. *Related Entity* -- An officer, director, partner, employee, agent, consultant, or subcontractor.

37. *Resident Project Representative*--The authorized representative of Engineer who may be assigned to the Site or any part thereof.

38. *Samples*--Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.

39. *Schedule of Submittals*--A schedule, prepared and maintained by Contractor, of required submittals and the time requirements to support scheduled performance of related construction activities.

40. *Schedule of Values*--A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

41. *Shop Drawings*--All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.

42. *Site*--Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by Owner which are designated for the use of Contractor.

43. *Specifications*--That part of the Contract Documents consisting of written requirements for materials, equipment, systems, standards and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable thereto.

44. *Subcontractor*--An individual or entity having a direct contract with Contractor or with any other

Subcontractor for the performance of a part of the Work at the Site.

45. *Substantial Completion*--The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion thereof.

46. *Successful Bidder*--The Bidder submitting a responsive Bid to whom Owner makes an award.

47. *Supplementary Conditions*--That part of the Contract Documents which amends or supplements these General Conditions.

48. *Supplier*--A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or any Subcontractor.

49. *Underground Facilities*--All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.

50. *Unit Price Work*--Work to be paid for on the basis of unit prices.

51. *Work*--The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.

52. *Work Change Directive*--A written statement to Contractor issued on or after the Effective Date of the Agreement and signed by Owner and recommended by Engineer ordering an addition, deletion, or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions under which the Work is to be performed or to emergencies. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the change ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.

1.02 *Terminology*

A. The following words or terms are not defined but, when used in the Bidding Requirements or Contract Documents, have the following meaning.

B. *Intent of Certain Terms or Adjectives*

1. The Contract Documents include the terms "as allowed," "as approved," "as ordered", "as directed" or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives "reasonable," "suitable," "acceptable," "proper," "satisfactory," or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action or determination will be solely to evaluate, in general, the Work for compliance with the requirements of and information in the Contract Documents and conformance with the design concept of the completed Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 9.09 or any other provision of the Contract Documents.

C. *Day*

1. The word "day" means a calendar day of 24 hours measured from midnight to the next midnight.

D. *Defective*

1. The word "defective," when modifying the word "Work," refers to Work that is unsatisfactory, faulty, or deficient in that it:

a. does not conform to the Contract Documents, or

b. does not meet the requirements of any applicable inspection, reference standard, test, or

approval referred to in the Contract Documents, or

c. has been damaged prior to Engineer's - recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 14.04 or 14.05).

E. *Furnish, Install, Perform, Provide*

1. The word "furnish," when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.

2. The word "install," when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.

3. The words "perform" or "provide," when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.

4. When "furnish," "install," "perform," or "provide" is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of Contractor, "provide" is implied.

F. Unless stated otherwise in the Contract Documents, words or phrases which have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2 - PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

A. When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.

B. *Evidence of Insurance:* Before any Work at the Site is started, Contractor and Owner shall each deliver to the other, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) which Contractor and Owner respectively are required to purchase and maintain in accordance with Article 5.

2.02 *Copies of Documents*

A. Owner shall furnish to Contractor up to ten printed or hard copies of the Drawings and Project Manual. Additional copies will be furnished upon request at the cost of reproduction.

2.03 *Commencement of Contract Times; Notice to Proceed*

A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Agreement or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Agreement. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement, whichever date is earlier.

2.04 *Starting the Work*

A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to the date on which the Contract Times commence to run.

2.05 *Before Starting Construction*

A. *Preliminary Schedules:* Within 10 days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), Contractor shall submit to Engineer for timely review**:**

1. a preliminary Progress Schedule; indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract Documents;

2. a preliminary Schedule of Submittals; and

3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.06 *Preconstruction Conference*

A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.05.A, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, and maintaining required records.

2.07 *Initial Acceptance of Schedules*

A. At least 10 days before submission of the first Application for Payment a conference attended by Contractor, Engineer, and others as appropriate will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.05.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.

1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work nor interfere with or relieve Contractor from Contractor's full responsibility therefor.

2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.

3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to component parts of the Work.

ARTICLE 3 - CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

3.01 *Intent*

A. The Contract Documents are complementary; what is required by one is as binding as if required by all.

B. It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents. Any labor, documentation, services, materials, or equipment that may reasonably be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the intended result will be provided whether or not specifically called for at no additional cost to Owner.

C. Clarifications and interpretations of the Contract Documents shall be issued by Engineer as provided in Article 9.

3.02 *Reference Standards*

A. Standards, Specifications, Codes, Laws, and Regulations

1. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.

2. No provision of any such standard, specification, manual or code, or any instruction of a Supplier shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees from those set forth in the Contract Documents. No such provision or instruction shall be effective to assign to Owner, or Engineer, or any of, their Related Entities, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

3.03 *Reporting and Resolving Discrepancies*

A. Reporting Discrepancies

1. *Contractor's Review of Contract Documents Before Starting Work*: Before undertaking each part of the Work, Contractor shall carefully study and compare the Contract Documents and check and verify pertinent figures therein and all applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy which Contractor may discover and shall obtain a written interpretation or clarification from Engineer before proceeding with any Work affected thereby.

2. *Contractor's Review of Contract Documents During Performance of Work*: If, during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents or between the Contract Documents and any provision of any Law or Regulation applicable to the performance of the Work or of any standard, specification, manual or code, or of any instruction of any Supplier, Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 6.16.A) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in Paragraph 3.04.

3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor knew or reasonably should have known thereof.

B. Resolving Discrepancies

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and:

a. the provisions of any standard, specification, manual, code, or instruction (whether or not specifically incorporated by reference in the Contract Documents); or

b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Amending and Supplementing Contract Documents*

A. The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof by either a Change Order or a Work Change Directive.

B. The requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, by one or more of the following ways:

1. A Field Order;

2. Engineer's approval of a Shop Drawing or Sample; (Subject to the provisions of Paragraph 6.17.D.3); or

3. Engineer's written interpretation or clarification.

3.05 *Reuse of Documents*

A. Contractor and any Subcontractor or Supplier or other individual or entity performing or furnishing all of the Work under a direct or indirect contract with Contractor, shall not:

1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or Engineer's consultants, including electronic media editions; or

2. reuse any of such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaption by Engineer.

B. The prohibition of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

3.06 *Electronic Data*

A. Copies of data furnished by Owner or Engineer to Contractor or Contractor to Owner or Engineer that may be relied upon are limited to the printed copies (also known as hard copies). Files in electronic media format of text, data, graphics, or other types are furnished only for the convenience of the receiving party. Any conclusion or information obtained or derived from such electronic files will be at the user's sole risk. If there is a discrepancy between the electronic files and the hard copies, the hard copies govern.

B. Because data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the party receiving electronic files agrees that it will perform acceptance tests or procedures within 60 days, after which the receiving party shall be deemed to have accepted the data thus transferred. Any errors detected within the 60-day acceptance period will be corrected by the transferring party..

C. When transferring documents in electronic media format, the transferring party makes no representations as to long term compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by the data's creator.

ARTICLE 4 - AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS; REFERENCE POINTS

4.01 *Availability of Lands*

A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work. Owner will obtain in a timely manner and pay for easements for permanent structures or permanent changes in existing facilities. If Contractor and Owner are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, as a result of any delay in Owner's furnishing the Site or a part thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which the Work is to be performed and Owner's interest therein as

necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.

C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

4.02 *Subsurface and Physical Conditions*

A. *Reports and Drawings:* The Supplementary Conditions identify:

1. those reports of explorations and tests of subsurface conditions at or contiguous to the Site that Engineer has used in preparing the Contract Documents; and

2. those drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) that Engineer has used in preparing the Contract Documents.

B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the general accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their Related Entities with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or

3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions, or information.

4.03 *Differing Subsurface or Physical Conditions*

A. *Notice:* If Contractor believes that any subsurface or physical condition at or contiguous to the Site that is uncovered or revealed either:

1. is of such a nature as to establish that any "technical data" on which Contractor is entitled to rely as provided in Paragraph 4.02 is materially inaccurate; or

2. is of such a nature as to require a change in the Contract Documents; or

3. differs materially from that shown or indicated in the Contract Documents; or

4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

B. *Engineer's Review*: After receipt of written notice as required by Paragraph 4.03.A, Engineer will promptly review the pertinent condition, determine the necessity of Owner's obtaining additional exploration or tests with respect thereto, and advise Owner in writing (with a copy to Contractor) of Engineer's findings and conclusions.

C. Possible Price and Times Adjustments

1. The Contract Price or the Contract Times, or both, will be equitably adjusted to the extent that the existence of such differing subsurface or physical condition causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

a. such condition must meet any one or more of the categories described in Paragraph 4.03.A; and

b. with respect to Work that is paid for on a Unit Price Basis, any adjustment in Contract Price will be subject to the provisions of Paragraphs 9.07 and 11.03.

2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times if:

a. Contractor knew of the existence of such conditions at the time Contractor made a final commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract; or

b. the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous

areas required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such final commitment; or

c. Contractor failed to give the written notice as required by Paragraph 4.03.A.

3. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefor as provided in Paragraph 10.05. However, Owner and Engineer, and any of their Related Entities shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

4.04 *Underground Facilities*

A. *Shown or Indicated:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:

1. Owner and Engineer shall not be responsible for the accuracy or completeness of any such information or data; and

2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:

a. reviewing and checking all such information and data,

b. locating all Underground Facilities shown or indicated in the Contract Documents,

c. coordination of the Work with the owners of such Underground Facilities, including Owner, during construction, and

d. the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.

B. *Not Shown or Indicated*

1. If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated, or not shown or indicated with reasonable accuracy in the Contract Documents, Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer. Engineer will promptly review the Underground Facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence or location of the Underground Facility. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

2. If Engineer concludes that a change in the Contract Documents is required, a Work Change Directive or a Change Order will be issued to reflect and document such consequences. An equitable adjustment shall be made in the Contract Price or Contract Times, or both, to the extent that they are attributable to the existence or location of any Underground Facility that was not shown or indicated or not shown or indicated with reasonable accuracy in the Contract Documents and that Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment in Contract Price or Contract Times, Owner or Contractor may make a Claim therefor as provided in Paragraph 10.05.

4.05 *Reference Points*

A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.06 *Hazardous Environmental Condition at Site*

A. *Reports and Drawings:* Reference is made to the Supplementary Conditions for the identification of those reports and drawings relating to a Hazardous Environmental Condition identified at the Site, if any, that have been utilized by the Engineer in the preparation of the Contract Documents.

B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the general accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified

in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their Related Entities with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or

3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions or information.

C. Contractor shall not be responsible for any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work. Contractor shall be responsible for a Hazardous Environmental Condition created with any materials brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible.

D. If Contractor encounters a Hazardous Environmental Condition or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, Contractor shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 6.16.A); and (iii) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any.

E. Contractor shall not be required to resume Work in connection with such condition or in any affected area until after Owner has obtained any required permits related thereto and delivered to Contractor written notice: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work; or (ii) specifying any special conditions under which such Work may be resumed safely. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, either party may make a Claim therefor as provided in Paragraph 10.05.

F. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim therefor as provided in Paragraph 10.05. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 7.

G. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition: (i) was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be included within the scope of the Work, and (ii) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06. G shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

H. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.H shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

I. The provisions of Paragraphs 4.02, 4.03, and 4.04 do not apply to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 5 - BONDS AND INSURANCE

5.01 *Performance, Payment, and Other Bonds*

A. Contractor shall furnish performance and payment bonds, each in an amount at least equal to the

Contract Price as security for the faithful performance and payment of all of Contractor's obligations under the Contract Documents. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 13.07, whichever is later, except as provided otherwise by Laws or Regulations or by the Contract Documents. Contractor shall also furnish such other bonds as are required by the Contract Documents.

B. All bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All bonds signed by an agent must be accompanied by a certified copy of the agent's authority to act.

C. If the surety on any bond furnished by Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of Paragraph 5.01.B, Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the requirements of Paragraphs 5.01.B and 5.02.

5.02 *Licensed Sureties and Insurers*

A. All bonds and insurance required by the Contract Documents to be purchased and maintained by Owner or Contractor shall be obtained from surety or insurance companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds or insurance policies for the limits and coverages so required. Such surety and insurance companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary Conditions.

5.03 *Certificates of Insurance*

A. Contractor shall deliver to Owner, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Owner or any other additional insured) which Contractor is required to purchase and maintain.

B. Owner shall deliver to Contractor, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Contractor or any other additional insured) which Owner is required to purchase and maintain.

5.04 *Contractor's Liability Insurance*

A. Contractor shall purchase and maintain such liability and other insurance as is appropriate for the Work being performed and as will provide protection from claims set forth below which may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable:

1. claims under workers' compensation, disability benefits, and other similar employee benefit acts;

2. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees;

3. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees;

4. claims for damages insured by reasonably available personal injury liability coverage which are sustained:

a. by any person as a result of an offense directly or indirectly related to the employment of such person by Contractor, or

b. by any other person for any other reason;

5. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom; and

6. claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.

B. The policies of insurance required by this Paragraph 5.04 shall:

1. with respect to insurance required by Paragraphs 5.04.A.3 through 5.04.A.6 inclusive, include as additional insured (subject to any customary exclusion regarding professional liability) Owner and Engineer, and any other individuals or entities identified in the Supplementary Conditions, all of whom shall be listed as additional insureds, and include coverage for the respective officers, directors, partners, employees, agents, consultants and subcontractors of each and any of all such additional insureds, and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby;

2. include at least the specific coverages and be written for not less than the limits of liability provided in the Supplementary Conditions or required by Laws or Regulations, whichever is greater;

3. include completed operations insurance;

4. include contractual liability insurance covering Contractor's indemnity obligations under Paragraphs 6.11 and 6.20;

5. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other additional insured identified in the Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by the Contractor pursuant to Paragraph 5.03 will so provide);

6. remain in effect at least until final payment and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work in accordance with Paragraph 13.07; and

7. with respect to completed operations insurance, and any insurance coverage written on a claims-made basis, remain in effect for at least two years after final payment.

a. Contractor shall furnish Owner and each other additional insured identified in the Supplementary Conditions, to whom a certificate of insurance has been issued, evidence satisfactory to Owner and any such additional insured of continuation of such insurance at final payment and one year thereafter.

5.05 *Owner's Liability Insurance*

A. In addition to the insurance required to be provided by Contractor under Paragraph 5.04, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.

5.06 *Property Insurance*

A. Unless otherwise provided in the Supplementary Conditions, Owner shall purchase and maintain property insurance upon the Work at the Site in the amount of the full replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:

1. include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured;

2. be written on a Builder's Risk "all-risk" or open peril or special causes of loss policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, false work, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage, (other than caused by flood) and such other perils or causes of loss as may be specifically required by the Supplementary Conditions;

3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);

4. cover materials and equipment stored at the Site or at another location that was agreed to in writing by Owner prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by Engineer;

5. allow for partial utilization of the Work by Owner;

6. include testing and startup; and

7. be maintained in effect until final payment is made unless otherwise agreed to in writing by Owner, Contractor, and Engineer with 30 days written notice to each other additional insured to whom a certificate of insurance has been issued.

B. Owner shall purchase and maintain such boiler and machinery insurance or additional property insurance as may be required by the Supplementary Conditions or Laws and Regulations which will include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured.

C. All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with Paragraph 5.06 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other additional insured to whom a certificate of insurance has been issued and will contain waiver provisions in accordance with Paragraph 5.07.

D. Owner shall not be responsible for purchasing and maintaining any property insurance specified in this Paragraph 5.06 to protect the interests of Contractor, Subcontractors, or others in the Work to the extent of any deductible amounts that are identified in the Supplementary Conditions. The risk of loss within such identified deductible amount will be borne by Contractor, Subcontractors, or others suffering any such loss, and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.

E. If Contractor requests in writing that other special insurance be included in the property insurance policies provided under Paragraph 5.06, Owner shall, if possible, include such insurance, and the cost thereof will be charged to Contractor by appropriate Change Order. Prior to commencement of the Work at the Site, Owner shall in writing advise Contractor whether or not such other insurance has been procured by Owner.

5.07 *Waiver of Rights*

A. Owner and Contractor intend that all policies purchased in accordance with Paragraph 5.06 will protect Owner, Contractor, Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds (and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them) in such policies and will provide primary coverage for all losses and damages caused by the perils or causes of loss covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any of the insureds or additional insureds thereunder. Owner and Contractor waive all rights against each other and their respective officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them for all losses and damages caused by, arising out of or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insured or additional insured (and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them) under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner as trustee or otherwise payable under any policy so issued.

B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them for:

1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and

2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial utilization pursuant to Paragraph 14.05, after Substantial Completion pursuant to Paragraph 14.04, or after final payment pursuant to Paragraph 14.07.

C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 5.07.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them.

5.08 *Receipt and Application of Insurance Proceeds*

A. Any insured loss under the policies of insurance required by Paragraph 5.06 will be adjusted with Owner and made payable to Owner as fiduciary for the insureds, as their interests may appear, subject to the requirements of any applicable mortgage clause and of Paragraph 5.08.B. Owner shall deposit in a separate account any money so received and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof, and the Work and the cost thereof covered by an appropriate Change Order .

B. Owner as fiduciary shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within 15 days after the occurrence of loss to Owner's exercise of this power. If such objection be made, Owner as fiduciary shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If no such agreement among the parties in interest is reached, Owner as fiduciary shall adjust and settle the loss with the insurers and, if required in writing by any party in interest, Owner as fiduciary shall give bond for the proper performance of such duties.

5.09 *Acceptance of Bonds and Insurance; Option to Replace*

A. If either Owner or Contractor has any objection to the coverage afforded by or other provisions of the bonds or insurance required to be purchased and maintained by the other party in accordance with Article 5 on the basis of non-conformance with the Contract

Documents, the objecting party shall so notify the other party in writing within 10 days after receipt of the certificates (or other evidence requested) required by Paragraph 2.01.B. Owner and Contractor shall each provide to the other such additional information in respect of insurance provided as the other may reasonably request. If either party does not purchase or maintain all of the bonds and insurance required of such party by the Contract Documents, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage. Without prejudice to any other right or remedy, the other party may elect to obtain equivalent bonds or insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and a Change Order shall be issued to adjust the Contract Price accordingly.

5.10 *Partial Utilization, Acknowledgment of Property Insurer*

A. If Owner finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 14.05, no such use or occupancy shall commence before the insurers providing the property insurance pursuant to Paragraph 5.06 have acknowledged notice thereof and in writing effected any changes in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but the property insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy.

ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES

6.01 *Supervision and Superintendence*

A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction. Contractor shall not be responsible for the negligence of Owner or Engineer in the design or specification of a specific means, method, technique, sequence, or procedure of construction which is shown or indicated in and expressly required by the Contract Documents.

B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances. The superintendent will be Contractor's representative at the Site and shall have authority to act on behalf of Contractor. All communications given to or received from the superintendent shall be binding on Contractor.

6.02 *Labor; Working Hours*

A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.

B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours. Contractor will not permit the performance of Work on a Saturday, Sunday, or any legal holiday without Owner's written consent (which will not be unreasonably withheld) given after prior written notice to Engineer.

6.03 *Services, Materials, and Equipment*

A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start-up, and completion of the Work.

B. All materials and equipment incorporated into the Work shall be as specified or, if not specified, shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.

C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

6.04 *Progress Schedule*

A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.07 as it may be adjusted from time to time as provided below.

1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.07) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times. Such adjustments will comply with any provisions of the General Requirements applicable thereto.

2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 12. Adjustments in Contract Times may only be made by a Change Order.

6.05 *Substitutes and "Or-Equals"*

A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or-equal" item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to Engineer for review under the circumstances described below.

1. *"Or-Equal" Items:* If in Engineer's sole discretion an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by Engineer as an "or-equal" item, in which case review and approval of the proposed item may, in Engineer's sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this Paragraph 6.05.A.1, a proposed item of material or equipment will be considered functionally equal to an item so named if:

a. in the exercise of reasonable judgment Engineer determines that:

1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;

2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole,

3) it has a proven record of performance and availability of responsive service; and

b. Contractor certifies that, if approved and incorporated into the Work:

1) there will be no increase in cost to the Owner or increase in Contract Times, and

2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.

2. Substitute Items

a. If in Engineer's sole discretion an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item under Paragraph 6.05.A.1, it will be considered a proposed substitute item.

b. Contractor shall submit sufficient information as provided below to allow Engineer to determine that the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. Requests for review of proposed substitute items of material or equipment will not be accepted by Engineer from anyone other than Contractor.

c. The requirements for review by Engineer will be as set forth in Paragraph 6.05.A.2.d, as supplemented in the General Requirements and as Engineer may decide is appropriate under the circumstances.

d. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:

1) shall certify that the proposed substitute item will:

a) perform adequately the functions and achieve the results called for by the general design,

b) be similar in substance to that specified, and

c) be suited to the same use as that specified;

2) will state:

a) the extent, if any, to which the use of the proposed substitute item will prejudice Contractor's achievement of Substantial Completion on time;

b) whether or not use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item; and

c) whether or not incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty;

3) will identify:

a) all variations of the proposed substitute item from that specified , and

b) available engineering, sales, maintenance, repair, and replacement services;

4) and shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change,

B. *Substitute Construction Methods or Procedures:* If a specific means, method, technique, sequence, or procedure of construction is expressly required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by Engineer. Contractor shall submit sufficient information to allow Engineer, in Engineer's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The requirements for review by Engineer will be similar to those provided in Paragraph 6.05.A.2.

C. *Engineer's Evaluation:* Engineer will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to Paragraphs 6.05.A and 6.05.B. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No "or equal" or substitute will be ordered, installed or utilized until Engineer's review is complete, which will be evidenced by either a Change Order for a substitute or an approved Shop Drawing for an "or equal." Engineer will advise Contractor in writing of any negative determination.

D. *Special Guarantee:* Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.

E. *Engineer's Cost Reimbursement*: Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor pursuant to Paragraphs 6.05.A.2 and 6.05.B Whether or not Engineer approves a substitute item so proposed or submitted by Contractor, Contractor shall reimburse Owner for the charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.

F. *Contractor's Expense*: Contractor shall provide all data in support of any proposed substitute or "or-equal" at Contractor's expense.

6.06 *Concerning Subcontractors, Suppliers, and Others*

A. Contractor shall not employ any Subcontractor, Supplier, or other individual or entity (including those acceptable to Owner as indicated in Paragraph 6.06.B), whether initially or as a replacement, against whom Owner may have reasonable objection. Contractor shall not be required to employ any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against whom Contractor has reasonable objection.

B. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, or other individuals or entities to be submitted to Owner in advance for acceptance by Owner by a specified date prior to the Effective Date of the Agreement, and if Contractor has submitted a list thereof in accordance with the Supplementary Conditions, Owner's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor, Supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued . No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of any right of Owner or Engineer to reject defective Work.

C. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions. Nothing in the Contract Documents:

1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier or other individual or entity, nor

2. shall anything in the Contract Documents create any obligation on the part of Owner or Engineer to pay or to see to the payment of any moneys due any such Subcontractor, Supplier, or other individual

or entity except as may otherwise be required by Laws and Regulations.

D. Contractor shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with Contractor.

E. Contractor shall require all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with Engineer through Contractor.

F. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.

G. All Work performed for Contractor by a Subcontractor or Supplier will be pursuant to an appropriate agreement between Contractor and the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer. Whenever any such agreement is with a Subcontractor or Supplier who is listed as an additional insured on the property insurance provided in Paragraph 5.06, the agreement between the Contractor and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against Owner, Contractor, and Engineer,, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds (and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them) for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, Contractor will obtain the same.

6.07 *Patent Fees and Royalties*

A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if to the actual knowledge of Owner or Engineer its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.

B. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

6.08 *Permits*

A. Unless otherwise provided in the Supplementary Conditions, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of opening of Bids, or, if there are no Bids, on the Effective Date of the Agreement. Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

6.09 *Laws and Regulations*

A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.

B. If Contractor performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work. However, it shall not be Contractor's primary responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.

C. Changes in Laws or Regulations not known at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids) having an effect on the cost or time of performance of the Work shall be the subject of an adjustment in Contract Price or Contract Times. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

6.10 *Taxes*

A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

6.11 *Use of Site and Other Areas*

A. Limitation on Use of Site and Other Areas

1. Contractor shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and other areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof, or of any adjacent land or areas resulting from the performance of the Work.

2. Should any claim be made by any such owner or occupant because of the performance of the Work, Contractor shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.

3. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused by or based upon Contractor's performance of the Work.

B. *Removal of Debris During Performance of the Work:* During the progress of the Work Contractor shall keep the Site and other areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.

C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

D. *Loading Structures:* Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

6.12 *Record Documents*

A. Contractor shall maintain in a safe place at the Site one record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, and written interpretations and clarifications in good order and annotated to show changes made during construction. These record documents together with all approved Samples and a counterpart of all approved Shop Drawings will be available to Engineer for reference. Upon completion of the Work, these record documents, Samples, and Shop Drawings will be delivered to Engineer for Owner.

6.13 *Safety and Protection*

A. Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:

1. all persons on the Site or who may be affected by the Work;

2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and

3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.

B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.

C. All damage, injury, or loss to any property referred to in Paragraph 6.13.A.2 or 6.13.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor (except damage or loss attributable to the fault of Draw-

ings or Specifications or to the acts or omissions of Owner or Engineer or , or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).

D. Contractor's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 14.07.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

6.14 *Safety Representative*

A. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

6.15 *Hazard Communication Programs*

A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

6.16 *Emergencies*

A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

6.17 *Shop Drawings and Samples*

A. Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the acceptable Schedule of Submittals (as required by Paragraph 2.07). Each submittal will be identified as Engineer may require.

1. Shop Drawings

a. Submit number of copies specified in the General Requirements.

b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide and to enable Engineer to review the information for the limited purposes required by Paragraph 6.17.D.

2. *Samples:* Contractor shall also submit Samples to Engineer for review and approval in accordance with the acceptable schedule of Shop Drawings and Sample submittals.

a. Submit number of Samples specified in the Specifications.

b. Clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 6.17.D.

B. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals , any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.

C. Submittal Procedures

1. Before submitting each Shop Drawing or Sample, Contractor shall have determined and verified:

a. all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;

b. the suitability of all materials with respect to intended use, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work;

c. all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto; and

d. shall also have reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents.

2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents

with respect to Contractor's review and approval of that submittal.

3. With each submittal, Contractor shall give Engineer specific written notice of any variations, that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be both a written communication separate from the Shop Drawing's or Sample Submittal; and, in addition, by a specific notation made on each Shop Drawing or Sample submitted to Engineer for review and approval of each such variation.

D. *Engineer's Review*

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.

2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

3. Engineer's review and approval shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 6.17.C.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer's review and approval shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 6.17.C.1.

E. *Resubmittal Procedures*

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.

6.18 *Continuing the Work*

A. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by Paragraph 15.04 or as Owner and Contractor may otherwise agree in writing.

6.19 *Contractor's General Warranty and Guarantee*

A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its Related Entities shall be entitled to rely on representation of Contractor's warranty and guarantee.

B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:

1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or

2. normal wear and tear under normal usage.

C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:

1. observations by Engineer;

2. recommendation by Engineer or payment by Owner of any progress or final payment;

3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;

4. use or occupancy of the Work or any part thereof by Owner;

5. any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptability by Engineer;

6. any inspection, test, or approval by others; or

7. any correction of defective Work by Owner.

6.20 *Indemnification*

A. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or

arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable .

B. In any and all claims against Owner or Engineer or any of their respective consultants, agents, officers, directors, partners, or employees by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 6.20.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

C. The indemnification obligations of Contractor under Paragraph 6.20.A shall not extend to the liability of Engineer and Engineer's officers, directors, partners, employees, agents, consultants and subcontractors arising out of:

1. the preparation or approval of, or the failure to prepare or approve, maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or

2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

6.21 *Delegation of Professional Design Services*

A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable law.

B. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.

C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.

D. Pursuant to this Paragraph 6.21, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 6.17.D.1.

E. Contractor shall not be responsible for the adequacy of the performance or design criteria required by the Contract Documents.

ARTICLE 7 - OTHER WORK AT THE SITE

7.01 *Related Work at Site*

A. Owner may perform other work related to the Project at the Site with Owner's employees, or via other direct contracts therefor, or have other work performed by utility owners. If such other work is not noted in the Contract Documents, then:

1. written notice thereof will be given to Contractor prior to starting any such other work; and

2. if Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times that should be allowed as a result of such other work, a Claim may be made therefor as provided in Paragraph 10.05.

B. Contractor shall afford each other contractor who is a party to such a direct contract, each utility owner and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work, and shall properly coordinate the Work with theirs. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and

properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering their work and will only cut or alter their work with the written consent of Engineer and the others whose work will be affected. The duties and responsibilities of Contractor under this Paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of Contractor in said direct contracts between Owner and such utility owners and other contractors.

C. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 7, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

7.02 *Coordination*

A. If Owner intends to contract with others for the performance of other work on the Project at the Site, the following will be set forth in Supplementary Conditions:

1. the individual or entity who will have authority and responsibility for coordination of the activities among the various contractors will be identified;

2. the specific matters to be covered by such authority and responsibility will be itemized; and

3. the extent of such authority and responsibilities will be provided.

B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

7.03 *Legal Relationships*

A. Paragraphs 7.01.A and 7.02 are not applicable for utilities not under the control of Owner.

B. Each other direct contract of Owner under Paragraph 7.01.A shall provide that the other contractor is liable to Owner and Contractor for the reasonable direct delay and disruption costs incurred by Contractor as a result of the other contractor's actions or inactions.

C. Contractor shall be liable to Owner and any other contractor for the reasonable direct delay and disruption costs incurred by such other contractor as a result of Contractor's action or inactions.

ARTICLE 8 - OWNER'S RESPONSIBILITIES

8.01 *Communications to Contractor*

A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

8.02 *Replacement of Engineer*

A. In case of termination of the employment of Engineer, Owner shall appoint an engineer to whom Contractor makes no reasonable objection, whose status under the Contract Documents shall be that of the former Engineer.

8.03 *Furnish Data*

A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

8.04 *Pay When Due*

A. Owner shall make payments to Contractor when they are due as provided in Paragraphs 14.02.C and 14.07.C.

8.05 *Lands and Easements; Reports and Tests*

A. Owner's duties in respect of providing lands and easements and providing engineering surveys to establish reference points are set forth in Paragraphs 4.01 and 4.05. Paragraph 4.02 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of subsurface conditions and drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site that have been utilized by Engineer in preparing the Contract Documents.

8.06 *Insurance*

A. Owner's responsibilities, if any, in respect to purchasing and maintaining liability and property insurance are set forth in Article 5.

8.07 *Change Orders*

A. Owner is obligated to execute Change Orders as indicated in Paragraph 10.03.

8.08 *Inspections, Tests, and Approvals*

A. Owner's responsibility in respect to certain inspections, tests, and approvals is set forth in Paragraph 13.03.B.

8.09 *Limitations on Owner's Responsibilities*

A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

8.10 *Undisclosed Hazardous Environmental Condition*

A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 4.06.

8.11 *Evidence of Financial Arrangements*

A. If and to the extent Owner has agreed to furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents, Owner's responsibility in respect thereof will be as set forth in the Supplementary Conditions.

ARTICLE 9 - ENGINEER'S STATUS DURING CONSTRUCTION

9.01 *Owner's Representative*

A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract Documents and will not be changed without written consent of Owner and Engineer.

9.02 *Visits to Site*

A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.

B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 9.09. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

9.03 *Project Representative*

A. If Owner and Engineer agree, Engineer will furnish a Resident Project Representative to assist Engineer in providing more extensive observation of the Work. The authority and responsibilities of any such Resident Project Representative and assistants will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 9.09. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

9.04 *Authorized Variations in Work*

A. Engineer may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. These may be accomplished by a Field Order and will be binding on Owner and also on Contractor, who shall perform the Work involved promptly. If Owner or Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, and the parties are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment , a Claim may be made therefor as provided in Paragraph 10.05.

9.05 *Rejecting Defective Work*

A. Engineer will have authority to reject Work which Engineer believes to be defective, or that Engineer believes will not produce a completed Project that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Engineer will also have authority to require special inspection or testing of the Work as provided in Paragraph 13.04, whether or not the Work is fabricated, installed, or completed.

9.06 *Shop Drawings, Change Orders and Payments*

A. In connection with Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, see Paragraph 6.17.

B. In connection with Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, see Paragraph 6.21.

C. In connection with Engineer's authority as to Change Orders, see Articles 10, 11, and 12.

D. In connection with Engineer's authority as to Applications for Payment, see Article 14.

9.07 *Determinations for Unit Price Work*

A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of Paragraph 10.05.

9.08 *Decisions on Requirements of Contract Documents and Acceptability of Work*

A. Engineer will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. All matters in question and other matters between Owner and Contractor arising prior to the date final payment is due relating to the acceptability of the Work, and the interpretation of the requirements of the Contract Documents pertaining to the performance of the Work, will be referred initially to Engineer in writing within 30 days of the event giving rise to the question

B. Engineer will, with reasonable promptness, render a written decision on the issue referred. If Owner or Contractor believe that any such decision entitles them to an adjustment in the Contract Price or Contract Times or both, a Claim may be made under Paragraph 10.05. The date of Engineer's decision shall be the date of the event giving rise to the issues referenced for the purposes of Paragraph 10.05.B.

C. Engineer's written decision on the issue referred will be final and binding on Owner and Contractor, subject to the provisions of Paragraph 10.05.

D. When functioning as interpreter and judge under this Paragraph 9.08, Engineer will not show partiality to Owner or Contractor and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity.

9.09 *Limitations on Engineer's Authority and Responsibilities*

A. Neither Engineer's authority or responsibility under this Article 9 or under any other provision of the Contract Documents nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.

D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 14.07.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals that the results certified indicate compliance with the Contract Documents.

E. The limitations upon authority and responsibility set forth in this Paragraph 9.09 shall also apply to, the Resident Project Representative, if any, and assistants, if any.

ARTICLE 10 - CHANGES IN THE WORK; CLAIMS

10.01 *Authorized Changes in the Work*

A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work by a Change Order, or a Work Change Directive. Upon receipt of any such document, Contractor shall

promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).

B. If Owner and Contractor are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change Directive, a Claim may be made therefor as provided in Paragraph 10.05.

10.02 *Unauthorized Changes in the Work*

A.Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents as amended, modified, or supplemented as provided in Paragraph 3.04, except in the case of an emergency as provided in Paragraph 6.16 or in the case of uncovering Work as provided in Paragraph 13.04.B.

10.03 *Execution of Change Orders*

A. Owner and Contractor shall execute appropriate Change Orders recommended by Engineer covering:

1. changes in the Work which are: (i) ordered by Owner pursuant to Paragraph 10.01.A, (ii) required because of acceptance of defective Work under Paragraph 13.08.A or Owner's correction of defective Work under Paragraph 13.09, or (iii) agreed to by the parties;

2. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive; and

3. changes in the Contract Price or Contract Times which embody the substance of any written decision rendered by Engineer pursuant to Paragraph 10.05; provided that, in lieu of executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations, but during any such appeal, Contractor shall carry on the Work and adhere to the Progress Schedule as provided in Paragraph 6.18.A.

10.04 *Notification to Surety*

A. If notice of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times) is required by the provisions of any bond to be given to a surety, the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

10.05 *Claims*

A. *Engineer's Decision Required*: All Claims, except those waived pursuant to Paragraph 14.09, shall be referred to the Engineer for decision. A decision by Engineer shall be required as a condition precedent to any exercise by Owner or Contractor of any rights or remedies either may otherwise have under the Contract Documents or by Laws and Regulations in respect of such Claims.

B. *Notice:* Written notice stating the general nature of each Claim, shall be delivered by the claimant to Engineer and the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto. The responsibility to substantiate a Claim shall rest with the party making the Claim. Notice of the amount or extent of the Claim, with supporting data shall be delivered to the Engineer and the other party to the Contract within 60 days after the start of such event (unless Engineer allows additional time for claimant to submit additional or more accurate data in support of such Claim). A Claim for an adjustment in Contract Price shall be prepared in accordance with the provisions of Paragraph 12.01.B. A Claim for an adjustment in Contract Time shall be prepared in accordance with the provisions of Paragraph 12.02.B. Each Claim shall be accompanied by claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant believes it is entitled as a result of said event. The opposing party shall submit any response to Engineer and the claimant within 30 days after receipt of the claimant's last submittal (unless Engineer allows additional time).

C. *Engineer's Action*: Engineer will review each Claim and, within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any, take one of the following actions in writing:

1. deny the Claim in whole or in part,

2. approve the Claim, or

3. notify the parties that the Engineer is unable to resolve the Claim if, in the Engineer's sole discretion, it would be inappropriate for the Engineer to do so. For purposes of further resolution of the Claim, such notice shall be deemed a denial.

D. In the event that Engineer does not take action on a Claim within said 30 days, the Claim shall be deemed denied.

E. Engineer's written action under Paragraph 10.05.C or denial pursuant to Paragraphs 10.05.C.3 or 10.05.D will be final and binding upon Owner and Contractor, unless Owner or Contractor invoke the dispute resolution procedure set forth in Article 16 within 30 days of such action or denial.

F. No Claim for an adjustment in Contract Price or Contract Times will be valid if not submitted in accordance with this Paragraph 10.05.

ARTICLE 11 - COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

11.01 *Cost of the Work*

A. *Costs Included:* The term Cost of the Work means the sum of all costs, except those excluded in Paragraph 11.01.B, necessarily incurred and paid by Contractor in the proper performance of the Work. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to Contractor will be only those additional or incremental costs required because of the change in the Work or because of the event giving rise to the Claim. Except as otherwise may be agreed to in writing by Owner, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall include only the following items, and shall not include any of the costs itemized in Paragraph 11.01.B.

1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time at the Site. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.

3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 11.01.

4. Costs of special consultants (including but not limited to Engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.

5. Supplemental costs including the following:

a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.

b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.

c. Rentals of all construction equipment and machinery, and the parts thereof whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.

d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, imposed by Laws and Regulations.

e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.

f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 5.06.D), provided such losses and damages have

resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.

g. The cost of utilities, fuel, and sanitary facilities at the Site.

h. Minor expenses such as telegrams, long distance telephone calls, telephone service at the Site, expresses, and similar petty cash items in connection with the Work.

i. The costs of premiums for all bonds and insurance Contractor is required by the Contract Documents to purchase and maintain.

B. *Costs Excluded:* The term Cost of the Work shall not include any of the following items:

1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expediters, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 11.01.A.1 or specifically covered by Paragraph 11.01.A.4, all of which are to be considered administrative costs covered by the Contractor's fee.

2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.

3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.

4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.

5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraphs 11.01.A and 11.01.B.

C. *Contractor's Fee:* When all the Work is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 12.01.C.

D. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to Paragraphs 11.01.A and 11.01.B, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

11.02 *Allowances*

A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.

B. *Cash Allowances*

1. Contractor agrees that:

a. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and

b. Contractor's costs for unloading and handling on the Site, labor, installation , overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.

C. Contingency Allowance

1. Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.

D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

11.03 *Unit Price Work*

A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.

B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by Contractor will be made by Engineer subject to the provisions of Paragraph 9.07.

C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.

D. Owner or Contractor may make a Claim for an adjustment in the Contract Price in accordance with Paragraph 10.05 if:

1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and

2. there is no corresponding adjustment with respect any other item of Work; and

3. Contractor believes that Contractor is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price and the parties are unable to agree as to the amount of any such increase or decrease.

ARTICLE 12 - CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES

12.01 *Change of Contract Price*

A. The Contract Price may only be changed by a Change Order. Any Claim for an adjustment in the Contract Price shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.

B. The value of any Work covered by a Change Order or of any Claim for an adjustment in the Contract Price will be determined as follows:

1. where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 11.03); or

2. where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 12.01.C.2); or

3. where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum is not reached under Paragraph 12.01.B.2, on the basis of the Cost of the Work (determined as provided in Paragraph 11.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 12.01.C).

C. *Contractor's Fee:* The Contractor's fee for overhead and profit shall be determined as follows:

1. a mutually acceptable fixed fee; or

2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:

a. for costs incurred under Paragraphs 11.01.A.1 and 11.01.A.2, the Contractor's fee shall be 15 percent;

b. for costs incurred under Paragraph 11.01.A.3, the Contractor's fee shall be five percent;

c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraph 12.01.C.2.a is that the Subcontractor who actually performs the Work, at whatever tier, will be paid a fee of 15 percent of the costs incurred by such Subcontractor under Paragraphs 11.01.A.1 and 11.01.A.2 and that any higher tier Subcontractor and Contractor will each be paid a fee of five percent of the amount paid to the next lower tier Subcontractor;

d. no fee shall be payable on the basis of costs itemized under Paragraphs 11.01.A.4, 11.01.A.5, and 11.01.B;

e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and

f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 12.01.C.2.a through 12.01.C.2.e, inclusive.

12.02 *Change of Contract Times*

A. The Contract Times may only be changed by a Change Order. Any Claim for an adjustment in the Contract Times shall be based on written notice submitted

by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.

B. Any adjustment of the Contract Times covered by a Change Order or any Claim for an adjustment in the Contract Times will be determined in accordance with the provisions of this Article 12.

12.03 *Delays*

A. Where Contractor is prevented from completing any part of the Work within the Contract Times due to delay beyond the control of Contractor, the Contract Times will be extended in an amount equal to the time lost due to such delay if a Claim is made therefor as provided in Paragraph 12.02.A. Delays beyond the control of Contractor shall include, but not be limited to, acts or neglect by Owner, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, abnormal weather conditions, or acts of God.

B. If Owner, Engineer, or other contractors or utility owners performing other work for Owner as contemplated by Article 7, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times , or both. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

C If Contractor is delayed in the performance or progress of the Work by fire, flood, epidemic, abnormal weather conditions, acts of God, acts or failures to act of utility owners not under the control of Owner, or other causes not the fault of and beyond control of Owner and Contractor, then Contractor shall be entitled to an equitable adjustment in Contract Times, if such adjustment is essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays described in this Paragraph 12.03.C.

D. Owner, Engineer and the Related Entities of each of them shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of Engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

E. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delays within the control of Contractor. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of Contractor.

ARTICLE 13 - TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

13.01 *Notice of Defects*

A. Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor. All defective Work may be rejected, corrected, or accepted as provided in this Article 13.

13.02 *Access to Work*

A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and governmental agencies with jurisdictional interests will have access to the Site and the Work at reasonable times for their observation, inspecting, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's Site safety procedures and programs so that they may comply therewith as applicable.

13.03 *Tests and Inspections*

A. Contractor shall give Engineer timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.

B. Owner shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:

1. for inspections, tests, or approvals covered by Paragraphs 13.03.C and 13.03.D below;

2. that costs incurred in connection with tests or inspections conducted pursuant to Paragraph 13.04.B shall be paid as provided in said Paragraph 13.04.C; and

3. as otherwise specifically provided in the Contract Documents.

C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.

D. Contractor shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for Owner's and Engineer's acceptance of materials or equipment to

be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to Owner and Engineer.

E. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, it must, if requested by Engineer, be uncovered for observation.

F. Uncovering Work as provided in Paragraph 13.03.E shall be at Contractor's expense unless Contractor has given Engineer timely notice of Contractor's intention to cover the same and Engineer has not acted with reasonable promptness in response to such notice.

13.04 *Uncovering Work*

A. If any Work is covered contrary to the written request of Engineer, it must, if requested by Engineer, be uncovered for Engineer's observation and replaced at Contractor's expense.

B. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, furnishing all necessary labor, material, and equipment.

C. If it is found that the uncovered Work is defective, Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05.

D. If, the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

13.05 *Owner May Stop the Work*

A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

13.06 *Correction or Removal of Defective Work*

A. Promptly after receipt of notice, Contractor shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by Engineer, remove it from the Project and replace it with Work that is not defective. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or removal (including but not limited to all costs of repair or replacement of work of others).

B. When correcting defective Work under the terms of this Paragraph 13.06 or Paragraph 13.07, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

13.07 *Correction Period*

A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents) or by any specific provision of the Contract Documents, any Work is found to be defective, or if the repair of any damages to the land or areas made available for Contractor's use by Owner or permitted by Laws and Regulations as contemplated in Paragraph 6.11.A is found to be defective, Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:

1. repair such defective land or areas; or

2. correct such defective Work; or

3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and

4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others or other land or areas resulting therefrom.

B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by Contractor.

C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications .

D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this Paragraph 13.07, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

E. Contractor's obligations under this Paragraph 13.07 are in addition to any other obligation or warranty. The provisions of this Paragraph 13.07 shall not be construed as a substitute for or a waiver of the provisions of any applicable statute of limitation or repose.

13.08 *Acceptance of Defective Work*

A. If, instead of requiring correction or removal and replacement of defective Work, Owner (and, prior to Engineer's recommendation of final payment, Engineer) prefers to accept it, Owner may do so. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness) and the diminished value of the Work to the extent not otherwise paid by Contractor pursuant to this sentence. If any such acceptance occurs prior to Engineer's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work, and Owner shall be entitled to an appropriate decrease in the Contract Price, reflecting the diminished value of Work so accepted. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05. If the acceptance occurs after such recommendation, an appropriate amount will be paid by Contractor to Owner.

13.09 *Owner May Correct Defective Work*

A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work or to remove and replace rejected Work as required by Engineer in accordance with Paragraph 13.06.A, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, Owner may, after seven days written notice to Contractor, correct or remedy any such deficiency.

B. In exercising the rights and remedies under this Paragraph 13.09, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, take possession of Contractor's tools, appliances, construction equipment and machinery at the Site, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this Paragraph.

C. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 13.09 will be charged against Contractor, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of the adjustment, Owner may make a Claim therefor as provided in Paragraph 10.05. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.

D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 13.09.

ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION

14.01 *Schedule of Values*

A. The Schedule of Values established as provided in Paragraph 2.07.A will serve as the basis for progress

payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed.

14.02 *Progress Payments*

A. Applications for Payments

1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.

2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.

3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

B. *Review of Applications*

1. Engineer will, within 10 days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to Owner or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.

2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations on the Site of the executed Work as an experienced and qualified design professional and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:

a. the Work has progressed to the point indicated;

b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, to the results of any subsequent tests called for in the Contract Documents, to a final determination of quantities and classifications for Unit Price Work under Paragraph 9.07, and to any other qualifications stated in the recommendation); and

c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.

3. By recommending any such payment Engineer will not thereby be deemed to have represented that:

a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract Documents; or

b. that there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.

4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:

a. to supervise, direct, or control the Work, or

b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or

c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or

d. to make any examination to ascertain how or for what purposes Contractor has used the moneys paid on account of the Contract Price, or

e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.

5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 14.02.B.2. Engineer may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent

inspections or tests, revise or revoke any such payment recommendation previously made, to such extent as may be necessary in Engineer's opinion to protect Owner from loss because:

a. the Work is defective, or completed Work has been damaged, requiring correction or replacement;

b. the Contract Price has been reduced by Change Orders;

c. Owner has been required to correct defective Work or complete Work in accordance with Paragraph 13.09; or

d. Engineer has actual knowledge of the occurrence of any of the events enumerated in Paragraph 15.02.A.

C. *Payment Becomes Due*

1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended will (subject to the provisions of Paragraph 14.02.D) become due, and when due will be paid by Owner to Contractor.

D. *Reduction in Payment*

1. Owner may refuse to make payment of the full amount recommended by Engineer because:

a. claims have been made against Owner on account of Contractor's performance or furnishing of the Work;

b. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;

c. there are other items entitling Owner to a set-off against the amount recommended; or

d. Owner has actual knowledge of the occurrence of any of the events enumerated in Paragraphs 14.02.B.5.a through 14.02.B.5.c or Paragraph 15.02.A.

2. If Owner refuses to make payment of the full amount recommended by Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, when Contractor corrects to Owner's satisfaction the reasons for such action.

3. If it is subsequently determined that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 14.02.C.1.

14.03 *Contractor's Warranty of Title*

A. Contractor warrants and guarantees that title to all Work, materials, and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to Owner no later than the time of payment free and clear of all Liens.

14.04 *Substantial Completion*

A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete (except for items specifically listed by Contractor as incomplete) and request that Engineer issue a certificate of Substantial Completion.

B. Promptly after Contractor's notification, , Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.

C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the tentative certificate during which to make written objection to Engineer as to any provisions of the certificate or attached list. If, after considering such objections, Engineer concludes that the Work is not substantially complete, Engineer will within 14 days after submission of the tentative certificate to Owner notify Contractor in writing, stating the reasons therefor. If, after consideration of Owner's objections, Engineer considers the Work substantially complete, Engineer will within said 14 days execute and deliver to Owner and Contractor a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as Engineer believes justified after consideration of any objections from Owner.

D. At the time of delivery of the tentative certificate of Substantial Completion, Engineer will deliver to Owner and Contractor a written recommendation as to division of responsibilities pending final payment between Owner and Contractor with respect to security, operation, safety, and protection of the Work, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless Owner and Contractor agree otherwise in writing and so inform Engineer in writing prior to Engineer's issuing the definitive certificate of Substantial

Completion, Engineer's aforesaid recommendation will be binding on Owner and Contractor until final payment.

E. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to complete or correct items on the tentative list.

14.05 *Partial Utilization*

A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions.

1. Owner at any time may request Contractor in writing to permit Owner to use or occupy any such part of the Work which Owner believes to be ready for its intended use and substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor will certify to Owner and Engineer that such part of the Work is substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.

2. Contractor at any time may notify Owner and Engineer in writing that Contractor considers any such part of the Work ready for its intended use and substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.

3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 14.04 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 5.10 regarding property insurance.

14.06 *Final Inspection*

A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

14.07 *Final Payment*

A. Application for Payment

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance certificates of inspection, marked-up record documents (as provided in Paragraph 6.12), and other documents, Contractor may make application for final payment following the procedure for progress payments.

2. The final Application for Payment shall be accompanied (except as previously delivered) by:

a. all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required by Paragraph 5.04.B.7;

b. consent of the surety, if any, to final payment;

c. a list of all Claims against Owner that Contractor believes are unsettled; and

d. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of or Liens filed in connection with the Work.

3. In lieu of the releases or waivers of Liens specified in Paragraph 14.07.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (i) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (ii) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner or Owner's property might in any way be responsible have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien.

B. *Engineer's Review of Application and Acceptance*

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations

under the Contract Documents have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of payment and present the Application for Payment to Owner for payment. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable subject to the provisions of Paragraph 14.09. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

C. Payment Becomes Due

1. Thirty days after the presentation to Owner of the Application for Payment and accompanying documentation, the amount recommended by Engineer, less any sum Owner is entitled to set off against Engineer's recommendation, including but not limited to liquidated damages, will become due and , will be paid by Owner to Contractor.

14.08 *Final Completion Delayed*

A. If, through no fault of Contractor, final completion of the Work is significantly delayed, and if Engineer so confirms, Owner shall, upon receipt of Contractor's final Application for Payment (for Work fully completed and accepted) and recommendation of Engineer, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by Owner for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if bonds have been furnished as required in Paragraph 5.01, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by Contractor to Engineer with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

14.09 *Waiver of Claims*

A. The making and acceptance of final payment will constitute:

1. a waiver of all Claims by Owner against Contractor, except Claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 14.06, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from Contractor's continuing obligations under the Contract Documents; and

2. a waiver of all Claims by Contractor against Owner other than those previously made in accordance with the requirements herein and expressly acknowledged by Owner in writing as still unsettled.

ARTICLE 15 - SUSPENSION OF WORK AND TERMINATION

15.01 *Owner May Suspend Work*

A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by notice in writing to Contractor and Engineer which will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be granted an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension if Contractor makes a Claim therefor as provided in Paragraph 10.05.

15.02 *Owner May Terminate for Cause*

A. The occurrence of any one or more of the following events will justify termination for cause:

1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule established under Paragraph 2.07 as adjusted from time to time pursuant to Paragraph 6.04);

2. Contractor's disregard of Laws or Regulations of any public body having jurisdiction;

3. Contractor's disregard of the authority of Engineer; or

4. Contractor's violation in any substantial way of any provisions of the Contract Documents.

B. If one or more of the events identified in Paragraph 15.02.A occur, Owner may, after giving Contractor (and surety) seven days written notice of its intent to terminate the services of Contractor:

1. exclude Contractor from the Site, and take possession of the Work and of all Contractor's tools, appliances, construction equipment, and machinery at the Site, and use the same to the full extent they could be used by Contractor (without liability to Contractor for trespass or conversion),

2. incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and

3. complete the Work as Owner may deem expedient.

C. If Owner proceeds as provided in Paragraph 15.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Owner arising out of or relating to completing the Work, such excess will be paid to Contractor. If such claims, costs, losses, and damages exceed such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this Paragraph Owner shall not be required to obtain the lowest price for the Work performed.

D. Notwithstanding Paragraphs 15.02.B and 15.02.C, Contractor's services will not be terminated if Contractor begins within seven days of receipt of notice of intent to terminate to correct its failure to perform and proceeds diligently to cure such failure within no more than 30 days of receipt of said notice.

E. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue. Any retention or payment of moneys due Contractor by Owner will not release Contractor from liability.

F. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 5.01.A, the termination procedures of that bond shall supersede the provisions of Paragraphs 15.02.B, and 15.02.C.

15.03 *Owner May Terminate For Convenience*

A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):

1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;

2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;

3. all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others; and

4. reasonable expenses directly attributable to termination.

B. Contractor shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

15.04 *Contractor May Stop Work or Terminate*

A. If, through no act or fault of Contractor, (i) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (ii) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (iii) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the Contract and recover from Owner payment on the same terms as provided in Paragraph 15.03.

B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this Paragraph 15.04 are not intended to preclude Contractor from making a Claim under Paragraph 10.05 for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this Paragraph.

ARTICLE 16 - DISPUTE RESOLUTION

16.01 *Methods and Procedures*

A. Either Owner or Contractor may request mediation of any Claim submitted to Engineer for a decision under Paragraph 10.05 before such decision becomes final and binding. The mediation will be

governed by the Construction Industry Mediation Rules of the American Arbitration Association in effect as of the Effective Date of the Agreement. The request for mediation shall be submitted in writing to the American Arbitration Association and the other party to the Contract. Timely submission of the request shall stay the effect of Paragraph 10.05.E.

B. Owner and Contractor shall participate in the mediation process in good faith. The process shall be concluded within 60 days of filing of the request. The date of termination of the mediation shall be determined by application of the mediation rules referenced above.

C. If the Claim is not resolved by mediation, Engineer's action under Paragraph 10.05.C or a denial pursuant to Paragraphs 10.05.C.3 or 10.05.D shall become final and binding 30 days after termination of the mediation unless, within that time period, Owner or Contractor:

1. elects in writing to invoke any dispute resolution process provided for in the Supplementary Conditions, or

2. agrees with the other party to submit the Claim to another dispute resolution process, or

3. gives written notice to the other party of their intent to submit the Claim to a court of competent jurisdiction.

ARTICLE 17 - MISCELLANEOUS

17.01 *Giving Notice*

A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:

1. delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or

2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

17.02 *Computation of Times*

A. When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

17.03 *Cumulative Remedies*

A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract Documents. The provisions of this Paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

17.04 *Survival of Obligations*

A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

17.05 *Controlling Law*

A. This Contract is to be governed by the law of the state in which the Project is located.

17.06 *Headings*

A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

SECTION 00800

SUPPLEMENTARY CONDITIONS

1. DEFINITIONS

Add the following:

The term(s) "**or equal**" or "**approved equal**," shall be interpreted to mean an item or material or equipment similar to that named and which is suited to the same use and capable of performing the same function and be of the same quality as that named. Such material or equipment shall be subject to approval by the Engineer.

The term **Acceptance**, shall be interpreted to mean that the OWNER of the work is satisfied that it is fully complete and in accordance with the Contract Documents.

The term **Affidavit**, shall be interpreted as the instrument which is to be signed by the Contractor and submitted to the OWNER through the Engineer, upon completion of that job, showing that all bills have been paid. It shall also mean such instrument that may be requested by the OWNER incident to partial payments.

The term **Approval**, shall be interpreted as the item in question is accepted as satisfactory.

The term **Article**, shall be interpreted as the prime subdivision of a section of these or any other referenced Specifications, the instructions to Bidders, the Special Conditions and the General Conditions.

The term **Materials**, shall be interpreted as any substance proposed to be used in connection with the construction of any structure, facility or appurtenance, or of other work under the contract.

The term "**Provided**", as used in the Specifications upon the Drawings, shall be understood to mean "provided complete in place", that is, "furnished and installed". Where "as shown," "as indicated", "as detailed", or words of similar importance are used, it shall be understood that the references to the Drawings and/or Specifications accompanying these documents are intended unless otherwise expressly stated.

The words "**furnish**", "**furnish and**", "**install**", and "**provide**" or words with similar meaning shall be interpreted unless otherwise specifically stated, to mean "furnish and install complete in place and ready for service".

2. AWARD OF CONTRACT

The award of the contract, if it is awarded, will be to the lowest responsible, responsive Bidder. No Notice of Award will be given until the OWNER has concluded such investigations as he deems necessary to establish the responsibility, qualifications and financial ability of the Bidders to do the Work in accordance with the Contract Documents to the satisfaction of the OWNER within the time prescribed. The OWNER reserves the right to reject the Bid of any Bidder who does not pass such investigation to the OWNER's satisfaction. In analyzing Bids, the OWNER may take into consideration alternates and unit prices, if requested by the Bid forms. If the Contract is awarded, the OWNER will issue the Notice of Award and give the successful Bidder a contract for execution within one hundred and twenty (120) days after the opening of Bids.

3. FORFEITURE OF BID SECURITY

Failure of the successful Bidder to execute and deliver the Agreement and deliver the required Bonds to the OWNER within 10 working days or 15 calendar days of receipt of the Agreement from the Owner, shall be just cause for the OWNER to annul the Notice of Award and declare the Bid and any security therefore forfeited.

4. QUALIFICATION OF SUB CONTRACTORS MATERIALMEN AND SUPPLIERS

Within ten working days after bid opening, the CONTRACTOR will submit to the OWNER and the ENGINEER for acceptance a list of the names of sub contractors and such other persons and organizations (including those who are to furnish principal items of materials or equipment) proposed for those portions of the work as to which the identity of the subcontractors and other persons and organizations must be submitted as specified in the Contract Documents. Within thirty working days after receiving the list, the Engineer will notify the CONTRACTOR in writing if either the OWNER or the ENGINEER, after due investigation, has reasonable objection to any subcontractor, person or organization on such list. The failure of the OWNER or the ENGINEER to make objection to any subcontractor, person or organization on the list within thirty days of receipt shall constitute an acceptance of such subcontractor, person or organization. Acceptance of any such subcontractor, person or organization shall not constitute a waiver of any right of the OWNER or the ENGINEER to reject defective work, material or equipment or work material or equipment not in conformance with the requirements of the contract documents.

5. DELIVERY OF BONDS

Add to paragraph 2.01

Failure of the successful Bidder to execute the Agreement and deliver the required Bonds within ten (10) days of the Notice of Award shall be just cause for the Owner to annul the award and declare the Bid and any guarantee thereof forfeited.

7. CHANGE OF THE CONTRACT TIME

Add paragraph 12.03

Because this is a calendar day contract, normal rainfall, weather and climatic conditions which may be reasonably expected are not considered grounds for an extension of contract time.

8. PAYMENTS TO CONTRACTOR AND COMPLETION

Add the following to paragraph 14.07(c).

The certificate of completion will not be issued nor the final payment made until ALL punch list items have been completed.

9. CONTRACTOR'S LIABILITY INSURANCE

Refer to General Condition 5.04

The Contractor will, at his own expense, purchase and maintain such insurance as will protect the Owner and the Contractor from claims under workmen's compensation laws,

disability benefit laws or other similar employee laws; from claims for damages because of bodily injury, occupational sickness or disease, or death of his employees, or any person other than his employees, including claims insured by usual personal injury liability coverage; from claims for injury to or destruction of tangible property including loss of use resulting therefrom - any or all of which may arise out of or result from the Contractor's operations under the Contract Documents, whether such operations be by any Subcontractor or anyone directly or indirectly employed by any of them or for whose acts may be legally liable. This insurance shall be written for not less than $1,000,000.00 combined single limit per occurrence (no aggregate limitation) or as required by law, whichever is greater, and shall include contractual liability insurance. Before starting the work, the Contractor will file with the Owner and Engineer certificates of such insurance, acceptable to the Owner; these certificates shall contain a provision that the coverage afforded under the policies will not be cancelled or materially changed until at least 15 days after written notice is given to the Owner and Engineer. These policies shall be written to cover the Contractor and Owner jointly. The Certificate of Insurance form is included in Section 00650.

10. OWNERS INDEMNITY

Refer to General Conditions 5.03 through 5.04 and 6.20.

A. The Contractor shall obtain, maintain and furnish to the Owner during the life of this Contract, full Owner's Protective Liability Insurance that will protect him against all losses or claims which may arise from operations under the Contract Documents.

B. To the fullest extent permitted by law, the CONTRACTOR shall indemnify, defend, and hold harmless the OWNER, the ENGINEER, and their officers, agents, and employees, against and from all claims and liability arising under or by reason of the Contract or any performance of the WORK, but not from the sole negligence or willful misconduct of the OWNER and/or the ENGINEER. Such indemnification by the CONTRACTOR shall include but not be limited to the following:

1. Liability or claims resulting directly or indirectly from the negligence or carelessness of the CONTRACTOR or its agents in the performance of the WORK, or in guarding or maintaining the same, or from any improper materials, implements, or appliances used in its construction, or by or on account of any act or omission of the CONTRACTOR or its agents;

2. Liability or claims arising directly or indirectly from or based on the violation of any law, ordinance, regulation, order, or decree, whether by the CONTRACTOR or its agents:

3. Liability or claims arising directly or indirectly from the use or manufacture by the CONTRACTOR, its agents, or the OWNER in the performance of this Contract of any copyrighted composition, secrete process, patented or unpatented invention, article, or appliance, unless otherwise specifically stipulated in this Contract;

4. Liability or claims arising directly or indirectly from the breach of any warranties, whether express or implied, made to the OWNER or any other parties by the CONTRACTOR or its agents;

5. Liabilities or claims arising directly or indirectly from the willful misconduct of

the CONTRACTOR or its agents; and

6. Liabilities or claims arising directly or indirectly from any breach of the obligations assumed herein by the CONTRACTOR.

C. The CONTRACTOR shall reimburse the OWNER, and the ENGINEER for all costs and expenses, (including but not limited to fees and charges of engineers, architects, attorneys, and other professionals and court costs) incurred by said OWNER, and the ENGINEER in enforcing the provisions of this Paragraph.

D. The indemnification obligation under this Paragraph shall not be limited in any way by any limitation of the amount or type of damages, compensation, or benefits payable by or for the CONTRACTOR or any such subcontractor or other person or organization under worker's compensation acts, disability benefit acts, or other employees benefit acts.

11. PROPERTY INSURANCE

Refer to General Conditions 5.06.

A. The Contractor shall, at his own expense, obtain and maintain property insurance and furnish to the Owner during the life of this Contract the full insurable value of the project. This insurance shall include the interests of the Owner, the Contractor and Subcontractors in the work shall insure against the perils of Fire, Extended Coverage, Vandalism and Malicious Mischief.

B. The Owner and Contractor waive all rights against each other for damages cause by fire or other perils to the extent covered by insurance provided under this Article, except such rights as they may have to the proceeds of such insurance. The Contractor shall require similar waivers by Subcontractors.

12. SALES TAX

Refer to General Conditions 6.10.

The Contractor shall familiarize himself with the requirements and procedures as applicable of the State of Florida pertaining to the exemption from State Sales Tax as it may apply to the Owner.

13. INDEMNITY

Refer to General Conditions 5.01.

The Bid Items for Payment and Performance Bond premium and consideration for indemnification to Owner and Engineer are included in the Schedule of Prices and must be completed by the Bidder in order to comply with Florida Statute 725.06.

14. PERMITS

Refer to General Conditions 6.08.

The Contractor will be required to obtain all required permits, including a permit from the Indian Creek Village prior to the start of construction. The Contractor will be required to

comply with all permitted drawings.

15. LAWS AND REGULATIONS

Refer to General Conditions 6.09

A. The Contractor shall obey all applicable Federal, State and local laws including but not limited to the ones listed below.

B. The Contractor shall comply with Executive Order No. 11246, entitled "Equal Opportunity Employment," as amended by Executive Order No. 11275, and as supplemented in Department of Labor Regulations (No. 41 CFR, Chapter 60).

C. The Copeland "Anti-Kickback" Act (18 U.S.C. Section 874), as supplemented in U.S. Department of Labor Regulations (29 CFR, Chapter 60).

D. All applicable standards, orders or regulations issued pursuant to the Clean Air Act of 1970 (40 U.S.C. Section 1857 et. seq.) as amended and the Federal Water Pollution Control Act (33 U.S.C. Section 1251 et seq.) as amended.

E. The Florida State Statute 446.101 Apprentice and Training Employment Regulations.

F. Florida Industrial Code No. 8C as amended and especially 8C-29 (CB-1958), Florida Department of Commerce, Bureau of Workmen's Compensation.

G. The requirements of Title VI of the Civil Rights Act of 1964 (42 U.S.C. 200d) (Nondiscrimination in Federally Assisted Programs) and implementing regulations issued at 24 CFR Part 1.

H. Age Discrimination Act of 1975 (42 U.S.C. 6101-07) and implementing regulations at 24 CFR Part 146, and the prohibitions against discrimination against handicapped individuals under section 504 of the Rehabilitation Act of 1973 (29 U.S.C. 794) and implementing regulations at 24 CFR Part 8.

I. The requirements of section 3 of the Housing and Urban Development Act of 1968 (12 U.S.C. 1701u).

J. The requirements of Executive Orders 11625 and 12432 (concerning Minority Business Enterprise), and 12138 (concerning Women’s Business Enterprise).

16. REVIEW OF APPLICATIONS FOR PROGRESS PAYMENTS

Refer to General Conditions 14.02

Owner shall, within thirty (30) days of presentation to him of the Application for Payment with Engineer's recommendation pay Contractor the amount recommended. This is in lieu of 20 days.

17. PARTIAL AND FINAL PAYMENT PROCEDURES

Refer to General Conditions 14.02 and 14.07

A. If the work progresses according to this Contract, the Contractor will be paid each month, 90 percent of the value of the work completed during the preceding month. For the purpose of preparing a monthly estimate for partial payment, the Contractor will make an approximate estimate of the value of all work done and materials furnished as of the last day of each calendar month, and will deduct 10 percent thereof and all previous payments and charges, and the balance will be paid by the Owner to the Contractor on or about sixty days after the submittal to the Owner. The Owner's Engineer shall review, revise and correct, if necessary, and then approve the estimate for partial payment before it is submitted by the Owner's Engineer to the Owner. The 10 percent which is deducted each month is reserved by the Owner as a partial guaranty to it of the faithful execution of this Contract. As a consideration of such payment of 90 percent, the Owner shall have the right to enter upon and put into proper service any or all parts of the work which may be in condition for use; however, such use shall not be construed as the final acceptance and the commencement of the one year guarantee bond period for any or all parts of the work, unless final acceptance is made for the complete project at that time. No claim or charge is to be made by the Contractor for such use, nor is such use to be construed as an acceptance by the Owner of any part of the work so used.

B. Upon receipt of written notice from the Contractor that the work has been completed in conformity with the Drawings and Specifications and any approved changes thereto, the Owner's Engineer shall promptly examine the work and, making such tests as he may deem proper and using all of the care and judgment normally exercised in the examination of completed work by a properly qualified and experienced professional engineer, shall satisfy himself that the Contractor's statement appears to be correct. He shall then inform the Owner in writing that he has examined the work and that it appears to conform to the Contract Drawings, Specifications and any approved Change Orders and that therefore he recommends acceptance and final payment to the Contractor. However, it is agreed by the Owner and the Contractor that such statement by the Owner's Engineer does not in any way relieve the Contractor from his responsibility to deliver a completed job in good and workmanlike condition, and does not render the Engineer or the Owner liable for any faulty work done or materials used by the Contractor.

C. The Owner's Engineer will then make a final estimate of the value of all work done and will deduct therefrom all previous payments which have been made. The Owner's Engineer will report such estimate to the Owner together with his recommendation as to the acceptance of the work or his findings as to any deficiencies therein. Such recommendation as to the acceptance of the work by the Owner's Engineer will be made to his best knowledge and behalf. After receipt and acceptance by the Owner of the properly executed Affidavit and the Release of Lien and within 60 days after approval of the Engineer's estimate and recommendation by the Owner, the amount of the estimate, less any charges or damages herein provided for, will be paid. Upon such final payment, the Owner shall be released by the Contractor from all liability whatever growing out of this Contract, except for the balance, if any, of such amount as may have been retained to cover charges, claims or damages, as specified; and if the Owner is satisfied that no such charges, claims or damages exist or will arise, no such amount will be retained. All prior estimates are subject to correction in the final estimate.

D. Each monthly request for a partial payment shall be submitted on an Application for Payment Form shown on Page 00800-8 & 9 which shall be accompanied by an executed copy of the Certification of Contractor shown on Page 00800-10, and by a

progress report.

E. Measurement and payment for work items for which direct payment is provided will be achieved as required by the Technical Specifications. When no direct payment for work or materials is required in General Conditions, the Special Conditions, the Proposal, the sections of the Technical Specifications or in other parts of the Contract Documents or shown, indicated or noted on the Drawings, compensation therefor shall be included in the Contract Unit or Lump Sum Prices for the several pay items under this Contract and shown and listed in the Proposal.

F. When the work has been completed, the Contractor shall execute a Final Release of Lien and an Affidavit declaring that all bills have been paid in full.

G. These documents will be furnished to the Owner in a form similar to those which appear on the following pages:

18. MEDIATION

Any claim or dispute arising out of or related to this agreement shall be subject to informal mediation as a condition precedent to the institution of legal or equitable proceeding by either party. Both parties waive the right to arbitration. The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in Miami-Dade County, Florida, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in the circuit court for the 11th Judicial Circuit for the State of Florida.

19. ATTORNEY'S FEES

In the event of any dispute and/or legal action arising from an interpretation and/or the performance of any of the documents and/or contracts in this Manual, Owner and Contractor hereby agree that the prevailing party shall be awarded reasonable attorney's fees and costs, including but not limited to, the cost of paralegals, accountants and attorney's fees and costs of appellate proceedings, if applicable.

20. INDEMNIFICATION AND HOLD HARMLESS

Notwithstanding anything to the contrary in this Supplementary Condition, the general conditions and/or any other documents in this Manual, and in consideration of the sum of $10.00 paid by Owner to Contractor, the Contractor hereby agrees to indemnify and hold Owner harmless from any costs, expenses, damages and/or liability to the Owner arising from Contractor's Work.

21. EXPRESS WARRANTIES

Notwithstanding any provisions to the contrary under this Supplemental Conditions, the general conditions and/or any other document in this Manual, Contractor expressly warrants all labor and materials used in the Work for a period of one (1) year from the date Final Payment is received by the Contractor.

22. PROHIBITED MATERIALS

Pursuant to Chapter 83-174, Laws of Florida, the use of asbestos or asbestos-based materials is strictly prohibited.

23. RECORDS RETENTION

Refer to General Conditions 6.12. The Contractor shall retain all relevant project records for three years after receiving final payment from the Owner.

Date: _____

APPLICATION FOR PAYMENT NO._____

Project No. _____

To: _____(OWNER)
From: _____(CONTRACTOR)
Contract for: _____
_____

For Work accomplished through the date of: _____, 20___.

SUMMARY OF CONTRACT AMOUNTS

1. Original Contract Price: …… $_____
2. Change Orders No. through: …… $_____
3. Contract Price with all approve Change Orders: …….. $_____
4. Work completed to date: …… $_____
5. Less (10%) Retainage: …… $_____
6. Amount due to date: …… $_____
7. Less previous payments (or applications): …… $_____

8. **AMOUNT DUE THIS APPLICATION**: **$**_____

Note: This application must be accompanied with the Certification of Contractor Form and worksheet for completed items as shown on page 00800-10.

Accompanying Documentation: _____
_____
_____
_____

Payment of the above AMOUNT DUE THIS APPLICATION is recommended.

Dated:_____, 20___.

Stantec Consulting Service Inc.

By: _____
Project Manager

APPLICATION FOR PAYMENT NO.

Contractor's Schedule of Completed Work Items

Project: _____ Sheet _____ of _____

Owner's Contract No.: _____ Engineer's Project No.: _____

For work accomplished through the date of: _____, 20_____.

Item No.	Description	ORIGINAL CONTRACT QUANTITIES				WORK COMPLETED	
		Quantity	Unit	Unit Price	Amount	Quantity	Amount
	Totals (Original Contract)				$		$
	Change Order No. 1:				$		$
	Change Order No. 2:				$		$
	PROJECT TOTAL:				$		$

CERTIFICATION OF CONTRACTOR

According to the best of my knowledge and belief, I certify that all items and amounts shown on Application for Payment No._____ are correct, that all work has been performed and/or materials supplied in full accordance with the terms and conditions of this Contract, dated _____, 20___, between _____(Owner) and _____ _____(Contractor);

I further certify that all just and lawful bills against the undersigned and his subcontractors and suppliers for labor, material and equipment employed in the performance of this Contract have been paid in full accordance with their terms and conditions; that all taxes imposed by Chapter 212, Florida Statutes (Sales and Use Tax Act), as amended, have been paid and discharged; and that there are no Vendor's, Mechanic's or other Liens or rights to liens or conditional sales contracts which should be satisfied or discharged before such payment is made.

Date:_____ Contractor:_____

STATE OF FLORIDA)
ss
COUNTY OF)

Personally appeared before me this _____ day of _____, 20____,

_____ known (or made known) to me as

the _____

(Owner) (Partner)(Corporate Officer)- Give Title of _____ Contractor(s), who

subscribed and swore to the above instrument in my presence.

_____
Notary Public - (Type Name)
State of Florida-at-Large
My Commission Expires:_____

The Contractor shall execute this Certificate and attach it to each Application For Payment.

AFFIDAVIT

STATE OF FLORIDA)
ss
COUNTY OF)

Before me, the undersigned authority, authorized to administer oaths and take acknowledgements, personally appeared _____, who, after being first duly sworn, upon oath deposes and says that all lienors contracting directly with, or directly employed by (him, them, it) and that all taxes imposed by Chapter 212, Florida Statutes (Sales and Use Tax Act) as amended, have been paid and discharged, and that all bill, wages, fees, claims and other charges incurred by _____ _____ in connection with the construction of _____ have been paid in full.

SIGNED:_____

By:_____

WITNESSES:

_____

_____

SWORN AND SUBSCRIBED TO BEFORE ME THIS ____day_____,20___AD.

_____
Notary Public
State of Florida-at-Large

My Commission Expires:_____

FINAL RELEASE OF LIEN

KNOW ALL MEN BY THESE PRESENTS, that _____

_____ for and in consideration of the sum of

_____Dollars

($_____) paid to _____ by the _____, receipt of which is hereby acknowledged, do(es) hereby release and quitclaim to the Indian Creek Village, the Owner, its successors or assigns, all liens, lien rights, claims or demands of any kind whatsoever which _____ now has (have) or might have against the property, building, and/or for any incidental expense for the construction of:

_____

_____

_____

thereon or in otherwise improving said property situated as above described.

IN WITNESS WHEREOF _____have (has) hereunto set_____ hand and seal__ this _____day of _____, 20__, A.D.

WITNESS:

_____ _____(Seal)

SWORN AND SUBSCRIBED TO BEFORE ME THIS ____day of _____, 20___ A.D.

_____
Notary Public State of Florida
at-Large
My Commission Expires:____

SECTION 00900

ADDENDUM

SECTION 01000

SPECIAL CONDITIONS

1.1 SCOPE

A. This project consists of improvements the roadway easement within the Village, as shown on project manual and plans prepared by Stantec Consulting Services Inc.

1.2 NOTICES

A. In conformance with the requirements of Article 1.04 Notice and Service of the General Conditions all notices or other papers required to be delivered by the Contractor to the Owner shall be delivered to the office of the Owner's Engineer, at an address provided to the Contractor at the preconstruction conference.

1.3 COORDINATION OF PLANS, SPECIFICATIONS AND SPECIAL PROVISIONS

A. In case of discrepancy, computed dimensions shall govern over scaled dimensions; supplemental specifications shall govern over Standard Specifications; and Special Conditions shall govern over; Drawings, Supplemental and Standard Specifications.

1.4 LAYING OUT THE WORK

A. The Contractor shall be responsible for establishing all lines and grades together with all reference points as required by the various trades. All layout work shall be done using competent and experienced personnel under the supervision of a Land Surveyor registered in the State of Florida.

B. The Contractor shall provide all labor, instruments and stakes, templates, and other materials necessary for marking and maintaining all lines and grades. The lines and grades shall be subject to any checking the Owner or Engineer may decide necessary.

C. No separate cost item is provided for laying out the work, the cost of which is considered incidental to the work and shall be included in the unit prices for items in the Proposal.

D. The Contractor shall safeguard all existing and known Property corners, monuments and marks adjacent to but not related to the work and shall bear the cost of re-establishing them if disturbed or destroyed. He shall also safeguard all points, stakes, grade marks, monuments and bench marks made or established on the work, bear the cost of re-establishing them if disturbed and bear the cost of rectifying work improperly installed due to not maintaining or protecting or to removing without authorization such established points, stakes and marks.

1.5 PRECONSTRUCTION CONFERENCE

A. In addition to the provisions of the General Conditions, Article 1.03.9, the following parties will be asked to attend the Preconstruction Conference: AT&T Telephone Company, Atlantic Communications, Florida Power & Light Company, Indian Creek Village Public Works, TECO People Gas, and Miami-Dade Water and Sewer

Department. At the preconstruction meeting, the Contractor shall present a construction phasing plan for the Engineers approval.

1.6 PERMITS AND LICENSES

A. Before starting work, the Contractor shall obtain and pay for all required licenses and permits. The Indian Creek Village will waive the fees for such permits it normally issues.

1.7 CONTRACTOR'S OFFICE

A. The Contractor shall provide and maintain an office with telephone facilities where he or a responsible representative of his organization may be reached at any time while work is in progress. Such office may be at any location the Contractor considers desirable within Miami-Dade or Broward County.

1.8 USE OF EXPLOSIVES

A. No blasting shall be done.

1.9 USE OF PUBLIC STREETS

A. The use of public streets and alleys shall be such as to provide a minimum of inconvenience to the public and to other traffic. Certain elements of the work will be conducted off peak hours as specified in the Contract Documents. Any earth or other excavated material spilled from trucks shall be removed immediately by the Contractor and the streets cleaned to the satisfaction of the Owner.

1.10 CARE OF TREES, SHRUBS AND GRASS

A. The Contractor shall be fully responsible for maintaining in good condition all cultivated grass plots, trees and shrubs. Where maintained shrubbery, grass strips or area must be removed or destroyed incident to the construction operation, the Contractor shall, after completion of the work, replace or restore to the original condition all destroyed or damaged sod, shrubbery or grass areas. Tree limbs which interfere with equipment operation and are approved for pruning shall be neatly trimmed and the tree cut coated with a tree paint. The cost for restoration shall be included in the total Bid amount, no separate pay item for this work provided.

1.11 OBSTRUCTIONS

A. All water pipes, storm drains, force mains, gas or other piping, telephone or power cables or conduits, and all other obstructions, whether or not shown, shall be temporarily removed from or supported across pipeline excavations. Before disconnecting any pipes or cables, the Contractor shall obtain permission from the owner, or shall make suitable arrangements for their disconnection by the owner. The Contractor shall be responsible for any damage to any such pipes, conduits or cables, and shall restore them to service promptly as soon as the work has progressed past the point involved. Approximate locations of known water, sanitary, drainage, power and telephone installations along route of new pipelines or in vicinity of the work are shown, but must be verified in the field by the Contractor. The Contractor shall uncover these pipes, ducts, cables, etc., carefully, by hand, to verify location and

depth of cover. Any discrepancies or differences found shall be brought to the attention of the Owner and Engineer of Record in order that necessary changes may be made. These conditions are supplemental to general requirements elsewhere in these specifications. Where fences, walls or other man-made obstructions exist illegally in the public right-of-way, the Owner will have them removed upon adequate prior notice by the Contractor.

1.12 DAMAGE TO EXISTING STRUCTURES AND UTILITIES

A. The Contractor shall be responsible for and make good all damage to pavement and driveways beyond the limits of the work zone, to buildings, telephone or other cables, water pipes, sanitary pipes, or other structures which may be encountered, whether or not shown on the Drawings.

B. Information shown on the Drawings as to the location of existing utilities has been prepared from the most reliable data available to the Engineer. This information is not guaranteed, however, and it shall be this Contractor's responsibility to determine the location, character and depth of any existing utilities. He shall assist the utility companies, by every means possible to determine said locations. Extreme caution shall be exercised to eliminate any possibility of any damage to utilities resulting from his activities.

1.13 NOTIFICATION TO UTILITY COMPANIES

A. The excavators shall comply with Florida Statute 553.851 regarding notification of existing gas and oil pipeline company owners and shall also notify "SUNSHINE STATE ONE CALL FOR FLORIDA, INC." at 1-(800)432-4770 prior to excavating. Evidence of such notice shall be furnished to the City prior to excavating.

1.14 TESTS

A. The Contractor will pay for all required tests. Generally, tests will be compaction and density tests, limerock quality tests, concrete quality tests (cylinder breaks). On asphaltic concrete and pipe, the manufacturer's or supplier's certificate that the material meets the requirements of the specification will be accepted subject to verification by the Owner's Engineer. Any and all tests which have to be repeated because of the failure of the tested material to meet specifications shall be paid for by the Contractor and the costs of any such tests shall be deducted from payments due the Contractor. Water required for leakage tests shall be furnished by the Contractor.

B. Testing Frequencies

Concrete: Perform one (1) test per 50 C.Y., or at least one (1) per day if less than 50 C.Y.
One test shall consist of one (1) slump, temperature read and one (1) set of five (5) cylinders for compressive strength.

Roadway: For sub-grade perform one (1) density test every 100 L.F. each lane (100% T-99). Sample for proctor test.
For stabilized sub-grade, perform one (1) density test every 100 L.F. each lane (98% T-180). Sample for proctor test, and L.B.R.
For Limerock Base, perform one (1) density test every 100 L.F. each

lane (98% T-180). Use Pit Proctor.
For Curb Pad, perform one (1) density test every 100 L.F. (98% T-180).

Drainage: For trenches, perform one (1) density test every 100 L.F.

1.15 RECORD AS-BUILT DRAWINGS

A. During the entire construction operation, the Contractor shall maintain records of all deviations from the Drawings and Specifications and shall prepare therefrom "record" drawings showing correctly and accurately the locations of all improvements to reflect the work as it was actually constructed. The locations of all improvements shall be as surveyed and certified by a Land Surveyor licensed in the State of Florida and shall include edge of pavement and back of sidewalk elevations taken at 50 foot intervals and at high and low points, rim and invert elevations on all storm water inlets and manholes, trench bottom elevations on all trench drains taken at 25-foot intervals and top of pipe elevations on all storm sewers taken at 25-foot intervals. These drawings shall consist of reproducibles and shall conform to recognized standards of drafting, shall be neat and legible. One set of reproducibles and one set of AUTOCAD Drawing files shall be submitted to the Owner. Final acceptance of the project will be withheld until delivery of the set of "record" drawings is made to the Owner.

1.16 SUBSURFACE INVESTIGATION

A. The Contractor shall be responsible for having determined to his satisfaction, prior to the submission of his bid, the nature and location of the work, the conformation of the ground, the character and quality of the substrata, the types and quantity of materials to be encountered, the nature of the ground water conditions, the character of equipment and facilities needed preliminary to and during the execution of the work, the general and local conditions and all other matters which can in any way affect the work under this contract. The prices established for the work to be done will reflect all costs pertaining to the work. Any claims for extras based on substrata or ground water table conditions will not be allowed.

1.17 SUSPENSION OF WORK

A. Should the Owner be prevented or enjoined from proceeding with work either before or after the start of construction because of any litigation or other reason beyond the control of the Owner, the Contractor shall not be entitled to make or assert claim for damage by reason of said delay; but time for completion of the work will be extended to such reasonable time as the Owner may determine to compensate for time lost by such delay, with such determination to be set forth in writing.

1.18 PAYMENT FOR UTILITIES

A. The Contractor shall obtain the necessary utility service by making application for the service and paying such fees and charges required by the utility companies.

1.19 MAINTENANCE OF TRAFFIC

A. General:

1. The Contractor shall be responsible for the proper maintenance control and detour of traffic in the area of construction, during the course of construction. All traffic control and maintenance procedures shall be in accordance with the requirements of the Florida Department of Transportation and Miami-Dade County traffic engineering and the Indian Creek Village. It shall be the Contractor's responsibility, as Bidder, prior to submitting his Bid, to determine the requirements of these agencies so that his Proposal reflects all costs to be incurred, including the costs to hire off-duty police officers as required. No claims for additional payment will be considered for costs incurred in the proper maintenance, control, detour and protection of traffic.

2. Traffic shall be maintained at all times where practical and as more particularly specified hereinafter. No traffic shall be detoured without prior knowledge and approval of the respective traffic control agency having jurisdiction. The Contractor shall notify such agencies 48 hours in advance of such time he proposes to detour traffic.

3. The Contractor shall keep all law enforcement, fire protection and ambulance agencies informed, in advance, of his construction schedules, and shall notify all such agencies, 48 hours in advance, in the event of detour of any roadway.

4. All traffic control signs and devices, barricades, flashers, flambeaus and similar devices shall be furnished and maintained by the Contractor.

5. Excavated or other material stored adjacent to or partially upon a roadway pavement shall be adequately marked for traffic and pedestrian safety at all times. Necessary access to adjacent property shall be provided at all times.

6. The work shall be conducted in a manner to cause the least possible interruption to traffic. Where traffic must cross excavations, the Contractor shall provide suitable bridges at street intersections and driveways.

7. The Contractor shall notify all businesses in the area that will be affected by the proposed detour or lane closure, 48 hours in advance of proposed work.

8. The Contractor shall provide access to all private property and driveways at all times.

1.20 BARRICADES AND PROTECTION OF WORK

A. The Contractor shall protect his work throughout its length by the erection of suitable barricades and handrails, where required. He shall further indicate this work at night by the maintenance of suitable lights or flares, especially along or across through-fares. Wherever it is necessary to cross a public walk, he shall provide suitable safe walkways with hand railings. He shall also comply with all laws or ordinances covering the protection of such work and the safety measures to be employed therein. The Contractor shall carry out his work so as not to deny access to private property. All utility access manholes, valves, fire hydrants and letter boxes shall be kept accessible at all times.

END OF SECTION

SECTION 01010

SUMMARY OF WORK

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work included: Listing of Significant Items:

1. Work Sequence
2. Contractor Use of Sites
3. Owner Use of Facilities
4. Coordination

1.2 WORK COVERED BY CONTRACT DOCUMENTS

A. Work for this contract comprises work to be performed on the project entitled: Roadway Redevelopment Plan, Indian Creek Village, Florida, as shown, described, and detailed within this project manual and on the project plans and specifications. It consists of improvements to the roadways within the Village. The improvements include pavement reconstruction, concrete curbs/gutters, drainage improvements, sanitary sewer system, pedestrian trail, lighting, pavement marking and signage, landscaping, irrigation.

1.3 WORK SEQUENCE

A. Construct Work in phases to accommodate Owner's Service requirements during construction period. Coordination is also required with the Indian Creek Country Club.

B. Coordinate construction schedule and operations with Engineer.

1.4 CONTRACTOR USE OF SITES

A. Limit use of sites for Work and for construction operations, to allow for:

1. Owner servicing areas with municipal services.
2. Work by other contractors.

B. Limit access to construction area.

C. Coordinate use of sites under direction of Engineer.

1.5 OWNER USE OF FACILITIES

A. Owner and residents will require use of roadway during entire period of construction.

B. Cooperate with Owner to minimize conflict, and to facilitate Owner's servicing of area’s municipal service needs.

END OF SECTION

SECTION 01025

MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.1 DESCRIPTION

A. The Contractor shall receive and accept the compensation provided in the Proposal and the Contract as full payment for furnishing all materials, labor, tools and equipment, for performing all operations necessary to complete the work under the Contract, and also in full payment for all loss or damages arising from the nature of the work, or from any discrepancy between the actual quantities of work and quantities herein estimated by the Engineer/Architect, or from the action of the elements or from any unforeseen difficulties which may be encountered during the prosecution of the work until the final acceptance by the Owner.

B. The prices stated in the proposal include all costs and expenses for taxes, labor, equipment, materials, commissions, transportation charges and expenses, patent fees and royalties, labor for handling materials during inspection, together with any and all other costs and expenses for performing and completing the work as shown on the Drawings and specified herein.

C. The Contractor's attention is again called to the fact that the quotations for the various items of work are intended to establish a total price for completing the work in its entirety. Should the Contractor feel that the cost for any item of work has not been established by the Bid Form or Payment Items, he shall include the cost for that work in some other applicable bid item, so that his proposal for the project does reflect his total price for completing the work in its entirety.

1.2 MEASUREMENT

A. The quantities for payment under this Contract shall be determined by measurements of the completed items, in place, ready for service and accepted by the Owner, in order to determine the completed unit quantity or, in the case of lump sum items, a percentage completion for each work item as described on the bid form.

1.3 PAYMENT ITEMS

A. Basis of Payment

Contract prices for the various work items are intended to establish a total price for completing the project in its entirety. The Contractor shall include in the Bid price any work item and materials for which a separate pay item has not been included in the Bid Form. All work and incidental costs shall be included for payment under the several scheduled items of the overall contract, and no separate payment will be made therefor.

END OF SECTION

SECTION 01340

SUBMITTALS AND SUBSTITUTIONS

PART 1 GENERAL

1.1 SECTION INCLUDES:

A. Work included: Make submittals required by the Contract Documents, and revise and resubmit as necessary to establish compliance with the specified requirements.

1.2 RELATED SECTIONS:

A.. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

B. Individual requirements for submittals also may be described in pertinent Sections of these Specifications.

C. Work not included:
1. Submittals which are not required will not be reviewed by the Engineer.
2. The Contractor may require his subcontractors to provide drawings, setting diagrams, and similar information to help coordinate the Work, but such data shall remain between the Contractor and his subcontractors and will not be reviewed by the Engineer.

1.3 SUBMITTALS FOR REVIEW

A. Make submittals of Shop Drawings, Samples, substitution requests, and other items in accordance with the provisions of this Section.

1.4 QUALITY ASSURANCE

A. Coordination of submittals:
1. Prior to each submittal, carefully review and coordinate all aspects of each item being submitted.
2. Verify that each item and the submittal for it conform in all respects with the specified requirements.
3. By affixing the Contractor's signature to each submittal, certify that this coordination has been performed.

B. Substitutions:
1. The Contract is based on the standards of quality established in the Contract Documents. Substitutions will be considered only when listed at time of bidding, on the Contractors letterhead and when substantiated by the Contractor's submittal of required data within 10 calendar days after the bid opening.
2. The following products do not require further approval except for interface within the Work:
   a. Products specified by reference to standard specifications such as ASTM and similar standards.
   b. Products specified by manufacturer's name and catalog model

number.

3. Do not substitute materials, equipment, or methods unless such substitution has been specifically approved in writing for this Work by the A/E.

C. "Or Equal":

1. Where the phrase "or equal," or "or equal as approved by the Architect/Engineer (A/E)," occurs in the Contract Documents, do not assume that the materials, equipment, or methods will be approved as equal unless the item has been specifically so approved for this Work by the A/E.
2. The decision of the Architect/Engineer shall be final.

PART 2 PRODUCTS

2.1 SHOP DRAWINGS

A. Scale and measurements: Make Shop Drawings accurately to a scale sufficiently large to show all pertinent aspects of the item and its method of connection to the Work.

B. Types of prints required:

1. Submit Shop Drawings in PDF format when possible.

C. Review comments of the A/E will be shown on the blueline or blackline when it is returned to the Contractor. The Contractor may make and distribute such copies as are required for his purposes.

2.2 MANUFACTURER'S LITERATURE

A. Where contents of submitted literature from manufacturers includes data not pertinent to the submittal, clearly show which portions of the contents is being submitted for review.

B. Submit the number of copies which are required to be returned, plus one copy which will be retained by the A/E.

2.3 SAMPLES **(ONLY IF REQUIRED IN OTHER SECTIONS)**

A. Provide Sample of Samples identical to the precise article proposed to be provided. Identify as described under "Identification of submittals" below.

B. Number of Samples required:

1. Unless otherwise specified, submit Samples, in the quantity which is required to be returned, plus one which will be retained by the Engineer.
2. By prearrangement in specific cases, a single Sample may be submitted for review and, when approved, be installed in the Work at a location agreed upon by the A/E.

PART 3 EXECUTION

3.1 IDENTIFICATION OF SUBMITTALS

A. Consecutively number all submittals.

1. When material is resubmitted for any reason, transmit under a new letter of transmittal and with a new transmittal number.

2. On resubmittals, cite the original submittal number for reference.

B. Accompany each submittal with a letter of transmittal showing all information required for identification and checking.

C. On at least the first page of each submittal, and elsewhere as required for positive identification, show the submittal number in which the item was included.

D. Maintain an accurate submittal log for the duration of the Work, showing current status of all submittals at all times. Make the submittal log available to the Engineer for his review upon request.

3.2 GROUPING OF SUBMITTALS

A. Unless otherwise specified, make submittals in groups containing all associated items to assure that information is available for checking each item when it is received.
1. Partial submittals may be rejected as not complying with the provisions of the Contract.
2. The Contractor may be held liable for delays so occasioned.

3.3 TIMING OF SUBMITTALS

A. Make submittals far enough in advance of scheduled dates for installation to provide time required for reviews, for securing necessary approvals, for possible revisions and resubmittals, and for placing orders and securing delivery.

B. In scheduling, allow at least ten working days for review by the Engineer following his receipt of the submittal.

3.4 ARCHITECT/ENGINEER'S REVIEW

A. Review by the A/E does not relieve the Contractor from responsibility for errors which may exist in the submitted data.

B. Revisions:
1. Make revisions required by the A/E.
2. If the Contractor considers any required revision to be a change, he shall so notify the Engineer within ten calendar days in writing. If after the review of the A/E it is determined that the required revisions are in fact a legitimate change in work or time the procedures set forth in Articles 10, 11, & 12 of the General Conditions shall be followed.
3. Make only those revisions directed or approved by the A/E.

C. Reimbursement of Architect’s/Engineer's costs:
1. In the event substitutions are proposed to the A/E after the Contract has been awarded, the A/E will record all time used by him and by his consultants in evaluation of each such proposed substitution.
2. Whether or not the A/E approves a proposed substitution, the Contractor promptly upon receipt of the Engineer's billing shall reimburse the Engineer at the rate of three times the direct cost to Engineer and his consultants for all time spent by them in evaluating the proposed substitution.

END OF SECTION

SHOP DRAWING/CATALOG CUT SUBMITTAL

TRANSMITTAL NO:

DATE:

PROJECT:

PROJECT NO._____

SUBMISSION BY: _____

ITEM: _____ SPECIFICATION SECTION AND PARA. NO _____

CHECK ONE OF THE FOLLOWING:

_____ SPECIFIED ITEM.
_____ SUBSTITUTION*

* If Substitution, submittal shall include information required by the General Conditions. Attach sufficient pages to this form to fully respond to the requirements of the General Conditions.

PRIME CONTRACTOR:

PRIME CONTRACTOR'S CONTRACT NO.

SUB-CONTRACTOR:

MANUFACTURER:

SUPPLIER:

MANUFACTURER'S CATALOG NO.

DRAWING NO:

(RESERVE THE SPACE BELOW FOR DATE AND SHOP DRAWING REVIEW STAMPS)

ATTACH THIS PAGE TO EACH COPY OF THE SHOP DRAWINGS OR CATALOG CUTS

SECTION 01640

PRODUCT HANDLING

PART 1 GENERAL

1.1 SECTION INCLUDES:

A. Work included: Protect products scheduled for use in the Work by means including, but not necessarily limited to, those described in this Section.

1.2 RELATED SECTIONS:

A. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of the Specifications.

B. Additional procedures also may be prescribed in other Sections of these Specifications.

1.3 QUALITY ASSURANCE

A. Include within the Contractor's quality assurance program such procedures as are required to assure full protection of work and materials.

1.4 MANUFACTURER'S RECOMMENDATIONS

A. Except as otherwise approved by the Architect/Engineer (A/E) determine and comply with manufacturer's recommendations on product handling, storage, protection and installation.

1.5 PACKAGING

A. Deliver products to the job site in their manufacturer's original container with labels intact and legible.
   1. Maintain packaged materials with seals unbroken and labels intact until time of use.
   2. Promptly remove damaged material and unsuitable items from the job site, and promptly replace with material meeting the specified requirements, at no additional cost to the Owner.

B. The A/E may reject as non-complying such material and products that do not bear identification satisfactory to the A/E as to manufacturer, grade, quality, and other pertinent information.

1.6 PROTECTION

A. Protect finished surfaces, including jambs and soffits of openings used as passageways, through which equipment and materials are handled.

B. Provide protection for finish floor surfaces in traffic areas prior to allowing equipment or materials to be moved over such surfaces.

C. Maintain finished surfaces clean, unmarred, and suitably protected until accepted by the Owner.

1.7 REPAIRS AND REPLACEMENTS

A. In the event of damage, promptly make replacements and repairs to the approval of the Engineer and at no additional cost to the Owner.

B. Additional time required to secure replacements and to make repairs will not be considered by the A/E to justify an extension in the Contract Time of Completion.

END OF SECTION

SECTION 02010

SUBSURFACE INVESTIGATION

PART 1 - GENERAL

1.1 DESCRIPTION

A. Soils investigation report:
   1. A soils investigation report (Soil Boring Tests) was prepared for the site of this Work and is available for Bidder's review.

B. Use of data:
   1. Bidders should visit the site and acquaint themselves with existing conditions.
   2. Prior to bidding, bidders may make their own subsurface investigation to satisfy themselves as to site and subsurface conditions, but such investigations may be performed only under time schedules and arrangements approved in advance by the Village.

1.2 QUALITY ASSURANCE

A. Work performed that does not meet technical or design requirements, but make no deviation from the Contract Documents without specific and written approval from the Engineer.

END OF SECTION

SECTION 02020

SITE WORK

PART 1 - GENERAL

1.1 CLEARING AND GRUBBING:

A. All roots, stumps, and other perishable matter shall be removed to a depth of two feet (2') below existing ground in areas of fill or two feet(2') below the finished subgrade surface in areas of excavation. The entire area shall be cleared of heavy vegetation, grass, roots and other perishable material before excavation or fill is started. Any holes or depressions resulting from the removal of stumps, roots, etc. shall be immediately filled with acceptable material, and brought to the same degree of compaction as the surrounding area. Any trees, poles, structures, etc. designated for preservation shall be protected and left standing. The Contractor shall remove from the job site, an disposed of, all timber, stumps, roots, and objectionable material resulting from clearing and grubbing. All trees and shrubs scheduled for removal shall be removed under this section. No extra cost shall be allowed for tree removal unless otherwise shown on bid proposal.

PART 2 – PRODUCTS

2.1 PREPARATION OF SUBGRADE:

A. All soft or unyielding material and other portions of the subgrade which will not compact readily shall be removed and replaced with acceptable material. Fill shall be placed in succeeding layers of eight inches (8") measured loose. Each eight inch (8") layer shall be thoroughly compacted with a three-wheel, ten ton roller before any succeeding layer is placed. Where local rock extends to the surface of the subgrade, that portion of the subgrade containing such rock shall be scarified to a minimum depth of six inches (6") below the finished subgrade. The rock shall be scarified a sufficient number of times to secure a smooth and even surface. After all unsatisfactory conditions have been corrected, the subgrade shall be shaped to a smooth and even surface conforming to the design cross-section and rolled with a three-wheeled roller weighing not less than ten tons. Water shall be added in sufficient quantity to insure a minimum density of not less than 95% for a depth of six inches (6") and 90% for the succeeding twelve inches (12") of the maximum density as determined by the AASHTO method T-180-74, Method D. No rock base shall be placed on the subgrade until so directed by the Engineer. The subgrade preparation shall extend a minimum of six inches (6") past the outer edge of the curb, if curb is not required, the subgrade preparation shall then be extended a minimum of six inches (6") past the edge of pavement.

END OF SECTION

SECTION 02151

SHORING AND BRACING OF EXCAVATIONS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work included: Provide shoring at excavations and else where as required to protect workmen, materials, other properties, and the public.

B. Related Work:
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
2. As established in the General Conditions of the Contract, the Contractor is solely responsible for means and methods of construction and for the sequences and procedures to be used.

1.2 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Employ a professional engineer registered in the State of Florida, who is qualified to design the shoring system and to inspect and report on the quality of its construction. All plans must bear the signature and seal of this engineer.

C. Comply with pertinent requirements of governmental agencies having jurisdiction, and with the Florida Trench Safety Act (See Section 00665).

1.3 SUBMITTALS

A. Comply with pertinent provisions of Section 01340.

B. Prior to submitting shoring design for approval of governmental agencies having jurisdiction, submit the design to the Engineer for review.

1. Should changes in the shoring design be required subsequent to the Engineers review, coordinate all such changes with the Engineer and secure the Engineer approval of changes in space allocations.

C. Upon completion of construction of this portion of the Work, submit to the Engineer two copies of a letter signed by the approved shoring design engineer stating that, to the best of the shoring design engineer's knowledge, the shoring system was constructed in accordance with the arrangement reviewed by the Engineer.

PART 2 - PRODUCTS

2.1 DESIGN

A. Design a shoring system which will safely and adequately prevent collapse of

adjacent materials and which will permit construction of the Work to the arrangement shown on the Drawings.

B. Secure all needed approvals, including those of governmental agencies having jurisdiction and of adjacent property owners if required, at no additional cost to the Owner.

2.2 MATERIALS

A. Provide materials of all kinds as required for execution of the approved shoring system.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 INSTALLATION

A. Construct and install the shoring system in strict accordance with the design approved by the governmental agencies having jurisdiction, and in strict accordance with the space arrangement approved by the Engineer.

END OF SECTION

SECTION 02201

EARTHWORK FOR UTILITY STRUCTURES

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work included: Excavation, backfilling and compaction for the installation of utility structures and related construction.

B. Related Work:
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

1.2 QUALITY ASSURANCE

A. Codes and Standards: Perform excavation work in compliance with applicable requirements of authorities having jurisdiction.

B. Testing and Inspection Services: Contractor shall employ and pay for a qualified independent geotechnical testing laboratory to perform soil testing and inspection service during earthwork operations.

C. Testing Laboratory Qualifications: To qualify for acceptance, the geotechnical testing laboratory must demonstrate to the Engineer's satisfaction, based on evaluation of laboratory-submitted criteria conforming to ASTM E 699, that it has the experience and capability to conduct required field and laboratory geotechnical testing without delaying the progress of the Work.

1.3 SUBMITTALS

A. Test Report: Submit the following reports directly to the Engineer from the testing services, with a copy to the Contractor:
1. Verification of suitability of each footing sub-grade material, in accordance with specified the requirements.
2. Field reports; in-place soil density tests.
3. Report of actual unconfined compressive strength and/or results of bearing tests of each strata tested.

1.4 PROJECT CONDITIONS

A. Site Information:
1. Test borings and exploratory operations may be performed by Contractor, at the Contractor's option; however, no change in the Contract Sum will be authorized for such exploration.

B. Existing Utilities: Locate existing underground utilities in areas of excavation of work. If utilities are indicated to remain in place, provide adequate means of support and protection during earthwork operations.
1. Should uncharted, or incorrectly charted, piping or other utilities be

encountered during excavation, consult Engineer immediately for directions. Cooperate with Owner and utility companies in keeping respective services and facilities in operation. Repair any damaged utilities to the satisfaction of utility owner.

2. Do not interrupt existing utilities serving facilities occupied by owner or others, during occupied hours, except when permitted in writing by the Engineer; and then only after acceptable temporary utility services have been provided.
3. Provide a minimum of 48-hour notice to the Engineer, and receive written notice to proceed before interrupting any utility.

C. Use of Explosives: Use of explosives is not permitted.

D. Protection of Persons and Property: Barricade open excavations occurring as part of this work and post with warning lights.

1. Operate warning lights as recommended by authorities having jurisdiction.
2. Protect building structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
3. Perform excavation by hand within dripline of large trees to remain. Protect root systems from damage or dry-out to the greatest extent possible. Maintain moist conditions for root system and cover exposed roots with moistened burlap.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. Satisfactory soil materials are defined as those complying with ASTM D2487 soil classification groups GW, GP, GM, SM, SW, and SP.

B. Unsatisfactory soil materials are defined as those complying with ASTM D3487 soil classification groups GC, SC, ML, MH, CL, CH, OL, OH, and PT.

C. Sub-base Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, crushed slag, crushed limerock and natural or crushed sand.

D. Backfill and Fill Materials: Satisfactory soil materials free of clay, rock or gravel larger than 2 inches in any dimension, debris, waste, frozen materials, vegetation and other deleterious matter.

PART 3 - EXECUTION

3.1 EXCAVATION

A. Excavation is unclassified and includes excavation to subgrade elevations indicated, regardless of character of materials and obstructions encountered. the Work. Do not proceed until unsatisfactory conditions are corrected.

B. Excavation Classifications: The following classifications of excavation will be made when rock is encountered:

1. Earth Excavation includes excavation of pavements and other obstructions visible on surface; underground structures, utilities, and other items indicated

to be demolished and removed; together with earth and other materials encountered that are not classified as rock or unauthorized excavation.

2. Rock excavation for trenches and pits includes removal and disposal of materials and obstructions encountered that cannot be excavated with a track mounted power excavator, equivalent to Caterpillar Model No. 215CLC, and rated at not less than 115 HP flywheel power and 32,000-pound drawbar pull and equipped with a short stick and a 42-inch wide, short tip radius rock bucket rated at 0.81 cubic yard (heaped) capacity. Trenches in excess of 10 feet in width and pits in excess of 30 feet in either length or width are classified as open excavation.

3. Rock excavation in open excavations includes removal and disposal of materials and obstructions encountered that cannot be dislodged and excavated with modern, track-mounted, heavy-duty excavating equipment is defined as Caterpillar Model No. 973 or equivalent track-mounted loader, rated not less than 210 HP flywheel power and developing minimum of 45,000-pound breakout force (measured in accordance with SAE J732).
   a. Typical of materials classified as rock are (boulders 1/2 cu. yd. or more in volume, solid rock, rock in ledgers, and rockhard cementitious aggregate deposits.
   b. Intermittent drilling, or ripping performed to increase production and not necessary to permit excavation of material encountered will be classified as earth excavation.

3.2 STABILITY OF EXCAVATIONS

A. General: Comply with local codes, ordinances, and requirements of agencies having jurisdiction.

B. Slope sides of excavations to comply with local codes, ordinances, and requirements of agencies having jurisdiction. Shore and brace where sloping is not possible because of space restrictions or stability of material excavated. Maintain sides and slopes of excavations in safe condition until completion of backfilling.

C. Shoring and Bracing: Provide materials for shoring and bracing, such as sheet piling, uprights, stringers, and shoring and bracing in excavations regardless of time period excavations will be open. Extend shoring and bracing as excavation progresses.

3.3 DEWATERING

A. Prevent surface water and subsurface or ground water from flowing into excavations and from flooding project site and surrounding area.

1. Do not allow water to accumulate in excavations. Remove water to prevent softening of foundation bottoms, undercutting structure bases, and soil changes detrimental to stability of subgrades and foundations. Provide and maintain pumps, well points, sumps, suction and discharge lines, and other dewatering system components necessary to convey water away from excavations.
2. Establish and maintain temporary drainage ditches and other diversions outside excavation limits to convey rain water and water removed from excavations to collecting or runoff areas. Do not use trench excavations as temporary drainage ditches.

3.4 STORAGE OF EXCAVATED MATERIALS

A. Stockpile excavated materials acceptable for backfill and fill where directed. Place, grade, and shape stockpiles for proper drainage.

B. Dispose of excess excavated soil material and materials not acceptable for use as backfill or fill.

3.5 EXCAVATION FOR STRUCTURES

A. Conform to elevations and dimensions shown within a tolerance of plus or minus 0.10 foot, and extending a sufficient distance from footings and foundations to permit placing and removal of concrete formwork, installation of services, and other construction and for inspection.
   1. Excavations for footings and foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before concrete reinforcement is placed. Trim bottoms of required lines and grades to leave solid base to receive other work.

3.6 BACKFILL AND FILL

A. General: Place soil material in layers to the required subgrade elevations, for each area classification listed below, using materials specified in Part 2 of this Section.

B. Backfill excavations as promptly as work permits, but not until completion of the following:
   1. Acceptance of construction below finish grade including where applicable, damp proofing, waterproofing, and perimeter insulation.
   2. Removal of concrete formwork.
   3. Removal of shoring and bracing, and backfilling of voids with satisfactory materials. Cut off temporary sheet piling driven below bottom of structures and remove in a manner to prevent settlement of the structure or utilities, or leave in place if required.
   4. Removal of trash and debris from excavation.
   5. Permanent or temporary horizontal bracing is in place on horizontally supported walls.

3.7 PLACEMENT AND COMPACTION

A. Ground Surface Preparation: Remove vegetation, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to placement of fills. Plow, strip, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so that fill material will bond with existing surface.
   1. When existing ground surface has a density less than that specified under "Compaction" for a particular area classification, break up the ground surface, pulverize, moisture-condition to optimum moisture content, and compact to the required depth and percentage of maximum density.

B. Place backfill and fill materials in layers not more than 6 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.

C. Before compaction, moisten or aerate each layer as necessary to provide optimum

moisture content. Compact each layer to the required percentage of maximum dry density or relative dry density for each area classification. Do not place backfill or fill material on surfaces that are muddy.

D. Place backfill and fill materials evenly adjacent to structures, piping, or conduit to the required elevations. Prevent wedging action of backfill against structures or displacement of piping or conduit by carrying material uniformly around structure, piping, or conduit to approximately same elevation in each lift.

E. Control soil and fill compaction, providing a minimum percentage of density as specified for each area classification indicated below. Correct improperly compacted areas or lifts as directed by the Engineer if soil density tests indicate inadequate compaction.
   1. Percentage of Maximum Density Requirements: Compact soil to not less than the following percentages of maximum density, in accordance with AASHTO T-1800:
      a. Under structures, (and pavements, compact top 12 inches of subgrade and each layer of backfill or fill material at 98 percent minimum density.
   2. Moisture Control: Where subgrade or a layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface of the subgrade or layer of soil material. Apply water in minimum quantities as necessary to prevent free water from appearing on the surface during or subsequent to compaction operations.
      a. Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density.
      b. Stockpile or spread soil material that has been removed because it is too wet to permit compaction. Assist drying by harrowing, or pulverizing until moisture content is reduced to a satisfactory value.

3.8 GRADING

A. Uniformly grade areas within limits of grading under this section, including adjacent transition areas. Smooth finished surface within specified tolerances, compact with uniform levels or slopes between points where elevations are indicated or between such points and existing grades.

B. Grade areas adjacent to building lines to drain away from structures and to prevent ponding. Finish surfaces free from irregular surface changes and as follows:
   1. Pavement: Shape surface of areas under pavement to line, grade, and cross-section, with the finished surface not more than 1/2 inch above or below the required subgrade elevation.

C. Grading surface of fill under building slabs: Grade smooth and even, free of voids, compacted as specified, and to the required elevation. Provide final grades within a tolerance of 1/2 inch when tested with a 10-foot straight edge.

D. Compaction: After grading, compact subgrade surfaces to the depth and indicated percentage of maximum or relative density for each area classification.

3.9 FIELD QUALITY CONTROL

A. Quality Control Testing During Construction: Allow testing service to inspect and approve each subgrade and fill layer before further backfill or construction work is

performed.

1. Perform field density tests in accordance with ASTM D 1556 (sand cone method) or ASTM D 2167 (rubber balloon method), as applicable.
    a. Field density tests may also be performed by the nuclear method in accordance with ASTM D 2922, providing that calibration curves are periodically checked and adjusted to correlate to tests performed using ASTM D 1556. In conjunction with each density calibration check, check the calibration curves furnished with the moisture gages in accordance with ASTM D 3017.
    b. If field tests are performed using nuclear methods, make calibration checks of both density and moisture gages at the beginning of the work, on each different type of material encountered, and at intervals as directed by the Engineer.
2. Foundation Subgrade: For each strata of soil on which footings will be placed, perform at least one test to verify required design bearing capacities. Subsequent verification and approval of each foundation subgrade may be based on a visual comparison of each subgrade with related tested strata when acceptable to the Engineer.
3. Paved Areas: In each compacted fill layer, perform one field density test for every 500 L.F. of overlaying or paved area, but in no case fewer than three tests.
4. Foundation Wall Backfill: Perform at least two field density tests at locations and elevations as directed.
5. If in the opinion of the Engineer, based on the testing service reports and inspections, subgrade or fills that have been placed are below the specified density, perform additional compaction and testing until the specified density is obtained.

3.10 EROSION CONTROL:

A. Provide erosion control methods in accordance with requirements of authorities having jurisdiction.

3.11 MAINTENANCE

A. Protection of Graded Areas: Protect newly graded areas from traffic and erosion. Keep free of trash and debris.

B. Repair and reestablish grades in settled, eroded, and rutted areas to specified tolerances.

C. Reconditioning Compacted Areas: Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, reshape, and compact to the required density prior to further construction.

D. Settling: Where settling is measurable or observable at excavated areas during the general project warranty period, remove surface (pavement, lawn, or other finish), add backfill material, compact, and replace surface treatment. Restore appearance, quality, and condition of surface or finish to match adjacent work, and eliminate evidence of restoration to the greatest extent possible.

3.12 DISPOSAL OF EXCESS AND WASTE MATERIAL

A. Removal to Designated Areas on Owner's Property: Transport acceptable excess excavated material to designated soil storage areas on Owner's property. Stockpile

soil or spread as directed by the Engineer.

B. Removal from Owner's Property: Remove waste materials, including unacceptable excavated material, trash, and debris, and dispose of it off Owner's property.

END OF SECTION

SECTION 02221

TRENCHING, BEDDING, AND BACKFILL FOR PIPE

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work included: The Contractor shall furnish all labor, equipment, and incidentals necessary to perform all excavation, backfill, fill, grading and slope protection required to complete the piping work shown on the Drawings and specified herein. The work shall include, but not necessarily be limited to: manholes, vaults, duct conduit, pipe, roadways and paving; all backfilling, fill and required borrow; grading; disposal of surplus and unsuitable materials; and all related work such as sheeting, bracing, and water handling.

B. Related Work:
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
2. Section 02150: Shoring and Bracing
3. Section 02201: Earthwork for Utility Structures
4. Section 02576: Paving and Resurfacing

1.2 TRENCH PROTECTION

A. A Contractor shall construct and maintain sheeting and bracing as required to support the sides of excavations, to prevent any movement which could in any way diminish the width of the excavation below that necessary for proper construction, and to protect adjacent structures, existing piping and/or foundation material from disturbance, undermining, or other damage. Care shall be taken to prevent voids outside of the sheeting, but if voids are formed, they shall be immediately filled and rammed.

B. For pipe trench sheeting, no sheeting is to be withdrawn if driven below mid-diameter of any pipe, and no wood sheeting shall be cut off at a level lower than 1 foot above the top of any pipe unless otherwise directed by the Engineer. If during the progress of the work the Engineer decides that additional wood sheeting should be left in place, he may direct the Contractor in writing. If steel sheeting is used for trench sheeting, removal shall be as specified above unless written approval is given by the Engineer for an alternate method of removal.

C. All sheeting and bracing not left in place shall be carefully removed in such a manner as not to endanger the construction or other structures, utilities, existing piping, or property. All voids left or caused by withdrawal of sheeting shall be immediately refilled with sand by ramming with tools especially adapted to that purpose by watering or otherwise as may be directed.

D. The right of the Engineer to order sheeting and bracing left in place shall not be construed as creating any obligation on his part to issue such orders, and his failure to exercise his right to do so shall not relieve the Contractor from liability for damages to persons or property occurring from or upon the work occasioned by negligence or otherwise, growing out of a failure on the part of the Contractor to

leave in place sufficient sheeting and bracing to prevent any caving or moving of the ground.

1.3 JOB CONDITIONS

A. The Contractor shall examine the site and review the available test borings or undertake his own soil borings prior to submitting his bid, taking into consideration all conditions that may affect his work. The Owner and Engineer will not assume responsibility for variations of sub-soil quality or conditions at locations other than places shown and at the time the investigations was made. Boring log data and soil samples are available for examination after signing a release at the office of the Engineer.

B. Existing Utilities: Locate existing underground utilities in the areas of work. If utilities are to remain in place, provide adequate means of protection during earthwork operations.
   1. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult the Engineer and the Owner for such piping or utility immediately for directions.
   2. Cooperate with Owner and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility owner.

C. Protection of Persons and Property: Barricade open excavations occurring as part of this work and post with warning lights. Operate warning lights as recommended by authorities having jurisdiction.
   1. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.

1.4 SUBMITTALS

A. The Contractor shall furnish the Engineer, for approval, a representative sample of fill material obtained from onsite sources weighing approximately 50 pounds, at least ten calendar days prior to the date of anticipated use of such material.

B. For each material obtained from other than onsite sources, the Contractor shall notify the Engineer of the source of the material and shall furnish the Engineer, for approval, a representative sample weighing approximately 50 pounds, at least ten calendar days prior to the date of anticipated use of such material.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General:
   1. Materials for use as base, fill and backfill shall be as described below:
      a. Satisfactory soil materials are defined as those complying with American Association of State Highway and Transportation Officials (AASHTO) M-145, soil classification Groups A-1, A-2-4. A-2-5, and A-3.
      b. Unsatisfactory soil materials are those defined in ASSHTO M-145

soil classification Groups A-2-6, A-2-7, A-6, and A-7 along with peat and other highly organic soils.

B. Structural Fill:
1. Structural fill material shall be satisfactory soil material consisting of a minimum of 60 percent clean medium to fine grain sized quartz sand, free of organic, deleterious and/or compressible material. Rock in excess of 2-1/2 inches in diameter shall not be used in the fill material. Structural fill shall not contain hardpan, stones, rocks, cobbles or other similar materials.

C. Common Fill:
1. Common fill material shall be satisfactory soil material containing no more than 20 percent by weight finer than No. 200 mesh sieve. It shall be free from organic matter, much, marl, and rock exceeding 2-1/2 inches in diameter. Common fill shall not contain broken concrete, masonry, rubble or other similar materials.
2. Material falling within the above specification, encountered during the excavation, may be stored in segregated stockpile for reuse. All material which, in the opinion of the Engineer, is not suitable for reuse shall be spoiled as specified herein for disposal of unsuitable materials.

D. Rock Bedding:
1. Rock bedding shall be 3/8" to 3/4" washed and graded limerock. This rock shall be graded so that 99% will pass a 3/4" screen and 80% will be retained on a No. 8 screen.

PART 3 - EXECUTION

3.1 GENERAL

A. All excavation, backfill and grading necessary to complete the work shall be made by the Contractor and the cost thereof shall be included in the contract price.

B. Material shall be furnished as required from off site sources and hauled to the site.

C. The Contractor shall take all the necessary precautions to maintain the work area in a safe and workable condition.

D. The Contractor shall protect his work at all times by flagging, marking, lighting and barricading. It shall also be the Contractor's responsibility to preserve and protect all above and underground structures, pipe lines, conduits, cables, drains or utilities which are existing at the time he encounters them. Failure of the Drawings to show the existence of these obstructions shall not relieve the Contractor from this responsibility. The cost of repair of any damage which occurs to these obstructions during or as a result of construction shall be borne by the Contractor without additional cost to the Owner.

3.2 TRENCH EXCAVATION

A. Excavation for all trenches required for the installation of pipes and electrical ducts shall be made to the depths indicated on the Drawings. Excavate trench to provide a minimum of 20 inch clear cover over the pipe bell unless otherwise noted on the Drawings. Excavate in such manner and to such widths as will give suitable room

for laying the pipe or installing the ducts within the trenches, for bracing and supporting and for pumping and drainage facilities. The trench width at the top of the pipe shall not exceed the allowable as determined by the depth of cut and indicated on the Drawings.

B. Rock shall be removed to a minimum 8-inches clearance around the bottom and sides of all the pipe or ducts being laid.

C. Where pipe or ducts are to be laid in limerock bedding or encased in concrete the trench may be excavated by machinery to or just below the designated subgrade provided that the material remaining in the bottom of the trench is no more than slightly disturbed.

D. Where the pipes or ducts are to be laid directly on the trench bottom, the lower parts of the trenches shall not be excavated to the trench bottom by machinery. The last of the material being excavated shall be done manually in such a manner that will give a flat bottom true to grade so that pipe or duct can be evenly and uniformly supported along its entire length on undisturbed material or bedding rock. Bell holes shall be made as required manually so that there is no bearing surface on the bells and pipes are supported along the barrel only.

3.3 PIPE INTERFERENCES AND ENCASEMENT

A. The Contractor shall abide by the following schedule of criteria concerning interferences with other facilities.
   1. In no case shall there be less than 0.3 feet between any two pipe lines or between pipe lines and structures.
   2. Class I Concrete Encasement: Wherever there is more than 0.3 feet but less than 1.5 feet clearance between sewers, sewer house laterals, force mains and water mains or water services, then a concrete encasement shall be provided in accordance with the typical detail as shown on the Drawings.
   3. Class II Concrete Encasement: Wherever there is more than 0.3 feet but less than 1.0 feet clearance between any two pipe lines, or between pipe lines and structures, then a concrete encasement shall be provided in accordance with the typical detail as shown on the Drawings.

B. The Engineer shall have full authority to direct the placement of the various pipes and structures in order to facilitate construction, expedite completion and to avoid conflicts.

3.4 BACKFILLING

A. Backfilling over pipes shall begin as soon as practicable after the pipe has been laid, jointed, and inspected and the trench filled with suitable compacted material to the mid-diameter of the pipe.

B. Backfilling over ducts shall begin not less than three days after placing concrete encasement.

C. All backfilling shall be prosecuted expeditiously and as detailed on the Drawings.

D. Any space remaining between the pipe and sides of the trench shall be packed full by hand shovel with selected earth, free from stones having a diameter greater than 2-inches and thoroughly compacted with a tamper as fast as placed, up to a level of one foot above the top of the pipe. Compact to 95% maximum density in layers not to exceed 4 inches up to the centerline of the pipe from the trench bottom and in layers not to exceed 4 inches up to the centerline of the pipe from the trench bottom and in layers not to exceed 6 inches from the pipe centerline to 12 inches above the pipe.

E. The filling shall be carried up evenly on both sides with at least one many tamping for each man shoveling material into the trench.

F. The remainder of the trench above the compacted Backfill, as just described above, shall be filled and thoroughly compacted with common fill by rolling, ramming, of puddling, as the Engineer may direct. Compact common fill in 6-inch layers to 98% maximum density.

G. The bedding rock in much areas shall consists of at least 6 inches of washed and graded limerock placed in the trench to the proposed elevation of the centerline of the pipe prior to any pipe lying. This bedding shall not be used under any circumstances as a drain for ground water. The Contractor shall take all precautions necessary to maintain the bedding in a compacted state and to prevent washing, erosion or loosening of this bed.

H. In location where pipes pass through building walls, the Contractor shall take the following precautions to consolidate the refill up to an elevation of at least 1 foot above the bottom of the pipes:
   1. Place structural fill in such areas for a distance of not less than 3 feet on either side of the center line of the pipe in level layers not exceeding 6-inches in depth.
   2. Wet each layer to the extent directed and thoroughly compact each layer with a power tamper to the satisfaction of the Engineer.

3.5 GRADING

A. Grading shall be performed at such places as are indicated on the Drawings, to the lines, grades, and elevations shown or as directed by the Engineer and shall be made in such a manner that the requirements for formation of embankments can be followed. All unacceptable material encountered, of whatever nature within the limits indicated, shall be removed and disposed of as directed. During the process of excavation, the grade shall be maintained in such condition that it will be well drained at all times. When directed, temporary drains and drainage ditches shall be installed to intercept or divert surface water which may affect the prosecution or condition of the work.

B. If at the time of excavation it is not possible to place any material in its proper section of the permanent structure, it shall be stockpiled in approved areas for later use. No extras will be considered for stockpiling or double handling of excavating material.

C. The right is reserved to make minute adjustments or revisions in lines or grades if found necessary as the work progresses, due to discrepancies on the Drawings or in order to obtain satisfactory construction.

D. Stones or rock fragments larger than 2-1/2 inches in their greatest dimensions will not be permitted in the top 6 inches of the subgrade line of all dikes, fills or embankments.

E. All fill slopes shall be uniformly dressed to the slope, cross-section and alignment shown on the Drawings, or as directed by the Engineer.

F. In cuts, all loose or protruding rocks on the back slopes shall be barred loose or otherwise removed to line or finished grade of slope. All cut and fill slopes shall be uniformly dressed to the slope, cross-section and alignment shown on the Drawings or as directed by the Engineers.

G. No grading is to be done in areas where there are existing pipe lines that may be uncovered or damaged until such lines which must be maintained are relocated, or where lines are to be abandoned, all required valves are closed and drains plugged at manholes.

H. The Contractor shall replace all pavement cut of otherwise damaged during the progress of the work as specified elsewhere herein.

3.6 DISPOSAL OF UNSUITABLE AND SUPPLY MATERIAL

A. All surplus and/or unsuitable excavated material shall be disposed of in one of the following ways as directed by the Engineer.
   1. Transport to soil storage area on Owner's property and stockpile or spread as directed by the Engineer.
   2. Transport from Owner's property and legally dispose of. Any permit required for the hauling and disposing of this material beyond Owner's property shall be obtained prior to commending hauling operations.

B. Suitable excavated material may be used for fill if it meets the specifications for common fill and is approved by the Engineer. Excavated material so approved may be neatly stockpiled at the site where designated by the Engineer provided there is an area available where it will not interfere with the operation of the facility nor inconvenience traffic or adjoining property owners.

END OF SECTION

SECTION 02223

EXCAVATION BELOW NORMAL GRADE AND GRAVEL REFILL

PART 1 - GENERAL

1.1 DESCRIPTION

A. If in the opinion of the Engineer, the material at or below the normal grade of the bottom of the trench (0.7-feet below the invert of the pipe) is unsuitable for foundation, it shall be removed to the depth directed by the Engineer and replaced by drain rock, at no additional cost to the Owner.

B. Related Work:
1. Documents affecting work of this section include, but are not necessarily limited to General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
2. Section 02221: Trenching, Bedding and Backfill for Pipe.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Drain rock shall be 3/8-inch to 3/4-inch washed and graded limerock. The rock shall be graded so that 99% will pass a 3/4-inch screen and 80% will be retained on a No. 8 screen.

PART 3 - EXECUTION

3.1 EXCAVATION AND DRAINAGE:

A. Whatever the nature of unstable material encountered or the groundwater conditions, trench drainage shall be complete and effective.

B. If the Contractor excavates below grade through error or for his own convenience, or through failure to properly dewater the trench, or disturbs the subgrade before dewatering is sufficiently complete, he may be directed by the Engineer to excavate below grade as set forth in the preceding paragraph, in which case the work of excavating below grade and finishing and placing the refill shall be performed at the Contractors own expense.

3.2 REFILL

A. If the material at the level of trench bottom consists of fine sand, sand and silt or soft earth which may work into the drain rock notwithstanding effective drainage, the subgrade material shall be removed to the extent directed and the excavation refilled with coarse sand, or a mixture graded from coarse sand to fine peastone, to form a filter layer preserving the voids in the gravel bed of the pipe. The composition and gradation of gravel shall be approved by the Engineer prior to placement. Gravel shall be placed in 6-inch layers thoroughly compacted. If directed by the Engineer, drain rock shall be used for refill of excavation below grade.

END OF SECTION

SECTION 02575

LIMEROCK BASE

PART 1 – PRODUCTS

1.1 MATERIALS

A. Limerock shall be Miami Oolite Limerock obtained from local sources, free from roots, leaf-mold, humus, sand, or other objectionable material. No salvaged limerock from any source whatsoever shall be used. Limerock shall contain by weight not less than 75% of carbonates of calcium and magnesium. All rock shall pass of three inch ring.

PART 2 – EXECUTION

2.1 PLACING ROCK

A. Six Inch Base: After the subgrade has been carefully prepared, loose rock shall be spread uniformly over the full width of the roadway to a thickness of not less than eight inches (8"). If any of the subgrade material should become mixed with the rock, all affected rock shall immediately be removed and replaced with new clean rock. The rock shall them be bladed to conform to the cross-section and rolled; water being added if and as needed or as directed by the Engineer. Rolling shall continue until a dense unyielding mass is obtained. The compacted thickness shall be not less than six inches (6").

B. Eight Inch Base and greater: Where eight inch base is specified in the plans or specifications, a first course of rock approximately six inches (6”) thick shall be spread over the full width of the roadway. If any of the subgrade material should become mixed with the rock, all affected rock shall be immediately removed and replaced with new clean rock. The rock shall then be bladed to conform to the cross-section, and rolled until the entire depth of the course is compacted into a dense, unyielding mass. Water shall be added if and as necessary or as directed by the Engineer. After satisfactory construction of the first course, the surface shall be lightly scarified to the depth of not less than two inches (2”), and the rock for the second course added in sufficient thickness to insure a total compacted thickness of eight inches (8”). The rock for the second course shall be rolled and watered in a manner similar to the first course. The compacted thickness of the total base shall not be less than eight inches (8”).

2.2 ROLLING

A. All rolling shall be done initially at the sides of the roadway, and continue towards the center until all the rock has been thoroughly compacted into a dense an unyielding mass. Sufficient water shall be provided to insure a good surface and bond. Compaction equipment adequate to obtain a minimum of 95% of the maximum density as determined as AASHTO Designation T-180-74 Method D.

2.3 FINISHING

A. After the base course has been thoroughly compacted, the surface shall be lightly scarified to depth of approximately on-half the depth of the base, and then watered, bladed and rolled as specified above. Upon completion, the base shall be true to grade and cross-section and thoroughly bonded. The edge of the completed limerock base shall meet the full design

thickness as shown in the plans and specifications. The finish surface of the base shall be checked with a template finished by the Contractor, cut to the required crown and cross-section, and with a fifteen foot (15') straightedge, also furnished by the Contractor, laid parallel to the centerline of the road. Any variation greater than one-quarter (1/4") of an inch shall be corrected by scarifying to a depth of one-half (1/2") the thickness of the base, removing or adding rock as required, after which the entire area shall be watered, rolled, and brought to a satisfactory state of compaction.

2.4 BITUMINOUS TREATMENT

A. All limerock base surfaces shall be treated with an application of bituminous material as hereinafter specified.

END OF SECTION

SECTION 02576

PAVING AND RESURFACING

PART 1 - GENERAL

1.1 DESCRIPTION

A. The work of this section includes, but is not limited to:
   1. Temporary Paving
   2. Permanent Paving

B. Related Work:
   1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

1.2 QUALITY ASSURANCE

A. Referenced Standards:
   1. Florida Department of Transportation Standard Specifications for Road and Bridge Construction Latest Edition, including Supplements.

1.3 SUBMITTALS

A. Certificates:
   1. Submit certification from bituminous and aggregate suppliers attesting that materials conform to the Controlling Agency Specifications.

1.4 JOB CONDITIONS

A. Control of Traffic:
   1. Take measures to control traffic during repaving operations. Do not allow traffic on repaved areas until authorized by the Engineer.
   2. Employ traffic control measures necessary to maintain and to protect traffic, to protect the work in progress, to protect adjacent property from excess dust resulting from the construction area and to maintain traffic through, around, or adjacent to the construction area. The work shall include the furnishing and maintaining of all traffic control devices, flaggers, construction of temporary structures when required, labor, equipment and materials to keep the traveled road smooth and the furnishing and application of dust palliatives.

B. Restore existing paving outside the limits of the work that is damaged by the contractor's operations to its original condition at the expense of the Contractor.

PART 2 - PRODUCTS

2.1 FLEXIBLE PAVEMENT MATERIALS AND AGGREGATES

A. Bituminous Treatments, surface courses and concrete pavements shall conform to Florida Department of Transportation Standard Specifications for Road and Bridge Construction, Latest Edition. Thickness shall be a minimum of 1 inch of Type S-3

Asphaltic Concrete Pavement, unless otherwise noted on plans.

B. Refer to Section 300, Florida Department of Transportation Specifications, Latest Edition. All bituminous materials and aggregates used in paving and resurfacing are designated in these specifications and shall conform to the applicable portions of the State specifications.

PART 3 - EXECUTION

3.1 TEMPORARY PAVING

A. Place temporary paving immediately upon completion of trench back-filling. Unpaved trenches shall not remain unpaved longer than one working day after back-filling.

B. Shape and compact subgrade material, then place and compact crushed stone base course to the required thickness.

C. Place temporary paving material. Compact to required minimum thickness with trench roller having minimum 300 pounds per inch-width of compaction roll.

D. Continuously maintain temporary paving to the satisfaction of the Engineer and the state and local road departments.

E. Remove and dispose of temporary pavement prior to the placement of permanent pavement.

3.2 PERMANENT PAVING

A. Excavate to the lines and grades on plans to receive permanent pavement, including the disposal of surplus excavated material. Remove all muck and organic materials.

B. Remove temporary paving material. Construct permanent base and surface courses to the required compacted thickness shown on the plans in accordance with Florida Department of Transportation Standards for Road and Bridge Construction.

C. Trim existing paving to remove damaged areas. Cut straight joint lines and right angle offsets.

D. Maintain permanent paving to the satisfaction of the Engineer and the local and state road departments throughout the contract maintenance period.

3.3 BITUMINOUS OVERLAY

A. Where indicated on the drawings, standard details, or directed by the engineer, place a bituminous overlay.

B. Construct in accordance with Florida Department of Transportation Standards for Road and Bridge Construction.

3.4 DRIVEWAYS

A. Trim concrete and bituminous driveway surfaces to remove damaged areas. Saw cut straight joint lines parallel to the centerline of the trench. Cut offsets at right angles to the trench centerline.

B. Restore existing concrete driveways trenched through with a 6" layer of concrete reinforced with 6 x 6 10/10 wire mesh.

C. Restore existing asphalt driveways trenched through in kind or with minimum 1" layer wearing course over 12" layer of D.O.T. road rock.

D. Restore earth driveways with a 6" layer of 3/4" stone backfill. Florida DOT 901-6 No. 14.

E. Restore brick driveways with like brick placed on a 4" thick wet sand bed. Place bricks in like pattern and spacing.

3.5 CONCRETE CURB AND SIDEWALK REPAIRS – IF DAMAGED DURING CONSTRUCTION

A. Replace curbs and sidewalks damaged by construction to match new or existing.

B. Reconstruct curbs and sidewalks to the first expansion joint on either side of the damaged portion. Install preformed expansion joint material.

C. Sidewalks shall be new construction for the full width of the existing slabs.

D. Reconstruct sidewalks to 4 inch thickness of Class I concrete placed on a 4 inch base of compacted material.

E. Sidewalks and curbs materials and construction methods shall be in accordance with Sections 522 and 520 of the referenced Florida Department of Transportation Specifications.

END OF SECTION

SECTION 02577

BITUMINOUS PRIME COAT

PART 1 – GENERAL

1.1 REQUIRED USE:

A. Where an asphaltic concrete is to be applied, the rock base shall be first treated with a prime coat.

1.2 RATE OF APPLICATION:

A. The bituminous material for the prime coat shall be applied at the rate of 0.10 gallons to 0.12 gallons per square yard at a pressure of 25-75 pounds per square inch.

PART 2 – PRODUCTS

2.1 MATERIALS:

A. The bituminous material to be used shall be a rapid curing cut-back asphalt. The asphalt shall be homogeneous and shall not have been distilled at a temperature high enough to injure the asphalt by cracking, and it shall show no separation upon standing. The bituminous material used shall conform to the current Florida Department of Transportation Specifications concerning prime coats.

PART 3 – EXECUTION

3.1 WEATHER AND TEMPERATURE LIMITATIONS:

A. The prime coat shall only be applied when the surface is dry or contains sufficient moisture to obtain uniform distribution or the bituminous material, when the atmospheric temperature is above 50^{o}F., and when the weather is not foggy or rainy. There shall be a minimum of three continuous days of dry warm weather after the prime coat is applied before the application of asphaltic concrete (Note: See Section 02578 Tack Coat).

3.2 EQUIPMENT:

A. The equipment used by the Contractor shall be self-powered pressure bituminous material distributor having equipment for heating bituminous material. The distributor shall be equipped with pneumatic tires having a sufficient width to avoid either breaking the bond or forming ruts in the surface and shall have a tachometer, pressure gauges, volume measure devices, and a thermometer for reading temperatures of the tank contents.

3.3 APPLICATION OF BITUMINOUS MATERIAL:

A. Immediately before the application of the prime coat, the full width of the surface to be treated shall be “hard bladed”, and then swept with a power broom supplemented with hand brooms and mechanical blowers. Care shall be taken to remove all loose material, dust, dirt, clay and other objectionable material. The application of the bituminous material shall be by means of a pressure

distributor of approved type, applied uniformly at the temperature pressure and rate specified. Care shall be taken to protect all buildings, curbs, sidewalks, manholes, catch basins, and other structures in the right-of-way or adjacent to work from being sprayed or stained by the bituminous material. Immediately after application of the prime coat, the surface shall be covered with Gray Bay Sand.

END OF SECTION

SECTION 02578

TACK COAT

PART 1 – GENERAL

1.1 REQUIRED USE:

A. Where an asphaltic concrete leveling or wearing course is to be applied, the existing surface shallfirst be treated with the application of a tack coat. A tack coat will not be used on newly constructed limerock base courses which have been primed, except upon direction of the Engineer because of unusual conditions of the primed surface.

1.2 RATE OF APPLICATION

A. Approximate rate of application of bituminous material shall be 0.12 gallons per square yard at a pressure of 25-75 pounds per square inch.

PART 2 – PRODUCTS

2.1 MATERIALS:

A. The bituminous material to be used shall be a rapid curing cut-back asphalt. The asphalt shall be homogeneous and shall not have been distilled at a temperature high enough to injure the asphalt by cracking, and it shall show no separation upon standing. The bituminous material used shall conform to the current Florida Department of Transportation Specifications concerning tack coats.

PART 3 - EXECUTION

3.1 WEATHER AND TEMPERATURE LIMITATIONS:

A. The tack coat shall be applied only when the existing surface is dry, when the atmospheric temperature is above 50^{O}F., and when the weather is not foggy or rainy.

3.2 EQUIPMENT:

A. The equipment used by the Contractor shall be self-powered pressure bituminous material distributor having equipment for heating bituminous material. The distributor shall be equipped with pneumatic tires having a sufficient width to avoid either breaking the bond or forming ruts in the surface and shall have a tachometer, pressure gauges, volume measure devices, and a thermometer for reading temperatures of the tank contents.

3.3 APPLICATION OF BITUMINOUS MATERIAL:

A. Immediately before the application of the tack coat, the full width of the surface to be treated shall be swept clean of all sand, clay, dust or other objectionable material. The application of the bituminous material shall be by means of a pressure distributor of approved type, applied uniformly at the temperature pressure and rate specified. The tack coat shall be applied sufficiently in advance of the laying of the wearing surface to permit drying, but shall not be applied so far in advance or over such an area as lose its adhesiveness as a result of being covered with dust or other foreign matter. Care shall be taken to protect all buildings, curbs,

sidewalks, manholes, catch basins, and other structures in the right-of-way or adjacent to work from being sprayed or stained by the bituminous material. The tack coat shall be kept from traffic until the wearing surface is laid.

END OF SECTION

SECTION 02720

STORM DRAINAGE SYSTEM

PART 1 - GENERAL

1.01 WORK INCLUDED

A. The work covered and described in this Section includes the furnishing and construction of culverts, storm sewers, inlets and other drainage structures as shown on the Drawings and specified herein.

1.02 SUBMITTALS

A. Shop Drawings: Shop drawings for the following items shall be submitted for approval.
1. Grates and Castings
2. Precast structures
3. Pollution Retardant Baffles

B. Pipe certification of quality by producer shall be delivered to Engineer ten days prior to installation.

1.03 JOB CONDITIONS

A. Existing Drainage System: Maintain operational, prevent siltation with the method as approved and as directed by the Engineer.

PART 2- PRODUCTS

2.01 MATERIALS

A. Concrete Pipe: Concrete pipe shall be reinforced concrete culvert pipe conforming to ASTM Designation C 76, Table III, except when otherwise indicated. Pipe joints shall be rubber gasket joints, and the pipe joint shall be manufactured to meet the requirements of the approved type of gasket to be used. Pipe joints and rubber gaskets shall conform to the requirements of Section 941 and 942 of the FDOT Standard Specifications.

B. Corrugated aluminum pipe (C.A.P.) shall be helical type, conforming to ASTM B209 and AASHTO M196, as manufactured by Kaiser Aluminum, Inc., or approved equal. The corrugation pattern and gauge shall be as follows:

DIA.	CORRUGATION	GAUGE
12" TO 21"	2-2/3" X ½"	16
24" TO 27"	2-2/3" X ½"	16
30"	2-2/3" X 1-½"	14
36" TO 54"	3" X 1"	14
60" TO 78"	3" X 1"	12

Pipe couplings for C.A.P. shall be 12" wide (minimum), 24" for 60" diameter or larger, split bands of the same alloy as the pipe may be one gauge lighter than the pipe. Polyurethane or other manufacturer supplied sealant shall be used with the couplings.

C. French Drain Pipe: Pipe for the french drains shall be one of the following types, unless otherwise specified on the drawings, that conform to the respective specification, except perforations and joints shall be as shown on the Drawings.
   1. Concrete Pipe - ASTM Designation C14
   2. Perforated Concrete Pipe - AASHTO Designation Ml 75
   3. Perforated and Nonperforated Clay Pipe - ASTM Designation C700, Standard Strength
   4. Bituminous Coated Corrugated Metal Pipe (Perforated) - AASHTO Designations Type Ill and Ml 90, Type A
   5. Corrugated Aluminum Perforated Pipe - AASHTO Designation Ml 97
   6. High Density Polyethylene (HDPE) – ASTM D3350

D. Brick: Brick for drainage structures shall be dense, hard burned, shale or clay brick conforming to ASTM Designation C32, Grade MM or C 62, Grade MW, except that brick absorption shall be between five and twenty-five grams of water absorbed in one minute by dried brick, set flat face down, in 1/8-inch of water.

E. Cement Mortar: Cement mortar for manhole construction shall be one part cement and two parts clean sharp sand to which may be added lime in the amount of not over twenty-five percent volume of cement. It shall be mixed dry and then wetted to proper consistency for use. No mortars that have stood for more than one hour shall be used.

F. Concrete: Concrete shall conform to the requirements of Section 03300 - “Cast-in-Place Concrete”.

G. Precast Concrete Units: Precast concrete inlets shall conform to applicable requirements of Section 03480 – “Precast Concrete Specialties”.

H. Castings: Castings for inlets and other items shall conform to the ASTM Designation A 48, Class 25. Castings shall be true to pattern in form and dimensions and free of pouring faults and other defects in positions which would impair their strength or otherwise make them unfit for the service intended. No plugging or filling will be allowed. Catch basin gratings shall be as specified on the drawings.

I. The trench liner shall be Mirafi 700X filter fabric or approved equal.

J. Ballast rock for french drains shall be limerock free from deleterious matter and 3/4-inch to 2 ½-inches in size with not more than 10% passing the ½-inch sieve.

K. Pea rock shall be graded so that 100% passes the 1-inch sieve and not more than 5% passes the 1/4-inch sieve.

L. Roofing felt shall be 30 pound felt.

PART 3- EXECUTION

3.01 PREPARATION

A. Pipe Trenches:

1. Pipe trenches shall be of necessary widths for the proper laying of the pipe and the banks shall be as nearly vertical as practicable. In paved areas, the trench shall be vertical and sheeted, if required; the clearance between the pipe and trench wall or back of sheeting shall not exceed 18 inches. The bottom of the trenches shall be excavated to a depth of the outside bottom of the pipe barrel. Any over excavation shall be replaced with suitable compacted material. Excavation for inlets and other appurtenances shall be sufficient to provide a clearance between their outer vertical surfaces and the face of the excavation or sheeting, if used, of not less than 12- inches.
2. Soft, spongy, or otherwise unsuitable material encountered below the established grade of the excavation which will not provide a firm foundation for subsequent work shall be removed and replaced as directed. Unless otherwise directed, all such unstable materials shall be removed for the full width of the excavation and replaced with approved fill material.
3. Where sheeting and bracing are necessary to prevent caving of the trench sidewalls or sidewalls of excavation for other structures, and to safeguard the workmen, the trench or excavation for other structures shall be dug to such width that the proper allowance is made for the space occupied by the sheeting and bracing to provide clearance as specified above.

3.02 INSTALLATION

A. Laying Concrete Pipe:

1. All pipe shall be placed on a minimum of 8" stable granular material free of rock formation and other foreign formations, all pipe shall be carefully laid true to the line and grade shown on the Drawings. Any deviation from true alignment or grade which would result in a displacement from the normal position of the gasket of as much as 1/4-inch, or which would produce a gap exceeding ½-inch between sections of pipe for more than 1/3 of the circumference of the inside of the pipe, will not be acceptable and where such occurs, the pipe shall be relaid without additional compensation. No mortar, joint compound, or other filler which would tend to restrict the flexibility of the gasket joint shall be applied to the gap. Pipes having defects that have not caused their rejection are to be so laid that these defects will be in the upper half of the sewer.
2. Before installation of the pipe gasket, the surface of the pipe joint, including the gasket recess, shall be clean and free from grit, dirt, or other foreign matter at the time the joints are made. In order to facilitate closure of the joint, application of an approved vegetable soap lubricant immediately prior to closing of the joint will be permitted.
3. All pipes shall be laid with bells or grooves uphill. As the pipes are laid throughout the work, they must be thoroughly cleaned and protected from dirt and water. No length of pipe shall be laid until the two preceding lengths have been thoroughly embedded in place so as to prevent any movement or disturbance of the finished joint. No walking on or working over the pipes after they are laid, except as may be necessary in tamping earth and

refilling, will be permitted until they are covered to a depth of one-foot. No pipe shall be laid except in the presence of an authorized inspector. Fill placed around the pipe shall be deposited on both sides simultaneously to approximately the same elevation and uniformly compacted. Whenever the pipe laying is discontinued, as at night, the unfinished end is to be securely protected from displacement due to caving of the banks or from other injury and a suitable stopper is to be inserted therein.

B. Laying Corrugated Pipe:

1. All corrugated pipe shall be carefully laid, true to the line and grade shown on the Drawings. Where a coupling is required, the pipe gasket and coupling band shall be centered over the joint with the coupling band bolts securely tightened without cutting the gasket.
2. Fill placed around the pipe shall be deposited on both side simultaneously to approximately the same elevation and uniformly compacted. Whenever the pipe laying is discontinued, as at night, the unfinished end is to be securely protected from displacement due to caving of the banks or from other injury and a suitable stopper is to be inserted therein.

C. French Drain Trenches:

1. French drain trenches shall be excavated to the lines and grade shown on the Drawings, filter fabric shall be laid in the open trench, and the trench backfilled with ballast rock to the bottom of the proposed pipe.
2. Filter fabric shall be sufficiently wide to cover both walls and bottom of trench. If width of filter fabric is not adequate, the fabric shall be installed longitudinal across the trench width (the width of the fabric laying in the direction of the trench length). Overlap not less than 24-inches the ends of the filter fabric when laid cross-wise, or when one roll ends and another is started. Use wire to hold the fabric ends together.
3. The pipe shall be laid with open joints as shown on the Drawings. The remaining ballast rock shall be placed, and the line and grade of the pipe shall be maintained.
4. Limerock and Mira Fi 700 x Filter Fabric liner shall be placed over ballast rock as shown on the Drawings.
5. The remaining trench shall be backfilled with suitable material. Backfill material 12-inches and above the felt paper shall be compacted to not less than 98 percent of the maximum density as determined by AASHTO Designation T-180C.

D. Drainage Structures:

1. Concrete inlets or other structures shall be constructed in conformity with the Miami-Dade County Standard Details. Forms shall be designed and constructed so that they may be removed without injury to the concrete and shall be left in place for at least 24 hours after concrete is poured. Concrete shall be thoroughly tamped and shall be cured for at least five days after removal of forms. Honeycomb places shall be thoroughly cleaned, saturated with water and pointed up with mortar.
2. Precast inlets or other structures may be used in lieu of cast-in-place structures. Grates are to be set in place in mortar to the proper line and grade.

E. Backfilling for Pipe Culverts and Drainage Structures:

1. After the pipe has been installed, approved selected material from excavation at a moisture content which will facilitate compaction shall be placed along side the pipe in layers not exceeding 6-inches loose measure in depth. Care shall be taken to insure thorough compaction of the fill under the haunches of the pipe. Each layer shall thoroughly compacted by rolling or tamping with mechanical rammers. This method of filling and compacting shall be continued until the fill is 12-inches above the pipe, then the remainder of the backfill shall be placed in lifts not exceeding 9-inches. The operation of heavy equipment shall be conducted so that no damage to the pipe will result. Backfill material 12-inches and above the top of the pipe shall be compacted to not less than 95 percent of maximum density as determined by AASHTO Designation T 180. Selected material for backfill shall not contain any stones or rock larger than 3-inches. Tests for density of compaction shall be made at the places designated by the Engineer, and deficiencies shall be corrected by the Contractor without additional cost to the Town.

END OF SECTION

02850 - SPECIFICATION FOR SEGMENTAL RETAINING WALL SYSTEMS

PART 1: GENERAL

1.01 Description

A. Work includes furnishing and installing segmental retaining wall (SRW) units to the lines and grades designated on the project's final construction drawings or as directed by the Architect/Engineer. Also included is furnishing and installing appurtenant materials required for construction of the retaining wall as shown on the construction drawings.

1.02 Reference Standards

A. Segmental Retaining Wall Units

1. **ASTM C 1372** - Standard Specification for Segmental Retaining Wall Units
2. **ASTM C 140** - Standard Test Methods of Sampling and Testing Concrete Masonry Units

B. Geosynthetic Reinforcement

1. **ASTM D 4595** - Tensile Properties of Geotextiles by the Wide-Width Strip Method
2. **ASTM D 5262** - Test Method for Evaluating the Unconfined Creep Behavior of Geosynthetics
3. **GRI:GG1** – Single-Rib Geogrid Tensile Strength
4. **GRI:GG5** - Geogrid Pullout

C. Soils

1. **ASTM D 698** - Moisture Density Relationship for Soils, Standard Method
2. **ASTM D 422** - Gradation of Soils
3. **ASTM D 424** - Atterberg Limits of Soil

D. Drainage Pipe

1. **ASTM D 3034** - Specification for Polyvinyl Chloride (PVC) Plastic Pipe
2. **ASTM D 1248** - Specification for Corrugated Plastic Pipe

E. Engineering Design

1. "NCMA Design Manual for Segmental Retaining Walls," Second Edition

F. Where specifications and reference documents conflict, the Architect/Engineer shall make the final determination of applicable document.

1.03 Submittals

A. Materials Submittals: The Contractor shall submit manufacturers' certifications two weeks prior to start of work stating that the SRW units and geosynthetic reinforcement meet the requirements of Section 2 of this specification.

B. Design Submittal: The Contractor shall submit two sets of detailed design calculations and final retaining wall plans for approval at least two weeks prior to the beginning of wall construction. All calculations and drawings shall be prepared and sealed by a professional Civil Engineer (P.E.) – (Wall Design Engineer) experienced in SRW design and licensed in the state where the wall is to be built.

1.04 Delivery, Storage and Handling

A. Contractor shall check materials upon delivery to assure that specified type and grade of materials have been received and proper color and texture of SRW units have been received.

B. Contractor shall prevent excessive mud, wet concrete, epoxies and like materials that may affix themselves from coming in contact with materials.

C. Contractor shall store and handle materials in accordance with manufacturer's recommendations.

D. Contractor shall protect materials from damage. Damaged materials shall not be incorporated into the retaining wall.

PART 2: MATERIALS

2.01 Segmental Retaining Wall Units

A. SRW units shall be machine-formed, Portland cement concrete blocks specifically designed for retaining wall applications. SRW units currently approved for this project are:

VERSA-LOK Mosaic Retaining Wall System that includes three unit types: VERSA-LOK Standard units, VERSA-LOK Cobble units and VERSA-LOK Accent units, as manufactured by _____.

B. Color of SRW units shall be _____.

C. Finish of SRW units shall be split-face.

D. SRW unit faces shall be of straight geometry.

E. SRW unit heights shall be both 4 and 6 inches.

F. SRW units shall be designed to stack in "panels" 10 inches high by 24 inches wide consisting of the three SRW unit types that can be stacked in varied patterns to create a random look.

G. SRW units (not including aggregate fill in unit voids) shall provide a minimum weight of 105 psf wall face area.

H. SRW units shall be solid throughout the full depth of the unit.

I. SRW units shall have a depth (front face to rear) to height ratio of 2:1, minimum.

J. SRW units shall be interlocked with connection pins, which provide ¾-inch setback from the unit below (4- and 6-inch high units are stacked alternately, yielding an overall 8.5-degree cant from vertical).

K. SRW units shall be capable of being erected with the horizontal gap between adjacent units not exceeding 1/8 inch.

L. SRW units shall be capable of being installed with a continuous, level course at every 10 inches of height so geosynthetic reinforcement layers can be placed level within the wall face.

M. SRW units shall be capable of providing overlap of units on each successive course of a corner so that walls meeting at corner are interlocked and continuous. SRW units that require corners to be mitered shall not be allowed.

N. SRW units shall be sound and free of cracks or other defects that would interfere with the proper placing of the unit or significantly impair the strength or permanence of the structure. Cracking or excessive chipping may be grounds for rejection. Units showing cracks longer than ½ inch shall not be used within the wall. Units showing chips visible at a distance of 30 feet from the wall shall not be used within the wall.

O. Concrete used to manufacture SRW units shall have a minimum 28 days compressive strength of 3,000 psi and a maximum moisture absorption rate, by weight, of 8% as determined in accordance with ASTM C140. Compressive strength test specimens shall conform to the saw-cut coupon provisions of ASTM C140.

P. SRW units' molded dimensions shall not differ more than $\pm$ 1/8 inch from that specified, in accordance with ASTM C1372.

2.02 Segmental Retaining Wall Unit Connection Pins

A. SRW units shall be interlocked with VERSA-Tuff Snap-Off connection pins, 6.8 inches in length, with a section that can snap off, yielding a 4.6-inch long pin. The pins shall

consist of glass-reinforced nylon made for the expressed use with the SRW units supplied.

2.03 Geosynthetic Reinforcement

A. Geosynthetic reinforcement shall consist of geogrids or geotextiles manufactured as a soil reinforcement element. The manufacturers/suppliers of the geosynthetic reinforcement shall have demonstrated construction of similar size and types of segmental retaining walls on previous projects.

The geosynthetic type must be approved one week prior to bid opening. Geosynthetic types currently approved for this project are:

VERSA-Grid Geogrids

B. The type, strength and placement location of the reinforcing geosynthetic shall be as determined by the Wall Design Engineer, as shown on the final, P.E.-sealed retaining wall plans.

2.04 Leveling Pad

A. Material for leveling pad shall consist of compacted sand, gravel, or combination thereof (USCS soil types GP,GW, SP, & SW) and shall be a minimum of 6 inches in depth. Lean concrete with a strength of 200-300 psi and 3 inches thick maximum may also be used as a leveling pad material. The leveling pad should extend laterally at least a distance of 6 inches from the toe and heel of the lowermost SRW unit.

2.05 Drainage Aggregate

A. Drainage aggregate shall be angular, clean stone or granular fill meeting the following gradation as determined in accordance with ASTM D422

Sieve Size	Percent Passing
1 inch	100
3/4 inch	75-100
No. 4	0-60
No. 40	0-50
No. 200	0-5

2.06 Drainage Pipe

A. The drainage collection pipe shall be a perforated or slotted PVC, or corrugated HDPE pipe. The drainage pipe may be wrapped with a geotextile to function as a filter.

B. Drainage pipe shall be manufactured in accordance with ASTM D 3034 and/or ASTM D 1248.

2.07 Reinforced (Infill) Soil

A. The reinforced soil material shall be free of debris. Unless otherwise noted on the final, P.E.-sealed, retaining wall plans prepared by the Wall Design Engineer, the reinforced material shall consist of the inorganic USCS soil types GP, GW, SW, SP, SM, meeting the following gradation, as determined in accordance with ASTM D422:

Sieve Size	Percent Passing
4 inch	100
No. 4	20-100
No. 40	0-60
No. 200	0-35

B. The maximum particle size of poorly-graded gravels (GP) (no fines) should not exceed 3/4 inch unless expressly approved by the Wall Design Engineer and the long-term design strength (LTDS) of the geosynthetic is reduced to account for additional installation damage from particles larger than this maximum.

C. The plasticity of the fine fraction shall be less than 20.

PART 3: DESIGN PARAMETERS

3.01 Soil

A. The following soil parameters, as determined by the Owner's Geotechnical Engineer shall be used for the preparation of the final design:

	Unit Weight (γ) (pcf)	Internal Friction Angle (ϕ) (degrees)	Cohesion (c)
Reinforced Fill	_____	_____	0
Retained Soil	_____	_____	0
Foundation Soil	_____	_____	_____

(If internal friction angles are not available for the above section, the specifier can provide the USCS soil type classification for the reinforced, retained, and foundation soils and/or attach the geotechnical investigation report for this project.)

B. Should the actual soil conditions observed during construction differ from those assumed for the design, design shall be reviewed by the Wall Design Engineer at the Owner's Geotechnical Engineer's direction.

3.02 Design

A. The design analysis for the final, P.E.-sealed retaining wall plans prepared by the Wall Design Engineer shall consider the external stability against sliding and overturning, internal stability and facial stability of the reinforced soil mass and shall be in accordance with acceptable engineering practice and these specifications. The internal and external stability analysis shall be performed in accordance with the "NCMA Design Manual for Segmental Retaining Walls," using the recommended minimum factors of safety in this manual.

B. External stability analysis for bearing capacity, global stability, and total and differential settlement shall be the responsibility of the Owner and the Owner's Geotechnical Engineer. Geotechnical Engineer shall perform bearing capacity, settlement estimates, and global stability analysis based on the final wall design provided by the Wall Design Engineer and coordinate any required changes with Wall Design Engineer.

C. While vertical spacing between geogrid layers may vary, it shall not exceed 2.0 feet maximum in the wall design.

D. The geosynthetic placement in the wall design shall have 100% continuous coverage parallel to the wall face. Gapping between horizontally adjacent layers of geosynthetic (partial coverage) will not be allowed.

PART 4:CONSTRUCTION

4.01 Inspection

A. The Owner or Owner's Representative is responsible for verifying that the Contractor meets all the requirements of the specification. This includes all submittals for materials and design, qualifications, and proper installation of wall system.

B. Contractor's field construction supervisor shall have demonstrated experience and be qualified to direct all work at the site.

4.02 Excavation

A. Contractor shall excavate to the lines and grades shown on the project grading plans. Contractor shall take precautions to minimize over-excavation. Over-excavation shall be filled with compacted infill material, or as directed by the Engineer/Architect, at the Contractor's expense.

B. Contractor shall verify location of existing structures and utilities prior to excavation. Contractor shall ensure all surrounding structures are protected from the effects of wall excavation. Excavation support, if required, is the responsibility of the Contractor.

4.03 Foundation Preparation

A. Following the excavation, the foundation soil shall be examined by the Owner's Engineer to assure actual foundation soil strength meets or exceeds the assumed design bearing strength. Soils not meeting the required strength shall be removed and replaced with infill soils, as directed by the Owner's Engineer.

B. Foundation soil shall be proof-rolled and compacted to 95% standard Proctor density and inspected by the Owner's Engineer prior to placement of leveling pad materials.

4.04 Leveling Pad Construction

A. Leveling pad shall be placed as shown on the final, P.E.-sealed retaining wall plans with a minimum thickness of 6 inches. The leveling pad should extend laterally at least a distance of 6 inches from the toe and heel of the lowermost SRW unit.

B. Granular leveling pad material shall be compacted to provide a firm, level bearing surface on which to place the first course of units. Well-graded sand can be used to smooth the top 1/4 inch to 1/2 inch of the leveling pad. Compaction will be with mechanical plate compactors to achieve 95% of maximum standard Proctor density (ASTM D 698).

4.05 SRW Unit Installation

A. All SRW units shall be installed at the proper elevation and orientation as shown on the final, P.E.-sealed wall plans and details on the construction plans, or as directed by the Wall Design Engineer. The SRW units shall be installed in general accordance with the manufacturer's recommendations. The specifications and drawings shall govern in any conflict between the two requirements.

B. For ease of installation, generally the base course of SRW units shall be all 6-inch-high Standard units placed on the leveling pad. The units shall be leveled side-to-side, front-to-rear and with adjacent units, and aligned to ensure intimate contact with the leveling pad. The base course is the most important to ensure accurate and acceptable results. No gaps shall be left between the front of adjacent units. Alignment may be done by means of a stringline or offset from baseline to the back of the units. Placing panels of Mosaic directly on the leveling pad is also acceptable. In this case, the entire 10-inch- high course of panels must be installed before the level and alignment can be checked.

C. All excess debris shall be cleaned from top of units.

D. Mosaic panels shall be placed on the units below. Each panel shall be installed completely prior to installing horizontally adjacent panels. Each Mosaic panel shall be 10 inches high by 24 inches wide, consisting of one Standard unit, one Cobble unit, and two Accent units. With each adjacent panel, the units at the bottom of the panels should be alternated from 4-inch-high units to 6-inch-high units. As an example, one panel shall have Accent units at

the base of the panel with Standard and Cobble units on top. The next adjacent panel shall have the Standard and Cobble units at the bottom and Accent units on top. The order of the Cobble and Standard units shall be randomly mixed within the panels to avoid a repetitive pattern. The entire length of each 10-inch-high course of panels shall be installed before starting the next course of panels.

E. Each unit in a Mosaic panel shall be pinned to the units below in the following manner: Two VERSA-Tuff connection pins shall be inserted through the pin holes of each unit into receiving slots in units below, creating an approximate ¾-inch setback from the unit below. Pins shall be fully seated in the pin slot below. When pinning 4-inch-high Accent units, the top 2 inches of the 6.8-inch pin will initially extend above the Accent unit. The top of the pin shall be snapped off by hitting the top of the pin from the side. Once pinned, the units shall be pushed forward to remove any looseness in the unit-to-unit connection.

   Prior to placement of next course of panels, the level and alignment of the units shall be checked and corrected where needed.

F. The next course of panels shall be placed so that it is staggered at least 4 inches from the vertical joints between the panels below. The patterns in the Mosaic panels generally shall not line up with the course below. The bond of the panels shall be varied on subsequent courses to create a random look.

G. Layout of curves and corners shall be installed in accordance with the wall plan details or in general accordance with SRW manufacturer's installation guidelines. Walls meeting at corners shall be interlocked by overlapping successive courses of panels. Special corner panels shall be installed such that both sides of the corner panels vertically align the upper and lower units to create 10-inch-high joints to butt against adjacent regular Mosaic panels. For each course of panels, the corner panels shall be installed first, then regular panels installed out from the corners.

H. Procedures C. through G. shall be repeated until reaching top of wall units, just below the height of the cap units. Geosynthetic reinforcement, drainage materials and reinforced backfill shall be placed in sequence with unit installation as described in Section 4.06, 4.07 and 4.08.

4.06 Geosynthetic Reinforcement Placement

A. All geosynthetic reinforcement shall be installed at the proper elevation and orientation as shown on the final P.E.-sealed retaining wall plan profiles and details, or as directed by the Wall Design Engineer.

B. At the elevations shown on the final plans, (after the units, drainage material and backfill have been placed to this elevation) the geosynthetic reinforcement shall be laid horizontally on compacted infill and on top of the concrete SRW units, to within 1 inch of

the front face of the unit below. Embedment of the geosynthetic in the SRW units shall be consistent with SRW manufacturer's recommendations. Correct orientation of the geosynthetic reinforcement shall be verified by the Contractor to be in accordance with the geosynthetic manufacturer's recommendations. The highest-strength direction of the geosynthetic must be perpendicular to the wall face.

C. Geosynthetic reinforcement layers shall be one continuous piece for their entire embedment length. Splicing of the geosynthetic in the design-strength direction (perpendicular to the wall face) shall not be permitted. Along the length of the wall, horizontally adjacent sections of geosynthetic reinforcement shall be butted in a manner to assure 100% coverage parallel to the wall face.

D. Tracked construction equipment shall not be operated directly on the geosynthetic reinforcement. A minimum of 6 inches of backfill is required prior to operation of tracked vehicles over the geosynthetic. Turning should be kept to a minimum. Rubber-tired equipment may pass over the geosynthetic reinforcement at slow speeds (less than 5 mph).

E. The geosynthetic reinforcement shall be free of wrinkles prior to placement of soil fill. The nominal tension shall be applied to the reinforcement and secured in place with staples, stakes or by hand tensioning until reinforcement is covered by 6 inches of fill.

4.07 Drainage Materials

A. Drainage aggregate shall be installed to the line, grades and sections shown on the final P.E.-sealed retaining wall plans. Drainage aggregate shall be placed to the minimum thickness shown on the construction plans between and behind units (a minimum of 1 cubic foot for each exposed square foot of wall face unless otherwise noted on the final wall plans).

B. Drainage collection pipes shall be installed to maintain gravity flow of water outside the reinforced-soil zone. The drainage collection pipe shall daylight into a storm sewer or along a slope at an elevation below the lowest point of the pipe within the aggregate drain.

4.08 Backfill Placement

A. The reinforced backfill shall be placed as shown in the final wall plans in the maximum compacted lift thickness of 10 inches and shall be compacted to a minimum of 95% of standard Proctor density (ASTM D 698) at a moisture content within 2% of optimum. The backfill shall be placed and spread in such a manner as to eliminate wrinkles or movement of the geosynthetic reinforcement and the SRW units.

B. Only hand-operated compaction equipment shall be allowed within 3 feet of the back of the wall units. Compaction within the 3 feet behind the wall units shall be achieved by at least three passes of a lightweight mechanical tamper, plate, or roller.

C. At the end of each day's operation, the Contractor shall slope the last level of backfill

away from the wall facing and reinforced backfill to direct water runoff away from the wall face.

D. At completion of wall construction, backfill shall be placed level with final top of wall elevation. If final grading, paving, landscaping and/or storm drainage installation adjacent to the wall is not placed immediately after wall completion, temporary grading and drainage shall be provided to ensure water runoff is not directed at the wall nor allowed to collect or pond behind the wall until final construction adjacent to the wall is completed.

4.09 SRW Caps

A. SRW caps shall be properly aligned and glued to underlying units with VERSA-LOK adhesive, a flexible, high-strength concrete adhesive. Rigid adhesive or mortar are not acceptable.

B. Caps shall overhang the top course of units by 3/4 inch to 1 inch. Slight variation in overhang is allowed to correct alignment at the top of the wall.

4.10 Construction Adjacent to Completed Wall

A. The Owner or Owner's Representative is responsible for ensuring that construction by others adjacent to the wall does not disturb the wall or place temporary construction loads on the wall that exceed design loads, including loads such as water pressure, temporary grades, or equipment loading. Heavy paving or grading equipment shall be kept a minimum of 3 feet behind the back of the wall face. Equipment with wheel loads in excess of 150 psf live load shall not be operated within 10 feet of the face of the retaining wall during construction adjacent to the wall. Care should be taken by the General Contractor to ensure water runoff is directed away from the wall structure until final grading and surface drainage collection systems are completed.

END OF SECTION

SECTION 03100

PAVERS

PART 1 - GENERAL

1.1 CONFORMITY: Conform to the requirements of the general conditions of the contract.

1.2 Work Included:

a.) Preparation of sub-base

b.) Construct reinforced concrete base.

c.) Supply and Install interlocking concrete paving stones in quality, shape, thickness and color as specified, set on 1" sand bed.

d.) Supply and place all accessory items as required by the Contract.

e.) Cleaning and sealing of pavers.

1.3 Product Handling: Paving stones shall be delivered and unloaded at job site with or without pallets and bound in such manner that no damage occurs to the product during handling, shipping and unloading.

PART 2 - PRODUCTS

2.1 Solid Concrete Interlocking Paving Stones: ASTM Designation C936-82

A.) Paver Module shall be American Pavers, **or approved equal** as follows:

Shape	**Thickness**
Various (See Plans)	2-3/8"

B.) Colors shall be various (see plans)

C.) Cementitious Materials: Portland Cements shall conform to ASTM Specification C-150.

D.) Aggregates: Shall conform to ASTM Specification C-33 for Normal Weight Concrete Aggregate (no expanded shale or lightweight aggregates) except that grading requirements shall not necessarily apply.

E.) Other Constituents: Coloring pigments, air entraining agents, integral water Repellents, finely ground silica, etc., shall conform to ASTM standards where applicable, or shall be previously established as suitable for use in concrete.

F.) Physical Requirements:

1. Compressive Strength: At the time of delivery to the work site, the average comprehensive strength shall not be less than 8,000 I with No individual unit strength loss than 7,200 PSI with testing procedures in accordance with ASTM – Standard C-140.

2. Absorption: The average absorption shall not be greater that 5 percent (5%) with no individual unit absorption greater than seven percent (7%).

3. Abrasion Resistance: When tested in accordance with method C418, specimens shall not have a greater volume loss that 0.915 in. 3 per 7.75 in.2. The average thickness loss shall not exceed 0.118 in (3mm).

I.) Visual Inspection: All units shall be sound and free of defects that would interfere with the proper placing of the unit or impair the strength or performance of the construction. Minor Cracks incidental to the usual methods of manufacture, or minor chipping resulting from customary methods of handling in shipment and delivery shall not be deemed grounds for rejections.

J.) Sampling and testing:

1. The Engineer shall be accorded facilities to inspect and sample the units at the place of manufacture from lots ready for delivery.

K.) Rejection: In case the shipment fails to conform to the specified requirements, the manufacturer may sort it, and now test units should/shall be selected at random by the Purchaser from the retained lot and tested at the expenses of the manufacturer. In case the Second set of test units fails to conform to the specified requirements; the entire lot shall be rejected.

L.) Expense of Tests: The expense of Inspection and testing shall be borne by the purchaser unless otherwise agreed.

2.2 Edge Restraint:

A.) All edges: Of the installed paving stones shall be restrained. The type of edge restraint shall be approved at locations as noted on plans.

B.) The Edge Restraint can be:

1. Concrete Curbing or Sidewalk
2. Buildings

PART 3 - EXECUTION:

3.1 The Contractor: Must have a minimum of 2 years experience in the Installation of Interlocking concrete paving stones.

3.2 Preparation of Sub base: Material as specified should be compacted to at least 98% of the modified Proctor Dry Density, which is determined in accordance with ASTM T-180.

3.3 Preparation of the Base Course:

A. Base Course:

1. 8” thick 3000 psi concrete, reinforced as detailed on plans.

2. 1” sand bed as detailed on plans.

3.4 Laying of Concrete Paving Stones:

A.) The Paving Stones: Shall be laid in the approved pattern as noted or shown on drawings.

B.) The Paving Stones: Shall be laid in such a manner that the desired pattern is maintained and the joints between the adjacent units are approximately 1 1/6 in. (1.5mm) to 1/8 in. (3mm wide).

C.) String Lines: Should be used to hold pattern lines true.

D.) The Gaps: At the edge of the paver surface shall be filled with standard edge stone or with stones cut to fit. Cutting shall be accomplished to leave a clean edge to the traffic surface using a double-headed breaker or a masonry saw is recommended. Whenever possible, no cuts should result with a paver less than 1/3 of original dimension. Gaps less that 3/8 in. (10mm) should be filled with sand.

E.) After Vibration: Clean masonry type sand containing at least 30% of 1/8” (3mm) particles shall be spread over the paving stone surface. Allowed to dry and vibrated into joints with additional vibrator passes and brushing so as to completely fill joints.

F.) Final Elevation: Unless otherwise specified, the final surface elevations should not deviate more than 3/8-in. (10mm) under a 10-foot (3m) straight edge. The surface elevation of pavers should be 1/8 in. (3mm) to ¼ in. (6mm) above adjacent drainage inlets, concrete collars or channels.

G.) Surplus Material: Shall then be swept from the surface or left on surface during construction time to insure complete filling of joints during initial use. This sand also may provide surface protection from construction debris.

H.) Upon completion: Of work in the Section, the Contractor shall clean up all work areas by removing all debris, surplus material and equipment from the site.

END OF SECTION

SECTION 03200

CONCRETE REINFORCEMENT

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work included: Provide concrete reinforcement where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.

B. Related Work:
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
2. Section 03300: Cast-in-place concrete.

1.2 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Comply with pertinent provisions of the following, except as may be modified herein.
1. Building Code Requirements for Reinforced Concrete, ACI 318-89
2. Manual of Standard Practice for Detailing Reinforced Concrete Structures, ACI 315-80 (Revised 88)
3. Standard Specifications for Deformed and Plan Billet-Steel Bars for Concrete Reinforcement, ASTM A615-87.
4. Standard Specifications for Steel Wire fabric for concrete reinforcement, ASTM A82-85.
5. Standard Specifications for Welded Steel wire fabric for concrete reinforcement, ASTM A185-85
6. CRSI "Manual of Standard Practice". 1990 edition.

1.3 SUBMITTALS

A. Comply with pertinent provisions of Section 01340.

B. Product data: Within 30 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
1. Materials list of items proposed to be provided under this Section;
2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements;
3. Shop Drawings showing details of bars, anchors, and other items, if any, provided under this Section.

1.4 PRODUCT HANDLING

A. Comply with pertinent provisions of Section 01640.

B. Delivery and storage:
   1. Use necessary precautions to maintain identification after bundles are broken.
   2. Store in a manner to prevent excessive rusting and fouling with dirt, grease, and other bond-breaking coatings.

PART 2 - PRODUCTS

2.1 REINFORCEMENT MATERIALS AND ACCESSORIES

A. Bars:
   1. Provide deformed billet steel bars complying with ASTM A615, using grades shown on the Drawings.
   2. Where grades are not shown on the Drawings, use grade 60.

B. Steel Wire:
   1. Comply with ASTM A82.
   2. For tie wire, comply with Fed Spec QQ-W-461, annealed steel, black, 16 gauge minimum.

C. Welded wire fabric:
   1. Provide welded steel, complying with ASTM A185.

D. Welding electrodes:
   1. Comply with AWS A5.1, low hydrogen, E70 series.

E. Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcement in place:
   1. Use wire bar type supports complying with CRSI recommendations, unless otherwise shown on the Drawings.
   2. Do not use wood, brick, or other non-complying material.
   3. For slabs on grade, use supports with sand plates or horizontal runners where base material will not support chair legs.
   4. For exposed-to-view concrete surfaces, where legs of supports are in contact with forms, provide supports with either hot-dip galvanized or plastic-protected legs.

2.2 FABRICATION

A. General:
   1. Fabricate reinforcing bars to conform to the required shapes and dimensions, with fabrication tolerances complying with the CRSI Manual.
   2. In case of fabricating errors, do not straighten or rebend reinforcement in a manner that will weaken or injure the material.
   3. Reinforcement with any of the following defects will not be acceptable.
      a. Bar lengths, depths, and/or bends exceeding the specified fabrication tolerances;
      b. Bends or kinks not shown on the Drawings;
      c. Bars with reduced cross-section due to excessive rusting or other cause.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 INSTALLATION

A. General:
1. Comply with the specified standards for detail and method of placing reinforcement and supports, except as may be modified herein.
2. Clean reinforcement to remove loose rust and mill scale, earth, and other materials which reduce or destroy bond with concrete.
3. Position, support, and secure reinforcement against displacement by formwork, construction, and concrete placing operations.
4. Locate and support reinforcement by metal chairs, runners, bolsters, spacers, and hangers, as required.
5. Place reinforcement to obtain minimum coverage for concrete protection.
6. Arrange, space, and securely tie bars and bar supports together with the specified tie wire.
7. Set wire ties so twisted ends are directed away from exposed concrete surfaces.

B. Install welded wire fabric in as long lengths as practicable, lapping adjoining pieces at least one full mesh, plus two inches, 12 inches, or as noted in the plans.

C. Provide sufficient numbers of supports, and of strength to carry the reinforcement.

D. Do not place reinforcing bars more than 2" beyond last leg of any continuous bar support.

E. The minimum clear distance between parallel bars, except in columns, shall be equal to the nominal diameter of the bars. In no case shall the clear distance between bars be less than one inch, nor less than one and one-third times the maximum size of the coarse aggregate.

F. Do not use supports as bases for runways for concrete conveying equipment and similar construction loads.

G. Interior and exterior horizontal lapped corner bars shall be provided at all corners to match the size, type, and spacing of horizontal footing, or wall reinforcement.

H. CONCRETE PROTECTION for REINFORCEMENT: The following minimum concrete cover shall be provided for reinforcement:

Minimum cover, in:
1. Concrete cast against and permanently exposed to earth ..... 3”

2. Concrete exposed to earth or weather:
   #6 through #11 bars.....2”
   #5 bar, W31 or D31 wire, and smaller..... ….1-1/2”
3. The Contractor shall provide the necessary bolsters, chairs, concrete blocks, and miscellaneous reinforcement for the support of reinforcing. Steel wire bar supports used in slabs, beams, and columns shall be Class B, plastic protected.

3.3 SPLICES

A. Lap splices:
   1. Tie securely with the specified wire to prevent displacement of splices during placement of concrete.

B. Splice devices:
   1. Obtain the Engineer's approval prior to using splice devices.
   2. Install in accordance with manufacturer's written instructions.
   3. Splice in a manner developing at least 125% of the yielding strength of the bar.

C. Welding:
   1. Perform in accordance with AWS D1.4-79.

D. Do not splice bars except at locations shown on the Drawings, except as otherwise specifically approved by the Engineer.

E. In slabs, beams, and girders, splices in reinforcement at points of maximum stress shall be avoided wherever possible. Such splices where used shall be welded, lapped, or otherwise fully developed, but, in any case shall transfer the entire stress from bar to bar without exceeding the allowable bond and shear stresses. The minimum overlap for a lapped splice shall be 24 bar diameters, but not less than 12 inches. The clear distance between bars shall also apply to the clear distance from a contact splice and adjacent splices or bars.

F. Splices in slabs or walls not shown int he plans shall be Class B contact lap splices.

3.4 TESTING

A. Samples:
   1. Samples for physical tests of reinforcement will consist of at least two pieces, each 18" long, of each size of reinforcement steel, selected by the testing agency from material at the building site or at the fabricator's or supplier's yard.
   2. Material to be sampled at the building site shall have been delivered thereto at least 72 hours before it is needed.

B. Test:
   1. Where samples are taken from bundles as delivered from the mill, with the bundles identified as to heat number, and provided mill analyses accompany the report, then one tensile test and one bend test will be made from a specimen of each ten tons or fraction thereof of each size of reinforcement steel.
   2. Where positive identification of the heat number cannot be made, or where random samples are taken, then one series of tests will be made from each

2-1/2 tons or fraction thereof of each size of reinforcement steel.

END OF SECTION

SECTION 03212

FLEXIBLE PAVEMENT FOR TRAIL

PART 1 GENERAL

1.1 DESCRIPTION:

Rubberway flexible pervious pavement is a multi-layer, monolithic, pour-in-place pavement system.

1.2 SECTION INCLUDES:

A. Pavements
B. Pathways
C. Walkways
D. Sidewalks
E. Tree Wells
F. Plaza Surrounds
G. Medians
H. Public Right of Way

1.3 DEFINITIONS:

A. Subbase: A layer in a paving system between the sub-grade and the surface course, or between the subgrade and the flexible paving.

B. Base Reinforcement: The use of a geo synthetic within the aggregate base course to enhance the performance of the paving.

C. Geogrid: Biaxial or triaxial woven polypropylene material for base course reinforcement and confinement, and subgrade stabilization and increased subgrade load capacity.

D. Subgrade: The soil prepared and compacted to support a structure or paving system.

E. Panel: An individual paving slab bordered by joints or slab edges.

F. Exposure Conditions, Moderate: Exposure to a climate where the paving will not be in a saturated condition when exposed to freezing and will not be exposed to deicing agents or other aggressive chemicals.

G. Exposure Conditions, Severe: Exposure to deicing chemicals or other aggressive agents or where the paving can become saturated by continual contact with moisture or free water before freezing.

H. Permeable/ Porous Paving: A paving system comprising of material with sufficient continuous voids to allow water to pass from the surface to the underlying layers.

I. Pervious/ Permeable: The property of a material which permits movement of water through it under ordinary hydrostatic pressure.

1.4 SUBMITTALS:

A. Samples:
   1. Submit (1) Color chart representing full range of manufacturers color options
   2. Submit (1) Specified Rubberway Labeled Sample, Project Specific 4” x 4” square in full thickness of color selected by Architect or Owner
   3. Submit (1) Copy of Manufacturers Technical Data Sheets on each product to be used
   4. Submit (1) Installation Overview

B. Shop Drawings: Project specific shop drawing shall include plan view cross section

C. Contractor’s Project References:
   1. Submit a list of successfully completed projects including project name, location, and type of surfacing installed

D. Close Out Submittals:
   1. Submit (1) Manufacturer standard product materials warranty / Signed by company officer with Corporate Seal
   2. Submit (1) Standard labor warranty
   3. Submit (1) Copy of Surface Care and Maintenance guide

1.5 QUALITY ASSURANCE

A. The Manufacturers Qualifications: Manufacturer must have a minimum of 15 years manufacturing with the products specified.

B. Contractors Qualifications: The installing foreman must be a Certified Rubberway installer or authorized agent and have specialized or similar experience installing and performing the work of this section that is required for this project.

C. Flexible Paving surface system shall be installed by Certified Rubberway authorized factory trained technicians only, to be warranted.

D. Certified Rubberway Onsite Technical Training Directors are available for hire, to oversee and train uncertified, qualified contractors, interested to become certified on a given project. There is a fee related to this service and the system will be warranted.

1.6 DELIVERY AND STORAGE

A. Delivery of Materials: Materials should be delivered to site in manufacturer’s unopened container with labels clearly identifying the product name and manufacturer. See manufacturer’s guidelines for temperature requirements for the locale of installation.

B. Storage of Materials: The GC contractor shall provide a secure, clean, dry location for storage of materials at temperatures above 50°F. Under no circumstances should materials be stored outside unless fully protected from moisture with 10 mil polyethylene barrier and tarpaulin. All materials stored outside shall be inspected by dealer for moisture contamination before application. Store out of direct sunlight to avoid moisture and condensation.

SECTION 03212

FLEXIBLE PAVEMENT FOR TRAIL

1.7 PROJECT SITE CONDITIONS

A. Environmental site conditions must be between 50 and 85 degrees F. Do not install when sub base is saturated or wet or when ground is frozen.

B. Sub-base shall be free of any materials and debris and released to the applicator clean and in good stable compacted condition.

C. GC to protect the area after installation to avoid damage- up to 48 hours

D. Upon completion of installation, installer shall remove all unused materials, tools, equipment, and rubbish.

E. No smoking, open flames, or sparks from electrical equipment shall be permitted during the application of materials.

1.8 MATERIAL GUARANTEE

A. The rubber pavement shall be guaranteed against defects in materials for (10) years.

PART 2 PRODUCTS

2.1 MANFACTURER

A. USSA, Inc.(United Sustainable Surfacing of America)
Telephone: 877-288-0045
US Headquarters, West Coast: 4000 Barranca Parkway, Suite 250, Irvine, CA 92604
East Coast: 275 Greenwich Ave. Suite 3A, Greenwich, CT 06830
Mid Atlantic: 825 10th Ave. NW Suite 755, Washington DC 20001
South East: 1688 Meridian Av Suite 600, Miami Beach, FL 33139
email: info@rubberway.com
web www.rubberway.com

1. All materials made in the USA and must be obtained through the manufacturer Rubberway, Inc or an approved distributor acceptable to Manufacturer.

A. Substitutions: Will be considered in accordance with product requirements and providing valid submittal documentation which is equivalent or better with all test results and are performed by accredited 3rd party test labs as outlined below in Section 2.2.

B. Requests for substitutions will be considered in accordance with provisions of Section 01 0 00 –Product requirements and must be requested within 10 days before prior to the bid date.

2.2 INDEPENDENT 3rd PARTY TESTING SYSTEM CHARACTERISTIC REQUIREMENTS

A. PRODUCT: RUBBERWAY EVOLUTION RR6000: SPECIFIED THICKNESS: 2”

1. ADA Compliant: Pass
2. COF of Permeability: 508.8 gallons/min/yard2
3. Freeze Thaw Change -25 cycles (+) .44%: No Change in visual
4. Slip Resistance C0128 Federal Spec AA60005 Test RR-F-621E: 99 dry and 76 wet
5. Proof load test 25,000 lbs- ASTM F970 Static Load Limit –Results: 98.78% recovery
6. EPA-TCLP-Method 6010B- Heavy Metal Leachate: Pass
7. EPA-STLC- (DHS WET EPA 6010B)-Pass
8. EPA 8270C- Pass
9. EPA 8260B-Pass
10. EPA 7470A- Pass
11. EPA 7470A STLC Mercury (DHS WET) Pass
12. Fish Bioassay - Results >750 mg/l Analyte was not detected
13. SRI- Solar Reflectance Index: 31 when using Grey
14. Water Extractable 0% organic extractable No VOC's
15. Class A ASTM E108- Rooftop- Passes

B. LEED CREDITS: This system will qualify for recycled content, heat island effect when using Grey or Tan colors, storm water management, innovation in design and when possible, regional labor and materials.

1. Heavy Metal leaching tests required to meet EPA 1312 standards.
2. Recycled content must exceed 80% postconsumer per unit of product.
3. System must meet a 20 year design life.
4. Local and or regional materials within 500 miles, when feasible.
5. System must be manufactured on site.
6. Solar reflectance Index value exceed- 31 with grey color

2.3 RUBBER PAVEMENT MATERIALS

A. BONDING AGENT: Must have the capacity to bind with: rubber, wood, steel, concrete, aluminum, compacted aggregate. BINDER- Delivered in 5 gallon pails or Drums- Labeled RUBBERWAY 6000

B. SYNTHETIC VIRGIN RUBBER

1. RUBBER: EPDM Rubber granules 4-9 mesh– bagged in 55 lb

2. COLOR OPTIONS: Terracotta Red, Mid Brown, Coco Brown, Beige, Light Grey, Mid Grey, Eggshell. Colors To be determined by Architect, Landscape Architect or Engineer. Long lead times may be required.

C. RECYCLED RUBBER and RECYCLED STONE AGGREGATE

1. STONE: Triple washed, Kiln dry, coarse aggregate No. 8 (3/8-1/2) per ASTM C33 Bagged in 50 lb bags

2. RUBBER: Recycled SBR, dry, 6-20 mesh sieve analysis. Bagged in 50 lb bags

D. RECYCLED RUBBER AND ROCK AGGREGATE

1. RUBBERWAY RUBBER ROCK EVOLUTION 6000 SYSTEM 2" total thickness– The combination of EPDM rubber granulate for wear layer at ½", Recycled Rubber mixed with aggregate and unique bonding agent for the base layer at 1.5". Rock aggregate to be triple washed, dried, coarse aggregate- No. 8 (3/8"-1/2) combined with RUBBERWAY 6000 BINDER and EPDM Rubber for the wear layer surface.

2.4 MIX DESIGN

A. Using materials acceptable by the manufacturer, design a tentative mix and test mock up for the consistency intended for use on the system specified. Follow instructions per the manufacturer's installation overview provided at the time of installation.

2.5 FORMS

A. Make forms with temporary wood, steel, concrete or pressure treated lumber or other material that is sufficiently rigid to maintain specified tolerances, and capable of supporting finished surfacing to specified height.

B. Forms shall be clean and free of debris of any kind, including rust.

C. Form release: Vegetable oil or TXIB Solvent

PART 3 EXECUTION

3.1 SUBGRADE PREPARATION

A. Prepare subgrade as specified in the contract documents and detailed drawings.

B. Construct subgrade to ensure that the required paving thickness is obtained in all locations.

C. Keep all traffic off the subgrade during construction to the maximum extent practical. Regrade subgrade disturbed by delivery vehicles or other construction traffic as needed.

D. Compact the material added to obtain final subgrade elevation.

E. Determine subgrade permeability in accordance with ASTM D3385 before flexible paving placement.

3.2 GEO TEXTILE FABRIC

A. Geo textile fabric shall be a permeable non-woven geo textile composite composed of polypropylene fibers which are formed into a stable network such that the fibers retain their relative position. The Marafi 140 NC or equal is inert to biological degradation and resists naturally encountered chemicals, alkalis, and acids. The flow rate shall be 140

(gal/min/sq.ft) Fabric shall be installed over compacted sub grade under permeable aggregate.

1. Fabric shall be held in place with sub base aggregate.

3.3 SUB BASE

A. Prepare subbase in accordance with contract documents and detail drawings.

B. Subbase shall be performed in conformance to the alignment, grade and cross section indicated on the drawing. The stone shall be placed in horizontal layers and each layer proof rolled to 90- 95% compaction.

C. (Modified proctor) with a vibratory smooth drum roller.

D. Moisture content of the stone shall be 4-7% of dry weight to ensure no migration of fines during transport and installation.

3.4 SITE PREPARATION:

A. The contractor shall strip all debris and organic matter from areas to be graded and shall haul this material off site for legal disposal.

B. The Contractor shall be responsible for placing and compacting approved base material in accordance with the specifications.

C. The Contractor shall be responsible to have adjacent grass edged and removed from all areas receiving the synthetic surface. It may be necessary to apply a liquid herbicide such as Roundup to any adjacent edges of surfacing areas.

D. Turn off any surrounding adjacent sprinklers 1 week prior to work being performed

3.5 PERMEABLE AGGREGATE

A. Rubber surfacing system shall be installed on dry sub-structure. The system shall be installed over a 90%, 4” depth, compacted #57 Permeable stone topped off with a ½” #8 Choker Course. Permeable material used for permeable base construction shall conform to the following specifications.

Sieve No.57 Sub Base Aggregate	**mm**	**Percent Passing %**
1 ½”	37.5	100%
1”	25	95-100%
½”	12.5	25-60%
4	4.75	0-10%

8	2.36	0-5%

Sieve No.8 Choker Course	**mm**	**Percent Passing %**
½"	12.5	100%
3/8"	9.5	85-100%
4	4.75	10-30%
8	2.36	0-10%
16	1.18	0-5%

Aggregate Requirements:

Fragmentation must be at 90%. Depending on the type of rock present in the crushed stone mix, other mechanical characteristics might be necessary for approval. Do not use rounded aggregate.

Compaction of sub base should be with at least 5 passes of roller compactor or one with vibration. Stabilization of the soil or base material may be necessary with weak or saturated soil. Per specifiers approval an additional acceptable sub-base is class 2 road base compacted 95%.

3.6 EXAMINATION

A. Do not begin installation until substrates have been properly laid and compacted according to manufacturer's instructions and inspected by an authority approved by the owner.

B. Consulting arborist is recommended for tree root inspection when porous pavement is being installed around tree roots. Roots can be left intact up to 1 ½" from grade (flush to base layer of proposed system detail when installation is specific to sidewalk repair and the sub-base is permeable). Any tree root trimming should be approved and supervised by a consulting arborist.

C. Protect all surrounding areas to avoid damage to adjacent surfaces.

PART 4 INSTALLATION

4.1 PLACING FINISHED PAVING

A. Installation of the permeable paving surface material shall take place only when

proper environmental conditions and the temperature is 50 degrees F and rising. If, in the installer's opinion, the weather or climate conditions are harmful for proper surface installation, work will be delayed until conditions are agreeable.

B The materials shall be prepared in a mechanical mixer until a homogenous mix is obtained.

C The Recycled Rubber base layer granules shall be integrated with the stone and the polyurethane binder to achieve the full depth thickness of the specified surface. The mix shall be a matrix of exposed granules and rock to proper mixing ratio of rubber/rock to binder shall be no less than 15% by the weight of the rubber and rock mix. Application to be monolithic, in one single layer to the specified depth, unless otherwise specified.

D Prime the Base layer surface prior to application of the wear layer surface.
The wear layer surface consisting of EPDM granules shall be integrated with rock if specified or without and mixed with the polyurethane binder 6000 only to achieve the full depth thickness of the specified surface. The mix shall be a matrix of exposed EPDM granules and rock (If specified) to proper mixing ratio of rubber/rock to binder shall not be less than 15% by the weight of the rubber and rock mix. Application to be monolithic in one single layer to the specified depth, unless otherwise specified.

E. Install per manufacturer's installation instructions. All joint work shall be troweled flush with the adjacent mat.

F. All cold dry seams shall be cut straight at an inward 45 degree angle and primed prior to commencing with subsequent work.

4.2 EDGING

A. When curbs or steel edging are not used, temporary forms can be used and then bevel the edge of the top surface to a 45 degree angle. If concrete curbs are used, prime the interior edges of concrete curbs with binding agent.

4.3 PROTECTION

A. No traffic or other trades shall be allowed on the surface following completion for ample cure time of 2-5 days.

B. Other Trades: It shall be the responsibility of the general contractor to protect the surface from damage by other trades before acceptance by the Owner or his agent. Completely cover the paving surface with 4 mil thick polyethylene sheet if necessary, until the project is completed and turned over to the owner.

PART 5 GUARANTEE

The surface materials shall be guaranteed against defects for a period of five (5) years from the date of completion and (10 Years if inclusive of a prepaid maintenance package)

SECTION 03212

FLEXIBLE PAVEMENT FOR TRAIL

The surface installation shall be guaranteed against defects in workmanship for a period of one (1) year from the date of completion. This one year guarantee shall be provided directly to the owner by approved installation company. This guarantee excludes the following as applicable:

- Where materials or the installation is damaged by others or use of improper equipment.
- The surface has not been properly maintained according to manufactures maintenance instructions and recommendations.
- Damage from improper vehicle traffic, other than those specified by manufacturer.
- Failure of the asphalt base, concrete, or aggregate sub base.
- Defects caused by vandalism, Force Majeure, or natural disasters.
- Unless other terms and conditions are previously agreed upon by both parties and stipulated in the contract.

This guarantee is in lieu of all other warranties, expressed or implied, including but not limited to any warranty of merchantability or fitness for a particular purpose and shall not include any other damages, either direct or consequential.

END OF SECTION

SECTION 03250

CAST-IN-PLACE CONCRETE
SIDEWALKS, CURBS, CURBS & GUTTERS, CROSSWALKS
AND MISCELLANEOUS CONCRETE

PART 1 - GENERAL

1.1 Description

A. Work included: Provide cast-in-place concrete, sidewalks, curbs, curbs and gutters, crosswalks and miscellaneous concrete, where shown on the Drawings as specified herein, and as needed for a complete and proper installation.

B. Related Work

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

1.2 Quality Assurance

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section. The concrete curb and sidewalk contractor/sub-contractor shall have a minimum of 5 years experience in the construction of urban and decorative sidewalks. Accreditation through ACI Course or similar accreditation is desirable.

B. Quality control

1. See requirements for testing as stated in part 3 of this Section.

1.3 SUBMITTALS

A. Comply with pertinent provisions of Section 01340.

B. Mockup: Cast mockup samples of size equal to an 8’ x 8’ Slab from a 2 cubic yard sample pour to demonstrate proposed surface finish, patterns, texture, and color. Use the same cement brand and manufacture, aggregate type and construction methods that will be used on the job. Provide samples at least 30 days prior to pour schedule. Maintain sample panels on the job-site, exposed to view for duration of Project, after Engineer’s acceptance of visual qualities. Pour mockup under weather conditions that will approximate actual conditions, including shading, weather conditions, temperature, time of day, finishers, tools, curing practices, etc. Check and verify air content and slump after addition of color pigments. Pour new mockup if adjustments are made to mix design.

1.4 Product Handling

A. Comply with pertinent provisions of Section 01640.

PART 2 - PRODUCTS

2.1 Concrete Mixes

A. Provide a mix design prepared by the approved testing agency, based on strengths of the approved materials, and meeting the requirements stated on the Drawings, and Specifications.

1. Secure the Engineers approval of each mix design, including new mix designs required to be prepared should there occur a change in materials being used.

2.2 Concrete Quality

A. Concrete shall be Class I normal weight, and shall attain a 28-day compressive strength of a minimum of 3000 psi.

1. The maximum water-cement ratio shall be 0.65.
2. The minimum cement content for concrete shall be five bags per cubic yard.
3. Concrete shall contain a water reducing admixture capable of increasing workability and reducing the amount of mixing water, conforming to ASTM C494-82, Type A. Other admixtures may be used if approved by the Engineer. Admixtures shall be added to the mix in accordance with the manufacturer's specifications, and at a controlled rate. Concrete with calcium chloride and add mixtures containing calcium chloride is not acceptable and will be refused or rejected.
4. Fly ash, slag or other such additives to cement product is prohibited.

2.3 Coloring

A. Integral Colored Concrete mixture shall be Class I concrete, as described above. Concrete shall be supplied with the color admixture added. Coloring and mixture, as specified on drawings; shall be integral color pigments (ASTM C-979) natural and synthetic iron oxides and chromium oxides. Use only pure pigments, without additives or fillers, with record of satisfactory performance in concrete mixes. Approved Manufacturer: “Scofield Chromix G and L Admixtures” (or approved equal). Color shall be “Indian Creek Village Beige”. Dosage as recommended and supplied by the manufacturer. Or as approved by Engineer.

2.4 Curing/Sealing Compound

A. ASTM C-309, Type 1, Class A, Non-Yellowing, solvent or water based resin. Select and use only one product for all cure & sealing throughout job. Composed of Acrylic copolymer resin curing compound with minimum solids content of 25% to 30%.

Approved materials: Lambert Corp. Orlando, FL.

1. Aqua Kure Clear (dissipating membrane)
2. UV Super Seal (solvent based cure and seal)

PART 3 - EXECUTION

3.1 Surface Conditions

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 Subgrade Preparation

A. All roots, vegetation and other deleterious materials shall be removed from the area of the proposed sidewalk. Roots, when present, shall be removed to a depth of 12". Existing rock shall be removed to at least 1" below proposed subgrade elevation. Fill materials, where required, shall be clean limerock or mixture of limerock and sand acceptable to the Engineer. Subgrade shall be compacted to a minimum field density of 95% of the maximum density as determined by AASHTO Method, Designation T180-74, Method D.

3.3 Forms

A. General: Steel forms shall be used for all work except at sidewalk radii where wood forms (1/4" min. thickness) may be used and which shall be bent to a smooth uniform curve. Wood forms shall not be used for Curb or Curb & Gutter work. Forms shall be as follows: (a) externally secured and braced where feasible; (b) substantial and unyielding; (c) of adequate strength to contain the concrete without building between supports and without apparent deviation form the neat lines, contours and shapes shown in the plans. They shall be designed to withstand the additional forces of vibration without apparent deviation from the desired shape or position. Assembled forms shall be mortar tight and, shall be constructed to render a concrete surface of smooth, uniform finish. Provisions shall be made for the removal of forms without injury to concrete surfaces. Blocks and bracing shall be removed from the forms and in no case shall any portion of the forms be left in the concrete.

The Contractor where practical may use asphalt abutting the sidewalk in lieu of form work. The asphalt must be saw cut in such a manner that the edge of the sidewalk where it abuts the asphalt is true to grade and alignment.

The form shall be set plumb, properly aligned, and with their bottom in furl and continuous contact with the subgrade. Forms shall be cleaned and lightly oiled before concrete is placed.

B. Form Alignment, Bracing and These: Forms shall be constructed in such manner that they may be adequately secured for alignment, shape and grade. Bracing systems, ties and anchorages used for this purpose shall be substantial and sufficient to insure against apparent deviation from shape, alignment and grade. Nails driven into existing concrete shall not be used for this purpose. Bracing systems, ties anchorages shall not be used which will unnecessarily deface of mark, or have an injuries or undesirable effect on surfaces which will be a part of the finished surface.

C. Preparation and Cleaning: The condition of the forms shall meet the following requirements at the time concrete casting is begun: (a) All forms shall be treated with an approved form-release agent before placing concrete. Material which will adhere to, or disorder the concrete shall not be used. (b) The forms shall be cleaned of all dirt, sawdust, shavings and other debris. (c) All inspection and cleanout holes shall be closed

and secured.

3.4 Concrete Mixing

A. Job mixed concrete shall not be permitted.

B. Ready-mixed concrete shall be mixed and delivered in accordance with the requirements of the Standard Specification for Ready-Mixed Concrete, ASTM C94-85.

C. No concrete shall be retempered after it has taken an initial set nor shall any batch or portion thereof be deposited in forms more than one and one-half hours after the mixing of that particular batch has commenced.

D. No water shall be added at the job site to concrete delivered by truck as ready for use without the approval of the Engineer, and then, only when slump tests are made and the concrete so delivered is known to be of less than the slump specified.

E. Concrete consistency:

1. Use the amount of water established by the approved mix design.
    a. Do not exceed the maximum quantity specified for the grade of concrete.
    b. Use the minimum amount of water necessary to produce concrete of the workability required by the Engineer.
    c. Do not supplement the predetermined amount of water with additional water for any reason.
2. Measure concrete consistency by ASTM C143 method.
    a. As part of the routine testing and inspecting, test twice each day or partial day's run of the mixer.
    b. Maintain a complete and accurate record of tests.
3. Provide a 3" maximum concrete slump.

F. Miscellaneous provisions:

1. Provide strengths of concrete as shown on the Drawings.
2. Provide concrete dense and free from honeycomb and other defects.
3. Place and finish members to conform to the shapes and dimensions indicated, with all surfaces true to line, plumb, and level.

3.5 Concrete Reinforcement

A. Provide reinforcement as detailed on Drawings and Specifications.

3.6 Conveying and Placing Concrete

A. Inspection: No concrete shall be placed until inspected for depth, forming and reinforcement. Proper finishing tools shall be on the jobsite at time of inspection. Failure to obtain required inspection shall be sufficient cause for rejection. Such inspection and approval shall not relieve the contractor of the responsibility of obtaining satisfactory concrete surfaces, free from warping, bulging or other objectionable defects. Special attention shall be paid to the ties and bracing. Where the forms appear to be insufficiently braced or unsatisfactorily built, the progress of the work shall be stopped until the defects have been corrected to the satisfaction of the Engineer.

B. Preparation

1. Remove all laitance, oil, and loose particles from concrete and concrete surfaces, and thoroughly clean the forms with water under stiff pressure.
2. Remove laitance after concrete has hardened partially (not less than two hours nor more than four hours after place in) by brushing with stiff bristles, or by directing a stream of water from a 1/4" nozzle, or by other method approved by the Engineer, to expose the clean top surface of the coarse aggregate.
3. Where cleaning is not satisfactory to the Engineer sandblast the surface and then wash again.

C. Method of Depositing

1. Concrete shall be deposited as nearly as practical in its final position to avoid segregation due to handling or flowing. The concrete shall be carried on at such a rate that the concrete is at all times plastic and flows readily. No concrete that has been contaminated by foreign materials shall be deposited on the work.
2. When concreting is started, it shall be carried on as a continuous operation until the placing of the panel or section is completed. The top surface shall be generally level.
3. All concrete shall be thoroughly compacted by suitable means during the operation of placing, and shall be thoroughly worked, into corners.
4. Place concrete only under the degree of inspection described elsewhere in these Specifications, and as required by governmental agencies having jurisdiction.
5. Do not place concrete outside of regular working hours unless required inspection authorities have been notified properly and are present.
6. Concrete shall be pump-mix.
7. Deposit concrete so that the surface is kept level throughout, a minimum being permitted to flow from one position to another, and place as rapidly as practicable after mixing.
8. Do not use in this Work any concrete not placed within 30 minutes after leaving the mixer.

D. Adverse Weather

1. The Contractor shall assume all risks connected with the placing of concrete during adverse weather conditions, and permission given to place concrete under such conditions will in no way relieve the Contractor of the responsibility for satisfactory results. Should concrete placed under such conditions, prove unsatisfactory, it shall be removed, disposed of and replaced at the Contractor's expense.

3.7 FINISHING

A. Exposed work shall have a steel trowelled finish after which it shall be lightly broomed to eliminate a slick finish. Use magnesium or plastic blades suitable for color concrete finishing. After forms have been removed from exposed areas, all voids shall be filled and rubbed where necessary using color compound to give the face a finished look. All laitance and slopover shall be thoroughly removed from any adjacent surfaces before the final finishing process is completed.

B. Nonslip Broom Finish: Apply as indicated. Immediately after float finishing, slightly roughen concrete surface by brooming with fiber-bristle non-staining broom perpendicular to main traffic route. Coordinate required final finish with Engineer before application.

C. Floated finished: Provide a floated finish after seeding of crushed coquina shell aggregate suitable for Curing and eventual sand blasting of the exposed aggregate surfaces. (Refer to plans sections to provide specified finishes)

D. Deep Broom or Bond finish: Apply as indicated. Immediately after float finishing roughen concrete surface by brooming with stiff-bristle non-staining broom perpendicular to main traffic route. Bond finish by crossing patters with each other. Coordinate required final finish with Engineer before application.

E. Colored concrete Finish: Apply a float finish to slab surfaces. Delay finishing of colored concrete work until bleed water has evaporated. Use mechanical floats or trowels. Finish in one direction; using one-way motion of blades to create a uniform colored surface.

1. Time of Pour: Wherever possible, schedule pouring of colored concrete to occur under the same weather conditions. Avoid pouring in shaded and sunlight areas simultaneously. Do not pour colored concrete on marginal weather days.
2. Do not fog, sprinkle, or otherwise add water to the surface of colored concrete during finishing operation.
3. No added water to adjust slumps above as specified on this section will be allowed. Max 4” at discharge prior to adding High range Super-plasticizer, but not more than 5” slump overall.

F. Expose aggregate finish: Broadcast crushed coquina shell onto floated slab surface and
trowel until flush with surface.

G. Apply curing agent and allow to cure for a minimum of 7 days before light sandblasting and exposing of the surface shell aggregate finish.

3.8 Edges and Joints

A. Edges of all sidewalks shall be finished with one-quarter inch (1/4") radius joint and edging tools. Edges of curbs shall be to the radius shown on typical section.

B. Joints in sidewalks shall be spaced uniformly equal to width of sidewalk except where sidewalk exceeds six feet (6') in which case the uniform spacing shall be one-half width with a longitudinal joint at mid-width. All such joints shall be formed with tool having a bit depth of one and one-half inches (1-1/2") as approved by the City and shall have a minimum tooled radius of one-quarter inch (1/4") each side.

At spacing of twenty feet (20') maximum (or nearest multiple of required joint spacing) there shall be an open joint one-quarter inch (1/4"), minimum, wide and full depth of sidewalk which may be formed with removable spline but having edges tooled to a one-quarter inch radius. Expansion joints or saw cutting can only be used where approved in writing.

An open joint shall be provided where new sidewalk abuts existing. A longitudinal joint parallel to curb poured monolithic with the sidewalk shall be tooled to a minimum depth of

one-quarter inch and with a one-quarter inch radius each side. Joints in curbs or curbs and gutters shall be at a maximum spacing of ten feet (10') or a minimum spacing of four feet (4') and formed with a one-quarter inch thick steel template of proper contour and with exposed edges tooled to a one-quarter inch radius.

C. Expansion material must be used between the back of curb (or curb and gutter) and sidewalk, between concrete driveway and sidewalk, between any existing vertical surface (except existing sidewalk) and sidewalk and between root barriers and sidewalk. Expansion joints shall be a maximum of 1/2" thick and the expansion material shall be cut one-eighth inch (1/8") below the surface at the proposed sidewalk curb or gutter.

D. When specified on the plans or requested by the Contractor and approved by this department, sawcutting of sidewalks, curb or gutter shall be done as follows:

1. All joints shall be formed (at wearing surface) with tool having a bit of at least one-half inch (1/2") deep and radius of one-quarter (1/4") each side.
2. Open joints where required shall be saw cut the full depth of sidewalk, curb or gutter.
3. Intermediate joints at spacing required shall be saw cut a minimum depth of one and one-half inch (1-1/2").
4. Saw blades used shall not be less than one-eighth inch (1/8") nor more than one-quarter (1/4") thick and shall not be allowed to deviate from a straight line, but such joints shall be clean cut and uniform in width with tooled edges at surface remaining undamaged.
5. Open joints shall be saw cut within forth-eight(48) hours and intermediate joints with twenty-four (24) hours after finishing.

E. Concrete sidewalks which are part of driveways and approaches shall have joint spacing to match adjoining sidewalk.

3.9 Curing and Protection

A. Protect finished concrete from premature drying and excessive cold or hot temperatures.

In hot, dry, and windy weather protect concrete from rapid surface moisture loss before and during finishing operations. Apply curing compound according to manufacturer's instructions.

1. Start initial curing as soon as surface is hard enough to walk on it without marring the finish.
2. Curing Compound: Apply Curing Agent at a rate of 300 to 400 Sq/Ft per gallon (7-10 m/sq X Liter) or as recommended by manufacturer. Apply to concrete slabs as soon as final finishing operation is complete. Apply uniformly in continuous operation by pump or power airless sprayer according to manufacturer's directions; **do not exceed recommended rate or allow Curing compound to puddle.**
3. Protect work by closing area to foot traffic for a min. of 12 hours. After Curing agent has dried. Protect from other trades by placing barricades. Only use white Kraft paper to keep dirt and contaminants off the color slabs if necessary. Do not use plastic covers or moistened fabrics.

3.10 Cleaning and Final Sealing

Clean and rinse all surfaces after the sand-blasting operation and allow drying prior to applying a final coat of **Lambert UV Super Seal** or as specified in section 2.04 (or your section) at the rate of 400 Sq/Ft per gal. (10 rn/sq. x Liter)

3.11 Defective Concrete

A. The following concrete will be deemed to be defective, and shall be removed promptly from the job site.

1. Concrete which is not formed as indicated, is not true to intended alignment, is not plumb or level where so intended, is not true to intended grades and levels;
2. Has voids or honeycomb that have been cut, resurfaced, or filled, unless with the approval of the Architect;
3. Has sawdust, shavings, wood, or embedded debris;
4. Or does not conform fully to provisions of the Contract Documents.

B. Repairs and replacement

1. Defective concrete may be cut out and repaired with gunite, or other approved methods, when and as directed by the Engineer.
2. Where defective concrete is found after removal of the forms, cut out the defective concrete, if necessary, and make the surfaces match adjacent surfaces.
3. Work uneven surfaces and angles of concrete to a surface matching adjacent concrete surfaces.

3.12 Testing

A. The Engineer shall have the right to order tests on any material entering into concrete or reinforced concrete to determine its suitability for the proposed purpose. To order reasonable tests of the concrete from time to time to determine whether the materials and methods in use are such as to produce concrete of the necessary quality; and to order the test under load of any portion of the structure, when conditions have been such as to leave doubt as to the adequacy of the structure to serve the purpose for which it is intended.

B. Tests of materials and of concrete shall be in accordance with the requirements of the American Society for Testing Materials. Test shall be made by a testing laboratory approved by the Engineer. Test reports shall be submitted to the Engineer. The costs of such tests resulting from construction related problems shall be assumed by the Contractor.

C. Tests on concrete used in construction shall be made by an approved testing laboratory, and reports submitted to the Engineer. The costs of such tests shall be assumed by the Contractor.

1. Not less than three specimens shall be made for each standard test, nor less than one test for each 50 cubic yards of concrete used on the project.
2. Specimens shall be made and cured in accordance with the Standard Method of Making and Curing Concrete Compression and Flexure Test Specimens in the

Field,
ASTM C31-84.
3. Specimens shall be tested in accordance with the Standard Method of Test for Compression Strength of Molded Concrete Cylinders, ASTM C39-84. Reports to the
Engineer shall be submitted for each test performed.
3. Test cylinders taken off truck-mixed concrete shall be taken at the approximate
4. one-quarter point and the three-quarter point of the load.

D. The age for strength tests of concrete shall be 28 days. Strength tests for an earlier age shall be submitted if the Engineer has approved concrete in the structure to receive its full working loads at such earlier time. Seven day tests may be used with the approval of the Engineer, provided that the relation between the seven and 28-day strengths of the concrete is established by tests for the materials and proportions used.

E. To conform to the requirements of these specifications, the average strength of the laboratory cured cylinders representing each class of concrete as well as the average of any five consecutive strength tests representing each class of concrete shall be equal to or greater than the specified strength and not more than one strength test in ten shall have an average value of less than 90 percent of the specified strength.

F. When there is a question as to the quality of the concrete in the structure, the Engineer shall have the right to require core tests in accordance with the Standard Method of Obtaining and Testing Drilled Cores and Sawed Beams of Concrete, ASTM C42-84a, to order load tests on that portion of the structure where the questionable concrete has been placed, or to require other reasonable tests to evaluate the strength of the structure.

END OF SECTION

SECTION 03300

CAST-IN-PLACE CONCRETE (STRUCTURES)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies cast-in-place concrete, including reinforcement, concrete materials, mix design, placement procedures, and finishes.

B. Related Sections include the following:
   1. Division 2 Section "Earthwork" for fill under new concrete work.
   2. Division 3 Section “Concrete Finish”.

1.3 SUBMITTALS

A. General: In addition to the following, comply with submittal requirements in ACI 301.

B. Product Data: For each type of manufactured material and product indicated.

C. Design Mixes: For concrete mix.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed concrete work similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.

C. Source Limitations: Obtain each type of cement of the same brand from the same manufacturer's plant, each aggregate from one source, and each admixture from the same manufacturer.

D. Comply with ACI 301, "Specification for Structural Concrete," including the following, unless modified by the requirements of the Contract Documents.
   1. General requirements, including submittals, quality assurance, acceptance of structure, and protection of in-place concrete.
   2. Formwork and form accessories.
   3. Steel reinforcement and supports.
   4. Concrete mixtures.
   5. Handling, placing, and constructing concrete.

PART 2 - PRODUCTS

2.1 FORMWORK

A. Furnish formwork and form accessories according to ACI 301.

2.2 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.

B. Plain-Steel Welded Wire Fabric: ASTM A 185, fabricated from as-drawn steel wire into flat sheets.

C. Deformed-Steel Welded Wire Fabric: ASTM A 497, flat sheet.

2.3 CONCRETE MATERIALS

A. Portland Cement: ASTM C 150, Type I.

B. Normal-Weight Aggregate: ASTM C 33, uniformly graded, not exceeding 1-1/2-inch (38-mm) nominal size.

C. Water: Potable and complying with ASTM C 94.

2.4 ADMIXTURES

A. General: Admixtures certified by manufacturer to contain not more than 0.1 percent water-soluble chloride ions by mass of cement and to be compatible with other admixtures. Do not use admixtures containing calcium chloride.

B. Air-Entraining Admixture: ASTM C 260.

C. Water-Reducing Admixture: ASTM C 494, Type A.

D. High-Range, Water-Reducing Admixture: ASTM C 494, Type F.

E. Water-Reducing and Accelerating Admixture: ASTM C 494, Type E.

F. Water-Reducing and Retarding Admixture: ASTM C 494, Type D.

2.5 RELATED MATERIALS

A. Vapor Retarder: Multi-ply reinforced polyethylene sheet, ASTM E 1745, Class C, not less than 7.8 mils (0.18 mm) thick; or polyethylene sheet, ASTM D 4397, not less than 10 mils (0.25 mm) thick.

B. Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber, or ASTM D 1752, cork or self-expanding cork.

2.6 CURING MATERIALS

A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

B. Water: Potable.

C. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.

2.7 CONCRETE MIXES

A. Comply with ACI 301 requirements for concrete mixtures.

B. Prepare design mixes, proportioned according to ACI 301, for normal-weight concrete determined by either laboratory trial mix or field test data bases, as follows:
   1. Compressive Strength (28 Days): 3000 psi (20.7 MPa).
   2. Slump: 4 inches (100 mm).
      a. Slump Limit for Concrete Containing High-Range Water-Reducing Admixture: Not more than 8 inches (200 mm) after adding admixture to plant- or site-verified, 2- to 3-inch (50- to 75-mm) slump.

C. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content of 2.5 to 4.5 percent.
   1. Air content of trowel-finished interior concrete floors shall not exceed 3.0 percent.

PART 3 - EXECUTION

3.1 FORMWORK

A. Design, construct, erect, shore, brace, and maintain formwork according to ACI 301.

3.2 VAPOR RETARDER

A. Install, protect, and repair vapor-retarder sheets according to ASTM E 1643; place sheets in position with longest dimension parallel with direction of pour.

B. Lap joints 6 inches (150 mm) and seal with manufacturer's recommended tape.

3.3 STEEL REINFORCEMENT

A. Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
   1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

3.4 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Locate and install so as not to impair strength or appearance of concrete, at locations indicated or as approved by Architect.

C. Isolation Joints: Install joint-filler strips at junctions with slabs-on-grade and vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
   1. Extend joint fillers full width and depth of joint, terminating flush with finished concrete surface, unless otherwise indicated.

3.5 CONCRETE PLACEMENT

A. Comply with recommendations in ACI 304R for measuring, mixing, transporting, and placing concrete.

B. Consolidate concrete with mechanical vibrating equipment.

3.6 FINISHING FORMED SURFACES

A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defective areas repaired and patched, and fins and other projections exceeding 1/4 inch (6 mm) in height rubbed down or chipped off.
   1. Apply to concrete surfaces not exposed to public view.

B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defective areas. Completely remove fins and other projections.
   1. Apply to concrete surfaces exposed to public view or to be covered with a coating or covering material applied directly to concrete, such as waterproofing, dampproofing, veneer plaster, or painting.
   2. Do not apply rubbed finish to smooth-formed finish.
   3. Apply the following rubbed finish, defined in ACI 301, to smooth-formed finished concrete.
      a. Smooth-rubbed finish.

C. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

3.7 FINISHING UNFORMED SURFACES

A. General: Comply with ACI 302.1R for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Screed surfaces with a straightedge and strike off. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane before excess moisture or bleedwater appears on the surface.
   1. Do not further disturb surfaces before starting finishing operations.

C. Trowel and Fine-Broom Finish: Apply a partial trowel finish, stopping after second troweling, to surfaces indicated and to surfaces where ceramic or quarry tile is to be installed by either thickset or thin-set methods. Immediately after second troweling, and when concrete is still plastic, slightly scarify surface with a fine broom.

D. Nonslip Broom Finish: Apply a nonslip broom finish to surfaces indicated and to exterior concrete platforms, steps, and ramps. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route.

3.8 TOLERANCES

A. Comply with ACI 117, "Specifications for Tolerances for Concrete Construction and Materials".

3.9 CONCRETE PROTECTION AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection, and follow recommendations in ACI 305R for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Begin curing after finishing concrete, but not before free water has disappeared from concrete surface.

D. Curing Methods: Cure formed and unformed concrete for at least seven days by moisture curing, moisture-retaining-cover curing, curing compound, or a combination of these as follows:
   1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
      a. Water.
      b. Continuous water-fog spray.
      c. Absorptive cover, water saturated and kept continuously wet. Cover concrete surfaces and edges with 12-inch (300-mm) lap over adjacent absorptive covers.
   2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
   3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

3.10 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified independent testing and inspecting agency to sample materials, perform tests, and submit test reports during concrete placement according to requirements specified in this Article. Perform tests according to ACI 301.

1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mix, plus one set for each additional 50 cu. yd. if more than 25 yards or poured in one day.

B. Remove and replace concrete that does not comply with requirements in this Section.

END OF SECTION

SECTION 03345

CONCRETE FINISHING (STRUCTURES)

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work included: Provide finishes on cast-in-place concrete as called for on the Drawings, specified herein, and needed for a complete and proper installation.

B. Related work:
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
2. Section 03300: Cast-in-place concrete.

1.2 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Except as may be modified herein or otherwise directed by the Engineer, comply with ACI 301, "Specifications for Structural Concrete for Buildings."

1.3 SUBMITTALS

A. Comply with pertinent provisions of Section 01340.

1.4 PRODUCT HANDLING

A. Comply with pertinent provisions of Section 01640.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General:
1. Carefully study the Drawings and these Specifications, and determine the location, extent, and type of required concrete finishes.

2. As required for the Work, provide the following materials, or equals approved in advance by the Engineer.

B. Concrete materials: Comply with pertinent provisions of Section 03300, except as may be modified herein.

C. Liquid bonding agent:
1. Submit specifications of bonding agent for Engineers Approval.

D. Curing and protection paper:

1. Approved products:
   a. "Sisalkraft, Orange Label";
   b. Equal products complying with ASTM C171.
2. Where concrete will be exposed and will be subjected to abrasion, such as floor slabs, use nonstaining paper such as "Sisalkraft, Seekure 896," or equal paper faced with polyethylene film.

E. Liquid curing agents:
1. Where application of specified finish materials will be inhibited by use of curing agents, cure the surface by water only; do not use chemical cure.
2. For curing other areas, use "Hunt TLF" manufactured by Hunt Process Company, Inc.

2.2 OTHER MATERIALS

A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Engineer.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 FINISHING SLABS

A. Definition of finishing tolerances:
1. "Class A": True plane within 1/8" in ten feet as determined by a ten foot straightedge placed anywhere on the slab in any direction.
2. "Class B": True plane within 1/4" in ten feet as determined by a ten foot straightedge placed anywhere on the slab in any direction.
3. "Class C": True plane within 1/4" in two feet as determined by a two foot straightedge placed anywhere on the slab in any direction.

B. Troweled finish:
1. Provide a floated finish as described above, followed by a power troweling and then a hand troweling.
   a. Produce an initial surface which is relatively free from defects, but which still may show some trowel marks.
   b. Provide hand troweling when a ringing sound is produced as the trowel is moved over the surface.
   c. Thoroughly consolidate the surface by hand troweling.
2. Provide a finished surface essentially free from trowel marks, uniform in texture and appearance, and in a plane of Class A tolerance.
   a. On surfaces intended to support floor coverings, use grinding or other means as necessary and remove all defects of such magnitude as would show through the floor covering.

3.3 CURING AND PROTECTION

A. Beginning immediately after placement, protect concrete from premature drying, excessively hot and cold temperatures, and mechanical injury.

B. Preservation of moisture:
   1. Unless otherwise directed by the Engineer, apply one of the following procedures to concrete not in contact with forms, immediately after completion of placement and finishing.
      a. Ponding or continuous sprinkling.
      b. Application of absorptive mats or fabric kept continuously wet;
      c. Application of sand kept continuously wet;
      d. Continuous application of steam (not exceeding 150 degrees F) or mist spray;
      e. Application of waterproof sheet materials specified in Part 2 of this Section.
      f. Application of other moisture-retaining covering as approved by the Engineer;
      g. Application of the curing agent specified in Part 2 of this Section or elsewhere in the Contract Documents.
   2. Where forms are exposed to the sun, minimize moisture loss by keeping the forms wet until they can be removed safely.
   3. Cure concrete by preserving moisture as specified above for at least seven days.

C. Temperature, wind, and humidity:
   1. Cold weather:
      a. When the mean daily temperature outdoors is less than 40 degrees F, maintain the temperature of the concrete between 50 degrees F and 70 degrees F for the required curing period.
      b. When necessary, provide proper and adequate heating system capable of maintaining the required heat without injury due to concentration of heat.
      c. Do not use combustion heaters during the first 24 hours unless precautions are taken to prevent exposure of the concrete to exhaust gases, which contain carbon dioxide.
   2. Hot weather: When necessary, provide wind breaks, fog spraying, shading, sprinkling, ponding, or wet covering with a light colored material, applying as quickly as concrete hardening and finishing operations will allow.
   3. Rate of temperature change: Keep the temperature of the air immediately adjacent to the concrete during and immediately following the curing period as uniform as possible and not exceeding a change of 5 degrees F in any one hour period, or 50 degrees F in any 24 hour period.

D. Protection from mechanical injury:
   1. During the curing period, protect the concrete from damaging mechanical disturbances such as heavy shock, load stresses, and excessive vibration.
   2. Protect finished concrete surfaces from damage from construction equipment, materials, and methods, by application of curing procedures, and by rain and running water.
   3. Do not load self-supporting structures in such a way as to overstress the concrete.

END OF SECTION

SECTION 03480

PRECAST CONCRETE SPECIALTIES

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work included: The Contractor shall furnish all materials, labor and equipment and construct manholes, catch basins and/or other utility structure as shown on the Drawings and as specified herein.

B. Every effort shall be made by the Contractor to construct watertight structures.

C. The forms, dimensions, concrete, and construction methods shall be approved by the Engineer in advance of construction.

D. Related Work:
1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
2. Section 02201: Earthwork for Utilities Structures
3. Section 02221: Trench, Bedding and Backfill for Pipe.

1.2 QUALITY ASSURANCE

A. Quality Assurance: Use a precasting plant which has been certified by the precast concrete institute and has been engaged for more than five (5) years in the manufacturing of precast utility structures.

1.3 SUBMITTALS

A. Comply with pertinent provisions of Section 01340.

B. Product data: Within 21 calendar days after award of the Contract, submit:
1. Materials list of items proposed to be provided under this Section;
2. Manufacturer's specifications, catalog cuts, and other data needed to prove compliance with the specified requirements;
3. Manufacturer's recommend installation procedures which, when approved by the Engineer, will become the basis for accepting or rejecting actual installation procedure used on the work.
4. Shop Drawings showing complete details and reinforcement schedules for fabrication, assembly and installation. Furnish anchor bolts required for installation of other work.

1.4 PRODUCT HANDLING

A. Comply with pertinent provisions of Section 01640.

B. The quality of all materials, the process of manufacture, and the finished sections shall be subject to inspection and approval by the Engineer, or other representatives of the Owner. Such inspection may be made at the places, and the sections shall be subject to rejection at any time on account of failure to meet any of the

Specification requirements; even though sample sections may have been accepted as satisfactory at the place of manufacture. Sections rejected after delivery to the job shall be marked for identification and shall be removed from the job at once. All sections which have been damaged after delivery will be rejected, and if already installed, shall be acceptably repaired, if permitted, or removed and replaced, entirely at the Contractor's expense.

C. At the time of inspection, the section will be carefully examined for compliance with the ASTM designation specified below and these Specifications, and with the approved manufacturer's drawings. All sections shall be inspected for general appearance, dimensions, "scratch-strength", blisters, cracks, roughness, soundness, etc. The surface shall be dense and close-textured.

D. Imperfections may be repaired, subject to the approval of the Engineer, after demonstration by the manufacturer that strong and permanent repairs result. Repairs shall be carefully inspected before final approval. Cement mortar used for repairs shall have a minimum compressive strength of 4,000 psi at the end of 7 days and 5,000 psi at the end of 28 days, when tested in 3-inch by 6-inch cylinder stored in the standard manner. Epoxy mortar may be utilized for repairs subject to the approval of the Engineer.

E. Each section of the utility structure must be inspected and stamped at the casting yard by an accredited testing laboratory.

PART 2 - PRODUCTS

2.1 PRECAST CONCRETE SECTIONS

A. Precast concrete manhole barrel and eccentric top sections shall conform to Specifications for Precast Reinforced Concrete Manhole Sections, ASTM Designation C478, except as otherwise specified below. The method of constructions shall conform to the detailed Drawings appended to these specifications and the following additional requirements:

1. The minimum wall thickness for the various size barrel sections shall be 8 inches.
2. Barrel sections shall have tongue and groove joints. Joints shall have round rubber gaskets performed and set in specially provided indentations. The round rubber "0"-ring gasket shall conform to ASTM C443 standard specifications, or Federal Specification SS-S-00210 (GSA-FSS), "Ram-Nek" as manufactured by the K.T. Snyder Co., Houston, Texas, or approved equal.
3. Concrete shall conform to ASTM C-94, Type II cement, with a compressive strength of 4,000 psi. Mortar shall be composed of one part cement to two parts sand.
4. The date of manufacture and the name or trademark of the manufacturer shall be clearly marked on the inside of each precast section. Each section of the manhole must be inspected and stamped by an accredited testing laboratory.
5. Sections shall be cured by an approved method for at least 28 days prior to painting and shall not be shipped until at least 2 days after having been painted.
6. Top sections shall be eccentric except that precast concrete slabs shall be used where cover over the top of the pipe is less than 4 ft for all manholes.

7. Precast concrete slabs over top section, where required, shall be capable of supporting the overburden plus a live load equivalent to AASHTO H-20 loading.
8. Reinforcement bars and steel shall be as a minimum what is shown on the Drawings for precast pump wet well section pump wet well sections.
9. The tops of bases shall be suitable shaped to mate with the precast barrel section.
10. The exterior and interior of the manhole shall be coated in accordance with Section 09900 with heavy duty coal tar epoxy coating containing not less than duty coal tar epoxy coating containing not less than 72.9% by volume non-volatile solids, equal to Koppers 300-N.

B. Precast electrical handholes and covers shall be as specified and as shown on the Drawings.

C. Precast leveling rings for setting cast iron frames over manholes shall be 2-inch thick and have one No. 2 continuous reinforcing steel bar.

D. Where pipes enter or exit manholes a :Kor-N-Seal" molded neoprene boot with stainless steel internal and external bonds as manufactured by the National pollution Control Systems, Inc., nashua, New Hampshire, or an approved equal shall be provided.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Precast Structures shall be constructed to the dimensions as shown on the Drawings and as specified in these Specifications.

B. The base shall be cast-in-place concrete as specified in Division 3 placed on a thoroughly compacted gravel subbase. The tops of the cast-in-place bases shall be shaped to mate with the pre-cast barrel section, and shall be adjusted in grade so that the top of the dome section is at the approximately correct elevation. Precast concrete structure sections shall be set so as to be vertical and with section in true alignment with a -inch maximum tolerance to be allowed.

C. Pre-cast bases, conforming to all requirements of ASTM C478 and above listed requirements for precast sections, may be used.

D. The outside and inside joint shall be filled with mortar and finished flush with the adjoining surfaces. Allow joints to set for 24 hours before painting. While pouring concrete for manholes or plastering manholes, great care shall be taken not to allow mortar to get into the sewer lines. The Contractor shall provide two plumbers test plugs of each size sewer pipe on the job to prevent this possibility.

E. After the manholes are completed, the inside and outside surfaces of the walls shall be located with two coats of a heavy duty coal tar epoxy coating. The masonry surface may be damp but not wet. If necessary, the contractor shall utilize blowers to achieve the necessary drying. The first coat shall be thinned approximately 15% with a thinner and furnished by the manufacturer. The total dry film thickness of the finished coating shall not be less than 10 mils. The Contractor shall take all necessary precautions to protect the workmen against toxic or harmful fumes during

the painting operations.

F. Backfilling shall be done in a careful manner, bringing the fill up evenly on all sides. If leaks appear in the structures, the inside joints shall be caulked to the satisfaction of the Engineer. The Contractor shall install the precast sections in a manner that will result in a watertight joint.

G. Holes in the concrete pipe sections required for handling or other purposes shall be plugged with a non-shrinking grout or by grout in combination with concrete plugs.

H. Where holes must be cut in the precast sections to accommodate pipes, cutting shall be done prior to setting them in place to prevent any subsequent jarring which may loosen the mortar joints. All cutting is to be performed only by power driven abrasive wheels or saws.

I. Cast iron frames specified and furnished under Division 5 shall be placed over precast concrete leveling rings, shimmed and set in portland cement mortar to the required grade. No more than three courses of leveling rings shall be used.

J. Brick manholes may be used only upon the approval of the Engineer.

K. New pipe connections to new and existing manholes are to be caulked watertight with non-shrinking grout in accordance with the details shown on the Drawings.

END OF SECTION

SECTION 16010

GENERAL REQUIREMENTS FOR ELECTRICAL WORK

PART 1 - GENERAL

1.01 DESCRIPTION

A. The requirements set out in the contract documents, apply to all work specified hereinafter in sections of this subdivision.

1.02 DRAWINGS

A. If any departures from the drawings are deemed necessary by the contractor, details of such departures and the reasons therefor shall be submitted to the owner's representative for review. No departures shall be made without prior written acceptance of the owner's representative.

B. Figured dimensions shall be followed without reference to scale.

C. The contractor shall maintain a set of electrical drawings at the job site neatly marked with all changes from the original contract drawings. This set of drawings shall not be used for construction purposes and shall be available to the owner's representative at all times. It shall be kept up to date as the job progresses and be delivered to the owner's representative at the completion of the contract.

D. A fresh, clean set of plans on which variations to the original construction documents are legibly recorded and designated "as-built" shall be furnished to the owner upon completion and acceptance of work and before final payment is made.

1.03 CODES AND STANDARDS

A. All work shall be in compliance with applicable portions of the latest approved edition of the national electrical code (NEC), the national electrical safety code (NESC), city and county codes and ordinances, and other codes which may or may not be specifically referenced in these contract documents. None of the terms or provisions of these contract documents shall be construed as waiving any of the rules, regulations or requirements of these codes and ordinances.

B. Where the contract documents call for construction materials of a better quality or larger size than required by the codes, the contract documents shall govern. The codes shall govern in case violations are indicated in the construction documents.

1.04 TEMPORARY POWER

A. The electrical contractor shall coordinate with the general contractor and local utility company and provide the necessary wiring, connections, service switches, poles,

wiring protective devices, lighting fixtures, lamps, outlet devices, disconnect switches, etc., as required for temporary lighting and power of voltage levels, phasing and adequate ampacity as required to facilitate the construction of the project. These services shall be installed in accordance with requirements of the utility company, NEC and OSHA at no additional cost to the owner.

1.05 UTILITIES

A. The contract documents reflect the general location, voltage, capacity, size and manner of routing all utilities known to be required on this project. It shall be the responsibility of the contractor to visit the site and to meet with the local utility company to coordinate all facilities required to provide complete and operative electrical power. The bid submitted by the contractor shall include costs for all such coordinative work as well as any and all utility company charges and/or fees.

1.06 GUARANTEE

A. The contract documents reflect the general location, voltage, capacity, size and manner of routing all utilities known to be required on this project. It shall be the responsibility of the contractor to visit the site and to meet with the local utility company to coordinate all facilities required to provide complete and operative electrical power. The bid submitted by the contractor shall include costs for all such coordinative work as well as any and all utility company charges and/or fees.

PART 2 - PRODUCTS

2.01 IDENTIFICATION AND LABELING

A. All equipment shall have manufacturer's nameplate permanently affixed in an obvious location. Panels shall contain a typed index card identifying all circuits.

B. Major pieces of equipment shall be labeled, as required by the NEC and directed by owner's representative, with engraved nameplates constructed of laminated phenolic. Letters shall be condensed gothic, 1/4 inch high. Nameplates shall be at least 1/16-inch thick, 3 ply, white surfaces, black core. Nameplates shall be fastened to equipment with pop rivets. Label shall include equipment name, voltage and phasing. Example: panel "a" 120/208v, 3 ph.

C. The contractor shall furnish arc flash calculations and labels on all service panels using available fault current from the utility.

PART 3 - EXECUTION

3.01 CUTTING AND PATCHING

A. Where it becomes necessary to drill or cut through any floors, walls or ceilings to permit the installation of any work under this contract, or to repair any defects that may appear prior to the expiration of the warranty, such cutting shall be done under the supervision of the owner's representative by the contractor. After the necessary work has been completed, the damage shall be repaired by the contractor, who shall pay all costs of such cutting and repairing.

B. All drilling for expansion bolts, hangers and other supports shall be done by the contractor, subject to the approval of the owner's representative. Labor and materials required to replace or rebuild parts cut or injured shall be furnished at the contractor's expense, subject to the satisfaction of the owner's representative.

3.02 SUBMITTALS

A. The contractor shall furnish at least 6 copies of the manufacturer's literature and drawings describing all proposed equipment and materials indicated in the specifications. The proposed use of the exact equipment and materials specified shall not change this requirement of including literature describing the proposed equipment. The front sheet of brochure shall have job name, architect, engineer, contractor and suppliers identified.

B. Submittals shall include detailed specifications and construction data. Manufacturer's regular catalog sheets will not be acceptable unless they indicate completely all of the specification requirements including but not limited to:

1. UL labeling.

2. Amperage, voltage, phase, etc.

3. Physical size.

4. Light fixture photometric data.

5. Schematics/shop drawings - major equipment only.

3.03 MATERIALS AND WORKMANSHIP

A. All materials shall be new and of quality grade, standard manufacturer. All materials of a type for which the Underwriters' Laboratories, Inc., has established a standard shall be listed by them and shall bear their label.

B. All work shall be performed by competent mechanics, skilled in their trade, and shall be executed in a thorough and substantial manner.

C. The contractor shall be held responsible for transportation of his materials to and on the job, and for their storage and protection until final acceptance of the job.

D. The contractor shall be held responsible for timely placing of all conduit outlet boxes, cabinets and other wiring devices in the walls, ceilings, slabs, beams, etc., as construction progresses.

E. Contractor shall furnish all necessary scaffolding, tackle, tools and appurtenances of all kinds, and all labor required for the safe and expeditious execution of his contract.

F. Reference in the specifications or drawings to any article, device, product, material, fixture, form or type of construction by naming more than one acceptable manufacturer shall be interpreted as establishing a standard of quality and shall not be construed as limiting competition; however, the contractor, in such cases, must get written prior approval for substitution of unnamed manufacturers. Requests for substitution must be received in writing, in accordance with the contract documents, at least 7 working days before bid date. The request shall include a detailed listing of all products and/or devices for which acceptance is being requested. Engineering specification sheets and/or construction details shall be included for comparative purposes. If the product is acceptable to the satisfaction of the owner's representative and the engineer, an addendum item will be issued stating acceptability. If doubt exists about the acceptability or equality of any unnamed product, device, fixture or article, the contractor shall request written authority for substitution from the engineer as stated in preceding paragraph. No verbal acceptance will be issued.

G. All equipment shall be installed in a manner to permit access to parts requiring service. All electrical equipment shall be installed in such a manner as to allow removal for service without disassembly of other equipment, and shall have working clearances as required by the national electrical code. Any piece of apparatus which is too large to fit through finished openings, shall be placed before enclosing structure is completed. Following placement, such apparatus shall be completely protected from damage.

3.04 OPERATION AND MAINTENANCE INSTRUCTIONS

A. The contractor shall furnish 6 sets of operating and maintenance instructions to the owner prior to final acceptance of the installation. These instructions shall include all items designated in the specifications, shall be assembled in an indexed three-ring binder as described in the paragraph titled "submittals" and shall include all warranties. Separate equipment brochures will not be acceptable. A pictorial parts list, operation and maintenance instructions, system description, schematic wiring diagrams and equipment cut sheets shall be included for each item with source information.

B. Final acceptance of the installation shall not occur until the owner's personnel have been trained in the maintenance and operation of all equipment for a minimum of 4 hours.

-End of Section-

SECTION 16050

BASIC MATERIALS AND METHOD

PART 1 - GENERAL

1.01 SECTION INCLUDES:

A. Conduit

B. Junction, pull and device boxes

C. Conductors

D. Disconnect switches

E. Overcurrent devices

F. Wiring devices

G. Lighting and branch circuit panelboards

H. Grounding

I. Testing

1.02 SUBMITTALS

A. Submit under provisions of section 16010

1.03 PRODUCT DATA

A. Provide manufacturer's literature and product data on all equipment listed in paragraph A.

PART 2 - PRODUCTS

2.01 CONDUIT

A. Rigid Aluminum (RAL) Conduits

1. Provide rigid aluminum conduit manufactured from 6063 alloy, temper T-1.

2. Provide rigid aluminum conduit manufactured in accordance with NEMA C80.5 – Electrical Rigid Aluminum Conduit, and UL-6A – Electrical Rigid Metal Conduit - Aluminum, Red Brass and Stainless Steel.

3. Manufacturer, or Equal

a. V.A.W. of America

b. Alcoa

B. PVC Rigid Non-Metallic Conduit

1. Provide rigid non-metallic conduit manufactured from Schedule 80 PVC, as indicated, and sunlight-resistant.

2. Provide rigid non-metallic conduit manufactured in accordance with NEMA TC-2 - Electrical Plastic Tubing and Conduit, and UL-651 - Standard for Rigid Non-metallic Conduit.

3. Manufacturer, or Equal

   a. Carlon

   b. Cantex

C. Liquid-Tight Flexible Conduit

1. Provide liquid-tight flexible conduit constructed of a flexible galvanized metal core with a sunlight-resistant thermoplastic outer jacket.

2. Provide liquid-tight flexible conduit manufactured in accordance with the requirements of UL-360 - Steel Conduits, Liquid-Tight Flexible.

3. Manufacturer, or Equal

   a. Anaconda, Sealtite

   b. Electriflex, Liquatite

D. Electrical Metallic Tubing (EMT) or Intermediate conduit (IMC) will not be accepted.

2.02 JUNCTION, PULL, AND DEVICE BOXES

A. Outdoor, above grade junction and pull boxes shall be of code stainless steel or aluminum. Boxes mounted vertically on a wall or structures shall be provided with hinged covers and catch-locks. All such boxes shall conform to NEC for size and gauge of material. Boxes shall be provided as required even if not indicated on drawings.

B. Ground pullboxes shall be polymer concrete type, sized in accordance with NEC. The pull box assembly shall have a minimum Tier 22 rating. Pullboxes shall not be installed in roadways or where subject to vehicular traffic. Covers shall fasten to the box with stainless steel bolts and shall be labeled “Electrical” or “Lighting” as applicable. Manufacturer shall be Hubbell Quazite or approved equal.

2.03 CONDUCTORS

A. Conductors shall be soft-drawn annealed copper. It shall conform to federal specifications for building wire applicable to the type of wire designated, and shall have

a conductivity of not less than 98 percent of pure copper. Insulation shall be XHHW-2 unless otherwise noted.

B. All wire shall be stranded. No wire smaller than #12 AWG may be used except for signal or control circuits which shall be a minimum of #14 AWG. All branch circuits shall be #12 AWG unless scheduled or noted otherwise.

C. Branch circuit conductors shall be color coded as follows:

1. 120/240v, 1 ph., 3W - black, red, and white.

D. All conductors shall be colored continuously for the entire length of the conductor except for phase conductors larger than #4 AWG, or neutral conductors #4 AWG or larger, where colored plastic tape may be used in lieu of continuously colored conductor insulation. Each conductor shall have at least three 1-inch bands (4-inch separation) at every termination and splice.

2.04 GROUNDING

A. Conductor size shall be as required by the national electrical code, stranded, soft drawn or soft annealed, unless otherwise shown on plans or specified.

B. Ground clamps for connecting conductors to copper, brass or lead pipes shall be made of copper. If pipes are steel or iron, ground clamps shall be galvanized iron. These clamps shall be designed to provide permanent and positive pressure and avoid mechanical injury to the pipes. Grounding conductors and jumpers shall be connected to each other and to items to be grounded by means of approved pressure connectors, clamps and/or other suitable methods approved by the engineer. Wherever conduit, cabinets, etc., are connected to the grounding system, the point and/or surface contacts shall be clean metal to metal.

C. All grounding conductor connections made below grade shall be made using an exothermic welded connection, "Cadweld," "Thermoweld" or approved equal.

D. Ground rods shall be min 3/4-inch diameter x 10 feet long, copper-clad steel-core.

E. All concrete-encased or direct-buried underground electrode conductors shall be stranded copper.

2.05 DISCONNECT SWITCHES

A. Switches shall be provided in NEMA 4X stainless steel enclosures or as noted on the drawings.

B. Shall be quick-make and quick-break.

C. Heavy-duty horsepower rated for use as a motor disconnect.

D. Capable of interrupting the locked rotor current of the motor served.

E. Be combined within the motor controller enclosure when specified.

F. Have switch blades which are fully visible in the off position when the door is open.

G. Be of dead-front construction with attached arc suppressors.

H. Shall have lugs UL listed for copper and/or aluminum cables.

I. All current-carrying parts shall be plated by electrolytic processes.

J. Be rated for 240 Volt A.C. to D.C. or 600 Volt A.C. as indicated on the drawings.

K. Shall have provisions for class r fuses as required.

2.06 PANELBOARDS / DISTRIBUTION PANELS

A. The service entrance power distribution panel shall be a combination meter socket, service disconnect, lighting controller, and panelboard as manufactured by Milbank or equal. The panel shall provide continuously on breakers for the pump station feeders. The panel shall also include a combination astronomical timeclock and photocell for switching lighting circuits. The lighting circuit control shall feature a Hand-Off-Auto switch for maintenance. The panel enclosure shall be rated NEMA 4X, factory painted stainless steel or aluminum. The color options shall be submitted to the owner for selection.

B. Panelboards shall conform to the requirements of UL 67, UL 50, NEMA no. PB1 and the NEC. Each panelboard shall be mounted in a NEMA 4X stainless steel enclosure with a removable front panel complete with latch and lock. All locks shall be keyed the same and two keys shall be provided for each lock. Cabinets shall have means for securing, supporting panelboard front. There shall be no sharp points or edges inside cabinets.

C. Bus bars shall be copper. Bus bar taps shall be arranged for sequence phasing of the branch circuit devices. Neutral bars shall be full size, insulated from the cabinet and mounted at the opposite end of the panel from the mains. A bare, uninsulated grounding bar, brazed to the cabinet, shall be provided. No double lugging will be permitted.

D. Branch circuit breakers shall be bolt-on, thermal magnetic molded case, quick-make, quick-break type designed for automatic or manual tripping, and shall be factory assembled to bus. Where spaces are indicated, bus shall have all applicable accessories provided to enable a breaker to be readily installed. Interrupting ratings shall be as indicated. Multipole breakers shall have common trip handle.

E. A directory frame and neatly typed card having a transparent cover shall be furnished on each door indicating loads.

2.07 CIRCUIT BREAKERS

A. All circuit breakers shall be UL listed, quick-make, quick-break, bolt-on type and be fully rated for the available fault current as scheduled on the drawings. Series rated breakers are unacceptable. Each breaker shall clearly indicate their ampacity and frame size and visually indicate "on", "off", or "tripped" condition.

B. When used for switching light circuits, shall be marked "SWD," indicating "switch duty rated."

2.08 RECEPTACLES

A. Receptacles shall be, 20 amperes, 125 volts, specification grade three wire, self or automatic grounding, white duplex, and shall be Hubbell #5362-i or approved equal.

B. All outdoor receptacles shall be AFCI, rated for outdoor locations and shall have a heavy-duty cast aluminum weatherproof while-in-use cover.

C. Other approved wiring device manufacturers are Bryant, P&S and Leviton.

D. Special purpose outlets and switches not covered by the specifications but noted on the drawings shall be of the amperage and voltage rating indicated.

PART 3 - EXECUTION

3.01 GENERAL

A. The contractor shall study all construction documents and carefully lay out all work in advance of fabrication and erection. Where conflicts occur, the contractor shall meet with all involved trades and the construction inspector and resolve the conflict prior to erection of any work.

B. The contractor shall locate all underground utilities before starting work.

3.02 CONDUITS

A. Minimum size conduit shall 1 inch unless otherwise noted

B. Above grade (exposed) conduit shall be rigid aluminum. Below grade conduits shall be PVC.

C. The transition from aluminum to PVC conduit shall occur underground on the horizontal plane, after the conduit riser and elbow. The conduit elbow shall be made from PVC coated (40-mil) rigid aluminum.

D. Where exposed to earth or concrete, aluminum conduit shall have a corrosion resistant bituminous coating.

E. All conduits shall be routed parallel or perpendicular to the structural lines. No diagonal runs will be permitted.

F. Where conduits are installed in slabs, they shall be set in position as soon as the forms are in place and in such manner as not to impair the strength of the slab. For exact locations, see architectural sections and locate as directed by owner's representative with respect to the reinforcing steel.

G. The electrical contractor shall exercise all necessary precaution to prevent the accumulation of water, dirt or concrete in conduit during work. Conduit ends shall be sealed by use of metallic "pennies" or resilient plastic sealing caps during construction until wire is pulled. Properly cap spare and empty conduit systems, stubbed up from below grade or from below floor level, with permanent caps.

H. Insofar as possible, horizontal runs of conduit shall be installed to provide a natural drain for condensation without pockets or traps where moisture may collect. All conduits shall be blown out and swabbed out before pulling in wire.

I. Conduits shall be securely supported to structures at intervals of not more than 8 feet or as required per NEC. They shall be fastened in place with aluminum or stainless steel channel, clamps or pipe straps, hangers, 3/8-inch diameter minimum rods or trapeze. No perforated steel tape is permitted. Supports of structural steel or manufactured framing members shall be provided with all necessary rods, anchors, clamps, spacers and bolts. Conduits above removable ceiling panels shall allow sufficient clearance for panel removal or insertion. Conduits of any size shall not be supported from ceiling hangers or light fixture hangers. Conduit shall not be supported from piping or mechanical equipment unless specifically shown on plans. Allow 7 feet of headroom clearance.

J. Furnish and install a polypropylene or nylon pull cord in every empty raceway installed hereunder to facilitate future installation of wires. Identify each end of pull wire with linen tags with complete information as to location of the other end of the wire.

K. Conduit which runs to or from all boxes, cabinets or enclosures having concentric or eccentric knockouts which partially perforate the metal around the conduit, and hence impair the continuity of system ground circuits, shall be provided with bonding jumpers sized in accordance with NEC table 250-95 connected between a grounding type bushing/locknut on the conduit and a ground bus or stud inside the enclosure.

L. Provide a green insulated ground conductor in all raceways sized according to NEC, or as noted on the drawings.

M. Provide expansion couplings where conduits cross expansion joints, and where required by the NEC.

N. Fasteners shall be stainless steel, self-drilling self-tapping screws in metal; wood screws in wood; or threaded expansion shields (Hilti drop-in anchors or approved equal) or inserts in masonry or concrete. Wooden, plastic or lead inserts will not be acceptable. Perforated strap iron shall not be used as a trap, support or hanger in any case.

3.03 BUILDING WIRE

A. No wire shall be drawn into conduit until all work of a nature which may cause injury is complete. An underwriter's-approved cable pulling compound shall be used as a lubricant where necessary. No material which may be injurious to the wire covering or insulation shall be used. Conductors pulled into wrong raceway or cut too short for termination shall be replaced. Conductors shall not be reinstalled after removal from a raceway.

B. Mains and feeders shall run their entire length in continuous pieces without joints or splices unless otherwise indicated.

C. Joints in branch circuits shall occur only where such circuits divide as shown on the plans. No splices shall be made in submersible locations.

D. All joints or splices shall be made as follows:

1. #8 AWG and smaller (dry locations) may be made by means of self-insulated spiral spring screw-on connector with resilient or unbreakable plastic insulating cap. No ceramic or brittle plastic shell connectors will be approved.

2. #8 AWG and smaller (damp or dry locations) shall be made with crimped copper sleeve type connectors wrapped with plastic electrical tape #133 (dry locations) or self-fusing (non-adhesive) electrical combination sheath and insulating tape no. 130 for damp locations.

3. #6 AWG and larger wires shall be connected by means of compression sleeves wrapped with plastic electrical tape (dry location) or Okoweld, or equal, self-fusing tape in damp locations.

E. Each and every electrical conductor termination shall be torque wrench or torque screwdriver tightened per UL and NEMA standards. This shall include all branch circuit, control circuit, feeder and service conductors for the entire project.

F. Splices and taps shall not be made in any conductor except at outlet boxes, pull boxes or junction boxes.

3.04 GROUNDING

A. The ground terminal on all convenience receptacles shall be bonded to the box and to the branch circuit grounding conductor with a bonding jumper to provide good continuity back to the source.

B. The service entrance switchboard ground bus shall be bonded to the building water service, building steel, UFER ground and ground rods with conductors sized per NEC table 250-94.

C. The electrical system shall be grounded in accordance with article 250 of the NEC. All conduit systems, cabinets, junction boxes, motor frames, electrically operated and/or controlled cooling/heating units, miscellaneous equipment, etc., shall be grounded by being connected to a common neutral grounding system.

D. Resistance between any point on the grounding electrode system and any object in the vicinity, including earth and floors, shall not exceed 25 ohms. Ground resistance measurements of all ground rods shall be made in normally dry weather, not less than 24 hours after rainfall. The contractor shall submit measured ground resistance to engineer.

3.05 DISCONNECT INSTALLATION/APPLICATION

A. For all single-phase motors 1 horsepower or less not requiring a starter, a manual motor starter switch with overloads shall suffice as the disconnect means. Where motor is furnished with integral overload protection, horsepower rated toggle switch may be used.

B. Where separate control voltages are used for control circuits within the motor controllers, the disconnect device shall disconnect simultaneously the control circuits together with the power circuits (see 430-74 NEC). The contractor shall be responsible for accomplishing this requirement.

C. Where a "twist-lock" disconnect is used for a motor or other load, the contractor shall be responsible for verifying that the equipment to be served has thermal (running) protection.

D. The contractor shall provide running protection in accordance with NEC when such protection is not supplied inherent with the equipment.

E. The contractor shall be responsible for mounting disconnect switches in locations providing clearance in front of switch in accordance with the NEC.

3.06 CIRCUIT BREAKER INSTALLATION/APPLICATION

A. Provide overcurrent protection for all wiring and equipment in accordance with required NEC, federal, state and local codes.

B. Should nameplate data disagree with the size or application of an overcurrent protective device shown on the drawings, bring it to the attention of the architect/engineer.

C. A label shall be placed inside each fused switch door. The label shall indicate the fuse type, ampere rating and interrupting rating. Manufacturer's labels are acceptable.

D. All breakers must clearly indicate their size, must clear panel doors and be mounted on frame allowing outward and inward adjustment. Depth of the panel shall also permit adjustment.

E. Each breaker shall be provided with a numerical designation strip.

F. All multipole breakers shall have common trip. Wires, pins, etc., between single-pole breakers to form common trip will not be acceptable.

G. In general, all 120-volt lighting and receptacle circuits shall be fed from 20-ampere single-pole breakers. Unless specifically called for, or NEC required, no breakers less than 20 amperes shall be allowed.

H. Where spaces are called for they shall be complete with bus links.

I. The use of "multi," "push-o-matic" or "quicklag" breakers shall not be permitted.

J. All breakers shall have the AIC ratings equal to or in excess of AIC rating of the panel or switchboard in which they are installed as shown in schedule on the drawings.

3.07 CONVENIENCE OUTLET AND SWITCH INSTALLATION

A. Standard convenience outlets shall be flush mounted 18 inches above finished floor to the center of the receptacle unless otherwise noted. Outlets above counters shall generally be mounted at 42 inches above the finished floor. Where doubt exists, contractor is responsible for verifying final mounting heights with owner's representative before installation.

B. Receptacles shall generally be mounted vertically in box, set plumb and true with the ground pin receiver in the top position. Grounding yoke shall be made electrically continuous to the outlet box. Grounding conductors shall be terminated to the grounding lug. All receptacles installed shall be installed with 6-inch pigtails so the device can be taken out of service without interrupting the circuit.

C. Switches shall be flush mounted 48 inches above finished floor unless otherwise noted. Where doubt exists about mounting location, the contractor is responsible for verifying requirements with owner's representative before installation.

3.08 TESTING

A. All tests shall be satisfactorily completed and accepted before final inspection or acceptance. Tests shall be bound with O&M manuals.

B. Insulation of feeder conductors shall be tested with a 1,000-volt megger at an ambient temperature of 60 degrees to 80 degrees f. Test each feeder conductor for a minimum acceptable reading of 100 meg ohms. Replace feeder conductors which do not meet the minimum reading or which differ appreciably from others.

C. The resistance to the grounding electrode shall be measured and recorded, and additional ground connections shall be made to bring resistance below 25 ohms.

-End of Section-

APPENDIX A

Mailbox Inventory

MAILBOXES

LOT #1

LOT #2

LOT#3

LOT#5

LOT#8

LOT#9

LOT#11

LOT#12

LOT#14

LOT#15

LOT#16

LOT#17

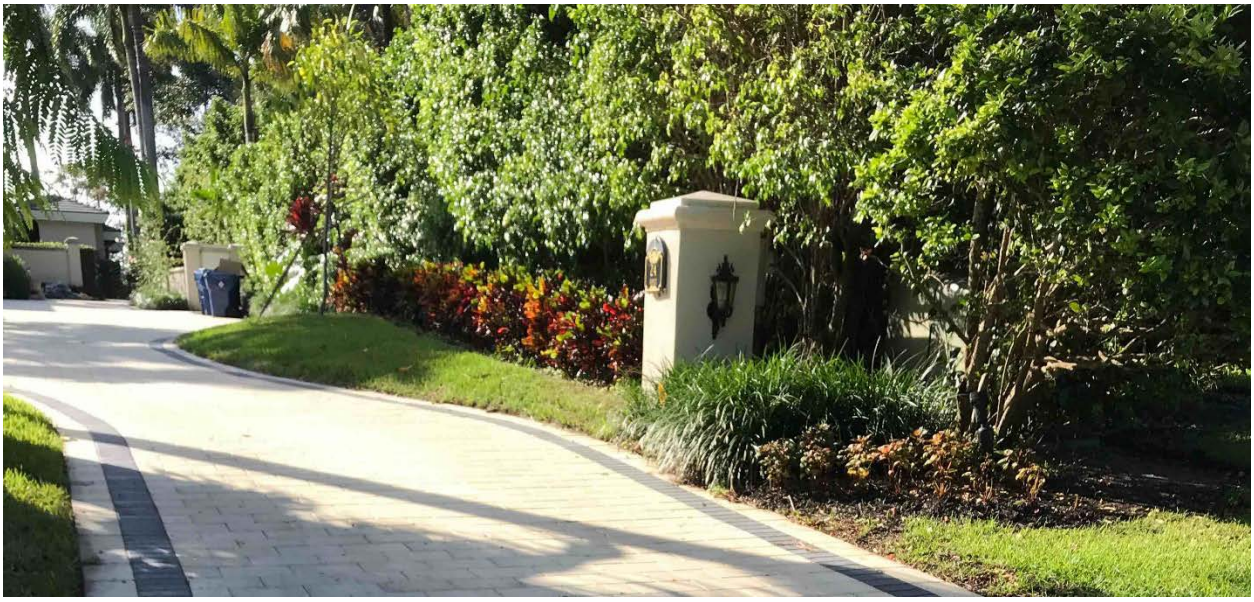
LOT#18

LOT#19

LOT#20 & LOT#21

LOT#22

LOT#24



LOT#25

LOT#26

LOT#27

LOT#28

LOT#29

LOT#30

LOT#30A

LOT#31 & LOT#32

LOT#33 & LOT#34

LOT#35

LOT#36

LOT#37

LOT#38

LOT#39

LOT#40

LOT#52(CLUBHOUSE)

APPENDIX B

Driveway Inventory

DRIVEWAYS

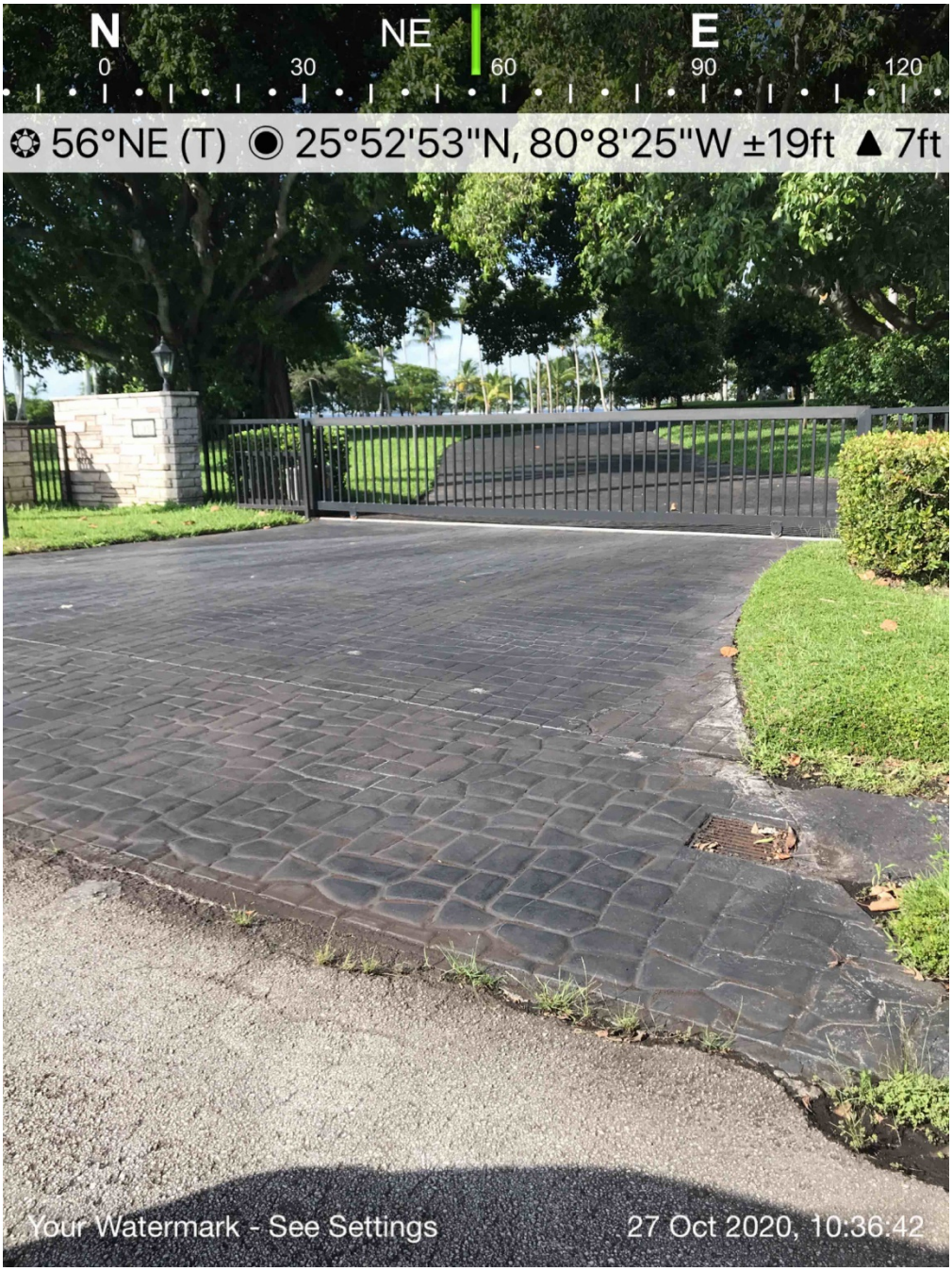
LOT#1

LOT#2

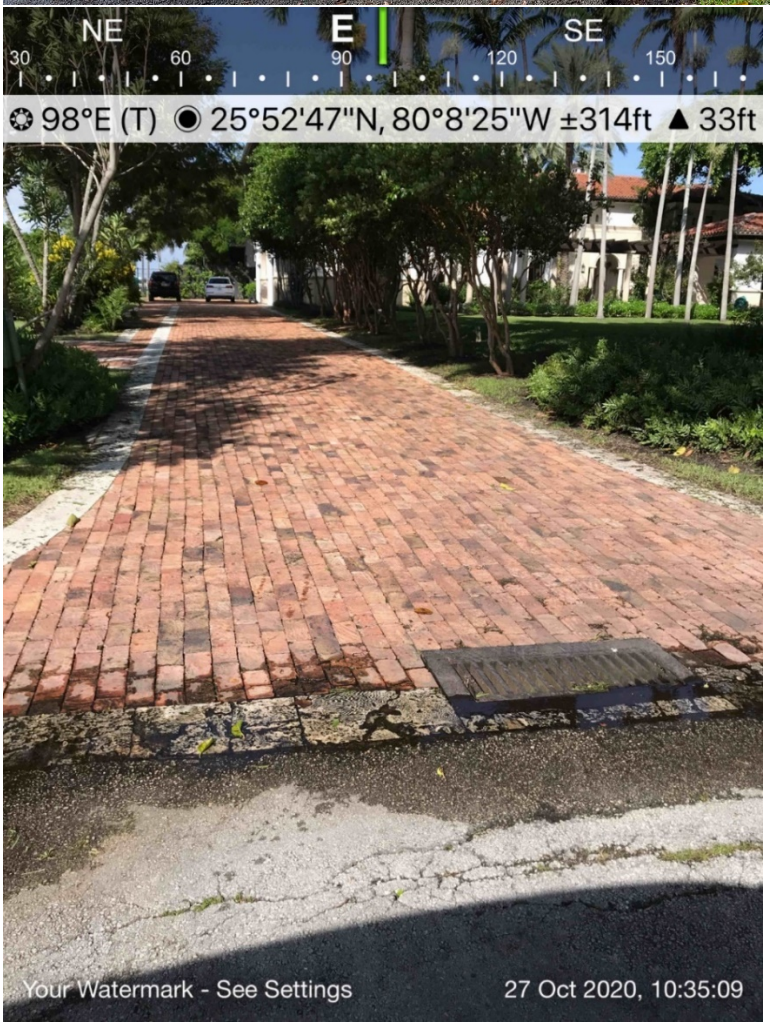
LOT#3


N
NE
E
0
30
60
90
120
61°NE (T) 25°52'58"N, 80°8'24"W ±104ft ▲7ft
Your Watermark - See Settings
27 Oct 2020, 10:37:38

LOT#5


N
NE
E
0
30
60
90
120
56°NE (T)
25°52'53"N, 80°8'25"W ±19ft
7ft
Your Watermark - See Settings
27 Oct 2020, 10:36:42

LOT#8 (2)


NE
E
SE
30
60
90
120
150
98°E (T)
25°52'47"N, 80°8'25"W ±314ft
33ft
Your Watermark - See Settings
27 Oct 2020, 10:35:09

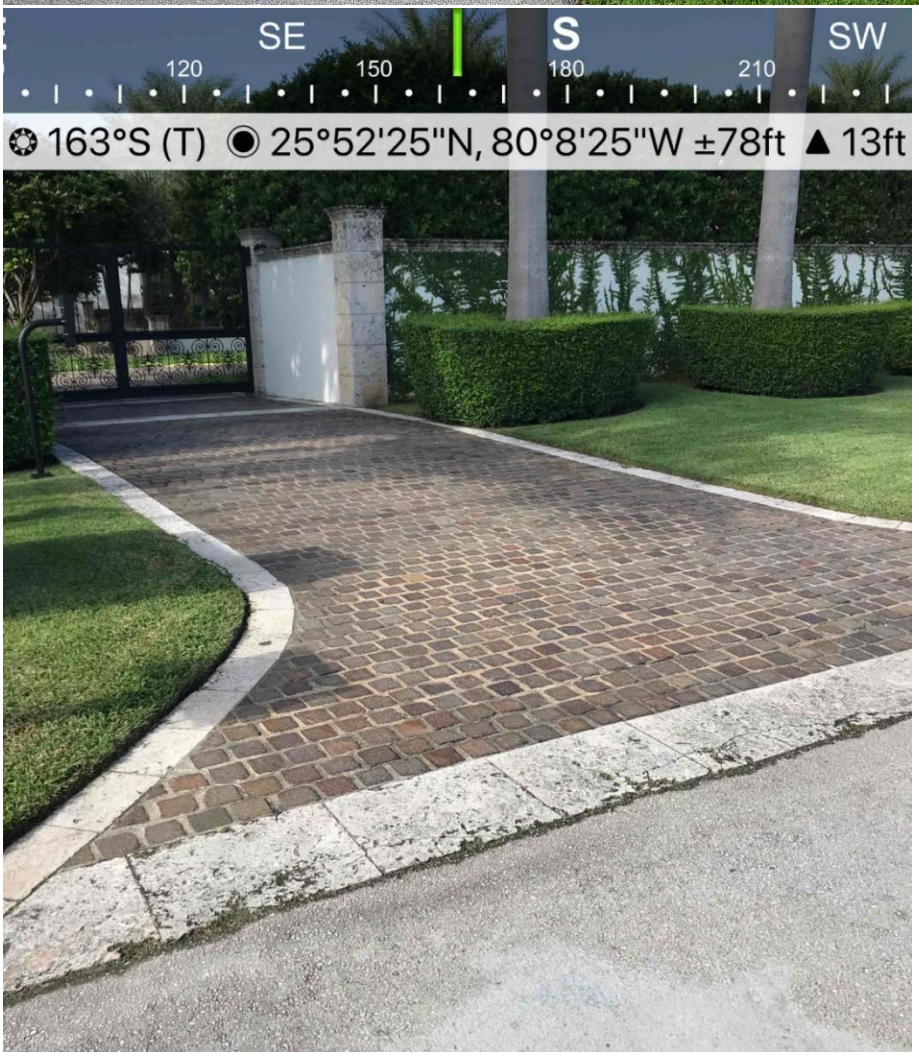
LOT#11(2)


SW
W
NW
210
240
270
300
254°W (T)
25°52'44"N, 80°8'27"W ±26ft
10ft
Your Watermark - See Settings
27 Oct 2020, 10:33:00

LOT#12 (3)

LOT#14(2)

LOT#15(2)



LOT#16


E
SE
S
60
90
120
150
180
127°SE (T)
25°52'25"N, 80°8'26"W ±52ft
11ft
Your Watermark - See Settings
27 Oct 2020, 10:17:40

LOT#17


SE
S
SW
120
150
180
210
240
188°S (T)
25°52'24"N, 80°8'23"W ±78ft
18ft
Your Watermark - See Settings
27 Oct 2020, 10:16:47

LOT#18


SE
S
SW
120
150
180
210
240
177°S (T)
25°52'24"N, 80°8'22"W ±26ft
10ft
Your Watermark - See Settings
27 Oct 2020, 10:16:10

LOT#19(3)


SE
S
SW
120
150
180
210
163°S (T)
25°52'24"N, 80°8'21"W ±209ft
18ft
Your Watermark - See Settings
27 Oct 2020 10:15:20

LOT#20 & LOT#21 (3)

LOT#22

LOT#23

LOT#24(2)

LOT#25(2)

LOT#26

LOT#27(2)

LOT#28(2)

LOT#29


N
NE
E
SE
0
30
60
90
120
70°E (T)
25°52'31"N, 80°8'2"W ±39ft
7ft
29
Your Watermark - See Settings
27 Oct 2020, 09:43:16

LOT#30 (2)

LOT#30A (2)

LOT#31 & LOT#32 (2)

LOT#33 & LOT#34 (3)

LOT#35


West Elevation
75°E (T) 25°52'39"N, 80°7'56"W ±19ft 8ft
27 Oct 2020, 09:21:00

LOT#36

LOT#37

LOT#38

LOT#39 (2)

LOT#40

LOT#41

APPENDIX C

Maintenance of Traffic Requirements

MAINTENANCE OF TRAFFIC CRITERIA

1. BRIDGE WEIGHT LIMITS OF 16 TONS WILL BE STRICTLY ENFORCED. MONITORED ACCESS FROM THE MAINLAND IS PROVIDED BY THE VILLAGE POLICE DEPARTMENT AT ENTRY GATE CONTROL. **ALL LARGE VECHICLES ATTEMPTING A BRIDGE CROSSING WILL BE REQUIRED TO PRESENT A TARE CERTIFICATE OR OTHER CERTIFIED WEIGHT DOCUMENT PRIOR TO BEING GRANTED ACCESS.** THE CONTRACTOR MUST PROVIDE METHODS TO SECURE VEHICLES LEAVING THE ISLAND SIDE FROM EXCEEDING THIS LIMIT, PORTABLE SCALES, FLAGGERS, TRAFFIC CONTROL DEVICES, ETC. ARE EXAMPLES OF PROCEDURES CONTRACTOR MAY UTILIZE. PRIOR TO START OF CONSTRUCTION A DETAILED PLAN ON CONFORMANCE MUST BE SUBMITTED TO VILLAGE REPRESENTTIVES FOR APPROVAL.

2. IN THE EVENT THAT A POLICE DETAIL IS REQUIRED DURING THE PROJECT TO ASSIST IN A UNIQUE CONSTRUCTION ACTIVITY THAT MAY IMPACT TRAFFIC BEYOND THE NORMAL DAILY WORK, THE CONTRACTOR WILL BE REQUIRED TO DETERMINE NEED AND SCHEDULING OF SAME. A MINIMUM 48 HOUR NOTICE MUST BE PROVIDED TO THE VILLAGE POLICE DEPARTMENT. CONTRACTOR WILL BE RESPONSIBLE FOR COSTS ASSOCIATED WITH SAID DETAILS, AN ALLOWANCE IS PROVIDED IN THE BID DOCUMENT FOR THIS PURPOSE.

3. TRAFFIC CONTROLS SHALL BE IN ACCORDANCE AND COORDINATED WITH THE PROJECT PLANS WHICH DELINEATE THE SCOPE OF ANTICIPATED ROADWAY DISRUPTION.

4. THE CONTRACTOR SHALL DEVELOP MAINTENANCE OF TRAFFIC PLAN OF THEIR OWN, WHICH MUST MEET WITH THE REQUIREMENTS SPECIFIED HEREIN. THE CONTRACTOR'S MAINTENANCE OF TRAFFIC PLANS SHALL BE SUBMITTED TO THE VILLAGE REPRESENTATIVES PRIOR TO IMPLEMENTATION OF SAME AND NO LESS THAN 14 DAYS PRIOR TO COMMENCEMENT OF CONSTRUCTION FOR REVIEW AND APPROVAL. THE PROPOSED MOT WILL TAKE INTO ACCOUNT THE WORK ANTICIPATED WILL BE CONFINED TO LIMITED AREAS WHICH WILL REACH SUBSTANTIAL COMPLETION PRIOR TO INITIATING WORK IN A NEW AREA,

5. IN THE EVENT ANY TEMPORARY PAVEMENT IS REQUIRED TO PROPERLY EXECUTE THE PROJECT SCOPE OF WORK THE PAVEMENT SHALL CONSIST OF A MINIMUM OF 6 INCH LIMEROCK BASE, PRIME COAT AND 11/2" OF ASPHALTIC MATERIAL. THE BASE LAVER SHALL BE PLACED OVER A FIRM, UNYIELDING, WELL-COMPACTED SUBGRADE. COST OF CONSTRUCTION AND REMOVAL OF ANY TEMPORARY PAVEMENT DEEMED NECESSARY SHALL BE THE RESPONIBILITY OF THE CONTRACTOR INCLUDED IN HIS CONTRACT SUM.

6. AT THE DISCRETION OF THE VILLAGE REPRESENTATIVES, IF A LANE CLOSURE CAUSES EXTENDED CONGESTION OR DELAY, THE CONTRACTOR SHALL BE DIRECTED TO REASSESS THE CLOSED LANE AND IMPLEMENT ALTERNATE PROCEDURES UNTIL SUCH TIME THAT TRAFFIC FLOW HAS RETURNED TO AN ACCEPTABLE LEVEL.

7. THE TRAFFIC AND TRAVEL WAYS SHALL NOT BE ALTERED BY THE CONTRACTOR TO CREATE A WORK ZONE UNTIL ALL LABOR AND MATERIAL ARE AVAILABLE FOR THE CONSTRUCTION IN THAT AREA.

8. REGULATORY SPEED ESTABLISHED WITHIN THE WORK ZONE TRAVEL WAYS SHALL BE 10 M.P.H. REDUCED SPEED AND REGULATORY SPEED SIGNS SHALL BE INSTALLED ON SEPARATE POSTS WITHIN THE CONSTRUCTION WORK ZONE

9. CONTRACTOR SHALL MAINTAIN ACCESS TO PRIVATE RESIDENTIAL AND THE COUNTRY CLUB PROPERTY DURING All PHASES OF CONSTRUCTION. TRENCH EXCAVATIONS CROSSING ACCESS TO RESIDENCES MUST BE ACCOMPLISHED IN MULTIPLE PHASES AFFORDING ACCESS WITHOUT UNDUE DELAY. USE OF STEEL PLATES IS ACCEPTABLE.

10. THE CONTRACTOR SHALL PROMPLY REMOVE WORK ZONE SIGNS WHEN CONDITIONS NO LONGER WARRANT THEIR USE.

11. THE CONTRACTOR SHALL NOT PROPOSE ANY ALTERNATIVE TRAFFIC CONTROL PLAN THAT REDUCES THE NUMBER OF TRAVEL LANES SHOWN ON THE CONTRACT TRAFFIC CONTROL PLANS.

12. DURING ASPHALT CONSTRUCTION OPERATIONS. NO MORE THAN 1-¼" DROP-OFF BETWEEN ADJACENT TRAVEL LANES OR AT TRANSVERSE JOINTS SHALL BE ALLOWED WHEN LANES ARE OPEN TO TRAFFIC. WHERE DROP OFF CONDITIONS EXIST, THE SIGNING FOR UNEVEN PAVEMENT SHALL BE INSTALLED FOR THE DURATION OF THE CONDITION.

13. THE CONTRACTOR IS TO PLACE TEMPORARY OR REMOVABLE PAVEMENT MARKINGS BETWEEN EACH LAVER OF PAVEMENT, AND IS RESPONSIBLE FOR THE TEMPORARY RELOCATION OF STOP BARS & STOP SIGNS AS APPLICABLE. PAVEMENT MARKINGS AND BARRICADES PLACEMENT SHALL BE APPROPRIATELY COORDINATED.

14. CONTRACTOR SHALL PROVIDE A PATH TO ALLOW SAFE PEDESTRIAN PASSAGE AROUND THE WORK ZONE(S) AT ALL TIMES.

15. DURING TIMES OF ACTUAL WORK ACTIVITIES FLAGGERS WILL BE REQUIRED AT BOTH EXTREMES OF THE CONSTRUCTION AREA WHERE ONE LANE TRAFFIC EXISTS IN CONSTANT VISUAL OR RADIO COMMUNICATIONS TO PREVENT HEAD ON CONFLICTS. MONITORING OF INTERMEDIATE TRAFFIC INSERTION IS ALSO REQUIRED. THE CONTRACTOR SHALL MAINTAIN AUTOMATED TEMPORARY SIGNALIZATION TO CONTROL SINGLE LANE TRAFFIC DURING NON-CONSTRUCTION PERIODS. AUTOMATED TRAFFIC SIGNALS WILL BE PROVIDED WITH UNINTERUPTABLE POWER SOURCE.

16. TRAFFIC SHALL BE MAINTAINED ON A PAVED, DUST-FREE SURFACE AT ALL TIMES. ALL LANES TEMPORARY OR PERMANENT MUST BE MAINTAINED WITH A 10' MINIMUM WIDTH.

17. CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE EROSION CONTROL MEASURES TO PREVENT CLOGGING OF DRAINAGE STRUCTURES AND SEDIMENT INTRUSION ON WATERWAYS DURING CONSTRUCTION. THESE MEASURES SHALL BE APPROVED BY THE VILLAGE'S REPRESENTATIVES AND CONFORM WITH CURRENT APPLICABLE ENVIRONMENTAL CODES.

18. CONTRACTOR MUST MAINTAIN DRAINAGE AT ALL TIMES. THE EXISTING DRAINAGE SYSTEM SHALL BE KEPT OPERATIONAL OR TEMPORARY DRAINAGE PROVIDED WHILE THE PROPOSED DRAINAGE SYSTEM IS BEING CONSTRUCTED.

19. AT THE END OF EACH WORK DAY OR WHENEVER THE WORK ZONE BECOMES INACTIVE, ANY DROP OFF GREATER THAN 6 INCHES (150 MM) ADJACENT TO THE PEDESTRIAN, BICYCLE, AND WHEELCHAIR TRAVEL

PATHS SHALL BE BACKFILLED FLUSH WITH SAND PATHS OR PROTECTED WITH TEMPORARY FENCE, CONCRETE BARRIER WALL OR APPROVED HANDRAIL.

20. THE CONTRACTOR SHALL FURNISH AND MAINTAIN VARIABLE MESSAGE SIGNS AS DIRECTED BY THE VILLAGE REPRESENTATIVES FOR THE DURATION OF THE CONTRACT. MESSAGES FOR THE VMS SHALL BE AS DIRECTED BY THE VILLAGE. THE VMS SHALL BE IN PLACE ONE WEEK BEFORE THE START OF ANY WORK ITEMS AFFECTING THE EXISTING VEHICULAR AND PEDESTRIAN TRAFFIC.

APPENDIX D

Signage Details

www.pelcoinc.com
EDMOND, OK 73013
405-340-3434
FAX: 405-340-3435

ASSEMBLY SHEET

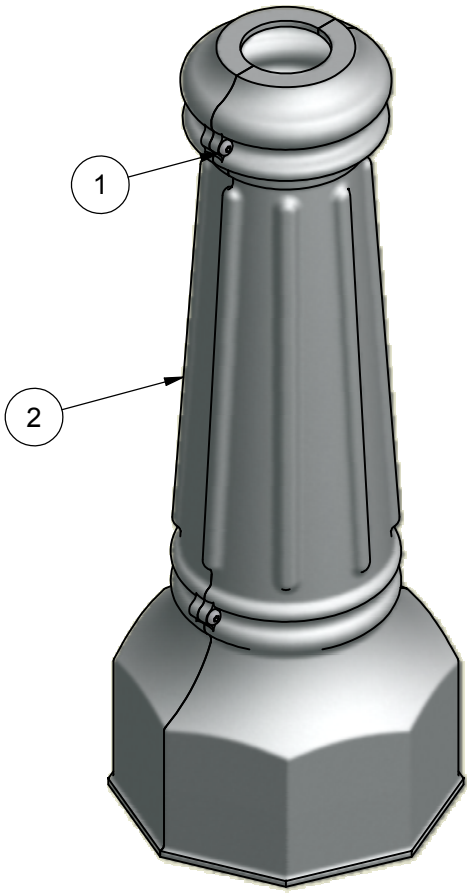
REF:

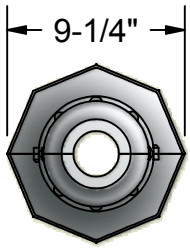
TITLE: Base Assy, Old Towne I, 24" High, 2-3/8" OD Pole, Alum, Textured Black

PART NO.: AP-0801

Part No.
AP-0801-2.38-P59

Top I.D.
Process No Color





Options
Top of Base I.D.
2-3/8" Dia. Min
3-1/2" Dia. Max
Paint

Note:
Bottom of Base I.D.: 7-1/2"Ø Max

ITEM	PART NUMBER	DESCRIPTION	QTY
1	FS-2091-SS	Capscrew, Soc Button Hd, 1/4"-20 x 5/8" , Type 304 Stainless	4
2	AP-8001	Base Half, Ornamental for 2-1/2" Pole, 319 Alum	2

PELCO PRODUCTS, INC.
www.pelcoinc.com
EDMOND, OK 73013
405-340-3434
FAX: 405-340-3435

ASSEMBLY SHEET

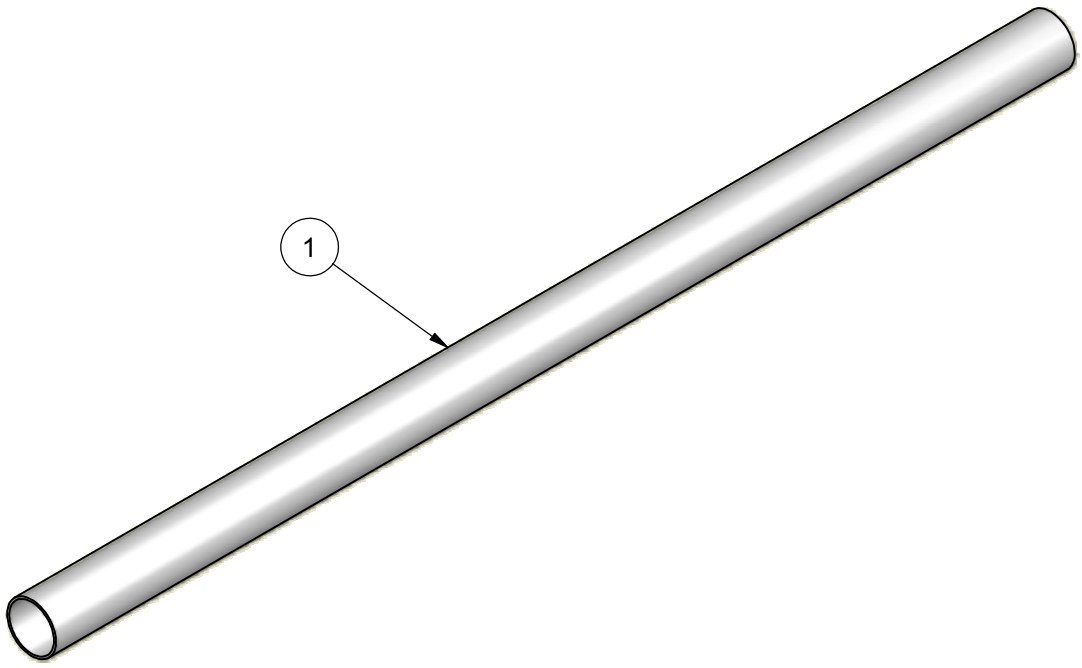
REF:

TITLE: Pipe, 2-1/2" Sch 10 x Length, Steel

PART NO.: AP-2072

PART NO
AP-2072-L-PNC

Length
Process No Color=PNC
Paint=PXX



OPTIONS
Length:
5', 5-1/2', 10', 11', 13', 14'
Paint
Powdercoat Over Galv

ITEM	PART NUMBER	DESCRIPTION	QTY
1	AP-2072-L-PXX	Pipe, 2-1/2" Sch 10 x Length, Steel	1

DRAWN: L ACORD DATE: 3/5/2004	CHK'D: R WOODS DATE: 10/8/2008	REV: C-02/20/10 CM	REV CHK'D: TC DATE: 2/20/2010	SHEET 1 OF 1

PELCO PRODUCTS, INC.
www.pelcoinc.com
EDMOND, OK 73013
405-340-3434
FAX: 405-340-3435

ASSEMBLY SHEET

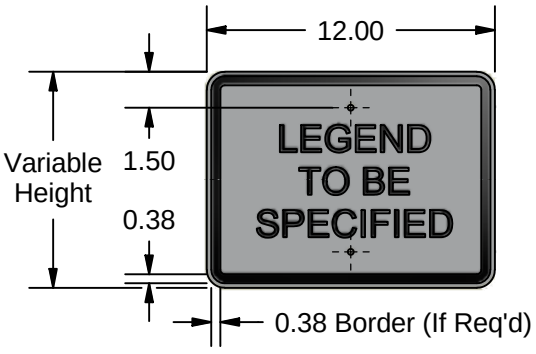
REF:

TITLE: Sign, 12"W x Height, White Reflective Legend, Alum

PART NO.: SF-5031

PART NO
SF-5031-09-PXX

Height
Paint



OPTIONS
Height: 9", 12", or 18"
Paint

Note: Specify Legend Required

ITEM	PART NUMBER	DESCRIPTION	QTY
1	SF-6012-L	Sign Blank, .100 x 12 x Height, Alum	1
2	SF-3008	Vinyl, Reflective Engineer Grade, PSA, White (Specify In Square Inches)	1

DRAWN: L Acord DATE: 2/4/2003	CHK'D: KAK DATE: 8/27/2012	REV: C 08/21/12 CJ	REV CHK'D: KAK DATE: 8/27/2012	SHEET 1 OF 1

PELCO PRODUCTS, INC.
www.pelcoinc.com
EDMOND, OK 73013
405-340-3434
FAX: 405-340-3435

ASSEMBLY SHEET

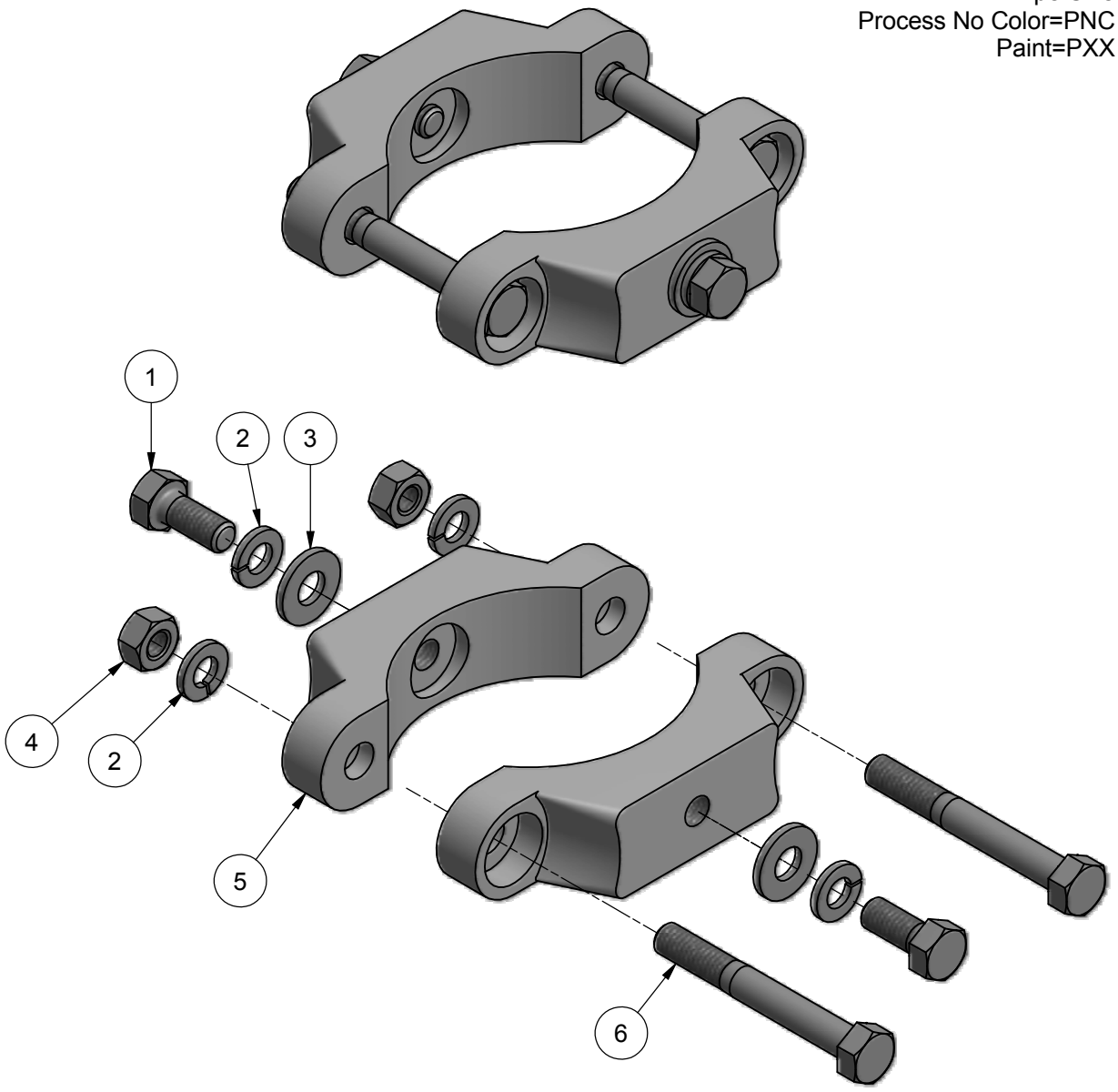
REF:

TITLE: Sign Clamp, Double, 2-1/2" (2-7/8" OD) Pipe, Set of 2, Alum

PART NO.: SH-0203-2.5

PART NO
SH-0203-2.5-PNC

Pipe Size
Process No Color=PNC
Paint=PXX



OPTION
Paint

ITEM	PART NUMBER	DESCRIPTION	QTY
1	FS-2031-SS	Bolt, Hex Hd, 5/16"-18 x 3/4", Type 304 Stainless	4
2	FS-4201-SS	Lock Washer, Split, 5/16", Type 304 Stainless	8
3	FS-4105-SS	Washer, Flat, 5/16", .343" ID x .687" OD x .051/.080" Thk, Type 304 Stainless	4
4	FS-1001-SS	Nut, Hex 5/16"-18, Type 304 Stainless	4
5	SH-2003-M1	Sign Clamp, U-Bolt, 2-1/2" (2-7/8" OD) Pipe, Set of 2, Alum	4
6	FS-2162-SS	Bolt, Hex Hd, 5/16"-18 x 2-1/2", Type 304 Stainless	4

DRAWN: Christina.Madden	DATE: 8/12/2010	CHK'D: GWA	DATE: 8/18/2010	REV:	REV CHK'D:	DATE:	SHEET 1 OF 1

PELCO PRODUCTS, INC.
PH: 405-340-3434
FAX: 405-340-3435
Edmond, OK 73013
www.pelcoinc.com

ASSEMBLY SHEET

REF:

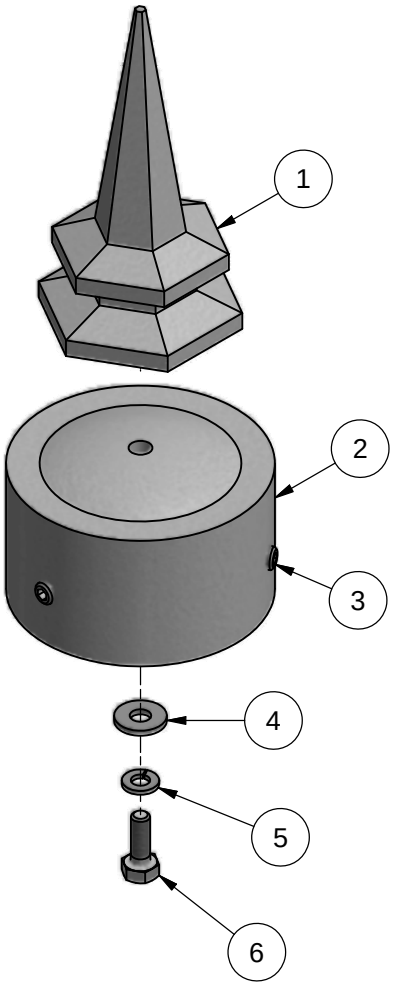
TITLE: Post Cap Assy, for 2-1/2" (2-7/8 OD) Pole, Alum

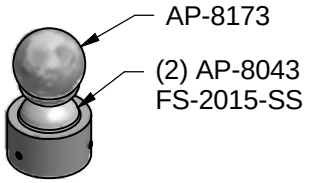
PART NO.: SH-1828

PART NO
SH-1828-BLXX-PXX

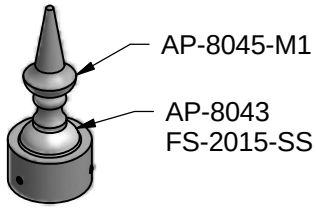
Finial/Color

Paint

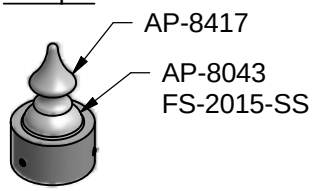




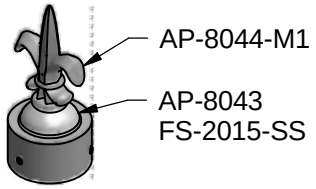
3" Ball



Steeple



Spear



Fleur

OPTIONS
Finial: SI=Spire BL=3" Ball ST=Steeple FL=Fleur SE=Spear
Paint

Note: Replaced provided zinc hardware with stainless steel hardware.

ITEM	PART NUMBER	DESCRIPTION	QTY
1	AP-8007-M1-PXX	Finial, Spire, Ornamental Street Light, Alum	1
2	SH-1616-M2	Cap, Closure 2-1/2" (Fits 2-7/8"OD Pole), w/ Set Screws & 5/16" Hole, Alum	1
3	FS-3224-SS	Set Screw, Soc Hd, 5/16"-18 x 3/8", Type 304 Stainless	3
4	FS-4102-SS	Washer, Flat, 1/4", .281" ID x.688" OD x .050" Thk, 18-8 Stainless	1
5	FS-4208-SS	Lock Washer, Split, 1/4", Type 304 Stainless	1
6	FS-2020-SS	Bolt, Hex Hd, 1/4"-20 x 3/4", Type 304 Stainless	1

LCA DRAWN:	8/17/1999 DATE:	KBM CHECKED:	3/28/2005 DATE:	JDC MFG ENG:	12/8/2014 DATE:	SJP QA:	12/8/2014 DATE:	I REV:	11/20/14 CBJ DATE:	JDC REV CHK'D:	12/8/2014 DATE:	SHEET 1 OF 1

PelcoVertical.idw 12/16/2013

APPENDIX E

Lighting Details

SWB Estate Fixture

CONSTRUCTION:
All structural components including hood and finial to be of high-strength cast aluminum. Polycarbonate panels, hood and base shall surround and create a weather tight chamber for the internal components and optical assembly.

DIMENSIONS: (h x octagon)
(33" x 18")

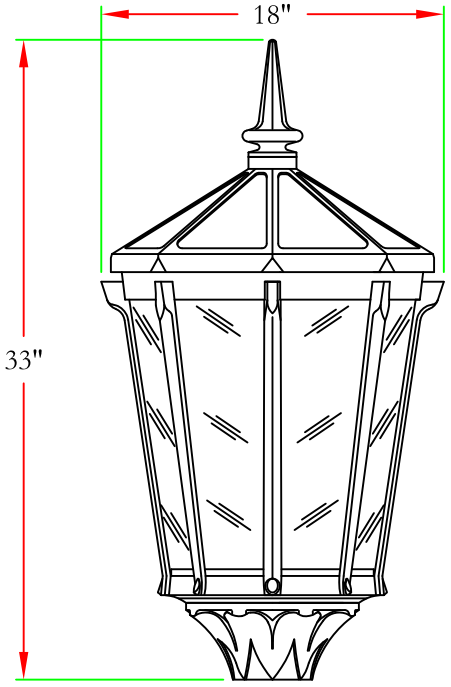
WEIGHT: (approximate)
40 pounds

OPTICAL:
LED module with optic may create symmetrical and asymmetrical light distributions.

ELECTRICAL:
Meets U.L. 1598 and 8750 standards for safety. Driver shall provide constant current. The system includes surge protection per IEEE/ANSI C62.41.2. Luminaire shall be grounded.

FINISH:
All components shall be finished with high gloss Super Durable polyester powder coat paint to be applied utilizing a multi-stage process that includes phosphate pretreatment, electrostatic powder application, and convection curing. Color to be specified.

MOUNTING:
Mounts to a Ø3" by 3" tall tenon. (3) 3/8"-16 UNC stainless steel allen head cup point set screws secure luminaire to post top tenon. All mounting hardware shall be stainless steel.



Catalog #:
SWB-NS-NB-IC-LEDV29B-1.05A-827-KHT2-SMS
Color: BLACK

VOLTAGE
■-120-277V (Standard, not available with BPC)
❑-120V
❑-208-277V

OPTIONS:

Light Distribution:
❑-KHT5 Type V
❑-KHT4 Type IV
❑-KHT3 Type III
■-KHT2 Type II

❑-BPC Photocell (Button Type)
(Advise Voltage)
❑-TLR Twistlock Photocell
receptacle (Replaces finial)

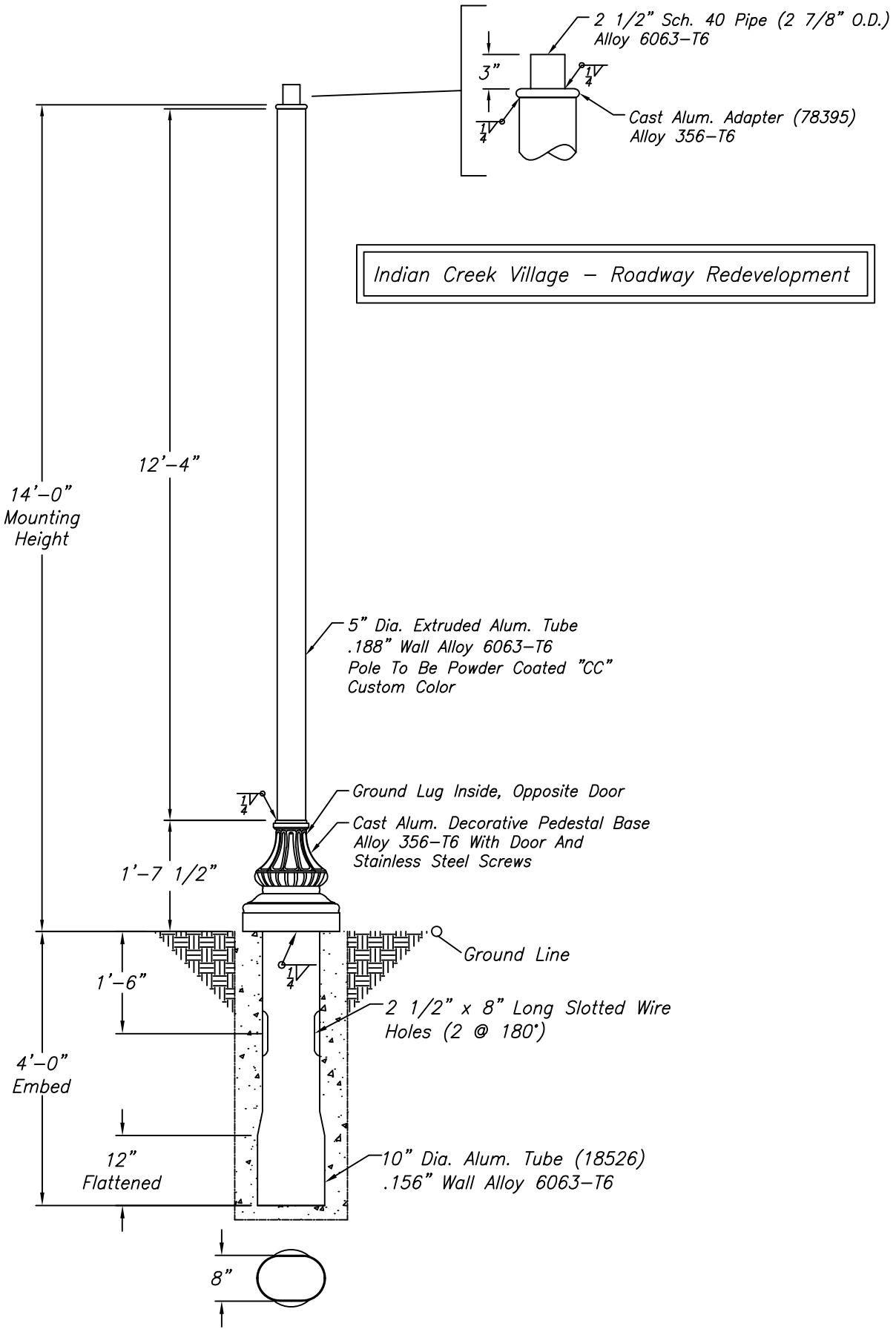
Luminaire Wattage:
■-LEDV29B-1.05A 1050mA, 58 Watt
❑-LEDV29B-0.7A 700mA, 38 Watt
❑-LEDV18C-0.7A 700mA, 26 Watt

CRI, CCT:
■-827 80CRI, 2700K CCT
❑-830 80CRI, 3000K CCT
❑-835 80CRI, 3500K CCT
❑-840 80CRI, 4000K CCT

Sentry Electric LLC
185 Buffalo Avenue, Freeport, New York 11520
Tel 516-379-4660 Fax 516-378-0624
www.sentrylighting.com E-mail: info@sentrylighting.com

Indian Creek Village, FL

DATE	11-11-2020			
DRAWN	L.A.	SCALE 1=10	DWG NO. 20-241-S1848-C108	REV
ENGINEER	S. KAY	SHEET 1 OF 1		



B32587X

WARNING: DO NOT INSTALL LIGHTING POLES WITHOUT LUMINAIRES

NO.	REVISIONS	DATE

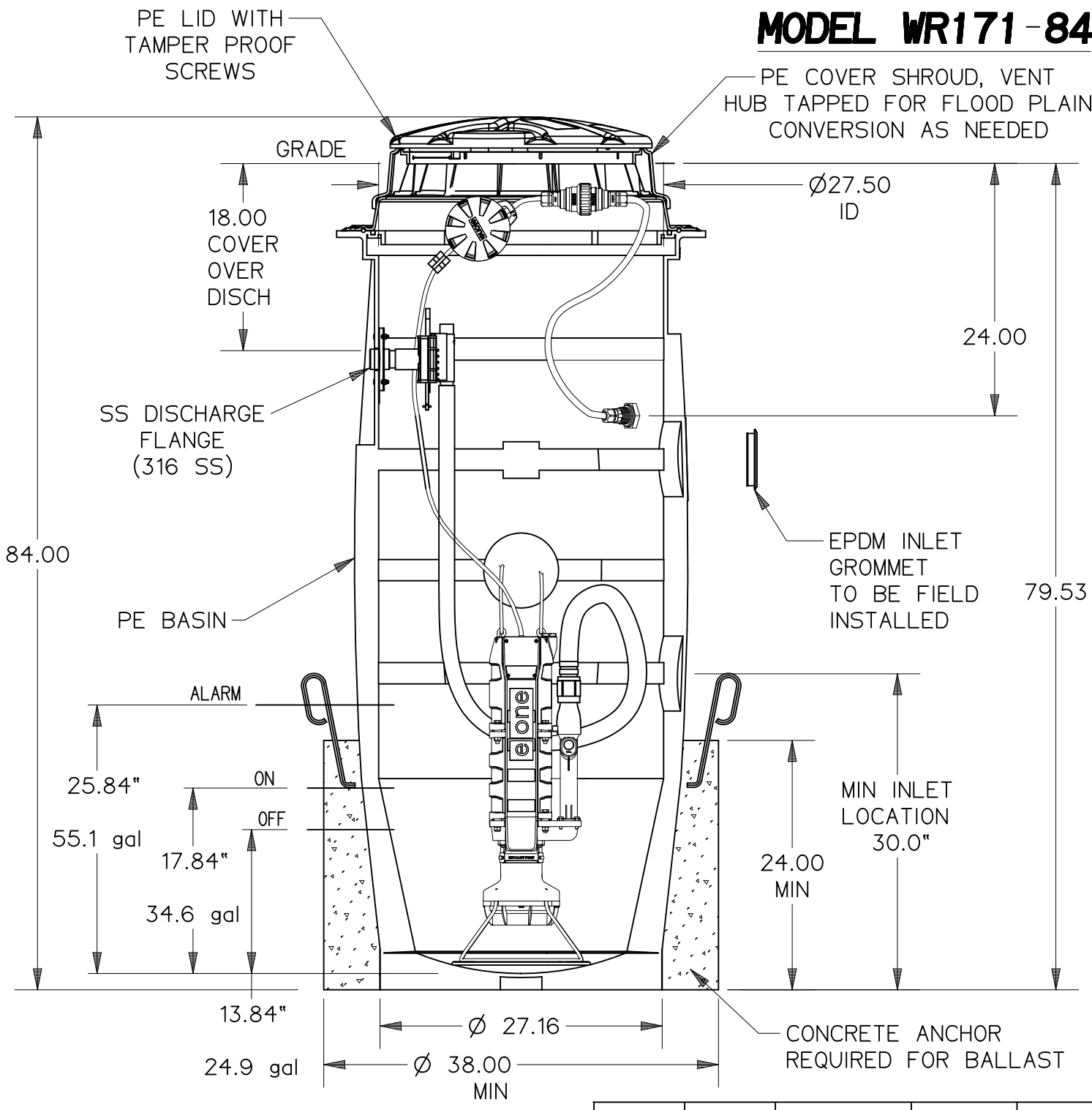
hapco
Abingdon, Va.

TITLE ARLEN SERIES LIGHT POLE	
CUSTOMER	
SCALE 16	DATE 05/30/2019
BY DJY	DWG. NO.
CHK'D	SKJYOPP43950B-014

APPENDIX F

Sewer Details

MODEL WR171-84



BALLAST SHOWN IS TO BE PRE-CAST
WITH LIFTING HOOKS (SPECIFIED BY OTHERS)

INTERNAL STATION VOLUME - 191 GAL
TANK ASSEMBLY WEIGHT - 165 LBS
NET BOUYANT FORCE - 1576 LBS
BALLAST AS SHOWN:
788 LBS (CONCRETE) + 1008 LBS (SOIL) = 1796 LBS
CONCRETE VOLUME (AS SHOWN) - 9.0 CU FT (.33 CU YD)

SGS		08/02/17	11	N/A
DR BY	CHK'D	DATE	ISSUE	SCALE

SEWER SYSTEMS

MODEL WR171-84

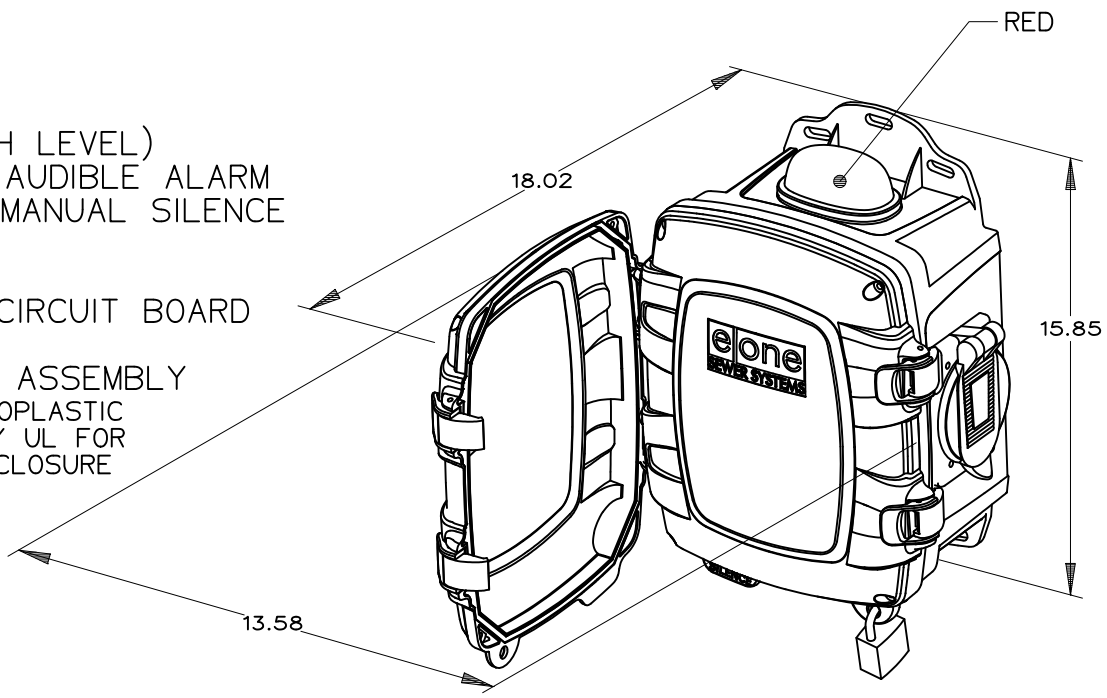
ESD 11-0174

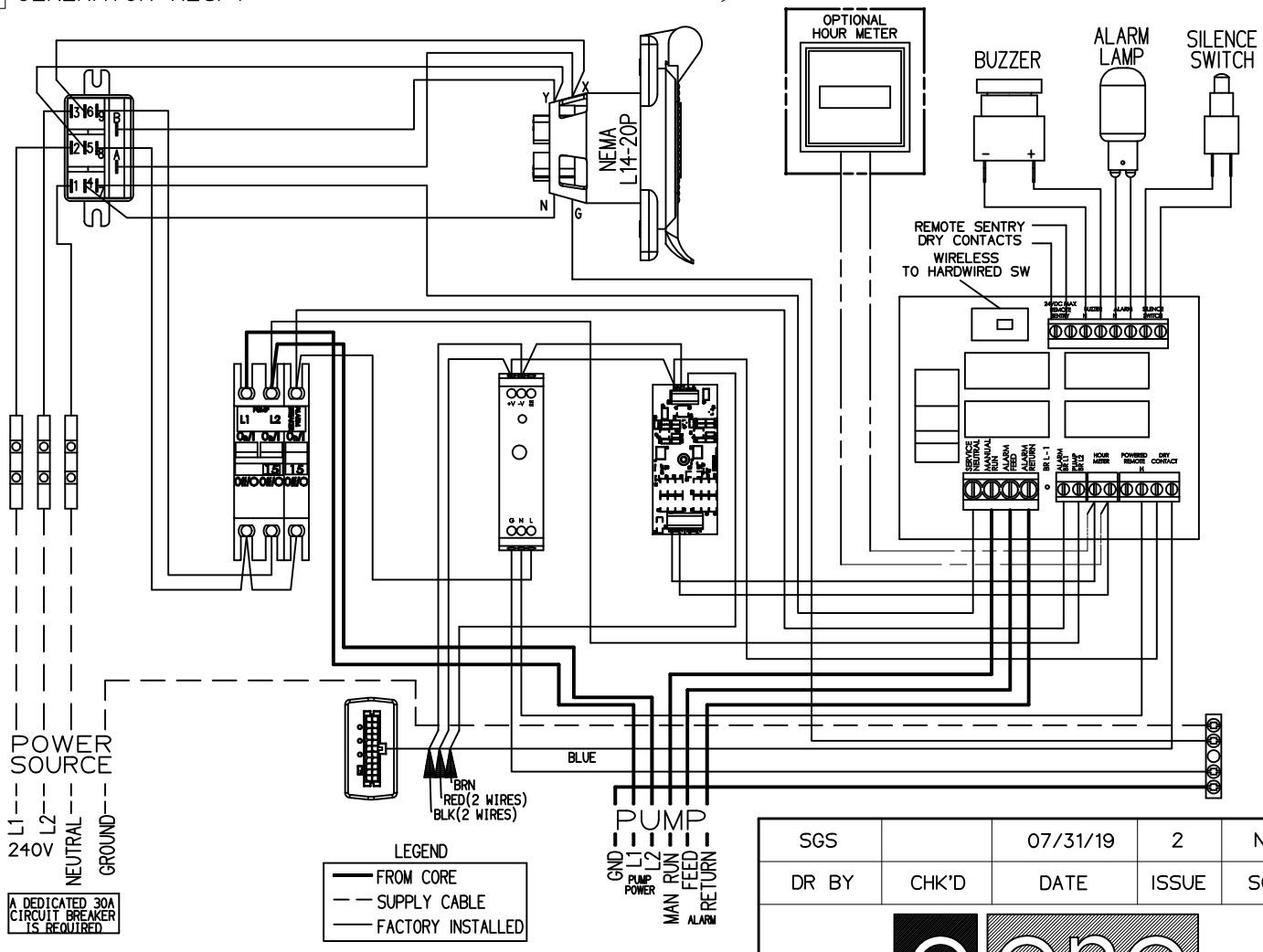
SIMPLEX SENTRY

REDUNDANT RUN (HIGH LEVEL)
EXTERNAL VISUAL & AUDIBLE ALARM
EXTERNAL LATCHING MANUAL SILENCE
MANUAL RUN
PUMP RUN INDICATOR
CONFORMAL COATED CIRCUIT BOARD
PADLOCK
NEMA 4X ENCLOSURE ASSEMBLY
CORROSION PROOF THERMOPLASTIC POLYESTER APPROVED BY UL FOR ELECTRICAL CONTROL ENCLOSURE

OPTIONS:

- [x] ALARM CONTACTS
- [x] SENTRY ADVISOR
- [x] GENERATOR RECPT





PIN	FUNCTION	2000S	EXTREME
1	MANUAL RUN	RED	BROWN
2	L1	BLACK	RED
3	L2	WHITE	BLACK
4	GND	GREEN	GRN/YEL
5	ALARM FEED	ORANGE	YELLOW
6	ALARM RETURN	BLUE	BLUE

CONTROL CABLE:
TYPE TC: DIRECT BURIAL, 12AWG, SIX CONDUCTOR

UPC® ASME A112.3.4

LR28268 LISTED 506D

SGS		07/31/19	2	N/A
DR BY	CHK'D	DATE	ISSUE	SCALE

e/one SEWER SYSTEMS

SIMPLEX SENTRY, 240V 60Hz. W/GEN RECEPTACLE & ADVISOR

ESD 15-0094

E/ONE EXTREME SERIES

E/One Sentry Advisor

E/One Sentry Advisor offers a new level of sewer system monitoring and protection — and can even predict service needs.

Your time is valuable and resources are limited. Let E/One Sentry Advisor monitor your system and help reduce the number of emergency service call-outs and eliminate unnecessary overtime.

E/One Sentry Advisor monitors pump performance and records every start, run time duration and stop of each grinder pump on the system. Alarm conditions can be sent automatically to service personnel.

The online mapping feature shows the location of each grinder pump in the system, whether there are a few stations or hundreds.

Use reports to review system performance and spot data trends such as frequent alarms or unusually long run times.

Monitor and protect your sewer system with E/One Sentry Advisor

The modem in the alarm panel transmits pump run and alarm data. The web interface can be configured to send alarm notices via SMS text, phone or e-mail to multiple contacts. Data is stored online and can be used to generate system performance reports and help identify pending service needs.

e/one SEWER SYSTEMS

E/One Sentry Advisor

DESCRIPTION

The E/One Sentry Advisor is a remote monitoring system for E/One grinder pumps. Available for new and existing alarm panels, both 2000 Series and Extreme Series grinder pumps.

FEATURES AND BENEFITS

- Eliminate unnecessary call-outs and overtime
- Unlimited data collection — data is stored online and can be reported for the life of the Sentry Advisor system
- Monitor pump run times, generate reports and help identify potential service needs or trouble areas
- Monitors flow per day per home — identify sources of high flow into the grinder pump station due to infiltration
- Automatic alarm notifications via phone, SMS text or email
- Map the location of each grinder pump in the system
- Back-up battery for power loss notification

STANDARD PACKAGE FEATURES

- Includes all necessary components and wiring — cellular modem, antenna, auxiliary power supply, and dry contacts for both high level alarm and pump running.
- High level alarm
- Run time history (daily, cumulative, last run, minimum/maximum/average)
- Cycle history (daily and cumulative)
- Extended run time alerts (cycle, daily, etc.)
- Generate pump run and/or alarm event reports

OPTIONAL FEATURES (for Protect Plus Alarm Panels Only)

- Brownout and over-voltage alerts
- Run dry and over-pressure alerts
- Volts, amps, watts historical information
- Volts, amps, watts related alerts
- Detailed system status
- Visibility or system settings and user defined options
- Board-level fault indications (DIP switch, watt meter, alarm circuit protection)
- Seal leak detect notification (wireless pumps only)

Monitor each grinder pump station online at www.eonesentryadvisor.com

Current day's information

Pump history data chart

Events log details pump starts and stops

Environment One Corporation
2773 Balltown Road, Niskayuna, New York 12309
Voice 518.346.6161 Fax 518.346.6188
www.eone.com A Precision Castparts Company

E/ONE EXTREME SERIES

Uni-Lateral — Stainless Steel Lateral Valve

Introducing the Uni-Lateral from E/One, an all-stainless steel lateral valve for use with E/One grinder pump stations. Easily installed and accessed between the sewer main and sewer service line, Uni-Lateral's advanced design effectively protects against potentially harmful backflow.

The all-stainless Uni-Lateral is an integrated unit consisting of a check valve, ball valve and cleanout all in a compact module — a first for the domestic market. The kit's versatile design greatly reduces opportunity for leak paths — simplifying and speeding installation, while meeting all codes and regulations.

New stainless steel lateral valve for use with pressure sewer systems

The new Uni-Lateral is a one-piece valve that can be installed between any grinder pump and the sewer main.

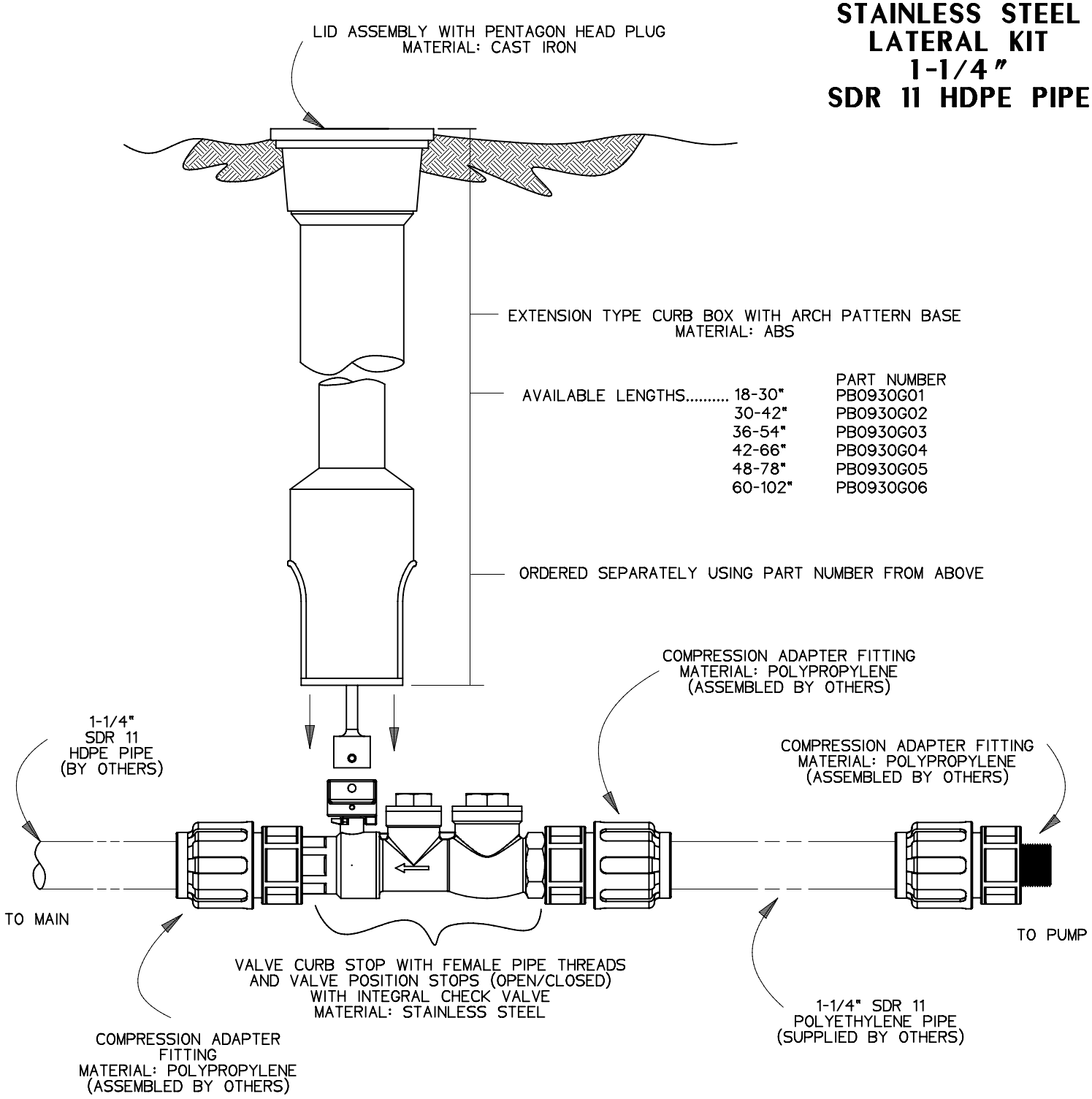
FEATURES AND BENEFITS

- Designed for use with HDPE and PVC pressure sewer piping
- All stainless steel construction
- Integrated stainless steel ball valve curb stop and check valve assembly
- Available with or without fittings
- All valve assemblies designed and tested to 150 psi service pressure

e/one SEWER SYSTEMS

Environment One Corporation
2773 Balltown Road, Niskayuna, New York 12309
Voice 518.346.6161 Fax 518.346.6188
www.eone.com A Precision Castparts Company

STAINLESS STEEL LATERAL KIT 1-1/4" SDR 11 HDPE PIPE



KIT PARTS ARE NOT ASSEMBLED

NOTES:

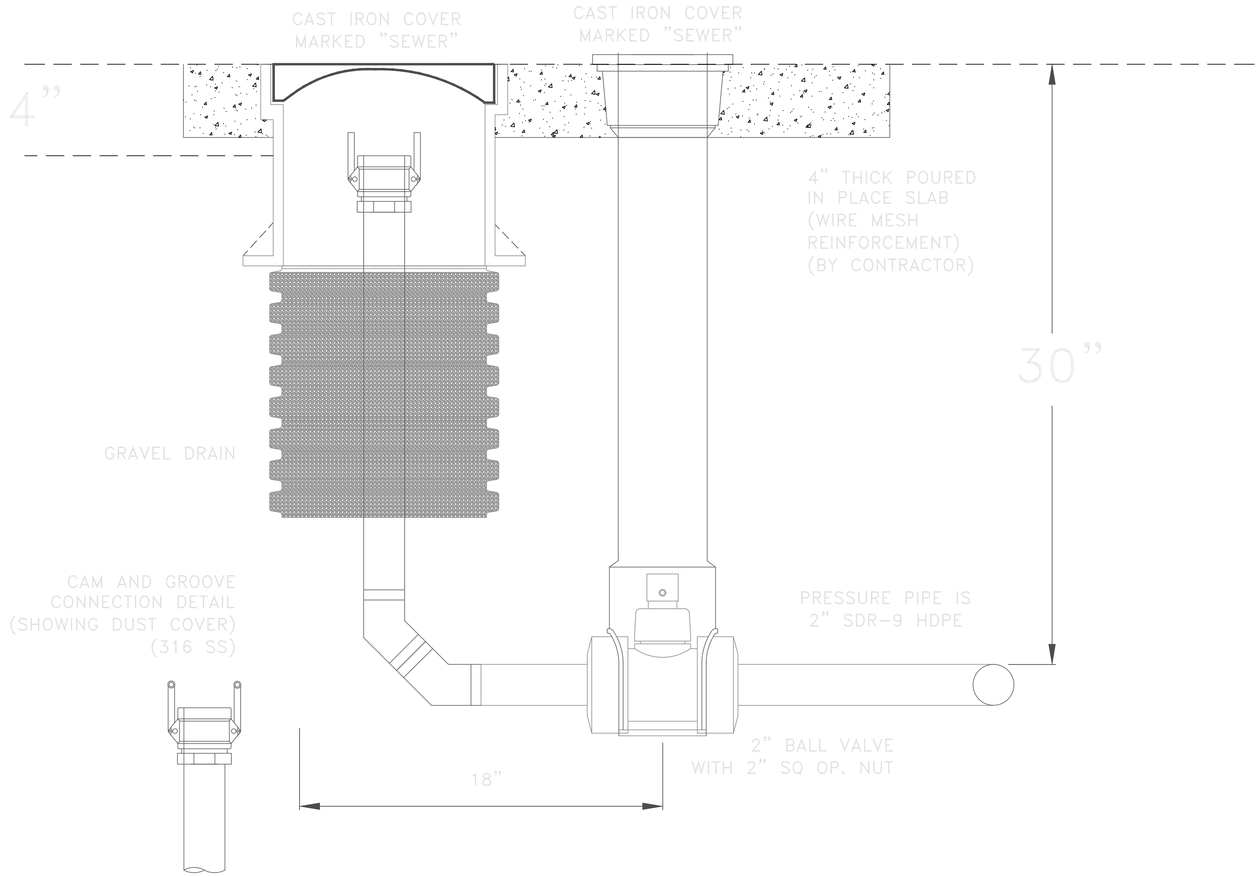
1. SS CURB STOP/CHECK VALVE AND FITTINGS ARE PROVIDED SEPARATELY, TO BE ASSEMBLED BY OTHERS
2. TO ASSEMBLE, APPLY A DOUBLE LAYER OF TEFLON TAPE, AND A LAYER OF PIPE DOPE (SUPPLIED BY OTHERS) TO THE THREADS ON THE PLASTIC FITTINGS AND INSTALL PER THE MANUFACTURER'S INSTRUCTIONS
3. ASSEMBLY IS TO BE PRESSURE TESTED (BY OTHERS)
4. ASSEMBLY IS TO BE USED WITH SDR11 HDPE PIPE
5. TO ORDER SS LATERAL KIT, USE PART NUMBER NC0193G01
6. CURB BOX IS TO BE ORDERED SEPARATELY, SEE ABOVE

SGS	DN	11/02/11	A	3/16
DR BY	CHK'D	DATE	ISSUE	SCALE

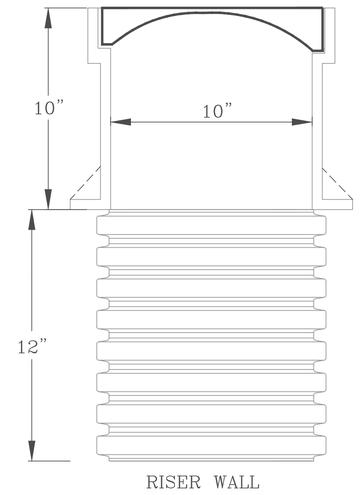
SEWER SYSTEMS

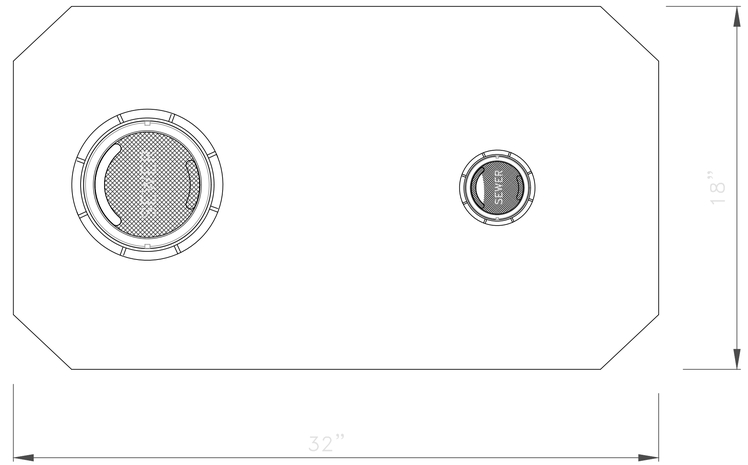
STAINLESS STEEL LATERAL KIT
1-1/4" SDR 11 HDPE PIPE

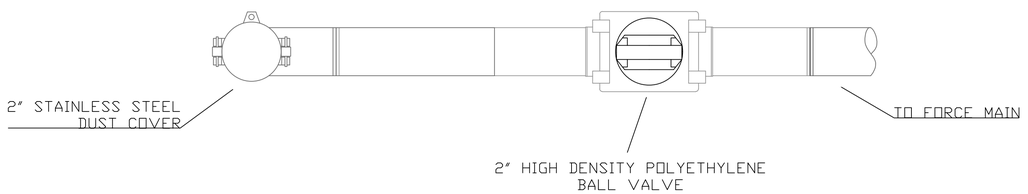
NA0330P02



FLUSHING CONNECTION
PROFILE VIEW







FLUSHING CONNECTION
PLAN VIEW

FJ NUGENT & ASSOCIATES, INC.
TERMINAL FLUSHING CONNECTION
DETAIL

FJ NUGENT & ASSOCIATES, INC.
411 WYLLY AVENUE
SANFORD, FL 32773
PHONE: 407-474-7800

Revisions

No.	By

Date	01/24/2017
Scale	NTS
Drawn	EDS
Checked By	BDS
Sheet	1

APPENDIX G

Stormwater Master Plan by CDM Smith

Stormwater Structures	
Catch Basins (CB)	47
Outfalls (OF)	12
Headwalls	7
Manholes (MH)	5
Weirs	1

Legend

- Headwall
- Catch Basin
- Repaired Catch Basins (2007)
- Storm Sewer Manhole
- Repaired SSPs (2006)
- Repaired SSPs (2009)
- Repaired SSPs (2013)
- Repaired SSP (2015)
- Replaced SSPs (2005)
- Replaced SSPs (2006)
- Replaced SSPs (2011)
- Storm Sewer Pipes (SSPs)

N

Notes:
1. Private outfalls not shown.
2. Features shown are for illustration purposes only.

Source Data:
Parcels - Miami -Dade County GIS
Aerial Imagery - FDOT (2017)
Pipe Information - FloTech Environmental, LLC.
CCTV Inspections, July 2018

CDM Smith

0 150 300 600 900 1,200 1,500 Feet

Scale: 1 inch = 300 feet

Indian Creek Village
Figure 1: Existing Stormwater Infrastructure
November 2018

APPENDIX H

Geotechnical Reports by Nutting Engineers

REPORT OF
GEOTECHNICAL EXPLORATION

INDIAN CREEK VILLAGE IMPROVEMENTS
INDIAN CREEK VILLAGE
MIAMI BEACH, FLORIDA

FOR

STANTEC CONSULTING SERVICES, INC.
901 PONCE DE LEON BOULEVARD, SUITE 900
CORAL GABLES, FLORIDA 33134

PREPARED BY

NUTTING ENGINEERS OF FLORIDA, INC.
2051 NW 112TH AVE
SUITE 126
MIAMI, FLORIDA 33172

ORDER NO. 1661.62

JUNE 2020
(REVISED SEPTEMBER 2020)

Nutting Engineers
of Florida Inc. | Established 1967
Your Project is Our Commitment

Geotechnical & Construction Materials
Engineering, Testing, & Inspection
Environmental Services

Offices throughout the state of Florida

www.nuttingengineers.com info@nuttingengineers.com

September 23, 2020 (Revised from June 29, 2020)

Mr. Sean Compel
Stantec Consulting Services, Inc.
901 Ponce de Leon Boulevard, Suite 900
Coral Gables, Florida 33134
Phone: (305) 445-2900 ext 2292
Email: sean.compel@stantec.com

Re: Report of Geotechnical Exploration
Indian Creek Village Improvements
Indian Creek Village
Miami Beach, Florida

Dear Mr. Compel:

Nutting Engineers of Florida, Inc. has performed a geotechnical exploration for the referenced project in Miami Beach, Florida. The purpose of the exploration was to obtain information concerning the site and subsurface conditions at specific test locations in order to provide soil parameters for the proposed construction. This report presents our findings and recommendations.

PROJECT INFORMATION

Per your email dated February 11, 2020, and review of the aerial provided, we understand that the total length of the roadway is approximately 9,000 linear feet and recommendations are desired for removal of existing drainage systems including catch basins, drainage pipes and aprons. We understand the project will include; installation of new continuous drainage system with exfiltration trenches; pipe to be high density polyethylene (HDPE); exfiltration trenches will be 15 feet below grade, backfilled with Mirafi non-woven filter fabric and ¾-inch diameter washed rock, rehabilitation of existing drainage outfalls, replacement of existing service lines (from main to meters) with new 2-inch diameter polyethylene service lines, new low-pressure sanitary sewer system including underground duplex grinder pump package system and continuous 2-inch HDPE forcemain including valves and fittings, new duplex sanitary pump station including mechanical and electrical, and tapping connection to existing forcemain on Bay Drive.

If any of the above information or assumptions are incorrect, we should be notified in writing in order to revisit our recommendations.

1310 Neptune Drive · Boynton Beach, Florida 33426 · (561) 736-4900 · Fax (561) 737-9975
Broward (954) 941-8700 · Port St. Lucie (772) 408-1050 · Miami Dade (305) 624-0060

GENERAL SUBSURFACE CONDITIONS

Soil Survey Maps

As part of the geotechnical exploration, we have reviewed available Soil Conservation Service (SCS) survey maps for Miami-Dade County. These SCS maps provide qualitative information about potential general shallow soil conditions in the project vicinity. This information was derived from approximately 6 ft. deep manual auger borings, aerial photo and surface feature interpretation at some point in the past (mid 1980's to early 1970's). The SCS data may or may not reflect actual current site conditions. A review of the Soil Survey for Dade County revealed that at the time the survey was conducted, the soils at the site were described as St. Augustine sand. This deep, nearly level, somewhat poorly drained soil is on Key Biscayne and Indian Creek Islands. Typically, the surface layer is dark brown sand about 3 inches thick. Below this is 48 inches of gray and light gray sand that has common fine lenses of gray marl in the lower 22 inches. The subsoil is gray and light gray sand about 29 inches thick. It has few fine lenses of gray marl in the upper 6 inches. Included in this mapping are soils that are similar to St. Augustine sand but do not have pockets of loamy material or marl and have pockets of organic material. We note that the maximum depth of the soil survey is approximately six feet.

Subsurface Exploration

NUTTING ENGINEERS OF FLORIDA, INC. was requested to perform eight (8) Standard Penetration Test (SPT) borings (ASTM D-1586) to depths of ten to twenty feet below land surface as well as nine (9) exfiltration tests in accordance with South Florida Water Management District specifications. The locations of the tests are indicated on the attached site plan presented in the Appendix of this report. The locations were established in the field using approximate methods; namely, a measuring wheel and available surface controls. As such the locations should be considered to be approximate.

The appended boring logs present information and descriptions of the subsurface conditions at each specific test boring location. Representative samples collected from the SPT borings were visually reviewed in the laboratory by a geotechnical engineer in order to confirm the field classifications. The Standard Penetration Test N-values, the number of successive blows required to drive the sampler into the soil one foot, are presented on the individual boring logs. The SPT N value has been empirically correlated with various soil properties and is considered to be indicative of the relative density of cohesionless soils and the consistency of cohesive soils. The correlation of penetration resistance with relative density is presented in the Soil Classification Criteria attached in the Appendix.

Test Boring Results

In general, the review of the boring logs indicated a surficial layer of asphalt and basecourse followed by very loose to medium dense sand to silty sand with varying amounts of shells and limestone fragments to depths of approximately four feet below grade. Below this layer, the borings revealed silty sand and very soft fibrous peat to approximately eight feet underlain by very loose to medium dense sand, limestone fragments, and trace shell fragments to depths of

twenty feet, the maximum depth explored. A detailed description of the soil/rock profile is presented on the test boring records provided in the Appendix.

Rock Formation Note:

Generally, rock in the South Florida area may include limestone or sandstone which have irregularities and discontinuities including vertical and horizontal solution features, varying surface and bottom elevations, and varying degrees of hardness. The rock features may also contain intervening sand and other material filled lenses. The standard penetration test boring executed in this evaluation was performed in accordance with the normal standard of care in this area. Despite this, this process may sometimes fail to detect the presence of rock strata by passing through solution features. Solution features can be very common in rock strata in Southeast Florida. Also given the brittle nature of some rock strata, rocks may readily shatter when hit by the split spoon. Despite this, these strata which may not be depicted in the soil boring logs may present significant resistance to excavation. Resistance to excavation may generate vibrations which may be perceived to or actually induce settlements in subject nearby structures.

Asphalt Core Results

Twelve (12) asphalt cores were performed within the roadways at the location of each boring in order to provide a representative profile of the existing pavement section. The roadway generally had an asphalt thickness of approximately 3 to 10 inches, with an average thickness of approximately 7 inches. The base course was generally 0.5 to 3 inches thick with an average thickness of approximately 1.4 inches. Locations and individual asphalt core results are included in the appendix of this report.

Laboratory Testing and Results

Soil samples obtained from the drilling operations were preserved in jars and visually classified in the laboratory by a geotechnical engineer to confirm the field classifications. Selected soil samples of the organic peat recovered from the borings were subjected to testing to determine natural moisture and organic contents to estimate the engineering properties of these soils. The tests were performed on a selected samples believed to be representative of the materials encountered. Results of the test are tabulated below:

LABORATORY RESULTS

Test Boring #	*Soil Description*	*Sample Depth Interval (Feet)*	*Moisture Content (%)*	*Organic Content (%)*
B-5	Dk. Brown Peat	6 – 8	196	26
B-6	Dk. Brown Peat	4 – 6	177	27
B-7	Dk. Brown Sandy Peat	6 – 8	51	10

Exfiltration Results

Nine (9) 'Usual Open-Hole' exfiltration tests were performed in accordance with South Florida Water Management District (SFWMD) specifications to a depth of fifteen feet below the existing ground surface. The tests were performed in order to determine the hydraulic conductivity of the in situ subsurface soils to evaluate drainage requirements for the project, by others.

The hydraulic conductivity values ranged from 3.56×10^{-6} to 1.44×10^{-4} cubic feet per second, per square foot, per foot of head. Detailed soil descriptions and flow rates are presented in the Appendix.

Groundwater Table Observation

The immediate groundwater level was measured at the boring locations at the time of drilling. The groundwater level was encountered at approximately one and a half to five feet below the existing ground surface at the time of drilling.

The immediate depth to groundwater measurements presented in this report may not provide a reliable indication of stabilized or longer term depth to groundwater at this site. Water table elevations can vary dramatically with time through rainfall, droughts, storm events, flood control activities, nearby surface water bodies, tidal activity, pumping and many other factors. For these reasons, this immediate depth to water data **should not** be relied upon alone for project design considerations.

ENGINEERING EVALUATION AND RECOMMENDATIONS

Our soil exploration encountered substantial deleterious materials, silt and peat, from a depth of approximately four to twenty feet below grade. Where open trench excavation methods are used, this material will need to be addressed. The following recommendations are general in nature as detailed plans are not available at this time. Once plans are more finalized, we can provide specific details as needed. Based on similar projects in the area and discussions with the design team, it was decided to over-excavate the pipe area, and install a geotextile (Tencate MiraFi RS Series or equivalent) for soil separation and tensile support.

We recommend where peat or silt is encountered during the installation of the piping, the pipe invert should be over-excavated to at least 12 inches below the proposed pipe. A Mirafi RS-Series geotextile (or equivalent), should then be placed along the bottom of the excavation and should cover the entire width of the base of the excavation. Once the geotextile is in place, backfilling may be performed as specified by the civil engineer. Sand and/or limestone fragments encountered above the peat layer may be stockpiled and used for backfill. We note that leaving compressible soils in place will have the potential for future settlements.

Backfill material and procedures should be specified by the civil engineer of record. In areas where No. 57 stone is placed below a different type of material, filter fabric should be placed at the interface between the two materials.

Dewatering

The immediate groundwater table was encountered at depths of approximately one and a half to five feet below the existing ground surface at the time of our soil borings and is subject to variations as stated. Other qualified personnel shall be responsible for the design, permitting, maintenance, and other factors related to dewatering and groundwater control, if needed. Alternatively, it may be elected to perform the installation in the wet without benefit of dewatering if this is deemed to be feasible by other qualified personnel. We note that during construction, if compaction is needed, the groundwater level should be maintained at least two feet below the bottom of the excavations so that adequate compaction and density tests can be performed. If this is not feasible, our office should be contacted for additional consultation.

Trench Excavations

Excavations of five feet or more will need to be sloped or shored in accordance with State of Florida and OSHA recommendations. It is our opinion that if the excavation remains dry, temporary side slopes of 3 horizontal to 1 vertical may be used for this project. Where existing utilities, roadways or other obstructions prevent sloping the soils, shoring will be required.

Pavement

The following would apply within the proposed road section. Any deleterious material encountered should be removed and replaced with suitable fill as specified in the "Site Preparation" section of this report. A stabilized subgrade having a minimum LBR of 40 shall be placed to a depth of at least twelve inches below the base course. The stabilized subgrade should be compacted to an equivalent density of 98 percent of the modified Proctor maximum dry density. The base course should be placed to at least eight inches below the asphalt and should have a minimum LBR of 100. The base material should be compacted to 98 percent of the modified Proctor maximum dry density. The pavement material and thickness should be based on design requirements. It is our opinion that onsite materials may meet both of the LBR requirements, however, specific tests should be performed to confirm this.

GENERAL INFORMATION

Our client for this geotechnical evaluation was:

Mr. Sean Compel
Stantec Consulting Services, Inc.
901 Ponce de Leon Boulevard, Suite 900
Coral Gables, Florida 33134

The contents of this report are for the exclusive use of the client, the client's design & construction team and governmental authorities for this specific project exclusively. Information conveyed in this report shall not be used or relied upon by other parties or for other projects without the expressed written consent of NE.

This report discusses geotechnical considerations for this site based upon observed conditions and our understanding of proposed construction for foundation support. Environmental issues including (but not limited to), soil and/or groundwater contamination are beyond our scope of service for this project. As such, this report shall not be used or relied upon for evaluation of environmental issues.

If conditions are encountered which are not consistent with the findings presented in this report, or if proposed construction is moved from the location investigated, this office shall be notified in writing immediately so that the condition or change can be evaluated and appropriate action taken.

The Geotechnical Engineer warrants that the findings, recommendations, specifications, or professional advice contained herein, have been presented after being prepared in accordance with general accepted professional practice in the field of foundation engineering, soil mechanics and engineering geology. No other warranties are implied or expressed.

We appreciate the opportunity to provide these services for you and look forward to completing this and other projects with you. If we can be of any further assistance with the design or construction services, or if you need additional information, please feel free to contact us at your convenience.

Sincerely,
NUTTING ENGINEERS OF FLORIDA, INC.

Adrian Ramirez
Engineering Intern

Richard C. Wohlfarth 9/25/20

Richard C. Wohlfarth, P.E. #50858
Director of Engineering

Attachments: Boring Location Plan
Test Boring Logs
Exfiltration Test Results
Asphalt Core Summary
Soil Classification Criteria
Limitations of Liability

NUTTING ENGINEERS OF FLORIDA, INC. ESTABLISHED 1967	INDIAN CREEK VILLAGE IMPROVEMENTS INDIAN CREEK VILLAGE MIAMI BEACH, FLORIDA	APPROXIMATE TEST LOCATIONS	NOT TO SCALE	FIGURE 1

Nutting Engineers of Florida

BORING NUMBER B-1

PROJECT NUMBER 1661.62

CLIENT Stantec

PROJECT NAME Indian Creek Village Improvements

PROJECT LOCATION Miami Beach, FL

DATE STARTED 6/8/20 COMPLETED 6/8/20

SURFACE ELEVATION REFERENCE Same as road crown

DRILLING METHOD Standard Penetration Boring

GROUND WATER LEVELS:

LOGGED BY Dancor CHECKED BY A. Ramirez

▽ AT TIME OF DRILLING 1.7 ft

APPROXIMATE LOCATION OF BORING As located on site plan

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	Blows	N-Value	▲ SPT N VALUE ▲ 10 20 30 40 / PL MC LL 20 40 60 80 / □ FINES CONTENT (%) □ 20 40 60 80
0		DRILLED ASPHALT				
		Lt. brown LIMESTONE FRAGMENTS	SS 1	18-8-5-4	13	▲
		▽ Brown fine SAND and LIMESTONE FRAGMENTS, trace shells				
		Brown fine SAND and SHELLS	SS 2	2-3-2-1	5	▲
5		Gray SILTY SAND, trace shells	SS 3	1-WOH		
			SS 4	1-WOH-1		
			SS 5	1-WOH		
10			SS 6	1-WOH-1-WOH		
			SS 7	1-2-WOH-1		
15			SS 8	1-2-WOH-1		
			SS 9	2-2-1-1	3	▲
20		Bottom of hole at 20.0 feet.				

Nutting Engineers of Florida

BORING NUMBER B-2

PROJECT NUMBER 1661.62

CLIENT Stantec

PROJECT NAME Indian Creek Village Improvements

PROJECT LOCATION Miami Beach, FL

DATE STARTED 6/8/20 COMPLETED 6/8/20

SURFACE ELEVATION REFERENCE Same as road crown

DRILLING METHOD Standard Penetration Boring

GROUND WATER LEVELS:

LOGGED BY Dancor CHECKED BY A. Ramirez

▽ AT TIME OF DRILLING 1.8 ft

APPROXIMATE LOCATION OF BORING As located on site plan

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	Blows	N-Value	▲ SPT N VALUE ▲ 10 20 30 40 / PL MC LL 20 40 60 80 / ☐ FINES CONTENT (%) ☐ 20 40 60 80
0		DRILLED ASPHALT				
		Lt. brown LIMESTONE FRAGMENTS	SS 1	19-13-7-4	20	▲
		Lt. brown fine SAND, trace shells ▽				
		Gray SILTY SAND	SS 2	1-2-1-WOH		
5			SS 3	2-1-1-1	2	▲
			SS 4	1-WOH-1-WOH		
10			SS 5	2-1-1-1	2	▲
		Bottom of hole at 10.0 feet.				

Nutting Engineers of Florida

BORING NUMBER B-3

PROJECT NUMBER 1661.62

CLIENT Stantec PROJECT NAME Indian Creek Village Improvements

PROJECT LOCATION Miami Beach, FL

DATE STARTED 6/8/20 COMPLETED 6/8/20 SURFACE ELEVATION REFERENCE Same as road crown

DRILLING METHOD Standard Penetration Boring GROUND WATER LEVELS:

LOGGED BY Dancor CHECKED BY A. Ramirez ▽ AT TIME OF DRILLING 4.8 ft

APPROXIMATE LOCATION OF BORING As located on site plan

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	Blows	N-Value	▲ SPT N VALUE ▲ 10 20 30 40 / PL MC LL 20 40 60 80 / □ FINES CONTENT (%) □ 20 40 60 80
0		DRILLED ASPHALT				
		Lt. brown LIMESTONE FRAGMENTS	SS 1	19-10-8-7	18	▲
		Lt. brown fine SAND, trace shells	SS 2	6-6-7-4	13	▲
5	▽		SS 3	1-2-2-2	4	▲
			SS 4	2-2-1-WOH		
		Gray SILTY SAND	SS 5	1-1-1-1	2	▲
10		Bottom of hole at 10.0 feet.				

Nutting Engineers of Florida

BORING NUMBER B-4

CLIENT Stantec

PROJECT NUMBER 1661.62

PROJECT NAME Indian Creek Village Improvements

PROJECT LOCATION Miami Beach, FL

DATE STARTED 6/8/20 COMPLETED 6/8/20

SURFACE ELEVATION REFERENCE Same as road crown

DRILLING METHOD Standard Penetration Boring

GROUND WATER LEVELS:

LOGGED BY Dancor CHECKED BY A. Ramirez

▽ AT TIME OF DRILLING 1.4 ft

APPROXIMATE LOCATION OF BORING As located on site plan

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	Blows	N-Value	▲ SPT N VALUE ▲ 10 20 30 40 / PL MC LL 20 40 60 80 / ☐ FINES CONTENT (%) ☐ 20 40 60 80
0		DRILLED ASPHALT				
		Lt. brown LIMESTONE FRAGMENTS				
		▽ Lt. brown fine SAND, trace shells	SS 1	2-4-8-8	12	▲
			SS 2	5-5-5-3	10	▲
5			SS 3	5-6-6-5	12	▲
		Lt. brown to gray fine SAND and SHELLS	SS 4	5-7-6-5	13	▲
			SS 5	3-5-3-2	8	▲
10		Bottom of hole at 10.0 feet.				

Nutting Engineers of Florida

BORING NUMBER B-5

CLIENT Stantec

PROJECT NUMBER 1661.62

PROJECT NAME Indian Creek Village Improvements

PROJECT LOCATION Miami Beach, FL

DATE STARTED 6/8/20 COMPLETED 6/8/20

SURFACE ELEVATION REFERENCE Same as road crown

DRILLING METHOD Standard Penetration Boring

GROUND WATER LEVELS:

LOGGED BY Dancor CHECKED BY A. Ramirez

▽ AT TIME OF DRILLING 2.4 ft

APPROXIMATE LOCATION OF BORING As located on site plan

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	Blows	N-Value
0		DRILLED ASPHALT			
		Lt. brown LIMESTONE FRAGMENTS	SS 1	29-9-4-3	13
		Lt. brown fine SAND, trace shells			
		Gray SILTY SAND ▽	SS 2	4-4-3-6	7
5		Gray fine SAND and WOOD	SS 3	2-50/2"	100+
		Brown PEAT	SS 4	2-1-1-2	2
10		Gray fine SAND, trace peat and shells	SS 5	1-5-5-4	10
		Bottom of hole at 10.0 feet.			

▲ SPT N VALUE ▲
10 20 30 40

PL MC LL
20 40 60 80

□ FINES CONTENT (%) □
20 40 60 80

>>▲

TEST NUTTING BOREHOLE 2-1661.62 STANTEC - INDIAN CREEK VILLAGE IMPROVEMENTS.GPJ GINT US.GDT 6/18/20

Nutting Engineers of Florida

BORING NUMBER B-6

PROJECT NUMBER 1661.62

CLIENT Stantec

PROJECT NAME Indian Creek Village Improvements

PROJECT LOCATION Miami Beach, FL

DATE STARTED 6/8/20 COMPLETED 6/8/20

SURFACE ELEVATION REFERENCE Same as road crown

DRILLING METHOD Standard Penetration Boring

GROUND WATER LEVELS:

LOGGED BY Dancor CHECKED BY A. Ramirez

▽ AT TIME OF DRILLING 1.6 ft

APPROXIMATE LOCATION OF BORING As located on site plan

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	Blows	N-Value	▲ SPT N VALUE ▲ 10 20 30 40 / PL MC LL 20 40 60 80 / ☐ FINES CONTENT (%) ☐ 20 40 60 80
0		DRILLED ASPHALT				
		Lt. brown LIMESTONE FRAGMENTS	AU 1			
		▽ Lt. brown to gray fine SAND and SHELLS				
		Gray fine SAND	SS 2	6-6-6-4	12	▲
5		Dk. brown PEAT	SS 3	2-1-2-2	3	▲
		Gray SILTY SAND and PEAT	SS 4	1-WOH-2-3		
		Gray fine SAND, trace peat	SS 5	4-6-6-3	12	▲
10		Bottom of hole at 10.0 feet.				

TEST NUTTING BOREHOLE 2-1661.62 STANTEC - INDIAN CREEK VILLAGE IMPROVEMENTS.GPJ GINT US.GDT 6/18/20

Nutting Engineers of Florida

BORING NUMBER B-7

PROJECT NUMBER 1661.62

CLIENT Stantec

PROJECT NAME Indian Creek Village Improvements

PROJECT LOCATION Miami Beach, FL

DATE STARTED 6/8/20 COMPLETED 6/8/20

SURFACE ELEVATION REFERENCE Same as road crown

DRILLING METHOD Standard Penetration Boring

GROUND WATER LEVELS:

LOGGED BY Dancor CHECKED BY A. Ramirez

▽ AT TIME OF DRILLING 1.6 ft

APPROXIMATE LOCATION OF BORING As located on site plan

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	Blows	N-Value
0		DRILLED ASPHALT			
		Lt. brown LIMESTONE FRAGMENTS	SS 1	14-11-10-8	21
		▽ Lt. brown fine SAND and SHELLS			
		Lt. brown to gray fine SAND and SHELLS	SS 2	8-8-7-5	15
5		Gray fine SAND	SS 3	3-1-1-2	2
		Dk. brown PEAT	SS 4	2-3-7-12	10
		Gray fine SAND, trace peat	SS 5	10-13-15-20	28
10		Bottom of hole at 10.0 feet.			

▲ SPT N VALUE ▲
10 20 30 40

PL MC LL
20 40 60 80

☐ FINES CONTENT (%) ☐
20 40 60 80

TEST NUTTING BOREHOLE 2-1661.62 STANTEC - INDIAN CREEK VILLAGE IMPROVEMENTS.GPJ GINT US.GDT 6/18/20

Nutting Engineers of Florida

BORING NUMBER B-8

CLIENT Stantec

PROJECT NUMBER 1661.62

PROJECT NAME Indian Creek Village Improvements

PROJECT LOCATION Miami Beach, FL

DATE STARTED 6/8/20 COMPLETED 6/8/20

SURFACE ELEVATION REFERENCE Same as road crown

DRILLING METHOD Standard Penetration Boring

GROUND WATER LEVELS:

LOGGED BY Dancor CHECKED BY A. Ramirez

▽ AT TIME OF DRILLING 2.1 ft

APPROXIMATE LOCATION OF BORING As located on site plan

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	Blows	N-Value	▲ SPT N VALUE ▲ 10 20 30 40 / PL MC LL 20 40 60 80 / ☐ FINES CONTENT (%) ☐ 20 40 60 80
0		DRILLED ASPHALT				
		Lt. brown LIMESTONE FRAGMENTS	SS 1	22-15-8-6	23	
		Lt. brown fine SAND, trace limestone fragments and shells				
		▽ Lt. brown to gray fine SAND, trace shells	SS 2	10-8-10-7	18	
5		Gray fine SAND, trace wood	SS 3	2-1-14-4	15	
		Gray fine SAND, trace wood and peat	SS 4	4-4-3-4	7	
10		Gray fine SAND, trace peat	SS 5	6-10-15-18	25	
		Bottom of hole at 10.0 feet.				

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Report of Exfiltration Test

Client:	Stantec	Order No	1661.62
Project:	Indian Creek Village Improvements	Report No	1
Location:	Indian Creek Village	Date:	6/9/20
	Miami Beach, FL		
Test:	Usual Open Hole Exfiltration Test		
Surface Elevation:	Same as road crown	Water table from ground surface:	1.66'
Casing Diameter:	6"		
Tube Depth:	15'		

Sample Location: Approx. as located on site plan

Material:

0'-0.20'	ASPHALT
0.20'-1'	Lt. brown LIMESTONE FRAGMNETS
1'-15'	Gray SILTY SAND and SHELLS

One Minute Increme	Pump Rate in Gal/Min
1	0.25
2	0.25
3	0.50
4	0.25
5	0.25
6	0.25
7	0.25
8	0.25
9	0.25
10	0.25

$K = 1.64 \times 10^{-5}$ cfs/ft^{2}ft.head

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Report of Exfiltration Test

Client:	Stantec	Order No	1661.62
Project:	Indian Creek Village Improvements	Report No	2
Location:	Indian Creek Village	Date:	6/9/20
	Miami Beach, FL		
Test:	Usual Open Hole Exfiltration Test		
Surface Elevation:	Same as road crown	Water table from ground surface:	2.75'
Casing Diameter:	6"		
Tube Depth:	15'		

Sample Location: Approx. as located on site plan

Material:

0'-0.25'	ASPHALT
0.25'-1'	Lt. brown LIMESTONE FRAGMENTS
1'-2'	Lt. brown fine SAND, LIMESTONE FRAGMENTS and SHELLS
2'-15'	Gray SILTY SAND and SHELLS

One Minute Increme	Pump Rate in Gal/Min
1	0.50
2	0.50
3	0.50
4	0.50
5	0.25
6	0.50
7	0.25
8	0.25
9	0.25
10	0.25

$K = 1.41 \times 10^{-5}$ cfs/ft^{2}ft.head

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Report of Exfiltration Test

Client:	Stantec	Order No	1661.62
Project:	Indian Creek Village Improvements	Report No	3
Location:	Indian Creek Village	Date:	6/8/20
	Miami Beach, FL		
Test:	Usual Open Hole Exfiltration Test		
Surface Elevation:	Same as road crown	Water table from ground surface:	2.91'
Casing Diameter:	6"		
Tube Depth:	15'		

Sample Location: Approx. as located on site plan

Material:

0'-0.12'	ASPHALT
0.12'-0.4'	Lt. brown LIMESTONE FRAGMENTS
0.4'-9'	Lt. brown fine SAND and SHELLS
9'-15'	Gray SILTY SAND

One Minute Increme	Pump Rate in Gal/Min
1	0.12
2	0.12
3	0.12
4	0.12
5	0.12
6	0.12
7	0
8	0
9	0.12
10	0.12

$K = 3.56 \times 10^{-6}$ cfs/ft^{2}ft.head

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Report of Exfiltration Test

Client:	Stantec	Order No	1661.62
Project:	Indian Creek Village Improvements	Report No	4
Location:	Indian Creek Village	Date:	6/8/20
	Miami Beach, FL		
Test:	Usual Open Hole Exfiltration Test		
Surface Elevation:	Same as road crown	Water table from ground surface:	5.83'
Casing Diameter:	6"		
Tube Depth:	15'		

Sample Location: Approx. as located on site plan

Material:

0'-0.16'	ASPHALT
0.16'-0.8'	Lt. brown LIMESTONE FRAGMENTS
0.8'-8'	Lt. brown fine SAND and SHELLS
8'-15'	Gray SILTY SAND, trace shells

One Minute Increme	Pump Rate in Gal/Min
1	0.50
2	0.50
3	0.50
4	0.50
5	0.50
6	1.00
7	1.00
8	0.50
9	0.50
10	0.50

$K = 1.20 \times 10^{-5}$ cfs/ft^{2}ft.head

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Report of Exfiltration Test

Client:	Stantec	Order No	1661.62
Project:	Indian Creek Village Improvements	Report No	5
Location:	Indian Creek Village	Date:	6/9/20
	Miami Beach, FL		
Test:	Usual Open Hole Exfiltration Test		
Surface Elevation:	Same as road crown	Water table from ground surface:	1.41'
Casing Diameter:	6"		
Tube Depth:	15'		

Sample Location: Approx. as located on site plan

Material:

0'-0.25'	ASPHALT
0.25'-1'	Lt. brown LIMESTONE FRAGMENTS
1'-3'	Lt. brown fine SAND and SHELLS
3'-7'	Gray fine SAND and SHELLS
7'-8'	Brown fine SAND and WOOD
8'-15'	Gray fine SAND, trace shells

One Minute Increme	Pump Rate in Gal/Min
1	0.12
2	0.12
3	0.12
4	0.12
5	0.12
6	0.12
7	0.12
8	0.12
9	0.12
10	0.12

$K = 8.68 \times 10^{-6}$ cfs/ft^{2}ft.head

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Report of Exfiltration Test

Client:	Stantec	Order No	1661.62
Project:	Indian Creek Village Improvements	Report No	6
Location:	Indian Creek Village	Date:	6/9/20
	Miami Beach, FL		
Test:	Usual Open Hole Exfiltration Test		
Surface Elevation:	Same as road crown	Water table from ground surface:	1.66'
Casing Diameter:	6"		
Tube Depth:	15'		

Sample Location: Approx. as located on site plan

Material:

0'-0.20'	ASPHALT
0.20'-0.75'	Lt. brown LIMESTONE FRAGMENTS
0.75'-2'	Lt. brown fine SAND and SHELLS
2'-6'	Gray fine SAND and SHELLS
6'-7'	Dk. brown PEAT
7'-15'	Gray fine SAND, trace shells

One Minute Increme	Pump Rate in Gal/Min
1	0.25
2	0.25
3	0.12
4	0.25
5	0.12
6	0.12
7	0.25
8	0.12
9	0.12
10	0.12

$K = 1.05 \times 10^{-5}$ cfs/ft^{2}ft.head

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Report of Exfiltration Test

Client:	Stantec	Order No	1661.62
Project:	Indian Creek Village Improvements	Report No	7
Location:	Indian Creek Village	Date:	6/9/20
	Miami Beach, FL		
Test:	Usual Open Hole Exfiltration Test		
Surface Elevation:	Same as road crown	Water table from ground surface:	2.5'
Casing Diameter:	6"		
Tube Depth:	15'		

Sample Location: Approx. as located on site plan

Material:

0'-0.20'	ASPHALT
0.20'-0.8'	Lt. brown LIMESTONE FRAGMENTS
0.8'-5'	Gray fine SAND and SHELLS
5'-6'	Dk. brown PEAT
6'-15'	Gray SILTY SAND, trace shells

One Minute Increme	Pump Rate in Gal/Min
1	3.00
2	3.00
3	3.00
4	3.00
5	3.00
6	2.75
7	3.00
8	3.00
9	3.00
10	3.00

$K = 1.22 \times 10^{-4}$ cfs/ft^{2}ft.head

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Report of Exfiltration Test

Client:	Stantec	Order No	1661.62
Project:	Indian Creek Village Improvements	Report No	8
Location:	Indian Creek Village	Date:	6/9/20
	Miami Beach, FL		
Test:	Usual Open Hole Exfiltration Test		
Surface Elevation:	Same as road crown	Water table from ground surface:	1.58'
Casing Diameter:	6"		
Tube Depth:	15'		

Sample Location: Approx. as located on site plan

Material:

0'-2'	Lt. brown fine SAND and LIMESTONE FRAGMENTS, trace shells
2'-4'	Lt. brown fine SAND
4'-6'	Gray fine SAND
6'-8'	Dk. brown PEAT
8'-15'	Gray fine SAND

One Minute Increme	Pump Rate in Gal/Min
1	1.25
2	1.25
3	1.00
4	1.00
5	1.00
6	1.25
7	1.25
8	1.00
9	1.25
10	1.00

$K = 7.03 \times 10^{-5}$ cfs/ft^{2}ft.head

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Report of Exfiltration Test

Client: Stantec
Project: Indian Creek Village Improvements
Location: Indian Creek Village
Miami Beach, FL
Test: Usual Open Hole Exfiltration Test
Surface Elevation: Same as road crown
Water table from ground surface: 2.16'

Order No 1661.62
Report No 9
Date: 6/9/20

Casing Diameter: 6"
Tube Depth: 15'

Sample Location: Approx. as located on site plan

Material:

0'-1'	Lt. brown LIMESTONE FRAGMENTS
1'-4'	Lt. brown fine SAND, trace shells
4'-15'	Gray fine SAND, trace shells

One Minute Increme	Pump Rate in Gal/Min
1	3.00
2	3.00
3	3.00
4	3.50
5	3.00
6	3.00
7	3.25
8	3.00
9	3.00
10	3.00

$K = 1.44 \times 10^{-4}$ cfs/ft^{2}ft.head

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Report of Asphaltic Pavement Cores

Client Name: Stantec Consulting Services, Inc.
Project Name: Indian Creek Village Improvements
Project Location: Indian Creek Village, Miami Beach, FL

Order Number: 1661.62
Report Number: 1
Date of Test: 6/9/2020
Sampled By: Dancor

Core Number	Core Location	Approx. Asphalt Thickness (In.)	Approx. Base Course Thickness (In.)
C-1	As located on site plan	7	0.5
C-2	As located on site plan	10	1.0
C-3	As located on site plan	8	1.0
C-4	As located on site plan	4	3.0
C-5	As located on site plan	8	2.0
C-6	As located on site plan	6	0.5
C-7	As located on site plan	10	2.0
C-8	As located on site plan	7	1.0
C-9	As located on site plan	8	1.5
C-10	As located on site plan	9	2.0
C-11	As located on site plan	5	1.5
C-12	As located on site plan	3	1.0

SOIL AND ROCK CLASSIFICATION CRITERIA

SAND/SILT

N-VALUE (bpf)	RELATIVE DENSITY
0 – 4	Very Loose
5 – 10	Loose
11 – 29	Medium
30 – 49	Dense
>50	Very dense
100	Refusal

CLAY/SILTY CLAY

N-VALUE (bpf)	UNCONFINED COMP. STRENGTH (tsf)	CONSISTENCY
<2	<0.25	v. Soft
2 – 4	0.25 – 0.50	Soft
5 – 8	0.50 – 1.00	Medium
9 – 15	1.00 – 2.00	Soft
16 – 30	2.00 – 4.00	v. Stiff
>30	>4.00	Hard

ROCK

N-VALUE (bpf)	RELATIVE HARDNESS	ROCK CHARACTERISTICS
N≥ 100	Hard to v. hard	Local rock formations vary in hardness from soft to very hard within short vertical and horizontal distances and often contain vertical solution holes of 3 to 36 inch diameter to varying depths and horizontal solution features. Rock may be brittle to split spoon impact, but more resistant to excavation.
25≤ N ≤ 100	Medium hard to hard	
5≤ N ≤ 25	Soft to medium hard	

PARTICLE SIZE

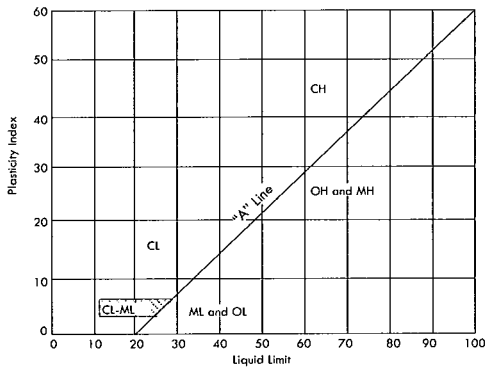
Boulder	>12 in.
Cobble	3 to 12 in.
Gravel	4.76 mm to 3 in.
Sand	0.074 mm to 4.76 mm
Silt	0.005 mm to 0.074 mm
Clay	<0.005 mm

DESCRIPTION MODIFIERS

0 – 5%	Slight trace
6 – 10%	Trace
11 – 20%	Little
21 – 35%	Some
>35%	And

Major Divisions			Group Symbols	Typical names	Laboratory classification criteria
Coarse-grained soils (More than half of material is larger than No. 200 sieve size)	Gravels (More than half of coarse fraction is larger than No. 4 sieve size)	Clean gravels (Little or no fines)	GW	Well-graded gavels, gravel-sand mixtures, little or no fines	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_z = \frac{(D_{30})^2}{D_{10} x D_{60}}$ *between* 1 and 3
			GP	Poorly graded gravels, gravel-sand mixtures, little or no fines	Not meeting all gradation requirements for GW
		Gravels with fines (Appreciable amount of fines)	GW* d / u	Silty gravels, gravel-sand-silt mixtures	Atterberg limits below "A" line or P.I. less than 4 / Above "A" line with P.I. between 4 and 7 are *borderline* cases requiring use of dual symbols.
			GC	Clayey gravels, gravel-sand-clay mixtures	Atterberg limits above "A" line with P.I. greater than 7
	Sands (More than half of coarse fraction is smaller than No. 4 sieve size)	Clean sands (Little or no fines)	SW	Well-graded sands, gravelly sands, little or no fines	$C_u = \frac{D_{60}}{D_{10}}$ greater than 6; $C_z = \frac{(D_{30})^2}{D_{10} x D_{60}}$ *between* 1 and 3
			SP	Poorly graded sands, gravelly sands, little or no fines	Not meeting all gradation requirements for SW
		Sands with fines (Appreciable amount of fines)	SM* d / u	Silty sands, sand-silt mixtures	Atterberg limits below "A" line or P.I. less than 4 / Limits plotting in hatched zone with P.I. between 4 and 7 are *borderline* cases requiring use of dual system.
			SC	Clayey sands, sand-clay mixtures	Atterberg limits above "A" line with P.I. more than 7
Fine-grained soils (More than half of material is smaller than No. 200 sieve size)	Silts and clays (Liquid limit less than 50)		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity	
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy, clays, silty clays, lean clays	
			OL	Organic silts and organic silty clays of low plasticity	
	Silts and clays (Liquid limit greater than 50)		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts	
			CH	Inorganic clays or high plasticity, fat clays	
			OH	Organic clays of medium to high plasticity, organic silts	
	Highly organic soils		PT	Peat and other highly organic soils	

Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows:
Less than five percent.....GW, GP, SW, SP
More than 12 percent.....GM, GC, SM, SC
5 to 12 percent.....*Borderline* cases requiring dual systems**



Plasticity Chart

LIMITATIONS OF LIABLILITY

WARRANTY

We warranty that the services performed by Nutting Engineers of Florida, Inc. are conducted in a manner consistent with that level of care and skill ordinarily exercised by members of the profession in our area currently practicing under similar conditions at the time our services were performed. ***No other warranties, expressed or implied, are made***. While the services of Nutting Engineers of Florida, Inc. are a valuable and integral part of the design and construction teams, we do not warrant, guarantee or insure the quality, completeness, or satisfactory performance of designs, construction plans, specifications we have not prepared, nor the ultimate performance of building site materials or assembly/construction.

SUBSURFACE EXPLORATION

Subsurface exploration is normally accomplished by test borings; test pits are sometimes employed. The method of determining the boring location and the surface elevation at the boring is noted in the report. This information is represented in the soil boring logs and/or a drawing. The location and elevation of the borings should be considered accurate only to the degree inherent with the method used and may be approximate.

The soil boring log includes sampling information, description of the materials recovered, approximate depths of boundaries between soil and rock strata as encountered and immediate depth to water data. The log represents conditions recorded specifically at the location where and when the boring was made. Site conditions may vary through time as will subsurface conditions. The boundaries between different soil strata as encountered are indicated at specific depths; however, these depths are in fact approximate and dependent upon the frequency of sampling, nature and consistency of the respective strata. Substantial variation between soil borings may commonly exist in subsurface conditions. Water level readings are made at the time and under conditions stated on the boring logs. Water levels change with time, precipitation, canal level, local well drawdown and other factors. Water level data provided on soil boring logs shall not be relied upon for groundwater based design or construction considerations.

LABORATORY AND FIELD TESTS

Tests are performed in *general* accordance with specific ASTM Standards unless otherwise indicated. All criteria included in a given ASTM Standard are not always required and performed. Each test boring report indicates the measurements and data developed at each specific test location.

ANALYSIS AND RECOMMENDATIONS

The geotechnical report is prepared primarily to aid in the design of site work and structural foundations. Although the information in the report is expected to be sufficient for these purposes, it shall not be utilized to determine the cost of construction nor to stand alone as a construction specification. Contractors shall verify subsurface conditions as may be appropriate prior to undertaking subsurface work.

Report recommendations are based primarily on data from test borings made at the locations shown on the test boring reports. Soil variations commonly exist between boring locations. Such variations may not become evident until construction. Test pits sometimes provide valuable supplemental information that derived from soil borings. If variations are then noted, the geotechnical engineer shall be contacted in writing immediately so that field conditions can be examined and recommendations revised if necessary.

The geotechnical report states our understanding as to the location, dimensions and structural features proposed for the site. ***Any significant changes of the site improvements or site conditions must be communicated in writing to the geotechnical engineer immediately*** so that the geotechnical analysis, conclusions, and recommendations can be reviewed and appropriately adjusted as necessary.

CONSTRUCTION OBSERVATION

Construction observation and testing is an important element of geotechnical services. The geotechnical engineer's field representative (G.E.F.R.) is the "owner's representative" observing the work of the contractor, performing tests and reporting data from such tests and observations. ***The geotechnical engineer's field representative does not direct the contractor's construction means, methods, operations or personnel.*** The G.E.F.R. does not interfere with the relationship between the owner and the contractor and, except as an observer, does not become a substitute owner on site. The G.E.F.R. is responsible for his/her safety, but has no responsibility for the safety of other personnel at the site. The G.E.F.R. is an important member of a team whose responsibility is to observe and test the work being done and report to the owner whether that work is being carried out in general conformance with the plans and specifications. The enclosed report may be relied upon solely by the named client.

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October 30, 2020

Mr. Sean Compel
Stantec
901 Ponce de Leon Blvd., Suite 900
Coral Gables, FL 33134

Subject: Report of Exfiltration Test
Indian Creek Village Improvements
Miami Beach, FL

Dear Mr. Compel:

Nutting Engineers of Florida, Inc. has performed nine exfiltration tests at the above referenced location. This report presents a brief description of the field procedures, and the results of the exfiltration tests.

Nine exfiltration tests were performed to depths of ten feet below existing grade in accordance with South Florida Water Management District (SFWMD) criteria for 'Usual Open-Hole' conditions.

Prior to starting the test, a 6-inch diameter hole was augured to the test depth to determine the depth to groundwater and to examine subgrade soils. After establishing the above parameters, the hole was stabilized by a full-length perforated PVC pipe in accordance with South Florida Water Management District specifications. Water was then pumped into the hole maintaining a constant water level at the ground surface. The stabilized flow rates were recorded in one-minute intervals for a total of 10 minutes.

The exfiltration tests revealed the hydraulic conductivity ('K'-value) of the soil ranged from 1.23×10^{-5} to 4.56×10^{-4} cubic feet per second per square foot per foot of head. Soil descriptions and flow rates for the tests are shown on the attached exfiltration summary sheet. We note that the water table was encountered at a depth of approximately one foot to four and a half feet below ground surface. This testing was performed to determine the hydraulic conductivity value only. Soil information shall not be used for other purposes.

We appreciate the opportunity to provide these services for you. Should you have any questions, or if we can be of further assistance, please feel free to contact us.

Respectfully Submitted:
NUTTING ENGINEERS OF FLORIDA, INC.

RCW 10/30/20

Richard C. Wohlfarth, P.E. # 50858
Director of Engineering

2051 N.W. 112th Ave., Suite 126 · MIAMI, FLORIDA 33172 · 305-824-8827 · FAX (305) 824-8827
Broward (954) 941-8700 · Port St. Lucie (772) 408-1050 · Palm Beach (561) 736-4900

NUTTING ENGINEERS OF FLORIDA, INC. ESTABLISHED 1967

INDIAN CREEK VILLAGE IMPROVEMENTS
INDIAN CREEK VILLAGE
MIAMI BEACH, FLORIDA

APPROXIMATE TEST LOCATIONS

NOT TO SCALE

FIGURE 1

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Report of Exfiltration Test

Client: Stantec
Project: Indian Creek Village Improvements
Location: Miami Beach, FL

Order No 1661.62
Report No 1
Date: 10/28/20

Test: Usual Open Hole Exfiltration Test
Surface Elevation: Approx. same as road crown
Water table from ground surface: 1.17'

Casing Diameter: 6"
Tube Depth: 10'

Sample Location: Approx. as located on site plan

Material:

0'- 0.17'	DRILLED ASPHALT
0.17'- 1'	Lt. brown LIMESTONE FRAGMENTS
1'- 2'	Lt. brown fine SAND and LIMESTONE FRAGMENTS
2'- 10'	Gray fine SAND and SILTY SAND

One Minute Increme	Pump Rate in Gal/Min
1	0.25
2	0.25
3	0.25
4	0.13
5	0.13
6	0.25
7	0.13
8	0.25
9	0.25
10	0.25

$K = 2.70 \times 10^{-5}$ cfs/ft^{2}ft.head

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Report of Exfiltration Test

Client: Stantec
Order No 1661.62
Project: Indian Creek Village Improvements
Report No 2
Location: Miami Beach, FL
Date: 10/28/20

Test: Usual Open Hole Exfiltration Test
Surface Elevation: Approx. same as road crown
Water table from ground surface: 3.42'

Casing Diameter: 6"
Tube Depth: 10'

Sample Location: Approx. as located on site plan

Material:

0'- 0.17'	DRILLED ASPHALT
0.17'- 1'	Lt. brown LIMESTONE FRAGMENTS
1'- 2'	Lt. brown fine SAND and LIMESTONE FRAGMENTS
2'- 10'	Gray SILTY SAND

One Minute Increme	Pump Rate in Gal/Min
1	0.25
2	0.25
3	0.25
4	0.25
5	0.25
6	0.25
7	0.25
8	0.25
9	0.25
10	0.25

$K = 1.23 \times 10^{-5}$ cfs/ft^{2}ft.head

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Report of Exfiltration Test

Client: Stantec
Project: Indian Creek Village Improvements
Location: Miami Beach, FL

Order No 1661.62
Report No 3
Date: 10/28/20

Test: Usual Open Hole Exfiltration Test
Surface Elevation: Approx. same as road crown
Water table from ground surface: 3.25'

Casing Diameter: 6"
Tube Depth: 10'

Sample Location: Approx. as located on site plan

Material:

0'- 0.17'	DRILLED ASPHALT
0.17'- 1'	Lt. brown LIMESTONE FRAGMENTS
1'- 5'	Lt. brown fine SAND and SHELLS
5'- 10'	Gray fine SAND and SHELLS

One Minute Increme	Pump Rate in Gal/Min
1	1.00
2	0.50
3	0.50
4	1.00
5	0.50
6	1.00
7	0.50
8	0.50
9	0.50
10	0.50

$K = 3.34 \times 10^{-5}$ cfs/ft^{2}ft.head

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Report of Exfiltration Test

Client: Stantec
Project: Indian Creek Village Improvements
Location: Miami Beach, FL

Order No 1661.62
Report No 4
Date: 10/28/20

Test: Usual Open Hole Exfiltration Test
Surface Elevation: Approx. same as road crown
Water table from ground surface: 4.5'

Casing Diameter: 6"
Tube Depth: 10'

Sample Location: Approx. as located on site plan

Material:

0'- 0.17'	DRILLED ASPHALT
0.17'- 1'	Lt. brown LIMESTONE FRAGMENTS
1'- 7'	Lt. brown fine SAND and SHELLS
7'- 10'	Gray fine SAND, trace shells

One Minute Increme	Pump Rate in Gal/Min
1	5.00
2	5.00
3	4.50
4	4.50
5	5.00
6	4.50
7	4.50
8	4.50
9	4.50
10	4.50

$K = 1.86 \times 10^{-4}$ cfs/ft^{2}ft.head

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Report of Exfiltration Test

Client: Stantec
Project: Indian Creek Village Improvements
Location: Miami Beach, FL

Order No 1661.62
Report No 5
Date: 10/28/20

Test: Usual Open Hole Exfiltration Test
Surface Elevation: Approx. same as road crown
Water table from ground surface: 1.33'

Casing Diameter: 6"
Tube Depth: 10'

Sample Location: Approx. as located on site plan

Material:

0'- 0.25'	DRILLED ASPHALT
0.25'- 1'	Lt. brown LIMESTONE FRAGMENTS
1'- 3'	Lt. brown fine SAND, trace limestone fragments and shells
3'- 8'	Gray fine SAND and SHELLS
8'- 10'	Dk. Brown PEAT

One Minute Increme	Pump Rate in Gal/Min
1	1.00
2	1.00
3	1.50
4	1.00
5	1.00
6	1.00
7	1.50
8	1.50
9	1.00
10	1.00

$K = 1.30 \times 10^{-4}$ cfs/ft^{2}ft.head

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Report of Exfiltration Test

Client: Stantec
Project: Indian Creek Village Improvements
Location: Miami Beach, FL

Order No 1661.62
Report No 6
Date: 10/28/20

Test: Usual Open Hole Exfiltration Test
Surface Elevation: Approx. same as road crown
Water table from ground surface: 1.33'

Casing Diameter: 6"
Tube Depth: 10'

Sample Location: Approx. as located on site plan

Material:

0'- 0.25'	DRILLED ASPHALT
0.25'- 1'	Lt. brown LIMESTONE FRAGMENTS
1'- 3'	Lt. brown fine SAND and LIMESTONE FRAGMENTS
3'- 8'	Gray fine SAND, trace shells
8'- 10'	Dk. Brown PEAT

One Minute Increme	Pump Rate in Gal/Min
1	0.50
2	0.50
3	0.50
4	0.50
5	0.50
6	0.50
7	0.50
8	0.50
9	0.50
10	0.50

$K = 5.64 \times 10^{-5}$ cfs/ft^{2}ft.head

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Report of Exfiltration Test

Client: Stantec — Order No 1661.62
Project: Indian Creek Village Improvements — Report No 7
Location: Miami Beach, FL — Date: 10/28/20

Test: Usual Open Hole Exfiltration Test
Surface Elevation: Approx. same as road crown — Water table from ground surface: 1.67'

Casing Diameter: 6"
Tube Depth: 10'

Sample Location: Approx. as located on site plan

Material:

0'- 0.25'	DRILLED ASPHALT
0.25'- 1'	Lt. brown LIMESTONE FRAGMENTS
1'- 2'	Lt. brown fine SAND and SHELLS
2'- 5'	Gray fine SAND and SHELLS
5'- 7'	Dk. Brown PEAT
7'- 10'	Grat fine SAND

One Minute Increme	Pump Rate in Gal/Min
1	2.50
2	2.00
3	2.00
4	2.50
5	2.50
6	2.00
7	2.50
8	2.50
9	2.50
10	2.50

$K = 2.15 \times 10^{-4}$ cfs/ft^{2}ft.head

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Report of Exfiltration Test

Client: Stantec
Project: Indian Creek Village Improvements
Location: Miami Beach, FL

Order No 1661.62
Report No 8
Date: 10/28/20

Test: Usual Open Hole Exfiltration Test
Surface Elevation: Approx. same as road crown
Water table from ground surface: 1.75'

Casing Diameter: 6"
Tube Depth: 10'

One Minute Increme	Pump Rate in Gal/Min
1	3.00
2	3.00
3	3.50
4	3.50
5	3.00
6	3.00
7	3.50
8	3.50
9	3.00
10	3.50

Sample Location: Approx. as located on site plan

Material:

0'- 0.29'	DRILLED ASPHALT
0.29'- 1'	Lt. brown LIMESTONE FRAGMENTS
1'- 2'	Lt. brown fine SAND, trace limestone fragments
2'- 5'	Gray fine SAND and SHELLS
5'- 8'	Dk. Brown PEAT
8'- 10'	Grat fine SAND

$K = 2.85 \times 10^{-4}$ cfs/ft^{2}ft.head

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Report of Exfiltration Test

Client:	Stantec	Order No	1661.62
Project:	Indian Creek Village Improvements	Report No	9
Location:	Miami Beach, FL	Date:	10/28/20

Test: Usual Open Hole Exfiltration Test

Surface Elevation: Approx. same as road crown Water table from ground surface: 1.42'

Casing Diameter: 6"

Tube Depth: 10'

Sample Location: Approx. as located on site plan

Material:

0'- 0.08'	DRILLED ASPHALT
0.08'- 1'	Lt. brown LIMESTONE FRAGMENTS
1'- 2'	Lt. brown fine SAND and SHELLS
2'- 10'	Gray fine SAND, trace shells

One Minute Increme	Pump Rate in Gal/Min
1	4.00
2	4.00
3	4.00
4	4.50
5	4.50
6	4.00
7	4.50
8	4.50
9	4.50
10	4.50

$K = 4.56 \times 10^{-4}$ cfs/ft^{2}ft.head

LIMITATIONS OF LIABLILITY

WARRANTY

We warranty that the services performed by Nutting Engineers of Florida, Inc. are conducted in a manner consistent with that level of care and skill ordinarily exercised by members of the profession in our area currently practicing under similar conditions at the time our services were performed. ***No other warranties, expressed or implied, are made***. While the services of Nutting Engineers of Florida, Inc. are a valuable and integral part of the design and construction teams, we do not warrant, guarantee or insure the quality, completeness, or satisfactory performance of designs, construction plans, specifications we have not prepared, nor the ultimate performance of building site materials or assembly/construction.

SUBSURFACE EXPLORATION

Subsurface exploration is normally accomplished by test borings; test pits are sometimes employed. The method of determining the boring location and the surface elevation at the boring is noted in the report. This information is represented in the soil boring logs and/or a drawing. The location and elevation of the borings should be considered accurate only to the degree inherent with the method used and may be approximate.

The soil boring log includes sampling information, description of the materials recovered, approximate depths of boundaries between soil and rock strata as encountered and immediate depth to water data. The log represents conditions recorded specifically at the location where and when the boring was made. Site conditions may vary through time as will subsurface conditions. The boundaries between different soil strata as encountered are indicated at specific depths; however, these depths are in fact approximate and dependent upon the frequency of sampling, nature and consistency of the respective strata. Substantial variation between soil borings may commonly exist in subsurface conditions. Water level readings are made at the time and under conditions stated on the boring logs. Water levels change with time, precipitation, canal level, local well drawdown and other factors. Water level data provided on soil boring logs shall not be relied upon for groundwater based design or construction considerations.

LABORATORY AND FIELD TESTS

Tests are performed in *general* accordance with specific ASTM Standards unless otherwise indicated. All criteria included in a given ASTM Standard are not always required and performed. Each test boring report indicates the measurements and data developed at each specific test location.

ANALYSIS AND RECOMMENDATIONS

The geotechnical report is prepared primarily to aid in the design of site work and structural foundations. Although the information in the report is expected to be sufficient for these purposes, it shall not be utilized to determine the cost of construction nor to stand alone as a construction specification. Contractors shall verify subsurface conditions as may be appropriate prior to undertaking subsurface work.

Report recommendations are based primarily on data from test borings made at the locations shown on the test boring reports. Soil variations commonly exist between boring locations. Such variations may not become evident until construction. Test pits sometimes provide valuable supplemental information that derived from soil borings. If variations are then noted, the geotechnical engineer shall be contacted in writing immediately so that field conditions can be examined and recommendations revised if necessary.

The geotechnical report states our understanding as to the location, dimensions and structural features proposed for the site. ***Any significant changes of the site improvements or site conditions must be communicated in writing to the geotechnical engineer immediately*** so that the geotechnical analysis, conclusions, and recommendations can be reviewed and appropriately adjusted as necessary.

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