CONTRACT DOCUMENTS

FOR

CONSTRUCTION

OF

ANNUAL TRAFFIC SIGNAL CONSTRUCTION CONTRACT

PALM BEACH COUNTY, FLORIDA

PROJECT NO. 2022052

PALM BEACH COUNTY, FLORIDA

PROJECT NAME: ANNUAL TRAFFIC SIGNAL CONTRACT

PROJECT NO.: 2022052

BOARD OF COUNTY COMMISSIONERS
PALM BEACH COUNTY, FLORIDA
ENGINEERING & PUBLIC WORKS
ROADWAY PRODUCTION DIVISION

Project Name: **ANNUAL TRAFFIC SIGNAL CONSTRUCTION CONTRACT**

Project Number: 2022052

ADDENDUM NO. 1

Date of Issuance: March 10, 2022

SPECIFICATIONS: **Delete: A, TSP-13**

Insert: AA, TSP-13A

Add pages TSP-137, TSP-138

PLANS: **Delete: Traffic Signal Standards - Drawing T-6.3 Sheet 16 of 28 (Not Dated)**

Insert: Traffic Signal Standards - Drawing T-6.3 Sheet 16 of 28 (Dated 3/8/22)

It is required that **ADDENDUM NO. 1** be acknowledged in the space provided on the **PROPOSAL FORM.**

APPROVED BY: FJ

INDEX

Bidding Forms

NOTICE TO BIDDERS

A NON-MANDATORY PRE-BID MEETING WILL BE HELD ON

THURSDAY, FEBRUARY 24, 2022 AT 10:00 A.M.

AT THE ENGINEERING & PUBLIC WORKS DEPARTMENT

IN THE THIRD FLOOR MAIN CONFERENCE ROOM (3W-12)

LOCATED AT 2300 NORTH JOG ROAD

WEST PALM BEACH, FLORIDA, 33411-2745

ATTENDANCE VIA TELECONFERENCE OPTION:
CALL (561) 776-2160
PIN: 903287

IF THERE ARE ANY QUESTIONS

CONCERNING THIS MEETING,

PLEASE CONTACT THE OFFICE OF

ROADWAY PRODUCTION

AT (561) 684-4150

ADVERTISEMENT FOR

Sealed Bids will be received by the Board of County Commissioners, Palm Beach County, Florida, in the Office of Palm Beach County Engineering & Public Works Department, Roadway Production Division, located at 2300 North Jog Road, Third Floor Room 3W-33, West Palm Beach, Florida, 33411-2745, up to 2:00 P.M., local time, and opened in the Third Floor Conference Room (3W-12) on **Tuesday, March 15, 2022**, for furnishing all Materials, labor, Equipment and supplies necessary for the Construction of:

ANNUAL TRAFFIC SIGNAL CONSTRUCTION CONTRACT
PALM BEACH COUNTY PROJECT NO. 2022052

Bids will be accepted via standard shipping services *(such as UPS, FedEx, USPS, or similar)* **at 2300 North Jog Road, Third Floor, Room 3W-33, West Palm Beach, Florida, 33411-2745 up to the deadline listed above.**

Bids will be accepted via hand delivery *(including courier services)* from 1:00 P.M. until 2:00 P.M. **on the bid due date listed above outside the Engineering & Public Works Lobby at 2300 North Jog Road, Third Floor, Room 3E-62 and opened at 2:00 p.m. in this location.**

All conditions and requirements for Bid submission, consideration, and award are contained in the Contract Documents, which are posted on the following Palm Beach County web site:
https://pbcvssp.co.palm-beach.fl.us/webapp/vssp/AltSelfService

To review the Contract documents for this project, go to the above URL and click on the project hyperlink. Contractors may then download and print the Contract documents (Plans, Specifications, Excel Proposal Forms, check list "with required forms" and any other related documents).

Hard copy documents will be available at the Department for a non-refundable service fee of **$55**. The Contractor shall contact Palm Beach County Roadway Production Division at (561) 684-4150 **in advance** to arrange for hard copies.

All Bids shall be submitted in accordance with the Bid documents, including but not limited to the General Provision Section 2 and accompanied by the documentation referenced therein.

The NON-MANDATORY Pre-Bid Meeting will be held on Thursday, February 24, 2022 at 10:00 A.M., in the Third Floor Main Conference Room (3W-12) in the Palm Beach County Building at 2300 North Jog Road, West Palm Beach, Florida. The pre-bid meeting may be attended via teleconference by calling (561) 776-2160 and entering PIN 903287 at the above listed date and time. Attendance at this pre-bid meeting is not mandatory but is highly recommended and strongly encouraged. To the extent you are unable to attend the pre-bid meeting, you may request and obtain an audio recording of the meeting by contacting Palm Beach County Roadway Production Division at (561) 684-4150.

The Board of County Commissioners reserves the right to reject any or all Bids. By order of the Board of County Commissioners, Palm Beach County, Florida.

ATTEST:
JOSEPH ABRUZZO, CLERK OF THE CIRCUIT COURT
& COMPTROLLER

DAVID RICKS, P.E., COUNTY ENGINEER

ATTEST:
BOARD OF COUNTY COMMISSIONERS
PALM BEACH COUNTY, a political subdivision of the State of Florida, by and through its Board of County Commissioners

BY: Robert S. Weinroth, Mayor

PUBLISH: PALM BEACH POST
SUNDAY: FEBRUARY 13, 2022
SUNDAY: FEBRUARY 20, 2022

At a minimum, submit
One (1) original package containing the following:

(see contract documents to determine of other requirements apply)

_____ EBO Schedules 1 & 2 (pages EBO-1, EBO-2)

_____ All Proposal Pages (P Pages)

_____ Signed Contractor's Certification (Last P Page)

_____ Signed/Sealed Local Preference (Page LP-2)
with Copy of Bidder's Palm Beach County Tax Receipt (If Eligible)

_____ Signed/Sealed Living Wage (Pages LW-2, LW-3, LW-4)

_____ Scrutinized Companies (Page SC-1)

_____ Acknowledged/Sealed Bid Bond and Bid Bond forms pages BB-1 and BB-2

_____ Certificate of Resolution (Page CC-1)

_____ Copy of Firm's Active License to Conduct Business in the State of Florida

_____ Certification of Sublet Work (Page SW-1)

_____ FDOT Pre-qualification Letter or Similar Project Experience
(see General Provisions Section 2-1)

Please do not staple or permanently bind the bid documents.

INSTRUCTIONS TO BIDDERS

Prospective Bidders are hereby advised that Division I of the FDOT Standard Specifications for Road and Bridge Construction July 2021 (and as amended herein) (Specifications) shall serve as instructions to Bidders along with the following:

1. Annual Construction Contract on a Task Work Order Basis
2. Addenda – Changes while Bidding
3. Pre-Bid Site Inspection and NON-MANDATORY Pre-Bid Meeting
4. Laws Affecting Public Work
5. Power of Attorney
6. Equal Business Opportunity (EBO) Program
7. Incentives
8. VSS Registration Required
9. Posting of Bid Tabulations

1. ANNUAL CONSTRUCTION CONTRACT ON A TASK WORK ORDER BASIS

See Contract Provisions for:

- **Annual Construction Contract Intent**: *See Special Provisions Item #1*
- **Contract Expiration/Extension**: *See Special Provisions Item #3*
- **Method of Ordering Work**: *See Special Provisions Item #4*
- **Prosecution of the Work**: *See Special Provisions Item #5*
- **Spending Limit/Contract Amount**: *See Contract Page C-1*
- **Bond Requirements**: *See General Provisions Section 3-5*

2. ADDENDA – CHANGES WHILE BIDDING: No interpretation of the meaning of the Plans, Specifications or other Contract Documents will be made to any Bidder orally. Every Request for Information (RFI) is preferred to be submitted to the Director, Palm Beach County Roadway Production Division via electronic mail (e-mail) to email address:

ENG-RoadwayBids@pbcgov.org

RFI's may also be mailed or faxed to the Director at the following: 2300 N. Jog Road, Suite #3W-33, West Palm Beach, Florida, 33411-2745. Fax: 561-684-4166. For the RFI to be given consideration, it must be submitted at least five (5) Working Days prior to the date and time fixed for the opening of Bids.

Any and all such interpretations and any supplemental instructions will be in the form of written Addenda to the Contract Documents which, if issued, will be posted on the following URL: https://pbcvssp.co.palm-beach.fl.us/webapp/vssp/AltSelfService up to seventy-two (72) hours prior to the date and time fixed for the opening of Bids. The exceptions to this notification period shall be that of an Addenda whose content is limited to the listing of additional approved manufacturers and substitutions, or one which contains minor clarifications or changes, which shall be issued up to 24 hours prior to the date fixed for the Contract Letting. The request for

Bids may be withdrawn, or the date for receipt of Bids may be postponed, at any time prior to the bid opening.

The Bidder shall acknowledge and certify receipt of all addenda by completing the Proposal Form page. Copies of Addenda will also be made available for inspection at the Department where Bidding Documents are on file for that purpose. Failure of any Bidder to receive any such Addenda of interpretation shall not relieve any Bidder from any obligation under the Bid as submitted. All addenda so issued shall, ultimately, become part of the Contract Documents.

3. PRE-BID SITE INSPECTION AND NON-MANDATORY PRE-BID MEETING

SITE INSPECTION – This is an annual countywide contract on a work task order basis. The sites for the work task orders are to be determined as the need arises. Therefore no Department sponsored Pre-Bid Inspection Meeting will be held for this Contract.

NON-MANDATORY PRE-BID MEETING – See Notice to Bidders.

4. LAWS AFFECTING PUBLIC WORK: Bidders shall be familiar with the various Federal, State and Local Laws affecting the prosecution of the Work. As outlined in Section 2-11 of the Specifications, Palm Beach County (County) Administrative Code Section 305.02 & 402.00, and the Purchasing Ordinance (Palm Beach County Code, Chapter 2, Article III, Division 2, Part A), the County is responsible to assure the qualifications of any or all prospective Contractors.

5. POWER OF ATTORNEY: Attorneys-in-fact who sign Proposal Guaranties and Contract Bonds must file with such bond a certified copy of their power of attorney to sign said bonds.

6. EQUAL BUSINESS OPPORTUNITY PROGRAM

Please note that all forms related to the Equal Business Opportunity (EBO) Program, including waiver forms and good faith effort documentation can be found at:

https://discover.pbcgov.org/oebo/Pages/Compliance-Programs.aspx.

6.1 - Definitions The following terms, phrases, words and their derivations shall have the meanings given. Where not inconsistent with the context, words used in the present tense include the future tense, words in the plural number include the singular number, "any" includes "all," "and" includes "or." Capitalized terms are defined as set forth in the EBO Ordinance, and in the Contract.

6.1.1 - **"Prime"** and **"prime consultant"** mean, refer, and relate to **"Prime Contractor,"** as defined in the EBO Ordinance, and to **"Consultant,"** as defined in the Contract, and as applicable.

6.1.2 - **"Solicitation"** and **"solicit"** mean, refer, and relate to Advertisement for Proposals.

6.1.3 - **"Proposer"** shall mean **"Bidder"**

6.1.4 - **"Proposal"** shall mean **"Bid"** as defined in the EBO Ordinance.

6.1.5 – **"Sub-Contractor"** shall mean **"Sub-consultant"** as applicable.

6.2 - Policy

It is the policy of Palm Beach County's Board of County Commissioners that all segments of its business population, including, but not limited to, small, local, minority and women owned businesses, have an equitable opportunity to participate in the Department's procurement process, prime contract and subcontract opportunities. In pursuance of that policy, the Department's Board of County Commissioners adopted an Equal Business Opportunity Ordinance which is codified in Sections 2-80.20 through 2-80.30 (as may be amended) of the Palm Beach County Code. The EBO Ordinance sets forth the Department's requirements for the EBO Program, and is incorporated herein and made part of this Contract. The Contractor must comply with the requirements contained in this section for the Contractor to be deemed responsive to the solicitation requirements. The provisions of the EBO Ordinance are applicable to this solicitation, and shall have precedence over the provisions of this solicitation in the event of a conflict. Failure to comply with the EBO Ordinance may result in any of the penalties listed in section 6.9.

6.3 - Application of S/M/WBE Goals through Affirmative Procurement Initiatives (APIs)

The Contractor must adhere to the Affirmative Procurement Initiatives (APIs) as incorporated herein, including Advertisement for Bid, and the specifications set forth in Contractor's response, which are both incorporated herein by reference. Failure to comply with this Section is a material breach of this Contract. The Bidder is encouraged to seek additional small business enterprises for participation in subcontracting opportunities.

6.3.1 - Application of API(s)

The API approved for this solicitation, including any applicable S/M/WBE goals, were Waived on January 20, 2022 by the Palm Beach County Office Of Equal Business Opportunity.

Any bid that fails to comply with the API requirements included in this solicitation after the period allowed for waiver requests has lapsed shall be deemed non-responsive to the solicitation requirements.

6.3.2 - API Waiver Requests

If The Contractor is unable to comply with the API(s) requirements as set forth in this solicitation, the Contractor shall submit a request for a waiver or partial waiver at least seven (7) business days prior to the bid due date as stated in the solicitation.

If the Contractor requests a waiver from an API requirement from the Office of Equal Business Opportunity (OEBO) at least seven (7) business days prior to the bid due date, then the bid due date will be extended pending the outcome of a waiver request. Additionally, if the waiver is granted, the solicitation will be amended accordingly and the due date extended. After submission of a bid, if The Contractor, through no fault of its own, is unable to meet the S/M/WBE participation specified in its bid, then The Contractor must immediately seek substitute S/M/WBEs to fulfill the requirements and obtain the approval of the EBO Director. If, after reasonable Good Faith Efforts, as defined below, the Contractor is unable to find an acceptable substitute S/M/WBE, a post-bid opening waiver may be requested. The request shall document the reasons for the Contractor's inability to meet the goal requirement. In the event the Contractor is found not to have performed Good Faith Efforts, as defined below, in its attempt to find a suitable substitute for the initial S/M/WBE proposed utilization, one (1) or more of the penalties and sanctions as set forth in the EBO Ordinance may be applied.

6.3.3 - Good Faith Efforts

Such waiver request shall include specified documentation that demonstrates satisfactory Good Faith Efforts, as defined below, were undertaken by The Contractor to comply with the requirements as described under the selected API. The Good Faith Effort waiver request with instructions for submission to the OEBO, is located on the EBO website at https://discover.pbcgov.org/oebo/Pages/Compliance-Programs.aspx. The OEBO shall review a waiver request within seven (7) business days of receipt. The bid due date will be extended during this review period. If the OEBO determines that adequate Good Faith Efforts, as defined below, have been demonstrated by the Contractor to warrant a partial or total waiver of the API, then the solicitation shall be amended accordingly to reflect the partial or total waiver, and any bids received by the Department in the interim shall be returned unopened. The amended solicitation shall then be advertised to all prospective Bidders and the bid due dated extended. However, if the OEBO determines that the Bidder failed to submit documentation sufficient to demonstrate that Good Faith Efforts, as defined below, were undertaken by the Bidder to support its waiver or partial waiver request, the request for waiver or partial waiver shall be denied, and the solicitation shall remain unchanged. In the event of an adverse waiver or partial waiver request decision, the Bidder shall have the right to request reconsideration of the adverse decision by the Director OEBO, and if still aggrieved, shall be subsequently entitled to the process for an appeal to a Special Master as referenced in Section 2.-80.28 (b) of the EBO Ordinance. The solicitation due date shall be extended pending the OEBO Director's reconsideration and Special Master appeal process, if requested.

6.3.4 - Documentation Required for Good Faith Efforts

Documentation means documentation of the Bidder's intent to comply with the applicable API(s), including, but not limited to, the following:

- documentation as stated in the solicitation reflecting the Bidder's commitment to comply with S/M/WBE goals as established by the OEBO for a particular contract; or
- documentation of efforts made toward achieving EBO program goals
    - solicitations of bids/proposals/qualification statements from all qualified S/M/WBE firms listed in the OEBO's directory of certified S/M/WBE firms;
    - correspondence from qualified S/M/WBE firms documenting their unavailability to perform S/M/WBE contracts;
    - documentation of efforts to subdivide work into smaller quantities for subcontracting purposes to enhance opportunities for S/M/WBE firms;
    - documentation of a Prime Consultant's posting of a bond covering the work of S/M/WBE Sub-Contractors;
    - documentation of efforts to assist S/M/WBE firms with obtaining financing, bonding or insurance required by the Bidder; and
    - documentation of consultations with trade associations and contractors that represent the interests of S/M/WBEs in order to identify qualified and available S/M/WBE Sub-Contractors.

Scoring of Good Faith Efforts documentation and administrative determinations regarding the adequacy of such Good Faith Efforts is the responsibility of the OEBO.

6.4 - Proposal Submission Documentation

S/M/WBE bidders, proposing as prime contractors, are advised that they must complete Schedule 1 and Schedule 2, listing the work to be performed by their own workforce, as well as the work to be performed by all Sub-Contractors, including S/M/WBE Sub-Contractors. Failure to include this information on Schedule 1 will result in the participation by the S/M/WBE prime bidder's own workforce NOT being counted towards meeting the S/M/WBE goal. This requirement applies even if the S/M/WBE bidder intends to perform 100% of the work with their own workforce.

6.4.1 - S/M/WBE Participation. Bidder represents and warrants that Bidder will meet the S/M/WBE participation percentages submitted in its bid with the Sub-Contractors contained on Schedules 1 and 2 and at the dollar values specified. Bidder agrees to provide any additional information requested by the Department to substantiate participation.

6.4.2 - Bidders are required to submit Schedules 1 and 2 with their bid in order to be deemed responsive to this solicitation. Sub-Contractor documentation shall be submitted as follows:

6.4.2.1 - Schedule 1 - List of Proposed Sub-Contractors
A completed Schedule 1 submitted by the prime shall list the names of all Sub-Contractors intended to be used in performance of the Contract, if awarded. The total proposed percentage of S/M/WBE participation shall also be included on this form. This schedule shall also be used if an S/M/WBE Contractor is performing all or any portion of this Contract with their work force.

6.4.2.2 - Schedule 2 - Letter of Intent
A completed Schedule 2 is a binding document between the Contractor and a Sub-Contractor (or any tier) and should be treated as such. The Schedule 2 shall contain bolded language indicating that by signing the Schedule 2, both parties recognize this Schedule as a binding document. Each Schedule 2 shall be properly executed by the Contractor and by the proposed Sub-Contractor. If the Contractor is an S/M/WBE, a Schedule 2 shall be submitted to document work to be performed by its workforce. All S/M/WBE(s) shall specify, in detail, the type of work they will perform along with the dollar amount they will be compensated and/or percentage of work they will perform. If any Sub-Contractor intends to subcontract any portion of their work, they are required to list the dollar amount and the name of the Sub-Contractor on this form. All named Sub-Contractors on this form must also complete and submit a separate Schedule 2. The Contractor may count toward its S/M/WBE goal second and third tiered certified S/M/WBE(s); provided that the Contractor submits a completed Schedule 2 form for each S/M/WBE.

A detailed quote or bid may be attached with a signed Schedule 2.

6.4.2.3 – Schedule Submittals

6.4.2.3.1 - Failure to submit a properly executed Schedule 1 and Schedule 2 will result in a bid being rejected as non-responsive to the solicitation.

6.4.2.3.2 - In the event of a conflict between Schedules 1 and 2 when calculating S/M/WBE participation, the information provided on Schedule 2 shall have precedence.

6.4.2.3.3 - In the event of mathematical error(s), the unit price, if available, shall prevail and the prime's total offer shall be corrected accordingly.

6.4.3 - The Department reserves the right to accept the use of a Sub-Contractor or to reject the selection of a particular Sub-Contractor and to inspect all facilities of any Sub-Contractors in order to make a determination as to the capability of the Sub-Contractor to perform properly under this Contract.

6.5 - S/M/WBE Certification

Only those firms certified by Palm Beach County at the time of bid submission shall be counted toward the established S/M/WBE goals. Upon receipt of a completed application, **IT TAKES UP TO NINETY (90) BUSINESS DAYS TO BECOME CERTIFIED AS AN S/M/WBE WITH PALM BEACH COUNTY.** It is the responsibility of the bidder to confirm the certification of any proposed S/M/WBE; therefore, it is recommended that bidders visit the online Vendor Directory at https://discover.pbcgov.org/oebo/Pages/Vendor-Directory.aspx to verify S/M/WBE certification status. Firms must continue to recertify during the life of the Contract as the Department may only count toward the established goal, work performed by an S/M/WBE during the time their certification dates are valid.

6.6 - Counting S/M/WBE Participation

Once a business is determined to be an eligible S/M/WBE according to the County certification procedures, the Contractor may count toward its goals only that portion of the total dollar value of a contract performed by the S/M/WBE. Prior to issuance of this solicitation, the total dollar value of a contract will be determined by the Department by defining factors to be considered as value. Total dollar value of retail contracts shall be determined by Gross Receipts, as defined in the EBO Ordinance.

6.6.1 - Certified S/M/WBE participation will only count toward the established goal in a business category in which it does not exceed the size standard.

6.6.2 - The Contractor may count toward the established API a portion of the total dollar value of a contract with a joint venture, based on the clearly defined portion of the work to be performed by the certified S/M/WBE of the joint venture.

6.6.3 - The Contractor may count toward the established API the entire expenditures for materials and equipment purchased by an S/M/WBE Sub-Contractor, provided that the S/M/WBE Sub-Contractor has the responsibility for the installation of the purchased materials and equipment.

6.6.4 - The Contractor may count sixty percent (60%) of its expenditure to S/M/WBE suppliers / distributors that are not manufacturers toward the established goal.

6.6.5 - The Contractor may count toward the established goal, second and third tiered certified S/M/WBEs, provided that the Prime submits a completed Schedule 2 form for each S/M/WBE.

6.6.6 - The Contractor may count the entire expenditure to an S/M/WBE manufacturer toward the established goal (i.e., a supplier/distributor that produces goods from raw materials or substantially alters the goods before resale).

6.6.7 - The Contractor may only count towards the established goal the goods and services in which the S/M/WBE Sub-Contractor is certified and performs with their work force.

6.7 - Responsibilities After Contract Award

6.7.1 - Schedule 3- Sub-Contractor Activity Form

The Contractor shall submit a completed Activity Report form (Schedule 3) with each invoice, or payment application when any Sub-Contractor has provided services during the period in which the Prime is requesting payment. This form shall contain the names of all Sub-Contractors, and specify the contracted dollar amount; approved change orders; revised contract amount; amount drawn this period; amount drawn to date; and payments to date issued to all Sub-Contractors with their starting date.

6.7.2 - Schedule 4- Payment Certification Form

A fully executed Schedule 4 shall be submitted for each Sub-Contractor after receipt of payment from the Contractor. The Contractor shall submit this form with each payment application or invoice submitted to the Department when the Department has paid the Contractor on the previous payment application for services provided by a Sub-Contractor. If any Sub-Contractor intends to disburse funds associated with this payment to another Sub-Contractor for labor provided on this Contract, the amount and name of the Sub-Contractor shall be listed on this form. All named Sub-Contractors on this form must also complete and submit a separate Schedule 4 after receipt of payment. If the Contractor is a certified S/M/WBE, a Schedule 4 shall be submitted to reflect the amount of payment retained by the Contractor for services performed by its own workforce. All bidders hereby agree and assure that they will meet the S/M/WBE participation percentages submitted in their respective bids with the Sub-Contractors contained on Schedules 1 and 2 and at the dollar values specified. Respondents or bidders agree to provide any additional information requested by the Department to substantiate participation.

6.7.3 - The successful CONSULTANT shall submit a Sub-Contractor Activity Form (Schedule 3) and Payment Certification Forms (Schedule 4) with each payment application or as otherwise required by EBO. **Failure to provide these forms may result in a delay in processing payment or disapproval of the invoice until they are submitted.** The Sub-Contractor Activity Form (Schedule 3) is to be filled out by the Contractor and the Payment Certification Forms (Schedule 4) are to be executed by the Sub-Contractor to verify receipt of payment.

6.7.4 - Upon letter notification by the Department that the EBO payment portal/tracking system is available for use, the Contractor is required to input all Sub-Contractor payment information directly into the EBO payment portal prior to submitting a payment application.

6.7.5 - Post Proposal Waiver Request. After submission of a bid, if Bidder, through no fault of its own, is unable to meet the S/M/WBE participation specified in its bid, then Bidder must immediately seek substitute S/M/WBEs to fulfill the requirements and obtain the approval of the EBO Director. If, after reasonable Good Faith Efforts, the Bidder is unable to find an acceptable substitute S/M/WBE, a post-bid opening waiver may be requested. The request shall document the reasons for the Bidder's inability to meet the goal requirement. In the event the Bidder is found not to have performed Good Faith Efforts in its attempt to find a suitable a substitute for the initial S/M/WBE proposed utilization, one (1) or more of the penalties and sanctions as set forth herein may be imposed by the EBO Office.

6.7.6 - Change Orders and Modifications. If the Department's issuance of an alternate or change order on a project results in changes in the scope of Work to be performed by a S/M/WBE Sub-Contractor listed at bid opening, the Contractor must submit a modified, completed and signed Schedule 2 that specifies the revised scope of Work to be performed by the S/M/WBE, along with the price and /or percentage.

6.8 - S/M/WBE Substitutions - Contractor must notify the Office of EBO of changes in S/M/WBE utilization and get prior approval for any substitutions.

If a Sub-Contractor fails to perform or make progress, as required by this Contract, and it is necessary to replace the Sub-Contractor to complete the work in a timely fashion, the Contractor shall promptly do so, subject to acceptance of the new Sub-Contractor by the Department.

6.8.1 - After Contract award, the Contractor will only be permitted to substitute a certified S/M/WBE that is unwilling or unable to perform. The Contractor will only be permitted to modify the scope of work or price of an S/M/WBE listed at bid opening or date/time for submission of the response to the solicitation as a result of the Department's issuance of an amendment, alternate or change orders on a project. Substitutions shall be done with like certified S/M/WBEs in order to maintain the participation percentages submitted with the bid.

6.8.2 - All requests for modifications or substitutions shall be submitted to the Department's Office of EBO on the EBO Request for S/M/WBE Substitution Modification

Removal Form for review. Upon receiving an approval for substitution, the Contractor shall submit a completed and signed Schedule 2 for the new S/M/WBE; the new S/M/WBE shall specify the type of work to be performed, and the dollar amount and/or percentage shall also be specified upon receiving approval for modification or substitution. A detailed quote or bid may be attached with a properly executed Schedule 2.

6.9 - EBO Program Compliance- Penalties

6.9.1 - Under the EBO Ordinance, the OEBO is required to implement and monitor S/M/WBE utilization during the term of any contract resulting from this solicitation. It is the Department's policy that S/M/WBEs shall have the maximum feasible opportunity to participate in the performance of Palm Beach County contracts. All Bidders are required to comply with the EBO Ordinance and shall be expected to comply with the API(s) applicable to this solicitation, as well as the S/M/WBE utilization proposed by a Bidder in its Proposal, which utilization plan forms a part of any resulting Contract.

6.9.2 – The Office of EBO has the right to review Contractor's records and interview Sub-Contractors. The Director of the OEBO or designee may require such reports, information, and documentation from the Bidder as are reasonably necessary to determine compliance with the EBO Ordinance requirements.

6.9.2.1 - Non-compliance with the EBO Ordinance must be corrected within fifteen (15) days of notice of non-compliance.

6.9.2.2 - If the Contractor does not resolve the non-compliance within fifteen (15) calendar days of receipt of written notice of non-compliance, then upon recommendation of sanctions by the Director of EBO or designee in consultation with the Department regarding the failure of a contractor, vendor, respondent or bidder or other business representative to comply with any portion of the EBO Ordinance, the Director of the EBO or designee (for purposes of imposing penalties, the Purchasing Director shall serve as the EBO designee) may impose any or all of the following penalties on the non-complying party any or all of the following penalties:

- Suspension of Contract;
- Withholding of funds;
- Termination of Contract based upon a material breach of Contract pertaining to EBO Program compliance;
- Suspension or Debarment of a respondent or bidder, contractor or other business entity from eligibility for providing goods or services to the Department for a period not to exceed three (3) years; and

- Liquidated damages equal to the difference in dollar value of S/M/WBE participation as committed to in the Contract, and the dollar value of S/M/WBE participation as actually achieved, if applicable.

6.10 – Payments to Sub-Contractors

6.10.1 - Contractor shall pay Sub-Contractors undisputed amounts within ten (10) days after Department pays the Contractor. In the event of a disputed invoice, the Contractor shall send the Sub-Contractor(s) and Department a written notice of the dispute within five (5) days after receipt of the subject invoice.

6.10.2 - The Contractor agrees to pay its Sub-Contractors in compliance with the Florida Prompt Payment Act. In the event Contractor fails to comply with payments(s) to its Sub-Contractors in accordance with the Florida Prompt Payment Act, Contractor shall be subject to any and all penalties and sanctions available under the terms of the EBO Program, its contract with the Department, or any other applicable law.

7. INCENTIVES

Apprentice Incentive

Palm Beach County offers an Apprentice Incentive payment to a contractor who actually expends a minimum of $25,000 (including Sub-Contractors) in payroll costs on apprentice wages. For purposes of this section, "apprentice" means any person who is participating in a Florida Department of Education registered apprenticeship program. The Living Wage provisions of this Contract shall not be diminished by paying an apprentice less than the Living Wage.

Upon completion of the Contract, Contractor may apply for the payment which will be added to the Contract by change order. If the County determines that the Contractor complied with the requirements of this section, it will reimburse the contractor 20% of its apprentice wages (including payroll taxes, costs, and benefits) up to a maximum reimbursement of $100,000. The request must be submitted no later than 45 days after Substantial Completion of the project.

For projects with construction costs of $20,000,000 or greater, the threshold amount of expenditures for apprentices which must be paid to qualify for the incentive shall increase to $50,000 and the maximum reimbursement payment to $200,000.

To be eligible for the Apprenticeship Incentive payment, the apprentice employer (through the Contractor) must provide the following documentation: apprentice name(s), contact information, the apprentice Registered Apprenticeship Partners Information Data System (RAPIDS) Registration number, certification from the apprentice program that the employee was in good standing during the time on the project, registered trade, and certified payroll for the apprentice hours worked on the project.

The Contractor is required to forward all documentation, assembled and submitted by the apprentice employer in accordance with the above paragraph, to the County for review and disposition. Any incentive that the County approves shall be provided to the apprentice employer in full.

Glades Resident Incentive

Palm Beach County offers an incentive Payment to any contractor (and Sub-Contractors) who hires a new employee that is a resident of the Glades area for work on County contracts (Glades Employee). For purposes of this section, "resident of the Glades area" means any person whose legal residence is located in the Glades area as defined in the Palm Beach County Local Preference Ordinance.

To be eligible for the Incentive Payment, the employee must be a full-time employee of the Contractor for a minimum of 3 weeks on this project and cannot have worked for the Contractor claiming the Glades Employee as a new hire for 90 days prior to this project. Within 5 days of the Contractor hiring and the Glades Employee reporting to work at the project site, Contractor must provide the following documentation (Hiring Certification): Glades Employee name, contact information including legal residence, copy of driver's license or other proof of residence, hire date, start date at project site, and trade. Both the Glades Employee and employer must sign the Hiring Certification with signatures notarized.

The County has the right, but not the obligation, to conduct unannounced field interviews with the Glades Employee to ensure compliance with the requirements of this Section.

Upon completion of the Contract, Contractor may apply for the Incentive Payment which will be added to the Contract by change order. The documentation (Incentive Certification) required includes resubmitting of the Hiring Certification along with the employment end date or last day on the job site (whichever is earlier), a certified payroll for the hours worked on the project, and employee wages and benefits paid. The Incentive Certification must be signed by both the Glades Employee and employer with both signatures notarized. No markup will be allowed either by the General Contractor or a Sub-Contractor.

If the County determines that the Contractor complied with the requirements of this section, it will reimburse the contractor 30% of the new employee(s) wages (including payroll taxes, costs, and benefits) up to a maximum reimbursement of $100,000. The request must be submitted no later than 45 days after Substantial Completion of the project.

A Contractor can only claim the Incentive Payment once for each Glades Employee within a rolling twelve (12) month period, but the incentive can be claimed across multiple County contracts.

It is a Contract requirement of the Contractor that any reimbursement requested by a Sub-Contractor under this Section be processed by the Contractor to the County for review.

8. VSS REGISTRATION REQUIRED: Prior to Contract award or renewal (Award), Contractor must register in the County's Vendor Self Service (VSS) at https://pbcvssp.co.palm-beach.fl.us/webapp/vssp/AltSelfService. If Contractor intends to use Sub-Contractors, Contractor must also ensure that all Sub-Contractors are registered as vendors in VSS prior to Contract Award. All Sub-Contractor agreements must include a contractual provision requiring that the Sub-Contractor register in VSS. County will not finalize Contract Award until Contractor has certified that the Contractor and all of its Sub-Contractors are registered in VSS.

9. POSTING OF BID TABULATIONS: Recommended award will be posted for review by interested parties at the Engineering & Public Works Department located at 2300 N. Jog Rd., Suite #3W-33, West Palm Beach, Florida, 33411-2745, Florida, and will remain posted for a period of at least seventy-two (72) hours prior to approval by the Board of County Commissioners. Failure to file a protest to the Director of Purchasing Department within the time prescribed in the County Purchasing Ordinance shall constitute a waiver of proceedings under the referenced County Ordinance.

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SPECIAL PROVISIONS

1. Annual Construction Contract on a Task Work Order Basis
2. Award
3. Expiration/Extension
4. Method of Ordering (Work Orders)
5. Prosecution of the Work
6. Commercial Non-Discrimination
7. Palm Beach County Office of the Inspector General
8. Public Entity Crimes
9. Chapter 119, F.S. Public Records
10. Subletting or Assigning Contracts
11. Non-Collusion
12. Conflict of Interest
13. E-Verify
14. Counterparts
15. Bond Waiver Program
16. Additional Insured Parties
17. Use of Patented Processes, Etc.
18. Daily Reports
19. Price/Delivery/Acceptance
20. Local Government Prompt Payment Act
21. Basis of Payment
22. Utilities Contacts
23. Maintenance of Traffic
24. School Zone
25. Limits of Construction
26. Restoration Agreements
27. Permit Completion Certifications
28. National Pollutant Discharge Elimination System (NPDES) Compliance
29. Construction Impacts to Bus Operations
30. Regulated Substance Use Requirements
31. Unit Prices
32. Contingent Items
33. Clearing and Grubbing
34. Subsoil Excavation
35. Embankment
36. Premium for Conflict Conditions
37. Pipe Culverts
38. Pipe Culverts (Storm Sewer Pumping & Cleaning)
39. Storm Sewer System Pipe Plugs
40. Final Pipe Inspection
41. Video Report
42. Gravity Wall Construction
43. Irrigation System within Restoration Agreement Areas
44. Color Treated and Stamped Concrete
45. Engraving of Curb Face
46. Guardrail & Special Safety Pipe Rail
47. Planting Standards
48. Resetting Fence
49. Record Drawings (Roadway)
50. Record Drawings and Documents (Bridge)
51. Dynamic Load Test Support
52. *Additional Reporting
53. Detail for Installation of Median Irrigation Sleeves for Thoroughfare Roads
54. Liquid Asphalt Calculations
55. Supplemental Concrete at Drainage Structure Top Detail

SPECIAL PROVISIONS

1. ANNUAL CONSTRUCTION CONTRACT ON A TASK WORK ORDER BASIS: The intent of this Contract is to award a Contract to a Contractor(s) to perform Work on a Work task order basis. Work Task Orders shall be issued on an "as needed" basis. See Special Provisions for Method of Ordering Work. The line items in the Proposal pages are intended to set unit prices for the task Work Orders. No tasks are guaranteed as part of this Contract. The total value of Work Orders issued under this Contract shall not exceed the amount listed on page C-1 of this document, however, this may be increased by mutual agreement between the Contractor and Palm Beach County via a Contract Amendment.

2. AWARD: As the best interest of the Board of County Commissioners may require, the right is reserved to make award(s) on an item-by-item basis, or an all-or-none basis. See General Provision 3-2.1.

3. EXPIRATION/EXTENSION: This Contract expires thirty-six (36) months from the date of Board approval. Option for extension and other Contract deviations will only be exercised upon mutual written agreement through a Board approved Contract Amendment, while adhering to all other original terms, conditions and unit prices of the Contract.

4. METHOD OF ORDERING (WORK ORDERS): The Department(s) will issue Work Orders on an "as needed" basis. The Department has no obligation to issue any Work under this Contract to any Contractor. All terms and conditions of the Bid are applicable. The individual Work Orders will specify the Work to be performed, its location, a not-to-exceed cost (based on the Contract unit prices), and a schedule for performance. The Contractor will be sent a Work Order for signature. Within five (5) Working Days of receipt, the Contractor shall sign and return the Work Order along with all applicable OEBO schedules. Then each Work Order will be executed (signed) by the authorized Department representative and Notice To Commence will be sent to the Contractor. If the Contractor fails to sign the Work Order within the required time, the Work Order will be signed by only the authorized Department representative and will serve as the fully executed Work Order and Notice To Commence will be sent to the Contractor. The Contractor's failure to sign a Work Order within five (5) Working Days does not prevent execution of the Work Order (which is solely by signature of the authorized Department representative), and all Work Orders must be performed upon Notice To Commence.

Upon completion of the Work Order task, the Contractor will submit an individual invoice, a copy of the original Work Order, the appropriately completed SBE-M/WBE participation forms referenced in Item 7 of the SBE-M/WBE Program section of this Contract, a Contractor's affidavit, and consent of Surety.

Contractor shall comply will all requirements in the Contract Documents for obtaining final payment. Final payment of a Work Order does not terminate the Contract or extinguish the Surety's obligations under the Contract.

The Contractor will receive progress payments based on submitted invoices. The payment amount will be based on the Work done and accepted. No retainage is withheld.

5. PROSECUTION OF THE WORK: The Contractor will be required to maintain within Palm Beach County, at all times while this Contract is in effect, the Equipment necessary to properly carry out the provisions of these Specifications. After receiving Notice To Commence with the Work for a particular Work Order, the Contractor shall commence promptly within five (5) Working Days. The Contractor shall efficiently prosecute the Work with adequate personnel and Equipment until completion, which shall be within 30 Calendar Days, or as specified in the Work Order. Failure to comply with either time requirement shall result in Liquidated Damages, assessed on a Work Order basis and in the amounts shown in Section 8-10.2 of the Standard Specifications.

After receiving the Notice To Commence with Work for a particular task, the Contractor shall complete the construction of a span-wire traffic signal within a maximum of 90 days, and a mast arm signal within a maximum of 210 days. For Delays caused by factors beyond the control of the Department and/or the Contractor, the engineer will halt the clock until such time as such factors have been mitigated or resolved.

Character of Workmen and Equipment – The Contractor shall provide a minimum of two certified IMSA Level II (electronics) technicians as required by Palm Beach County Engineering Department and shall have enough Equipment and personnel to be able to work on two projects simultaneously on any day during the life of this Contract.

6. COMMERCIAL NON-DISCRIMINATION: The County is committed to assuring equal opportunity in the award of contracts and complies with all laws prohibiting discrimination. Pursuant to Palm Beach County Resolution R2017-1770, as may be amended, the Contractor warrants and represent that throughout the term of the Contract, including any renewals thereof, if applicable, all of its employees are treated equally during employment without regard to race, color, religion, disability, sex, age, national origin, ancestry, marital status, familial status, sexual orientation, gender identity or expression, or genetic information. Failure to meet this requirement shall be considered default of the Contract.

The Contractor represents and warrants that it will comply with the County's Commercial Nondiscrimination Policy described in Resolution 2017-1770, as amended. As part of such compliance, the Contractor shall not discriminate on the basis of race, color, national origin, religion, ancestry, sex, age, marital status, familial status, sexual orientation, gender identity or expression, disability, or genetic information in the solicitation, selection, hiring or commercial treatment of Sub-Contractors, vendors, suppliers, or commercial customers, nor shall the Contractor retaliate against any person for reporting instances of such discrimination. The Contractor shall provide equal opportunity for Sub-Contractors, vendors and suppliers to participate in all of its public sector and private sector subcontracting and supply opportunities, provided that nothing contained in this clause shall prohibit or limit otherwise lawful efforts to remedy the effects of marketplace discrimination that have occurred or are occurring in the County's relevant marketplace in Palm Beach County. The Contractor understands and agrees that a material violation of this clause shall be considered a material breach of any resulting contract and may result in termination of the contract, disqualification or debarment of the Contractor from participating in County contracts, or other sanctions. This clause is not enforceable by or for the benefit of, and creates no obligation to, any third party.

All Sub-Contractor agreements shall include this commercial non-discrimination clause.

7. PALM BEACH COUNTY OFFICE OF THE INSPECTOR GENERAL: Palm Beach County has established the Office of the Inspector General in Palm Beach County Code, Section 2-421 – 2-440, as may be amended. The Inspector General's authority includes but is not limited to the power to review past, present and proposed Department contracts, transactions, accounts and records, to require the production of records, and to audit, investigate, monitor, and inspect the activities of the Contractor, its officers, agents, employees, and lobbyists in order to ensure compliance with Contract requirements and detect corruption and fraud.

Failure to cooperate with the Inspector General or interfering with or impeding any investigation shall be in violation of Palm Beach County Code, Section 2-421 – 2-440, and punished pursuant to Section 125.69, Florida Statutes, in the same manner as a second degree misdemeanor.

8. PUBLIC ENTITY CRIMES: In accordance with F.S. 287.133 (2) (a), persons and affiliates who have been placed on the convicted vendor list may not submit Bids, Contract with, or perform work (as a contractor, supplier, Sub-Contractor or consultant) with any public entity (i.e. Palm Beach County) in excess of Twenty five Thousand dollars (or such other amount as may be hereafter established by the Florida Division of Purchasing in accordance with F.S. 287.017) for a period of 36 months from the date of being placed on the convicted vendor list.

As provided in F.S. 287.132-133, by entering into this Contract or performing any Work in furtherance hereof, the contractor certifies that it, its affiliates, suppliers, Sub-Contractors and consultants who will perform hereunder, have not been placed on the convicted vendor list maintained by the State of Florida Department of Management Services within the 36 months immediately preceding the date hereof. This notice is required by F.S. 287-133(3)(a).

The Contractor, Contractor's employees, or Sub-Contractors of Contractor and employees of Sub-Contractors shall comply with Palm Beach County Code, Section 2-371 - 2-377, the Palm Beach County Criminal History Records Check Ordinance (Ordinance), for unescorted access to critical facilities (Critical Facilities) or criminal justice information facilities (CJI Facilities) as identified in Resolutions R2013-1470 and R2015-0572, as amended. The Contractor is solely responsible for the financial, schedule, and/or staffing implications of this Ordinance. Further, the Contractor acknowledges that its Contract price includes any and all direct or indirect costs associated with compliance with this Ordinance, except for the applicable FDLE/FBI fees that shall be paid by the Department.

This Contract may include sites and/or buildings which have been designated as either "critical facilities" or "criminal justice information facilities" pursuant to the Ordinance and above referenced Resolutions, as amended. Department staff representing the Department will contact the Contractor(s) and provide specific instructions for meeting the requirements of this Ordinance. Individuals passing the background check will be issued a badge. The Contractor shall make every effort to collect the badges of its employees and its Sub-Contractors' employees upon conclusion of the Contract and return them to the Department. If the Contractor or its Sub-Contractor(s) terminates an employee who has been issued a badge, the Contractor must notify the Department within two (2) hours. At the time of termination, the Contractor shall retrieve the badge and shall return it to the Department in a timely manner.

The Department reserves the right to suspend the Contractor if the Contractor 1) does not comply with the requirements of County Code Section 2-371 - 2-377, as amended; 2) does not contact the Department regarding a terminated Contractor employee or Sub-Contractor employee within the stated time; or 3) fails to make a good faith effort in attempting to comply with the badge retrieval policy.

9. CHAPTER 119, F.S. PUBLIC RECORDS

Notwithstanding anything contained herein, as provided under Section 119.070 I, F.S., if the Contractor: (i) provides a service; and (ii) acts on behalf of the Department as provided under Section 119.011(2) F.S., the Contractor shall comply with the requirements of Section 119.0701, Florida Statutes, as it may be amended from time to time. The Contractor is specifically required to:

1. Keep and maintain public records required by the Department to perform services as provided under this Contract.

2. Upon request from the Department's Custodian of Public Records, provide the Department 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 or as otherwise provided by law. The Contractor further agrees that all fees, charges and expenses shall be determined in accordance with Palm Beach County PPM CW-F-002, Fees Associated with Public Records Requests, as it may be amended or replaced from time to time.

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 the Contractor shall transfer, at no cost to the Department, all public records in possession of the Contractor unless notified by the Department's representative/liaison, on behalf of the Department's Custodian of Public Records, to keep and maintain public records required by the Department to perform the service. If the Contractor transfers all public records to the Department 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 by the Contractor must be provided to the Department, upon request of the Department's Custodian of Public Records, in a format that is compatible with the information technology systems of the Department, at no cost to the Department.

Failure of the Contractor to comply with the requirements of this Article shall be a material breach of this Contract. The Department shall have the right to exercise any and all remedies available to

it, including but not limited to, the right to terminate for cause. Contractor acknowledges that it has familiarized itself with the requirements of Chapter 119, F.S., and other requirements of State law applicable to public records not specifically set forth herein.

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, PLEASE CONTACT THE CUSTODIAN OF PUBLIC RECORDS AT:

Records Request, Palm Beach County Public Affairs Dept.
301 N. Olive Avenue
West Palm Beach, FL 33401
By email at: RECORDSREQUEST@PBCGOV.ORG
Or by Telephone at: 561-355-6680

10. SUBLETTING OR ASSIGNING CONTRACTS: All awards will be made with the understanding that the Work awarded will be performed by the Contractor to whom the award is made, with the assistance of workers, under the Contractor's immediate supervision, and the Contract shall not be sublet, conveyed, transferred or assigned to another Contractor except with the consent of the Department. In no event will the Contractor be released from responsibility. Contractor shall perform not less than 40% of the total Contract amount with its own organization.

11. NON-COLLUSION: Bidder certifies that this Bid is made without prior understanding, agreement, or connection with any corporation, firm or person submitting a Bid for the same Materials, services, supplies, or Equipment and is in all respects fair and without collusion or fraud. Conviction for the commission of any fraud or act of collusion in connection with any sale, bid, quotation, proposal or other act incident to doing business with Palm Beach County may result in permanent debarment.

No premiums, rebates or gratuities permitted; either with, prior to or after any delivery of material or provision of services. Any such violation may result in award cancellation, return of Materials, discontinuation of services, removal from the vendor bid list(s), and/or debarment or suspension from doing business with Palm Beach County.

12. CONFLICT OF INTEREST: The award is subject to the provisions of the applicable Federal laws, rules and regulations, the Florida Statutes and the Department's ordinances and resolutions. All Bidders must disclose with their Bid the name of any officer, director, or agent of their firm who is also an employee of the Department.

The Contractor represents that it presently has no interest and shall acquire no interest, either direct or indirect, which would conflict in any manner with the performance of services required hereunder, as provided for in Chapter 112, Part III, Florida Statutes, and the Palm Beach County

Code of Ethics. The Contractor further represents that no person having any such conflict of interest shall be employed for said performance of services.

The Contractor shall promptly notify the Department's representative, in writing, by certified mail, of all potential conflicts of interest of any prospective business association, interest or other circumstance which may influence or appear to influence the Contractor's judgement or quality of services being provided hereunder. Such written notification shall identify the prospective business association, interest or circumstance, the nature of Work that the Contractor may undertake and request an opinion of the Department as to whether the association, interest or circumstance would, in the opinion of the Department, constitute a conflict of interest if entered into by the Contractor. The Department agrees to notify the Contractor of its opinion by certified mail within thirty (30) days of receipt of notification by the Contractor. If, in the opinion of the Department, the prospective business association, interest or circumstance would not constitute a conflict of interest by the Contractor, the Department shall so state in the notification and the Contractor shall, at its option, enter into said association, interest or circumstance and it shall be deemed not in conflict of interest with respect to services provided to the Department by the Contractor under the terms of this Contract.

Further, all Bidders must disclose the name of any Department employee who owns, directly or indirectly, an interest of ten percent or more in the Bidder's firm or any of its branches.

13. E-VERIFY: Contractor warrants and represents that it is in compliance with section 448.095, Florida Statutes, as may be amended, and that it: (1) is registered with the E-Verify System (E-Verify.gov), and uses the E-Verify System to electronically verify the employment eligibility of all newly hired workers; and (2) has verified that all of Contractor's subcontractors performing the duties and obligations of this Contract are registered with the E-Verify System, and use the E-Verify System to electronically verify the employment eligibility of all newly hired workers.

Contractor shall obtain from each of its subcontractors an affidavit stating that the subcontractors does not employ, contract with, or subcontract with an Unauthorized Alien, as that term is defined in section 448.095(1)(k), Florida Statutes, as may be amended. Contractor shall maintain a copy of any such affidavit from a subcontractors for, at a minimum, the duration of the subcontract and any extension thereof. This provision shall not supersede any provision of this Contract which requires a longer retention period.

The Department shall terminate this Contract if it has a good faith belief that Contractor has knowingly violated Section 448.09(1), Florida Statutes, as may be amended. If the Department has a good faith belief that Contractor's subcontractors has knowingly violated section 448.09(1), Florida Statutes, as may be amended, the Department shall notify Contractor to terminate its contract with the subcontractors and Contractor shall immediately terminate its contract with the subcontractors. If the Department terminates this Contract pursuant to the above, Contractor shall be barred from being awarded a future contract by the Department for a period of one (1) year from the date on which this Contract was terminated. In the event of such contract termination, Contractor shall also be liable for any additional costs incurred by the Department as a result of the termination.

14. COUNTERPARTS: This Contract, including the exhibits referenced herein, may be executed in one or more counterparts, all of which shall constitute collectively but one and the same Contract. The Department may execute the Contract through electronic or manual means. Contractor shall execute by manual means only, unless the Department provides otherwise.

15. BOND WAIVER PROGRAM: A Bid Bond is not required for bids of less than $50,000 and will be waived for all other bids of less than $200,000 if the Bidder is going to participate in the Bond Waiver Program, provided that the Bidder complies with Palm Beach County Resolution R89-1178 and with Palm Beach County Policies and Procedures relative to the Bond Waiver Program (CW-F-016). For bids with values between $50,000 and $200,000, the Bidder must complete an affidavit entitled "Intent to Participate in Bond Waiver Program Bid Affidavit" or provide a Bid Bond. Failure to provide a Bid Bond or complete and return this affidavit with the Bid shall result in rejection of the Bid. For all contracts less than $200,000, the Public Construction Bond will be waived as well, provided that the Bidder complies with Palm Beach County Resolution R89-1178 and with Palm Beach County Policies and Procedures relative to the Bond Waiver Program (CW-F-016). Copies of the requirements of the Bond Waiver Program (CW-F-016) can be found at the following website: *http://discover.pbcgov.org/PDF/PPM/Index.pdf*. The forms for the Bond Waiver Program can be found at *http://discover.pbcgov.org/engineering/roadwayproduction/Pages/Bid-Documents.aspx*.

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SPECIAL PROVISIONS

INTENT TO PARTICIPATE IN BOND WAIVER PROGRAM
BID AFFIDAVIT

Project Number: _____

If the Contractor intends on participating in the Bond Waiver Program, this form must be completed in its entirety and returned with the Contractor's Bid.

FAILTURE TO COMPLETE THIS FORM OR INCLUDE A BID BOND FOR PROJECTS WITH VALUES BETWEEN $50,000 AND $200,000, SHALL RESULT IN REJECTION OF THE BID.

_____ (Bidder) hereby states that it intends on participating in the Bond Waiver Program as described in Palm Beach County Resolution R89-1178 and Palm Beach County Policies and Procedures.

_____
Contractor Signature

_____
Title

STATE OF _____

COUNTY OF _____

The foregoing instrument was acknowledged before me by means of ☐ physical presence or ☐ online notarization, this _____ day of _____, 20_____, by _____ *(name)* as _____ *(title)* for _____ _____ *(firm)*, on behalf of the *(choose one)* corporation / company / partnership, who is ☐ personally known to me or has produced _____(type of identification) as identification.

_____
Notary Signature

Notary Public, State of _____

(Stamp/Seal)

_____
Print Notary Name

Commission Number

My Commission Expires_____

16. ADDITIONAL INSURED PARTIES: The Contractor performing the construction for Palm Beach County (County) shall be required to carry and furnish insurance coverage, in accordance with General Provision Section 7-13, "Insurance Required", naming County as additional insured on the Certificate of Insurance Form(s), which shall reference the Project Limits and the Project Number, and shall read: "Palm Beach County Board of County Commissioners, a Political Subdivision of the State of Florida, its Officers, Employees and Agents".

Where the limits of Work for this Department project impact the rights-of-way of other agencies (e.g., Florida Department of Transportation (FDOT); South Florida Water Management District (SFWMD); Lake Worth Drainage District (LWDD); and other agencies as applicable), said parties shall also be named as "ADDITIONAL INSURED", either on the same form or on separate forms.

The Contractor shall coordinate all Work within the rights-of-way and air rights-of-way, as they apply, through the Engineer. Also, the Contractor shall notify the County and the agencies, as required in the Contract Documents or within a reasonable time frame prior to the start of any Work within said Right-of-Way, to allow for appropriate accommodations by the agencies.

17. USE OF PATENTED PROCESSES, ETC.: The basis on which a Contract will be awarded will be the bid prices. Prices shall include all charges for the use of patent processes, Materials or methods, and for all other similar incidental charges not expressly provided for in these Contract Documents.

18. DAILY REPORTS: The Contractor shall keep daily reports of all personnel and Equipment on the project for review by the Department for the entire Contract Time.

19. PRICE/DELIVERY/ACCEPTANCE: Price quoted must be the price for new merchandise and free from defects. Any Bids containing modifying or "escalator" clauses will not be considered unless specifically requested in the Bid Specifications.

Deliveries of all items shall be made as soon as possible. **Deliveries resulting from this Bid are to be made during the normal working hours of the Department**. Time is of the essence and the Bidder's delivery date must be specified and adhered to. Should the Bidder, to whom the order or Contract is awarded, fail to deliver on or before his/her stated date, the Department reserves the right to **CANCEL** the order or Contract and make the purchase elsewhere. The successful Bidder(s) shall be responsible for making any and all claims against carriers for missing or damaged items.

Delivered items will not be considered "accepted" until authorized agent for the Department has, by inspection or test of such items, determined that they fully comply with Specifications.

The Board of County Commissioners may return, for full credit, any item(s) received which fail to meet the Department's performance standards.

20. LOCAL GOVERNMENT PROMPT PAYMENT ACT: In accordance with the Local Government Prompt Payment Act (F.S. 218.70, *et seq*), the Contractor is hereby notified of the following:

1. The Contractor will be notified at the Pre Construction Meeting the manner in which pay requests are to be prepared and directed to the Department. For a pay request to be deemed acceptable, the Contractor must provide the following:

   Pay Request No. 1
   - OEBO Schedule 3
   - Certification of Compliance with the Living Wage Ordinance

   Pay Request No. 2 and all others following, but not including the Final
   - OEBO Schedule 3
   - OEBO Schedule 4
   - Disbursement of Previous Periodic Payments to Sub-Contractors
   - Certification of Compliance with the Living Wage Ordinance

   Final Pay Request
   - OEBO Schedule 3
   - OEBO Schedule 4
   - Disbursement of Previous Periodic Payments to Sub-Contractors
   - Disbursement of Final Payment to Sub-Contractors
   - Form 1
   - Form 2 including Bonding Affidavit
   - Record of Construction Materials Affidavit
   - Certification of Compliance with the Living Wage Ordinance
   - Equal Business Opportunity (EBO) Final Participation Form
   - Release and Concurrence of Final Payment Amount
   - Form of Guarantee

2. A single list of items (Punch List) required to render the Work complete, satisfactory, and acceptable will be prepared by the Department. The Punch List shall be developed as a result of a joint inspection of the Work, conducted within 30 Calendar Days after reaching substantial completion, by the Contractor, together with the Department, with all unsatisfactory Work listed on the Punch List. The Punch List shall be provided to the Contractor within 5 Working Days of the joint inspection.

3. If the pay request and support data are not approved, the Contractor is required to submit new, revised or missing information according to the Department's instructions. Otherwise, the Contractor shall prepare and submit to Department an invoice in accordance with the estimate, as approved. In the event any dispute with respect to any payment or pay request cannot be resolved between the Contractor and the Department, Contractor shall, in accordance with the alternative dispute resolution requirements of Florida Statute section 218.76, demand in writing a meeting with and review by the County Engineer. In place of the County Engineer,

the Deputy County Engineer may conduct the meeting and review. Such meeting and review shall occur within forty-five (45) Working Days of receipt by the Department of Contractor's written demand. The County Engineer, or Deputy County Engineer, shall issue a written decision on the dispute within fifteen (15) Working Days of such meeting. This decision shall be deemed the Department's final decision for the purposes of the Local Government Prompt Payment Act.

Contractor must remit undisputed payment due for labor, services, or materials furnished by Sub-Contractors and suppliers hired by the Contractor, within 10 days after the Contractor's receipt of payment from the Department, pursuant to Section 218.70 et seq., Florida Statutes. Contractor shall provide Sub-Contractors and suppliers hired by Contractor with a written notice of disputed invoice within 5 business days after receipt of invoice which clearly states the reasons for the disputed invoice.

21. BASIS OF PAYMENT: Payment will be based on field measured quantities. No additional payment will be made for any Work which exceeds that called for in the Contract Documents.

22. UTILITIES CONTACTS: Potential utility conflicts may vary with each Work site. Prior to commencing Work, the Contractor shall visit the Work site and ascertain all site conditions, including utilities. It shall be the Contractor's responsibility to avoid conflicts with existing underground and overhead utilities and structures. Contractor shall contact the utility owners to arrange for protection or adjustment of utilities as provided in Section 7.

The Contractor shall notify all utilities servicing the Work area at least 48-hours prior to any excavation so that underground utilities may be located. The Contractor has the responsibility to contact **Sunshine State One-Call of Florida, Inc. at 1-800-432-4770** to schedule marking locations of the utilities which subscribe to their service. The Contractor shall also call (561) 641-3429 for Palm Beach County Water Utility locations and call (561) 233-3900 for Palm Beach County Traffic Control Utility locations.

The Contractor shall properly maintain and protect all utilities. The Contractor shall be responsible for the cost to repair all damages to utilities caused by his operations.

The Contractor shall fully cooperate at all times with the Owners of Utility Companies in order to maintain the operation of the existing utilities with the least amount of interference and interruption possible.

When utility installation/adjustments are included as part of the Proposal, all utility companies (including Palm Beach County Water Utilities Dept.) reserve the right to accept or reject Bid items on their part of Work and perform their Work by their forces or other contracted forces.

23. MAINTENANCE OF TRAFFIC: Maintenance of Traffic (MOT) including Pedestrian MOT shall be incidental to the pay items. If the Contractor and/or its Sub-Contractors do not perform the MOT and do not install and maintain those items covered under MOT according to the requirements of the standards, then Palm Beach County reserves the right to reduce said item based

on the pro rata performance as determined by the Department on each payment application or $1,000.00 per day, whichever is greater.

The Contractor shall assure compliance with FDOT Index 600 of the current Roadway and Traffic Design Standards. All references to "determinations by engineer" will be the responsibility of the Contractor, and shall be brought to the attention of the Department prior to implementation. The cost of complying with the stated standards shall be incidental to the MOT pay item. The Contractor shall ensure that at no time will traffic (temporary or otherwise) be permitted over installed exfiltration trenches.

Pedestrian traffic must be maintained throughout the duration of construction unless otherwise indicated.

For any lane closures that extend into the peak hour(s) or any other lane closure time restriction presented in the Contract Documents, the Contractor may be charged up to $1,000.00 per lane per ½ hour.

Lights and flags are required on the first two warning signs in the series.

* SPEC Preparer – are there any special lane closure restrictions for this project? Discuss here.

24. SCHOOL ZONE

During the first and last weeks of the school year, no Work may occur within a school zone.

**NOTE TO SPEC PREPARER: THIS SECTION MUST ALSO SPECIFICALLY STATE IF THERE ARE ANY LANE CLOSURE RESTRICTIONS.*

* *SPEC Preparer – ask if there are any restrictions such as "Work on school property including driveways shall only be performed during weekends or non-school days."*

25. LIMITS OF CONSTRUCTION: The Contractor shall confine the construction of the Roadway within the limits of the right of way unless the right of entry to adjacent properties has been acquired by the Department at the time of construction.

26. RESTORATION AGREEMENTS: Contractor is hereby notified that any construction performed within Restoration Agreement (RA) areas shall be restored to a condition similar or equal to that existing before such construction occurred, at no expense to the Department. Prior to disturbing the Restoration Agreement area, the Contractor shall stake the RA limits, locate/document all improvements within the area, and submit this information to the Department, prior to starting construction. Upon completion of the construction, the Engineer, together with the Contractor, shall conduct an inspection of the area to confirm that all improvements have been appropriately restored. Payment for all Work to complete the item shall be incidental to the cost of the Project.

27. PERMIT COMPLETION CERTIFICATIONS: The Contractor is advised that this Contract includes completing and executing all Construction Completion/Construction Certifications as required by each permit included in the PER section of the Contract Documents.

The Contractor is responsible for retaining the services of a Professional Engineer, registered in the State of Florida and qualified in the field of the required Work, to inspect the Work related to Permit(s), and certify in accordance with the instructions of each permit.

The Contractor shall submit two (2) originals of the completed and executed form to the Department, along with the required "As-Built" information (to be obtained by the Contractor).

All costs associated with Permit Compliance Certifications, including obtaining and depicting "As-built" information are incidental to the Contract.

28. NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) COMPLIANCE: This Contract requires compliance with the NPDES General Permit. The "Florida Department of Environmental Protection NPDES Generic Permit For Storm Water Discharge from Large and Small Construction Activities", dated February 2015, which contains the description and requirements of the permit, is available at the following URL:

http://www.dep.state.fl.us/water/stormwater/npdes/docs/cgp.pdf

The MS WORD format of the Storm Water Pollution Prevention Plan (SWPPP) template is available at the following URL:

http://www.dep.state.fl.us/water/stormwater/npdes/SWPPP.htm

Notice of Intent and Notice of Termination forms are available on DEP's URL:

http://dep.state.fl.us/water/stormwater/npdes/permits_forms.htm

The Contractor shall complete and submit the NOI and payment to DEP, and if discharging to the County's MS4 facility, provide a copy of the NOI or the acknowledgement letter within 7 calendar days to the Department (https://floridadep.gov/water/stormwater/content/construction-activity-cgp). If a SWPPP is not included in the Contract Plans, or the Contractor chooses to prepare his own SWPPP, the SWPPP template shall be utilized by the Contractor for developing the SWPPP for the project. Any SWPPP prepared by the Contractor shall be submitted to the Department at the Pre-Construction meeting for the project for approval by the Engineer.

Failure to sign any required documents or certification statements will be considered a default of the Contract. Any soil disturbing activities performed without the required signed documents or certification statements may be considered a violation of the DEP Generic Permit.

All costs associated with obtaining and complying with the provisions of this permit and to all federal, State and local storm water pollution prevention permits, rules, laws or ordinances, including the implementation of the SWPPP for the project during construction are incidental to

the Contract. Also included is the cost of all construction erosion and pollution control measures not covered under other specific pay items, the cost of performing and executing the joint inspection & maintenance reports (as shown in the SWPPP "Template"), and the execution of the Contractor Certification form of the Proposal pages. The Contractor Certification form must be signed and submitted with the Bid Proposal.

SITE DESCRIPTION

Project Name and Location:	**ANNUAL TRAFFIC SIGNAL CONSTRUCTION CONTRACT** Palm Beach County, Florida
Palm Beach County Project No.:	**2022052**
Owner Name & Address:	Board of County Commissioners, Palm Beach County Roadway Production Division 2300 N. Jog Road West Palm Beach, FL 33411
Work Description:	**Annual Traffic Signal Construction Contract**
Runoff Coefficient:	
Site Area:	**TBD**
Site Map:	**TBD**

Sequence of Major Soil Disturbing Activities:

1. Signal and Street Lights

Name of Receiving Bodies: TBD

29. CONSTRUCTION IMPACTS TO BUS OPERATIONS: Public Works and private development construction activities often impact Palm Tran bus operations and bus stops. Timely communication and coordination with Palm Tran and other affected transit agencies during preliminary project.

Planning is essential in order to prevent potential conflicts. Contractors should make every effort to schedule their Work to minimize impacts and the duration of impacts to transit operations and riders.

Contractors should provide Palm Tran with the name and telephone contact of their construction managers prior to the commencement of all construction projects affecting bus stops or impacting bus routes.

- Contact Palm Tran for coordination and review requirements (561 841-4246, 561 841-4223, or 561 841-4224).
- Maintenance of rider access to and from bus stops during construction is desirable. This issue should be discussed at the Pre-Construction Meeting.
- All Work shall conform to the requirements of the Americans with Disabilities Act (ADA), including provisions for temporary access to and from bus stops.
- If necessary, the contractor shall work with Palm Tran to establish an approved temporary bus stop location.
- Contractor shall notify Palm Tran through Palm Beach County Construction Coordination Division at least 10 Working Days (2 weeks) in advance of the start of construction, modification of construction effort with transit impacts, and construction completion, so that Palm Tran can advise its riders.
- Contractor may not remove any bus stop signs, transit shelters, transit benches, or other related transit infrastructure without prior Palm Tran authorization. Contractor may be asked to remove existing bus stop signage or install temporary and permanent bus stop signage. Typically, Palm Tran will make arrangements to remove all other transit infrastructure. If Palm Tran does not remove their facilities in a timely manner, these facilities may become part of the clearing and grubbing.
- Contractor is responsible for construction of an approved ADA accessible access to and from bus stop boarding and alighting areas, when called for in the Plans.
- The cost for the above is incidental to the project.

30. REGULATED SUBSTANCE USE REQUIREMENTS

"Best Management Practices" for the Construction Industry

A. The Contractor shall be responsible for assuring that each contractor or Sub-Contractor evaluates each site before construction is initiated to determine if any site conditions may post particular problems for the handling of any Regulated Substances. For instance, handling Regulated Substances in the proximity of water bodies or wetlands may be improper.

B. If any regulated substances are stored on the construction site during the construction process, they shall be stored in a location and manner which will minimize any possible risk of release to the environment. Any Regulated Substances shall have constructed below it an impervious containment system constructed of Materials of sufficient thickness, density and composition that will prevent the discharge to the land, groundwater, or surface waters, or any pollutant which may emanate from said storage container or containers. Each containment system shall be able to contain 150% of the contents of all storage containers above the containment system.

C. Each contractor shall familiarize themselves with the manufacturer's safety data sheet supplied with each material containing a Regulated Substance and shall be familiar with procedures required to contain and clean up any releases of the Regulated Substance. Any tools or Equipment necessary to accomplish same shall be available in case of a release.

D. Upon completion of construction, all unused and waste Regulated Substance and containment systems shall be removed from the construction site by the responsible contractor and shall be disposed of in a proper manner as prescribed by law.

31. UNIT PRICES: The Contractor is advised that the Contract is a unit price contract. As such, the Bidder shall include all labor, Materials, transportation, Equipment, fuel, and all other items necessary to complete the item of Work, in the unit price for the item. All items incidental to or necessary for the completion of the bid item shall be included in the unit price for the item.

The Contractor shall also comply with to Section 9-3.1 in relation to unit prices.

32. CONTINGENT ITEMS: The Contractor shall not use contingent items to meet the EBO goal(s) participation for the Contract. The SBE and M/WBE participation goals established for the Contract, as specified in the Instructions to Bidders, shall include all pay items for the project, less the contingency items. The use of contingent pay items shall only increase the SBE and M/WBE participation of the Contract, over and above the required goals achieved by use of regular pay items.

33. CLEARING AND GRUBBING: The Contractor is required to notify the owner of any fences, irrigation systems, etc., that lie within the Right-of-Way, to give them the courtesy to remove them before construction. The Contractor shall replace fences, shrubbery, sod, etc., within the limits of construction and outside the Right-of-Way to their original condition, unless otherwise directed by the Engineer. Cost of which is incidental to construction. All Work associated with the re-establishment and/or temporary relocation of mailboxes shall be done in accordance with Index no. 532 of the current FDOT Roadway and Traffic Design Standards. Specific attention should be directed to coordination with the local postmaster. Payment for all Work required to establish each mailbox in the temporary and/or final location, including any material required to construct the mailbox to current standards, shall be included in the cost of clearing and grubbing, unless the Contract includes a pay item for the Work.

34. SUBSOIL EXCAVATION: Where muck, rock, clay, or other material within the limits of the Roadway is unsuitable in its original position, excavate such material to the cross-sections shown in the Plans or indicated by the Engineer, and backfill with suitable material. Shape backfill material to the required cross-sections. Where the removal of plastic soils below the finished earthwork grade is required, meet a construction tolerance, from the lines shown in the Plans as the removal limits, of ±0.2 feet in depth and ±6 inches (each side) in width. Final payment for the Subsoil Excavation, C.Y. will be based on initial and final cross sections, and signed & sealed quantity computations which are to be prepared by a Professional Land Surveyor or Professional Engineer licensed in the State of Florida, and submitted to the Department for acceptance. Initial cross sections shall be taken at 50 foot intervals, or as otherwise directed by the Engineer. When the excavation of unsuitable material is completed to satisfy field conditions, and verified as such by the Engineer, final cross sections shall be taken at 50 foot intervals, or as otherwise directed by the Engineer. The cross sections shall show elevations at the appropriate break points and shall be plotted. Quantity computations shall be prepared (using the Average End Area Method), and submitted to the Engineer for acceptance. The Contractor is advised that no compensation will be

made for excavation below the depth required to satisfactorily remove the unsuitable material. The cost for the cross sections and computations shall be incidental to the pay item, Subsoil Excavation, C.Y. Subsoil Excavation, C.Y., shall include the cost of embankment to replace the excavated subsoil, labor, Materials, Equipment, fuel, transportation and other related Work to complete the pay item.

35. EMBANKMENT: The quantity will be at the plan quantity compacted in place. Where payment for embankment is not to be included in the payment for the excavation, and is to be paid for on a cubic yard basis for the item of Embankment, the plan quantities to be paid for will be calculated by the method of average end areas unless the Engineer determines that another method of calculation will provide a more accurate result. The measurement will include only material actually placed above the original ground line, within the lines and grades indicated in the Plans or directed by the Engineer. The length used in the computations will be the station-to-station length actually constructed. The original ground line used in the computations will be as determined prior to placing of embankment, and no allowance will be made for subsidence of material below the surface of the original ground. In no case will payment be made for material allowed to run out of the embankment on a flatter slope than indicated on the cross-section. The Contractor shall make his own estimate on the volume of material actually required to obtain the compacted in-place pay section.

36. PREMIUM FOR CONFLICT CONDITION: The pay item is included for use when conflicts are encountered:

"Premium for Conflict Condition" - when pay items for regular inlet/manhole structures are specified in the Proposal, and it becomes necessary to construct a 'conflict structure', the Contractor shall provide a unit price cost (premium) to cover the additional Work necessary to convert the regular inlet / manhole structure into a conflict structure.

The above item shall be paid for on an 'EACH' basis and shall include the cost of all labor, Materials, Equipment, fuel, transportation, and other items necessary to complete the Work.

37. PIPE CULVERTS

1. For pipe Culverts not within the scope of a FDOT Permit or Construction Agreement, proposed pipe material and size shall meet FDOT Specifications, but is limited to:

    - Reinforced Concrete
    - High Density Polyethylene except:
        - Not permitted under Thoroughfare Roadway pavement.
        - Not permitted under pavement of Roadways providing immediate access to coastal islands.
        - Not permitted within the confines of a mechanically stabilized earth (MSE) wall.
        - Not permitted in locations where failure would jeopardize buildings adjacent to the Right-of-Way.

  - The above restrictions include pipe locations taking into consideration the angle of repose of soil under any structure or the proposed pavement, including planned future widening.
- A-2000 Polyvinyl-chloride, except:
  - Not permitted where the pipe will be exposed to direct sunlight.
  - Not permitted when the manufacture date of the pipe to be installed exceeds 2 years.
- Corrugated Polypropylene.

Corrugated metal pipe may only be used as the last segment of pipe before discharging into a lake or canal when called for on the Plans.

Pipe diameter must match or exceed sizes shown in Plans; equivalent larger size pipes may be required if proposed pipe n value exceeds 0.012. Contractor to supply the required certified testing and computations for pipe life (see FDOT Drainage Manual). All pipe Culverts provided must meet or exceed 100 year design service life.

2. For pipe Culverts within the scope of a FDOT Permit or Construction Agreement, proposed pipe material and size are limited to pipes approved by FDOT, except non-reinforced concrete pipe shall not be used. Pipe diameter must match or exceed sizes shown in Plans; equivalent larger size pipes may be required if proposed pipe n value exceeds 0.012. Contractor to supply the required certified testing and computations for pipe life (see FDOT Drainage Manual). All pipe Culverts provided must meet or exceed 100-year design service life.

38. PIPE CULVERTS (STORM SEWER PUMPING & CLEANING)

New Storm Sewer System

The Contractor is advised that this Contract includes "pumping-down" and "cleaning" of the new storm sewer system(s), as directed by the Engineer. The Contractor shall include the cost of all labor, Materials, Equipment, transportation, fuel and all other items necessary to complete the "pumping-down" and "cleaning" of the new system(s). The Contractor shall remove the water from the system(s) to allow for visual inspections for leaks, deficiencies and lamping. When directed by the Engineer, the Contractor shall make all the necessary repairs to the new storm sewer system(s)

Payment for this Work on the new storm sewer system(s) shall be incidental to the pay item, "Pipe Culvert (Storm)", L.F.

Existing Storm Sewer System

Also included as a pay item is "pumping-down" of the **"existing"** storm sewer system(s) (to the lake/canal outfall point, or as directed by the Engineer), and shall be paid on a lineal foot basis under the pay item(s):

"Storm Sewer Pumping" (Exist.) (24" or less),
"Storm Sewer Pumping" (Exist.) (>24" to 48"),
"Storm Sewer Pumping" (Exist.) (>48")

The item(s) shall also include all costs associated with the removal of the water from the system(s) for visual inspection of leaks, deficiencies and/or lamping.

"Cleaning" of the existing storm system(s) is included as a contingent pay item and the Work required under this item will be determined by the Engineer upon review of the system(s) after the pumping phase.

The "cleaning" of the existing storm sewer system(s) shall be paid on a lineal foot basis under the pay item(s):

"Storm Sewer Cleaning" (Exist.) (24" or less),
"Storm Sewer Cleaning" (Exist.) (>24"to 48"),
"Storm Sewer Cleaning" (Exist.) (>48")

At the semi-final inspection, the contractor shall temporarily plug the system(s) at structures, outfall, or as otherwise directed by the Engineer, and pump the water out of the system to below one third of the diameter of the pipe (from the invert), or as otherwise directed by the Engineer. The Contractor and the Engineer shall visually inspect the system(s) for leaks, deficiencies, and lamping problems. If leaks, deficiencies and/or lamping problems are discovered in the new pipe system(s), the contractor shall make corrective repairs, as required, in accordance with Article 5-10.2 of the General Provisions of this specification, at no additional cost to the Department. If leaks, deficiencies and/or lamping problems are discovered in the existing pipe system(s), the contractor shall notify the Engineer, and the Engineer shall determine if the Contractor should provide a cost proposal for the Work required to make the corrective repairs, in accordance with Article 5-10.2.

39. STORM SEWER SYSTEM PIPE PLUGS: The Contractor shall prepare, and submit to the Engineer for approval, a plan/sequence of the plug locations for pumping down the storm system(s) satisfactory to the Engineer. Upon completion of the storm pumping sequences, the Contractor shall notify the Engineer 24 hours prior to removing any of the temporary plugs for the Engineer to visually confirm/verify the removal of the pipe plug. Cost for the Plans and coordination of all the Work required for the above shall be incidental to the cost of the storm sewer items of Work.

40. FINAL PIPE INSPECTION: Upon completion of placement of concrete pavement or the placement of structural asphalt, but prior to placement of asphalt friction course, dewater installed pipe and provide the Engineer with a video recording schedule allowing for pipe videoing and reports to be completed and submitted to the Department and reviewed prior to continuation of pavement.
For pipe 48 inches or less in diameter, provide the Engineer a video DVD and report using low barrel distortion video Equipment with laser profile technology, non-contact video micrometer and associated software meeting the requirements outlined in Section 430-4.8.

The cost of the above Work shall be incidental to the related pay item for the pipe.

41. VIDEO REPORT: Provide a video report in accordance with Section 430-4.8.1. The cost of the above Work shall be incidental to the related pay item for the pipe.

42. GRAVITY WALL CONSTRUCTION: Unless otherwise directed, gravity walls are to be constructed from "inside" the Right of Way (no encroachment on private property). Any construction methods necessary to satisfy this requirement shall be incidental to the cost of the gravity wall.

43. IRRIGATION SYSTEM WITHIN RESTORATION AGREEMENT AREAS: The Contractor, prior to start of construction, shall obtain as-built information of the irrigation system(s) within restoration agreement areas, and catalogue related component information (manufacturer/part number/etc.) required to ensure appropriate replacement of the system and components. The as-built information shall be submitted to the Department, Construction Coordination Division, and upon completion of the construction, the Contractor shall restore the irrigation system and components to its original or better condition. Payment for all Work to complete the item shall be incidental to the cost of the Project.

44. COLOR TREATED AND STAMPED CONCRETE (5" THICK): The Contractor's attention is directed to the pay item for "Color Treated and Stamped Concrete", S.Y. This item which is proposed to be constructed in lieu of concrete traffic separators, as directed by the Engineer, consists of cast-in-place concrete (5") between Type "F" Curb and Gutter, having the surface colored with a color hardener (equivalent to the products supplied by Wm. D. Adeimy, Inc., 561/832-6305), and with the surface textured or imprinted with a pattern (as directed by the Engineer), and then sealed with a color seal. The Contractor is responsible for assuring the curbing is in no way discolored, damaged, marked, etc. by the application of the above.

Color Hardener:

- Apply the dry hardener when the bleed water disappears and the floating process will not disrupt the level of the surface.
- Normally apply the dry hardener evenly in two separate hakes, using two-thirds of the material for the first shake.
- Use wood floats or a power-troweling machine equipped with float blades to work the dry hardener completely and thoroughly into the surface after each application.
- After floating the final shakes, hand or machine trowel the surface to a flat, uniform finish and apply the specified texture. Apply antiquing release before imprinting with mat-type tools.
- Coverage requirements may vary according to intended use and color. 90lbs. per 100sq.ft. is considered the median range.

Curing:

- Use colored concrete sealer in the matching color to cure interior color hardened floors and exterior flat Work, that will receive regular maintenance and re-coating.
- Newly placed concrete should receive one thin finish coat of colored concrete sealer after placement and after the required curing time of 14-28 days has been reached. Before application of the finish coat, the moisture content of the concrete must be low enough so alkali and other salts do not become trapped beneath the coating, causing discoloration or clouding, thus the reason for the 14-28 day time frame.

The Work is to be performed on the job site by trained and experienced workers.

The pay item "Color Treated and Stamped Concrete", S.Y., includes all labor, Equipment, Materials, transportation, fuel and all other items incidental to or necessary for completing the Work.

The Contractor shall install a longitudinal 6" PVC (Schedule 80) pipe at stamped concrete areas, in accordance with the details for the "Irrigation Sleeves" (as detailed in the Special Provisions). This item shall be paid for under, "6" PVC Pipe (Schedule 80)", Lineal Feet, and shall include the cost of all labor, Materials, Equipment, fuel, transportation, and other items necessary to complete the Work.

45. ENGRAVING OF CURB FACE: The Contractor is hereby notified that the names of the roads shall be engraved on all quadrants of major intersections (two per quadrant), with four (4) inch high block letters, having a depth of one-half inch, and painted with a black finish. Locations shall be determined by the Engineer.

Samples of the engraving are available at the office of the Director, Construction Coordination Division, 2300 N. Jog Rd., Suite #3W-57, West Palm Beach, Florida, 33411-2745, Florida.

The cost for the pay item, "Engraving of Curb Face", EACH, shall include all labor, Equipment, Materials, transportation, fuel and all other items incidental to or necessary for completing the Work.

46. GUARDRAIL & SPECIAL SAFETY PIPE RAIL: At locations where sidewalks, walkways, bike paths or other media for bicycle and/or pedestrian traffic are within 4' of the back of the guardrail post, the contractor shall utilize "steel posts" and "special safety pipe rail" (2" diameter) as shown in FDOT INDEX 400.

Special note: Trinity Industries ET-plus system guardrails will not be allowed on Department Projects.

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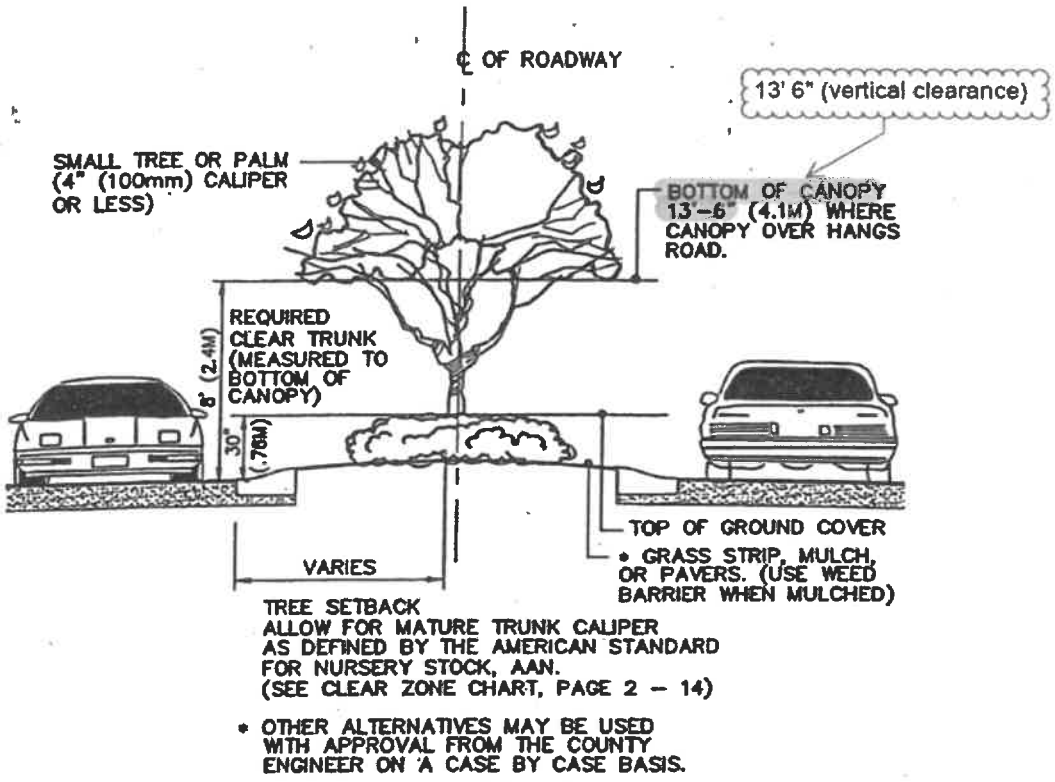
47. PLANTING STANDARDS

Mountable Curb and Uncurbed Median within Safe Sight Distance Triangle

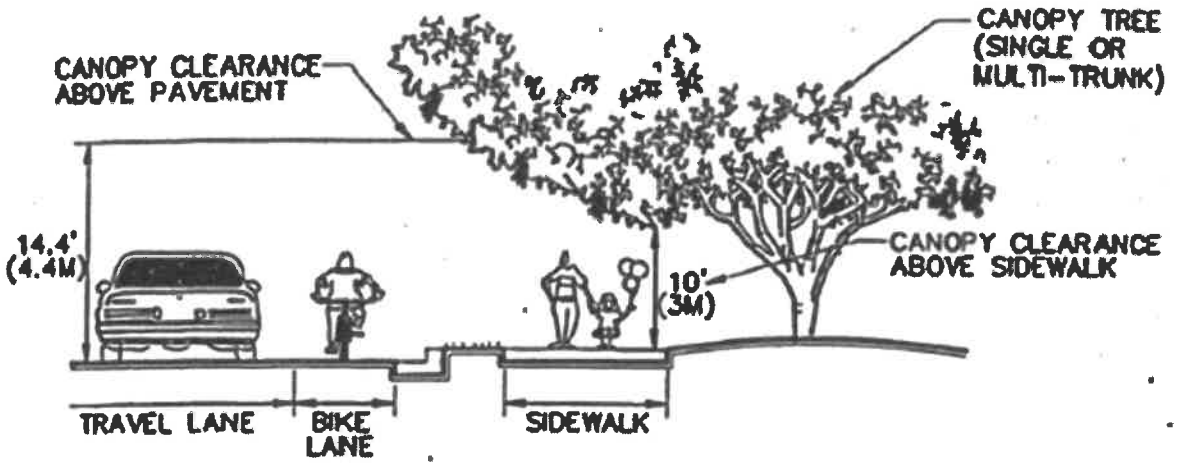


TYPICAL SECTION

Small trees and palms shall be used within mountable and uncurbed medians. Tree and palms that are 4" in caliper or less measured at 6" above grade shall be considered small and may be used within the medians. The plant material within these areas shall be maintained so that they do not overhang into the travel lane. Any portion of the tree that overhangs the travel lanes shall be maintained with a 13'-6" vertical clearance. Otherwise, no encroachment will be permitted.

Canopy Clearance for Sidewalks and Bicycle Paths
Sidewalks should be maintained free of all growth. The bottom limbs of trees overhanging the sidewalk should be at least 10' above the sidewalk.

When tree limbs extend over separate bike paths, they should be at least 10' above the bike path. When they extend over designated or undesignated bike lanes within the roadway, they must be at least 14.4' above the pavement (see next page).



BIKE LANE SECTION

Roadside Clear Zone

The roadside clear zone is that area outside the traveled way, available for use by errant vehicles. Vehicles frequently leave the traveled way during avoidance maneuvers and due to loss of control by the drive or due to the collisions with other vehicles. The primary function of the clear zone is to allow space and time for the driver to regain control of vehicle and avoid or reduce the consequences of collision with roadside objects. This area also serves as an emergency refuge location for disabled vehicles.

The width of the clear zone should be as wide as it is practicable. The minimum permitted widths are given in the following table. These are minimum values only and should be increased whenever feasible.

In rural areas it is desirable and frequently economically feasible, to substantially increase the width of the clear zone. Where traffic volumes and speeds are high, the width should be increased. The clear zone on the outside of horizontal curves should be increased due to the high probability of vehicles leaving the Roadway at a high angle.

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Minimum Width of Clear Zone

Type of Facility	Design Speed or Posted Speed (whichever is greater)						
	30 mph	35 mph	40 mph	45 mph	50 mph	55 mph	60 mph and above
	Minimum Clear Zone						
Rural	6' Local 10' Collector 14' Arterials	6' Local 10' Collector 14' Arterials	10' Collectors 14' Arterials	14' Arterials and Collectors ADT <1500 18' Arterials and Collectors ADT ≥1500	14' Arterials and Collectors ADT <1500 18' Arterials and Collectors ADT ≥1500	18' Arterials and Collectors ADT <1500 24' Arterials and Collectors ADT ≥1500	18' Arterials and Collectors ADT <1500 30' Arterials and Collectors ADT ≥1500
Urban	4'	4'		4'	N/A	N/A	N/A

Urban Facilities clear zone is measured from face of curb (6" type D or F)
Rural Facilities Use rural for urban facilities when no curb and gutter is present. Measured from edge of through travel lane on rural section.
Curb and gutter not to be used on facilities with design speed > 45 mph.
ADT in the table above refers to design year ADT.

48. RESETTING FENCE: The quantities to be paid for under this item shall be the length in feet of reset fence including gates. The quantity of removed and reset fence determined, as provide above, shall be paid for at the Contract unit price per linear foot for removed and reset fence. The item includes the cost of removing and resetting any existing gates. The above price and payment shall be full compensation for all the Work specified in this Section, including furnishing all the required new hardware, additional posts and replacement of any material damaged by the Contractor.

49. RECORD DRAWINGS (ROADWAY): The Contractor shall note that this Contract includes preparation of "Record Drawings". By definition, "Record Drawings" shall be the electronic information which reflects the as-built conditions of the project recorded at or about the time of the "substantial completion" inspection. The as-built information and permitting forms shall be prepared and certified (i.e., signed and sealed) by a Professional Engineer or Land Surveyor licensed in the State of Florida, as required by the project.

The as-built information shall indicate (at a minimum) the following:

- All changes, additions or deletions to the original design documents.
- Centerline/baseline ties to section line(s) (including ties at PC and PT).
- Stations/elevations/offsets at PC's, PT's, PI's, low points, high points, horizontal angle points.
- Stations/elevations/offsets at edge-of-pavement (EOP), top-of- curb and back-of-sidewalk, at locations shown on the Plans, at a minimum.
- At non-curb inlets show state plane coordinates, station/offset/elevation to the top-center of the grate.
- At curb inlets show the state plane coordinates, station/offset/elevation at EOP.

- At special and slotted structures - show the elevation(s), dimensions, and the invert of the weir; the bleeders/orifices; and pipe inverts.
- At outfalls, show the state plane coordinates, station/offset/invert/diameter of pipe, structure type and dimensions.
- The diameter, invert, shape, and material type of connecting pipes between all structures.
- For Irrigation Sleeves - show the state plane coordinates, station/offset/elevation for all end caps, and the invert elevation at the end cap.
- At lakes obtain cross sections at 50 foot intervals, or as otherwise directed by the Engineer (Top of Bank, Top of Slope, etc.).
- At bridges, show the low member elevation/station/offset.
- At end bents, show station/offset/elevation at two corners to ensure proper offset location.
- For "Begin and End" Bridge, indicate the stations/offsets/elevations at the respective points.
- All existing and proposed trees, show state plane coordinates, station/offset to the approximate center of the tree.
- All existing and proposed Irrigation wells and valve boxes, show state plane coordinates, station/offset to the top-center of the well and/or valve box.
- All existing and proposed pull boxes, show state plane coordinates, station/offset to the top-center of the box.
- All existing and proposed traffic control cabinets, show state plane coordinates, station/offset to the center of the box.

The above information shall be collected by survey, and the collected data shall be referenced on the Micro Station (.dgn) design file of the project (Micro Station (.dgn) is the only acceptable format). The electronic Micro Station (.dgn) files (and .pdf files of same) shall be submitted on three (3) CDs labeled with project information, one (1) set of black line Plans, and six (6) sets of signed & sealed black line Plans, boldly marked in large print **"RECORD DRAWINGS ROADWAY"**. PDF files shall be digitally or electronically signed and sealed in accordance with either FAC 5J-17.062 or FAC 61G15-23.

The above information shall be submitted to the Department (Director, Construction Coordination), for approval, prior to scheduling a final inspection.

The cost of the location survey, compilation/reproduction/conversion of electronic files, Plans, and other information necessary to satisfy the above, shall be incidental to the cost of the items of Work.

The Contractor shall review all permits for this project and the general/special conditions which may call for "Record-Drawings" for a specific agency. The Contractor is responsible to satisfy the permit requirements in accordance with that agency's policy, with the understanding that the cost for said "Record-Drawings", shall be paid in accordance with PER-1.

50. RECORD DRAWINGS and DOCUMENTS (BRIDGE):

The Contractor is advised that bridge structures are subject to FDOT load rating requirements and shall take all necessary steps to comply with these requirements. See FDOT Load Rating Manual (Topic No. 850-010-035) at https://www.fdot.gov/maintenance/loadrating.shtm.

RECORD DRAWINGS (BRIDGE):
The Contractor shall note that this Contract includes preparation of "Record Drawings". By definition, "Record Drawings" shall be the electronic information which reflects the as-built conditions of the project recorded at or about the time of the "substantial completion" inspection. The as-built information and permitting forms shall be prepared and certified (i.e., signed and sealed) by a Professional Engineer or Land Surveyor licensed in the State of Florida, as required by the project.

The as-built information shall indicate (at a minimum) the following:

- All changes, additions or deletions to the original design documents (including shop drawings).
- Centerline/baseline ties to section line(s) (including ties at PC and PT).
- Stations/elevations/offsets at PC's, PT's, PI's, low points, high points, horizontal angle points.
- Stations/elevations/offsets at edge-of-pavement (EOP), top-of- curb and back-of-sidewalk, at locations shown on the Plans, at a minimum.
- At non-curb inlets show station/offset/elevation to the top-center of the grate.
- At curb inlets show the station/offset/elevation at EOP.
- At bridges, show the low member elevation/station/offset.
- At end bents, show station/offset/elevation at two corners to ensure proper offset location.
- For "Begin and End" Bridge, indicate the stations/offsets/elevations at the respective points.

The above information shall be collected by survey, and the collected data shall be referenced on the Micro Station (.dgn) design file of the project (Micro Station (.dgn) is the only acceptable format). The electronic Micro Station (.dgn) files (and .pdf files of same) shall be submitted on three (3) CDs labeled with project information, one (1) set of black line Plans, and six (6) sets of signed & sealed black line Plans, boldly marked in large print **"RECORD DRAWINGS BRIDGE"**.

The above information shall be submitted to the Department (Director, Construction Coordination), for approval, prior to scheduling a final inspection.

The cost of the location survey, compilation/reproduction/conversion of electronic files, Plans, and other information necessary to satisfy the above, shall be incidental to the cost of the items of Work.

The Contractor shall review all permits for this project and the general/special conditions which may call for "Record-Drawings" for a specific agency. The Contractor is responsible to satisfy the permit requirements in accordance with that agency's policy, with the understanding that the cost for said "Record-Drawings", shall be paid in accordance with PER-1.

DOCUMENTS (BRIDGE):
- **Schedule of Anticipated dates of Inspections:**
  In-Service Inspections and or Pre-Acceptance Inspection (before any new lanes are opened to traffic). The Schedule should be received within 60 days of the preconstruction meeting. The

Department must receive a two week advance confirmation notice prior to the In-Service Inspections and or Pre-Acceptance Inspection.

- **As-Built Load Rating**
  If the bridge is built per plan, the As-built load rating is simply a signed and sealed load rating FDOT summary sheet stating that there was no change during construction that would affect the load rating.

- **Pile Driving Records**

- **In-Service Inspection**
  The Structures Maintenance In-Service Inspection is conducted prior to any new lanes opening to public traffic. Note that for phased construction, there will be multiple in-service inspections required. The intent of this inspection is to verify the bridge is safe for public traffic in accordance with **FHWA** instructions **Q303-7**

51. DYNAMIC LOAD TEST SUPPORT: Dynamic Load Test Support shall include contractor furnishing of Equipment and personnel necessary for attachment of leads, supply power source, man-basket, shelter, and any other services necessary to provide support for the testing (reference FDOT Specifications Section 455-5.13). The Department will secure test lab services, including Pile Driver Analyzer (PDA), required for dynamic measurements during the driving of the test piles. All costs for Dynamic Load Test Support shall be incidental to the cost of test pile.

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PALM BEACH COUNTY

CONTRACTOR'S FINAL REPORT

COUNTY OF RESIDENCE FOR EMPLOYEES

(to be submitted with Contractor's Application for Final Payment)

To: Palm Beach County Project Manager

From: Contractor Superintendent

Date:

Project Name: Annual Traffic Signal Construction Contract

Project Number: 2020052

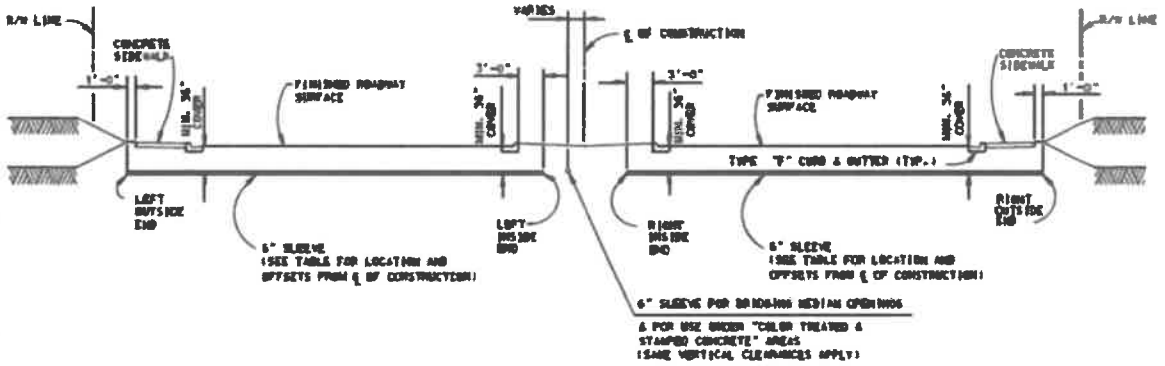
In accordance with the Special Provisions of the Contract, Contractor reports the following:

Total number of employees of Contractor and Sub-Contractors who worked for more than one day on the Project: _____

Number of employees of Contractor and Sub-Contractors who reported their county of residence as Palm Beach County: _____

_____

Signed



DETAIL FOR INSTALLATION OF MEDIAN IRRIGATION SLEEVES FOR THOROUGHFARE ROADS

(NOT TO SCALE)

AS-BUILT CERTIFICATION FORM

P.B.C. # _____

STATION	OFFSETS FROM ℄ OF CONSTRUCTION FOR ENDS OF 6" SLEEVES						REMARKS
	LEFT OUTSIDE END	LEFT INSIDE END	LENGTH OF PIPE ON LEFT SIDE	RIGHT INSIDE END	RIGHT OUTSIDE END	LENGTH OF PIPE ON RIGHT SIDE	
SUB-TOTAL							
TOTAL PROJECT #							

GENERAL NOTES

1. ALL SLEEVES (LEFT & RIGHT) SHALL BE INSTALLED AT SAME ℄ STATION, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
2. ALL SLEEVE ENDS ARE TO BE CAPPED.
3. ALL SLEEVE ENDS ARE TO BE MARKED AT THE TIME OF INSTALLATION WITH A 2"x4" WOODEN BOARD STANDING VERTICALLY FROM SLEEVE END TO 1' ABOVE FINISHED GROUND. EXPOSED WOODEN MARKER IS TO BE PAINTED ORANGE FOR FUTURE LOCATION PURPOSES.
4. SLEEVES ARE TO BE 6" P.V.C. SCHEDULE 80 PIPE BASED UPON F.D.O.T. SPECIFICATION SECTION 948, OR 6" BLACK HOT-DIPPED GALVANIZED STEEL PIPE WITH A MINIMUM WALL THICKNESS OF 0.280" BASED UPON A.S.T.M. STANDARD A53-64A.
5. BACKFILLING ABOVE SLEEVES SHALL BE PERFORMED ACCORDING TO F.D.O.T. SPECIFICATION SECTION 125-8.3 (BACKFILLING REQUIREMENTS FOR PIPE CULVERTS AND STORM SEWERS).
6. ALL STATIONS ARE APPROXIMATE. CONTRACTOR MUST CONTACT COUNTY ENGINEER PRIOR TO INSTALLATION TO DETERMINE EXACT LOCATION IN THE FIELD.
7. EACH SLEEVE END IS TO BE MARKED AT THE TIME OF INSTALLATION WITH A 3M ELECTRONIC MARKER (MODEL 1252) AND GPS STATE PLANE COORDINATES SHALL BE RECORDED.

PALM BEACH COUNTY · ENGINEERING AND PUBLIC WORKS · ROADWAY PRODUCTION

REVISED JANUARY 2008

PALM BEACH COUNTY ENGINEERING & PUBLIC WORKS DEPARTMENT
PALM BEACH COUNTY, FLORIDA

LIQUID ASPHALT CALCULATIONS

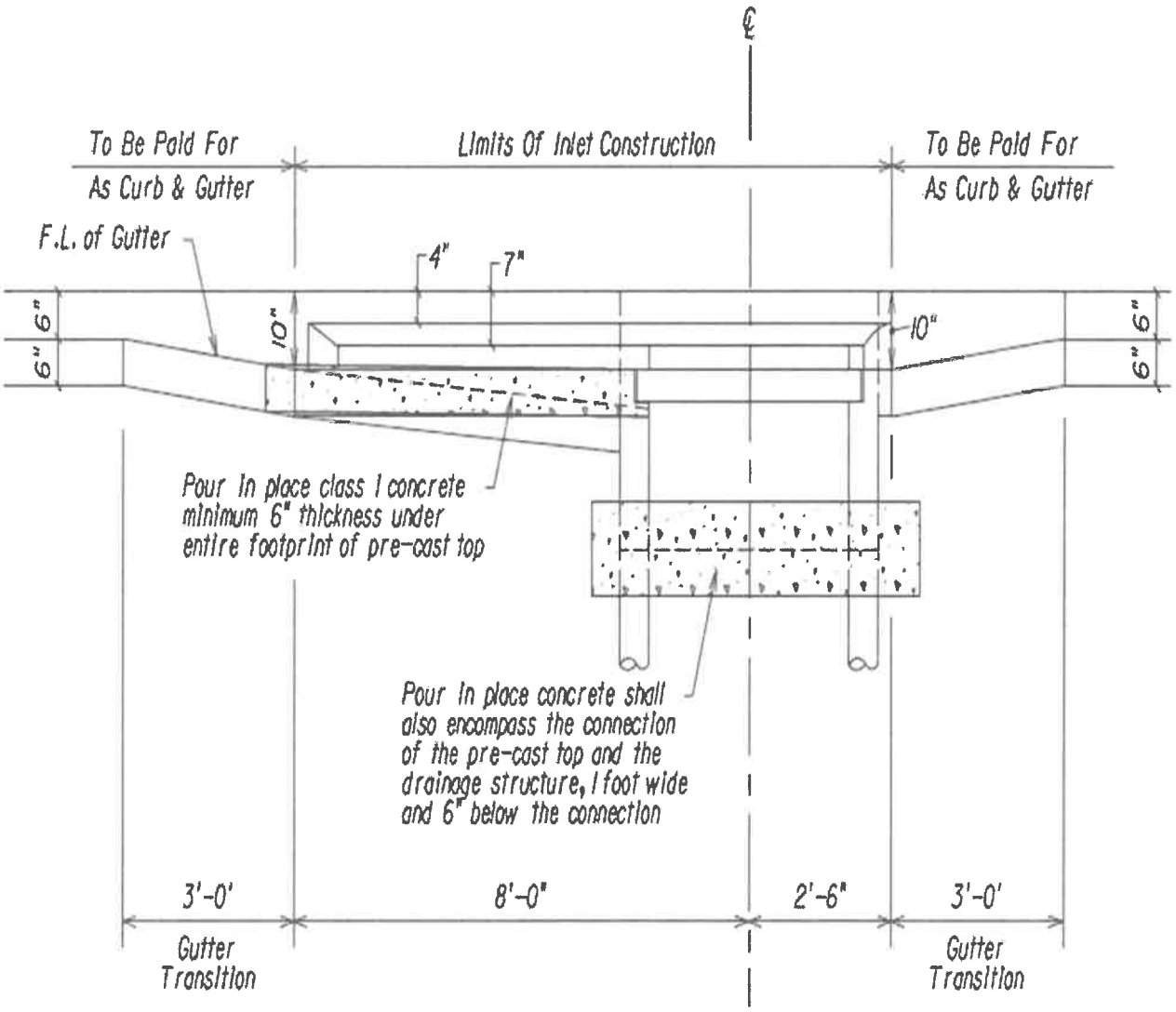
Estimate No: _____ Page No. _____ Status of: _____
Contractor: _____
Contract for: _____
Bid Index: _____

Month/Year	Tons	Pounds	*L.A. %	Weight of L.A.	Gal.	0.95% or 1.05% of Bid Index	Monthly Index	Difference (+ or -)	Change in Cost	Cumm.	Comm. Total
A	B	C	D	E	F	G	H	I	J	K	L
		2000.00	*								0.00
		2000.00	*								0.00
		2000.00	*								0.00
		2000.00	*								0.00
		2000.00	*								0.00
		2000.00	*								0.00
		2000.00	*								0.00
		2000.00	*								0.00
		2000.00	*								0.00
		2000.00	*								0.00
		2000.00	*								0.00
		2000.00	*								0.00

LIQUID ASPHALT:
All bids for materials covered by the Proposal are to include required liquid bituminous materials and tack coats. No additional payment will be made for the liquid bituminous materials in the prime and tack coats. The Department will adjust the bid unit price for bituminous material, excluding cutback and emulsified asphalt, to reflect increases or decreases in the Asphalt Price Index (API) of bituminous material from that in effect during the month in which bids were received.
A price adjustment may be made upon request by either party, when escalation or de-escalation of the cost of the liquid bituminous materials used in the Asphaltic Concrete Mixes included in this proposal exceed 5% (See General Provision Section 9-2.1.2 "Bituminous Material").

* NOTE: The L.A. % to be applied for Friction Courses is 6.5%.
For all other asphalt mixes the L.A. % shall be 6.25%.
This form shall be submitted to the Engineer on a monthly basis.

Rev 1/2008



INLET TYPE 5

(Curb Inlet Top Type 6 Symmetrical with Left Half)

SUPPLEMENTAL CONCRETE AT DRAINAGE STRUCTURE TOP DETAIL

1. INTENT AND SCOPE

The work detailed in these specifications consists of the installation and /or furnishing of traffic signal items, all according to the Florida Department of Transportation's (FDOT) Standard Specifications for Road and Bridge Construction dated January 2022 (or later version) (SSRBC-2022), the (FDOT) Standard Plans – FY 2022-2023 (or later version) (SP-FY 2022-23), FDOT Standard Mast Arm Assembly (Index Nos. 649-030 and 649-031), the attached Notes and Palm Beach County (PBC) Traffic Signal Installation Standards and Details-2022. http://pbcgov.com/engineering /traffic/pdf/signal_typicals.pdf. Where conflicts exist, the Notes and PBC-Typicals shall take precedence over FDOT standard specifications.

Installations shall be as shown on plans as presented to the Contractor at the commencement of each project in such amounts, to such locations, at such times as may be designated by the Director of Traffic or duly appointed representative (Engineer).

All items are to be bid on a unit price basis to establish the price for use on work authorizations (purchase orders) for specific projects.

The Contractor should fully understand that the Board of County Commissioners does not hereunder, contract to do any specific amount of work during the contract period.

The locations of the traffic signal projects will vary, and may be at any point within the boundaries of Palm Beach County. The Contractor will not be expected to operate their equipment or personnel beyond the limits of Palm Beach County under this contract.

For further information, please contact the Director of Traffic at 561-684-4030.

2. REPRESENTATIVE OF THE DIRECTOR OF TRAFFIC

The Director of Traffic Division will appoint one or more representatives (an Engineer) to inspect equipment used under this contract, observe personnel employed, and note the general performance of the Contractor. Any authorization to revoke, alter, enlarge, or relax the conditions of these specifications will be at the discretion of the Engineer. The Engineer will have the authority to reject defective equipment, and report on inept personnel, and to suspend any work that is being improperly done, subject to the final decision of the Director of Traffic Division.

3. STANDARD SPECIFICATIONS FOR ROAD & BRIDGE CONSTRUCTION

It is the intent of these Specifications that the FDOT Standard Specifications for Road and Bridge Construction dated January 2022 (or later version), (FDOT SP-FY 2022-23) will be used as the basis for this contract except as amended herein. Such wording as, Department of Transportation and Personnel, is intended to be replaced with that wording which would provide proper terminology, thereby making such Standard Specifications and Special Provisions of Palm Beach County in conjunction with Palm Beach County's personnel.

Add the following to the end of Article "4-1 **Intent of Contract"** of the FDOT SSRBC-2022: Included under

"The work covered by this Contract consists of the installation and/or furnishing and/or removal of traffic signal items.

No areas will be closed to traffic unless or until approved by the Engineer. During the period or periods that areas are closed to traffic, adequate provisions to control and/or detour traffic will be provided by the Contractor. Traffic control shall be in accordance with FDOT Traffic Control through Work Zones – SP 102-600 of the FDOT SP-FY 2022-23 for street and highway construction, maintenance, and utility operations, and shall be the responsibility of the Contractor.

The job is to be completed in a workmanlike manner and all debris removed within the time of construction."

4. CONTRACT NOTES

1. All materials and equipment supplied and installed on any project shall be, where applicable, on the FDOT Approved Product List (APL) and meet the FDOT Standard Specifications for Road and Bridge Construction, 2022. All materials and equipment shall be certified. Certificates shall be supplied with bid.

2. LED's used by the Contractor shall meet ITE and FDOT requirements.

3. Any changes to signalization plan during construction, the proposed change shall be submitted in writing to the Engineer for approval. No changes shall be implemented without the Engineer's approval.

4. The Contractor shall be responsible for the protection of all present utilities that have been located by the various utility companies. The Contractor shall also maintain and protect the existing traffic signals and their related equipment from damage caused by subcontractors and employees under the Contractor's contract but only to the extent of the Contractor's normal work operation, and shall not be responsible for routine maintenance, normal wear and tear, or an act of God, unless otherwise specified.

5. The Contractor shall be responsible for the adjustment and relocation of any and all traffic control signals and related equipment. A twenty-four (24) hour notice must be given to the Palm Beach County Traffic Division requesting the services of a signal technician to serve in an advisory capacity.

6. The Contractor shall bag all; newly installed signal heads with a heavy duty opaque plastic covering until final inspection and acceptance by the Engineer, unless otherwise specified. If, in the opinion of the Engineer, the new heads would create a hazard condition to motorists, the heads shall not be installed until one (1) hour before turn-on of the new equipment.

7. The Contractor shall provide barricades and warning and detour signs as required in Section 102-Maintenance of Traffic in FDOT SSRBC-2022.

8. The Contractor shall coordinate their activities to ensure that functioning traffic signals remain visible to motorists during construction of new signal equipment at existing signalized intersections. Any obstructions such as trees needs to be trimmed or removed that blocks the visibility of any signal heads as a driver approaches the intersection.

9. The Contractor shall notify Florida Power and Light Company (FPL) forty-eight (48) hours in advance before setting traffic signal poles. The Contractor shall provide all coordination with FPL necessary to obtain the power for signals. The Contractor shall also provide coordination with all other utilities having an impact on the signal installation.

10. All existing traffic signal equipment removed by the Contractor shall be tagged to identify location. A representative of Traffic Operations warehouse shall be given twenty-four (24) hour notice before delivery to an approved location by the Engineer. Equipment not identified will not be accepted and equipment not returned will result in the withholding of payment to the contractor. Traffic Operation warehouse personnel will issue a receipt to the Contractor for returned equipment.

11. When the Engineer determines that the need for a traffic signal is critical to the public welfare, early "turn-on" of the signal shall be required before the completion of the project.

12. The Engineer may, at any time, authorize Palm Beach County personnel to enter the controller cabinet in order to restore any and all signal equipment to proper operation if a malfunction or non-functioning of such equipment poses a hazard or inconvenience to motorists or pedestrians. Such authorized entry may occur at any time within the period of the Contract and such authorized entry shall in no way relieve the Contactor or Manufacturer of their respective warranties.

13. All traffic signals will be inspected prior to final acceptance for maintenance by Palm Beach County Traffic Operations. See Palm Beach County Traffic Operations – Signal Inspection Process in Attachment A.

14. A Ninety (90) day burn-in period will be required for all electrical or electronic equipment furnished and installed as part of any traffic signal installation or system of traffic control devices. The burn-in shall consist of the field operations of the signalization system in a manner which is in full accordance with the signal operation requirements of the plans and specifications.

    The burn-in period will commence after final inspection and a written conditional acceptance by the Engineer and will terminate 90 consecutive days thereafter, unless an equipment malfunction occurs. The written conditional acceptance of the signal will be granted to the contractor upon completion of final inspection of the signal. See PBC Traffic Signal Inspection Process in Attachment A. The burn-in period will be stopped, when instructed by the Engineer, for the length of time that the equipment is defective. When the equipment is repaired and is functioning properly, the burn-in period will resume from the point in time when it was stopped.

15. During the burn-in period, the Contractor shall restore operation of the installation within four (4) hours after notification of a malfunction. If the Contractor does not respond within four (4) hours, Palm Beach County shall have the option of making the necessary repair and billing the Contractor for the actual time and materials required.

16. When replacing sidewalks or curb and gutters, it shall be the responsibility of the Contractor to reinstall them to match existing color and surface texture.

17. Signal Timing: The Engineer will furnish timing. The Contractor shall notify the County Traffic Engineer seventy two (72) hours in advance of any requirement for timing.

18. The Contractor shall be required to install all span wire and/or mast arm mounted signing that is called for on any project. All non-powered signs, as required for the traffic signals by the design plans, shall be provided by Palm Beach County. Internally Illuminated Street Name Signs shall be provided by Palm Beach County when item is specified as Install-Only. All mounting hardware and labor for span wire signs shall be included in pay items 634-xxx. All mounting hardware and labor for mast arm signs shall be included in pay items 649-xxx. All mounting hardware and labor for concrete pole signs shall be included in pay item 641-2-AB-YY. All mounting hardware and labor for wood pole signs shall be included in pay item 643-XXX. All mounting hardware, labor and signs for pedestal signs shall be included in pay item 646-1-1X and item 646-1-12-A.

19. Where pedestrian pushbuttons are required, the Contractor shall be required to install one or two special signs per button, as provided by Palm Beach County. All mounting hardware and labor for span wire signs shall be included in pay items 634-xxx. All mounting hardware and labor for mast arm signs shall be included in pay items 649-xxx. All mounting hardware and labor for pedestal signs shall be included in pay items 646-1-1X and item 646-1-12-A. All mounting hardware and labor for concrete pole signs shall be included in pay item 641-2-AB-YY. All mounting hardware and labor for wood pole signs shall be included in pay item 643-XXX.

20. Signal Activation Scheduling: Scheduling of signal activation is the responsibility of the Engineer. Activation will be scheduled a minimum of seven (7) days after notification that the signal has been placed in flashing mode and inspections by County forces have been completed. The Contractor shall be present and shall conduct the turn-on to full operation in the presence of the Engineer. No activations shall be scheduled on Mondays, Fridays, weekends, holidays or the day before and after a holiday, unless otherwise approved by the Engineer.

21. The contractor shall provide the requested number of portable 4'x8' variable-message-sign's (VMS) to be located at an appropriate distance in advance of one (1) or more approaches to the intersection as specified by the Engineer one (1) week prior to the scheduled activation to full operation and shall remain in place for one (1) week following activation. Any proposed or necessary schedule change during the seven (7) days prior to scheduled turn-on will be at the determination and discretion of the Engineer. The cost for providing the temporary VMS signs shall be on a daily basis and shall be covered under Pay Item 102-99.

21.1. Prior to activation

21.1.A. The VMS message shall be:

21.1.A.1. (Panel One – Line 1) "Traffic"
21.1.A.2. (Panel One – Line 2) "Signal"
21.1.A.3. (Panel One – Line 3) "WILL BE"
21.1.A.4. (Panel Two – Line 1) "ACTIVATED"
21.1.A.5. (Panel Two – Line 2) "ON ***DAY***"
21.1.A.6. (Panel Two – Line 3) "***MONTH XX***"

21.1.B. Substitution for the word '*DAY*' shall be as follows:

21.1.B.1. Sunday as "SUN"
21.1.B.2. Monday as "MON"
21.1.B.3. Tuesday as "TUES"
21.1.B.4. Wednesday as "WED"
21.1.B.5. Thursday as "THUR
21.1.B.6. Friday as "FRI"
21.1.B.7. Saturday as "SAT"

21.1.C. Substitution for the word '*MONTH*' shall be as follows:

21.1.C.1. January as "JAN"
21.1.C.2. February as "FEB"
21.1.C.3. March as "MAR"
21.1.C.4. April as "APR"
21.1.C.5. May as "MAY"
21.1.C.6. June as "JUN"
21.1.C.7. July as "JUL"
21.1.C.8. August as "AUG"
21.1.C.9. September as "SEP"
21.1.C.10. October as "OCT"
21.1.C.11. November as "NOV"
21.1.C.12. December as "DEC"

21.1.D. Substitution for *'XX'* shall be as follows:

The numerical day of the month, from one (1) to thirty-one (31). Dates less than ten (10) shall be preceded by a zero (0); EXAMPLE: "JAN 03" for January 3rd.

21.2. After the turn-on, the VMS message shall be changed to:

20.2.1. (Panel One – Line 1) "TRAFFIC",
20.2.2. (Panel One – Line 2) "SIGNAL",
20.2.3. (Panel Two – Line 1) "NOW",
20.2.4. (Panel Two – Line 2) "ACTIVE"

NOTE: Panel Two, Line 1 and Line 2, shall FLASH three (3) times before reverting back to Panel One.

22. For mast arm signal installations, the contractor shall install wire mesh support grips for strain relief. All signal cable must be held by a strain relief (Le Grand BCO750FSS or approved equivalent) attached to the J Hook inside of a mast arm.

23. Lightning protection shall be attached to incoming power service, all signal outputs, all poles and pedestals.

24. All loop work to be completed in accordance to pay item 660-2-xxx. No loop work shall be permitted during the hours of 7:00 AM to 9:00 AM, and during the hours of 3:00 PM to 7:00 PM. Nor shall loop work be permitted on days prior to major holidays.

25. Ground rods to be supplied and attached to all signal poles, control cabinets and equipment footings and basis according to PBC standard specifications, and Typical Ground Rod Array Detail. The work and materials for grounding are incidental to items being grounded. Bid Item 620-1-1 "Grounding Electrode" is provided for the case when additional grounding Electrodes may be required.

26. Cable ties must be PANDUIT (BT2LH-TL0) Black Weather Resistant Nylon with stainless steel self-locking barb, or equivalent approved by the Engineer.

27. All threaded parts/assemblies that is metal on metal must be treated with anti-seizing compound.

28. Fiber Optic Specifications are listed in Attachment A; SPECIAL SPECIFICATIONS.

29. All conduit (Bid Items 630-2-1x-y) shall include a 14AWG insulated stranded (THHN) tracer wire and one (1) pull line. Multiple bundle conduit runs (i.e. 2-2") shall require only one (1) tracer per bundle runs and one (1) pull line per conduit in the bundle.

30. All 5-section or 4-section signal heads included in Bid-Items 650-1-25 and 650-1-24 consist of aluminum housing for the top red-indication and poly-housing for the bottom 4 or 3 indications (yellows and greens).

31. All pull boxes and covers shall be heavy duty traffic bearing (minimum Tier15, 22K bearing). Covers to be embossed with the word "PBC TRAFFIC SIGNAL" or "PBC ITS".

32. All bolts installed shall be long enough to protrude through the threaded hole, washer, and nut when applicable or as determined by the Engineer.

33. The Contractor shall have access to low profile auger truck (s) (LPAT) when requested by the Engineer. The operating height of the LPAT varies from 20 feet to 24 feet depending on the need. Upon receipt of the Work Authorization, the contractor shall make arrangements to reserve the LPAT for the project.

34. Shop drawings for all materials to be used under this contract shall be submitted to PBC Traffic Division for approval prior to purchase. Shop drawings shall include, but not limited to, conduits, cables, pull boxes, luminaires and photo cells, signal heads, pedestrian heads, pedestrian detectors, video detection system, illuminated street name signs, concrete poles,

mast arms, mast arm color sample chip and finishing process, wire mesh support grips, and controller cabinet assembly.

35. Contractor shall be able to secure the use of and provide a Telescoping Lift for mast arm installation. (to be paid under item Number 649-40-000-M)

PRICE ADJUSTMENTS:

At the discretion of Palm Beach County – County Engineer, price adjustments per project may be allowed up to the percentage increase or decrease of the cost of Furnish-and-Install and Furnish-Only items by the contractor. The percent increase or decrease shall be twenty five percent (25%) of the Furnish-and-Install items, and Fifty percent (50%) of the Furnish-Only items, of the change in the cost of HD Galvanized Coil, as published by MEPS as compared to the September 2021 price of $ 2470/ton. (Check web site: at: (https://mepsinternational.com/gb/en) or direct link at: (https://mepsinternational.com/gb/en/products/north-america-steel-prices)

Example:

1. August 2021 price = $ 2428
   Future new price = $ 3108
   Adjustment allowed = $ (3108 – 2428)/2428 X .25 = -7% (7% decrease in price)

2. August 2021 price = $ 2428
   Future new price = $ 3593
   Adjustment allowed = $ (3593 – 2428)/2428 X .25 = 12% (12% increase in price)

Contractor shall provide thirty (30) days written notice to Palm Beach County and written approval from Palm Beach County is required for cost increase. Price bid shall be effective without change for a duration One Hundred and Eighty Days (180) after the (commencement of) contract before an adjustment may be considered.

36. SUPLEMENTAL WORK: Work not listed in the Line item bid Prices may be Performed at prices mutually agreed by both parties based on FDOT SSRBC-2022 section 4-3.2.1.

The Engineer may direct in writing that extra work be done and, at the Engineer's sole discretion, the Contractor will be paid pursuant to an agreed Supplemental Agreement or in the following manner:

1. Labor and Burden:
2. Materials and Supplies:
3. Equipment
4. Indirect Costs, (Solely a mark-up of 17.5% on the payments in (1) through (3)

37. Grounding :

1. **Ground rods** – Use ground rods meeting the requirements of UL 467 that are listed by an OSHA Nationally Recognized Testing Laboratory (NRTL). Ground rods must be made of copper-clad steel with a nominal diameter of 5/8". Ground rod sections must be a minimum of eight feet in length and manufactured for the sole purpose of providing electrical grounding.
2. **Ground Rod Assembly** – Provide a ground rod assembly consisting of one or more ground rods coupled together, such that the total length of the assembly is a minimum of 40', driven into the earth at a single point, without disrupting the electrical continuity of the assembly.
3. **Exothermic / Mechanical Grounding Bond** – Make all connections to the ground rod assemblies in pull boxes using exothermic welds. Do not exothermically bond connections within a cabinet or pedestrian base. Apply an anti-oxidant compound to all mechanical connections. Remove all non-conducting surface coatings before each connection is made.
4. **Grounding Resistance** – Obtain a resistance to ground of not more than 5 ohms for the following applications. Install multiple ground rod assemblies totaling a maximum length of up to 80', as required to achieve minimum grounding resistance.
    a. Power service for traffic control devices
    b. Signal and ITS cabinets
    c. Pull boxes
5. Install a single ground rod assembly for the following applications.
    a. Pedestals for pedestrian signals
    b. Signal cable and span wire
    c. Aerial interconnect messenger wire
6. **Grounding Traffic Control Systems at Signalized Intersections** – Ensure that all separately grounded elements at an intersection (signal cabinet, power service, mast arms, strain poles, etc.) are bonded together to form an intersection grounding network array.
    a. For traffic signal poles, install #6 ground wire from the upper spans to the lower spans, and then from the lower spans down through the riser to the ground rod assembly at the pull box at the base of the pole, if there is one installed at that pole. Do not use guy wires for grounding purposes, however bond any guy wire to the span wire as part of the intersection grounding network.
    b. For pedestals for pedestrian signals and traffic signals, attach #6 ground wire from the base of the pedestal to the ground rod in the pedestal base foundation, and then through the conduit to the pull box, and exothermically weld it to the ground rod in that pull box.
    c. Attach intersection grounding array from the main pull box on the intersection controller corner, in through the conduit to the cabinet and connect to the ground rod inside the cabinet. Attach a ground wire from that ground rod to the single point main grounding bar inside the cabinet.

38. The abbreviations and acronyms used in this contract are as follows:

LF	Linear Feet	LS	Lump Sum (Complete)
SF	Square Feet	F&I	Furnish & Install
SY	Square Yards	F	Furnish-Only
CY	Cubic Yards	I	Install-Only
AS	Assembly	R	Remove
PI	Per Intersection		
EA	Each		
HR	Per Hour		
MH	Man Hour		
ED	Each Day		
WK	Per Week		

PROSECUTION OF THE WORK

The Contractor will be required to maintain within Palm Beach County, at all times while this contract is in effect, the equipment necessary to properly carry out the provisions of these specifications. After receiving notice to commence with the work for a particular project the Contractor shall commence promptly within seventy-two (72) hours and shall efficiently prosecute the work with adequate personnel and equipment until completion, within 30 calendar days, or as designated by the County Engineer or duly appointed representative. Failure to comply with either time requirement shall result in payment of Liquidated Damages at the cost of Five-Hundred ($500.00) Dollars per working day.

After receiving notice to commence with work for a particular project the Contractor shall complete the construction of a span-wire traffic signal within 120 days and a mast arm signal within 240 days. For a delay caused by factors beyond the control of the County and/or the Contractor the engineer will halt the clock until such time as such factors have been mitigated or resolved.

6. SPECIAL BID ITEM NOTES:

1. Bid Item **102-1-A** consists of Maintenance of Traffic for signalization modifications as necessitated by roadway construction. This pay item is for labor and equipment required to construct or modify traffic signals in order to accommodate changing highway geometrics resulting from on-going construction, and in Accordance with FDOT SP-FY 2022-23 Indices 102-602, 102-603, 102-604, 102-607, 102-608, 102-613, 102-615, 102-620, 102-660 and 102-628. It is estimated that 8 MOT hours will be necessary for span wire signals installations and 16 MOT hours for mast arm signals installation. Additional MOT hours may be provided at the discretion of the Engineer.

2. Bid Item **102-1-B** consists of Maintenance of Traffic – Securing Traffic Signal Poles by use of a crane or telescopic lift (as instructed by the Engineer, ,when drainage construction trenches, excavations, and similar construction necessitate this type of emergency work. A response time of no greater than twelve (12) hours is required. This item will be paid in one (1) hour increments with a four-hour minimum and is to include labor and equipment necessary to accommodate a crane or telescopic lift of twenty-five (25) ton minimum. This maintenance of traffic shall be implemented in Accordance with FDOT SP-FY 2022-23 Indices 102-600 through 102-680. Additional MOT for lane closure, as needed, will be added to this as item 102-1-A.

3. Bid Item **102-1-C** consists of Maintenance of Traffic for Utility locate soft-dig. Non-destructive vacuum excavation, safely exposing utilities using a combination of compressed and vacuum air. This method is to be used to expose utilities and obtain vertical elevation, diameter and materials at a location. Soft-dig depth to be 8 to 16 feet as requested by the engineer. Soft-dig is to be implemented in accordance with FDOT SP-FY 2022-23 Indices 102-600 through 102-680. Additional MOT for lane closure, as needed, will be added to this as item 102-1-A. This item may be issued as a separate task order during design in combination with 8 HRS of MOT item (102-1-A).

4. Bid Item **102-14** consists of Police assist for Maintenance of Traffic. This item will be paid for in one-hour increments. This maintenance of traffic shall be implemented in Accordance with FDOT SP-FY 2022-23 Indices 102-600 through 102-680. (Minimum of 4 hours)

5. Bid Item **102-99** consists of Variable Message Signs as described in Note No. 21 of "CONTRACT NOTES" listed above in this Technical Specifications document. Price provided in the contract shall be for one sign per day.

6. Bid Item **455-142** Cross-Hole Sonic Logging (CSL) Testing for Drilled Shaft test as per FDOT SSRBC-2022.

7. Bid Item **455-147-x** Thermal Integrity Testing for Drilled Shaft (TITDS) test as per FDOT SSRBC-2022. (Unit shall be per foundation – each drill shaft) up to 4' shaft diameter when x=1, 4.5'-6' when x=2.

8. Bid Item **522-x** consists of cutting concrete or paver-brick sidewalk (in square yard measurements) for the installation of conduit, pull boxes or hand holes. Patch as required to match existing construction. Consists of 4" thick concrete sidewalk when x = 1, and 6" thick concrete sidewalk when x = 2.

9. Bid Items **620-1-1** consists of furnish & install grounding electrode and all appurtenances necessary for a complete installation. (See PBC Traffic Signal Installation Standards and Details-2022, sheet T-5.3, T-5.4, T-6.2, T-6.3, T-9, T-9.1, and T-9.2 for details.

10. Bid Items **630-2-11-2** consists of (F&I) PVC (SCH. 40) underground in-trench conduit of 2" diameter. This item includes trenching, installing conduit, covering trench, and bringing ground to original condition.

11. Bid Items **630-2-11-2A** consists of (F&I) an additional PVC (SCH. 40) underground conduit in the same trench, 2" diameter. This item provides for additional conduit(s) added in trench covered under items 630-2-11-2.

12. Bid Items **630-2-12-2-y** consists of (F&I) HDPE (SDR 11) directional bore under-pavement conduit of 2" diameter. The **y** represents the number of 2-inch conduits per directional bore.

13. Bid Items **630-2-14-x** consists of furnish and install (F&I) hot dipped galvanized rigid steel conduit surface mounted. The conduit is 1" diameter when x = 1, 2' diameter when x = 2.

14. Bid Items **630-3** consists of Roding and cleaning out existing conduit of any size.

15. Bid Items **632-7-x** consists of removing signal cable when x=6 is for entire intersection and when x=7 is for removal by LF. For New or Reconstructed Intersections, use the per Intersection pay item. This includes intersections where new poles are installed/relocated. For Repairs/Replacement where new signal cable is needed, use the linear foot pay item. This includes non-intersection school zone signals, adding a signal head to an existing mast arm or span wire, or signal cables outside of an intersection. For projects where work with the Pedestrian Signals/Detectors and/or Vehicle Detectors around an intersection, the "PI- per intersection" item should be used. The "LF" item is more appropriate when adding an incidental item to one part/corner of an intersection.

16. Bid Item **632-7-1-x** consists of Furnish and Install signal cable, in linear feet where **'x'** represents the number of conductors. This items includes 19 conductors when x = 19.

17. Bid Item **632-7-1-19x** consists of Furnish and Install 19 conductor signal cable, where x defines the span length range for signal cable in linear feet (LF).
    For **x** = A defines the range of signal cable from 0 to 250'
    B defines the range of signal cable from 251 to 350'
    C defines the range of signal cable from 351 to 450'
    D defines the range of signal cable from 451 to 550'
    E defines the range of signal cable from 551 to 650'
    F defines the range of signal cable from 651 to 750'

G defines the range of signal cable from 751 and greater

The span-wire signal layout may be diagonal, triangular or box shaped as shown on plan. Span length range shown in this item represents total span length by adding all sides as measured on the signal plan. This item shall include all additional length of cable running along the poles to the controller cabinet.

Traffic signal cable shall meet the minimum requirements per IMSA - #19-1-1984 (or updated) specification, stranded type. All vehicle span wire mounted signal cable shall be a minimum nineteen (19) conductor cable, and color-coded to meet the latest IMSA specifications. All installation to follow FDOT SSRBC-2022 requirements detailed in section 632 (SIGNAL CABLE). **NO SPLICES** are allowed in any signal cable. Signal cable entering disconnect hangers or service head shall have a ten (10) inch drip coil, two turns (per Palm Beach County Traffic Signal Installation Standards and Details). Unit price of item shall be per entire intersection installation. Signal wiring to follow Palm Beach County Wiring Standards (See Palm Beach County Traffic Signal Installation Standards and Details 2022 sheet T-5.5 or latest revision.)

18. Bid Item **632-7-1-x** is pedestrian signal cable per intersection where **'x'** represents the number of conductors. The item includes 4 conductor when x = 4 and 7 conductor when x = 7. This item is measures in linear feet as requested for signal modifications as a partial signal construction.

19. Bid Item **632-7-1-xA** is pedestrian signal cable per intersection where **'x'** represents the number of conductors. This item includes 4 conductor when x = 4 and 7 conductor when x = 7. Pedestrian signal cable shall be run separately. All installation to follow FDOT SSRBC-2022 requirements detailed in section 632. **NO SPLICES** are allowed in any signal cable. **Unit price of item shall be per entire intersection installation**. This item is specified for intersections where new pedestrian features are proposed at three (3) or more corners.

20. Bid Item **634-4-153-Nx-** defines the span length range for span wire signal support assembly, which includes Catenary Wire, Messenger Wire, and all other appurtenances required for complete installation of the support assembly. All support cable shall be galvanized steel (A-475-72), 1 x 7 strand class A coating with Siemens Martin grade flexibility. Cable to be **3/8"** inch diameter when N=1, 7/16" when N=2, ½" when N=3, ¾" when N=5. Drop cable which may be **1/4 inch** (Steel, Galvanized – 6950 pounds.) (See PBC Traffic Signal Installation Standards and Details -2022 for details). Where **x** defines the beginning (from) and ending (to) range in linear feet (LF) of the total span length for the intersection:

    For **x** = A defines the range of signal cable from 0 to 250'
    B defines the range of signal cable from 251 to 350'
    C defines the range of signal cable from 351 to 450'
    D defines the range of signal cable from 451 to 550'
    E defines the range of signal cable from 551 to 650'
    F defines the range of signal cable from 651 to 750'
    G defines the range of signal cable from 751 and greater

The span-wire signal layout may be diagonal, triangular or box shaped as shown on plan. Span length range shown in this item represents total span length by adding all sides as measured on the signal plan.

21. Bid Item **635-2-xx** include the cost of a 1' minimum concrete apron (6" depth) around allboxes using Class NS concrete. Slope the apron away from the box.

21A. **Bid Item 639-1-xxx includes the meter socket with bypass as shown in Attachment A Special Specifications for electrical power service with meter base. Meter socket shall be ring less, UL listed, Type 3R, 600 Volts Alternating Current, 125 Continuous Ampere, Aluminum power coat finish, 5 terminal jaw, triplex ground, small closing plate, and 6 – 2/0 AWG for line and load side wire range.**

22. Bid Item **639-2-1-x** shall include an electrical power service. The size of the feeder conductors shall be such that the voltage drop will not exceed 2½ % of supply voltage at the final distribution point. **The service wire shall be XHHW.** No service conductors shall be smaller than #6 AWG. Triplex (3-conuctor wire) when x = 3 and Duplex (2- conductor wire) when x =2. Payment for the item shall be per linear foot of the run of 3- wires when x = 3 and the run of 2-wires when x=2.

23. Bid Items **641-1-x** shall include guying concrete strain poles, as specified on the plan(s), where x defines the # of guy wires per pole. For x=1, 1 guy wire per pole. X=2, 2 guy wires per pole. Contractor to provide yellow guy (96") long wire marker sleeve to guy wires.

24. Bid Items **641-2-XX-YY** shall include furnish & Install pre-stressed concrete pole with foundations. This item includes concrete foundations, ground rods, additional field drilling and all other appurtenances required for a complete installation in accordance with the concrete pole detail tabulation, and appropriate FDOT specifications. The concrete foundations shall adhere to PBC Traffic Signal Installation Standards and Details-2022, providing a minimum of three cubic yards per pole, standard 2,500 PSI strength, verified by a copy of delivery receipt. To maintain hole integrity once excavated, 48" tunnel liners are to be utilized in all pole installations, unless waived by the County. The Contractor shall be responsible for establishing the rake as specified by the pole manufacturer in relation to the load placed on the poles at the time of installation. The pole depth shall be as specified on the plan(s). The pole to be Type P-II when XX= 12, Type P-V when XX = 15, Type P-VI when XX = 16, Type P-VII when XX = 17, Type P-VIII when XX= 18, and Type P Custom Design when XX = 19. YY = Length of Pole. This item includes pole burial of up to 10 feet. For pole burial deeper than 10 feet, item number 641-30B shall also be given to supplement his item.

25. Bid Items **641-30B** This item shall include the additional labor material and equipment necessary for burial of concrete poles in excess of 10 feet. This item shall be usedtogether with item 641-2-XX-YY when deep burial of concrete poles is necessary (greater than 10 feet) Install pre-stressed concrete pole with foundations. This itemincludes concrete foundations, additional field drilling and all other appurtenances required for a complete and accepted installation in accordance with the concrete pole detail tabulation, and appropriate FDOT specifications. The concrete foundations shall adhere to PBC Traffic Signal Installation Standards and Details-2022, providing a minimum of three cubic yards per pole, standard 2,500 PSI strength, verified by a copy ofdelivery receipt. To maintain hole integrity once excavated, 48" tunnel liners are to be utilized in all pole installations, unless waived by the County. The pole depth shall be as specified on the plan(s). This item is measured in linear feet of additional pole burial depth.

26. Bid Items **643-1-x** This item shall include guying wood poles, as specified on the plan(s). Where x defines the # of guy wires per pole. For x=1, 1 guy wire per pole. X=2, 2 guy wires per pole.

27. Bid Item **646-1-1x Furnish & Install** Aluminum pedestal complete furnish and install consists of 4" in diameter pole, pole base, foundation, rebar, conduit anchor bolts, grounding rod, and transformer base unless (unless otherwise specified without). The T-base (pedestrian pedestal base) shall be oriented so the technician can open the door and see on-coming traffic. No gaps are permissible between concrete foundation/sidewalk and the pedestal base. Polybutylene waterproofing shall be used to fill in any gaps. Pedestal base nut shall be large enough to cover hole and washer and all set screws shall be installed. The set screws should go through side of the base into pedestal pole to penetrate into pipe to keep it from rotating. The pole shall not be rotate after a complete installation.

28. Bid item **649-2-AA-BB** Furnish and Install Drill Shaft Foundation for Mast Arm Assembly per FDOT Standard Mast Arm Assembly Index 649-030 and 649-031. The work shall include all Labor, Material, Equipment and all appurtenances necessary for a complete and accepted installation. AA shall call out the depth of the Drill Shaft and BB the Diameter of the Drill Shaft. The Contractor shall have access to low profile auger truck(s) when specified by Engineer, at no additional cost to County. This item is intended to be combined with item 649-22-xL. Anchor Bolt Assembly is paid under item 649-22-xL.

29. **Bid Item 649-2-AA-BB-AD** Furnish and Install labor material and equipment for increase depth in Drill Shaft Foundation. This item covers additional Depth to standard FDOT Drill Shaft Foundation specified under Bid Item 649-2-AA-BB. This item shall be issued with Bid Item 649-2-AA-BB when depth of foundation is more than the FDOT Standard Design Depth or as specified by the Engineer. (Unit shall be in linear foot of depth).

30. Bid Item **649-22-xL Furnish and Install** Mast Arm Assembly on existing Foundation. Where X denotes the Arm Size and L denotes a Mast Arm equipped with Luminaire (Street Light). When X=1 (30' Arm), x=3 (40' Arm), x=6 (50'Arm), x=10 (60' Arm), x=15 (70" Arm), x=21 (78' Arm). The Mast Arms shall be galvanized. When the Mast Arm is specified to be equipped with luminaire, this item includes Mast Arm, luminaire bracket, wiring, control and all incidental hardware necessary for proper installation. However, the cost for the Luminaire (LED or HPS Cobrahead) shall be paid under a separate item for the luminaire. The price/cost for the Furnishing and installing the Anchor Bolt Assembly shall be included in this item (649-22-xL). This item will be combined with item 649-2-AA-BB. (Furnish and Install Mast Arm Foundation complete).

31. Bid Item **649-23-x1 Install or relocate-Only** mast arm assembly to an existing foundation. This item includes providing flatbed truck to pick up mast arms from PBC Traffic Operations yard when x=1 for install and x=2 for relocate.

32. Bid Item **649-28-02** This line item (649-28-02) will be used in combination with line item 649-22-XX and shall be applied by the manufacturer. It is not intended to be used to paint existing Mast Arms in the field. When line item 649-22-XX is combined with line item 649-28-02, the Mast Arm Assemblies shall be powder coated at manufacturer's facility. Mast Arm painted using a process equivalent to powder coating may be considered if approved by the Engineer. The Mast Arm structure shall be powder coated after Galvanization in accordance with the sequence of operation below. This shall apply to the exterior surfaces of the Mast Arm Structure, the bottom of the base plate and the bottom 2.0 of the interior column.

1. After galvanization but prior to coating, all galvanized surfaces must be allowed to cool and vent gasses produced during the cooling process.
2. After galvanization has been allowed to air dry the above noted surfaces shall be cleaned to a brush blast condition per SSPC-SP6
3. The galvanizing thickness shall be tested to ensure that sufficient galvanizing remains on the substrate after the brush blasting operations to meet the galvanizing requirements.
4. The above noted surfaces shall be coated with urethane or triglycidyl isocyanurate (TGIC) polyester powder coating to a minimum dry film thickness of 2.0 mils 0.020". The coating shall be electrostatically applied and cured by heating the steel substrate to 350 degrees Fahrenheit min and 400 degrees Fahrenheit max.
5. The color of the powder coating shall be Verde Green (Porter Paint Code 7y23C5Y21P7Y8T12V) or similar as approved by the Engineer.
6. The powder coating shall be allowed to cure per manufacturer's recommended time period and curing conditions. The Mast Arm assemblies shall be shipped to the job-site wrapped in a protective coating sufficient to prevent damage.

33. Bid Item **649-2-RA-11:** This line item will address issues related to Non-Standard Drill shaft Foundations resulting from Design Variation from FDOT's Standard Plans or Special Design Mast Arm Foundations.

    The quantity to be paid for will be the increased differential from the weight of vertical Rebar (only) prescribed in the FDOT's Drill shaft Standard Mast Arm Assemblies Index 649-030 (FY 2019-20 Standard Plans). This item will be issued in addition to contract line item 649-2-AA-BB, and 649-AA-BB-AD (when additional reinforcement and or depth are required).

    Please note that any other variation/ change of the reinforcement from the Standard Drill Shaft Foundation is considered incidental to the price of the Drill Shaft and is included in the cost of the Drill Shaft as described in Line items 649-2-AA-BB, 649-2-AA-BB-AD and 649-RA-11.

    When line item 649-2-AA-BB-AD is issued, the cost for any additional weight of Rebar (RA) resulting from an increase in the number or size of Rebar (RA) from the FDOT standard foundation, if needed, shall be included in the price for item 649-2-AA-BB-AD. Weight of rebar will be calculated based on Standard Chart below.

BAR SIZE DESIGNATION*	WEIGHT (LBS/FOOT)	BAR DIAMETER (INCHES)	CROSS- SECTIONAL AREA (SQ. IN.) PER FT. AT 12" C.C.	AT 6" C.C.
#3	0.376	0.375	0.11	0.22
#4	0.668	0.500	0.20	0.40
#5	1.043	0.625	0.31	0.62
#6	1.502	0.750	0.44	0.88
#7	2.044	0.875	0.60	1.20
#8	2.670	1.000	0.79	1.58
#9	3.400	1.128	1.00	2.00
#10	4.303	1.270	1.27	2.54
#11	5.313	1.410	1.56	3.12
#14	7.650	1.693	2.25	4.50
#18	13.600	2.257	4.00	8.00

34. Bid Item **649-40-000-C Furnish & Install labor and materials necessary to raise existing foundation.** This item number applies to existing foundations where the need arises to raise the top of the foundation to grade (up to 8 inches) and provide grouting at Mast Arm Base. The cost for removing and reinstalling Mast Arm. If needed shall be paid under a separate item.
    Provisions of Florida DOT Standard Specifications for Road and Bridge Construction shall apply for all procedures:
    1. Up to 2" of concrete shall be removed. This process shall be done in a manner to avoid damage to the anchor bolts.
    2. After concrete removal, surface of shaft shall be thoroughly cleaned of debris and loose material.
    3. Apply APL approved epoxy to surface of shaft according to provisions of Section 926 FDOT Specifications
    4. Form it using adequate sonutube and pour concrete to correct elevation. Concrete shall have minimum 28 day strength as specified on original plans.

35. Bid Item **649-38-000-F Furnish & Install labor and materials necessary to repair existing damaged Mast arm Foundation**. This item applies to Foundation damaged due to impact, Bolt Circle Modification and other retrofit applications. The cost for removing and reinstalling Mast Arm if needed, shall be paid under a separate item.
    Provisions of FDOT Standard Specifications for Road and Bridge Construction shall apply for all procedures:
    1. Concrete shall be removed to below bottom of existing anchor bolts. This process shall be done in a manner to avoid damage to the vertical reinforcement.
    2. After concrete removal, surface of the shaft shall be thoroughly cleaned of debris and loose material.
    3. Vertical bars shall be checked and if necessary bent to proper alignment and clearance. The hoops, if removed or damaged during concrete removal, shall be replaced.
    4. Install anchor bolts according to the plans.
    5. Apply APL approved epoxy to surface of shaft according to provisions of Section 926 FDOT Specifications.

6. Form it using adequate sonutube and pour concrete to correct elevation. Concrete shall have minimum 28 day strength as specified on original plans.

36. Bid Item **650-1-1x and 650-1-2x Furnish & Install** or **Install-Only** Traffic Signal head where x denotes the number of sections. Specifications for this item shall be same as item 650-1-AB in FDOT basis of estimate (BOE). This item includes signal hanger, vertical & horizontal brackets, required to attach signal heads to mast arm structures, and all necessary appurtenances required for complete and accepted installation. Pipe and plate of bracket are aluminum and hanging cable and hardware are stainless steel. Pipe length shall be adequate to hold a 4-section head per Palm Beach County Standards.
When installing signal heads to span wire signals, this item includes disconnect hanger and all related hardware as described below. Traffic signal head includes signal housing, LED lenses, back plates, visors, and all other material necessary for complete and accepted installation. This items shall adhere to the PBC Signal Installation Standards and Details-2022 and the following specifications:

The manufacturer of traffic signal heads shall provide a method of positive locking. The method used shall prevent any misalignment due to high winds or objects which may come in contact with the signal head. Signal heads shall be cast aluminum with stainless steel door hinges, locking nuts, and washers. All signal indications (Red, Yellow, Green, and Pedestrian) shall be LED and FDOT and ITE approved as per attached specifications, unless otherwise specified. When all signal heads are assembled, no section shall be inverted. The signal head bodies shall be flat black, with flat black faces and tunnel visors. All signal head bodies at a given intersection shall be the same color.

For Span Wire Installation, the disconnect shall be flat black in color, and shall be provided for all signal heads. The disconnect shall include the following (See PBC Traffic Signal Installation Standards and Details-2022 for details):

1. Single door type with drop connections make with ¼" galvanized cable.
2. One SE-1006 terminal block.
3. One SE-1012 terminal block.
4. Disconnect wiring harness.
5. Disconnect hanger housing.
6. Disconnect wiring.
7. Positive locking of hub.
8. Stainless steel hinge pins and locking screws.
9. Signal cable entering disconnect hanger or service head shall have 10" drip coil, two turns.
10. Capable or holding one 12 and one 6 terminal block for a total of 18 terminals, tapped for #10-24 screws.
11. Housing to take tri-stud adapters 1156T with nylocks, and tapped for #1/4-20 square head set screws.
12. Shall have two separate aluminum adjustable locking bars.
13. Doors must be hinged to open horizontally, on two stainless pins.

14. Disconnect hanger housing and door must be high tensile cast aluminum. The door must lock in place with stainless steel thumbscrews and must be watertight. Thumbscrews must have shoulder. Hinges and all hardware shall be stainless steel.
15. The finish shall be chromate primer, baked enamel.
16. The terminal block mounting stud shall be threaded to take four. #10-24x1" Phillips screws.
17. The hanger must have a minimum of 300 cubic inches or working space on the inside housing.

The bid price of traffic signal heads for span-wire signals shall include disconnects and hangers.

37. Bid Item **650-1-5x Install-only** signal head. Specifications for this item shall be the same as Bid Item **650-1-1x and 650-1-2x**. When this bid item is included, signal head shall be provided by PBC.

38. Bid Item **653-19x Furnish & Install** shall be a Hand/Count/Person display comprised of LEDs, and shall comply with ITE and FDOT specifications, for count-down pedestrian signals PBC Signal Installation Standards and Details-2022, and special specifications shown in Attachment A. This will be one-way when x = 1, and two-way when x = 2.

39. Bid Item **660-2-x Furnish & Install** an inductance loop detector complete, including installation of loop wire, saw cut, sealant, lead-in, and individual lead-in per loop to cabinet. Lead-in slack of 6' coil per lead in the pull box (if applicable) and 6' coil in the cabinet for each lead-in. Color coding and labeling of the loops shall be provided in all cases (minimum depth of saw cuts of 2"). The loop wire shall be #14 AWG XHHW. The loop lead-in wire shall be #18 AWG shielded twisted stranded, tinned copper. It shall be Carol-Part # C2553.41.01 or equivalent. Sealant shall be liquid tar (step asphalt hot type 4) and Solder loop connection only. See PBC Signal Installation Standards and Details-2022 Sheet T-11, T-11.1, and T-12. See Note # 24 of the Contact Notes for exclusions for installation times.

40. Bid Item **660-2-102 Furnish & Install** refers to loop assembly Type B with a dimension of 6' X 6'. See PBC Signal Installation Standards and Details-2022 Sheet T-11, T-11.1 and T-12.

41. Bid Item **660-2-106-x Furnish & Install** refers to Loop Assembly Type F with width of 6' and a longitudinal dimension of 26' when x = A; and 46' when x = B. See PBC Signal Installation Standards and Details-2022 Sheet T-11 and T-11.1, and T-12.

42. Bid Item **660-4-10-xx Furnish & Install** cabinet and above ground equipment for Iteris type Video Detection System for a complete and accepted installation. The cabinet and above ground equipment and for the video detection system shall be per FDOT and Palm Beach County Specifications. This item shall include all cabinet equipment (shelf mounted processors, supplemental interface hardware, cabling, other cabinet system components) and all overhead equipment (cameras, mounting hardware and cabling for all cameras) and all appurtenances necessary for a complete and accepted installation.

43. Bid Item **660-4-30-xx Install only** video vehicle detection system. All materials required for installation to be provided by PBC.

44. Bid Item **660-5-30 Install only** wireless magnetometer vehicle detection system for a complete assembly. All materials and design required for installation to be provided by PBC.

45. Bid Item **665-1-xx Furnish & Install** or **Install-Only** Pedestrian Detector shall be Bulldog Series with Vandal Resistance ADA push button with custom etched PBC logo.

46. Bid Item **665-1-12-x Furnish & Install** Pedestrian Detector for the visually impaired – Accessible. For x = A includes cabinet equipment, and for x =B includes two (2) push button assemblies for one crossing. Each crossing shall consist of 2 ped detectors. This item shall include all appurtenances necessary for a complete installation (Polara or approved equal)

47. Bid Item **670-5-110-x Furnish & Install** Naztec (Trafficware/Cubic) Controller Cabinet Assembly, PBC Normal 54" TS-2, Type-5, 32 channel when x = A; PBC Special 68" TS-2, Type-6, 32 channel unless otherwise specified in plans when x = B; PBC Normal 50" TS-2, Type 4, 16 channel when x = C; PBC Advanced Transportation Controller (ATC) cabinet (ATX) when x = D1 for dual single door & when x =D2 for dual double door. All types of controller assemblies to have ATC, 32 channel output assembly Type 2 (including A, B, C, & D connectors). This item includes the cost to install all conduits and foundation associated with each type of cabinet. See Attachment A for detailed specifications Traffic Controller Assembly and See PBC Signal Installation Standards and Details-2022 for installation details. Written authorization must be obtained from the Engineer if a substitute controller assembly is proposed. In addition, the contractor shall demonstrate the ability of their equipment to perform to specifications listed in **Attachment A**.

48. Bid Item **670-5-310-x Install only** Naztec (Trafficware/Cubic) Controller Cabinet Assembly for Type 4, 5, 6 when x=A for 48"x54"foundation; PBC ATC (ATX) dual single door when x = B for 28"x82" foundation; PBC ATC (ATX) dual double door when x=C for 48"x78" foundation. This items includes the installation of all conduits and foundation associated with each type of cabinet per PBC Signal Installation Standards and Details-2022.

49. Bid Item **700-5-2x Furnish & Install** Internally Illuminated Street Name Signs and all necessary hardware (such as brackets and wiring) for a complete installation. The Contractor shall provide the sign face material to the Palm Beach County Sign Shop, which will apply the lettering prior to the Contractor's installation of the sign assembly, each sign to be equipped with individual photocell and receptacle. The signs shall adhere to the specifications in **Attachment A**.

    For **Bid item 700-5-4x**, where the bid item is noted as **Install-Only**, Palm Beach County will provide the signs, brackets, and all necessary hardware for a complete installation on

either mast arms or on strain poles. The Contractor will provide the labor to install the signs and necessary wiring for a complete installation.

50. Bid Item **700-6-13 Furnish & Install** 30"x30" LED Blankout sign. Transportation Control System (TCS LED BO No Turn on Red), Southern Manufacturing, or equal.

51. Bid Item **700-12-x2 Furnish & Install** ground mount Flashing Beacon Sign Assembly, with 2 beacons per sign. This bid item is for AC powered ground mount sign assembly when x = 1, and Solar powered ground mount sign assembly when x = 2 (Includes AI-500-030 or approved equal monitor device for solar systems, panel with relays and radio/transceiver for a complete wireless communication to PBC standards). The flashing beacon sign assembly shall adhere to the specifications in Attachment A for installations of wireless advance warning flashers.

52. Bid Item **700-12-32-x Furnish & Install** overhead Flashing Beacon Sign Assembly, with 2 beacons per sign. This bid item is for AC powered overhead sign assembly when x = 1, and Solar powered overhead sign assembly when x = 2. (Includes AI-500-030 or approved equal monitor device for solar systems.

53. Bid Item **715-1-1x** Consists of **Furnish and Install** Cross-linked polyethylene copper cable size as specified on the plans. Size of wire shall be (No. 8 to No. 6 when X=2 and No.4 to No. 2 when x=3.

54. Bid Item **715-4-13 Furnish & Install** Light Pole complete which includes pole, arm, concrete foundations, wiring, control, anchor bolts, grounding and related appurtenances required for a complete and accepted installation in accordance with FDOT Standard Roadway Aluminum Lighting.

55. Bid Item **715-5-xx Furnish and Install** Luminaire and Bracket arm. Luminaire shall be 263 input watt Cobra Head Luminaire (Type IV) light emitting diodes (LED) with 33,910 lumens at 4000K or 175 input watts Cobra Head (Typ IV) LED with 24,770 lumens at 4000K. The bracket arm is to be equivalent to Hapco 67524, slip fitting electrical aluminum or galvanized steel. The Contractor shall provide the necessary service wire, circuit breaker and/or box, photo-electric control (PEC), weather heads, lightning arrester, and conduit risers with all associated hardware. This item includes one luminaire and bracket arm each.

56. Bid Item **715-11-xxx-L Furnish and Install** luminaire (Retrofits or Installation without arm or pole). Luminaire shall be 263 input watt Cobra Head Luminaire (Type IV) light emitting diodes (LED) with 33,910 lumens at 4000K or 175 input watts Cobra Head (Typ IV) LED with 24,770 lumens at 4000K.

7. WARRANTY AND MATERIAL CERTIFICATIONS

Mast Arm combinations shall be free from defects in material and workmanship for a period of **five years from the date of final inspection and acceptance by the County**.

Copies of manufacturer's warranties shall be submitted upon invoicing of all products, including material certifications. Exception will be made at the discretion of the Engineer.

8. INVOICING AND PAYMENT

The Contractor shall submit only three invoices per job; two partials and one final. Additional partial invoicing may be allowed at the discretion of the Engineer. Palm Beach County Traffic Division will review the invoices and issue a payment authorization for each of the Partial and Final invoices. The final payment authorization will be issued only after the final inspection of the job has been completed and approved by the County designated engineer. The total project cost in the final invoice shall not exceed the initial cost estimate of the job listed in the bid-tab associated with the job work authorization and the cost of the change orders. All change orders shall be signed by the County designated engineer.

TECHNICAL SPECIAL PROVISIONS

ATTACHMENT

A

SPECIAL SPECIFICATIONS

Palm Beach County Traffic Operations
Signal Inspection Process

The following is Palm Beach County's Traffic Signal Inspection Process:

1) The signal contractor is to notify Palm Beach County 72 hours (3 working days) in advance to request a signal inspection through Traffic Engineering, or through an FDOT representative on a State project.

2) It will be the contractor's responsibility to provide Palm Beach County Traffic Operations with a copy of the intersection signal plan (blue print) on FDOT projects, prior to inspection. Palm Beach County Traffic shall have a copy of the intersection signal plans (blue prints) for County projects.

3) The County will inspect the intersection as soon as it can be scheduled. This will be determined at the time of the request due to work schedule, holidays, etc.

4) The contractor will be supplied a copy of PBC inspection sheet with itemized list(s) of deficiencies to be repaired in order to bring the intersection to FDOT or County standards within 2-3 days after inspection is completed.

5) It is the contractor's responsibility to submit a request to PBC Traffic Operations for reinspection when all the deficient items on the first inspection sheet have been corrected.

6) When all items on the inspection sheet list are found to be completed, PBC-TO will notify the contractor. It is the Contractor's responsibility to notify Traffic Engineering that he is ready for "Final" inspection with the County Traffic Engineer for transfer of maintenance responsibility to Palm Beach County.

7) If all items are not completed as of the 2nd inspection (1st re-inspection), the contractor will be charged a 2nd re-inspection fee equivalent to the amount of time (regular or overtime) required by the technician to re-inspect the items not repaired on the first reinspection in addition to PBC's vehicle rental rate, fuel, travel time, etc.

8) Due to high priority projects, such as school signals or emergency temporary installations and modifications, Traffic Engineering may determine that 72 hour (3 working days) request can be waived. The 72 hours may also be waived in the event of catastrophic situations such as a hurricane, tornado, or other natural disasters.

Contractors Installation Inspection Form

Intersection Name _____

Intersection Device # _____

County _____ **FDOT** _____

	Needs		
	OK	Adjust	Comments
Fan			
Thermostat			
Door Filter			
Controller			(Type)
MMU			Serial Port Connected Baud Rate 2400
Pre-emption			
Detection			
Delay Overrides			
Lightning Protection			
Line Current/Voltage			Vac Amps
Flash Operation			Red Yellow
Back Panel Print			
Loops to Print			

Pedestrian Head Alignment			
Pedestrian Detection			
Pedestrian Indications			
Head Alignment			
Mast Arms			Paint
Overhead Signs (Blades/IOSNS)			(type)
Signal Indications			
Strain Poles			
Stainless Hardware			
General Area			
Pull Boxes (Grounded Lid)			Pea Rock?
Base Grouted?			
End Caps Top Caps			
Access Panel Gaskets?			
Nut Covers?			
Luminaries			
Communications	Active	Yes____No____	Type Fiber, Cellular

Inspection Notes

J-Hook used? _____

Grommets? _____

Duct Sealant? _____

Other

Notes: _____

_____

_____

_____

_____

_____

_____

_____

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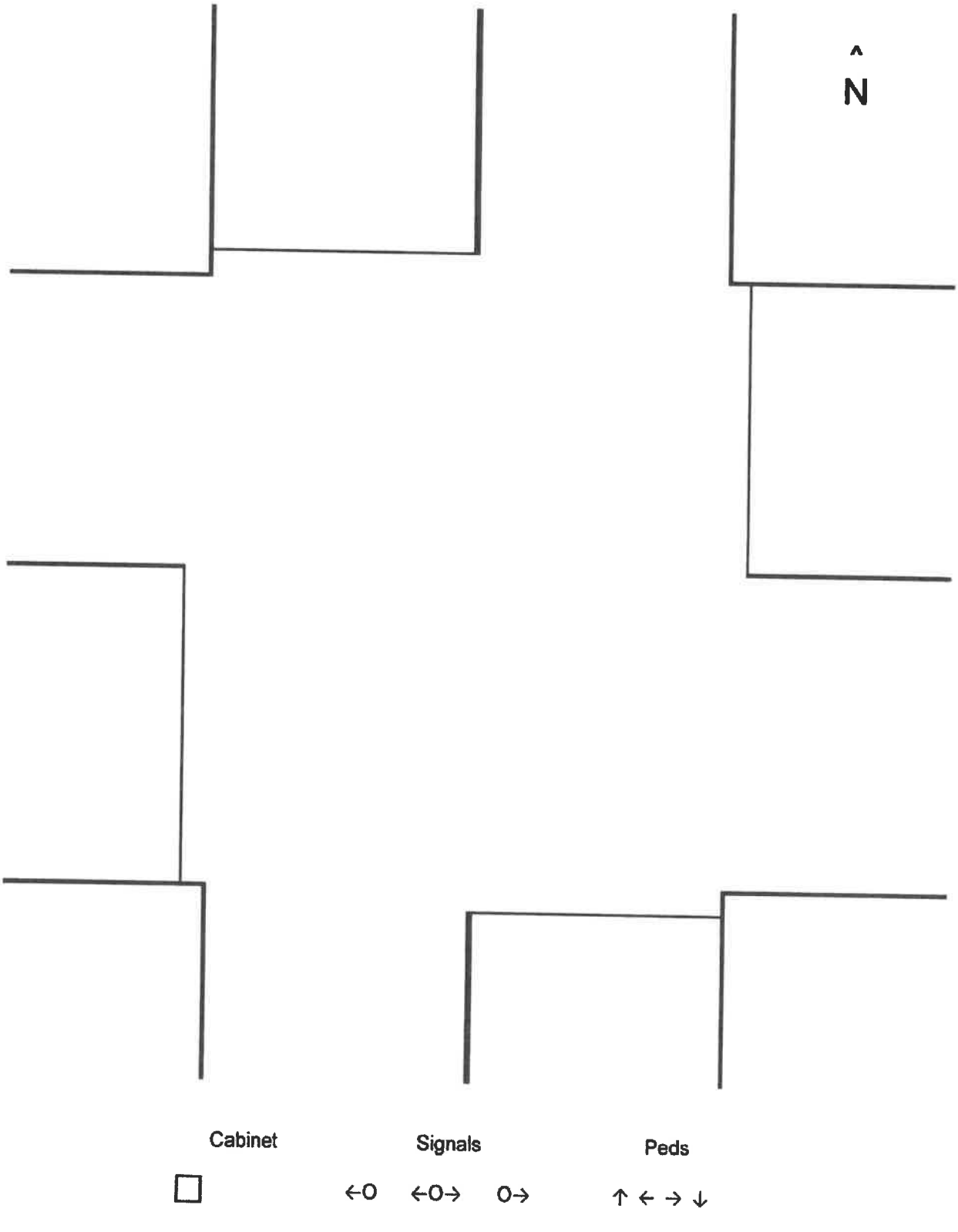
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Cabinet
Signals
Peds
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Inspection of Video Detection

Intersection Name:_____ Date:_____
Intersection Number:_____

Device	OK	Repair	TYPE	COMMENTS/Serial Numbers
TS2-IM BIU Module				Serial#:
Processor #1 Module				Serial#:
Processor #2 Module				Serial#:
Processor #3 Module				Serial#:
Processor #4 Module				Serial#:
Processor #5 Module				Serial#:
Processor #6 Module				Serial#:
Edge Connect Ethernet Module				Serial#:
eAccess Ethernet Module				Serial#:
Breakers in Proper Phase Order				
Surrestors in Proper Phase Order				
Monitor				Serial#:
Detection Zones Assigned				
Cameras Labeled				
Detection Zones Labeled				
Camera #1				Serial#:
Camera #2				Serial#:
Camera #3				Serial#:
Camera #4				Serial#:
Camera #5				Serial#:
Camera #6				Serial#:
No Horizon in View				
Lenses Clean				
Camera's in Focus				
Camera's Aligned				
Hardware Tight				
Cable's Neat				

SPECIFICATIONS FOR VEIDCLE TRAFFIC CONTROL SIGNAL INDICATIONS

FOR RED, YELOW, GREEN, & PEDESTRIAN LED SIGNAL INDICATIONS BID ITEMS 650-1-XX AND BID ITEM 653-19X

SPECIAL PROVISIONS: The following special provision shall be in addition to the Performance Specifications of the Institute of Transportation Engineers Performance Specifications - Vehicle Traffic Control Signal Heads - Light Emitting Diode (LED): Circular Signals, Latest update; Part 2 - LED Pedestrian Traffic Signal Modules, Latest update; Part 3 - LED Vehicle Arrow Traffic Signal Modules, Latest update; and the State of Florida Department of Transportation Minimum Specifications for Traffic Control Signals and Devices, Latest update Purchase Specification. In case of a conflict, the special provisions shall prevail.

GENERAL

The indicator shall maintain a uniform appearance across the lens and shall not exhibit areas of variable intensity such that there appears to be very bright points and shadowed or less intense point, to the motorist.

MECHANICAL

The assembly and manufacturing process for the LED signal assembly shall be such as to assure all internal LED and electronic components are adequately supported to withstand mechanical shock and vibration from high winds and other sources. The unit when installed shall be dust and moisture tight to protect all internal LED and electrical components.

WARRANTY

LED signals shall be replaced or repaired if an LED signal fails to perform as intended due to workmanship or material defects within the first 5 years from date of delivery. Or if an LED signal module exhibits luminous intensities less than the minimum values specified in ITE Specifications listed above within the first 3 years of the date of installation shall be replaced or repaired at no cost to Palm Beach County.

CERTIFICATION

In accordance with Florida Statues 316.0745 Uniform Signal and Device Code, the Contractor **must** provide a copy of the Certification issued by the State of Florida, Department of Transportation certifying that the LED assembly has been tested and approved.

PEDESTRIAN TRAFFIC CONTROL INDICATIONS (LED, FULL HAND/COUNTDOWN/PERSON)

Assembly shall be 16" x 18" **FULL Hand/Count-Down/Person, SIDE BY SIDE** and numeric count-down display. Assembly must have a message height of 10.5", a width of 7.0", Numbers Minimum height of 9" & width of 7" and be weather and watertight.

TECHNICAL SPECIAL PROVISIONS

SPECIFICATIONS

CABLE, FIBER OPTIC, SINGLE MODE, LOOSE TUBE, PURCHASE OF, TERM CONTRACT

PURPOSE AND INTENT

The sole purpose and intent of this Invitation for Bid (IFB) is to obtain a firm fixed price and establish a term contract for the purchase of 12, 24, 48 and 96 counts, Single Mode, Loose Tube, Fiber Optic Cable as specified herein.

1.0 GENERAL

1.1 The fiber optic cable shall be equal to or exceed the United States Department of Agriculture Rural Utilities Service (RUS) Code 7 CFR 1755.900 and meet the requirements of the ANSI/ICEA Standard for Fiber Optic Outside Plant Communications Cable, ICEA 640.

1.2 The 12, 24, 48 and 96 count loose tube, dry block, fiber optic cable, 8.2/125 SINGLE MODE fiber with an ultra-violet and fungus resistant, medium density polyethylene outer jacket, must be suitable for outdoor aerial/duct applications.

1.3 All reels shall have a 3" arbor hole in the center of the reel.

1.4 The quantity ordered for 12 and 24 count fiber will be 10,000 feet per reel plus or minus 10% overrun, for 48 count fiber will be 25,000 feet per reel plus or minus 10% overrun per reel and for 96 count fiber will be 20,000 feet per reel plus or minus 10% overrun per reel.

1.5 All reels will not be larger than 40" wide and 72" high.

2.0 TECHNICAL SPECIFICATIONS FOR 12, 24, 48 AND 96 COUNT FIBER CABLE

2.1 The optical fibers shall be placed Inside a loose buffer tube. The nominal outer diameter of the buffer tube shall be a minimum of 2.5mm.

2.2 Each buffer tube shall contain up to 12 fibers. The fibers shall not adhere to the inside of the buffer tube.

2.3 Each fiber shall be identifiable by means of color coding in accordance with TINEIA-598-B, "Optical Fiber Cable Color Coding," using ultraviolet curable inks.

2.4 The buffer tubes containing fibers shall be color coded with distinct and recognizable colors in accordance with TIA/EIA-598-B, "Optical Fiber Cable Color Coding." The color shall be stable across the operating temperature range and shall not fade or smear onto each other. Colors shall not cause fibers to stick together.

2.5 The buffer tubes shall be resistant to external forces and shall meet the buffer tube bend and shrink back requirements of 7 CFR 1755.900. Each buffer tube shall be filled with a hygroscopic non-nutritive to fungus, electrically non-conductive, homogenous gel. The gel shall be free from dirt and foreign matter. The gel shall be readily removable with a conventional nontoxic solvent.

2.6 Fillers shall be placed so that they do not interrupt the consecutive positioning of the buffer tubes. The outside diameter of the fillers shall be nominally a minimum of 2.5mm.

2.7 The central member shall consist of a dielectric, glass reinforced plastic rod. The buffer tubes shall be stranded around the dielectric central member using reverse oscillation, or "S-Z", stranding process. Water swellable yarns shall be applied longitudinally along the central member during stranding. Also, there shall be two polyester yarn binders applied contra helically with sufficient tension to secure each buffer tube layer to the central member without crushing the buffer tubes, The binders shall. be non-hygroscopic, non-wicking, and dielectric with low shrinkage and helically stranded evenly around the central member.

2.8 The cable shall be sheathed with medium density polyethylene. The minimum nominal jacket thickness shall be 1.3mm. The polyethylene shall contain carbon black to provide ultraviolet light protection and shall not promote the growth of fungus. The cable shall contain at least one ripcord under the sheath for easy sheath removal. The sheath material shall be made in accordance with ASTM D1248, Type II, Class C and Grades J4, E7 and ES. The sheath shall be free of holes, splits, and blisters. The sheath shall contain no metal elements and shall be of a consistent thickness. See Figure 1.

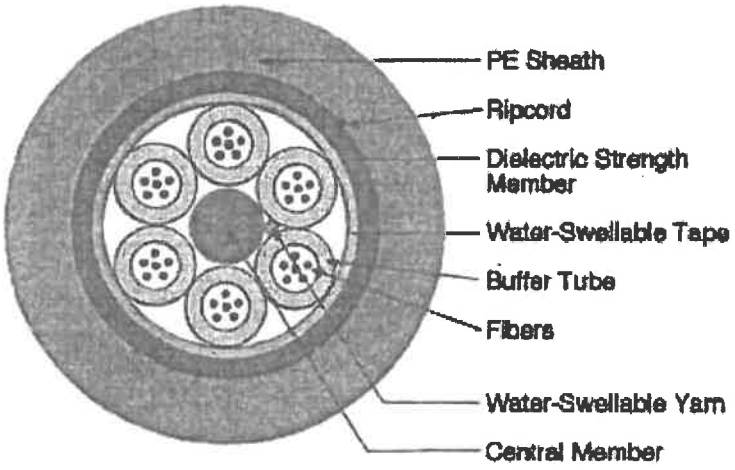


Figure 1

2.9 The sheath shall be marked with the manufacturers name, month and year manufactured, sequential meter or foot markings, a telecommunication handset symbol as required by Section 350G of the National Electrical Safety Code, fiber count, **PBC TRAFFIC,** and fiber type. The print color shall be white with a minimum height of 2.5 mm.

2.10 The maximum pulling tension shall be 600 lbf (lbs of force) during installation short term and 200 lbf (lbs of force) long term.

2.11 The shipping, storage and operating temperature range of the cable shall be -40 degrees C to +70 degrees C. The installation temperature range of the cable shall be -30 degrees C to +70 degrees C.

3.0 CABLE TESTS PROCEDURES STANDARDS

3.1 When tested in accordance with FOTP-3, "Procedure to Measure Temperature Cycling Effects on Optical Fibers, Optical Cable, and Other Passive Fiber Optic Components," the change in attenuation at extreme operational temperatures (-40°C and +70°C) shall not exceed 0.15 dB/km at 1550 nm for single-mode fiber.

3.2 When tested in accordance with FOTP-82, "Fluid Penetration Test for Fluid-Blocked Fiber Optic Cable," a one meter length of unaged cable shall withstand a one meter static head or equivalent continuous pressure of water for one hour without leakage through the open cable end.

3.3 When tested in accordance with FOTP-81, "Compound Flow (Drip} Test for Filled Fiber Optic Cable," the cable shall exhibit no flow (drip or leak} of filling and/dr flooding material at 10°c.

3.4 When tested in accordance with FOTP-41, "Compressive Loading Resistance of Fiber Optic Cables," the cable shall withstand a minimum compressive load of 220 N/cm (125 lbf/in) applied uniformly over the length of the sample. The 220 N/cm {125 lbf/in) load shall be applied at a rate of 2.5 mm (0.1 in) per minute. The load shall be maintained for a period of 1 minute. The load shall then be decreased to 110 N/cm (63 lbf/in). Alternatively, it is acceptable to remove the 220 N/cm (125 lbf/in) load entirely and apply the 110 N/cm (63 lbf/in) load within five minutes at a rate of 2.5 mm (0.1 in) per minute. The 110 N/cm (63 lbf/in) load shall be maintained for a period of 10 minutes. Attenuation measurements shall be performed before release of the 110 N/cm (63 lbf/in) load. The change In attenuation shall not exceed 0.15 dB at 1550 nm for single-mode fibers.

3.5 When tested in accordance with FOTP-104, "Fiber Optic Cable Cyclic Flexing Test," the cable shall withstand 25 mechanical flexing cycles around a sheave diameter not greater than 20 times the cable diameter. The change in attenuation shall not exceed 0.15 dB at 1550 nm for single-mode fiber.

3.6 When tested in accordance with FOTP-25, "Repeated Impact Testing of Fiber Optic Cables and Cable Assemblies," except that the number of cycles shall be two at three locations along a one meter cable length and the Impact energy shall be at least 4.4 Nm (in accordance with ICEA S-87-640)", the change in attenuation shall not exceed 0.15 dB at 1550 nm for single-mode fiber.

3.7 When tested in accordance with FOTP-33, "Fiber Optic Cable Tensile Loading and Bending Test," using a maximum mandrel and sheave diameter of 560 mm, the cable shall withstand a rated tensile load of 2670N (601 lbf) and residual load of 30% of the rated installation load. The axial fiber strain shall be ≤ 60% of the fiber proof level after completion of 60 minute conditioning and while the cable is under the rated installation load. The axial fiber strain shall be ≤ 20% of the fiber proof level after completion of 10 minute conditioning and while the cable is under the residual load. The change in attenuation at residual load and after load removal shall not exceed 0.15 dB at 1550 nm for single mode fiber.

3.8 When tested in accordance with FOTP-65, "Fiber Optic Cable Twist Test," a length of cable no greater than 2 meters shall withstand 10 cycles of mechanical twisting. The change in attenuation shall not exceed 0.15 dB at 1550 nm for single-mode fiber.

3.9 When tested in accordance with FOTP-37, "Low or High Temperature Bend Test for Fiber Optic Cable," the cable shall withstand four full turns around a mandrel of ≤ 20 times the cable diameter after conditioning for four hours at test temperatures of -30°C and +60"C. Neither the inner or outer surfaces of the jacket shall exhibit visible cracks, splits, tears, or other openings. The change in attenuation shall not exceed 0.3 dB at 1550 nm for single mode fiber.

3.10 All cabled optical fibers > 1000 meters in length shall be 100% attenuation tested. The attenuation of each fiber shall be provided with each cable reel.

4.0 TECHNICAL SPECIFICATIONS FOR 12, 24, 48 AND 96 COUNT SINGLE MODE FIBER

The single-mode fiber utilized in the optical fiber cable shall meet EIA/TIA 492CAAB, "Detail Specification for Class IVa Dispersion-Unshifted Single-Mode Optical Fibers," and ITU recommendation G.652, "Characteristics of Single-Mode Optical Fiber Cable."

TECHNICAL SPECIAL PROVISIONS

4.1 All fibers in the cable must be usable and meet required specifications.

4.2 Each optical fiber shall be sufficiently free of surface imperfections and inclusions to meet the optical, mechanical, and environmental requirements of this specification.

4.3 Each optical fiber shall consist of a doped silica core surrounded by a concentric glass cladding. The fiber shall be a matched clad design.

4.4 Each optical fiber shall be proof tested by the fiber manufacturer at a minimum of 100 kpsi (0.7 GN/m2}.

4.5 The attenuation specification shall be a maximum value for each cabled fiber at 23± 5° C on the original shipping reel.

4.6 Cladding Diameter: 125.0 ± 0.7 um

4.7 Core-to-Cladding Concentricity: ≤ 0.7 urn

4.8 Cladding Non-Circularity ≤ 1.0%

Defined As:

$$\left(1 - \frac{\text{Minimum Cladding Diameter}}{\text{Minimum Cladding Diameter}}\right) x100$$

4.9 Coating Diameter: 245 ± 5 um.

4.10 Colored Fiber Nominal Diameter: 253 - 259 um.

4.11 Attenuation: ≤ 0.4 dB/km at 1310 nm and ≤ 0.3 dB/km at 1550 nm.

4.12 Attenuation Uniformity: No point discontinuity greater than 0.10 dB at either 1310 nm or 1550 nm.

4.13 Attenuation at the Water Peak: ≤ 0.35 dB/km at 1383 ± 3 nm.

4.14 Cutoff Wavelength (2ocf}: ≤ 1260 nm.

4.15 IEEE 802.3 Performance: The fiber shall support laser-based Gigabit Ethernet (GbE) operation in the 1000BASE-LX (1300 nm} operating window at 5000 m.

4.16 Mode Field Diameter: 9.2 ± 0.4 um at 1310 nm 10.4 ± 0.5 um at 1550 nm.

4.17 Macro bend Attenuation: The attenuation due to 100 turns of fiber around a 75 ± 2 mm diameter mandrel shall not exceed 0.05 dB at 1310 nm. The attenuation due to 1 turn of fiber around a 32 ± 2 mm diameter mandrel shall not exceed 0.50.dB at 1550 nm.

4.18 Zero Dispersion Wavelength (lo}: 1302 nm ≤ lo ≤ 1324 nm.

4.19 Zero Dispersion Slope (So}: ≤ 0.092 ps/(nm2_km}.

4.20 Dispersion: ≤ 3.8 ps/(nm•km) from 1285 -1330 nm ≤ 18 ps/(nm•km) at 1550 nm.

4.21 Fiber Curl: ≥ 4.0 m radius of curvature.

4.22 Cable Fiber Polarization Mode Dispersion (PMD): ≤0.5.

$ps/\sqrt{km}$

TECHNICAL SPECIAL PROVISIONS
SPECIFICATIONS FOR TRAFFIC CONTROLLER ASSEMBLY

The following are the descriptions of the items for the Palm Beach County Controller Assemby specification. The items include the cabinet and the loop detectors.

PBC Normal 50" - TS2 - Type 4 - 16 Channel	**Qty**
Description	
Naztec TS2 Type 1 Regional Cabinet Assembly	1
ATC Controller must be compatible for TS1, TS2 & downward compatible	1
P- 44 Cabinet Assembly Type-4 Size	1
Naztec TS2 MMU Model 516L Ethernet LED Display	1
Naztec TS2 BIU Model 130	2
8- NEMA Load Switches, 1- NEMA Flasher, 4 Flash Transfer Relays	1
Luminaries Interface on Power Panel	1
Naztec TS 2 Cabinet Power Supply	1
16 Channel Detector Rack	1
2 Channel Opitcom Rack & Field Panel	1
16 Loop Detector Panel W/ 16 SRA - 6 LC Surge Arrestors	1
Set of FL DOT Spec Load Resistors For Back Panel	1
Thermostat Controlled Fan	1
Naztec TS2 Dual Channel Detector Card w/ Timing and Delay	8
50" H X 30" W X 17" D	

PBC Normal 54" - TS-2 Type 5 - 32 Channel	
Description	
Naztec TS2 Type 1 Regional Cabinet Assembly	1
ATC Controller must be compatible for TS1, TS2 & downward compatible	1
P-44 Cabinet Assembly Type-5 Size	1
Naztec TS2 MMU Model 516L Ethernet LED Display	1
Naztec TS2 BIU Model 130	4
16- NEMA Load Switches, 1 MEMA Flasher,8 Flash Transfer Relays	1
Luminaries Interface on Power Panel	1
Naztec TSW2 Cabinet Power Supply	1
16 Channel Detector Rack	2
2 Channel Opticom Rack & Field Panel	1
32 Loop Detector Panel W/32 SRA- 6LC Surge Arrestors	1
Set of FL DOT Spec Load ResistorsFor Back Panel	1
Ball Bearing Roller Drawer	1
Thermostat Controlled Fans	2
Hardened FSM Ethernet Switch	1
Naztec TS2 Dual Channel Detector Card W/ Timing and Delay	16
Add eight (8) detector Channel to Cabinet	1
54" H X 44" W X 27" D	

PBC Special 68" - TS2 - Type 6 - 32 Channel	**Qty**
Description	
Naztec TS2 Type 1 Regional Cabinet Assembly	1
ATC Controller must be compatible for TS1, TS2 & downward compatible	1
P-44 Cabinet Assembly Type-6 Size	1
Naztec TS2 MMU Model 516L Ethernet LED Display	1
Naztec TS2 BIU Model 130	4
16- NEMA Load Switches, 1 MEMA Flasher,8 Flash Transfer Relays	1
Luminaries Interface on Power Panel	1
Naztec TSW2 Cabinet Power Supply	1
16 Channel Detector Rack	2
2 Channel Opticom Rack & Field Panel	1
32 Loop Detector Panel W/32 SRA- 6LC Surge Arrestors	1
Set of FL DOT Spec Load ResistorsFor Back Panel	1
Ball Bearing Roller Drawer	1
Thermostat Controlled Fans	2
Hardened FSM Ethernet Switch	1
Naztec TS2 Dual Channel Detector Card W/ Timing and Delay	16
Add eight (8) detector Channel to Cabinet	1
68" H X 44" W X 27" D	

PBC Special 68" - TS2 - Type 6 - 64 Channel	
Description	
Naztec TS2 Type 1 Regional Cabinet Assembly	1
ATC Controller must be compatible for TS1, TS2 & downward compatible	1
P-44 Cabinet Assembly Type-6 Size	1
Naztec TS2 MMU Model 516L Ethernet LED Display	1
Naztec TS2 BIU Model 130	6
16- NEMA Load Switches, 1 MEMA Flasher,8 Flash Transfer Relays	1
Luminaries Interface on Power Panel	1
Naztec TSW2 Cabinet Power Supply	2
16 Channel Detector Rack	4
2 Channel Opticom Rack & Field Panel	1
64 Loop Detector Panel W/32 SRA- 6LC Surge Arrestors	1
Set of FL DOT Spec Load Resistors For Back Panel	1
Ball Bearing Roller Drawer	1
Thermostat Controlled Fans	2
Hardened FSM Ethernet Switch	1
Naztec TS2 Dual Channel Detector Card W/ Timing and Delay	32
Add eight (8) detector Channel to Cabinet	3
68" H X 44" W X 27" D	

ATC Controller Cabinet (ATX) - Per PBC request

16 load bays (output)

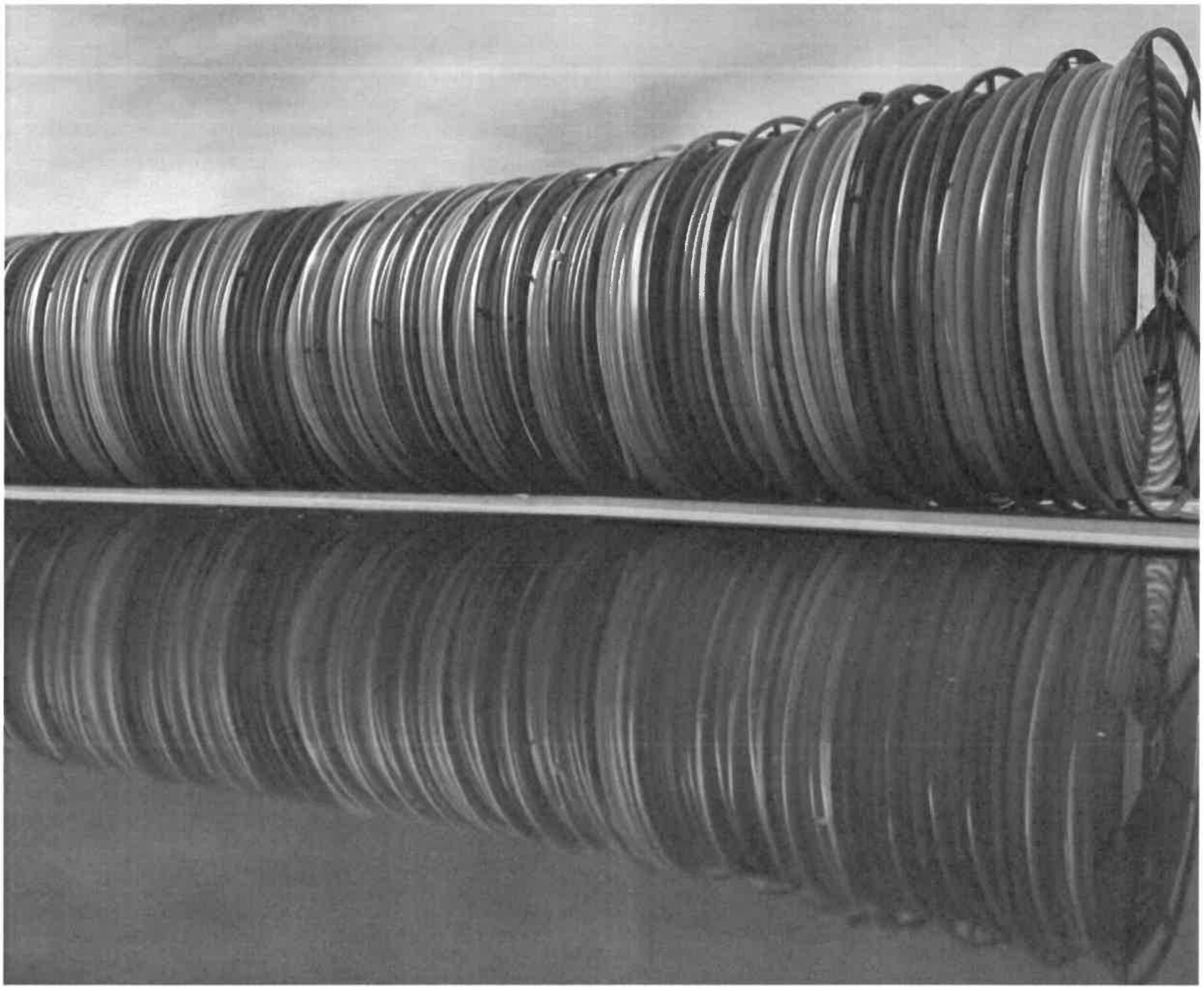
24 load bays (output)

32 load bays (output)

BLUE DIAMOND
Industries, LLC

TECHNICAL SPECIAL PROVISIONS

630-2-XXX



Protecting Critical Infrastructure

TSP-38

Blue Diamond Industries, a member of the Hexatronic Group of Sweden, is headquartered in Lexington, KY with manufacturing facilities in Middlesboro, KY near the Tennesse border and Aubrey, Texas just north of Dallas.

Blue Diamond Industries is a valued market leader in providing HDPE (High Density Polyethylene) conduit solutions for the protection of fiber optic, data and power cables. Blue Diamond's conduit solutions are installed through horizontal directional drilling, plowing and through traditional trenching methods, supporting a wide-range of market applications from residential, power utility, Cable TV, Broadband, Commercial & Industrial, Department of Transportation and the US infrastructure investment nationwide.

BLUE DIAMOND Industries, LLC

HEXATRONIC Group AB (publ)

Blue Diamond conduit solutions of duct, innerduct and microduct support the needs of a loyal customer base by providing optimal service and value through delivery, technology and economic benefit. Blue Diamond's highly efficient manufacturing locations provide the production agility necessary to support the demands of the rapidly growing infrastructure expansion throughout the US market.
Blue Diamond Industries is an ISO 9001:2015 certified company.

ASTM F2160 - Standard Specification for Solid Wall High Density (HDPE) Conduit Based on Controlled Outside Diameter
The industry standard for conduit for communication and power applications.

ASTM D3350 - Standard Specification for Polyethylene Plastics Pipe and Fittings Materials
Defines the raw materials requirements for all HDPE pipe. The standard cell class for ASTM F2160, D3485 and NEMA TC 7 conduit is PE33480C or E.

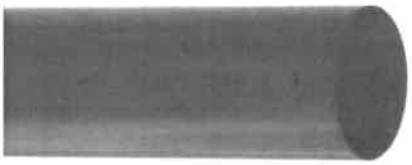
NEMA TC 7 - Smooth Wall Coilable Electrical Polyethylene Conduit
A standard used in power applications.

UL 651A - High density polyethylene conduit, and UL 1990-non-metalic underground conduit with conductors (Cable in Conduit - CIC)
The Underwriters Laboratory standard for power applications. Certification by UL is required to produce this conduit. UL conduit meets NEC Code Article 353.

ASTM D3485 - Standard Specfication for Smooth-Wall Coilable Polyethylene (PE) Conduit for Preassembled Wire and Cable
The ASTM Standard for Cable in Conduit (CIC) where the cable is installed during the extrusion process of the conduit.

HDPE Conduit

Blue Diamond Industries HDPE Conduit solutions enable the essential infrastructure by providing protection of fiber, data and power cables.

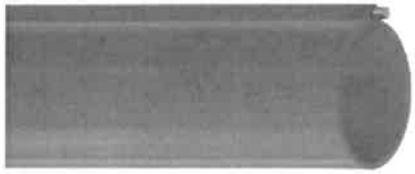


Smooth Wall Innerduct

Smooth wall is the standard High Density Polyethylene (HDPE) Duct. The interior of smooth wall has a slick finish which delivers the lowest coefficient of friction of all available non-lubricated innerduct. Smooth wall innerduct is a durable high quality product for direct burial and HDD (horizontal directional drilling) applications.

Ribbed Wall Innerduct

Blue Diamond's ribbed wall innerduct provides turbulent airflow when blowing fiber cable. Ribbed wall innerduct is available through 6" diameter in any SDR and SIDR rating.



Tracer Wire Innerduct

Tracer wire innerduct provides a method of locating underground fiber optic cable. The tracer wire is a single copper wire co-extruded onto the wall of the innerduct providing a corrosion resistant conductor. An alternative method of locating buried fiber optic cable is to use traceable tape, available pre-installed in any of our duct products.

Colors & Identification	
Standard colors available in:	*Special colors may be available
Striping:	Striping combinations are available in all colors. Three stripes located 120 degrees apart are extruded into the wall of the conduit.
Identification:	• Innerduct size, SDR, and sequential markings every 2' are in jet imprinted on every order. • Custom imprints such as company name, project name, or any special identification markings are also available.
Options:	• Lubrication • Up to three lengths/colors of innerduct per reel available in parallel or segmented. • Pre-installed pull tape, tracer tape, or cable. • SuperGlide®

SuperGlide®

SuperGlide® is a coextruded layer of low friction media in available in Blue Diamond conduit products. The compound of Siloxane and HDPE lowers the already low friction factor of the microduct to below 0.12. This is a significant improvement on the Telcordia Bellcore GRE 3155 Core recommended standard of 0.15.

UL Listed HDPE

630-2-XXX

UL Listed HDPE is a coilable nonmetallic underground conduit manufactured from High Density Polyethylene (HDPE) used for underground or innerduct applications to protect cables and wires. UL Listed HDPE is compliant with NEC 2017 Article 353 and is manufactured to UL 651A specifications. UL 1990 is the standard for UL certified conduit with conductors installed at the manufacturing facility, known as CIC (Cable in Conduit), Unit Duct, and Duct Cable. Its high tensile strength-to-weight ratio, superior crush resistance and low coefficient of friction for cable installation makes it ideal for directional boring.

Options:

- Sizes: ¾" - 6"
- Schedule 40
- Schedule 80
- Sizes 1 ½" - 6" SDR 13.5
- Multiple color and striping options
- Sequentially marked footage
- Also meets: NEMA TC-7 Smoothwall
- Coilable PE Electrical Plastic conduit

UL 651 Listed		SCH 40			SCH 80			SDR 13.5		
Nominal Duct Size	Nominal OD	Nominal ID	Min Wall	Weight LBS/FT	Nominal ID	Min Wall	Weight LBS/FT	Nominal ID	Min Wall	Weight LBS/FT
¾"	1.050	0.804	0.113	0.148	0.722	0.154	0.189	-	-	-
1"	1.315	1.029	0.133	0.218	0.936	0.179	0.278	-	-	-
1¼"	1.660	1.360	0.140	0.295	1.255	0.191	0.384	-	-	-
1½"	1.900	1.590	0.145	0.352	1.476	0.200	0.465	1.599	0.141	0.343
2"	2.375	2.047	0.154	0.472	1.913	0.218	0.644	2.002	0.176	0.531
2½"	2.875	2.445	0.203	0.744	2.290	0.276	0.983	2.429	0.213	0.768
3"	3.500	3.042	0.216	0.974	2.482	0.300	1.316	2.950	0.259	1.153
4"	4.500	3.998	0.237	1.387*	3.786	0.337	1.924	3.794	0.333	1.906
5"	5.563	5.009	0.258	1.880*	4.768	0.375	2.671	4.689	0.412	2.912
6"	6.625	6.031	0.280	2.444*	5.711	0.432	3.674*	5.585	0.491	4.130

*Note: Some dimensions only available in stick form.

CIC (Cable in Conduit) HDPE

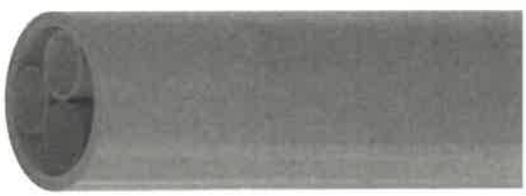
- Pre-installtion of power and communication cables inside conduit during the manufacturing process
- For use in DOT, Street or Airport Lighting, Coax and Fiber Optic Cable, Fiber to the Home, Power Utility and Renewable Energy markets
- Long lengths allow for directional drilling and plowing applications
- Reduces cost and labor with no need to pull cables after the conduit is installed
- Available in diameters from 3/4" through 3"
- Ability to manufacture to UL 1990, ASTM F2160 and ASTM D3485

3N1™ Boreable Conduit

Patent No. 9,819,160

- Pre-installation of 3 or 4 innerducts inside of a 4" case pipe
- No need to pull innerducts through after the bore, instead allowing for fiber or power cables to be installed immediately after the bore is complete
- Innerducts won't get stuck or twisted during installation
- Blue Diamond's 3N1™ can be directional drilled or plowed
- Available lengths are 500' to 1,000' on steel reels
- Configurations:

  4" SIDR 11.5 casing with 3-1.25" SDR 13.5 innerducts
  4" SDR 13.5 casing with 3-1" SDR 13.5 innerducts
  4" SIDR 11.5 casing with 4-1" SDR 13.5 innerducts



hdpe conduit sizes

630-2-XXX

ASTM F 2160
SDR Pipe Data

Nominal Duct Size	Nominal OD	SDR 9 Nominal ID	SDR 9 Min Wall	SDR 9 Weight LBS/FT	SDR 11 Nominal ID	SDR 11 Min Wall	SDR 11 Weight LBS/FT	SDR 13.5 Nominal ID	SDR 13.5 Min Wall	SDR 13.5 Weight LBS/FT
½"	0.840	0.633	0.093	0.099	0.667	0.076	0.085	0.696	0.062	0.072
¾"	1.050	0.797	0.117	0.152	0.839	0.095	0.130	0.874	0.078	0.110
1"	1.315	1.003	0.146	0.235	1.051	0.120	0.200	1.100	0.097	0.169
1 ¼"	1.660	1.270	0.184	0.372	1.338	0.151	0.314	1.394	0.123	0.264
1 ½"	1.900	1.452	0.211	0.488	1.534	0.173	0.409	1.599	0.141	0.343
2"	2.375	1.816	0.264	0.762	1.917	0.216	0.639	2.002	0.176	0.531
2 ½"	2.875	2.198	0.319	1.117	2.321	0.261	0.936	2.429	0.213	0.769
3"	3.500	2.676	0.389	1.657	2.825	0.318	1.387	2.950	0.259	1.153
4"	4.500	3.440	0.500	2.737	3.633	0.409	2.293	3.794	0.333	1.906
5"	5.563	4.252	0.618	4.182*	4.490	0.506	3.505	4.689	0.412	2.912
6"	6.625	5.064	0.736	5.930*	5.348	0.602	4.971	5.585	0.491	4.130

ASTM F 2160
SDR Pipe Data

Nominal Duct Size	Nominal OD	SDR 15.5 Nominal ID	SDR 15.5 Min Wall	SDR 15.5 Weight LBS/FT	SDR 17 Nominal ID	SDR 17 Min Wall	SDR 17 Weight LBS/FT	SCH 40 Nominal ID	SCH 40 Min Wall	SCH 40 Weight LBS/FT
½"	0.840	-	-	-	-	-	-	-	-	-
¾"	1.050	0.895	0.068	0.098	0.906	0.062	0.092	0.804	0.113	0.148
1"	1.315	1.127	0.084	0.151	1.140	0.077	0.139	1.029	0.133	0.218
1 ¼"	1.660	1.426	0.107	0.235	1.445	0.098	0.218	1.360	0.140	0.295
1 ½"	1.900	1.635	0.123	0.305	1.656	0.112	0.282	1.590	0.145	0.352
2"	2.375	2.049	0.153	0.469	2.076	0.140	0.434*	2.047	0.154	0.472
2 ½"	2.875	2.482	0.185	0.685	2.516	0.169	0.629*	2.445	0.203	0.744
3"	3.500	3.021	0.226	1.015	3.064	0.206	0.932*	3.042	0.216	0.974
4"	4.500	3.885	0.290	1.678	3.939	0.265	1.540*	3.998	0.237	1.387*
5"	5.563	4.801	0.359	2.565*	4.868	0.327	2.351*	5.009	0.258	1.882*
6"	6.625	5.719	0.427	3.633*	5.799	0.390	3.341*	6.031	0.280	2.445*

ASTM F 2160
SDR Pipe Data

Nominal Duct Size	Nominal ID	SIDR 9 Nominal OD	SIDR 9 Min Wall	SIDR 9 Weight LBS/FT	SIDR 11.5 Nominal OD	SIDR 11.5 Min Wall	SIDR 11.5 Weight LBS/FT	SIDR 15 Nominal OD	SIDR 15 Min Wall	SIDR 15 Weight LBS/FT
1"	1.049	1.302	0.117	0.194	1.251	0.091	0.151	1.209	0.070	0.117
1 ¼"	1.380	1.707	0.153	0.327	1.640	0.120	0.255	1.584	0.092	0.197*
1 ½"	1.610	1.989	0.179	0.444	1.910	0.140	0.343	1.845	0.107	0.263
2"	2.067	2.554	0.230	0.733	2.448	0.180	0.561	2.363	0.138	0.426
2 ½"	2.469	3.051	0.274	1.044	2.924	0.215	0.800	2.818	0.165	0.613
3"	3.068	3.791	0.341	1.612	3.634	0.267	1.233	3.502	0.205	0.929
4"	4.026	-	-	-	4.768	0.350	2.122	4.595	0.268	1.595
5"	5.046	-	-	-	5.976	0.439	3.337	5.759	0.336	2.501

Please note that some sizes and dimensions may require extended lead times. Please inquire for details.

*Note: Some dimensions only available in stick form.

hdpe conduit reel capacities

630-2-XXX

Pipe Size	Reel Size = Flange (outside diameter) x outer reel width x drum (inside drum diameter); Standard arbor hold diamter 3" - 3 ½"					
½"	48x48x30 5,500	60x48x30 10,500	72x48x30 17,000	78x48x30 20,000		
¾"	48x48x30 3,500	60x48x30 6,500	72x48x30 10,500	84x48x30 15,500	96x48x30 20,000	
1"	48x48x30 2,000	60x48x30 4,000	74x48x30 6,800	84x48x30 10,000	96x48x30 13,500	102x48x30 15,000
1 ¼"	60x48x30 2,500	72x48x30 4,000	84x48x30 6,500	90x48x30 7,500	96x48x30 8,500	102x48x30 10,000
1 ½"	72x48x36 3,000	84x48x36 4,500	96x48x36 6,500	102x48x36 7,500	114x48x36 9,000	
2"	72x48x42 1,500	84x48x42 2,500	90x48x42 3,000	96x48x42 3,750*	102x48x42 4,500	114x48x42 5,500
2 ½"	84x48x48 1,500	96x48x48 2,000	102x48x48 2,500	114x48x48 3,500		
3"	96x48x64 1,200	102x48x64 1,500	114x48x64 2,000	120x48x64 2,500		
4"	96x48x60 550 SDR | 500 SIDR	102x48x60 750 SDR | 700 SIDR	114x48x60 1,000 SDR | 900 SIDR	120x48x60 1,250 SDR | 1,100 SIDR		
5"	102x48x78 400	114x48x78 600	120x48x78 750			
6"	114x48x64 275	120x48x64 450				

Note: Ovality is a packaging condition when roundable conduit is wound into a coil or a reel. Larger conduit will have significant ovaility, 10%+, and may require re-rounding in the field. For further information refer to ASTM F2160.

*Can go up to 4000' of 2" on SDR 13.5 or heavier wall.
**Tracer wire will decrease maximum reel capacities.

Respool Footages* (Parallel or Segment)

*Respooled duct will decrease maximum reel capacities.

Pipe Size	2-way	3-way
1"	5,000	3,750
1 ¼"	4,000	2,500
1 ½"	2,500	1,500
2"	1,500	1,000
3"	375	

*Footage based on standard 96" reels.**Footage is based on equal lengths. Special put ups are available upon request.

Reels per Truckload	
48"	24
60"	20
72"	16
84"	14
96"	12
102"	12
114"	8
120"	8

TECHNICAL SPECIAL PROVISIONS

630-2-XXX

CORRUGATED

STANDARD CORRUGATED HDPE

RISER RATED

PLENUM RATED

STANDARD CORRUGATED HDPE

Premier Corrugated HDPE is manufactured from High Density Polyethylene (HDPE) and is intended to be placed inside of existing innerduct. It's ideal for pulls under 1000 ft. and is designed to reduce surface contact when pulling cable. This lightweight product offers maximum flexibility, and allows for installation in small or restricted areas. Corrugated duct is available in 1", 11/4" and 11/2". The standard color is orange and is offered in a variety of other colors. Sequential marked footage is standard. Custom options, such as multiple colors per reel and Slit Duct, are also available.

Corrugated HDPE Reels

SIZE	COLOR	PART NO.	NOMINAL I.D.	NOMINAL O.D.	PULL TAPE	REEL SIZE	REEL LENGTH (FT.)
1"	Orange	PEC-100T-500	1.049"	1.35"	900 lb	36-36-21	500
1"	Orange	PEC-100T-1000	1.049"	1.35"	900 lb	36-36-21	1000
1"	Orange	PEC-100T-2000	1.049"	1.35"	900 lb	44-36-21	2000

1"	Orange	PEC-100T-2800	1.049"	1.35"	[illegible]	48-41-24	2800
1"	Orange	PEC-100T-5000	1.049"	1.35"	[illegible]	66-41-24	5000
1"	Orange	PEC-100T-6000	1.049"	1.35"	900 lb	72-41-24	6000
1"	Orange	PEC-100T-9000	1.049"	1.35"	900 lb	82-41-24	9000
1 1/4"	Orange	PEC-125T-700	1.25"	1.56"	900 lb	36-36-21	700
1 1/4"	Orange	PEC-125T-1500	1.25"	1.56"	900 lb	44-36-21	1500
1 1/4"	Orange	PEC-125T-1800	1.25"	1.56"	900 lb	48-41-24	1800
1 1/4"	Orange	PEC-125T-3400	1.25"	1.56"	900 lb	66-41-24	3400
1 1/4"	Orange	PEC-125T-4000	1.25"	1.56"	900 lb	72-41-24	4000
1 1/4"	Orange	PEC-125T-6000	1.25"	1.56"	900 lb	82-41-24	6000
1 1/2"	Orange	PEC-150T-500	1.57"	1.80"	900 lb	36-36-21	500
1 1/2"	Orange	PEC-150T-700	1.57"	1.80"	900 lb	44-36-21	700
1 1/2"	Orange	PEC-150T-1000	1.57"	1.80"	900 lb	48-41-24	1000
1 1/2"	Orange	PEC-150T-2500	1.57"	1.80"	900 lb	66-41-24	2500
1 1/2"	Orange	PEC-150T-3500	1.57"	1.80"	900 lb	72-41-24	3500
1 1/2"	Orange	PEC-150T-5000	1.57"	1.80"	900 lb	82-41-24	5000

Corrugated HDPE Coils

SIZE	COLOR	PART NO.	NOMINAL I.D.	NOMINAL O.D.	PULL TAPE	COIL LENGTH (FT.)
1"	Orange	PEC-100T-500	1.049"	1.35"	900 lb	Up to 500
1 1/4"	Orange	PEC-125T-500	1.25"	1.56"	900 lb	Up to 500
1 1/2"	Orange	PEC-150T-350	1.57"	1.80"	900 lb	Up to 350

Sample Part Number

PE	C	100	T	S	2500
Polyethylene (High Density)	Corrugated	1" (I.D.)	Polyester Tape	*Slit Duct (optional)	Put-Up

* Pull tape not available w/ Slit Duct

RISER RATED

Features & Benefits

- Available in industry standard orange or white color for easy identification.
- Rugged corrugated design is flexible, light-weight yet provides excellent crush resistance.
- UL listed designed for riser applictions per NEC articles 770 & 800 and UL standard 2024.
- 1", 1-1/4", 1-1/2" and 2" to accomodate your specific fiber cable diameter.
- Sequential footage markings and product identification printed every 2 feet.
- Standard lengths ranging from 250 ft. coils to 5000 ft. reels.

GENERAL INFORMATION:

Our riser is ideally suited for use as a nonmetallic flexible raceway for protecting and organizing optical fibers in riser applications. Our riser is listed by Underwriters Laboratory (UL) for use with riser or general purpose optical fiber cables per National Electric Code (NEC) article 770 or communication cables per article 800.

Also available with Canadian - cUL ; meeting or exceeding the req ents for FT-4. Please request cUL listing at the time of quotation. ...s will assure the material is marked appropriately.

FAST AND EFFICIENT INSTALLATION

Its lightweight, flexible corrugated design makes it easy to install. The corrugations also assure excellent crush resistance for long term protection of delicate optical fibers. The internal corrugations reduce surface contact between the inside wall of the conduit and the cable jacket lowering friction protecting the cable from high tensile stress during installation. Our riser is available with pull tape factory installed, saving installation steps and lowering installation costs.

- **KEY PROPERTIES FOR FIBER-GUARD / RI PER UL 2024 AND ASTM D-4216**

DESCRIPTION	TEST METHOD	REQUIREMENT	VALUE
Maximum Flame Propagation	UL 2024, 11.1.2a	12.00 Feet	Passed
Max Temp. at 12 Ft.	UL 2024, 11.1.2b	≤850°F	Passed
Tensile Strength	ASTM D 638	> 6500 psi	> 6500 psi
Tensile Modulus	ASTM D 638	> 377,000 psi	380,000 psi
Notched Izod Impact	ASTM D 256	> 5 ft-lbs/in	15 ft-lbs/in

CONDUIT SPECIFICATIONS:

- Made in accordance with UL 2024 meeting or exceeding the flame requirements for riser or general purpose applications.
- Material Properties in accordance with ASTM D 4216
- Available with aramid fiber flame retardant Bull-Line pull tape installed.
- Standard Markings: Arnco, Riser-Guard / Riser, (UL listed), (diameter), (run code), (date), (footage markings)
- Standard colors are orange or natural (white).
- Optional colors available and will require a minimum run quantity.
- Designed for use with riser rated cables.

- **DIMENSIONAL AND WEIGHT TABLE:**

NOMINAL SIZE	AVERAGE OD	MINIMUM OD	WT./FT. (LBS.)	BEND RADIUS
1"	1.315"	1.000"	.143	6"
1-1/4"	1.630"	1.250"	.178	8"
1-1/2"	1.875"	1.500"	.206	10"
2"	2.375"	2.000"	.258"	12"

STANDARD REEL LENGTHS:

CATALOG NUMBER	NOMINAL SIZE	STANDARD LENGTH	COIL DIMENSIONS (F X W)		RELS/TL FLATBED
		(FEET/RL)	FLANGE	WIDTH	48'
CR 500 100 N799 1500R	1"	1500'	48"	46"	24
CR 500 100 N799 3000R		3000'	56"	46"	20
CR 500 100 N799 6000R		6000'	72"	46"	16
CR 500 125 N799 1250R	1-1/4"	1200'	48"	46"	24
CR 500 125 N799 3500R		3500'	72"	46"	16
CR 500 125 N799 6500R		6500'	90"	49"	12
CR 500 150 N799 3000R	1-1/2"	3000'	72"	49"	16

CR 500 150 N799 5200R		5200'	90"	49"	12
CR 500 200 N799 1500R	2"	1500'	72"	49"	16
CR 500 200 N799 3200R		3200'	90"	49"	12

Reel Notes:

(1) Flange (F) x Width (W) are overall reel dimensions.

(2) Total weight includes the weight of the reel.

(3) Color listed is natural for orange change 99 to 33 in cat #, for example CR 500 100 N799 1500R becomes CR 500 100 N733 1500R.

(4) Standard product is made with 1000# tensile Bull-Line aramid fiber pull tape installed (Cat# - WKK 1000).

STANDARD COIL LENGTHS:

CATALOG NUMBER	NOMINAL SIZE REELS	STANDARD LENGTH (FT) (FEET/RL)	COIL DIMENSIONS (D X W) DIA.	WIDTH	COILS/ SKID QTY	WT/COIL (POUNDS)
CR 500 100 N799 0250C	1"	250'	43"	8"	11	36
CR 500 100 N799 0500C		500'	48"	9"	10	72
CR 500 125 N799 0250C	1-1/4"	250'	49"	8.5"	10	45
CR 500 125 N799 0500C		500'	72"	7.5"	12	90
CR 500 150 N799 0250C	1-1/2"	250'	65"	7.5"	12	52
CR 500 150 N799 0500C		500'	70"	11"	8	104
CR 500 200 N799 0250C	2"	250'	74"	8"	10	65
CR 500 200 N799 0500C		500'	78"	13.5"	7	130

Coil Notes:

(1) Coil diameter (D) x Width (W) provides overall coil dimension.

(2) Weight is for weight of each coil based on size & length.

(3) Color listed is natural for orange change 99 to 33 in cat #, for example CR 500 100 N799 0250C becomes CR 500 100 N733 0250C.

(4) Standard product is made with 1000# tensile Bull-Line aramid fiber pull tape installed (Cat# - WKK 1000).

PLENUM RATED

Premier Plenum Duct is a flexible, non-metallic, corrugated raceway used for effective cable and fiber optic management within interior raceways. Premier Plenum meets UL-(910) standards for the National Electrical Code, Article 770, and satisfies UL-2024 standards for low smoke and flame propagation.

Premier Plenum is offered in 1", 11/4" and 11/2, with pre-installed pull tape for easy cable installation. The standard color is orange and is offered in a variety of other colors. Sequential marked footage is standard. Custom options, such as multiple colors per reel and Slit Duct, are also available.

Future growth or maintenance of your interior cable system is made easy with Premier Plenum.

Plenum Reels

SIZE	COLOR	PART NO.	NOMINAL I.D.	NOMINAL O.D.	PULL TAPE	REEL SIZE	REEL LENGTH (FT.)
1"	Orange	P-100T-500	1.049"	1.35"	900 lb	36-36-21	500
1"	Orange	P-100T-1000	1.049"	1.35"	900 lb	36-36-21	1000
1"	Orange	P-100T-2000	1.049"	1.35"	900 lb	44-36-21	2000
1"	Orange	P-100T-2800	1.049"	1.35"	900 lb	48-41-24	2800
1"	Orange	P-100T-5000	1.049"	1.35"	900 lb	66-41-24	5000
1"	Orange	P-100T-6000	1.049"	1.35"	900 lb	72-41-24	6000
1"	Orange	P-100T-9000	1.049"	1.35"	900 lb	82-41-24	9000
11/4"	Orange	P-125T-700	1.25"	1.56"	900 lb	36-36-21	700
11/4"	Orange	P-125T-1500	1.25"	1.56"	900 lb	44-36-21	1500
11/4"	Orange	P-125T-1800	1.25"	1.56"	900 lb	48-41-24	1800
11/4"	Orange	P-125T-3400	1.25"	1.56"	900 lb	66-41-24	3400
11/4"	Orange	P-125T-4000	1.25"	1.56"	900 lb	72-41-24	4000
11/4"	Orange	P-125T-6000	1.25"	1.56"	900 lb	82-41-24	6000
11/2"	Orange	P-150T-500	1.57"	1.80"	900 lb	36-36-21	500
11/2"	Orange	P-150T-700	1.57"	1.80"	900 lb	44-36-21	700
11/2"	Orange	P-150T-1000	1.57"	1.80"	900 lb	48-41-24	1000
11/2"	Orange	P-150T-2500	1.57"	1.80"	900 lb	66-41-24	2500
11/2"	Orange	P-150T-3500	1.57"	1.80"	900 lb	72-41-24	3500
11/2"	Orange	P-150T-5000	1.57"	1.80"	900 lb	82-41-24	5000

Plenum Coils

SIZE	COLOR	PART NO.	NOMINAL I.D.	NOMINAL O.D.	PULL TAPE	COIL LENGTH (FT.)
1"	Orange	P-100T-500	1.049"	1.35"	900 lb.	Up to 500
1 1/4"	Orange	P-125T-500	1.25"	1.56"	900 lb.	Up to 500
1 1/2"	Orange	P-150T-350	1.57"	1.80"	900 lb.	Up to 350

Test Results (Using Test Method UL-2024)

PROPERTIES	VALUE
Smoke peak optical	0.02
Smoke average optical density	0.01
Max. flame spread distance (ft.)	1.5'
Max. flame temperature	554°

Sample Part Number

P	100	T	S	2500
Plenum	1" (I.D.)	Polyester Tape	*Slit Duct (optional)	Put-Up

* Pull tape not available w/ Slit Duct

Select Product

TSP-49

ENDOT INDUSTRIES

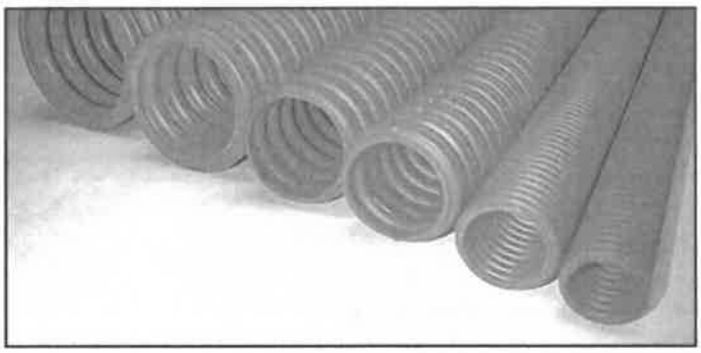
DUCT AND INNERDUCT — TECHNICAL SPECIFICATIONS

630-2-XXX

Endocor

CORRUGATED DUCT AND INNERDUCT

Designed specifically for fiber optic cables



FEATURES:

- Sizes from 1/2" through 2"
- Flexible & Lightweight for ease of handling
- Available in solid colors or stripes
- Available with multiple lengths/colors per reel
- Special high tensile strength versions available
- Available pre-threaded with pull line
- Available as Split Duct for covering cables in place
- Endocor is produced from High Density Polyethylene (HDPE)

ENDOCOR'S corrugated design provides high tensile strength with low weight per foot for ease of handling and significantly longer put ups that can be obtained with smoothwall or ribbed innerduct.

ENDOCOR provides the lowest cable pulling friction of any innerduct design because of reduced surface area and no reel memory eliminating spiraling of the innerduct in the conduit.

ENDOCOR SPLIT DUCT is produced from Low Density Polyethylene for ease of use and superior flexibility.

PART NO.	NOMINAL SIZE	O.D.	I.D.
ICE 050	1/2" (13mm)	0.850" (22mm)	0.652" (17mm)
ICE 075	3/4" (19mm)	1.116" (28mm)	0.870" (22mm)
ICE 100	1" (25mm)	1.400" (35mm)	1.050" (27mm)
ICE 125	1 1/4" (32mm)	1.600" (41mm)	1.250" (32mm)
ICE 150	1 1/2" (38mm)	1.900" (48mm)	1.680" (43mm)
ICE 200	2" (51mm)	2.400" (61mm)	2.180" (55mm)

ENDOCOR PART NUMBER SYSTEM - One Selection from Each Column Creates a complete Product Part Number

EXAMPLE – Regular Corrugated 3/4", on a 48" Reel, 3/16" PP rope, Orange = **ICE 075 22 21 02**

PRODUCT	SIZE (ID)	REEL DIAMETER	PULL LINE	COLOR
I CE = corrugated	050 = 1/2"	21 = 34" wood	01 = empty	01 = black
	075 = 3/4"	22 = 48" wood	13 = 1100# polyester	02 = orange
I CS = Split Duct	100 = 1"	25 = 72" wood	14 = 1250# polyester	03 = green
	125 = 1 1/4"	24 = 84" wood	15 = 1800# polyester	04 = red
	150 = 1 1/2"	39 = 72" steel	17 = 900# polyester	06 = blue
	200 = 2"	32 = 84" steel		07 = white
		33 = 96"x 44" steel		08 = gray
				09 = custom

For product quantity per reel refer to Endot's reel capacity charts.

CORPORATE HEADQUARTERS
60 Green Pond Road
Rockaway, NJ 07866
800-443-6368 • FAX 973-625-4087

ENDOT INDUSTRIES, INC.
www.endot.com • e-mail: info@endot.com

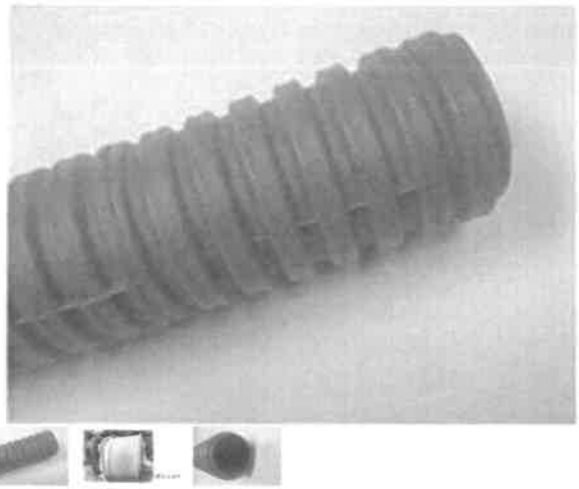
PLANT LOCATIONS
Rockaway, NJ
Greeneville, TN
Pryor Creek, OK

TECHNICAL SPECIAL PROVISIONS

630-2-XXX

PRODUCTS

Endocor Corrugated HDPE Innerduct



CORRUGATED DUCT AND IN[illegible]UCT **630-2-XXX**

Designed specifically for fiber optic cables

FEATURES:

- Flexible
- Corrosion-resistant
- Corrugated for lowest possible coefficient of friction
- Lightweight yet highly crush resistant
- No Memory for ease of handling in all weather
- Available in solid colors or stripes
- Standard and custom reel lengths
- Available with multiple lengths and colors on one reel
- Sizes from 1/2" through 2"
- Special high tensile versions available
- Available pre-threaded with a variety of pull tapes (optional)
- Endocor Corrugated Innerduct is produced from High Density Polyethylene (HDPE)

ENDOCOR'S corrugated design provides high tensile strength with low weight per foot for ease of handling and significantly longer pulls than can be obtained with smoothwall or ribbed innerduct.

ENDOCOR provides the lowest cable pulling friction of ANY innerduct design because of reduced surface area and no reel memory which eliminates spiraling in the conduit.

ENDOCOR 1050 and 1250 can be coupled with the easy to use, low cost ENDOCLIP (/Upload/files/Endoclip%20Connector%207-2010.pdf) for a fast joint that is stronger than the innerduct itself.

Part	---------- Nominal ----------		
No.	**SIZE**	**O.D.**	**I.D.**
500	**1/2"**(13mm)	**0.850"**(22mm)	**0.652"**(17mm)
750	**3/4"**(19mm)	**1.116"**(28mm)	**0.870"**(22mm)
1050	**1"**(25mm)	**1.400"**(35mm)	**1.050"**(27mm)
1250	**1 1/4"**(32mm)	**1.600"**(41mm)	**1.250"**(32mm)
1500	**1 1/2"**(38mm)	**1.900"**(48mm)	**1.500"**(36mm)
2000	**2"**(51mm)	**2.350"**(60mm)	**1.900"**(48mm)

• Benefits of steel conduit
• Types of steel conduit
• Applications
• Dimensional Data
• Technical Contacts
• Free Downloads

Types of Steel Conduit

(Product Definitions)

630-2-XXX

Steel Conduit and Tubing

Steel conduit has been in use as a "raceway system" for electrical conductors since the early 1900s. The wall thickness and strength of steel make Rigid Steel Conduit, Intermediate Metal Conduit and Electrical Metallic Tubing the wiring methods recognized as providing the most mechanical protection to the enclosed wire conductors. Additionally, a properly installed metal conduit system is recognized by the National Electrical Code® (NEC®) as an equipment grounding conductor. There are three basic types of steel conduit in use today:

Rigid Metal Conduit — RMC (ferrous metal)
Rigid metal conduit (RMC) is a listed threaded metal raceway of circular cross section with a coupling which can be either a standard straight tapped conduit coupling or the integral type. Threads on the uncoupled end are covered by industry color-coded thread protectors which protect the threads, keep them clean and sharp, and aid in trade size recognition. Rigid metal conduit is available in trade sizes 1/2 through 6. Thread protectors for trade sizes 1, 2, 3, 4, 5, and 6 are color-coded blue, trade sizes 1/2, 1 1/2, 2 1/2, 3 1/2 are black, and trade sizes 3/4 and 1-1/4 are red. The nominal finished length of RMC with coupling is 10 feet.

Rigid metal conduit can have a primary coating of zinc, a combination of zinc and organic coatings, or a nonmetallic coating (such as PVC). Supplementary coatings can be applied to all three where additional corrosion protection is needed.

(NOTE: Contact suppliers with product-specific questions).

Rigid metal conduit is the heaviest-weight and thickest-wall steel conduit. Where galvanized by the hot-dip process, it has a coating of zinc on both the inside and outside. Electro-galvanized rigid has a coating of zinc on the exterior only, with approved corrosion resistant organic coatings on the interior. Rigid with alternate corrosion protection generally has organic coatings on both the exterior and the interior surfaces. Galvanized rigid metal conduit (RMC) is non-combustible and can be used indoors, outdoors, underground, concealed or exposed. Rigid metal conduit with coatings that are not zinc based may have temperature limitations which will be noted on the manufacturer's product label and may not be listed for use in environmental air spaces; consult manufacturers' listings and markings.

Go to top

Intermediate Metal Conduit — IMC (ferrous metal)

This product was developed in the 1970s. Intermediate Metal Conduit (IMC) is a listed threaded steel raceway of circular cross section with a coupling which can be either a standard straight-tapped conduit coupling or the integral type. Threads on the uncoupled end are covered by industry color coded thread protectors which protect the threads, keep them clean and sharp, and aid in trade size recognition. IMC is available in trade sizes 1/2 through 4. Thread protectors for trade sizes 1, 2, 3, 4, are color-coded orange; trade sizes 1/2, 1 1/2, 2 1/2, 3 1/2 are yellow; and trade sizes 3/4 and 1 1/4 are green. The nominal finished length of IMC *with coupling* is 10 feet.

IMC has a reduced wall thickness, when compared to RMC, and weighs about one-third less than RMC. The outside has a zinc based coating and the inside has an approved organic corrosion-resistant coating. IMC is interchangeable with galvani

conduit. Both ... e threads with a 3/4-inch ... foot taper; use the same couplings and fittings; have the same support requirements; and are permitted in the same locations.

Electrical Metallic Tubing — EMT (ferrous metal)

Electrical Metallic Tubing (EMT), also commonly called thin-wall, is a listed steel raceway of circular cross section which is unthreaded, and nominally 10 feet long. The outside corrosion protection is zinc based and the inside has an approved corrosion resistant organic coating. EMT with integral couplings is available in trade sizes 2 1/2 - 4. EMT is installed by use of set-screw or compression-type couplings and connectors. EMT is permitted to have an integral coupling which is comprised of an expanded, "belled" shape of tube on one end with set screws.

Go to top

PVC-Coated Steel Conduit (PVC)

There are three types of PVC-coated conduit; couplings are supplied separately.

1. Primary PVC coating over bare steel which is a listed rigid conduit for environmentally suitable locations.
2. A PVC coating over listed galvanized steel conduit. This is a supplementary coating intended for added protection in severely *corrosive locations*.
3. A primary PVC coating over a supplementary coating of zinc. This is also intended for severely corrosive locations.

These PVC-coated raceways are generally installed as a system, which means the fittings, conduit bodies, straps, hangers, boxes, etc., are also coated. There are, however, installations where only a coated elbow is used in a galvanized conduit run, such as where emerging from the soil or concrete.

(NOTE: Manufacturers' instructions are very important when installing PVC coated products and

630-2-XXX

Steel Tube Institute

The membership of the Steel Tube Institute's Steel Conduit Section represents the leading producers of Steel Conduit tubing, who have banded together to promote the use of Steel Conduit. They are listed below. All members who have a website are linked. The names of those companies who have websites are printed in blue. To visit their home page, simply click on their name.

allied TUBE & CONDUIT	**Allied Tube & Conduit Corp.** 16100 S. Lathrop Avenue Harvey, IL 60426 Telephone: (708) 339-1610 Fax: (708) 339-9827
PICOMA	**Picoma Industries** 330 East Ninth Street Waynesboro, PA 17268 Telephone: (800) 742-6621 Fax: (717) 762-0948
Republicconduit™ Demand The Brand ® Maverick Tube Corporation	**Republic Conduit Maverick Tube Corp.** 16401 Swingley Ridge Rd. Suite 700 Chesterfield, MO 63017 Telephone: (800) 325-1777 Fax: (636) 733-1677
WESTERN TUBE & CONDUIT CORPORATION	**Western Tube & Conduit Co.** P.O. Box 2720 Long Beach, CA 90801-2720 Telephone: (310)

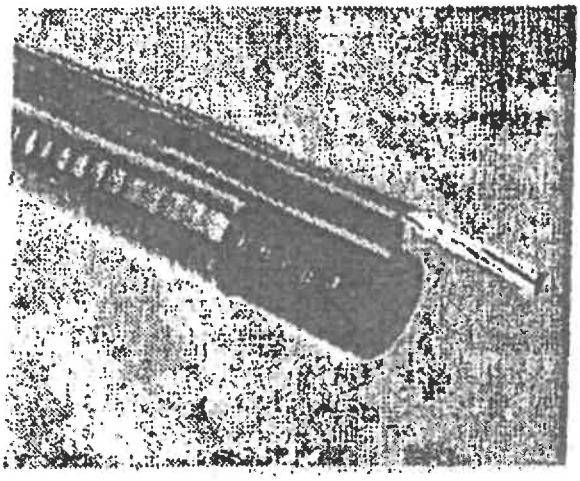
	537-6300 Fax: (310) 604-9785
Wheatland TUBE COMPANY	**Wheatland Tube Company** P.O. Box 600 Collingswood, NJ 08108 Telephone: (856) 854-5400 Fax: (856) 858-5578

630-2-XXX

STRAND-GUARD®
AERIAL FIGURE-8 CONDUIT

Product Bulletin

August 2001 — Rev. 3.0



Features:

- Flexible corrugated inner wall
- 6.6M or 10M strand strengths
- Multiple sizes, continuous long lengths
- Easy payoff
- Uses standard industry hardware
- Optional pre-installed pull tape

Benefits:

- Fast, straight, one-pass installation
- Designed for air-assisted fiber placement
- Lower installed cable and maintenance cost
- Provides added layout of protection for your fiber investment

MINIMIZE YOUR AERIAL INSTALLATION COSTS – IDEAL FOR AIR-ASSISTED CABLE PLACEMENT

ARNCO's Strand-Guard® is ideal for difficult access areas, such as water or interstate crossings, or heavy tree areas.

- There is no need to put up a strand making installation a one-pass operation. Easy straight payoff allows for direct placement.
- Standard hardware and ARNCO's Split-Lock™ coupler are all that is needed to construct the aerial plant.
- No expansion sleeves needed, as the corrugated inner liner absorbs mechanical strain.
- The Strand-Guard system is airtight, and the corrugated inner liner reduces cable surface contact, resulting in a lower coefficient of friction for pulling or air-assisted cable placement.

DESIGNED TO RESIST THE ELEMENTS

Strand-Guard was designed to stay up in the toughest conditions.

- A unique inner corrugated wall combined with a high-strength web dissipates the expansion contraction forces.
- A specially formulated flexible sunlight resistant outer jacket provides the protection and rigidity necessary to protect your fiber and allow air-assisted cable placement.
- Several high strength steel flooded strand options are available providing long-term adhesion and water resistance in heavy storm loads.
- Corrugated design absorbs internal ice expansion.

FLEXCALC™ PROGRAM

Ask your ARNCO® sales representative about our FlexCalc software for use in calculating sag tension requirements. The program is simple to use as it walks the user through a menu of choices culminating in a table of sag and tension information for the specific selections the user has requested. Please contact an ARNCO® sales representative or an authorized ARNCO® distributor for more details.

1-800-321-7914
WEB SITE: www.arncocorp.com
E-MAIL: info@arncocorp.com

ARNCO CORPORATION
860 GARDEN STREET, ELYRIA, OH 44035
PHONE: 440-322-1000 • FAX: 440-322-1001

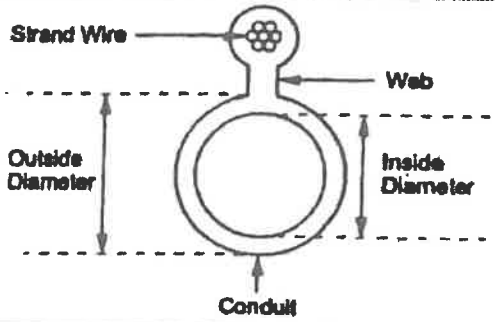
Product Bulletin

August 2001 — Rev. 3.0

STRAND-GUARD®
AERIAL FIGURE-8 CONDUIT

TECHNICAL SPECIFICATIONS & ORDERING INFORMATION

Strand-Guard® is a self-supporting conduit designed for ease of installation and long life in aerial applications. It is a very economical way to protect fiber optic cable installed aerially.



TECHNICAL SPECIFICATIONS

MATERIALS

Resin	Specialty formulated, UV stabilized, black polyethylene.
UV Protection	Minimum 2% carbon black (avg. particle size 20μ) with antioxidant.
Strand	High strength zinc galvanized steel, with flooding/adhesive compound.

DIMENSIONS

Description	Nominal I.D.	Nominal Composite O.D.	Nominal Composite Wall	Weight/Ft.
1.00" I.D. with 6.6M strand	1.00"	1.44"	.110"	.362 lbs.
1.00" I.D. with 10M strand	1.00"	1.44"	.110"	.511 lbs.
1.25" I.D. with 6.6M strand	1.25"	1.66"	.110"	.429 lbs.
1.25" I.D. with 10M strand	1.25"	1.66"	.110"	.578 lbs.
1.50" I.D. with 6.6M strand	1.50"	1.90"	.110"	.509 lbs.
1.50" I.D. with 10M strand	1.50"	1.90"	.110"	.658 lbs.
2.00" I.D. with 6.6M strand	2.00"	2.36"	.110"	.624 lbs.
2.00" I.D. with 10M strand	2.00"	2.36"	.110"	.773 lbs.

Dimensions	Bend Radius		Pull Strength(1) Max (@ 3.5% elongation)
	Unsupported	Supported	
1.00"	14"	13"	415 lbs.
1.25"	16"	15"	500 lbs.
1.50"	20"	18"	585 lbs.
2.00"	24"	22"	760 lbs.

1. Tensile yield is for duct component only and not strand. Installation tension should be placed on strand, not duct.

SPLIT-LOCK™ COUPLERS

Part No.	Description
IA 552 100 SS	1" I.D. SDR
IA 552 125 SS	1-1/4" I.D. SDR
IA 552 150 SS	1-1/2" I.D. SDR
IA 552 200 SS	2" I.D. SDR

Note: Specifications, dimensions and packaging subject to change. Consult factory or representative for current ordering information.

Printed in U.S.A.
R-105

ARNCO
Pipe Installation Systems
ARNCO® CORPORATION
860 GARDEN STREET, ELYRIA, OH 44035
PHONE: 440-322-1000 • FAX: 440-322-1001
1-800-321-7914
WEB SITE: www.arncocorp.com
E-MAIL: info@arncocorp.com

635-2-X

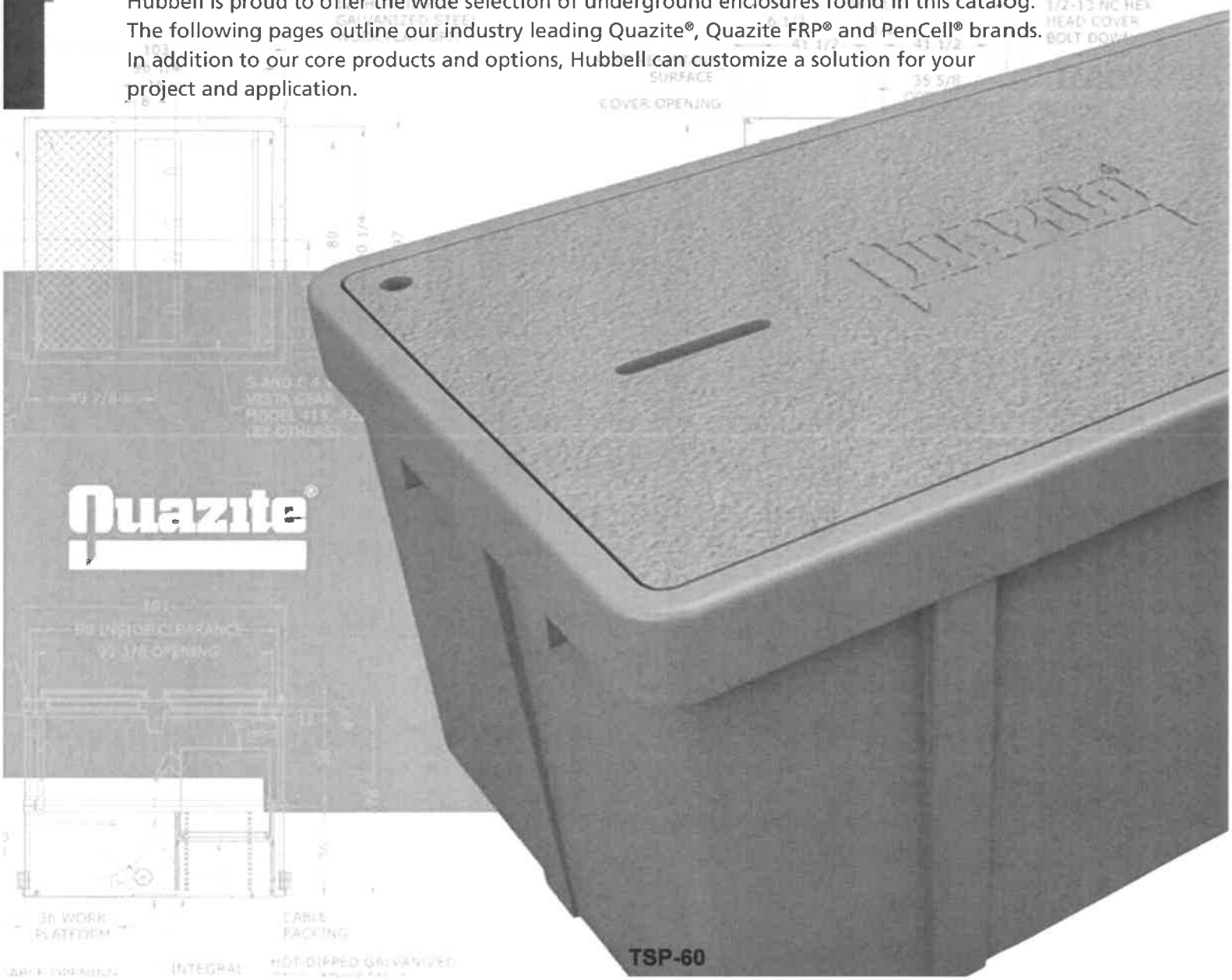
Hubbell Underground Enclosures

INTRODUCTION

Strength, performance, quality and outstanding customer service have been hallmarks of Hubbell underground enclosure brands for more than 40 years. The industry leader for applications in non-deliberate traffic areas, our enclosures provide rugged and cost-effective protection for a variety of electric utility, commercial and industrial, communications, water and gas equipment while meeting the specific demands of your industry.

All Hubbell underground enclosure brands come backed with cutting-edge engineering expertise and a total commitment to quality that is designed into our products. Our engineers are respected and valued advisors throughout the industry and our quality processes are among the most sophisticated in application. When you need unyielding performance and reliability, Hubbell underground enclosure brands are the right choice.

Hubbell is proud to offer the wide selection of underground enclosures found in this catalog. The following pages outline our industry leading Quazite®, Quazite FRP® and PenCell® brands. In addition to our core products and options, Hubbell can customize a solution for your project and application.



Hubbell Underground Enclosures

Hubbell offers three distinct brands of underground enclosures. All three are built with the same attention to quality and performance that you know and expect from Hubbell. Each brand is made of a different base material. Our comprehensive product offering is tailored to ensure that your application requirements are met, no matter what. Based on your design style preference, Hubbell offers Quazite monolithic polymer concrete, Quazite® FRP fiberglass-reinforced polymer and PenCell HDPE enclosure products. All three brands offer superior performance and unique benefits.

Quazite® Enclosures

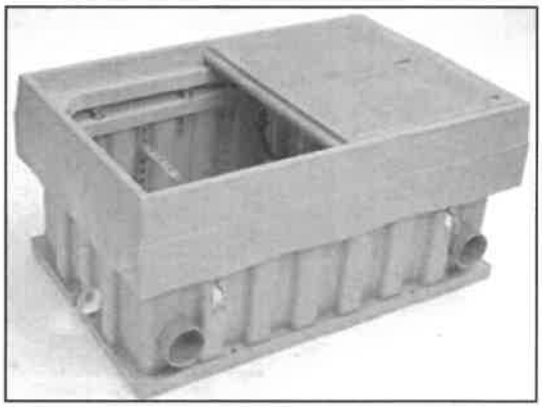
Polymer concrete is made from select-grade aggregates in combination with a polymer resin system. When combined through a process of mixing, molding and curing, an extremely powerful cross-linked bond is formed. Precast polymer concrete is reinforced with fiberglass to give it additional strength and rigidity.

Polymer Concrete

Quazite® FRP Enclosures

Fiberglass-reinforced polymer, also called FRP, is a special combination of polymer concrete and fiber-reinforced polymer. This hybrid construction, formed from an FRP shell and a polymer concrete ring and cover, delivers a high strength, lightweight, abrasion-resistant product that is protected from ultraviolet rays.

Fiberglass Reinforced Polymer



PenCell® Enclosures

Structural foam molded high density polyethelyne, also called HDPE, is a light weight, high strength plastic molding process that provides outstanding structural integrity and durability. HDPE enclosures are mated with covers made from a variety of materials: HDPE, polymer concrete or steel. This combination creates a highly versatile choice for underground utility enclosures where low weight and high strength are necessary.

High Density Polyethylene (HDPE)

Quazite: Available Size Chart

Style	Size	Depths	Assembly Load Rating Options	UL
PC	6x8	6 3/4	Tier 15	Yes
	8x8	12, 18	Tier 15	Yes
	8x18	7, 8	Tier 8, Tier 15	Yes
	11x18	12, 18	Tier 8	Yes
	12x12	12	Tier 8, Tier 15	Yes
	13x24	12	Tier 5	Yes
	17x30	12	Tier 5	Yes
PD	11x18	12	Tier 8, Tier 15, Tier 22	No
	11x21	12	Tier 8, Tier 15, Tier 22	No
	13x24	12, 18, 26	Tier 8, Tier 15, Tier 22	No
	17x30	12, 18, 26	Tier 8, Tier 15, Tier 22	Yes
	24x36	18, 26, 48	Tier 8, Tier 15, Tier 22	Yes
	30x48	24, 48	Tier 8, Tier 15, Tier 22	Yes
PG	10x15	12	Tier 8, Tier 15, Tier 22	No
	11x18	12, 18	Tier 8, Tier 15, Tier 22	Yes
	11x20	12, 18	Tier 8, Tier 15, Tier 22	No
	13x24	12, 18, 24	Tier 8, Tier 15, Tier 22	Yes
	17x30	12, 18, 22, 24, 30	Tier 8, Tier 15, Tier 22	Yes
	24x24	24*	Tier 8, Tier 15, Tier 22	Yes
	24x36	18, 24, 30, 36, 42*	Tier 8, Tier 15, Tier 22	Yes
	30x48	18, 24, 36, 48*	Tier 8, Tier 15, Tier 22	Yes
	30x60	21, 30, 36	Tier 5, Tier 15, Tier 22	No
	36x36	36*	Tier 8, Tier 15, Tier 22	Yes
	36x60	19, 24, 31, 36*	Tier 5, Tier 15, Tier 22	No
	36x72	21, 36	Tier 5, Tier 15, Tier 22	No
	48x48	36, 48	Tier 5, Tier 15, Tier 22	No
	48x60	48	Tier 22	No
	48x72	36, 48*	Tier 5, Tier 15, Tier 22	No
	48x78	27, 36	Design 12,000 lbs / Test 24,000 lbs	No
	48x96	48*	Tier 5, Tier 15, Tier 22	No
PT	10x15	18	Tier 8, Tier 15	No
	13x24	18	Tier 8, Tier 15	Yes
	17x30	18	Tier 8, Tier 15	Yes
PX	12x12	24	Tier 8, Tier 15	Yes
Median	5x16		Tier 8, Tier 15	No
	10x12		Tier 8, Tier 15	No
Round	27	36, 48	Tier 8, Tier 15, Tier 22	Tier 8 ONLY
	39	18, 24, 36, 48, 72	Tier 8, Tier 15, Tier 22	Yes

*Extensions Available

Quazite FRP: Available Size Chart

Style	Size	Depths	Load Rating Options
Straight Wall	6x8	6 3/4	Tier 8
	10x15	12	Tier 8, Tier 15
	11x18	12, 18	Tier 8, Tier 15, Tier 22
	11x21	12	Tier 5, Tier 8, Tier 15
	11x32	12	Tier 5, Tier 8, Tier 15
	12x12	12	Tier 8, Tier 15, Tier 22
	13x24	12, 18	Tier 8, Tier 15, Tier 22
	15x17	12	Tier 8, Tier 15
	15x27	12	Tier 5, Tier 8
	16x22	18	Tier 8, Tier 15
	17x30	12, 18, 22, 30	Tier 8, Tier 15, Tier 22
	24x24	12, 18, 24	Tier 8, Tier 15, Tier 22
	24x36	18, 24, 30	Tier 8, Tier 15, Tier 22
	30x48	18, 24, 36	Tier 8, Tier 15, Tier 22
	30x60	18, 30, 36, 48	Tier 8, Tier 15, Tier 22
	36x36	18, 24, 30, 36, 48	Tier 8, Tier 15, Tier 22
	36x60	18, 24, 30, 36, 48	Tier 8, Tier 15, Tier 22
	36x72	36, 48	Tier 8, Tier 15, Tier 22
Flared Wall	10x15	12, 18	Tier 8, Tier 15
	11x18	12, 18	Tier 8, Tier 15, Tier 22
	11x32	12	Tier 5, Tier 8
	12x12	12, 24	Tier 8, Tier 15
	13x24	12, 18, 24*	Tier 8, Tier 15, Tier 22
	15x17	12	Tier 5, Tier 8, Tier 15
	15x27	12	Tier 5, Tier 8
	16x22	30	Tier 8, Tier 15
	17x30	12, 18, 22, 24, 30, 34*	Tier 8, Tier 15, Tier 22
	24x36	18, 24, 30, 36. 42. 48*	Tier 8, Tier 15, Tier 22
	24x60	24	Tier 5
	30x48	18, 24, 30, 36	Tier 8, Tier 15, Tier 22

Style	Size	Depths	Load Rating Options
Corrugated Wall	30x48	18, 24, 30, 36, 48*	Tier 8, Tier 15, Tier 22
	30x60	18, 24, 30, 36, 48	Tier 5, Tier 8, Tier 15, Tier 22
	36x60	18, 24, 30, 36, 48	Tier 8, Tier 15, Tier 22
	36x72	18, 24, 30, 36, 48	Tier 8, Tier 15, Tier 22
	36x96	30, 36, 48	Tier 8, Tier 15, Tier 22
	48x48	18, 24, 30, 36, 48	Tier 8, Tier 15, Tier 22
	48x72	18, 24, 30, 36, 48	Tier 8, Tier 15, Tier 22
	48x78	18, 24, 30, 36, 48	Tier 8, Tier 15, Tier 22
	48x96	18, 24, 30, 36, 48	Tier 8, Tier 15, Tier 22
	78x96	36, 48	Tier 8, Tier 15, Tier 22
Round	2,000	24, 48	Tier 8, Tier 15, Tier 22
	2,700	36, 72	Tier 8, Tier 15
	3,200	36	Tier 8, Tier 15, Tier 22
	3,900	14, 30, 36	Tier 8, Tier 15, Tier 22

*Extensions Available

PenCell: Available Size Chart

635-2-X

Style	Size	Depths	Load Rating Options
DT	11x18	9, 11, 18, 20	5k, Tier 15
	12x12	14, 16, 20, 25	5K, Tier 15
	13x24	15, 17, 18, 23	5K, Tier 15
	17x30	15, 17, 18, 24, 26, 30, 32, 36, 38*	5k, Tier 15, Tier 22 (24" and 36" depth only)
	24x36	18, 24, 36	5K, Tier 15, Tier 22
	30x48	24, 36	5K, Tier 15, Tier 22
PE	6	9	5K
	9	10	5K
	10	18, 19	5K
	14	12, 17*	5K
	20	15, 17	5K, 10K
	30	12, 17, 19*	5K, 10K
	36	15	5K
	10x15	12	5K
	11x18	12	3K
	13x24	12	3K
	17x30	12	3K
PM	10x10	12	20K
	12x12	24	20K
	12x18	24	20K
	12x20	18	20K
	12x24	24	20K
	18x18	24	20K
	18x24	24	20K
	18x30	24	20K
	24x24	18, 24, 30, 36, 42, 48	5K, 20K
	24x36	18, 24, 30, 36, 42, 48	5K, 20K
	24x48	18, 24, 30, 36, 42, 48	5K, 20K
	24x60	18, 24, 30, 36, 42, 48	5K, 20K
	30x36	18, 24, 30, 36, 42, 48	5K, 20K
	30x48	18, 24, 30, 36, 42, 48	5K, 20K
	30x60	18, 24, 30, 36, 42, 48	5K, 20K
	36x36	18, 24, 30, 36, 42, 48	5K, 20K
	36x48	18, 24, 30, 36, 42, 48	5K, 20K
	36x60	18, 24, 30, 36, 42, 48	5K, 20K
Round	12x12	24	20K

*Extensions Available

GE
Lighting

GTX™ City
LED Countdown Pedestrian Signals
16 x 18 inch

Excellent Appearance & Visibility
- Robust LED system design enables high luminous intensity over product life cycle
- Efficient optical system minimizes power consumption while providing excellent uniformity and viewing angles
- Single piece transparent front window with internal masking to prevent:
  - countdown and icons display from being readily visible when not in operation
  - scratches and abrasions compared with external silk screen technology
- Bright and clear icons
- Fully uniform look
- Lower profile*
- Improved luminous intensity uniformity

Outstanding Reliability & Robust Operation
- Internal conflict monitor preventing walk and don't walk indications to light up at the same time
- Individual power supply drives each display to ensure proper indication
- Reduced overall power consumption*

* Compared to PS7-CFF1-27A

Meets Rigorous Certification & Testing Standards
- Intertek ETL Verified compliant
- DOE compliant
- Using MIL-STD-810F and NEMA 250-1991 Type 4 for environmental robustness, passed reliability and qualification testing including high temperature, high humidity cycling (HTHH for 1,000 hours)
- Compliant (for Full Hand/Full Person) with the ITE PTCSI LED Signal Modules
  - version dated August 2010

imagination at work

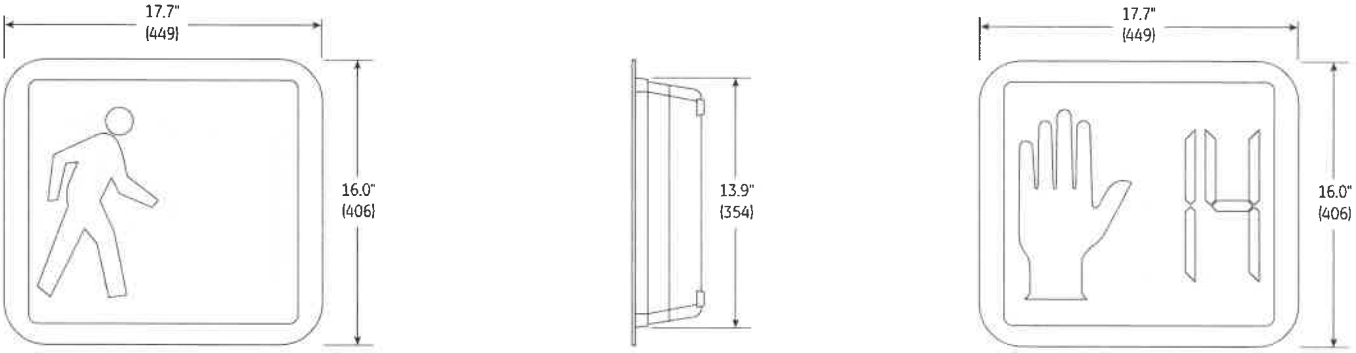
The Greatest Signals Stand the Test of Time.

GTX™ City LED Countdown Pedestrian Signals

• 16 x 18 inch module

Mechanical Outline

Dimensions in inches. (mm) indicates metric equivalent



Design Compliance

Test type	Compliance
Luminous intensity, Uniformity & Viewing Angles	ITE PTCSI LED Signal Modules version of August 2010
Chromaticity	ITE PTCSI LED Signal Modules version of August 2010
Moisture Resistance	MIL-STD-810F Procedure 1, Rain & Blowing Rain
Mechanical Vibration	MIL-STD-883 Test Method 2007
Electronic Noise	FCC Title 47 Sec 15 Sub. B[1]
Transient Voltage Protection	Sec. 2.1.6 NEMA TS 2-2003 Sec. 2.1.8 NEMA TS 2-2003
Controller Compatibility	NEMA TS-2-2003
Transient Suppression	Sec. 8.2 IEC 1000-4-5 & Sec. 6.1.2 ANSI/IEEE C62.41.2 - 2002, 3KV, 2 Ω Sec. 8.0 IEC 1000-4-12 & Sec. 6.1.1 ANSI/IEEE C62.41.2 - 2002, 6KV, 30 Ω
Wiring	NFPA 70, National Electric Code
Digits	MUTCD 2003, Section 4E.07, Countdown Numbers Minimum 9" Height & 7" Width

[1] Class A

Operating Specifications

Parameter	Rating
Operating Temperature Range*	-40 to +74°C (-40 to +165°F)
Operating Voltage Range	80 to 135 V (60Hz AC)
Power Factor (PF)	> 90 %
Total Harmonic Distortion (THD)	< 20 %
Voltage Turn-Off (VTO)	35 V
Start-up Time	< 75msec
Lens & Shell Material	UV Stabilized Polycarbonate
Wiring	16 AWG, Color Coded with Strain Relief
LED Color	Hand: Portland Orange Person: Lunar White Countdown: Portland Orange
Default Mode	Hand only

* Performed in compliance with ITE test method described in the technical notes

Product Information

Model Number	Dimensions		Symbol		AC Voltage	Power (W)			Minimum Luminous Intensity Cd/m²	
	Dimensions	Layout	Hand	Person	Nominal	Hand	Person	Countdown	Hand/Digit	Person
PS7-CFF1-VLA	16 x 18 in	Overlay Countdown	Full	Full	120V - 60Hz	6	6	8	1400	2200

[1] Class A.

[2] Full MUTCD Compliance

Test Condition : T_a = 25°C. All values are design or typical values when measured under laboratory conditions.

GE Lighting • **1-888-MY-GE-LED** • www.gelighting.com

1-888-69-43-533 for North America · or · +1.216.266.2419

660-2-XXX
TECHNICAL SPECIAL PROVISIONS

AWG	COND	STRAND	PART NO.	OUTER JKT THICKNESS		NOMINAL OD		SHIP WT / 1M'
				INCH	mm	INCH	mm	
24	1Pr	7x.0076 TC	4-2402* Equal to Belden™ 9841	.035	.89	.232	5.89	37
	2Pr	7x.0076 TC	4-2422* Equal to Belden™ 9842	.035	.89	.340	8.64	55
22	2	7x30 TC	22002TSD Equal to Belden™ 8761	.025	.64	.175	4.44	20
	3	7x30 TC	22003TSD Equal to Belden™ 8771	.025	.64	.187	4.75	24
	4	7x30 TC	22022TSD Equal to Belden™ 8723	.020	.51	.160	4.06	24
	6	7x30 TC	22033TSD Equal to Belden™ 8777	.034	.86	.228	5.79	37
20	2	7x28 TC	20002TSD Equal to Belden™ 8762	.028	.71	.204	5.18	27
	3	7x28 TC	20003TSD Equal to Belden™ 8772	.033	.84	.218	5.54	35
18	2	16/30 TC	21802TSD Equal to Belden™ 8760	.028	.71	.222	5.64	32
	3	16/30 TC	21803TSD Equal to Belden™ 8770	.028	.71	.236	5.99	39
	4	19/30 TC	318004SD Equal to Belden™ 9418	.035	.89	.245	6.22	52
16	2	19x29 TC	21602SD Equal to Belden™ 8719	.032	.81	.313	7.95	52
14	2	19x27 TC	14002TSD Equal to Belden™ 8720	.035	.89	.330	8.38	63
12	2	19x25 TC	21202TSD Equal to Belden™ 8718	.034	.86	.400	10.2	95

PRODUCT DESCRIPTION

Polyethylene insulated stranded tinned copper conductors, short overall twist length, aluminum mylar shielding with drain wire and an overall gray PVC jacket.

APPLICATIONS

- Security Systems
- Intercom Systems
- Sound/Audio System
- Power-Limited Controls

SPECIFICATIONS

Conductor Stranded Tinned Copper
Insulation Equal to competitor
Jacket PVC
Shield Aluminum Mylar
NEC Articles
- 800 CM
- 14-12 AWG CL2

Voltage Rating 300 V
Temp. Rating -25°C to 75°C
Drain Wire Equal to competitor

COLOR CODE CHART

***Equal to competitor**

AVAILABLE PUT-UPS

1,000' Reels and Boxes
500' Reels and Boxes
Other lengths available. Please consult your factory representative for availability.

*4-2402 and 4-2422 Are Constructed with a Tinned Copper Braid Shield

IMSA Specification 51-1 Loop Detector Cable

660-2-XXX

MADE IN THE USA

Cable Identification

Inkjet print on jacket "ADVANCED DIGITAL CABLE INC. YYYY IMSA 51-1 TYPE 600V"

**replace YYYY with year of manufacture*

Specifications		Color Code	Put-Ups
Conductor - Stranded Bare Copper per ASTM B-3, B-8 **Voltage Rating** - 600 V **Temp. Rating** - 75°C	**Insulation** - PVC/Nylon 14 AWG - .016" PVC + .05" Nylon 12 AWG - .016" PVC + .05" Nylon	Black *Other colors available upon request.*	Standard Reels 1,000', 2,500', 5,000' *Other lengths available. Please consult your factory representative for availability.*

PART NO.	AWG	OUTER JKT THICKNESS		NOMINAL O.D.		WEIGHT lbs. / 1M'
		INCH	mm	INCH	mm	
8452	14	.026	.660	.115	2.92	16
8454	12	.026	.660	.135	3.43	24

IMSA Specification 51-3 Loop Detector Cable

MADE IN THE USA

Cable Identification

Inkjet print on jacket "ADVANCED DIGITAL CABLE INC. XX AWG IMSA 51-3 YYYY 600V (UL) TYPE XHHW E218985"

**replace XX with the AWG size*

**replace YYYY with year of manufacture*

Specifications		Color Code	Put-Ups
Conductor - Stranded Bare Copper per ASTM B-3, B-8 **Voltage Rating** - 600 V **Temp. Rating** - 75°C	**Insulation** 14 AWG - .030" XLPE 12 AWG - .030" XLPE	Black *Other colors available upon request*	Standard Reels 1,000',2,500', 5,000' *Other lengths available. Please consult your factory representative for availability.*

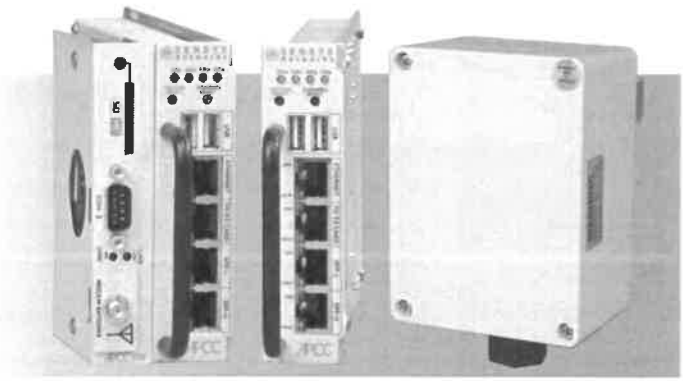
PART NO.	AWG	OUTER JKT THICKNESS		NOMINAL O.D.		WEIGHT lbs. / 1M'
		INCH	mm	INCH	mm	
8465	14	.030	.762	.133	3.38	17
8464	12	.030	.762	.150	3.81	26

TSP-69

ADC
ADVANCED DIGITAL CABLE INC
Phone: (800) 343 2579 • Fax: (828) 389 3922 • www.adcable.com

TECHNICAL SPECIAL PROVISIONS 660-5-XX

Access Point Controller Card (APCC)



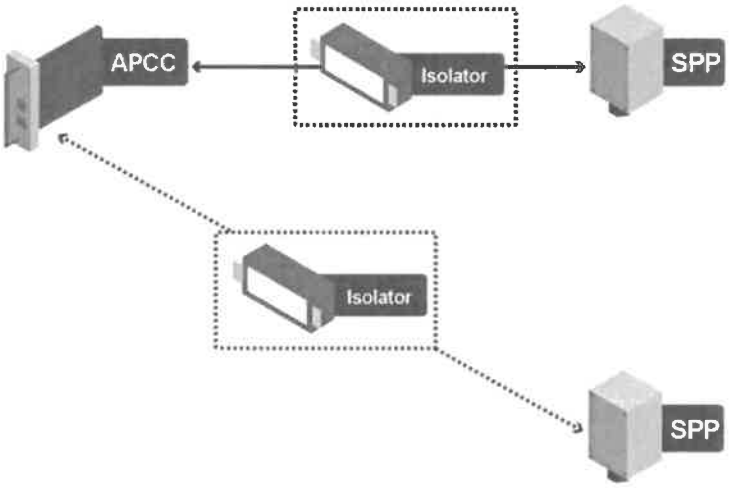
The Sensys Networks Access Point Controller Card (APCC) is a second generation controller card that maintains low power consumption, supports multiple radios, and allows for additional communication and processing power. The APCC, which is compatible with all of Sensys Networks VDS240 Wireless Vehicle Detection System products, receives and processes data from the sensors. The APCC then relays the sensor detection data to a roadside traffic controller or remote server traffic management system.

SPP Radio

The SPP is a low powered radio that maintains two-way wireless links to an installation's sensors and repeaters. The SPP establishes overall time synchronization, transmits configuration commands and message acknowledgements, and receives and processes data from the sensors. The SPP then uses wireless connections to relay the sensor detection data to the APCC.

Isolator

An isolator isolates and routes power from the APCC to the SPP and provides up to 2000 cable feet of communication for the APCC to and from the SPP at RS422 capabilities.



The minimum APCC system consists of an APCC, one SPP radio, and an isolator. The system can also consist of two SPP radios with an isolator for each SPP radio that offers electrical isolation up to 1500V, surge protection up to 1500V, and AC power cross protection.

Types of APCC configurations

The APCC single-slot configuration consists of dual SPP radio ports, Sensys Networks expansion (EX) port, and contact closure interface via backplane to a traffic controller. It also has dual USB 2.0 full speed host ports and 10/100Base-T network access. The APCC dual-slot configuration adds an SD memory card, real-time battery-backed clock, optional dual serial (DB9) interface*, and an optional second serial port or built in cellular modem.

* Full handshake control - COMM1 only

Functions / Features

Sensys Networks radio communications

- To/from Sensys Networks sensors
- To/from Sensys Networks repeaters

Relay of sensor data

- Via contact closure signals to traffic controller
- Via IP connectivity (wired or wireless) to traffic management systems, upstream servers, etc.
- Integrated cellular data modem (optional)

Processing of sensor data

- Per-lane or per-vehicle data
- Data binning over selectable time intervals
- Data filtering (e.g., adaptive holdover)

Storage of sensor data

- Data buffering (event caching) 500 K
- Data storage (processed data) 1 M
- MMC/HCSD retractable memory (optional)

Master timebase for all supported wireless sensors

- Common clock for sensor timestamps
- Can be synchronized to NIST timing signals

Radio signal quality measurements

- Receive Signal Strength Indicator (RSSI, in dBm)
- Link Quality Index (LQI, figure of merit)

Firmware upgrades

- Can be upgraded via IP connectivity or via local PC connection
- Can deliver upgrades to all other Sensys Networks devices

Simple installation

- Any roadside location that provides adequate signal coverage to sensors/repeaters
- No special requirements regarding setback, relative angle of the sun, or mounting stability

Low power consumption

No calibration or adjustment required

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Access Point Controller Card (APCC)

SENSYS networks

Functional Specifications

660-5-XX

interfaces	• communicates with traffic controller via 2x22 pin edge connector to backplane • (2) RS-422 full duplex to SPP radio(s) via RJ45 connector • (2) USB 2.0 full speed • RS-485 full duplex to EX cards via RJ45 connector • 10/100Base-T network access via RJ45 connector • to/from configuration device (PC) via TCP/IP over 10/100Base-T Ethernet • to/from central network management / data collection facilities via TCP/IP – 10 /100Base-T Ethernet – cellular data modem
IP connectivity	• HTTP, PPP, PPTP, SSH, optional encryption over tunnel • 10/100Base-T via RJ45 connector • GSM GPRS connectivity (optional) – dual-band 850/1900 MHz GSM (N. American version) – dual-band 900/1800 MHz GSM (int'l version) – up to 85.6 kbps • CDMA2000 1xRTT connectivity (optional) – dual-band 800/1900 MHz CDMA – (per specific cellular service provider) – up to 153.6 kbps
per-lane data processing	• counts (volume) • occupancy • average and median speeds • binned speeds and vehicle lengths over selectable time intervals
per-vehicle data processing	• initial vehicle detect time • gap • speed • length
memory processor	• 400 MHz ARM9 processor • Linux 2.6 operating system • 1 GB Flash • 64 MB RAM
over-the-air protocol	Sensys Networks NanoPower (SNP) protocol (TDMA)
physical layer protocol	IEEE 802.15.4 PHY
modulation	Direct Sequence Spread Spectrum Offset Quadrature Phase-Shift Keying (DSSS O-QPSK)
transmit/receive bit rate	250 kbps
frequency band	2400 to 2483.5 MHz (ISM unlicensed band)

frequency channels	Up to 16
channel bandwidth	Up to 2 MHz
antenna type	microstrip patch antenna (behind front face panel)
antenna field of view	±60° (azimuth & elevation)
nominal output power	0 dBm
spurious emissions	• 30 - 1000 MHz: < -36 dBm • 1 - 12.75 GHz: < -30 dBm • 1.8 - 1.9 GHz: < -44 dBm • 5.15 - 5.3 GHz: < -47 dBm
typical receive sensitivity	-101 dBm (PER ≤ 1%)
saturation (max input level)	≥ 10 dBm

Power, Physical, & Environmental

input voltage	• 22-26 VDC (24VDC nominal) • 9-15 VDC (12 VDC nominal)
power consumption	less than 700 mW (min w/out cell modem)
dimensions	• single-slot: 7" x 4.5" x 1.1" (18cm x 11.4 cm x 3 cm) • double-slot: 7" x 4.5" x 2.3" (18 cm x 11.4 cm x 6 cm) (optional) • APCC-SPP: 4.7" x 3.5" x 2.4" (12 cm x 9 cm x 6 cm) • Isolator: 6.5" x 3" x 1.3" (17 cm x 8 cm x 3 cm)
weight	• single-slot: 7.9 oz (224 g) • double-slot: 10.5 oz (298 g) (optional) • APCC-SPP: 14.1 oz (400 g) • Isolator: 5.6 oz (159 g)
operating temp	industrial -40°C to 80°C
SPP enclosure rating	NEMA 4X

APCC Front Panel User Interface

controls	• MASTER RESET: reset board • CHANNEL RESET: ignore events and clear pending events (all channels)
LEDs	• CH1, CH2, CH3, CH4: on/vehicle present or no sensors detected; off/vehicle not present or channel disabled; blinking: vehicle detected • LINK: on/operational; off/no link; blinking/active • FAULT: on/an enabled channel has a fault
switches	• RX termination for SPP ports • shelf and slot address

Available Products

660-5-XX

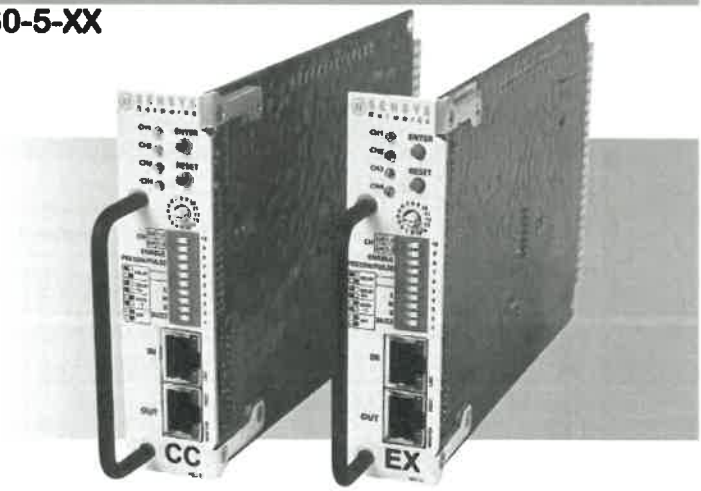
Products	Description	Detection Data Interfaces		
		10/100 Base-T	GSM/ GPRS	CDMA200 1xRTT
APCC-M	APCC Module	●		
APCC-M-E	APCC Module with Enhanced Ethernet	●		
APCC-MP-E	APCC Module, Peripheral Support (I/O Board without modem)	●		
APCC-MP-EA	APCC Module Peripheral Support	●		●
APCC-MP-EG	APCC Module Peripheral Support	●	●	
APCC-MP-EV	APCC Module Peripheral Support	●		●
APCC-R	APCC Module for Re-ID			
APCC-WF	Wi-Fi Radio for APCC-R			
APCC-BT	Bluetooth® (BT) Radio for APCC-R			
APCC-ACC-1	APCC Accessory Isolator			
APCC-SPP	APCC Serial Port Protocol (Digital Radio)			

Compliance

safety	2006/95/EC
EMC	• FCC: This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. • 2004/108/EC

CC & EX Contact Closure Cards

660-5-XX



The Sensys Networks VDS 240 Wireless Vehicle Detection System uses pavement-mounted magnetic sensors to detect the presence and movement of vehicles. The magneto-resistive sensors are wireless, transmitting their detection data in real-time via low-power radio technology to a nearby Sensys Networks access point that then relays the data to one or more local or remote traffic management controllers and systems.

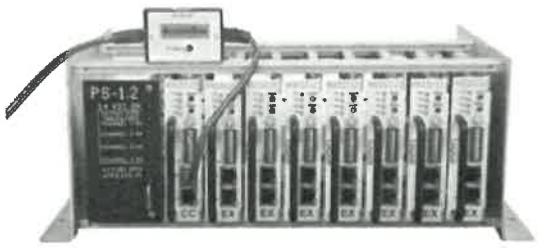
The Sensys Networks CC and EX Contact Closure Cards. The Sensys Networks VDS240 Wireless Vehicle Detection System can be used with Type 170, NEMA TS1, NEMA TS2, or Type 2070 ATC traffic controllers by installing one or more Sensys Networks contact closure cards into a detector shelf of the controller and connecting them to one or more Sensys Networks access points. The Sensys Networks Master (CC) and Expansion (EX) contact closure cards support this traffic controller interface, converting the real-time detection signals of the Sensys Networks wireless sensors supported by a access point into contact closure signals to the traffic controller.

Each CC and EX card provides one, two, three, or four channels, where each channel comprises an optically isolated contact closure relay and, if configured for TS2 operation, an additional contact closure relay to indicate the channel status. If the sensors supported by an access point require more than the four channels of a CC card, as many EX cards as required (up to 63) can be daisy-chained to the CC card, either via front-panel RJ45 jacks or via rewiring of the backplane connections. Multiple cards may also be needed if the traffic controller shelf has pre-defined functions or phases for each slot.

Each wireless sensor can be mapped to its own individual channel or up to 15 wireless sensors can be mapped to a single channel to effectively "OR" the sensor signals together so that if any of them detect a vehicle, the contact closure relay for that channel will close. In this way, a Sensys Networks VDS 240 Wireless Vehicle Detection System can be easily configured in the same way that inductive loops are configured to interface with a traffic controller.

Types of Contact Closure Cards. Sensys Networks offers two types of contact closure cards:

CC240, EX240
- Type 170 controllers
- Type 2070 controllers (without status relay)
- NEMA TS1 controllers
- NEMA TS2 controllers



CC/EX Card Functions/Features

Sensys Networks contact closure interface to traffic controller
- Type 170 controllers
- NEMA TS1 controllers
- Type 2070 controllers
- NEMA TS2 controllers

Plugs directly into input file or detector rack without any additional adapter

Up to four detection channels per card
- Optically isolated contact closure signals
- TS2 configuration includes status channels

Pulse or presence and delay or extension modes

Easy installation
- Configured via access point using TrafficDOT
- Optionally configured via front panel switches
- Buzzer to assist in on-site verification

Sensys Networks AccessBox

Junction box wired in-line between CC card and access point
- Routes power from CC card to access point
- Routes vehicle detections to controller via CC card
- Provides wired IP port for WAN connection and/or local management

CC & EX Contact Closure Cards

SENSYS networks

CC/EX Cards Functional Specifications

interfaces	• to/from traffic controller via 2x22 pin edge card connector • to/from Access Point via Sensys Networks AccessBox • to/from other Sensys contact closure cards – daisychain OUT port of CC or EX card to IN port of next EX card • optionally daisychain via backplane connections
TS2 status reporting	• all sensors active on channel – status relay: closed (continuous Low or On state) – TS2 state=1 (normal) • no sensors active on channel (no data rec'd in last 60s) – status relay: open (continuous High or Off state) – TS2 state=2 (failure) • not all sensors active on channel – status relay: pulse modulation with 150 ms Off time – TS2 state=5 (excessive inductance change)

CC/EX Card Front Panel User Interface

controls	• ENTER: configure card with DIP switch/ rotary dial settings • RESET: ignore events and clear pending events (all channels) • rotary switch: 16 settings for card configuration [0-15]
LEDs	• CH1, CH2, CH3, CH4: on/vehicle present or no sensors detected; off/vehicle not present or channel disabled; • blinking: vehicle detected • LINK: on/operational; off/no link; blinking/active • FAULT: on/an enabled channel has a fault • MONITOR: on/state of selected channel or reconfiguration in process

Power, Physical, & Environmental 660-5-XX

input voltage	• via traffic controller backplane • 11-26 VDC
power consumption	Up to 5 W (assuming connection to AP240-ESG)
surge protection	GR-1089
AC power cross protection	GR-1089
card dimensions	• single-slot width with extension to double-slot width • single-slot: 7" x 4.5" x 1.1" (18 cm x 11.4 cm x 3 cm) • double slot: 7" x 4.5" x 2.3" (18 cm x 11.4 cm x 6 cm)
accessbox dimensions	2.4" x 1.5" x 0.9" (6 cm x 3.8 cm x 2.2 cm)
weight	• CC: 5.5 oz (0.16 kg) • EX: 5 oz (0.14 kg)
operating temp	-40°F to 176°F (-40°C to +80°C)
humidity	10 – 95% non-condensing
vibration	MIL-STD-810
transportation vibration	bounce & drop per ISTA Proc. 1A

AccessBox Functional Specifications

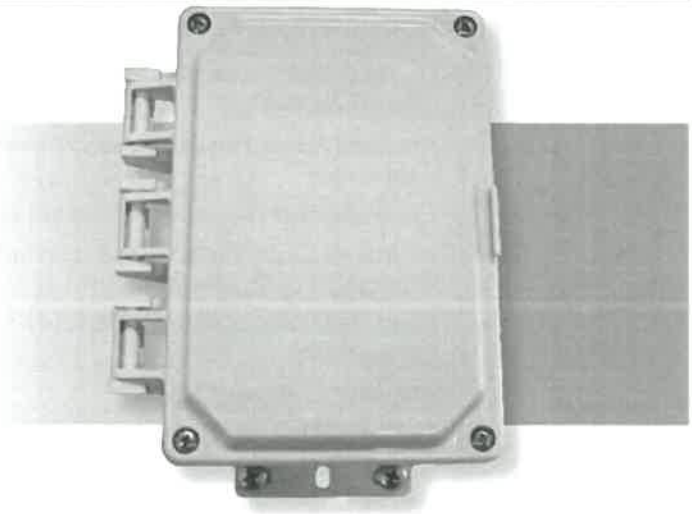
interfaces	• to/from Access Point via AP port • to/from CC (Master) card via CC port • to/from IP device/network via ACCESS port
circuits	• *Power*, one-pair used for access point power (48V nominal) • *Vehicle detections*, one-pair used for half-duplex control bus (RS-485) • *IP data*, two-pair used for 10/100Base-T Ethernet

Compliance

Cal Trans	CalTrans TEES (Transportation Electrical Equipment Specifications) – Revision 11/19/1999
NEMA	TS 2-2003 v02.06
FCC	Part 15

660-5-XX

RP240-BH-LL-2 Repeater



The Sensys Networks VDS240 Wireless Vehicle Detection System uses pavement-mounted magnetic sensors to detect the presence and movement of vehicles. The magneto-resistive sensors are wireless, transmitting their detection data in real-time via low power radio technology to a nearby Sensys Networks access point that then relays the data to one or more local or remote traffic management controllers and systems.

The Sensys Networks Repeater. In cases where one or more installed Sensys Networks wireless sensors are out of range of the nearest access point, one or more Sensys Networks repeaters can be used to provide a two-way relay between the out-of-range sensors and the access point. As many as two repeaters operating in tandem can be installed between a sensor and the access point. To simplify its deployment, a repeater is battery-powered and thus requires no wires or cabling.

Extended Range and Coverage. A repeater extends the range and coverage of an installation's access point. Mounted by the roadside on a pole or other structure, the repeater must be positioned so that both the sensors to be supported by the repeater and the communicating repeater or access point are within view and within range.

The access point and repeater antennas each provide a 120° field of view, allowing considerable flexibility. For example, a repeater can be installed approximately 1000 feet (305 meters) from the access point, where each device can then support wireless sensors within 75 – 150 feet (23 – 46) meters. Alternatively, a repeater can be mounted on the same pole or mast as the access point, separated by 2 to 4 feet (0.6 to 1.2 meters) to ensure that they can communicate, but pointed in the opposite direction. The access point would then support the sensors and repeaters directly in front of it, while the repeater pointing in the opposite direction would support its own sensors as well as another repeater and its sensors.

Types of Repeater. Sensys Networks currently offers the following type of repeater:

RP240-BH-LL-2

- Nominal battery capacity of 171 Ah
- Recommended replacement every 7 years

Functions / Features

Relay of radio communications

- To/from wireless sensors
- To/from access point
- To/from another repeater

Extension of range and coverage of the access point

- Can be operated in tandem – one repeater and its supported sensors can communicate with another repeater and then to the access point
- Maximum single-hop range of ~1000 feet (305 meters) from supporting access point or repeater

Fully wireless operation – no cable connections

- Battery powered
- Low power consumption

Radio signal quality measurements (of each link to wireless sensor or tandem repeater)

- Receive Signal Strength Indicator (RSSI, in dBm)
- Link Quality Index (LQI, figure of merit 40-99)

Firmware upgrades over-the-air from access point

Simple installation

- Any roadside location that provides adequate signal coverage to sensors and the access point or repeater
- No special requirements regarding setback, relative angle of the sun or mounting stability

No calibration or adjustment required

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660-5-XX

Functional Specifications

interfaces	• to/from sensors via 802.15.4 PHY radio • to/from repeaters via 802.15.4 PHY radio • to/from access point via 802.15.4 PHY radio
over-the-air protocol	Sensys Networks NanoPower (SNP) protocol (TDMA)
physical layer protocol	IEEE 802.15.4 PHY
modulation	Direct Sequence Spread Spectrum Offset Quadrature Phase-Shift Keying (DSSS O-QPSK)
transmit/receive bit rate	250 kbps
frequency band	2400 to 2483.5 MHz (ISM unlicensed band)
frequency channels	16
channel bandwidth	2 MHz
antenna type	microstrip patch antenna (behind front face panel)
antenna field of view	±60° (azimuth & elevation)
nominal output power	0 dBm
spurious emissions	• 30 - 1000 MHz: < -56 dBm • 1 - 12.75 GHz: < -44 dBm • 1.8 - 1.9 GHz: < -56 dBm • 5.15 - 5.3 GHz: < -51 dBm
typical receive sensitivity	-95 dBm (PER ≤ 1%)
saturation (max input level)	≥ 10 dBm

Power, Physical, & Environmental

power supply	• Li-SOCl2 3.6V battery pack – nominal capacity: 171 Ah
power consumption	<500 mW maximum
recommended unit replacement	every 7 years
dimensions	7.75" x 6.5" x 5.37" (19.68 cm x 16.51 cm x 13.65 cm)
weight	• 3.87 lbs (1.75 kg) • mounting kit: add'l 1.2 lbs (0.5 kg)
environmental	• designed for weatherproof, outdoor operation • NEMA Type 4x enclosure • IP65 ingress protection
operating temp	-40°F to 176°F / -40°C to +80°C

Compliance

safety	2006/95/EC
EMC	• FCC: This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. • 2004/108/EC

MAG2/Grind Resistant (GR) Sensor 660-5-XX
TECHNICAL SPECIAL PROVISIONS

The Sensys Networks VDS240 Wireless Vehicle Detection System uses wireless magneto-resistive sensors to detect the presence and movement of vehicles. The sensors – installed in holes cored in the roadway and covered with epoxy – transmit detection data in real-time via low-power radio technology to a nearby Sensys Networks access point. Vehicle detections are further relayed to a traffic signal controller, remote traffic management center, or other system.

The new MAG2/GR sensor developed by Sensys Networks utilizes the next generation of RF chipsets and circuitry. The MAG2 sensors are installed flush with the roadway surface in plastic shells. The plastic shells enable the removal and replacement of sensors during roadway milling operations. The GR sensors are installed at depth of up to 7 inches below the top of the roadway surface without plastic shells. Sensors installed at these depths do not have to be removed and replaced during most roadway milling operations.

In typical traffic management applications, a sensor is placed in the middle of a traffic lane to detect the presence and passage of vehicles. Vehicle speeds and length are measured by two sensors installed in the same lane with the exact distance between them configured in software. The recommended distance between sensors depends on the range of expected speeds to be measured: for typical freeway applications, a separation of 20 to 24 feet (6.1 to 7.3 meters) is recommended; for typical arterial applications, a separation of 10 to 12 feet (3.1 to 3.7 meters) is preferred.

Advanced Magnetometer-Based Vehicle Detection.
The state-of-the-art magneto-resistive sensing devices in each wireless sensor measure the x-, y-, and z-axis components of the Earth's magnetic field at a 128 Hz sampling rate. As vehicles come within range, changes in the x, y, or z axes of the measured magnetic field become apparent. When no vehicles are present, sensors continually measure the background magnetic field to estimate a reference. Each sensor automatically self-calibrates to the local environment, and to any long-term variations of the local magnetic field, by allowing this reference value to change over time.

Types of MAG2/GR Sensors:

VSN240-F-2

- Flush-mount wireless sensor for in-pavement installation
- For all freeway, arterial, and signal control applications

VSN240-T-2

- Flush-mount wireless sensor for in-pavement installation
- For signal control applications only

VSN240-F-GR

- For up to 7" depth in-pavement installation
- For all freeway, arterial, and signal control applications

VSN240-T-GR

- For up to 7" depth in-pavement installation
- For signal control applications only

Functions / Features

Lower power consumption

3-axis magnetometer for vehicle detection

- 128 Hz sampling rate
- Count and presence detection modes
- Modes for bicycle and motorcycle detection

Flush mount or up to 7" depth in-pavement installation with no wires or lead-in cabling

Fast and simple installation

- Installs in less than 10 minutes in small hole using a hammer or core drill
  - 4" (10 cm) diameter; a maximum of 7" (17.8 cm) deep
  - Covered with fast-drying epoxy
- Minimal lane closure time
- No saw cuts

Expected 10 year battery life

- Rugged mechanical design
- Auto-calibration

Reliable 2-way radio communications with access point

- Uniquely addressable and configurable
- Firmware can be upgraded over-the-air

Readily deployed where other systems cannot be used

- Split roadways
- High water tables
- Damaged pavement

TSP-77

1608 4th Street Suite 200 Berkeley CA 94710 info@sensysnetworks.com P 510.548.4620 F 510.548.8264

Functional Specifications

detection technique	3-axis magnetic field sensing
sampling rate	128 Hz
programmable vehicle detection parameters (mode B only)	• Z-axis detect threshold (mG) • Z-axis undetect threshold (mG) • X-axis undetect threshold (mG) • onset filter (ms) • holdover (ms) • auto-recalibration timeout (secs)
over-the-air protocol	Sensys Networks NanoPower (SNP) protocol (TDMA)
physical layer protocol	EEE 802.15.4 PHY
modulation	Direct Sequence Spread Spectrum Offset Quadrature Phase-Shift Keying (DSSS O-QPSK)
transmit/receive bit rate	250 kbps
frequency band	2405 to 2480 MHz (ISM unlicensed band)
frequency channels	16
channel bandwidth	2 MHz
antenna type	microstrip patch antenna (mounted below top surface of sensor)
antenna field of view	±60° (azimuth & elevation)
nominal output power	+3 dBm
spurious emissions	• 30 - 1000 MHz: < -36 dBm • 1 - 12.75 GHz: < -30 dBm • 1.8 - 1.9 GHz: < -44 dBm • 5.15 - 5.3 GHz: < -47dBm
typical receive sensitivity	-101 dBm (PER = 1%)
saturation (max input level)	≥ 10 dBm

Sensor Modes 660-5-XX

mode	application	description
B (event)	count stations; advance detection	• sends timestamped ON and OFF detection events using configurable detection parameters • not supported by VSN240-T
E (idle)	status reporting	disables magnetometer and sends sensor hardware and software version information
STOPBAR-# (presence detection)	stop bar detection; ramp management	sends timestamped *ON* and *OFF* detection events using pre-configured detection parameters
• 16 different stop bar detection modes can be selected • recommended stop bar detection modes for specific applications:		
	STOPBAR-0	bicycles/scooters
	STOPBAR-2	motorcycles
	STOPBAR-5	passenger vehicles (normal recalibration)
	STOPBAR-7	passenger vehicles (fast recalibration)
	STOPBAR-14	light rail

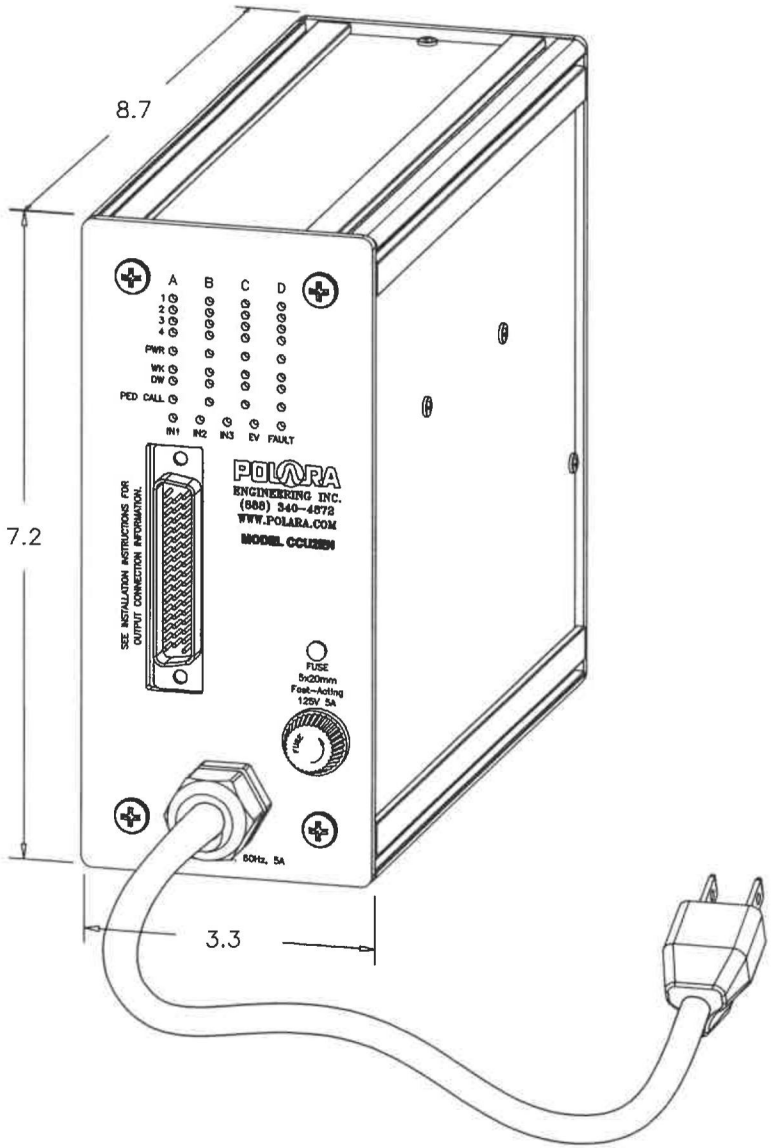
Power, Physical, & Environment

power supply	• non-replaceable primary Li-$SOCl_2$ 3.6v battery pack • 8.5 Ah (nominal capacity)
dimensions	2.9" x 2.9" x 2.2" (7.4 cm x 7.4 cm x 5.6 cm)
weight	0.47 lbs/0.213 kg (without shell)
environmental	• designed for in-pavement mounting • NEMA Type 6P enclosure • IP68 ingress protection
operating temp	-40°F to 176°F/-40°C to +85°C

Compliance

safety	2006/95/EC
EMC	• FCC: This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. • CE0678 • 2004/108/EC

CCU2EN - EZCOMMUNICATOR CENTRAL CONTROL UNIT WITH ETHERNET



The CCU2EN is to be installed inside the Traffic Cabinet and is powered by the AC supply mains (115 VAC). The CCU2EN is the power supply and signaling interface between the existing intersection Traffic Control Unit and Navigator Push Button Stations (PBS) which are located in the field. One CCU2EN can control up to 16 EN2 Push Button Stations, 4 maximum per channel. The CCU2EN controls up to four Pedestrian Channels, receiving its timing from the Walk and Don't Walk signals. Additional advanced configurations can be obtained by utilizing its general purpose inputs. All inputs and outputs have full optical isolation and include transient voltage protection.

The CCU2EN has two built-in conflict monitoring systems. The CCU2EN monitors the PBS and Ped-Head lights and powers off the channel upon a conflict. Each processor monitors each other and resets the CCU2EN upon loss of internal communication.

The CCU2EN is backward compatible with older 2-Wire Navigator N2 PBSs (v1.12 or newer). There is an option switch on the back of the CCU2EN which specifies N2 or EN2. If **all** PBSs are EN2 PBSs, the EN2 position is used. If **any** of the PBSs are older 2-Wire N2 PBSs then the N2 position must be used.

USB and Ethernet ports are available for a variety of configuration and remote monitoring functions using Polara's EZ APS Toolbox utility software.

Ped Walk / Don't Walk Inputs:

Optically isolated 80 – 150 Volts AC/DC, 5mA max.

Ped Outputs:

Optically Isolated 36 Volts AC/DC peak

300mA Solid State Fused Contact Closure

Fault Output:

Normally Open Relay Contacts 125 Volts AC/DC, 1A max.

A, B, C, D PBS Power Output:

Nominal 18-22 Volts DC, Short Circuit Protected - Auto Recovering

General Purpose Inputs:

10 – 36 Volts AC/DC peak, 10mA max, Optically Isolated

Environmental:

Operating: -34°C (-30°F) to +74°C (+165°F)

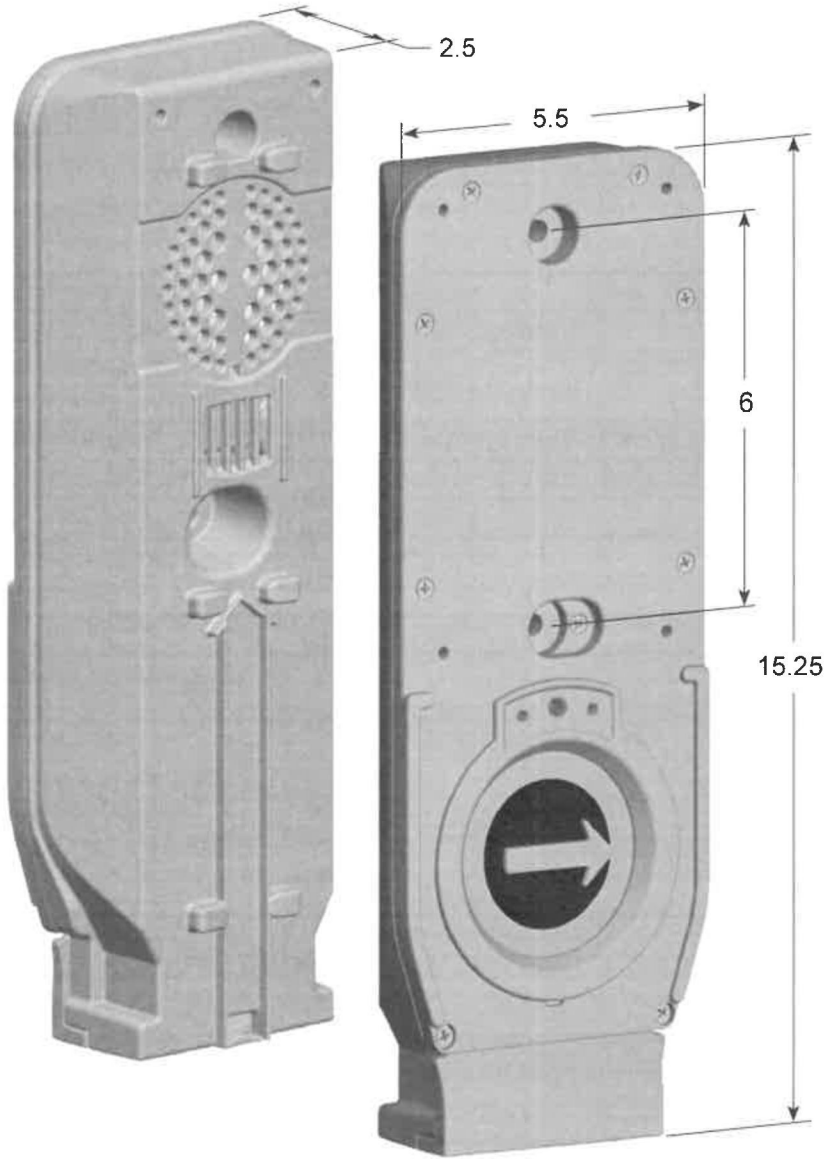
Storage: -45°C (-50°F) to +85°C (+185°F)

Hardware Kit:

CCU2ENHK: Standard 8 Foot Cables included with each CCU2ENHK.

CCU2ENHK-12: 12 Foot Cable can be ordered instead of 8 Foot Cable at an extra charge.

EN2 – EZ Communicator Navigator 2 Wire Push Button Station



All yellow color unit shown for clarity. Standard unit has Black base.

The EZ Communicator Navigator 2 Wire Push Button Station (EN2 PBS) is the pedestrian interface to the EZ Communicator Navigator Accessible Pedestrian System. A system includes a Central Control Unit (CCU2EN), an E-Configurator, and up to 16 Push Button Station (4 maximum per channel). The EN2 PBS provides valuable information and cues via both a vibrating arrow button and audible sounds making the intersection accessible for all pedestrians. All sounds emanate from the back of the unit. A sunlight-visible red LED latches "ON" to confirm the button has been pushed. The EN2 PBS includes the body (shown), sign, ADA compliant push button and mounting hardware.

By interfacing with the CCU2EN that installs in the traffic control cabinet, the EN2 PBS can provide the following standard features:

- Confirmation of button push via latching LED, sound, and tactile bounce
- Direction of travel (with extended button push)
- Standard locating tone during Don't Walk (and Clearance if desired)
- Cuckoo, Chirp, Rapid Tick, Verbal, or user customized voice messages during walk. A total of 10 walk sound options are included with an additional 2 locations for custom voice messages / walk sounds
- Vibrating button during walk
- Choice of 4 locating tones, custom sound, or verbal countdown during PED clearance
- All sounds automatically adjust to ambient over 60dB range
- Most sounds have a minimum and maximum volume independently set
- Sounds are synchronized across all PBSs
- Extended button push can turn on, boost volumes, and/or mute all sounds except those on the activated crosswalk
- Can provide pre-configured special messages played throughout the entire intersection upon a central system activated signal (preemption)
- Custom audio messages easily changed via USB port
- Firmware updates provided through USB port
- Independent ambient adjustment setting for the locate tone which allows fine adjustments for low ambient conditions
- Two separate program configurations with all options available which can be switched via external input

Operating Specifications

Parameter	Rating
Operating Temperature Range	-34°C to +74°C (-30°F to +165°F)
Storage Temperature Range	-45°C to +85°C (-50°F to +185°F)
Operating Force	3.0 lbs Maximum
MTBF	3,000,000 hours
Switch Operating Life	Greater than 20 Million Operations
Maximum Volume	100 dB @ 1 meter
Minimum Ambient Sound	37 dBA
Audio Quality	3% THD plus Noise @ 1 kHz

Design Compliance

Test Type	Compliance
Functionality	MUTCD 2009 - 4E
Temperature and Humidity	NEMA TS 2
Transient Voltage Protection	NEMA TS 2
Transient Suppression	IEC 61000-4-4, IEC 61000-4-5
Electronic Noise	FCC Title 47, Part 15, Class A
Mechanical Shock and Vibration	NEMA TS 2
EN2 PBS Enclosure	NEMA 250 - Type 4X
Electrical Reliability	NEMA TS 4

Notes:
1. Applicable sections only of reference standards.
2. All specifications are subject to change without notice.
3. All specifications are Typical unless otherwise specified.

The 2 Wire Navigator's preferred field wiring is to have a pair of wires (+ and –/ common) for each CCU2EN channel with from one to a maximum of four Push Button Stations per channel. Polara cannot guarantee a 2 wire system will work properly in all instances, especially if a single common to the buttons and signal lighting is shared. Each case will have to be tried and proven because it depends on the condition of the wires, splices, etc... In the event the 2 Wire system does not work, Polara will swap it out for a 4 Wire system as long as there is no damage to the units.

Terminal screws on each EN2 PBS include washers (clamping plates) intended for bare wire. Crimp Terminals are not recommended.

EN2 5 A N 0 – B – BD–EB

Additional Available Options
Button Options
NA – No Arrow
BD – Bi-Directional Arrow
Other Options
WPC – with Pole Cap
ES – External Speaker Option
EB – External Button Option

Body Color
(Base is always black. Lid color is designated by -B, -G, or -Y.)
B – Black Front
G – Green Front
Y – Yellow Front

Audio Message Options
0 – Standard Messages
1 – Custom Messages

Braille
N – No Braille on Face Plate
B – Braille on Face Plate

Face Plate
MUTCD Compliant
V – 9x12 R10-3
U – 9x12 R10-3b
T – 9x15 R10-3e

Non-MUTCD Compliant
A – 5x7 – International
B – 5x7 – Informational
C – 9x12 – Countdown
D – 5x7 or 9x12 – International Sign
O – (Letter O) – No Sign

Size of Face Plate
5 – 5" x 7¾"
9 – 9" x 12"
3 – 9" x 15"

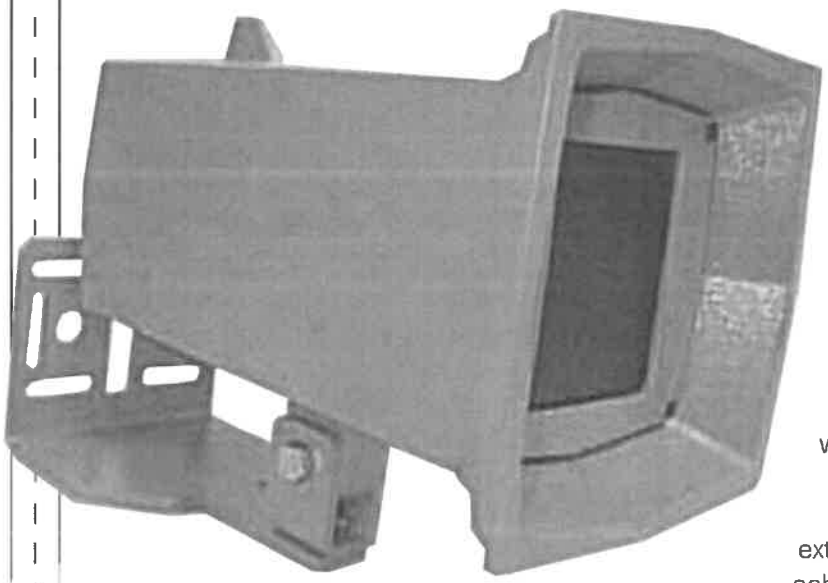
Navigator Family
EN2 – EZCommunicator Navigator 2 Wire Push Button Station

MS SEDCO

TC26-B

Motion and Presence Sensor

ENGINEERED FOR MOTION



DESCRIPTION

The TC**26-B** is a microwave motion sensor that will identify a vehicle moving in its detection pattern and then trigger the operation of a traffic controller. By utilizing microwave technology, this device provides accurate and consistent vehicle detection that is not affected by temperature, humidity, color or background variations.

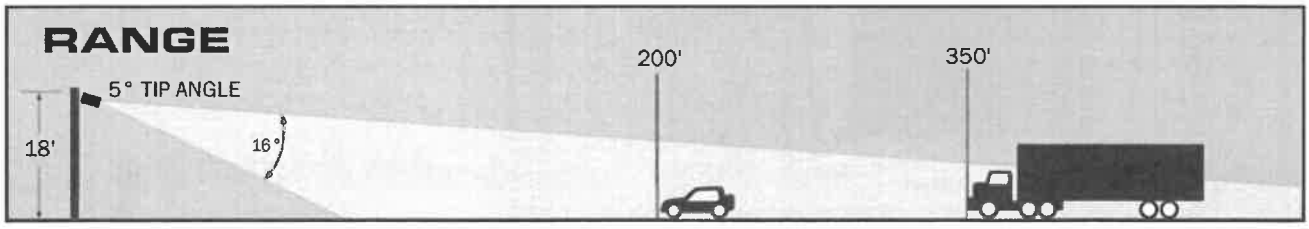
The TC**26-B** easily mounts above ground, requires no pavement cuts, and can be installed with minimal traffic disruption. All parameters are adjusted via external controls located on the back panel. The housing is factory sealed with an external wiring harness or an optional quick-connect cable eliminating the need to open the sensor during installation.

Once mounted, the installer simply connects the cable, makes the necessary adjustments, aims the sensor at the desired detection area and applies power. It's that simple!

BENEFITS

- Adjustable Range: up to 200' for cars, 350' for trucks
- Directional Scanning: select approach-only or depart-only motion
- Sealed Housing
- External Adjustment Panel & Connector: no need to open the housing during installation
- External Indicator LEDs: eases drive test confirmation
- Low Power—Ideal for Solar Applications: uses 1/5 the power of inductive loops
- Covers Single or Multiple Lanes
- Installs Easily Above Ground

RANGE



Range shown at maximum - not drawn to scale

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MS SEDCO

TC26-B

Motion and Presence Sensor

TECHNICAL SPECIAL PROVISIONS

6[illegible]3-XX

ENGINEERED FOR MOTION

SENSOR SPECIFICATIONS

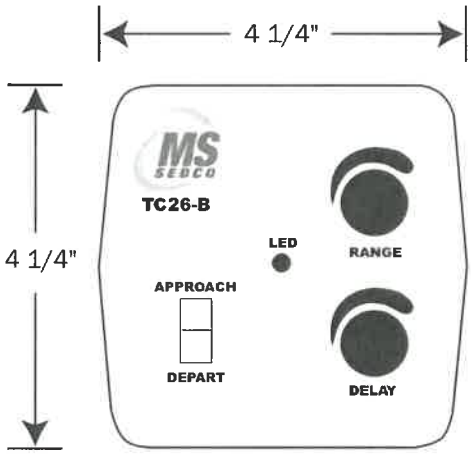
PHYSICAL:

- Physical Dimensions: 9.25"L x 5.5"W x 5.5"H (23.5cm L x 14.0cm W x 14.0cm H)
- Enclosure: Gray Powder Coated Aluminum
- Weight: 5 lbs.
- Wiring Harness: 18 GA-5 cond. cable (Std.) 18 GA-5 cond. quick-release (optional)
- Mounting Bracket: Predrilled & slotted (band or lag-bolt mount)

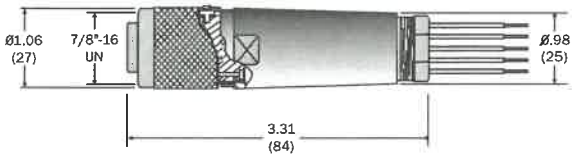
OPERATING:

- Operating Frequency: 10.525 gHz (X-band)
- Detection Method: Microprocessor Analyzed Doppler Microwave
- Detection Pattern: 200' long x 50' wide (cars) (max) 350' long x 75' wide (trucks)
- Detection Mode: Directional Motion
- Detection Hold Time: Continuous with motion
- Response Time: 0.25 seconds
- Time Delay: Adjustable 0.25 to 5.0 seconds
- Power Requirements: 12-24V AC or DC
- Current Draw: 75mA max. @ 24V DC 24V DC (N.O. and N.C.)
- Power Consumption: 1.8 Watts max. @ 24V DC
- Relay Output: Form C, rated at 3 Amps
- Output Power: 5mW typical, 2mW minimum
- Relay Contact Ratings: 0.5A:50V AC 1A:24V DC
- Temperature range: -35°F to 165°F (-37°C to 75°C)

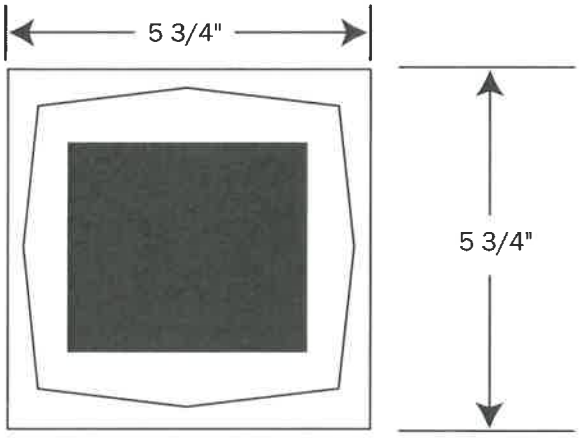
REAR VIEW (External Adjustment Panel)



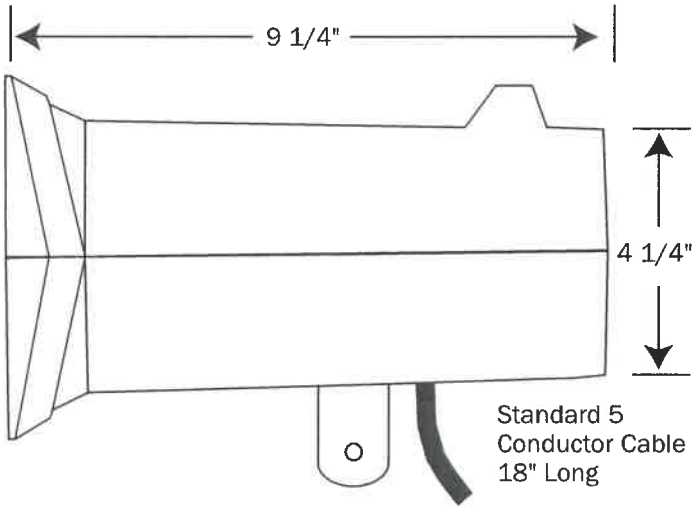
OPTIONAL QUICK RELEASE



FRONT VIEW



SIDE VIEW



TC26-Bv042018

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TC-CK1-SBE

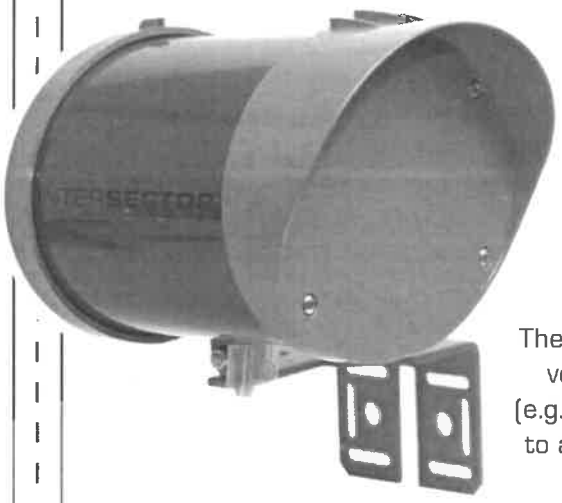
INTERSECTOR™

Motion and Presence Sensor

660-3-XX

MS SEDCO

ENGINEERED FOR MOTION



DESCRIPTION

The TC-CK1-SBE INTERSECTOR™ is a microwave-based radar motion and presence sensor used for intersection control. The unit interfaces with a traffic-control cabinet, and outputs signals when vehicles are present in user-defined zones. Zones are created using an X-Y coordinate system, and operation is verified and optimized using a laptop with a modern web browser (Google Chrome, FireFox, Microsoft Internet Explorer and Edge) as part of the installation process.

The TC-CK1-SBE allows users to create up to 8 detection zones and assign vehicle presence in these zones to up to 8 outputs to the control cabinet (e.g. left turn, straight through, right turn). Detection zones can be created to a maximum distance of 600 feet from the sensor itself. Unlike previous microwave radar sensors, the INTERSECTOR™ will track the presence of a vehicle in a detection zone for a predetermined time.

Interface boards are available for the INTERSECTOR™ which are compatible with both NEMA, 170, 179, and 2070 cabinets. For each sensor, one interface board is required in order to communicate with the control cabinet. Three interface boards are available. The TCIB-2.1 provides 2 outputs and uses a single slot in the cabinet. The TCIB-4.1 provides 4 outputs and uses a single slot, and TCIB-4.2 provides 4 outputs and utilizes two slots in the cabinet.

BENEFITS

The INTERSECTOR™ brings the advantages of microwave radar detection together with presence-tracking capabilities in an easy-to-understand visual image. The INTERSECTOR™ offers these advantages when compared to cameras or loops:

- Detection not affected by weather*
- Immune to sunrise/sunset or post-rain glare
- Not susceptible to in-road breakage
- Multiple lanes covered by a single unit
- Advanced and stop bar detection in a single unit
- Easily installs to corner pole
- Surge protection provided in detector
- Successfully detects bicycles/motorcycles
- Significant cost savings when compared to camera mounting requirements or multiple loops
- No privacy concerns
- Classifies bicycles as they approach a red light, allowing users to establish bicycle-only detection zones.

The INTERSECTOR™ allows users to:

- Graphically track vehicles as they approach the intersection
- Easily set up detection zones to provide programmable inputs to a control cabinet
- Verify that the system is functioning correctly and troubleshoot

*up to 2 in/hour of rain

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TC-CK1-SBE

INTERSECTOR™

Motion and Presence Sensor

MS SEDCO

ENGINEERED FOR MOTION

SENSOR SPECIFICATIONS

PHYSICAL:

- Size: 10.5x8.5x7 (LxWxH)
- Weight: 5 pounds
- Color: Blue body with gray endcaps
- Universal Mounting Bracket included

OPERATING:

- Temperature range: -40°C to +85°C
- Power requirements: Powered from TCIB over Ethernet cable

RADAR:

- Seven selectable frequency channels at 24 GHz
- Beam angle: Azimuth ±15 degrees out to 600'
- Elevation: 12 degrees
- Operates with FSK-4 mode

PERFORMANCE:

- Track multiple moving and stationary vehicles
- Tracking of X and Y location of each vehicle
- Updates 20 times per second
- Speed of each vehicle is shown for reference
- Motion detection—60 feet minimum to 600 feet maximum
- Stop bar presence detection—60 feet to 160 feet (20M~50M)
- Mounting height 14 to 20 feet*—Mounting outside this range may reduce performance (See Installation Table)
- Mounting location—corner signal pole, or on mast arm no further than 10 feet from signal pole—Maximum ±15 degrees offset from traffic direction—Mounting outside this range may reduce performance
- Ethernet interface with power supplied over the Ethernet (POE)—Maximum distance 300'—For longer distances, consult factory
- Eight programmable independent zones
- Eight Opto-isolated outputs
- Grid tracking with live interactive zones
- Simulation mode for demonstration
- Adjustable Delay Before Max time on stationary objects from 0 to 960 seconds
- Adjustable OZP/Max time on stationary objects from 0 to 960 seconds
- Provides histograms to verify setup of zones
- Selectable standard (English) or metric units
- User-defined delay and extension time for each zone
- Operational from cold start in 20 seconds—Full performance in 1 minute
- Automatically recovers from power failure
- FCC and IC approved
- IP addressable for remote set-up and monitoring
- Optional bicycle-only setting for detection zones
- Surge protection provided in detector

WARRANTY

A 3 year warranty is available from the manufacturer covering defects in materials and workmanship. Contact MS SEDCO for details.

INSTALLATION TABLE

RECOMMENDED SETTINGS

Distance to Stop Bar	Max.# Lanes	Mounting Height	Angle[1] (°)
60'-80'	2	16'	-6°
80'-100'	3	17'	-6°
100'-120'	4	18'	-4°
120'-160'	4	19'	-2°

[1] Tilt angle relative to road grade/slope. Values listed are meant to be starting points. Installed INTERSECTOR™ tilt angle may require adjustment depending on observed performance. See Figure 3 for a Tilt and Elevation Angle visual representation diagram.

* If the INTERSECTOR™ is mounted over active roadway, make sure bottom of sensor has adequate clearance for state and local requirements.

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TC-CK1-SBE

INTERSECTOR™

Motion and Presence Sensor

ENGINEERED FOR MOTION

The INTERSECTOR™ is a forward-looking stop bar presence and advanced zone radar detection system. It has high reliability of an above ground, non-intrusive radar detection. INTERSECTOR™ interfaces to MS Sedco TCIB, a standard rack detector interface card. INTERSECTOR™ can track individual vehicles by lane across a wide range of temperature and climate conditions.

TABLE 1: INTERSECTOR™ Performance: Detection Performance

Parameter	Value	Unit
Max Range for Pedestrian	160	Feet
Max Range for Passenger Car	600	Feet
Min Range	50	Feet
Number of Detection Lanes: >100 ft	4	Lanes
Number of Detection Lanes: 80-100 ft	3	Lanes
Number of Detection Lanes: 60-80 ft	2	Lanes
Radar Field of View: Azimuth	±15	Degrees
Max Offset Angle	±15	Degrees
Range Accuracy	Typical < ±2.5% or < ±2 ft	Greater of
Radar Channels	7	Unique Channels
Presence Detection Range	60 to 160	Feet
Motion Detection Range	60 to 600	Feet
Typical Mounting Height	Typical 14 to 20	Feet
Mounting Location	Rigid Location	Metal Pole or Mast Arm
Tilt Angle: Stop Bar = 60-100 ft	-6	Degrees
Tilt Angle: Stop Bar = 100-120 ft	-4	Degrees
Tilt Angle: Stop Bar = 120-160 ft	-2	Degrees
Radar Field of View: Elevation	12	Degrees
Radar Speed Range	± (0.2 to 150)	Miles-Per-Hour
Radar Speed Accuracy	Typical < ±2 MPH or ±2%	Greater of
Radar Update Rate	<50	Milli-Seconds
Tracking Initialization Time	<0.5	Seconds
New Object Validation Distance	60	Feet, Minimum

FIGURE 1: INTERSECTOR™ Installation Example

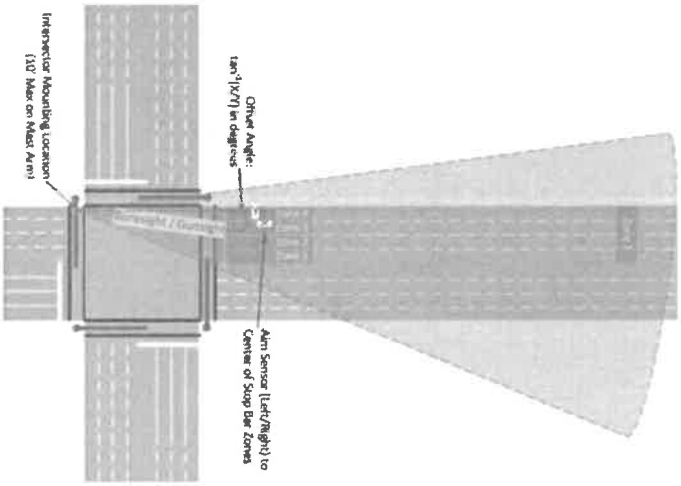


FIGURE 2: Recommended INTERSECTOR™ Mounting Location Depiction

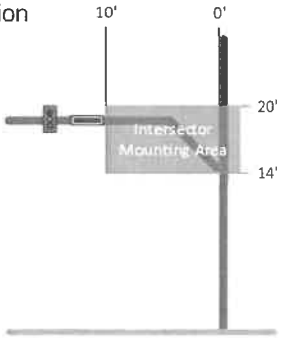
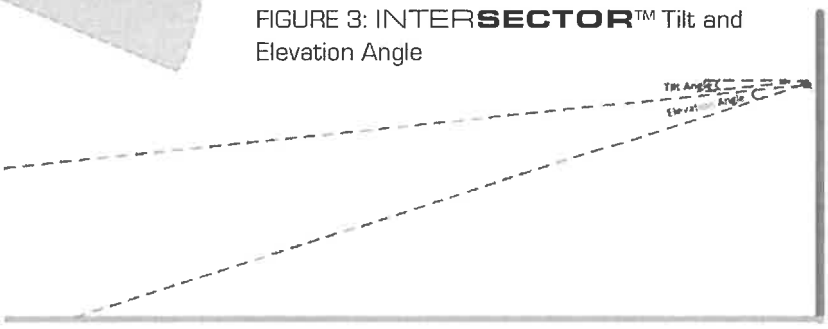


FIGURE 3: INTERSECTOR™ Tilt and Elevation Angle



TC-CK1-SBEv08222017

7898 Zionsville Road ■ Indianapolis, IN 46268
Telephone: (317) 842-2545 ■ Fax: (317) 849-3387
www.mssedco.com ■ custsvc@mssedco.com

TABLE 2: INTERSECTOR™ Performance: Available Software Features

Parameter	Value	Unit
Simultaneous Displayed Objects	Up to 32	Objects
Simultaneous Tracked Objects	Up to 64	Objects
Adjustable Zones	8	Per Intersector
Outputs	Up to 8	With Secondary Card
Counts	Loop from 0 to 65,535	By Zone
Adjustable Min and Max Speed Bins	Adjustable 0 to ±150 MPH	By Zone
Direction of Detection	Approach or Depart	Movement Relative to Sensor
Stationary Vehicle Hold Time	Adjustable from 0 to 960	Seconds, Delay Before Max Setting
Occlusion Zone Protection (OZP)	Adjustable from 0 to 960	Seconds, OZP Setting
Number System	Metric and English	Units
Web Interface	Chrome, IE, Edge, Firefox	Browsers (latest version)
Simulate Car Length	Point / Extend	By Zone
Adjustable Rain Threshold	Yes	From mist to extremely heavy
Adjustable Bike Classification Sensitivity	Yes	Adjustable Car/Bike decision threshold
Product Software Upgradable	Yes	Via Bootloader program

FIGURE 4: Rain Intensity Factor Correlated to Rainfall Rate

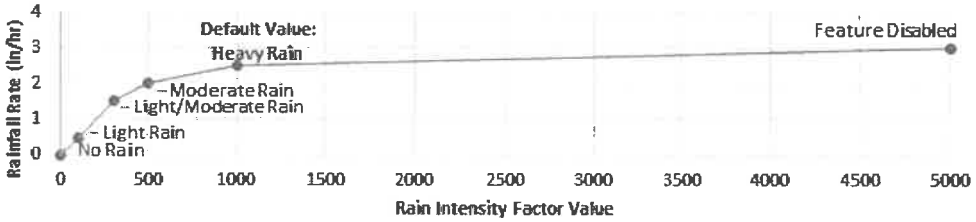


TABLE 3: INTERSECTOR™ Performance: Environmental Performance

Parameter	Value	Unit
NEMA TS2 2003	Pass	Appropriate sections
Temperature	-40 to +85	Degrees C
Shock	10	G's
Vibration	±0.5	G's
IP Rating	54	
Conformal Coating	Yes	

TABLE 4: INTERSECTOR™ Performance: Environmental Performance

Parameter	Value	Unit
Weight	5	Pounds
Dimensions	10.5 x 8.5 x 7	L x W x H Inches
Material: Front and Back Covers	UV-Protected Polycarbonate	
Material: Body	Powder Coated Aluminum	
Weep Hole	1/8	Inch Diameter
Ethernet Connector	IP67	

TABLE 5: INTERSECTOR™ Performance: General Parameters

Parameter	Value	Unit
Interface	100Base-T	Ethernet with power
Frequency	24.000 to 24.250	GHz
Max Transmit Power (EIRP)	20	dBm
Power Requirements: TC-CK1 Only	6.4	Watts
Power Requirements: System	8.8	Watts
Input Voltage Requirements	12 to 24	Volts – DC, Power over Ethernet
IP Address	Yes	Configurable
MAC Address	Yes	Set at factory
Preventative Maintenance	None required	When installed
Startup time	1	Minute
Regulatory	FCC and IC	FCC part 15.245 Canadian Standards: - RSS-210

TABLE 6: RF Channel to Radio Frequency Map

RF Channel	Frequency (GHz)
1	24.0810
2	24.0935
3	24.1060
4	24.1185
5	24.1310
6	24.1435
7	24.1560

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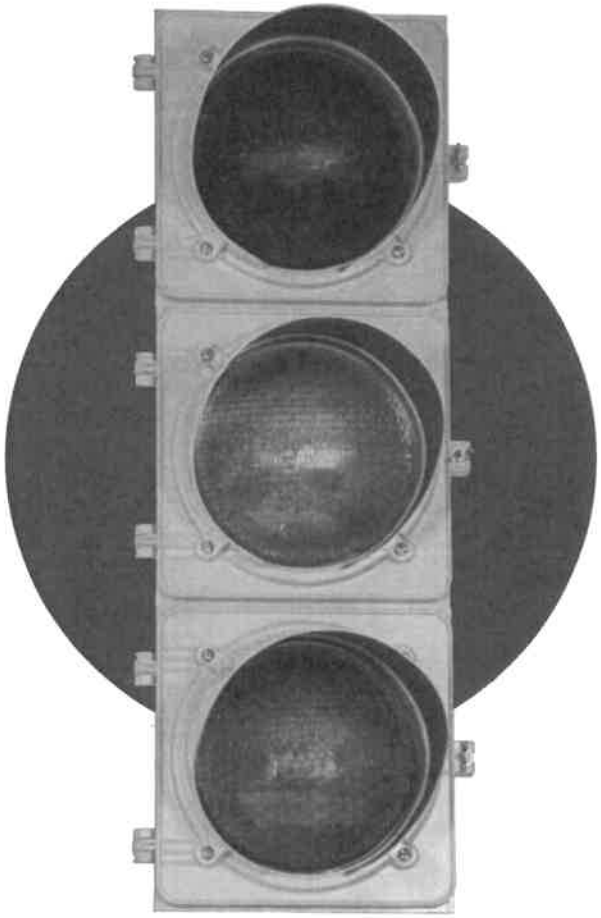
ORIUX
Experts in Mobility

Traffic Signals

Features & Benefits

Unique design and technological advantages make Oriux Signals "Best in class"



Polycarbonate Signals

- Unaffected by scratches
- Impregnated color means that they never need painting
- Impervious to corrosive atmospheres
- One-piece doors, grooved.
- Simple alignment and positive locking in 5 degree steps
- Ribbed for structural stability
- Reinforced plates available
- Adaptable to span wire or mast suspension
- Universal vertical and horizontal ready mounting arrangement
- Exterior hardware in stainless steel available
- LED ready or equipped with reflectors
- Weatherproof and dust tight one piece doors plus gasket
- Fifty percent lighter than aluminum

Aluminum Signals

- Equipped with exterior stainless-steel hardware
- Doors and lens gaskets make the signal
- weatherproof and dust-tight
- Integral visor rims prevent leakage
- Available reflectors in Alzak®
- The lamp receptacle can be rotated 360 degrees for filament alignment
- Integral locking rings included
- Adaptable for span wire, mast arm suspension, side

ORIUX
Experts in Mobility

TECHNICAL SPECIAL PROVISIONS 650-1-XX

Specifications

Polycarbonate

Material	Ultraviolet-stabilized polycarbonate resin. Stainless steel exterior hardware. Couplers are standard steel-zinc, but a stainless steel option is available.
Reflector	Snap-out assembly. Swing out frame. Lane control uses a standard reflector.
Lamp receptacle	Heat-resistant molded phenolic, Rotatable through 360°. Pre-wired with 26" #18 AWG 105°C type TEW color-coded leads with Quick-disconnect terminals
Wire opening between sections	Accommodates three 3/4" diameter cables
Terminal Block	1-section 2-point 2-section 3-point 3-section 5-point 4-section 5-point 5-section 5-point, and 5 point
Signal alignment	Integral 72-tooth serrated adjustable in 5 steps.
Weight	8" (200mm) LED-Ready Section = 1.85 lb (0.84kg) 12" (300mm) LED-Ready Section = 3.15 lb (1.43kg)
Overall dimension	8"(200mm) Section = 9.75"W x 10"Hx 6.16"D 12"(300mm) Section = 13.5"W x 13.44"H x 6.44"D

Aluminium

Material	Die-cast aluminum alloy housing and door. Stainless steel exterior hardware. Couplers are standard steel-zinc, but a stainless steel option is available.
Finish	Electrostatically applied powder coat with five stage iron phosphate treatment.
Reflector	Snap-out assembly. Swing out molded frame. Lane control uses a standard reflector
Lamp receptacle	Heat-resistant molded phenolic, Rotatable through 360°. Pre-wired with 26" #18 AWG 105°C type TEW color-coded leads with Quick disconnect terminals
Wire opening between sections	Accommodates three 3/4" diameter cables
Terminal Block	1-section 2-point 2-section 3-point 3-section 5-point 4-section 5-point, 2-point 5-section 5-point×2, and 3-point
Signal alignment	Integral 72-tooth serrated adjustable in 5° steps.
Weight	8" (200mm) LED-Ready Section = 4.2 lb. (1.9 kg) 12" (300mm) LED-Ready Section = 5.5 lb. (2.5 kg)
Overall dimension	8"(200mm) Section = 9.75"W x 10"Hx 6.16"D 12"(300mm) Section = 13.5"W x 13.44"H x 6.44"D

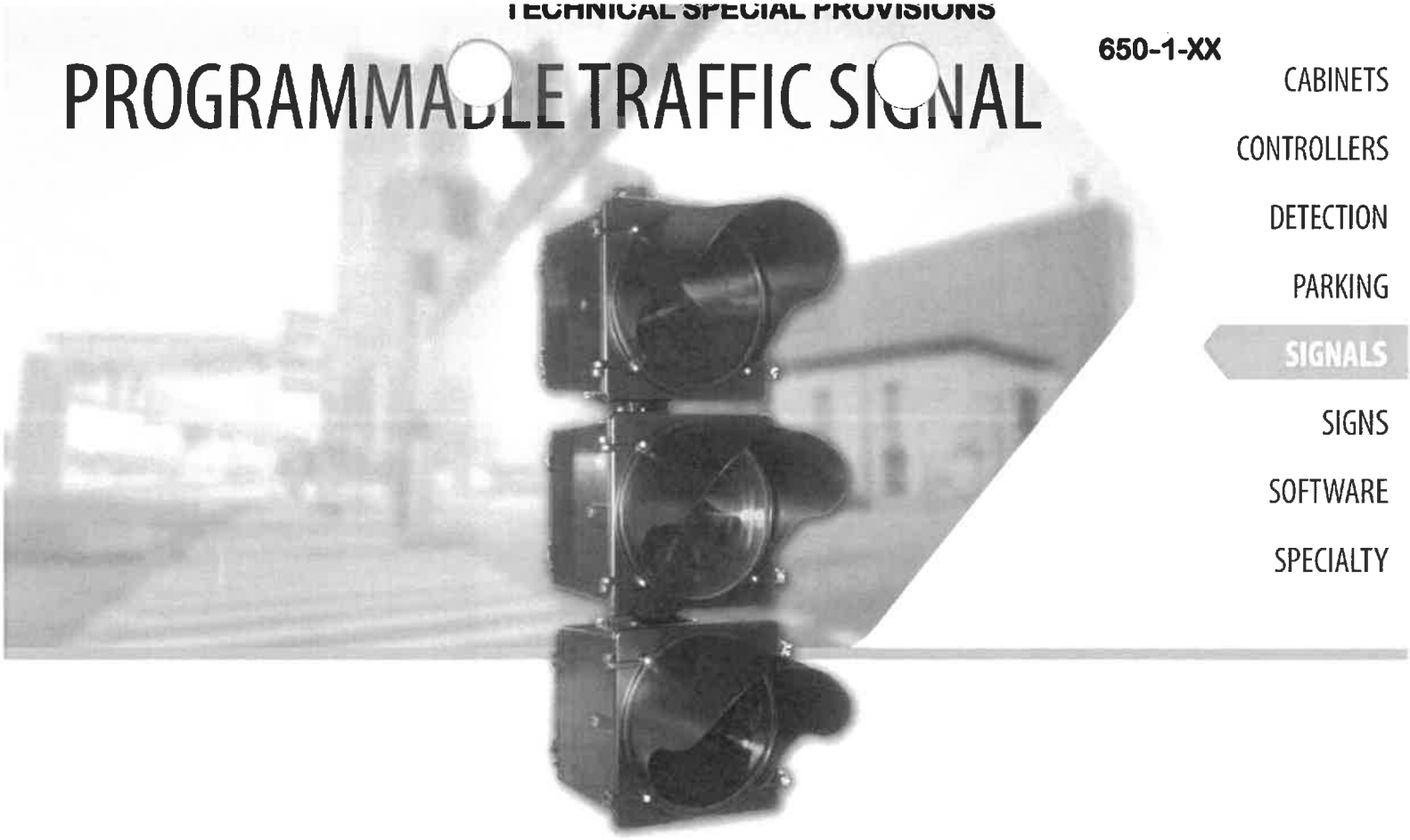
Poly and Aluminum signals are also available with LED ready Weights do not include hardware modifications. Door only, no visors.

TSP-89

Oriux
5401 N Sam Houston Pkwy W
Houston, TX 77086
Phone: 281-453-0200

650-1-XX

PROGRAMMABLE TRAFFIC SIGNAL



Overview

McCain's Programmable Traffic Signals are rugged, high performance, directional traffic signals used to limit signal visibility to specific target areas and increase intersection safety. These 12-inch traffic signals feature a focused and directional beam for precise lane control or to avoid motorist confusion when two intersections are in close proximity. McCain, an industry leader in signal manufacturing and supply, offers an extensive range of configurations and accessories, including backplates, visors, and signal assemblies to match all your traffic signal requirements.

Benefits

- Provide superior visibility
- Help reduce accidents and improve traffic flow
- Configure to meet your needs and specifications
- Stand the test of time with weather-tight doors and corrosion-resistant aluminum fabrication
- Available with a full range of accessories including; backplates, visors, and mounting hardware

Product Description

The McCain aluminum Programmable Traffic Signals are modular in design allowing them to be assembled in a variety of configurations. Signals are compatible with 115 VAC, three-prong, incandescent bulbs, and LED assemblies.

Programming is accomplished through the use of a Fresnel lens and a smaller clear lens. Masked-off portions of the smaller lens control which signal each lane sees during approach.

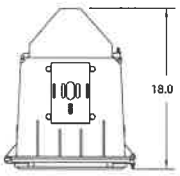
Signal sections can be tilted in two-degree increments for a maximum of ten degrees above and below the horizontal axis while still maintaining a common vertical axis.

The incandescent version of the signal head has an automatic dimming circuit to adjust light output according to environment conditions.

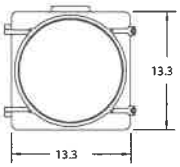
McCain®
A SWARCO Company

Programmable Traffic Signal

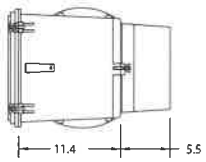
Top



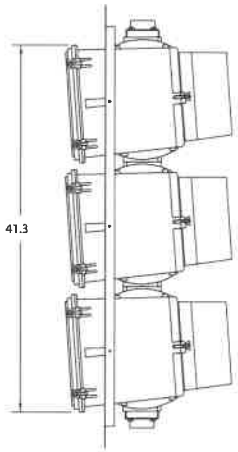
Front



Side



3-section



Dimensions rounded to the nearest 0.1"
Vertical dimension of 3-section is approximate
3-section shown as typical configuration with backplate and 4o tilt

Standard Features

- Individual modular sections
- Reinforcing ribs on top and bottom of housings for extra rigidity
- Stainless steel door roll pins and eye bolt/wing nut assemblies
- Moisture proof and dust tight neoprene gasket fitted to the gasket channel cast in the door perimeter
- 5-position, barrier-type terminal block with quick-disconnect terminals on one side of each position and screw clamp terminals on the other side of each position
- 3-prong, PAR-46 lamp secured by a wire ring and a spring load clip
- Acrylic lenses colored to ITE specifications
- Masking kit

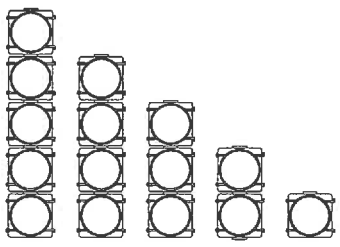
General Specifications

Dimensions:	13.3"H x 13.3" W x 18.0" D (1-section)
Material:	Housing: Cast aluminum, type 360, reduced corrosion, increased powder coat adhesion Door Hardware: Stainless steel
Finish(es):	Powder coated
Color(s):	Federal yellow, signal green, black, or custom colors Depends on style
Access:	Front door (1), rear door (1)
Lamp:	PAR-46, 115 VAC, 150 W
Environmental:	Operating temperature: -37° C to +74° C Humidity: 0 to 95% (non-condensing)
	Varies based on signal configuration
Shipping Weight:	23 lbs (1-section)

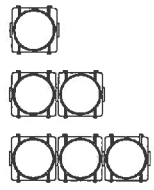
Options

- Visors
- Backplates
- Mounting preset tilt angles
  - 0° - horizontal mount
  - 4° - standard mount, MAT mount
  - 8° - MAS mount
- Various framework and fittings, orientation, and configurations Light Source: LED or incandescent

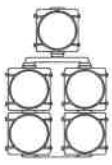
Typical Configurations



Vertical



Horizontal



Doghouse

McCain®
A SWARCO Company

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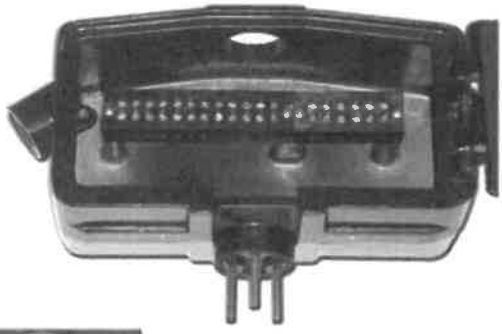
MULTICOM

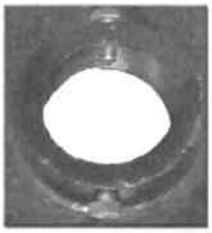
ENGINEERED CASTINGS

DISCONNECT HANGER

H
HOUSING



SERRATED TOP



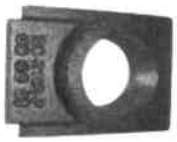
THREADED TOP
1 1/2" PIPE

1150-B-8

2152-T
HUB

H-2152-T

2152-N
HUB



2152-P
HUB

1150-12: H, SERRATED TOP, 1150-B-8, 2152-T, 2152-N OR 2152-P & (12)TERMINAL BLOCK
1150-18: H, SERRATED TOP, 1150-B-8, 2152-T, 2152-N OR 2152-P & (18)TERMINAL BLOCK

www.multicominc.com

Multicom, Inc.
Ph: 800-423-2594
Fax: 407-339-0204
Email: multicom@multicominc.com

*Specifications subject to change without notice

MULTICOM®

ENGINEERED CASTINGS

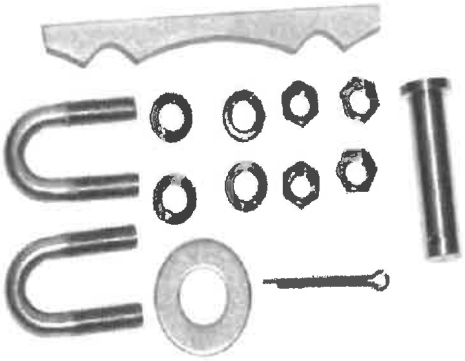
Span Wire Hanger

650-1-1X & 650-1-2X

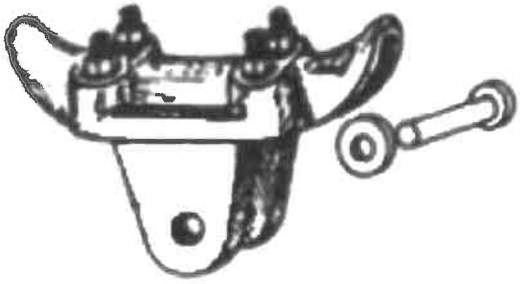
2079-SSB

H-2079

(Hardware for 2079-SSB / 2079-SPBC)



2079-PBC



2079-SSB: C-2079-SSB, H-2079

2079-PBC: C-2079-PBC, H-2079

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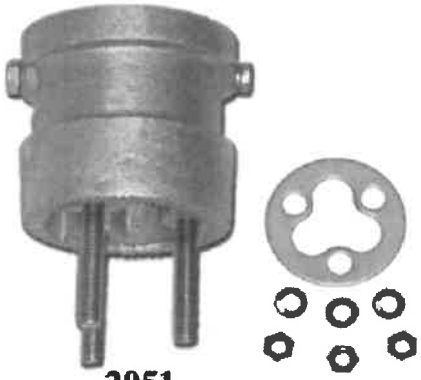
MULTICOM®

ENGINEERED CASTINGS

ADAPTERS

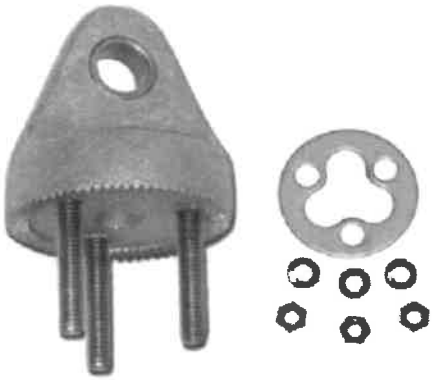
650-1-1X & 650-1-2X

65-Universal

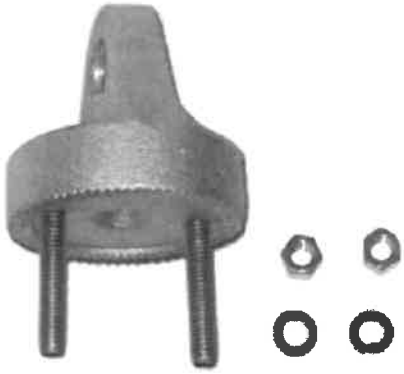


2051
1 1/2" to Tristud

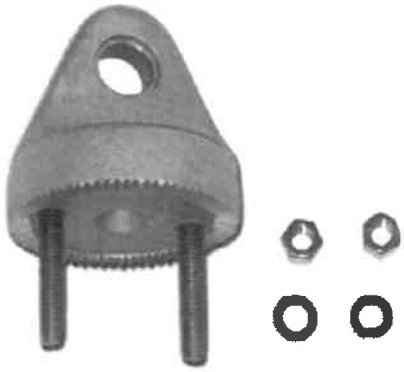
1155-FS



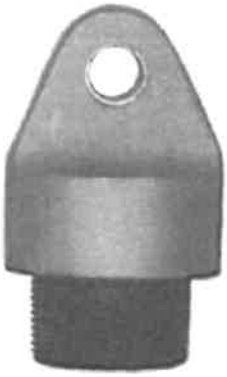
1156-T



1156-T2



1156-T2-S



1156-N

1156-C

1157-BN

1157-BT

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iteris®

RZ-4 Advanced™ WDR

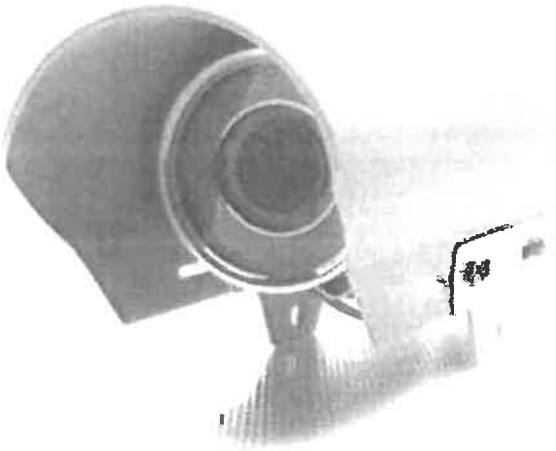
Advanced video detection enhanced with wide dynamic range technology

Benefits of the RZ-4 Advanced WDR

Specifically designed for vehicle and bicycle detection applications

Detects vehicles in any lighting and weather conditions.

Cable termination located at the rear of the camera simplifies cable connection



The industry's most advanced video detection camera

The RZ-4 Advanced WDR (RZ-4A WDR) is Iteris' premium video detection camera. Optimized for traffic video detection, the RZ-4A WDR combines Iteris' best-in-class all-weather performance video detection with Wide Dynamic Range (WDR) technology – using the advanced imager technology to handle extremes in light, dark, and severe glare conditions. In harsh backlit conditions, vehicles can be detected with >100dB of dynamic range; the camera can handle the most complicated scene.. The RZ-4A WDR's simple installation, backward compatibility, and the capability to adjust the camera from the cabinet provides an advanced, easy-to-use solution for video vehicle detection.

The RZ-4A WDR detects vehicles in any lighting and weather conditions. In contrast to other CCTV type or thermal imaging cameras, the RZ-4A WDR delivers a video signal that is optimized for processing by the Vantage® video detection systems.

Easy to install and maintain

The RZ-4A WDR camera also has the capability to set up the field of view (FOV) from the bucket truck or from the ground at the cabinet.

RZ-4 Advanced™ WDR

Advanced video detection enhanced with wide dynamic range technology

More Benefits

- Improved color and clarity of the video image, ideal for connection to a Vantage EdgeConnect™
- Quick-Click connectors and adjustable camera mount streamline installation and minimize setup time - no crimping tools required!
- Set up and configure at the camera or from the ground using the Advanced Lens Adjustment Module (sold separately)
- Performs in the most challenging lighting conditions
- Advanced heater enables optimal video detection performance in adverse weather conditions
- Advanced self-cleaning lens ensures lower camera maintenance.

SPECIFICATIONS

Imager	811 x 508 effective pixels	Physical	
	540 TV lines minimum	Dimensions	17" (43.2cm) long x 5" (12.7cm) diameter (without mounting bracket)
	Automatic white balance		
	>50 dB S/N ratio	Weight	5.7 pounds (2.6 Kg), including camera, lens, using, sunshield, and mounting bracket
	Dynamic range >100 dB		
	.003 lux capable	Environment	
	3D-DNR Noise Reduction	Temperature	-31° F to +165° F (-35° C to +74° C)
Lens	Focal length and focus adjustable at the rear of housing for a horizontal field of view ranging from 4.5°tele to 48° wide	Humidity	0% to 100%
		Vibration	0.5G, 3 axes, 5-30 Hz
		Shock	10G in all 3 axes
	12x zoom	Power	
Focus	Adjustable/auto focus	Standard	115/230 VAC (5W typical, 25W max.) 50/60 Hz
Connections	Terminal block type connection	Heater	Indium Tin Oxide, proportional power

TÜV CERT
ISO 9001:2008

iteris®

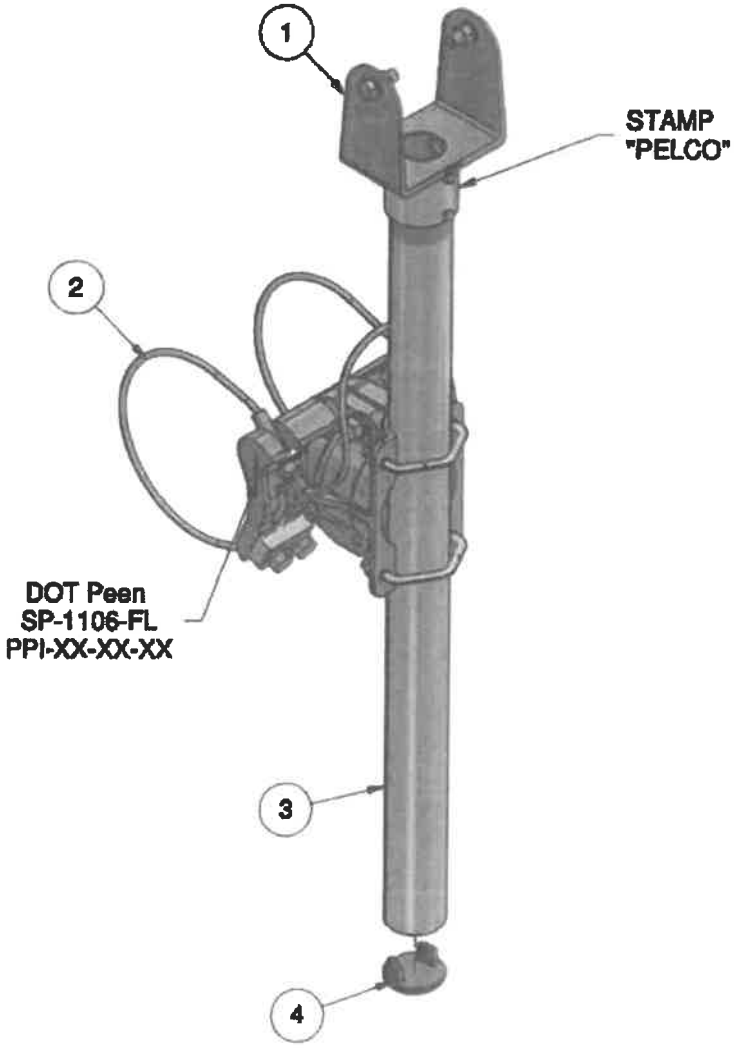
pelco PELCO PRODUCTS, INC.
PH: 405-340-3431
FAX: 405-340-3435
Edmond, OK 73013
www.pelcoinc.com

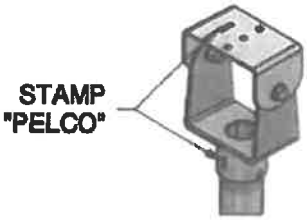
ASSEMBLY CUT SHEET

REF:	TITLE:	PART NO.:
State of Florida	Camera Bracket, Adjustable, Stellar Stainless Cable Mount, Alum, Cert# 659-035-005	SP-1106-FL

Example Part No
SP-1106-FL-1PC-23-62-PXX

Camera Mount
Tube Length
Cable Length
Process No Color=PNC
Paint=PXX





2-pc Camera Mount Option
(SH-0515-FL)

Cable Length	Max Pole Dia
62"	7.0"
84"	10.5"
96"	12.4"
110"	14.6"
120"	16.2"
132"	18.2"
144"	20.1"
220"	32.2"
280"	35.0"

Options
Camera Mount: 1PC=1 Piece (SH-0514-FL-PXX) 2PC=2 Piece (SH-0515-FL-PXX)
Tube Length: 23", 37", 46", 58", 74"
Cable Length: Min 4.5" Pole Dia, See Chart for Max
Paint

Note:
1. 1-Piece for mounting Iteris, Odetics or Econolite Solo Pro type cameras.
2. 2-Piece for mounting Burle cameras.

ITEM	PART NUMBER	DESCRIPTION	QTY
1	SH-0514-FL-PXX	Bracket, Camera Mount 1-Piece Tilt & Pan, Alum	1
2	SP-1079-FL-L-1106-PXX	Astro-Brac Stellar Clamp Kit, Cable Mount w/ SP-1106-FL Marking, Stainless Cable and Hardware, Alum	1
3	AB-2003-L-PXX	Gusseted Tube w/ PVC Insert, 1-1/2" TOE x Length, Alum	1
4	AS-0398-P02	Cap, Tube, Plastic, Black	1

CBJ DRAWN: 12/17/2013 DATE:	GWA CHECKED: 12/17/2013 DATE:	KAK MFG ENG: 12/17/2013 DATE:	RKV QA: 7/22/2019 DATE:	E REV: 7/17/19 KRB DATE:	JSH REV CHKD: 7/22/2019 DATE:	SHEET 1 OF 1

Pelco Assy.tdw 8/20/18

iteris®

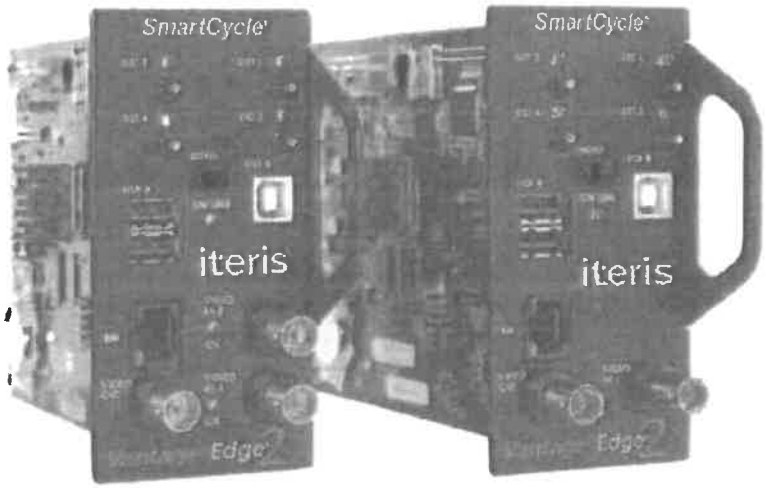
Vantage Edge®2
A machine vision processor that delivers superior performance

Benefits of the Vantage Edge2 System

Includes SmartCycle® and PedTrax™ technology

Simple to use interface reduces training time and improves productivity

Ease of set up and minimal lane closure time reduces manpower cost and keeps traffic flowing during equipment installation



State-of-the-art video detection processor

The Vantage Edge®2 processor is a key component in the family of Vantage® video detection solutions. The module combines state-of-the-art technology with sophisticated algorithms to deliver dependable vehicle detection required for today's complex transportation systems. The Edge2 processor features single or dual video inputs to maximize configuration efficiencies for intersection control, highway monitoring, and ramp metering flow control applications.

Maximum flexibility with optional modules

The processor module is complimented by multiple Input/Output and Extension Modules that provide flexible and expandable solutions to meet the needs of larger and more complex intersection configurations.

The Edge2 processor module and its associated expansion modules fit into standard detector racks to simplify installation and set up. All modules are designed as a simple and cost-effective replacement for the inductive loop amplifier module configuration.

Vantage Edge®2

A machine vision processor that delivers superior performance

The Edge2 processor and all of its associated modules can be completely configured by using a mouse and video monitor only, eliminating the need for expensive laptops or PDA devices.

More Benefits

- "Plug and play" operation enables use of existing detector rack
- Expandable and modular system allows for optimal configuration that helps to reduce cost while preserving room for incremental growth
- Includes PedTrax™ for pedestrian measurement and speed

SPECIFICATIONS

Power Consumption	12 or 24 VDC, 7W maximum
	• @12VDC - 490mA
	• @24VDC - 280mA
Video	Input type
	• NTSC, PAL
	• 75 Ohm 1 Vpp
	1 input channel
	• Single BNC connector
	2 input channel
	• Dual BNC connector
	Output - All models
	• Single BNC connector
Communication Ports	USB A Mouse
	USB A Thumbdrive
	USB B Comms
Detector I/O	Outputs (open collector +24VDC nominal 50mA)
	• 4 on rear edge of module
	Inputs
	• 4 on rear edge of module
Status Indicators	24 detection zones per camera channel
	4 LEDs indicate output detection state
	4 LEDs indicate video source
Environmental	-35°F to +165°F (-37°C to +74°C)
	0% to 95% humidity non-condensing
	0.5Gm, 3 axes, 5-30Hz vibration tested
	10G in all 3 axes for shock testing
Mechanical	7" L x 4.5" H x 2.3" W. (17.78cm x 11.43cm x 5.86cm)
	0.8lb (.363Kg)
Warranty	3 years limited warranty
Regulatory	NEMA TS-2 Compliant
	FCC part 15, Class A

TÜV CERT
ISO 9001:2008

iteris®

iteris®

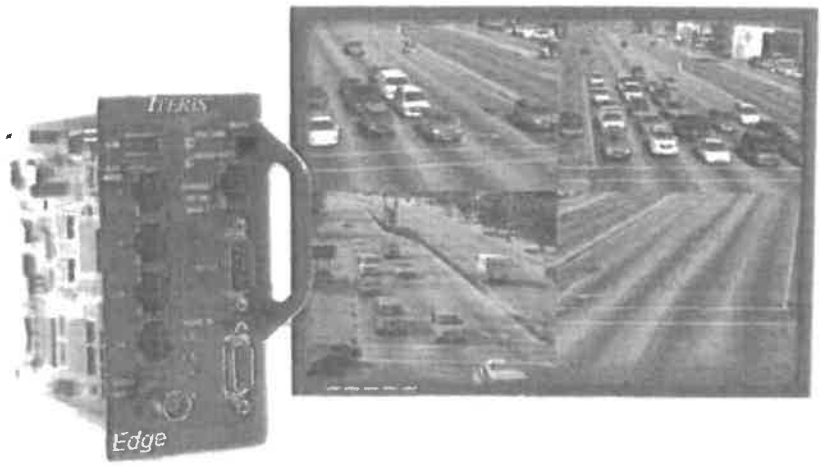
Vantage EdgeConnect™
Quad-view remote communications module

Benefits of Vantage EdgeConnect

Quickly review the operation of an entire intersection on one screen

Enhances connectivity between systems in the field and a remote management system

Simple-to-use interface reduces training time and improves productivity



Ethernet connectivity with streaming video

Vantage EdgeConnect™ is a unique 'technology first' product that enhances connectivity between systems in the field and a remote management system. Iteris' EdgeConnect quad-view remote communications module provides both local and remote management of data and Vantage EdgeConnect Quad-view remote communications module video over Ethernet — enabling system operators to manage their Vantage® video detection systems more efficiently and effectively by allowing the user to view real-time video and move data from the field to a central location.

Highly flexible for unique user experience

Vantage EdgeConnect's advanced MPEG4/H.264 video compression ability minimizes bandwidth usage, and is scalable to fit the bandwidth available.

Data rates can be set as low as 32 kbps or as high as 7 Mbps. Variable video frame rates between 5 and 30 frames per second also allow the user to optimize the streaming video to fit their specific application.

Vantage EdgeConnect™

Quad-view remote communications module

More Benefits

- MPEG4/H.264 video compression ability is scalable to fit the bandwidth available
- 'Plug and play' operation enables use of existing detector rack, minimizing the need for reconfiguring the controller cabinet
- Ease of setup and remote access reduces time and cost of installation and maintenance of equipment
- Single quad view video stream or four independent single streams

SPECIFICATIONS

Connections	4 BNC connectors for video input (via DB15 spider cable)
	4 RJ45 Edge2 Extension Module interface
	1 RJ45 Ethernet connector
	1 EIA-232 local access port
	USB mouse port
	1 BNC composite video out connector
Mechanical	Size 7.0" long, 4.5" high, 2.3" wide (17.8 cm long, 11.4 cm high, 5.8 cm wide)

Weight	0.64 lbs. (0.29 kg)
Temperature	-35° F to +165° F (-37° C to +74° C)
Humidity	0% to 95% non-condensing
Vibration	0.5G, 3 axes, 5-30 Hz
Shock	10G in all 3 axes
Electrical	12/24 VDC (500/260 mA) - 6.25 W max
Warranty	3 Years limited warranty

The EdgeConnect module provides the ability to view up to four camera feeds through a single IP connection, enabling the user to quickly review the operation of an entire intersection on one screen. The easy-to-use, browser-based user interface simplifies the management of video streams.

17 Rev1

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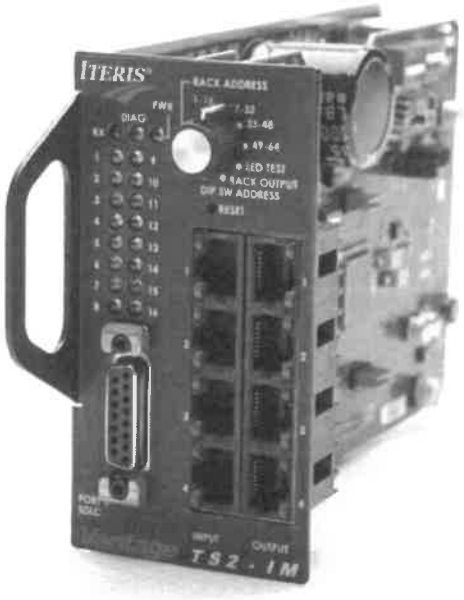
Vantage® TS2-IM
Simplify communications between your TS-2 controller and Iteris video detection modules

Benefits of the Vantage TS2-IM

64 detector output channels to the TS-2 Controller

Simple to use interface reduces training time and improves productivity levels

Expandable and modular system allows for optimal configuration



Feature packed interface module for maximum flexibility

The Vantage® TS2-IM (TS2 Interface Module) is a Bus Interface Unit (BIU) module that allows Iteris Vantage video detection systems to communicate with TS-2 controllers using standard SDLC protocols.

The TS2-IM module collects detection information from the Vantage Edge2 processor and passes the outputs to the TS-2 Controller using standard SDLC communications. An optional capability allows the module to monitor the TS-2 controller communications interface for phase conditions. This information can then be passed to the Edge2 processor modules as an input to allow for even greater flexibility in video detection functionality.

When used in conjunction with the Vantage video detection system, the TS2-IM module provides flexible input and output control strategies to enable the intersection controller to operate more efficiently.

Vantage® TS2-IM

Simplify communications between your TS-2 controller and Iteris video detection modules

An integrated BIU interface that co ıicates with the TS-2 Controller using the standard SDLC communications protocol

- Connectivity for up to four (4) Edge2 video detection processor modules
- Enhanced virtual zone function dependent upon phase condition for turning movements, count studies, etc.
- Seamless integration with existing loop amplifier modules within the same rack
- Fail-safe mode transmits outputs to the TS-2 Controller upon failure and offers self-diagnostic features
- Plug and Play operation with hot swappable capabilities

SPECIFICATIONS

Power	+24VDC, 160 mA (3.8W)
Connectors	Backplane
	• Standard TS-2 BIU connector
	Vantage
	• 8 x RJ45 receptacles (4 input, 4 output)
	SDLC TS-2
	• DB15 connector
Indicators and	16 x LEDs for detector call status
Controls	3 x LEDs for power and communication status
	7 point selectable mode switch for setup and operation

Op. Temperature	-34°C to +74°C (-30°F to 165°F)
Humidity	0% to 95% non-condensing
Vibration	0.5G, 3 axes, 5-30Hz vibration tested
Shock	10G in all 3 axes for shock testing
Mechanical	7" L x 4.5" H x 2.31" W
	(17.78cm x 11.43cm x 5.86cm)
Weight	0.66lb (.299Kg)
Regulatory	NEMA TS-2 compliant
Warranty	3 years limited warranty

More Benefits

- Plug and play operation enables the use of existing detector racks, thereby extending the life of the existing TS-2 controller and cabinet equipment
- Mounts into any standard TS-2 BIU rack slot
- Can be used as a replacement module for standard BIU modules
- Supports standard loop amplifier modules within same detector rack

August 2016 Rev1

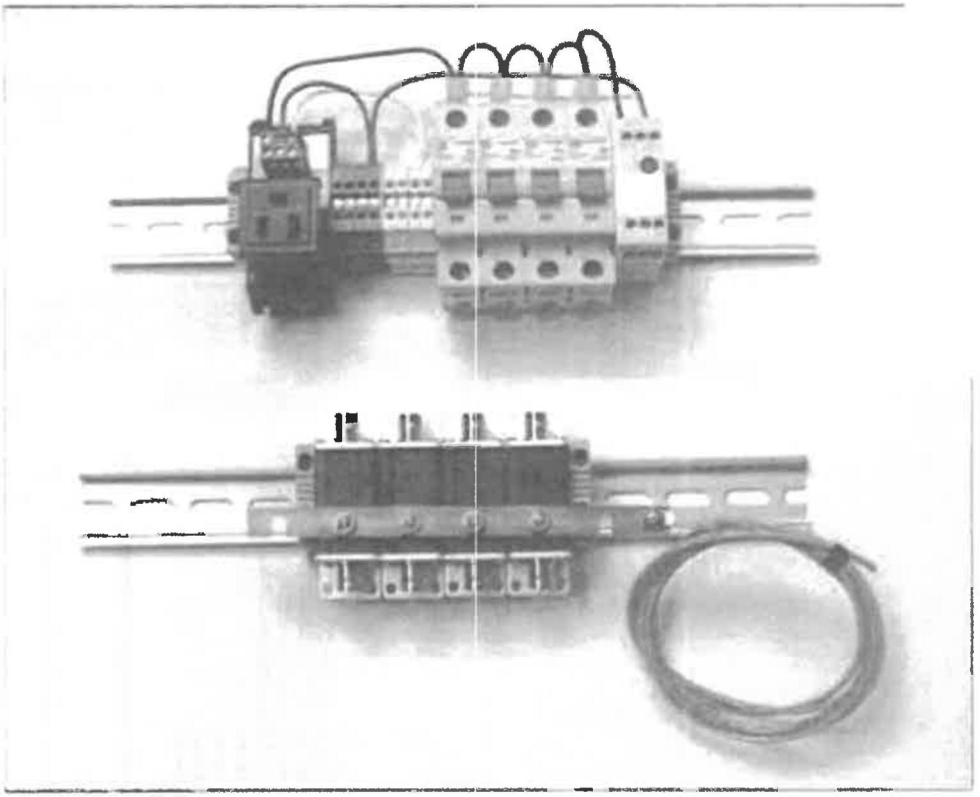
iteris®

ITERIS

DIN Rail Mounted Surge Panel

New DIN Rail Mounted Design
- Compact Design
- Better AC protection for:
  - Duplex Outlet
  - Camera Teminal Strips
- DIN Rail Mounted Coax Suppression

UL Listings
- AC surge - UL 1449 & 1283
- Circuit breakers - UL 1077
- AC outlet - UL recognized

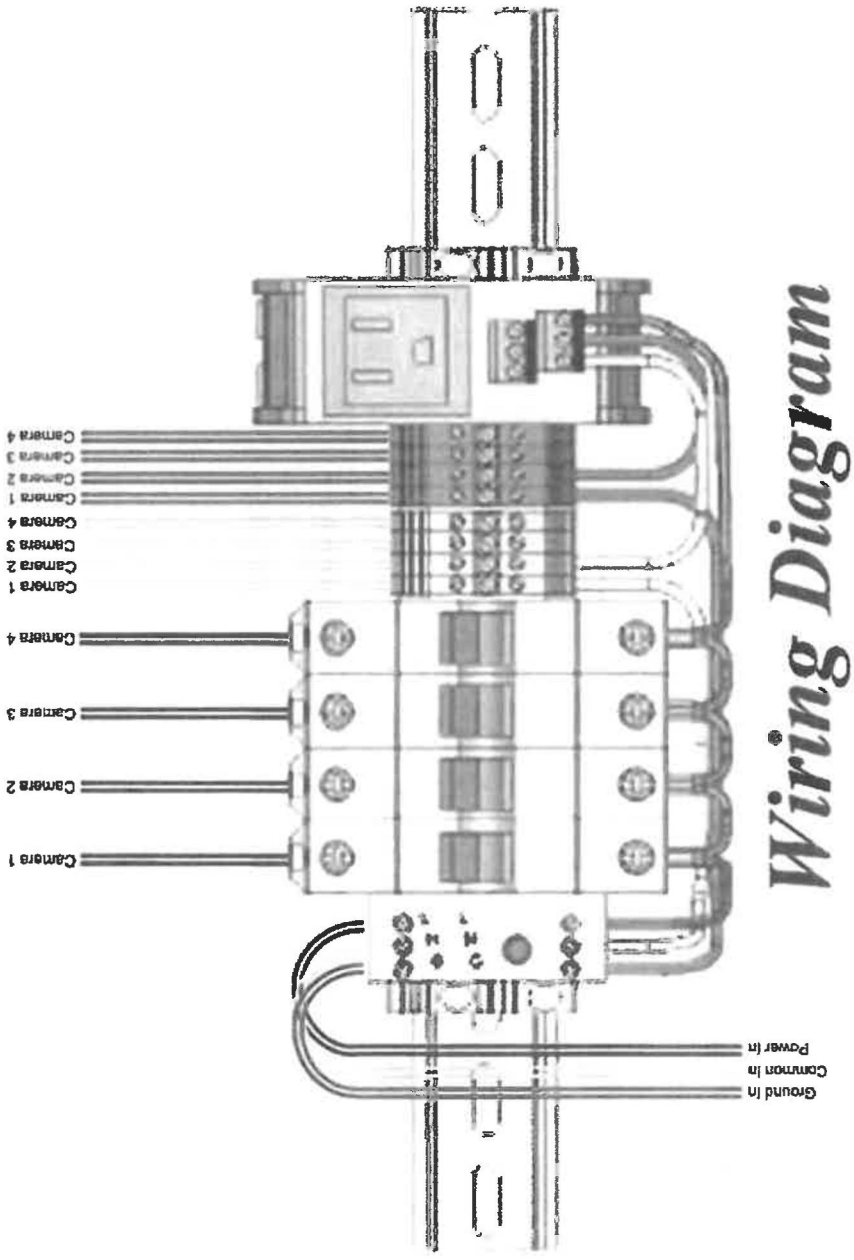


Iteris - 1501 Arthur Street - Orlando, FL 32804
407-292-9776 - fax: 407-292-9780- mobile: 407-383-1845
www.iteris.com - email: wsw@iteris.com

ITERIS

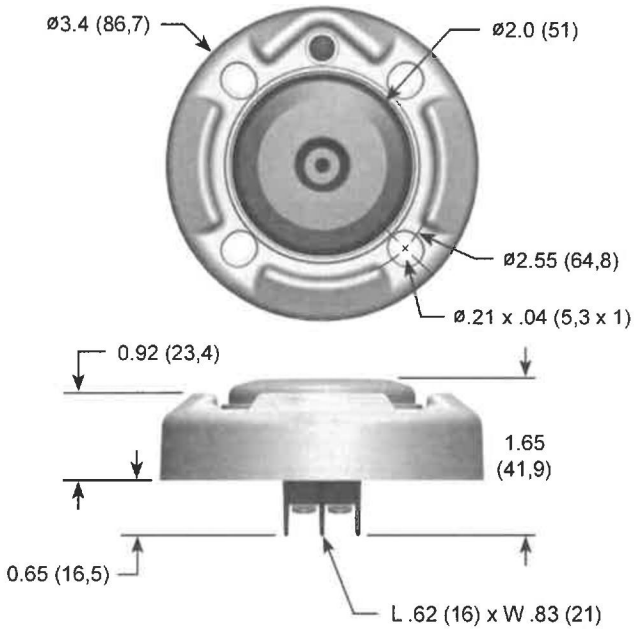
DIN Rail Mounted Surge Panel

Wiring Diagram



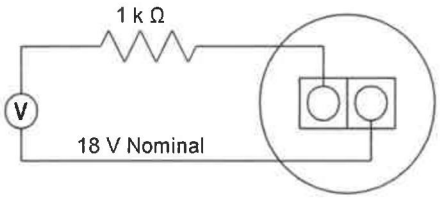
POLARA

BDL3 – BullDog *III* Series Vandal Resistant ADA Push Button



Push button with Palm Beach County logo
Manufacturer custom etch BDL3-B-CE

Suggested Test Circuit
(Momentary Mode Only)



BDL3-Y model shown.
Dimensions are in inches (millimeters).

This button is a highly vandal resistant button with essentially no moving parts. It is pressure activated, but can withstand an impact from a baseball bat or hammer. When the switch activates, you hear a beep and the LED either flashes (Momentary Mode) or lights and stays on until the walk cycle (Latching Mode).

Body Material: Aluminum, Powder Coated

Button Material:

Standard:	316 Stainless Steel
Arrow Button:	Anodized 6061 Aluminum, Nickel Plated Black Powder Coat on area surrounding arrow

Piezo Driven Solid State Switch:

Operating Force:	3.0 lbs. Maximum
Operating Temperature:	-30°F to 165°F (-34°C to 74°C)
Operating Voltage:	12-36 VDC, 9-25 VAC RMA (18 VDC Typ.)
MTBF:	8,800,000 hours Typ.
Switch Operating Life:	Greater than 300 million operations.
"Off" Current:	15µA Typ.
"On" Resistance:	40Ω Typ. (Momentary)
Maximum "On" Current:	30 mA (over-current protection) Typ.
Maximum "On" Time:	11 sec. Typ.
Debouce Time:	85 ms. Typ.

LED Operating Modes:

Momentary:	Approx 0.025 sec. LED flash each time button is pressed.
Latching:	LED activates only during non-walk phases and stays on until the beginning of the walk phase.

LED Specifications:

Luminous Intensity:	0.3 Lux @ 1 meter Minimum (Red)
Viewing Angle:	155° Typical

Beeper:

Volume:	68dB @ 1 meter Typ.
Beep on Press:	3.5 kHz
Beep on Release:	2.6 kHz
Beep Length:	50ms Typ.

Terminal screws include washers (clamping plates) intended for bare wire. Crimp Terminals are not recommended.

Warranty: 5 Years, free from manufacturers defects

See page 2 for additional design compliance and ordering information.

POLARA

Design Compliance

Test Type	Compliance
Activation Force	MUTCD 2009 - 4E
Temperature and Humidity	NEMA TS 2
Transient Voltage Protection	NEMA TS 2
Transient Suppression	IEC 61000-4-4, IEC 61000-4-5
Lightning and Power Protection	GR-1089-CORE, Extended to 6000V-400A, 25 reps, 120VAC-15 mins.
Electronic Noise	FCC Title 47, Part 15, Class A
Mechanical Shock and Vibration	NEMA TS 2
Ingress of Water	NEMA 250 - 6P, Rain, Snow, etc...
Ingress of Water	NEMA 250 - 6P, Submersion
Salt Spray and Corrosion	NEMA 250 - 6P
Ingress of Foreign Objects	NEMA 250 - 6P
Electrical Reliability	NEMA TS 4

Note: Applicable sections only of reference standards. All specifications are subject to change without notice.

Product Ordering Information

R BDL3 AL – B – 2H

Body Style
Blank for Round Body
R – Rectangular Body

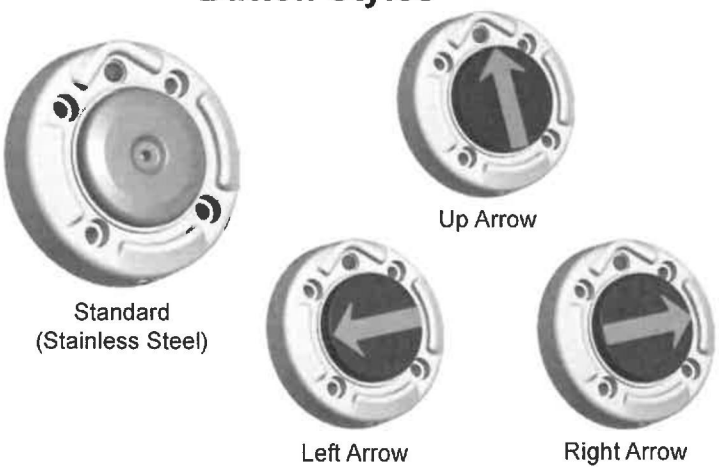
Product Category
BDL3 – BullDog III

Button Style
Blank for standard Stainless Steel button
AL – Left Arrow Button
AR – Right Arrow Button
AU – Up Arrow Button

Body Color
B – Black
G – Green
Y – Yellow

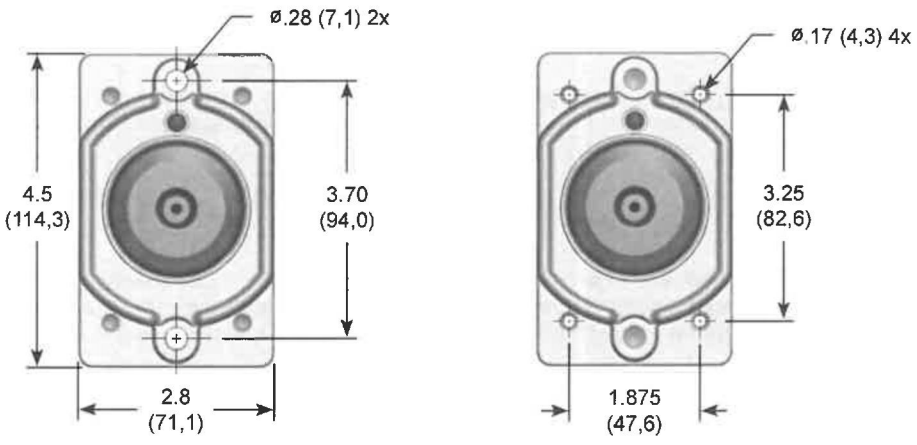
Mounting Hole Options
(Rectangular Body Only)
Blank for no holes pre-drilled
2H – 2 Holes Drilled
4H – 4 Holes Drilled

Button Styles



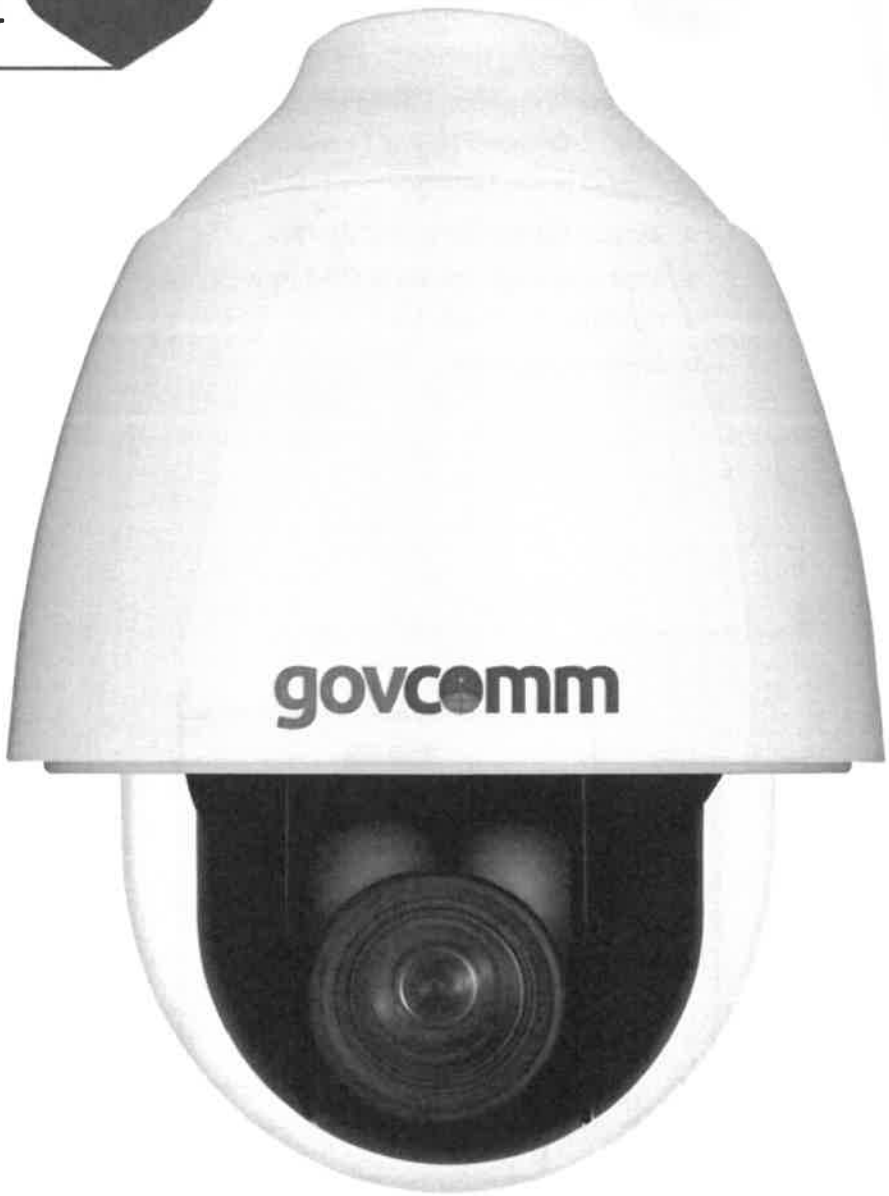
Mounting Hole Options

(Rectangular Body Only)



govcomm
Intelligent Transportation Systems

NDAA Compliant



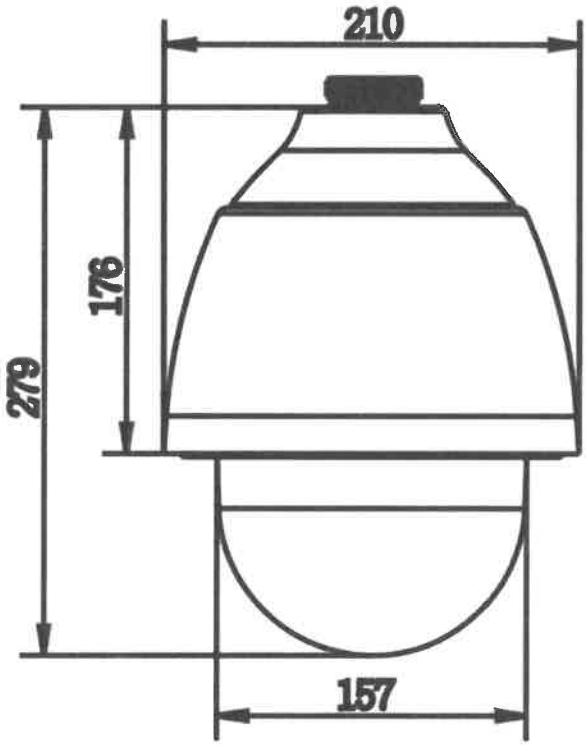
Hawk Series 2 Megapixel Pan-Tilt-Zoom Camera

- Model - GC-IMPO-2D40 (40X Optical Zoom)

Key Attributes

- Environmentally Hardened
- ONVIF Protocol
- 2 Megapixel Resolution
- 40X Optical Zoom
- Electronic Image Stabilization
- Extended Surge (6000TVS), Thunder & Static Protection
- Tilt Range -10° ~ 90° (Auto Flip)
- 1.5" Lowering Device Compatible
- Ingress Protection Rating IP66 & IK 10
- 24VAC 12VDC or Hi-PoE Power Options
- H.264 | H.265 | MJPEG
- 2 Input Alarms | 2 Output Alarms
- Supports Logo Upload to On Screen Display
- Configurable Compass
- Smart Feature Set

Dimensions



Unit : mm

Camera

Image Sensor: Sony 1/2.8" Progressive Scan CMOS

Min. Illumination: Color: 0.02 Lux @(F1.6, AGC ON)
B/W: 0.001 Lux @(F1.6, AGC ON)

White Balance: Auto/Manual/ATW (Auto-tracking White Balance)

Automatic Gain Control: Auto / Manual from 1dB to 9dB

Shutter Time: 1/1 s to 1/10,000 s

Day & Night: IR cut filter

Digital Zoom: 10X

Privacy Mask: 20 programmable color configurable polygon privacy masks

Focus Mode: Auto & Manual

Image Stabilization: Electronic Image Stabilization

Image Enhancements: 2&3D Digital Noise Reduction, Wide Dynamic Range & Back Light Compensation

PTZ

Movement Range: (Pan)360° endless

Pan Speed: Configurable, from 0.1°/s to 90°/s, Preset Speed: 400°/s

Movement Range: (Tilt)From -10° to 90°

Tilt Speed: Configurable, from 0.1°/s to 55°/s, Preset Speed: 300°/s

Proportional Zoom: Yes

Presets: 256

Patrol Scan: 8 patrols, up to 64 presets for each patrol

Pattern Scan: 8 cruise & 4 auto pan paths

Power-off Memory: Yes

Park Action: Preset, Patrol Scan & Pattern Scan

PTZ Position Display: Yes

Scheduled Task: Preset, Patrol Scan & Pattern Scan

Lens

Focal Length	4.3mm ~ 170mm 40X Optical Zoom
FOV	Horizontal field of view: 66.1° (wide), 1.8° (tele) Vertical field of view: 39.8° (wide), 1.1° (tele)
Aperture Range	F1.6 to F28

Compression

Video Compression: H.264, H.265 & MJPEG

Compression Type: Main Profile or High Profile

Video Bitrate: 64 kbps to 10240 kbps

Audio Bitrate: 16 - 40 kbps, uLAW & ALAW 64 kbps, AAC 128 kbps, PCM 128, 256, 384 & 768 kbps

Broadcast: Multicast & Unicast

Image

Max. Resolution: 1920 x 1080

Streams 1 - 4: H.264, H.265 & MJPEG Configurable up to 1920 x 1080 @ 60fps

Enhancements: Back Light Compensation, High Light Compensation, 3D & 2D Digital Noise Reduction, Electronic Image Stabilization, Distortion Correction

Scalable Video Coding: Yes

Network

Network Storage: Built-in memory card slot, support Micro SD/SDHC/SDXC, up to 128 GB; NAS

Alarm Linkage: Application, Motion, Network Failure, Periodical Event, Manual Trigger & Audio

Protocols: IPv4/IPv6, HTTP, HTTPS, DSCP, VLAN, FTP, SMTP, UPnP, SNMP, DNS, DDNS, NTP, RTSP, RTCP, RTP, TCP/IP, DHCP, PPPoE, UDP, IGMP, ICMP, Bonjour

Simultaneous Live View: Up to 10 Simultaneous Viewers

User/Host: Up to 20 Users, w/ 2 Levels - View & Control or View Only

Security Measures: User Authentication/HTTPS/IP Filter/IEEE 802.1x

API: ONVIF (Profile S/G/Q/T), SDK

Web Browser: Chrome, Edge Firefox & Internet Explorer

General

Power: 24 VAC or Hi-PoE

Working Environment: From -40°C to 74°C (-40°F to 165°F; Humidity: 95% or less

Protection Level: IP66 Standard (Outdoor), IK10, 6000V Lightning Protection, Surge Protection and Voltage Transient Protection

Material: Aluminum Alloy

Dimensions: Ø210mm x 279mm (Ø8.27" x 10.98")

Weight: Approx. 3 kg (6.61 lbs)

Interface

Alarm Interface: 4-ch alarm input/2-ch alarm output

Audio Interface: Full-Duplex, Half Duplex, Simplex, Adjustable Gain & Bit Rate

Network Interface: 1 RJ45 10/100 Ethernet Interface; PoE+

RS-485: Yes

7-Sep-21
Submittal Data
Palm Beach County

Pay Item Number	Qty	Description	FL Cert Number	Manufacturer
700-12-21		**Sign Beacon**		
	1	**Ground Mount Solar Powered 1-Bcn**		
		TF4001F-FL-DC, solar school zone flasher w/ beacon	700-026-018	Temple Inc.
		APL Contract Line Item 700-026-018a		
		12" Die cast vehicle signal	650-002-011	Mobotrex
		433-3230-905XL, Yellow ball LED, 10-30vdc		Dialight
		SP-1011-FL 1-way upper arm, Flat black	653-001-004	Pelco Products, Inc
		SP-1012-FL, 1-way lower arm, Flat black	653-001-003	Pelco Products, Inc
		SE-0357-P34, Hub plate, round pole, flat black	659-021-003	Pelco Products, Inc
	1	**Controller Accessories - Type 1 Time Switch**		
		FCU 500-071, School beacon timer switch	678-008-023	Temple Inc.
		APL Contract Line Item 678-008-023b		
646-1-11	1	**Aluminum Signal Pole - Pedestal**		
		PB-5100-16-PNC, Pedestal pole, threaded one end, 4" x 15'		Pelco Products, Inc
		SP-1116-FL-AD-NL-GL-PNC, Sq alum base, grounding lug	646-001-001	Pelco Products, Inc
		PB-5325-PNC, Collar Assy, Square Bases, Alum		Pelco Products, Inc
		PB-5518-GLV, Anchor bolt set, 3/4-10, w/ dbl nuts & washers		Pelco Products, Inc.

Please send your order RELEASE to: orders@temple-inc.com

Sign Beacon (School ne)

by Temple, Inc. (Manufacturer Website)
Model: TF4001F-FL-DC

700-12-XX

Active APL Certifications
700-026-018 (Approval Date: 11/5/2018)

Product Types
- Sign Beacon

Limitations
There are no items to display.

Documents
There are no items to display.

Comments
There are no items to display.

Contacts
Blair Temple
50 Davis Street, NE
Decatur, AL 35601
(800) 633-3221
blair.temple@temple-inc.com

Temple

TF4001F L-DC CONTROLLER CABINET WIRED TYPE I

Cabinet Dimensions: 24.50"H x 17.00"W x 10.125"D

Overview:

The Temple TF4001F-FL-DC Controller Cabinet Wired Type I is designed as a Flasher Deployment with various uses such as Advanced Warning, School Zone and Road Condition Warning. The TF4001F-FL-DC Controller Cabinet Wired Type I is designed according to the Florida Department of Transportation Section 676 Standard Specifications for Road and Bridge Construction.

Features:

- NEMA 3R Cabinet Enclosure
- 0.125" thick 5052-H32 Aluminum Alloy
- Double Flanged Door Opening
- 14 AWG Stainless Steel Hinge
- Closed-Cell Neoprene Gasket
- Corbin #2 Slam Lock
- Louvered Vents
- Back and Side Panel Mounting
- Removable Shelf
- Battery Tray
- Flat and Round Surface Mounting
- Re-Sealable Print Pouch
- Solar Charge Controller
- DC Powered Flasher Module
- Capacity of (1) 12V 110aH Battery
- Meets NEC Wiring Specifications
- Optional APL Approved Time Switch
- Optional Knockdown Sensor

Integrity Service Relationships

Mobotrex, 12" Die Ca[illegible]/ehicle Signal

by MoboTrex (formally Brown Traffic Products, Inc. (formally Siemens and Eagle))(Manufacturer Website)
Model: SG Aluminum Signal (includes old certification #: 65011010003011)

Active APL Certifications
650-002-011 (Approval Date: 5/14/1982)

Product Types
- 12" Die Cast Vehicle Signal

Limitations
There are no items to display.

Documents
There are no items to display.

Comments
All black die-cast aluminum LED-ready body sections containing the door and visor

Contacts
Bret Di Giovanni
301 W. Howard Ln #200
Austin, TX 78753
(512) 521-3073
bdigiovanni@mobotrex.com

Dialight

Low Voltage LED Traffic Modules

10 - 30 VDC Operation

FEATURES / BENEFITS

- ▲ Polarity Protected
- ▲ Robust High Flux LED Technology
- ▲ Ideal for Solar and Battery Application
- ▲ Long Life
- ▲ Standard 8" and 12" Modules
- ▲ Fully Sealed Module
- ▲ Incandescent Appearance
- ▲ Abrasion Resistant Lens Coating
- ▲ Easy to Install into Existing Signal Enclosure
- ▲ Polarity Marked on Wires

SPECIFICATIONS

- ▲ Low Voltage 10-30 VDC Operation
- ▲ Meets ITE VTCSH LED Circular Supplement Dated June 27, 2005 Intensity, Color and Uniformity Over the Full Temperature Range
- ▲ Quick Connect Terminals with Spade / Tab Adapters
- ▲ 75 mSec Turn on Time
- ▲ RF Immunity 10V/M, 80MHz to 1Ghz
- ▲ Colored Wire - Postive, White Wire - Negative
- ▲ Operating Temperature Range: -40°C to +74°C
- ▲ Complies with FCC title 47, Subpart B Section 15 for Radiated Emissions
- ▲ Vibration Resistant to Mil-Std-883, Test Method 2007
- ▲ Moisture Resistant per MIL-STD-810F, Method 506.4 for Rain and Blowing Rain

8" (200 MM) SIGNAL MODULES

Part Number	Color	Lens Type	Min Luminous Intensity* (cd)	Dominant Wavelength (nm)	Typical Wattage at 25°C
433-1110-005XL	Red	Tinted	165	625	5
433-3130-905XL	Yellow	Tinted	410	590	6
433-2120-005XL	Green	Tinted	215	500	7
433-2170-005XL	Green	Clear	215	500	7

12" (300 MM) SIGNAL MODULES

Part Number	Color	Lens Type	Min Luminous Intensity* (cd)	Dominant Wavelength (nm)	Typical Wattage at 25°C
433-1210-005XL	Red	Tinted	365	625	7
433-3230-905XL	Yellow	Tinted	910	590	12
433-2220-005XL	Green	Tinted	475	500	8
433-2270-005XL	Green	Clear	475	500	8

* Measured at peak intensity point

Dialight Corporation
1501 Route 34 South • Farmingdale, NJ 07727 USA
Tel: (1) 732-919-3119 • Fax: (1) 732-751-5778 • www.dialight.com

Pelco Products, Pede an Signal Bracket S d Cast

by Pelco Products, Inc. (Manufacturer Website)
Model: SP-1011-FL

Active APL Certifications
653-001-004 (Approval Date: 7/7/1987)
Previous Certification Numbers
- 65313382011013

Product Types
- Pedestrian Signal Bracket Sand Cast

Limitations
There are no items to display.

Documents
There are no items to display.

Comments
UPPER ARM ASSY. DIE CAST

Contacts
Mike Britten
320 SW 18th Street
Edmond, OK 73013
(405) 340-3434
Mike.Britten@PelcoInc.com

Pelco Products, Pedestrian Signal Bracket Sand Cast

by Pelco Products, Inc. (Manufacturer Website)
Model: SP-1012-FL

Active APL Certifications
653-001-003 (Approval Date: 7/7/1987)
Previous Certification Numbers
- 65313382011023

Product Types
- Pedestrian Signal Bracket Sand Cast

Limitations
There are no items to display.

Documents
There are no items to display.

Comments
LOWER ARM ASSY. DIE CAST

Contacts
Mike Britten
320 SW 18th Street
Edmond, OK 73013
(405) 340-3434
Mike.Britten@PelcoInc.com

Pelco Products, Pole [illegible]d

by Pelco Products, Inc. (Manufacturer Website)
Model: SE-0357-SS HUB

Active APL Certifications
659-021-003 (Approval Date: 1/8/1988)
Previous Certification Numbers
- 65910392011033

Product Types
- Pole End

Limitations
There are no items to display.

Documents
There are no items to display.

Comments
SIDE POLE MOUNTING

Contacts
Mike Britten
320 SW 18th Street
Edmond, OK 73013
(405) 340-3434
Mike.Britten@PelcoInc.com

Temple, Time Switch Type 1 (APL Product)

by Temple, Inc. (Manufacturer Website)
Model: FCU 500-071

Active APL Certifications
- 678-008-023 (Approval Date: 3/18/2016) (Service Life Expectancy:)

Product Types
- Time Switch Type 1

Resource Links
There are no items to display.

Random Sampling Frequency
There are no items to display.

Limitations
There are no items to display.

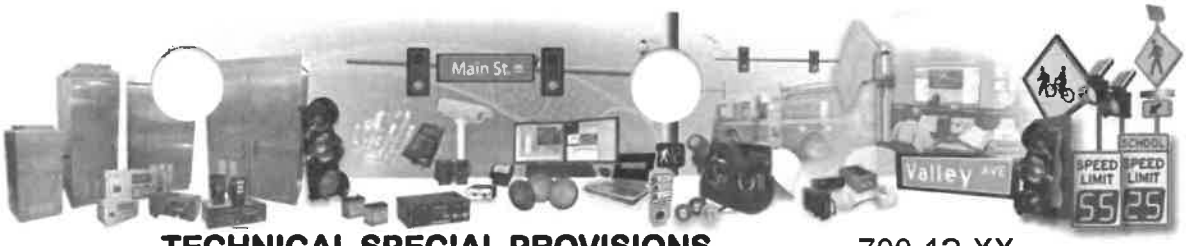
Documents
- FCU 500-071 with optional high gain antenna.pdf (PDF 937 KB)

Download the Adobe Reader

Comments
There are no items to display.

Manufacturer Detail
Temple, Inc.

Temple
www.temple-inc.com



TECHNICAL SPECIAL PROVISIONS 700-12-XX

Temple FCU 500-071 School Beacon Timer Switch and Cellular Modem

Overview

The Temple FCU 500-071 series provides a cost-effective, easy to integrate means of adding monitoring and control to School Beacon Flashers. It is designed for extreme temperature applications and has low power requirements, making it suitable for solar powered applications. The simple Integrated School Beacon Timer Switch and Cellular Modem can be retrofitted into existing School Beacon Cabinet Assemblies to upgrade the school beacons to the latest technology.

The unit provides an easy way to monitor the school beacons status and health such as AC power, battery backup, monitor beacon current, cabinet door open, local override control and temperature.

The unit works in conjunction with the Glance Platform, providing a cloud-based School Beacon solution. Simply connect the unit to your school beacons to add monitoring and control to your equipment. The unit allows you to remotely configure schedules for the school beacons from the Glance cloud based software.

Performance Features

- Low cost Internet connectivity solution
- Small form factor
- Remotely change schedule for multiple devices
- Email and text messages when faults are detected
- Compatible with Glance platform
- GPS enabled self-locating
- Low power consumption
- Local manual override switch
- Ability to control secondary school beacons upstream
- Integral battery back-up for power fail reporting
- Monitor beacon lamp current to determine when a beacon has failed

TSP-121

P.O. Box 2066, Decatur, AL 35602 • 1.800.633.3221
www.temple-inc.com

Hardware Specification

Temple FCU 500-071

Connectivity:

Cell Modem*	Yes
Ethernet Port (10/100Base-T)	Yes
RS-232 Port	Optional**

Industrial I/O:

Analog Inputs	AC Power, Solar Batteries and Temperature
Digital Inputs	Beacon Status and Door Open Switch
Digital Outputs	2 x Beacon Circuits

Miscellaneous:

Operating Systems	µC/OS-II
GPS	Yes
Operating Temperature	-40°C to 80°C (-40°F to 176°F)
Humidity	5-95% non-condensing
Dimensions	8"H x 5"W x 2"D
Input Voltage	16-30VDC, 120VAC
Real Time Clock	Yes
Flash Disk	Yes
Battery Backed Memory	Yes

Also Suitable For:

Solar/Battery Power	Yes
Lamp Monitoring	Yes
Scheduling	Yes

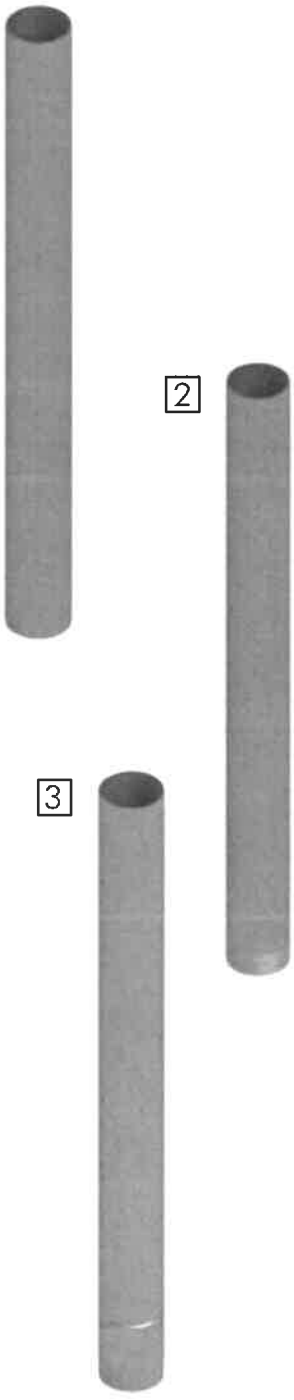
* Specify carrier at time of order
** Custom configurations available for volume orders

TSP-122

Pedestal Pole

TECHNICAL SPECIAL PROVISIONS

Pelco offers aluminum, iron, and plastic bases in various sizes as well as poles in aluminum and steel. Pelco's cast aluminum square base is FHWA certified and meets or exceeds AASHTO break-away requirements. Plastic replacement doors offer an economical way to deter vandalism.



1. **Pedestal Pole, 4" Sch 40, Spun Alum No Threads**

PB-5101 - [Length] - [Coating]

PNC=Process No Color
P__=Paint

2. **Pedestal Pole, 4"- 8 NPT Sch 40, Spun Alum w/ Pelican ID**

PB-5100 - [16] - [PNC]

PNC=Process No Color
P__=Paint

Pedestal Pole, 4"- 8 NPT Sch 80, Spun Alum

PB-5102 - [Length] - [Coating]

PNC=Process No Color
P__=Paint

Pedestal Pole, 4"- 8 NPT Sch 40, Steel

PB-5201 - [Length] - [Coating]

P__=Paint

Pedestal Pole, 4"- 8 NPT Sch 40, Galv Steel

PB-5200 - [Length] - GLV - [Coating]

Blank=Galvanized Only
P__=Paint over Galvanized

3. **Pedestal Pole, Welded, 4"- 8 NPT w/ 5-1/2" Nipple Length, Steel**

PB-5219 - [Length] - [Coating]

GLV=Galvanized
P__=Paint

Note: 1. Standard poles are typically sold in 1 foot increments. For other lengths contact sales.
2. See Reference Section for available paint colors.

TSP-123

Pelco Products, Trans mer Base

by Pelco Products, Inc. (Manufacturer Website)
Model: SP-1116-FL

Order as: SP-1116-FL-AD-NL-GL-PNC
AD = alum door
NL = no logo
GL = grounding lug
PNC = process no color

Active APL Certifications
646-001-001 (Approval Date: 10/5/2016)

Product Types
- Transformer Base

Limitations
There are no items to display.

Documents
Pelco Transformer Base SP-1116-FL Series.pdf (PDF 2864 KB)

Download the Adobe Reader

Comments
There are no items to display.

Contacts
Mike Britten
320 SW 18th Street
Edmond, OK 73013
(405) 340-3434
Mike.Britten@PelcoInc.com

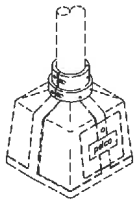
Pole & Base Accessories

Pole and base collar assemblies, for both square and octagonal bases, are available in highwind areas to add strength and help prevent loosening of connection.

Pole & Base Collar Assembly, Alum Square Base

PB-5325 - [PNC] (Coating)

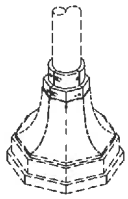
PNC=Process No Color
P__=Paint



Pole & Base Collar Assembly, Alum Octagonal Base

PB-5326 - [ ] (Coating)

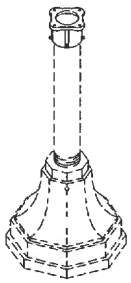
PNC=Process No Color
P__=Paint



Pedestal Adapter, 4" (4-1/2" OD Pole), Alum 6-1/2" Bolt Circle

SE-3104 - [ ] (Coating)

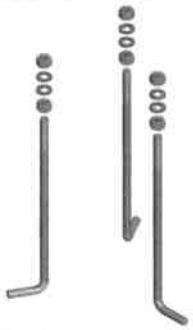
PNC=Process No Color
P__=Paint



Note: 1. All assemblies are supplied standard with stainless steel fasteners.
2. Specify options when ordering.
3. See Reference Section for available paint colors.

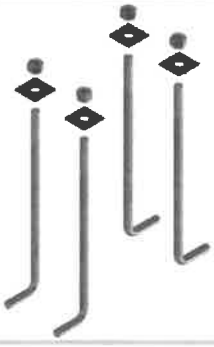
Anchor Bolts

Anchor bolt cages allow the critical bolt circle dimensions to be maintained when the steel is cast into the concrete. These cages may be used instead of anchor bolt sets.



PB-5305-GLV **Anchor Bolt Set of 3 w/Hardware 3/4"-10NC, Galv**

Note: Includes 3 Bolts, 6 Washers and 6 Nuts.



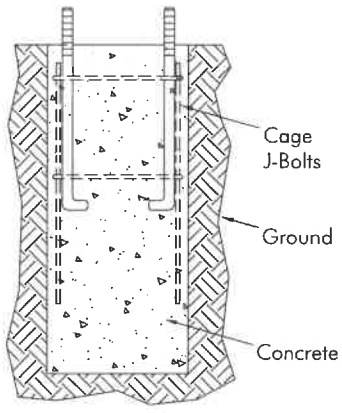
PB-5306-GLV **Anchor Bolt Set of 4 w/ Hardware 3/4"-10NC, Galv**

Note: Includes 4 each: Bolts, Washers and Nuts.

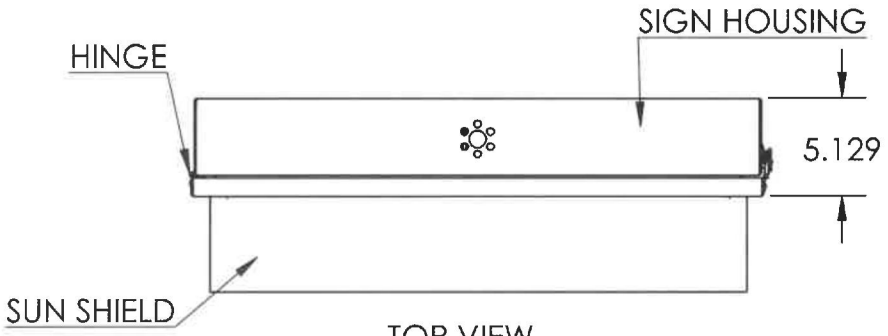
PB-5518-GLV **Anchor Bolt Set of 4 w/ Double Hdwr 3/4"-10NC, Galv**

Note: Includes 4 Bolts, 8 Washers and 8Nuts.

AP-1095-GLV **Anchor Bolt Cage, w/ Hardware 3/4"-10 x 18", 36" Rebar 13" Bolt Circle, Galv**



Typical Footing Detail

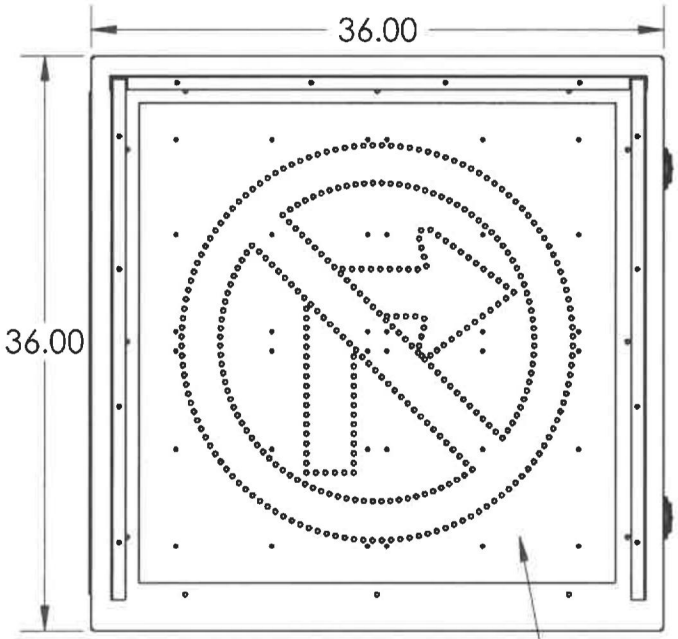


TOP VIEW

NOTES:
1. SIGN CONSTRUCTED FROM .0125 ALUMINUM.
2. SIGN BODY FORMED FROM A SINGLE PIECE OF ALUMINUM AND CONTINUOUSLY WELDED.
3. LOW POWER CONSUMPTION.
4. CONTINUOUS STAINLESS STEEL HINGE.
5. OPTIONAL DIMMER CIRCUIT.
6. LATCHES AND KEEPERS ARE 1/4 TURN STAINLESS STEEL

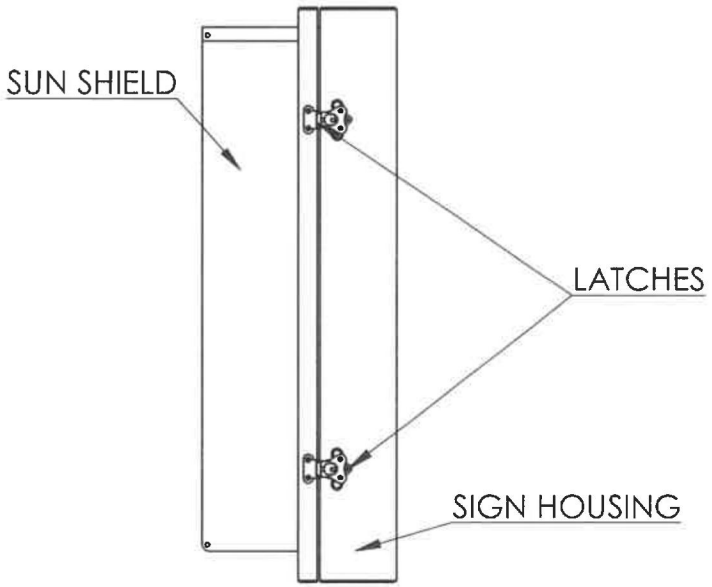
TECHNICAL SPECIAL PROVISIONS

700-6-XX



FRONT VIEW

VISIBLE MESSAGE AREA IS 30" X 30"



RIGHT SIDE VIEW

SOUTHERN
Manufacturing
501 Herndon Ave
Orlando, Fl. 32803 407-894-8851

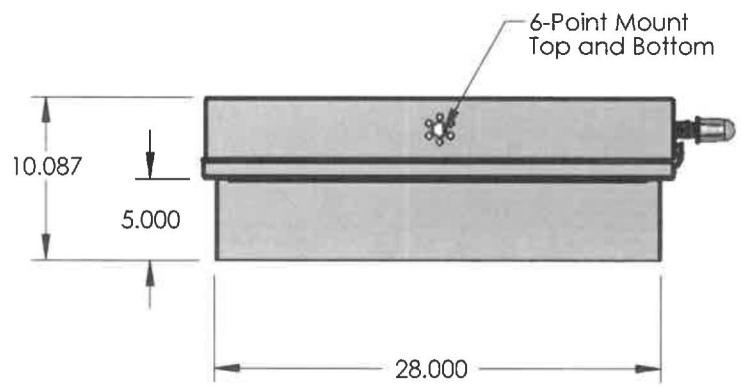
		NAME	DATE
DRAWN By:	AE		1/20/2009
CHECKED:			
MFG APPR:			
Cust APPR:			

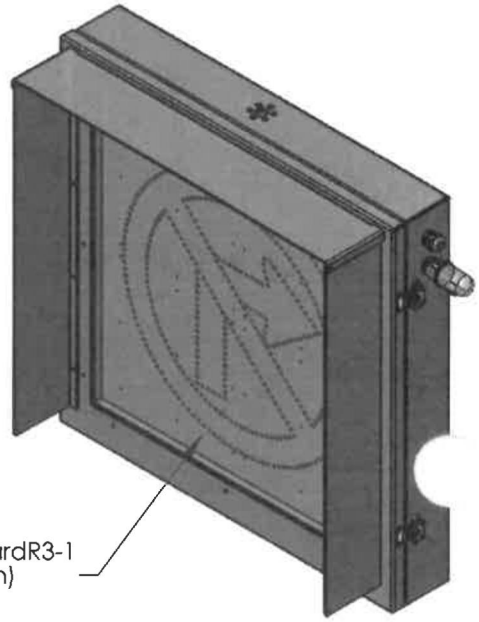
MATERIAL:	.125 Aluminum
FINISH:	As Per Order

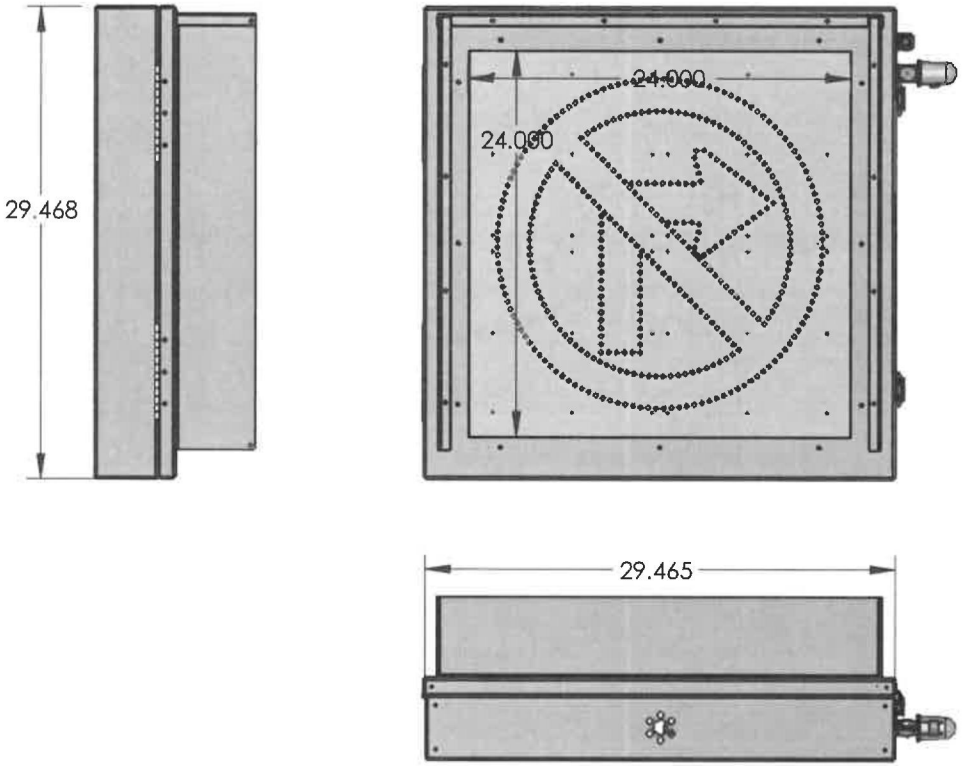
Item No. 700-89-2
30" x 30" LED BOS NRT Symbolic R3-1
Rev: 1
Scale: 1:10 | Sheet 1 of 1
SIZE A

TECHNICAL SPECIAL PROVISIONS

700-6-XX







Southern Manufacturing
501 Herndon Ave
Orlando, Fl. 32803
ph: 407-894-8851
fx: 407-894-5373

	NAME	DATE
DRAWN By:	TSH	10/17/2012
CHECKED:		
MFG APPR:		
Cust APPR:		

SOUTHERN MANUFACTURING CO.

P/N: BO2424BB-Y-R3-1

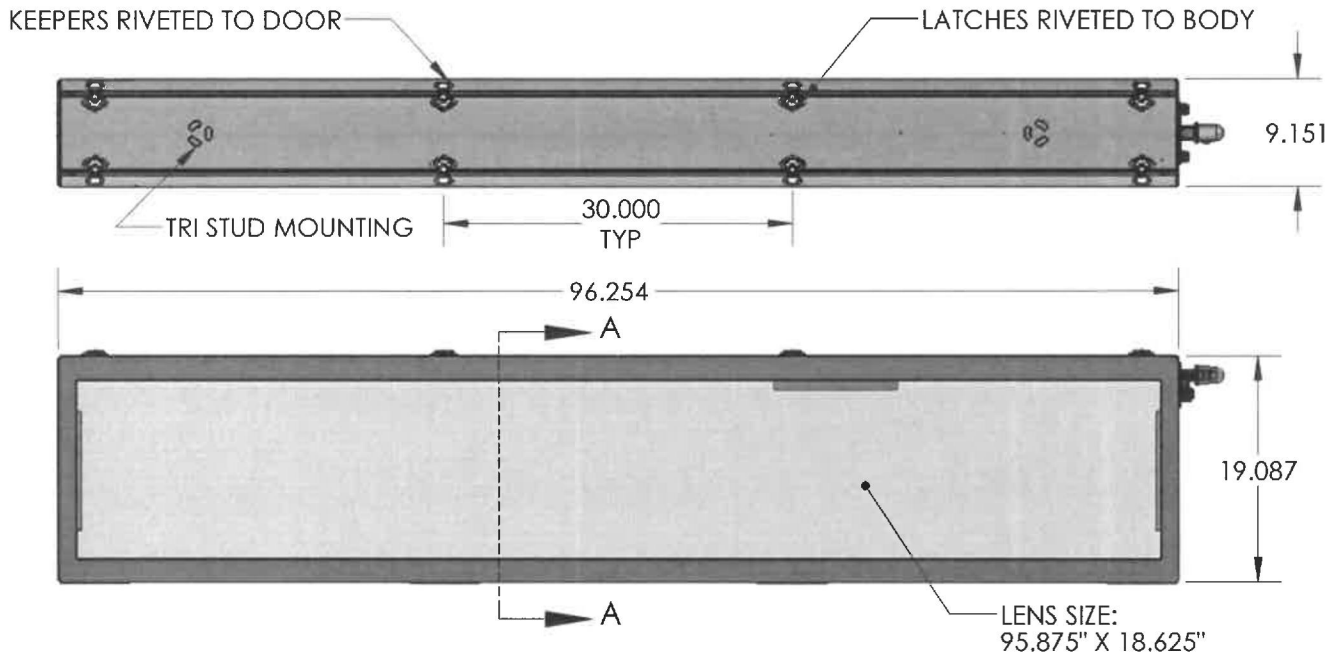
MATERIAL:

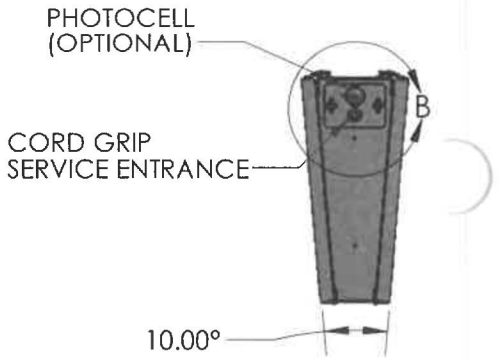
FINISH:

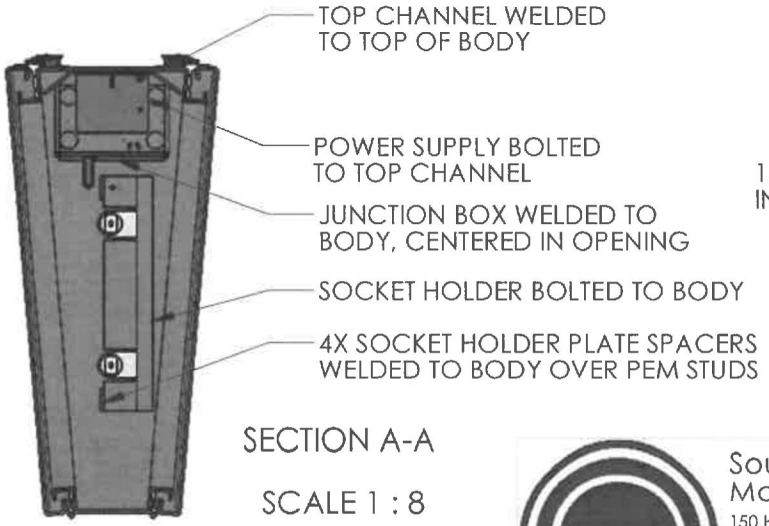
Rev: 0

Scale: Sheet 2 of 12 SIZE A

700-5-XX

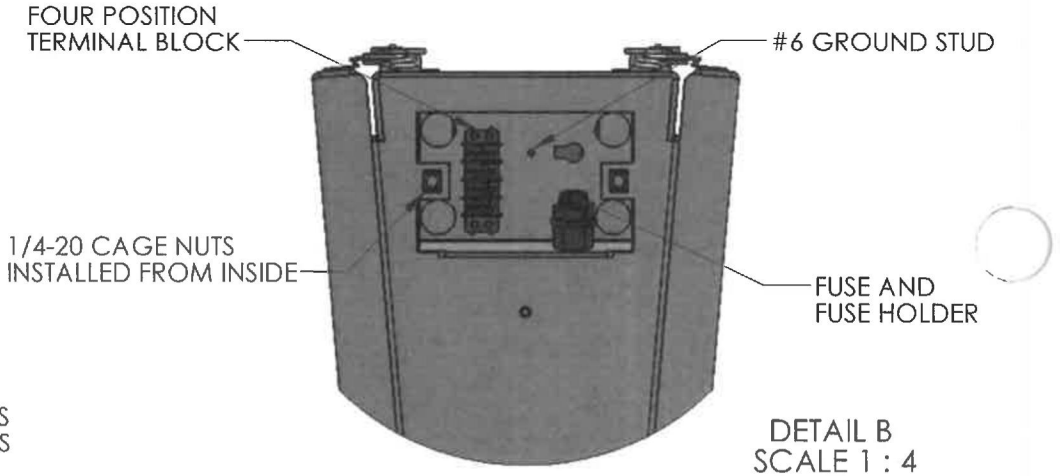






SECTION A-A

SCALE 1 : 8



DETAIL B
SCALE 1 : 4

Southern Manufacturing
150 Hope Street
Longwood, FL 32750
ph: 407-894-8851
fx: 407-831-1508

	NAME	DATE
DRAWN By:	TSH	2/6/2013
CHECKED:		
MFG APPR:		
Cust APPR:		

MATERIAL: 5052-H32 ALUMINUM 0.125"

FINISH: POWDER OUTSIDE: PER CUSTOMER
POWDER INSIDE: WHITE

SOUTHERN MANUFACTURING CO.

P/N: FL819DTA

FLUORESCENT 8' X 19" STREET SIGN TRI STUD MOUNTING

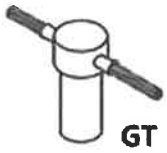
Rev: 1

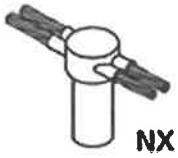
Scale: Sheet 1 of 1

SIZE A

5 4 3 2 1

One-Shot Cable To Ground Rod - GR/GT/NT/NX



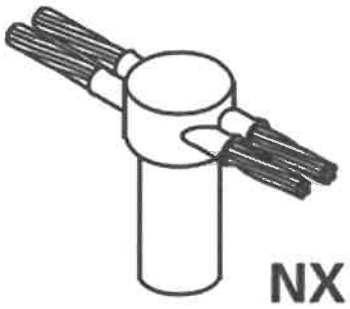


Cable To Ground Rod Using Cadweld One-Shot Connections
For plain or threaded copper clad and galvanized steel or stainless steel rods. The CADWELD ONE-SHOT case is a ceramic disposable body replacing the familiar semi-permanent graphite mold and associated Handle Clamp. Everything required is included except the flint ignitor.
R.E.A. Accepted
NEC Approved

Results 1 - 25 of 45

Item #	Ground Rod Size	Solid Conductor Size	Stranded Conductor Size	Type	Units Per Package	Price Each
GR1141G	1/2 in	6, 8	8	GR	12	$10.17
GR1141L	1/2 in	3, 4	4, 6	GR	12	$10.17
GR1141V	1/2 in	1, 2	2, 3	GR	12	QUOTE
GR1161G	5/8 in	6, 8	8	GR	12	$10.17
GR1161L	5/8 in	3, 4	4, 6	GR	12	$11.20
GR1161V	5/8 in	1, 2	2, 3	GR	12	$11.78
GR1162C	5/8 in	2/0, 1/0	1/0, 1	GR	12	$11.78
GR1162G	5/8 in	N/A	2/0	GR	12	$13.60
GR1162Q	5/8 in	N/A	4/0	GR	12	$16.09
GR1181G	3/4 in	6, 8	8	GR	12	$11.78
GR1181L	3/4 in	3, 4	4, 6	GR	12	$11.78
GR1181V	3/4 in	1, 2	2, 3	GR	12	$13.60
GR1182C	3/4 in	2/0, 1/0	1/0, 1	GR	12	$13.60
GR1182G	3/4 in	N/A	2/0	GR	12	$13.60
GR1182Q	3/4 in	N/A	4/0	GR	12	$14.80
GT1141G	1/2 in	6, 8	8	GT	12	$11.55
GT1141L	1/2 in	3, 4	4, 6	GT	12	$11.55
GT1141V	1/2 in	1, 2	2, 3	GT	12	$13.60
GT1161G	5/8 in	6, 8	8	GT	12	$11.78
GT1161L	5/8 in	3, 4	4, 6	GT	12	$11.78
GT1161V	5/8 in	1, 2	2, 3	GT	12	$13.60
GT1162C	5/8 in	2/0, 1/0	1/0, 1	GT	12	$14.62
GT1162G	5/8 in	N/A	2/0	GT	12	$14.62
GT1181G	3/4 in	6, 8	8	GT	12	$13.60
GT1181L	3/4 in	3, 4	4, 6	GT	12	$13.60

Results 1 - 25 of 45



Item # NX1161L, One-Shot Cable To Ground Rod - GR/GT/NT/NX
Price Each $14.33

Cable To Ground Rod Using Cadweld One-Shot Connections
For plain or threaded copper clad and galvanized steel or stainless steel rods. The CADWELD ONE-SHOT case is a ceramic disposable body replacing the familiar semi-permanent graphite mold and associated Handle Clamp. Everything required is included except the flint ignitor.
R.E.A. Accepted
NEC Approved

pecifications · Required Tools for Standard Weld · Suggested Tools · Order Note

pecifications

round Rod Size	5/8 in
olid Conductor Size	3, 4
tranded Conductor Size	4, 6
ype	NX
roduct Class	BA
nits Per Package	12
ormal Stock	No

equired Tools for Standard Weld

equired Tools for Standard Weld	T320, Flint Ignitor ($10.65)

uggested Tools

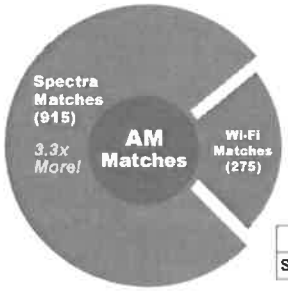
uggested Tools	T111, Surefire™ Torch Head ($138.91) T313, Cable Cleaning Brush ($12.83) T314, Cable Cleaning Brush ($58.50) T329, File ($19.62)

rder Note

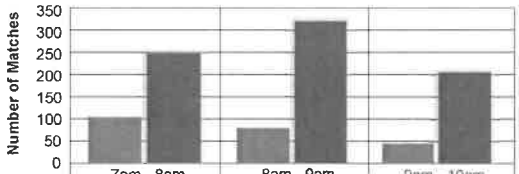
you choose the CADWELD PLUS WELD METAL system, please be sure to include the CADWELD Ignitor with your order.

BlueTOAD® Spectra

The FACTS are in... The BlueTOAD Spectra Detector, combines Discoverable and Non-Discoverable Bluetooth to deliver Most Samples – Most Matches – Most Advanced Travel-Time System!



BlueTOAD Spectra vs. Wi-Fi - Matches (AM)



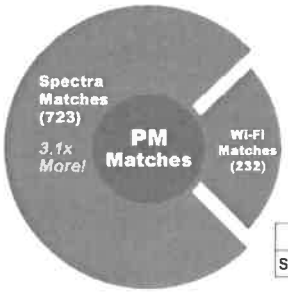
	7am - 8am	8am - 9am	9am - 10am
Wi-Fi Matches	125 (6.68%)	96 (4.92%)	54 (3.34%)
Spectra Matches	293 (15.67%)	379 (19.42%)	243 (15.00%)

Hourly Comparison

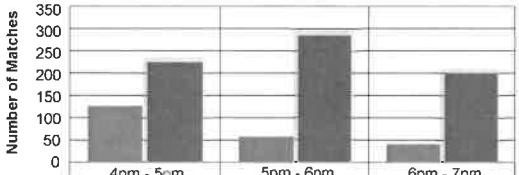
■ Wi-Fi Matches ■ Spectra Matches (%) Match Rate

Compared to Wi-Fi, Spectra data is more robust...

Throughout the day, the total number of Spectra matches is significantly higher, compared to Wi-Fi matches – averaging 3X (300%) more matches.



BlueTOAD Spectra vs. Wi-Fi - Matches (PM)



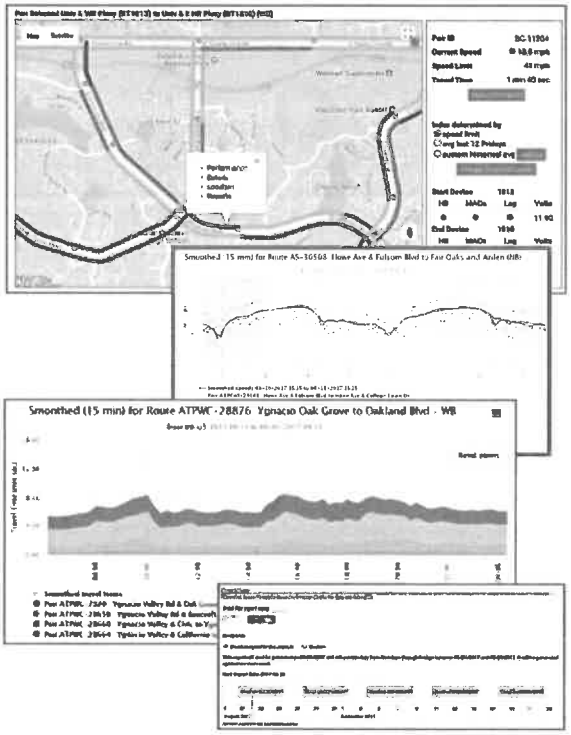
	4pm - 5pm	5pm - 6pm	6pm - 7pm
Wi-Fi Matches	130 (7.24%)	60 (3.05%)	42 (3.24%)
Spectra Matches	229 (12.76%)	291 (14.77%)	203 (15.64%)

Hourly Comparison

■ Wi-Fi Matches ■ Spectra Matches (%) Match Rate

BlueTOAD Spectra & BlueARGUS Advanced Web-Based Software

Combine interactive, real time speed and congestion maps with automated Performance Measurement reports using NEW Scheduler!



BlueTOAD® is the most advanced traffic-monitoring system on the market, directly measuring travel times using cost-effective, non-intrusive roadside technology.

BlueTOAD Spectra Detector

Now, advancements have been developed to increase the number of Detects and Matches, introducing **BlueTOAD Spectra**, which enables detection of "Non-Discoverable" (Paired) segments of Bluetooth signals along side BlueTOAD's industry leading detection of "Discoverable" (unpaired) Bluetooth devices. With the combination of discoverable and non-discoverable Bluetooth detection, testing has shown significant increases in detection and matches.

When a phone pairs up to a vehicle it is rendered "undiscoverable" and undetectable by a standard Bluetooth detector. However, BlueTOAD Spectra is able to detect that paired device adding significantly to detection density.

Spectra only detects 6 characters of the non-discoverable MAC address further enhancing privacy, not the usual 12 characters. With the number of States legislating use of "hands-free" mode, this new detector, coupled with the existing Bluetooth detector offers a greater amount of data, and significant increases in Origin/Destination metrics.

BlueARGUS — BlueTOAD Travel-Time-Based Performance Software

BlueARGUS is the most comprehensive database manipulation software, now optimized for travel-time data and dashboard-based visualization with BlueTOAD Spectra. Get richer insight to changing traffic patterns and trends. BlueARGUS/Spectra combined is optimized for any agency's need - city traffic department, county, state, MPO or engineering service provider.

by TRAFFICAST BlueTOAD®

BlueTOAD Spectra

BlueTOAD® Spectra

Technical Specificatio

BlueTOAD Spectra Ethernet

Power Specifications

Power over Ethernet (PoE)
IEEE 802.3af standard

PoE Voltage: 48 VDC
110/230 VAC supply to injector

DC Power

DC Supply Current:
@ 12V - Typical 150 mA
@ 12V - Maximum 250 mA

DC Supply Voltage: Minimum - 9.5 voe
Maximum - 50 voe

AC Power

100/230 VAC 50 Hz to 60 Hz

Operating Range

-40° C to +85° C

Processor

Real Time Microcontroller

8GB Removable microSD Card

Connectivity

PoE - Ethernet 10 BASE-T / 100 BASE-T

Static or DHCP IP Addressing

(Only one Ethernet connection needed per unit)

Bluetooth

Non-Discoverable 2.4 GHz Demodulator

Discoverable CSR Bluecore 4 Class 1

Bluetooth Radio (adjustable) Transmit Power Range: -90 dBm to +20 dBm

Antennae

Bluetooth: (2) - 2 dBi Omni

NEMA 4X Enclosure

10 in. x 3.0 in. x 3.0 in.

Weight: < 5 lbs.

BlueTOAD Spectra Cellular

Power Specifications

Solar Power SOW, 17.5 Vmp
Solar: 33 in x 21 in x 2 in, Weight: 17.3 lbs.

Solar Power 85 W, 17.9 Vmp
Solar: 47 in x 21 in x 2 in, Weight: 17.6 lbs.

Battery: 60/20 Ah Gel Sealed

DC Power

DC Supply Current:
@ 12V - Typical 250 mA
@ 12V - Maximum 500 mA

DC Supply Voltage: Minimum - 9.5 VDC
Maximum - 50 VDC

Power over Ethernet (PoE)

IEEE 802.3af standard

PoE Voltage: 48 VDC

110/230 VAC supply to injector

AC Power

100/230 VAC 50 Hz to 60 Hz

Operating Range

-40° C to +85° C

Processor

Real Time Microcontroller

8GB Removable microSD Card

Connectivity

4G LTE CAT4

Supports all legacy non-4G technologies

Bluetooth

Non-Discoverable 2.4 GHz Demodulator

Discoverable CSR Bluecore 4 Class 1

Bluetooth Radio (adjustable) Transmit Power Range: -90 dBm to +20 dBm

Antennae

Bluetooth: (2) - 2 dBi Omni

LTE: MIMO Receive Diversity

GPS: Passive Ceramic

NEMA 4X Enclosure

12.14 in x 10.26 in x 7.15 in

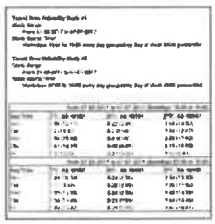
Weight (with battery & mounting brackets): 48 lbs.

Interactive, Real Time Speed Maps & XML

The BlueARGUS system provides an interactive and real-time speed map that allows the user to quickly access every link and all the corresponding information, such as travel-time, average speed and 48-hour performance graph. The real-time map can be viewed independently of the software via an encrypted link that the user can view the data compared to the speed limit or historical average to quickly see if there is reoccurring or non-reoccurring congestion - a great operational tool!

Report Scheduler and Historical Reporting

With the use of historical reports, the user can aggregate and compare data in virtually any combination of days, weeks, months or years. This is an extremely beneficial tool to measure the before and after travel-times of a new traffic signal software, the impact of a special event or incident or seasonal effects on travel-times and speeds. Now, the user can automate ALL performance measurement Reports with the NEW Report Scheduler.



Travel Time Reliability

TTR measures the travel-time index (TTI), buffer-time index (BTI) and planning-time index (PTI) of a driver's travel to best show the variability in their commute. In addition to average travel-time, TTR is a great performance tool that can be measured weekly, monthly, quarterly and/or annually by time of day and day of week.

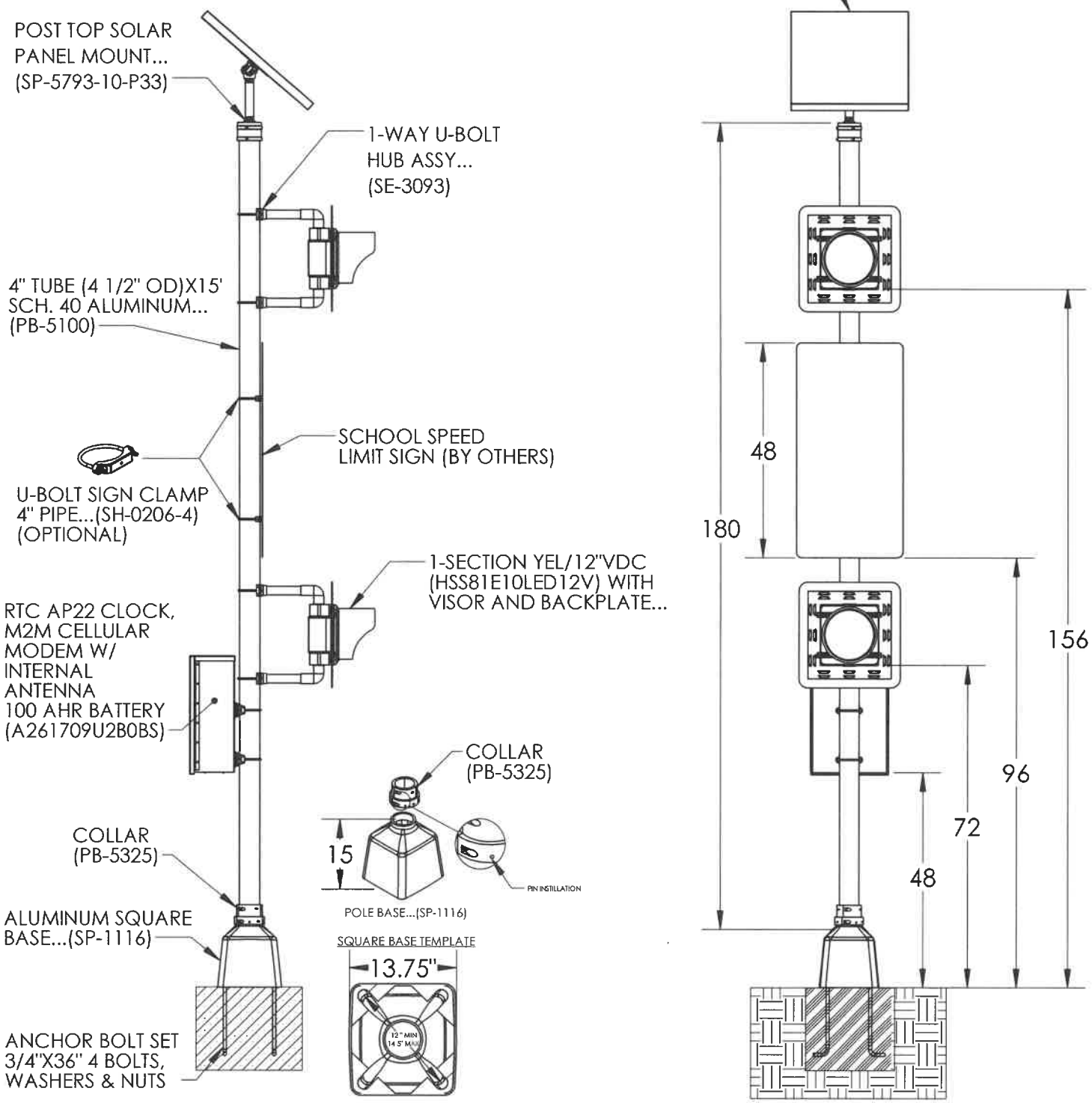
Enhanced Origin & Destination Studies

With the Origin & Destination Studies created in BlueARGUS users are able to determine the amount of through movements for a study area (Zones) or corridor, and monitor prevailing traffic patterns to assist on decisions related to route planning and congestion mitigation. With the new O/D Reports, a user can create as many traffic routes and zones as they wish, to compare number of matches and review trip details.

CHNICAL SPECIAL PROVI[illegible]S

700-12-XXX

FDOT APL#
700-026-012
678-009-005
700-026-016

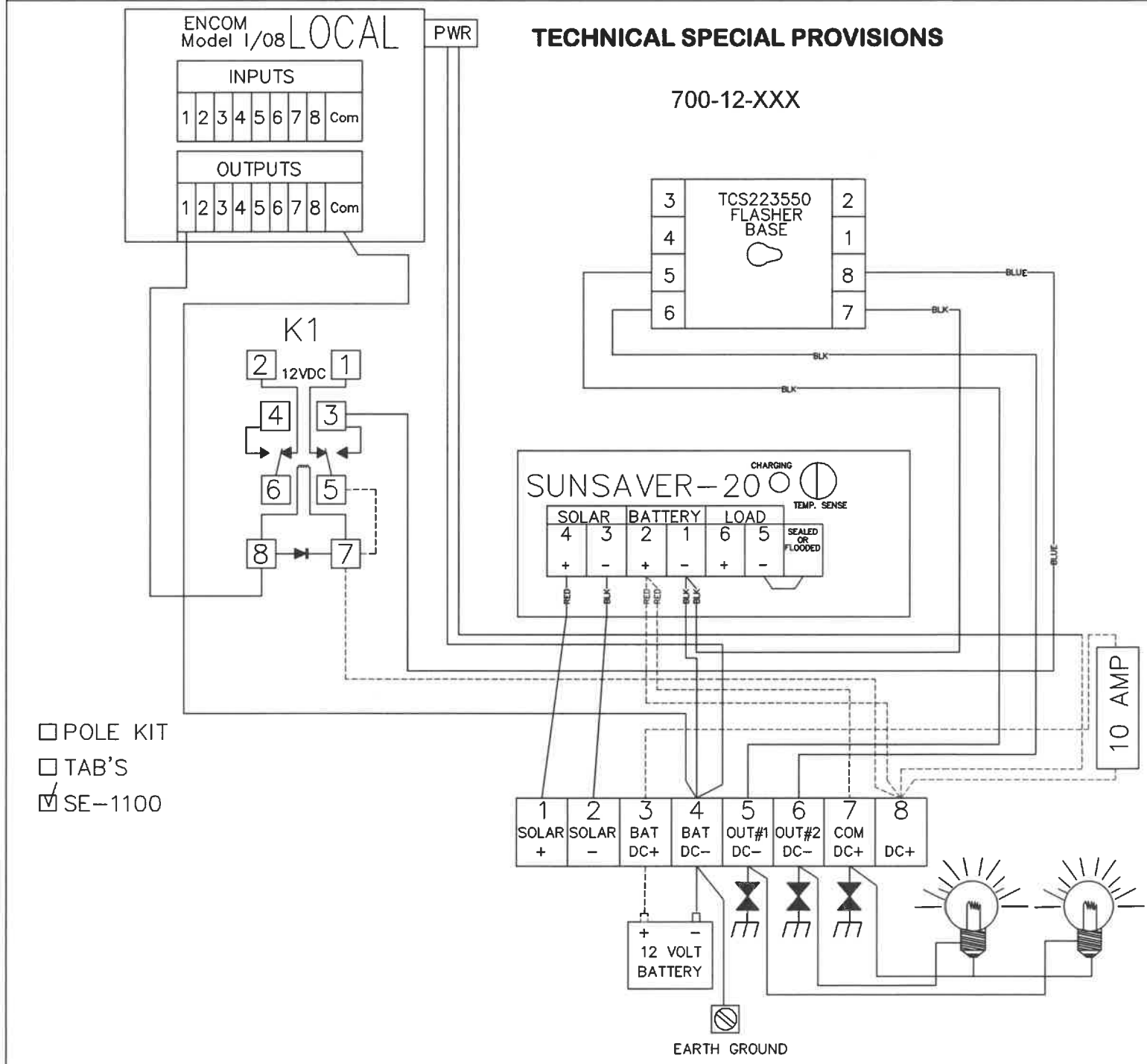


		THIRD ANGLE PROJECTIONS DIMENSIONS ARE IN INCHES TOLERANCES: X = ±.125 .X = ± .0625 .XX = ± .03125 ANGULAR: ±1 Degree		NAME	DATE
			DRAWN	MS	5/25/2017
			CHECKED		
			PROD APPR.		
			MFG APPR.		
		MATERIAL	Q.A.		
			PROPRIETARY AND CONFIDENTIAL		
NEXT ASSY	USED ON	FINISH	THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF TRANSPORTATION CONTROL SYSTEMS. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF TRANSPORTATION CONTROL SYSTEMS IS PROHIBITED.		
APPLICATION		DO NOT SCALE DRAWING			

TRANSPORTATION CONTROL SYSTEMS
1030 South 86th Street Tampa, Florida 33619 800.886.2735 813.630.2800 Fax813.630.2801
www.tcstraffic.com

TITLE			
CUSTOMER			
LOCATION		PROJECT	
SIZE A	SALES ORDER	DWG. NO. FPA-COLLIER DOUBLE	REV.
SCALE: 1:32	WEIGHT:		SHEET 1 OF 1

INSTALLATION PROCEDURE
CONNECTION ORDER
#1 BATTERY #2 SOLAR ARRAY #3 LOAD

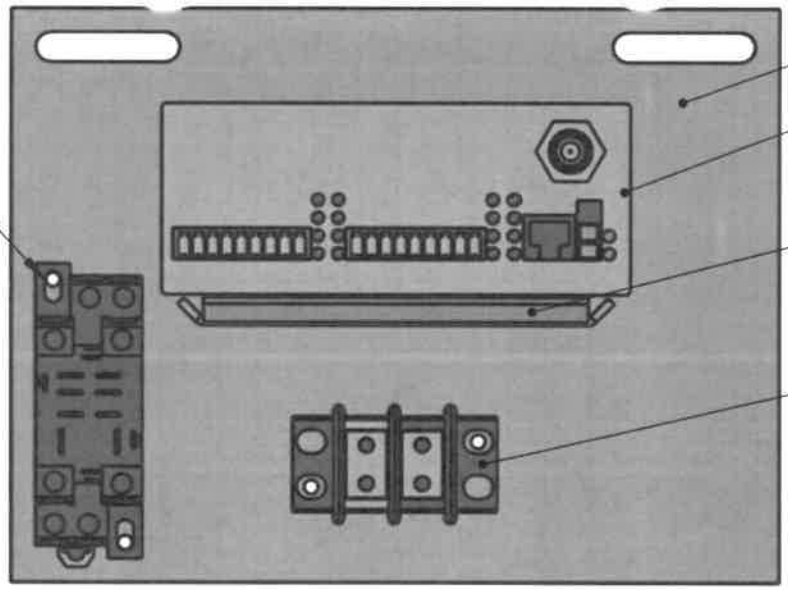


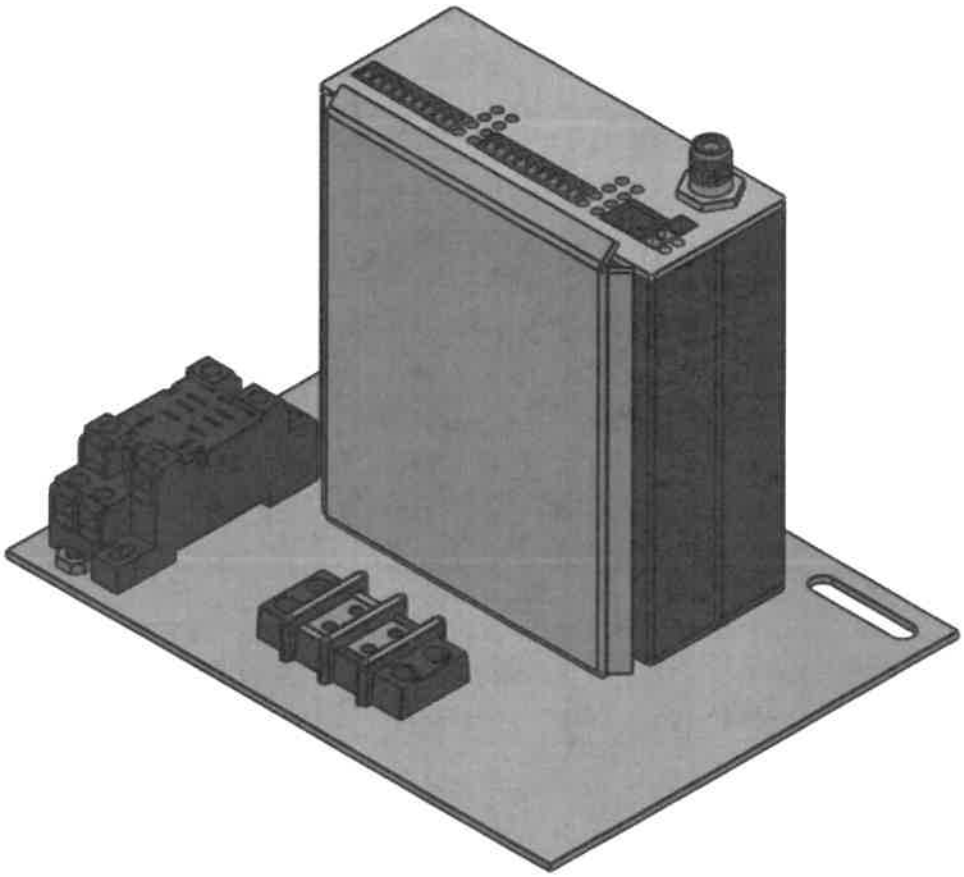
TRANSPORTATION CONTROL SYSTEMS
1030 SOUTH 86TH/ST Tampa, Florida 33619
(813) 630-2800

FDOT CERT. NO. 67014362608011

TITLE FLN202-ENCOM			PPB WIRELESS
CUSTOMER N/A			
LOCATION Push Button Or Hands Free Activation Pedestrin Crossing			
SALES ORDER # 000000	PRINT # 0000000 A	DATE 00/0000	PROJECT # 00000000

M:\Sales Order\ID2\C811DF82-98DE-4F80-B12D-2B768180485C\0\123000-123999\123388\L\L\FLN202-ENCOM (ID 123388).dwg, 5/





		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL ± ANGULAR: MACH ± BEND ± TWO PLACE DECIMAL ± THREE PLACE DECIMAL ±		NAME	DATE
			DRAWN	BT	05/08/2019
			CHECKED		
			ENG APPR.		
			MFG APPR.		
		MATERIAL	Q.A.		
			PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF TRANSPORTATION CONTROL SYSTEMS. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF TRANSPORTATION CONTROL SYSTEMS IS PROHIBITED.		
NEXT ASSY	USED ON	FINISH			
APPLICATION		DO NOT SCALE DRAWING			

TRANSPORTATION CONTROL SYSTEMS

TITLE: PANEL-93-1

CUSTOMER

LOCATION | PROJECT

SIZE A | SALES ORDER | DWG. NO. PANEL-93-1 | REV.

SCALE: 1:50 | WEIGHT: | SHEET 1 OF 1

MILBANK®
ENERGY AT WORK

UAP3505-XL-TG-HSP

Catalog Number	UAP3505-XL-TG-HSP
Marketing Product Description	5 Terminal Ringless Small Closing Plate Triplex Ground Lever Bypass Stainless Steel Hasp Aluminum Painted
UPC	784572301061
Length (IN)	4.844
Width (IN)	10
Height (IN)	18.5
Brand Name	Milbank
Type	Ringless Meter Socket
Application	Meter Socket
Standard	UL Listed;Type 3R
Voltage Rating	600 Volts Alternating Current
Amperage Rating	125 Continuous Ampere
Phase	1 Phase
Frequency Rating	60 Hertz
Size	4.844L x 10W x 18.5H
Number Of Cutouts	0
Cutout Size	No Main Breaker
Cable Entry	Overhead
Terminal	Lay in
Insulation	Glass Polyester
Mounting	Surface Mount

Enclosure	Aluminum with Powder Coat Finish
Jaw Quantity	5 Terminal
Bypass Type	Lever Bypass
Number of Meter Positions	1 Position
Equipment Ground	Triplex Ground
Hub Opening	Small Closing Plate
Line Side Wire Range	6 - 2/0 AWG
Load Side Wire Range	6 - 2/0 AWG
Number Of Receptacles	0

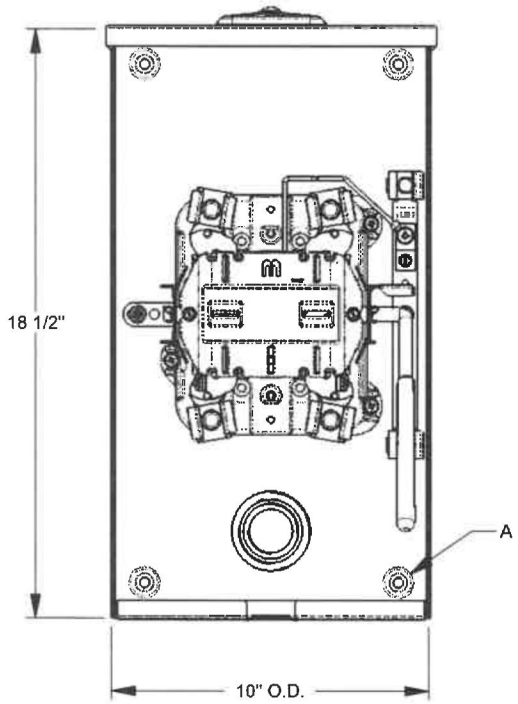
TSP-137

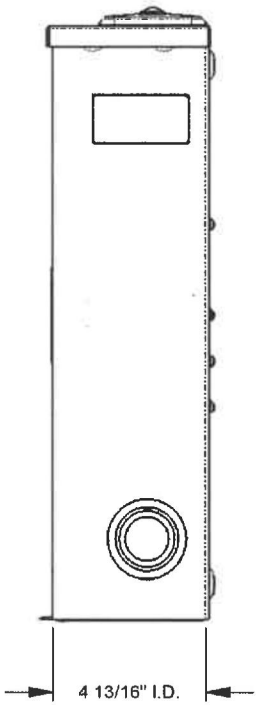
Please consult serving utility for their requirements prior to ordering or installing, as specifications and approvals vary by utility and may require local electrical inspector approval. All installations must be installed by a licensed electrician and must comply with all national and local codes, laws and regulations. Milbank reserves the right to make changes in specifications and features shown without notice or obligation.

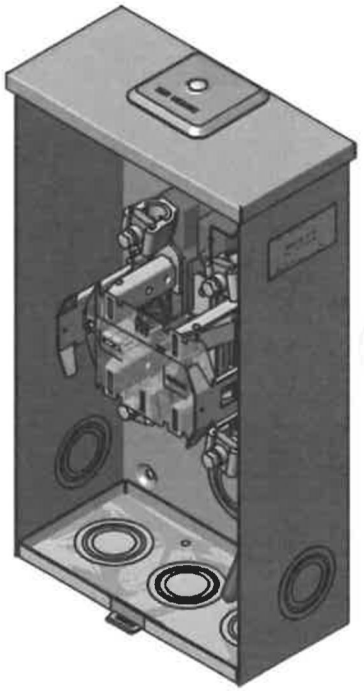
TECHNICAL SPECIAL PROVISIONS

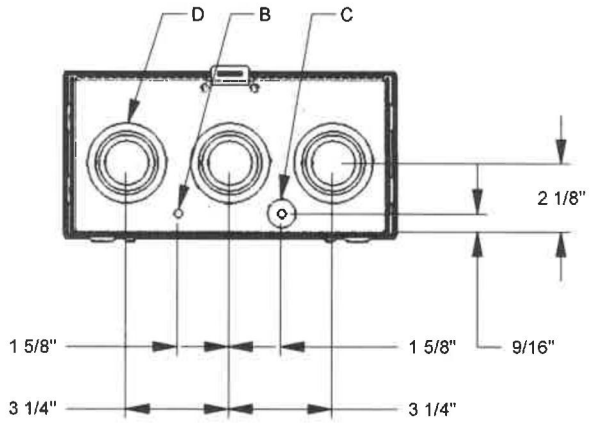
639-1-XXX

FEATURE TABLE		
ITEM	QTY	DESCRIPTION
A	4	STD. MNTG. EMBOSS
B	1	¼ SOLID K.O.
C	1	¼, ½ CONC. K.O.
D	6	1, 1¼, 1½, 2 CONC. K.O.









MILBANK
ENERGY AT WORK

Version:

1

All dimensions are +/- 1/16".
Drawing views are not to scale.

Please consult serving utility for their requirements prior to ordering or installing, as specifications and approvals vary by utility, and may require local electrical inspector approval. All installations must be installed by a licensed electrician and must comply with all national and local codes, laws and regulations. Milbank reserves the right to make changes in specifications and features shown without notice or obligation.

PALM BEACH COUNTY, FLORIDA

STANDARD SPECIFICATIONS FOR ROAD AND

BRIDGE CONSTRUCTION

DIVISION I, DIVISION II (Sections 100 thru 599), & DIVISION III

Florida Department of Transportation Standard Specifications for Road and Bridge Construction, dated July 2021 shall be used as the basis for the Work.

https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/programmanagement/implemented/specbooks/july2021/7-21ebook.pdf?sfvrsn=9a1c9abf_8

The Contractor agrees that the Florida Department of Transportation Standard Specifications for Road and Bridge Construction, July 2021 Edition, amended as follows by the General Provisions, but not otherwise changed, shall govern.

DIVISION II (Sections 600 thru 799)

Florida Department of Transportation Standard Specifications for Road and Bridge Construction, dated **January 2022** shall be used as the basis for the Work.

The Contractor agrees that the Florida Department of Transportation Standard Specifications for Road and Bridge Construction, **January 2022 Edition**, amended as follows by the General Provisions, but not otherwise changed, shall govern.

PALM BEACH COUNTY, FLORIDA
GENERAL PROVISIONS

DIVISION I
GENERAL REQUIREMENTS AND COVENANTS

SECTION 1
DEFINITIONS AND TERMS

1-3 Definitions

The following terms, when used in the Contract Documents, have the meaning described as follows:

Department THE FOLLOWING IS SUBSTITUTED:

The Palm Beach County Engineering & Public Works Department or The State of Florida Department of Transportation, as appropriate.

Engineer THE FOLLOWING IS SUBSTITUTED:

Palm Beach County Engineering, acting directly or through duly authorized representatives, such representatives acting within the scope of the duties and authority assigned to them.

Note: In order to avoid cumbersome and confusing repetition of expressions in these Specifications, it is provided that whenever anything is, or is to be done, if, as, or, when, or where "acceptable, accepted, approval, approved, authorized, condemned, considered necessary, contemplated, deemed necessary, designated, determined, directed, disapproved, established, given, indicated, insufficient, ordered, permitted, rejected, required, reserved, satisfactory, specified, sufficient, suitable, suspended, unacceptable, or unsatisfactory," it shall be understood as if the expression were followed by the words "by the Engineer", "to the Engineer", or "of the Engineer".

ADD THE FOLLOWING DEFINITION:
Financial Project Identification Number – *Project Number*

ADD THE FOLLOWING DEFINITION:
Lot - *The definition varies throughout the specification. The Engineer reserves the right to define the testing limits.*

ADD THE FOLLOWING DEFINITION:
Approved Products List - *Refers to FDOT's Approved Products List*

END OF SECTION

SECTION 2
PROPOSAL REQUIREMENTS AND CONDITIONS

2-1 Prequalification of Bidders DELETE AND INSERT THE FOLLOWING:

2-1.1 Palm Beach County Engineering & Public Works Department (Department) does not certify contractors. Although FDOT certification is not a requirement, the Department reserves the right to utilize FDOT's listing of pre-qualified contractors in determining a Bidder's eligibility to perform the Work required for this project.

Refer to URL http://www.fdot.gov/contracts/prequal_info/prequalified.shtm for access to pre-qualified FDOT contractors for construction contracts.

2-1.2 If the Bidder is not FDOT certified in the category of Traffic Signal, the Bidder shall provide with the Bid or within three (3) Business Days of the Department's request the following information regarding similar project(s) performed and completed by the Bidder within the past five years (Similar Projects Information):

Similar Projects Information *(complete the following for each similar project)*

Similar Project Experience	Name	
	Location	
	Total Construction Cost	
	Description	
Client/ Owner	Firm / Agency	
	Contact person	
	Phone number	
	Email	
Bidder's Role (prime/Sub-Contractor):		
Portion of Project Completed by Bidder:		
Construction Cost of Portion of Project Completed by Bidder:		

2-1.3 Additional information that may be requested by the Department may include but not be limited to the following (collectively, Additional Information):

- Supplemental listing of Similar Projects Completed by the Bidder
- FDOT Certification of Current Capacity and Status of Contracts On Hand (Form 525-010-46)
- Detailed information of financial resources of the Bidder

- Listing of equipment owned by the Bidder
- Key personnel resumes with a statement of their work category experience
- A list stating the types of work in which the Bidder can provide backup to show experience, expertise, and competence.
- The aggregate amount of work the Bidder currently has under contract
- Licensure information of the Bidder and personnel
- Any other pertinent information to assist in this qualification review

2-1.4 The Department will review the Similar Projects Information and, if requested, the Additional Information to determine if the Bidder has sufficient experience to perform the Work. Failure to provide the Similar Projects Information, and, where requested, the Additional Information, may cause the Bid to be rejected as non-responsive.

2-1.5 The Department reserves the right to request and require the Similar Projects Information and Additional Information to verify a Bidder's experience and qualifications for the Work, all of which shall be submitted within three (3) Business Days of the Department's request.

2-1.6 A person or affiliate who has been placed on the convicted vendor list following a conviction for a public entity crime may **not** submit the following:

(a) A bid on a contract to provide any goods or services to a public entity.

(b) A bid on a contract with a public entity for the construction or repair of a public building or public Work.

(c) Bids on leases of real property to a public entity.

A person or affiliate who has been placed on the convicted vendor list following a conviction for a public entity may not be awarded or perform Work as a contractor, supplier, Sub-Contractor, or consultant under a contract with any public entity, and may not transact business with any public entity in excess of the threshold amount provided in Section 287.017 F.S., for Category Two. All restrictions apply for a period of 36 months from the date of placement on the convicted vendor list.

2-2 Proposals

2-2.1 Obtaining Proposal Forms DELETE AND INSERT THE FOLLOWING:

Obtain a Proposal under the conditions stipulated in the Advertisement for Bid. The Advertisement states the location and description of the Work to be performed; the estimate of the various quantities (if applicable); the items of work to be performed (if applicable); the Contract Time; the amount of Proposal Guaranty; and the date, time, and place of the opening of Proposals. The

Proposal Form will also include any Special Provisions or other requirements which vary from or are not contained in the Standard Specifications.

The Plans, Specifications and other documents designated in the Advertisement are part of the Proposal, whether attached or not. Do not detach any papers bound with or attached to the Proposal.

ADD THE FOLLOWING SUB-ARTICLE:
2-2.1.1 Filling out Proposal Form (Pay Item Forms)

In filling out Proposal Forms, Bidders shall be governed by the following provisions:

(a) Proposals can be made on the blank Proposal Form provided (Excel file). The blank spaces in the Proposal Form must be filled in, regardless of whether quantities are shown, and no change shall be made either in the phraseology of, or in the items listed in the Proposal Form. It is the Bidder's responsibility to check and verify the accuracy of excel file formulas/extensions. Bidders are reminded that this is a unit price contract, and bid totals will be based on actual unit prices provided (see Section "e" below) regardless of extensions and totals shown.

(b) Each Proposal Form shall specify a unit price, for each of the separate items, as called for.

(c) Any Proposal which does not contain prices set opposite each of the items for which there is a blank space, or any Proposal which shall in any manner fail to conform to the conditions of the published notice will be cause for rejection.

(d) Proposals must be signed in ink by an authorized officer of the firm with the signature in full, and name and title of the officer. Example:

John Doe Contracting Company
By: John Doe, President

(e) In the event of mathematical errors in the extension of units and unit prices, the unit price shall prevail. The "Total Bid" as indicated on the Proposal Forms shall be the summation of the extension of units and unit prices only. Should the Proposal include "Alternate(s)", the total amount that will be considered for the "Alternate(s)" shall also be the summation of the extension of units and unit prices only, with the unit price prevailing.

When "Alternate(s)" are included, the Department reserves the right to award the Contract based on the "Total Bid" with or without the "Alternate(s)", with no recourse to the Contractor.

(f) When a corporation is a Bidder, the person signing shall state under the law of what state the corporation was chartered, and the name and title of the officer having authority under the by-laws to sign Contracts.

(g) Anyone signing the Proposal as agent must submit the Proposal with legal evidence of its agent's authority to do so. Post office address, county and state, must be given after the signature.

(h) Proposals that contain any omission, erasure, alteration, addition or item not called for in the Engineer's estimate, or that show irregularities of any kind, will be considered as informal or irregular. This will be cause for the rejection of the Bid.

2-2.2 Department Modifications to Contract Documents DELETE AND INSERT THE FOLLOWING:

Modifications to any Contract Documents will be posted at the following URL address:

https://pbcvssp.co.palm-beach.fl.us/webapp/vssp/AltSelfService

The Bidder shall take responsibility for checking and downloading the revised data from the Department's website. If the Department's website cannot be accessed, contact the Palm Beach County Purchasing Department at (561) 616-6800 or email PBCVendor@pbcgov.org.

2-2.3 Internet Bid Submittals DELETE IN ITS ENTIRETY

2-2.4 Hard Copy Bid Submittals DELETE AND INSERT THE FOLLOWING:

Unless otherwise indicated in the Advertisement for Bid, the Contractor shall prepare and submit the Bid as a hard copy submittal to the Department in accordance with the Contract Documents.

Print and submit Bid documents generated from the web site on letter size paper. Ensure that all computer generated sheets are legible. The Department prefers 12 point font size and recommends a minimum of 20 pound paper.

The Department will not be held responsible if the Bidder submits a Bid that is incomplete. Failure to follow proper procedures may cause the Bid to be declared non-responsive, or irregular.

2-5 Preparation of Proposals DELETE AND INSERT THE FOLLOWING:

2-5.1 General DELETE AND INSERT THE FOLLOWING:

Submit Proposals on the form described in 2-2. Any pay item that will be provided free or at no cost to the Department shall be indicated as "free" or "$00.00". If the pay item is left blank or N/A is used, the Bid may be declared irregular. Show the total of the Bid where called for on the Proposal Forms.

2-5.2 Internet Bid Submittals DELETE IN ITS ENTIRETY.

2-5.3 Hard Copy Bid Submittal DELETE AND INSERT THE FOLLOWING:

If the Proposal is made by an individual, either in the Bidder's own proper person or under a trade or firm name, the Bidder shall execute the Proposal under the Bidder's signature and enter the firm's office street address.

If made by a partnership, execute the Proposal by setting out in full the names of the partners, the firm name of the partnership, if any, have two or more of the general partners sign the Proposal and enter the Bidding firm's office street address.

If made by a corporation, execute the Proposal by setting out in full the corporate name and have the president or other legally authorized corporate officer or agent sign the Proposal, affix the corporate seal and enter the bidding corporation's office street address. If made by a limited liability company, execute the Proposal by setting out the company name, have the manager or authorized member sign the Proposal and enter the bidding company's office address.

If made by a joint venture, execute the Proposal by setting out the joint venture name, have the authorized parties sign the Proposal and enter the bidding office's street address.

2-6 Rejection of Irregular Proposals DELETE AND INSERT THE FOLLOWING:

A Proposal is irregular and the Department may reject it if it shows omissions, alterations of form, additions not specified or required, conditional or unauthorized alternate bids, or irregularities of any kind; or if the unit prices are obviously unbalanced, or if the cost is in excess of or below the reasonable cost analysis values.

ADD THE FOLLOWING SUB ARTICLE AFTER 2-6

2-6.1 Unbalanced Bid Items

Bid items in which the unit prices are not in line with the industry standards or averages for the items, may be considered to be unbalanced and rejected.

For a Bid to be balanced, each item must carry its proportionate share of direct cost, overhead and profit. Unbalanced items which are installed and billed at the beginning of a project may lead the Bid to be irregular due to front-end loading the Bid.

Bid which are determined by the Department to be unbalanced Bids or which contain unbalanced line item pricing when compared to competitor's Bids for the same item and standard industry prices, and which significantly deviate from the Department's determination of acceptable line item pricing, may be rejected by the Department.

2-7 Guaranty to Accompany Proposals (Bid Bond) DELETE AND INSERT THE FOLLOWING:

The Department will not consider any Proposal unless accompanied by a Proposal Guaranty of the character and amount indicated herein, and unless made payable to the Board of County Commissioners, Palm Beach County, Florida. Submit the Proposal with the understanding that the successful Bidder shall furnish a Contract Bond pursuant to the requirements of 3-5.

The Bidder's Proposal Guaranty is binding for all projects included in the Contract awarded to the Contractor pursuant to the provisions of this Sub article.

The Proposal Guaranty may be a Certified Check or a Cashier's Check and shall be made payable to the Board of County Commissioners, Palm Beach County, Florida, in the amount of 5% (Five Percent) of the total gross amount of the Bid as a guarantee that the Bidder, if given a letter of intent to award, will within fourteen (14) consecutive Working Days of the date of the letter, enter into a written Contract with the Board of County Commissioners in accordance with the accepted Bid. Certified checks shall be signed by the party whose Bid it accompanies.

2-8 Delivery of Proposals

2-8.1 Internet Bid Submittals DELETE IN ITS ENTIRETY

2-8.2 Hard Copy Bid Submittals DELETE AND INSERT THE FOLLOWING:

Submit the Proposal in a sealed envelope bearing on the outside the name of the Bidder, the Bidder's address, date of opening, and in large letters, the words:

CONSTRUCTION OF: ANNUAL TRAFFIC SIGNAL CONSTRUCTION CONTRACT

for which the Bidder submitted the Bid.

For Proposals that are submitted by mail, enclose the Proposal in a sealed envelope, marked as directed above. Enclose the sealed envelope in a second outer envelope addressed to the Department, at the place designated in the Advertisement. For a Proposal that is not submitted by mail, deliver it to the Department, or to the place as designated in the Advertisement. The Department will return Proposals received after the time set for opening Bids to the Bidder unopened.

A Bidder may withdraw a Proposal at any time prior to that fixed for opening Bids without prejudice to him/herself.

2-9 Withdrawal or Revision of Proposals

2-9.1 Internet Bid Submittals DELETE IN ITS ENTIRETY.

2-9.2 Hard Copy Bid Submittals DELETE AND INSERT THE FOLLOWING:

A Bidder may withdraw or revise a Proposal after submitting it, provided the Department receives a written request to withdraw or revise the Proposal prior to the time set for opening of Bids. The resubmission of any Proposal withdrawn under this provision is subject to the provisions of 2-8.

END OF SECTION

SECTION 3
AWARD AND EXECUTION OF CONTRACT

3-2 Award of Contract

3-2.1 General DELETE AND INSERT THE FOLLOWING:

If the Department decides to award the Contract, the Department will award the Contract to the lowest responsible, responsive Bidder whose Proposal complies with all the Contract Document requirements. If awarded, the Department will award the Contract within one hundred eighty (180) days after the opening of the Proposals, unless the Special Provisions change this time limit or the Bidder and the Department extend the time period by mutual consent.

For the purpose of award, the low Bid shall be the lowest amount bid for the "Total Bid", and if any alternates are considered, it shall be the "Total Bid" plus the addition for the alternate or alternates which the Department may select. In no case will any award be made until all necessary investigations are made into the responsibility of the lowest Bidder.

Prior to award of the Contract by the Department, the Bidder must provide proof of authorization to do business in the State of Florida.

Project Award

The Department reserves the right to make multiple awards for this contract. In the event the Department exercises this right, award will be made to the lowest, responsive, responsible Bidders. Work will be issued to the Bidders at the Department's discretion.

3-5 Contract Bond Required

3-5.1 General Requirements for All Bonds DELETE AND INSERT THE FOLLOWING:

Under no circumstances shall the Contractor begin Work until it has supplied the Department with a Contract Bond. Upon award, furnish to the Department, and maintain in effect throughout the life of the Contract, an acceptable Contract Bond. Obtain the Contract Bond from a Surety licensed to conduct business in the State of Florida, meeting all of the requirements of the laws of Florida and the regulations of the Department, and having the Department's approval. The Penal Sum of

the Contract Bond shall automatically increase as the Contract Amount increases; provided, however, that any increase of more than 20% from the initial Penal Sum, requires the Surety's written consent. Ensure that the Surety's Florida Licensed Insurance Agent's name, address, and telephone number is clearly stated on the Contract Bond form.

To insure the faithful performance of each and every condition, any stipulation and requirement of the Contract Documents and to indemnify and save harmless the Department from any and all damages, either directly or indirectly, arising out of any failure to perform same, the Contractor shall furnish to the Department, the Contract Bond on forms attached hereto.

3-5.1.1 Work Order For Less Than $200,000

For each Work Order in an amount less than $200,000, furnish to the Department and maintain in effect throughout the duration of the Work Order, a Surety Bond in the amount of $50,000, as security for faithful performance of Work Order(s) and for the payment of all persons performing labor and furnishing Materials in connection therewith. In the event that the amount of a proposed Work exceeds the amount of the Surety Bond, furnish additional Surety Bond, in increments of $50,000, so that the total amount of the Surety Bond(s) exceeds the amount of all Work Orders.

3-5.1.2 Work Order For $200,000 or More

For each Work Order in the amount of $200,000 or more, furnish to the Department and maintain in effect throughout the duration of the Work Order, an acceptable Surety Bond in an amount at least equal to the amount of the total Work Order, as security for faithful performance and for the payment of all persons performing labor, and furnishing Materials in connection therewith.

3-6 Execution of Contract and Contract Bond DELETE AND INSERT THE FOLLOWING:

The Contractor shall execute the Contract and provide satisfactory Contract Bond and documentation evidencing all insurance required per Section 7-13 (Insurance) to the Department within fourteen (14) Working Days of the date of the Letter of Intent to Award.

Per Section 8-1, Contractor shall perform not less than 40% of the total Contract with its own organization. Therefore, Contractor shall submit with the Contract Documents a detailed breakdown (in dollars and percentage) of how the total Contract amount is proposed to be distributed. The breakdown shall show all relevant information for the Contractor and all sub-contractors.

ADD THE FOLLOWING SUB-ARTICLE:
3-6.1 Recording of Contract Bond

Before commencing the Work, Contractor shall provide to the Department a certified copy of the recorded Contract Bond(s). Department may not make any payment to Contractor until Contractor has complied with this requirement.

3-7 Failure by Contractor to Execute Contract and Furnish Bond DELETE AND INSERT THE FOLLOWING:

In the event that the Contractor fails to execute the Contract and to furnish an acceptable Contract Bond, as prescribed in 3-5 and 3-6, within fourteen (14) Working Days of Intent to Award, the Department may cause the Contractor to forfeit the Proposal Guaranty to the Department not as a penalty but as liquidation of damages sustained. The Department may then award the Contract to the next lowest responsive, responsible Bidder, re-advertise, or accomplish the Work using alternate resources.

3-8 Audit of Contractor's Records DELETE AND INSERT THE FOLLOWING:

Upon execution of the Contract, the Department reserves the right to conduct an audit of the Contractor's records pertaining to the project. The Department or its representatives may conduct an audit, or audits, at any time prior to final payment, or thereafter pursuant to 5-13. The Department may also require submittal of the records from either the Contractor or any Sub-Contractor or material supplier. As the Department deems necessary, records include all books of account, supporting documents, and papers pertaining to the cost of performance of the Work. Retain all records pertaining to the Contract for a period of not less than four years from the date of the Engineer's final acceptance of the project, unless a longer minimum period is otherwise specified. Upon request, make all such records available to the Department or its representative(s). For the purpose of this Article, records include but are not limited to all books of account, supporting documents, and papers that the Department deems necessary to ensure compliance with the provisions of the Contract Documents. If the Contractor fails to comply with these requirements, the Department may disqualify or suspend the Contractor from bidding on or working as a Sub-Contractor on future Contracts. Ensure that the Sub-Contractors provide access to their records pertaining to the project upon request by the Department. Comply with Section 20.055(5), Florida Statutes, and incorporate in all subcontracts the obligation to comply with Section 20.055(5), Florida Statutes.

END OF SECTION

SECTION 4
SCOPE OF THE WORK

4-1 Intent of Contract DELETE AND INSERT THE FOLLOWING:

The intent of the Contract is to provide for the construction and completion in every detail of the Work described in the Contract. Furnish all labor, Materials, Equipment, tools, transportation and supplies required to complete the Work in accordance with the Contract Documents.

All of the Work involved in this project shall conform to the construction Plans and Specifications and shall be completed in a workmanlike manner. All debris is to be removed within the time specified in the Contract.

4-3 Alteration of Plans or of Character of Work

4-3.1 General DELETE AND INSERT THE FOLLOWING:

The Engineer reserves the right to make, at any time prior to or during the progress of the Work, such increases or decreases in quantities and such alterations in the details of construction as may be found necessary or desirable by the Engineer. Such increases, decreases or alterations shall not constitute a breach of Contract, shall not invalidate the Contract, nor release the Surety from any liability arising out of this Contract or the Contract Bond. The Contractor agrees to perform the Work, as altered, the same as if it had been a part of the original Contract.

4-3.9 Cost Savings Initiative Proposal DELETE IN ITS ENTIRETY.

4-4 Unforeseeable Work DELETE AND INSERT THE FOLLOWING:

When the Department requires Work that is not covered by a price in the Contract, and the Department finds that such Work is essential to the satisfactory completion of the Contract within its intended scope, the Department will make an adjustment to the Contract. The Engineer will determine the basis of payment for such an adjustment in a fair and equitable amount.

END OF SECTION

SECTION 5
CONTROL OF THE WORK

5-1 Plans and Working Drawings

5-1.1 Contract Documents DELETE AND INSERT THE FOLLOWING:

The Contractor will be furnished five (5) copies of the Plans and Specifications at the Pre-Construction Meeting. Additional copies may be purchased from the Department, at a total cost of **$45** per set of Plans and Contract Documents.

The Contractor shall have Contract Documents available on the job site at all times.

5-1.4.5 Submittal Paths and Copies

5-2 Coordination of Contract Documents DELETE AND INSERT THE FOLLOWING:

These Specifications, the Plans, Special Provisions, and all supplementary documents are integral parts of the Contract; a requirement occurring in one is as binding as though occurring in all. All parts of the Contract are complementary and describe and provide for a complete Work.

When not stipulated as being covered under other pay items, pay items will include:

- the Work and Materials specified in the Specifications
- additional, incidental Work, not specifically mentioned,
    - when so shown in the Plans
    - if indicated, or obvious and apparent, as being necessary for the proper completion of the Work

In cases of discrepancy, the governing order of the documents is as follows:

1. Proposal (i.e. pay items, Bid items)
2. Special Provisions
3. Technical Special Provisions
4. Plans
5. Standard Plans
6. Design Standards
7. Supplemental Specifications
8. General Provisions
9. Standard Specifications

Computed dimensions govern over scaled dimensions.

5-7 Engineering and Layout

5-7.1 Control Points Furnished by the Department ADD THE FOLLOWING AT THE END OF THIS ARTICLE:

Should reference points or benchmarks fall within construction limits, the Contractor shall notify the Engineer for survey coordination, and establish new reference points or benchmarks in locations that will not be affected by the construction and preserved upon completion of construction.

The Contractor shall have a licensed surveyor verify the accuracy of the survey data prior to proceeding with Work.

5-7.3 Layout of Work DELETE AND INSERT THE FOLLOWING:

Utilizing the control points furnished by the Department in accordance with 5-7.1, the Contractor shall have a licensed surveyor verify the accuracy of the survey data prior to proceeding with Work, and establish all horizontal and vertical controls necessary to construct the Work in conformity to the Contract Documents. Perform all calculations required, and set all stakes needed such as grade stakes, offset stakes, reference point stakes, slope stakes, and other reference marks or points necessary to provide lines and grades for construction of all Roadway, Bridge, and miscellaneous items.

When performing utility construction as part of the project, establish all horizontal and vertical controls necessary to carry out such Work.

5-10-Inspections

5-10.2 Inspection for Acceptance DELETE AND INSERT THE FOLLOWING:

Upon notification that all Contract Work, or all Contract Work on the portion of the Contract scheduled for acceptance, has been completed, the Engineer will make an inspection for acceptance. The inspection will be made within seven days of the notification. If the Engineer finds that all Work has been satisfactorily completed, the Department will consider such inspection as the final inspection. If any or all of the Work is found to be unsatisfactory, the Engineer will detail in writing the remedial Work required to achieve acceptance. The Contract Time shall be suspended to allow the Contractor time to complete the remedial Work in accordance with the following schedule; with the suspension commencing upon the date of the written notification by the Department:

Contract Amount	Contract Time Suspension
≤$5,000,000	30 Days
>$5,000,000≤$10,000,000	45 Days
>$10,000,000	60 Days

If all Work is not completed by the Contractor and accepted by the Engineer during the Contract Time Suspension, the Contract Time shall resume and, after any remaining Contract Time is expended, Liquidated Damages shall be assessed until all Work is accepted by the Engineer.

Upon satisfactory completion of the Work, the Department will provide written notice of acceptance, either partial or final, to the Contractor.

Until final acceptance in accordance with 5-11, replace or repair any damage to the accepted Work at no additional cost to the Department and as provided in 7-14.

5-12 Claims by Contractor

5-12.2 Notice of Claim

5-12.2.1 Claims for Extra Work DELETE IN ITS ENTIRETY

5-12.3 Content of Written Claim DELETE ITEM (5) IN ITS ENTIRETY

5-12.5 Pre-Settlement and Pre-Judgment Interest DELETE IN ITS ENTIRETY

5-12.6 Compensation for Extra Work or Delay DELETE IN ITS ENTIRETY

END OF SECTION

SECTION 6
CONTROL OF MATERIALS

6-1 Acceptance Criteria

ADD THE FOLLOWING SUB ARTICLE:
6-1.2.5

All Materials that are subjected to tests by samples or otherwise, shall be compensated for as follows:

(a) All tests made that indicate failures to meet the design criteria shall be paid for by the Contractor.

(b) All tests made that indicate passing of the design criteria and approved as such by the Engineer, shall be paid for by the Owner or Palm Beach County.

6-5.2 Source of Supply-Steel REPLACE TITLE OF ARTICLE WITH THE FOLLOWING:

Source of Supply-Steel (For Federal Aid Contracts only)

ADD THE FOLLOWING SUB ARTICLE:
6-6 Warranty

The Contractor guarantees to the Owner and Engineer that all Materials and Equipment furnished under this Contract will be new unless otherwise specified and that all Work will be of good quality, free from faults and defects and in conformance with Contract Documents. All Work not so conforming to these requirements may be considered defective. If required by the Engineer, the Contractor shall furnish satisfactory evidence as to the kind and quality of Materials, Work, and Equipment. All Work shall be warranted and guaranteed unconditionally for a period of one (1) year after the letter of final acceptance. The Surety shall be bound with and for the Contractor in the Contractor's faithful observance of the guarantee. The Contractor shall furnish to the Department, the Form of Guarantee on forms attached hereto.

END OF SECTION

SECTION 7
LEGAL REQUIREMENTS
AND RESPONSIBILITY TO THE PUBLIC

7-1.9 Florida Minority Business Loan Mobilization Program DELETE IN ITS ENTIRETY.

7-2 Permits and Licenses

7-2.1 General DELETE AND INSERT THE FOLLOWING:

Except for permits procured by the Department, if any, procure all permits and licenses, pay all charges and fees, and give all notices necessary and incidental to the due and lawful prosecution of the Work.

It shall be the Contractor's responsibility to become familiar with all local governmental codes, ordinances, and laws governing, associated with, or pertaining to the prosecution and completion of the Work. Any costs involved in procuring permits and licenses, complying with local codes, ordinances or laws, or giving notices shall be incidental to the project and paid by the contractor.

The Department will also acquire any modifications or revisions to an original permit when the Contractor requires such modifications or revisions to complete the construction operations specified in the Plans or Special Provisions and within the Right-of-Way limits.

Acquire all permits for Work performed outside the Right-of-Way or easements for the project. Acquire permits required by municipality or public agency, including but not limited to tree removal and dewatering permits. The permitting time shall be included in the Proposal and Work progress schedule. The Contractor shall also be responsible for completing appropriate certifications by a Professional Engineer, certified in the State of Florida, as outlined on PER-1.

In carrying out the Work in the Contract, when under the jurisdiction of any environmental regulatory agency, comply with all regulations issued by such agencies and with all general, special, and particular conditions relating to construction activities of all permits issued to the Department as though such conditions were issued to the Contractor. Post all permit placards in a protected location at the worksite.

In case of a discrepancy between any permit condition and other Contract Documents, the more stringent condition shall prevail.

7-11.3 Contractor's Use of Streets and Roads

7-11.3.2 On the State Highway System DELETE AND INSERT THE FOLLOWING:

When hauling Materials or Equipment to the project over roads and bridges on the State Highway System and such use causes damage, immediately, at no expense to the Department, repair such Road or Bridge to as good a condition as before the hauling began.

7-11.5 Utilities

7-11.5.1 Arrangements for Protection or Adjustment DELETE AND INSERT THE FOLLOWING:

Unless otherwise specified, all references to utility Work, conflicts, relocation, coordination, adjustments, permits, utility pay items, and similar references shall be considered separate and distinct from Roadway and Bridge items and shall pertain to all utilities including Palm Beach County Water Utilities Department (PBCWUD) and Palm Beach County Traffic Division. The

Contractor shall be responsible to be familiar with and assure that all utility related Work be performed in accordance with each respective utility department's minimum engineering and construction standards.

Sufficient time has been allotted in the Contract time for the Contractor to coordinate the installation and relocation, if necessary, of all utilities.

The Contractor shall be responsible to ascertain the exact location of all utilities prior to construction regardless of information which may be indicated on the drawings. Utilities shall be located and marked in the field.

The Contractor shall be responsible to verify if "other" utilities (not shown in the Plans) exist within the area of construction. Should there be utility conflicts, the Contractor shall inform the Engineer and notify the respective utility owners to resolve utility conflicts and utility adjustments, as required.

The Contractor shall plan his Work and conduct his construction operations in cooperation with the various utility companies. The Contractor shall use extreme caution where construction is performed in proximity to utilities, and the Engineer and the respective utility owner shall be notified when any Work may conflict with the utilities.

The Contractor shall make all necessary arrangements with the Utility Companies concerned for the maintenance of their lines during the construction period. In the event that complete relocation of utilities has not been accomplished prior to the effective date of the "Notice to Proceed", the Contractor nevertheless shall commence to Work under this Contract and schedule his Work to avoid interference with the utility relocation Work. The Department will not be liable for any damage to any utilities due to any action by the Contractor.

7-12 Responsibility for Damages, Claims, etc.

7-12.1 Contractor to Provide Indemnification DELETE AND INSERT THE FOLLOWING:

The Contractor shall protect, indemnify, defend, reimburse, save, and hold harmless the Department and all of its officers, agents, and employees from and against all suits, actions, claims, demands, liability, expense, loss, cost or causes of action of any kind or character, including attorney's fees and costs, whether at trial or appellate levels or otherwise, arising out of, because of, during, or due to the acts or omissions commission of the Contractor, its officers, agents, or employees or as a result of their performance of the terms of the Contract. In the performance of the Contract, neither the contractor/consultant, nor any of its officers, agents, or employees will be liable under this section for damages arising out of injury or damage to persons or property directly caused or resulting from the sole negligence of the Department or any of its officers, agents, or employees.

The Contractor shall include the provision in any and all agreements with Sub-Contractors executed in connection with this Contract.

Unless otherwise noted herein, no provision of this Contract is intended to, or shall be construed to, create any third party beneficiary or to provide any rights to any person or entity not a party to this Contract, including but not limited to any citizen or employees of the Contractor.

7-13 Insurance DELETE ENTIRE SECTION AND INSERT THE FOLLOWING:

7-13.1 General

Unless otherwise specified in this Contract, or approved by the Department, the Contractor shall, at its sole expense, maintain in full force and effect at all times during the Contract and the performance of Work, including the warranty period, insurance coverage with limits, including endorsements, not less than those set forth in the Insurance Coverage and Limit Table below and with insurers and under forms of policies acceptable to the Department. Contractor shall furnish to the Department Certificate(s) of insurance evidencing that such policies are in full force and effect, not later than fourteen (14) Calendar Days of the date of the letter of Intent to Award, but in any event, prior to execution of the Contract by the Department and prior to commencement of Work. Such certificate(s) shall adhere in every respect to the conditions set forth herein.

The requirements contained herein as to types and limits, as well as the Department's approval of insurance coverage to be maintained by Contractor, are not intended to and shall not in any manner limit or qualify the liabilities and obligations assumed by Contractor under the Contract.

7-13.1.1 Commercial General Liability Insurance

Furnish and maintain a standard Insurance Service Office (ISO) version Commercial General Liability policy form, or its equivalent providing coverage for, but not be limited to, Bodily Injury and Property Damage, Premises/Operations, Personal Injury, Products/Completed Operations, Independent Contractors, Contractual Liability, Broad Form Property Damage, X-C-U (X = Explosion; C = Collapse; U = Underground) Coverages (if applicable), Severability of Interest including Cross Liability, and be in accordance with all of the limits, terms and conditions set forth herein. Contractor agrees this coverage shall be provided on a primary basis.

7-13.1.2 Business Automobile Liability Insurance

Furnish and maintain a standard ISO version Business Automobile Liability coverage form, or its equivalent, providing coverage for all owned, non-owned and hired automobiles, and in accordance with all of the limits, terms and conditions set forth herein. Contractor agrees this coverage shall be provided on a primary basis. Notwithstanding the foregoing, should the Contractor not own any automobiles, the business auto liability requirement shall be amended to allow the Contractor to agree to maintain only Hired & Non-Owned Auto Liability. This amended coverage requirement may be satisfied by way of endorsement to the Commercial General Liability, or separate Business Auto Coverage form.

7-13.1.3 Workers' Compensation and Employer's Liability Insurance

Furnish and maintain Workers' Compensation Insurance and Employer's Liability, including Federal Act endorsement for U.S. Longshore and Harbor Workers' Compensation Act when any Work is on or contiguous to navigable bodies of U.S. waterways and ways adjoining, covering all of its employees on the Work site. This coverage shall be in accordance with all of the limits, terms and conditions set forth herein. Exemptions for a Contractor in or doing Work in the Construction Industry, or proof of Workers' Compensation coverage provided by an employee leasing arrangement shall not satisfy this requirement.

If any Work is sublet Contractor shall require all Sub-Contractors to similarly comply with this requirement unless such Sub-Contractors' employees are covered by Contractor's Workers' Compensation insurance policy. Contractor agrees this coverage shall be provided on a primary basis. Contractor shall defend, indemnify and save the Department harmless from any damages resulting to them for failure of Contractor to take out or maintain such insurance.

7-13.1.4 Additional Required Insurance

Furnish and maintain the following additional required insurance coverages with respect to any Work involving property, operations, or type of Equipment for which each insurance coverage described below has been designed specifically to provide coverage for when Work involves.

7-13.1.4.1 Railroad Protective Liability Insurance

With respect to any of the Work involving construction of a railroad grade crossing, overpass or underpass structure, or a railroad crossing signal installation, or any other Work or operations by the Contractor within the limits of the railroad right of way, including any encroachments thereon from Work or operations within the vicinity of the railroad right of way the Contractor shall furnish to the Department for transmittal to the railroad company, an original insurance policy which, with respect to the operations the Contractor or any of its Sub-Contractors perform, will provide for and in behalf of the railroad company, Railroad Protective Liability Coverage. Coverage shall be in accordance with all of the limits, terms and conditions set forth herein and conform with the requirements of the U.S. Department of Transportation, Federal Highway Administration, Federal-Aid Program Manual, Volume 6, Chapter 6, Section 2, Subsection 2, Transmittal 350, dated October 1, 1982, and any supplements or revisions. Contractor agrees this coverage shall be provided on a primary basis.

7-13.1.4.2 Watercraft Liability Insurance

With respect to any of the Work hereunder involving watercraft owned, hired, or borrowed, the Contractor shall furnish and maintain Protection and Indemnity, or similar Watercraft Liability. Coverage shall be included either by way of endorsement under the Commercial General Liability or by separate watercraft liability insurance and be in accordance with all of the limits, terms and conditions set forth herein. Contractor agrees this coverage shall be provided on a primary basis.

7-13.1.4.3 Aircraft Liability Insurance

With respect to any of the Work involving including fixed wing or helicopter aircraft, aircraft owned, hired, or borrowed, including the Contractor shall furnish and maintain Aircraft Liability. Passenger Liability shall be included when persons other than the pilot and crew are occupying the aircraft. Coverage shall be in accordance with all of the limits, terms and conditions set forth herein. Contractor agrees this coverage shall be provided on a primary basis.

7-13.2 Utility Owners Protective Liability Insurance

When the Work under the Contract involves the installation of attachments to joint-use utility poles, the Contractor shall furnish evidence to the Department that, with respect to the operations the Contractor performs, his Commercial General Liability is endorsed with a Broad Form Contractual Endorsement covering the below indemnification or the Department and Utility Company are to be an Additional Named Insured on the policy.

The Contractor hereby agrees to indemnify, defend, save and hold harmless the Department and any owner of Equipment attached to or supported by a jointly used pole from all claims, liabilities and suits whether or not due to or caused by negligence of the Department or joint pole Equipment owners for bodily injury or death to person(s) or damage to property resulting in connection with the performance of the described Work by Contractor, its Sub-Contractors, agents or employees.

7-13.3 Satisfying Limits Under an Umbrella Policy

If necessary, the Contractor may satisfy the minimum limits required above for either Commercial General Liability, Business Auto Liability, and Employer's Liability coverage under an Umbrella or Excess Liability. The underlying limits may be set at the minimum amounts required by the Umbrella or Excess Liability provided the combined limits meet at least the minimum limit for each required policy. The Umbrella or Excess Liability shall have an Annual Aggregate at a limit not less than two (2) times the highest per occurrence minimum limit required above for any of the required coverages. The Department and any other applicable entities shall be specifically endorsed as an "**Additional Insured**" on the Umbrella or Excess Liability, unless the Umbrella or Excess Liability provides continuous coverage to the underlying policies on a complete Follow-Form basis without exceptions and stated as such on the Certificate of Insurance.

7-13.4 Additional Insured

The Contractor agrees to endorse the Department and any other required entity as an Additional Insured on each insurance policy required to be maintained by the Contractor, except for Workers' Compensation and Business Auto Liability. The CG 2026 Additional Insured - Designated Person or Organization endorsement, or its equivalent, shall be endorsed to the Commercial General Liability. Other policies, when required, such as for watercraft, aircraft, and utility owners protective, shall provide a standard Additional Insured endorsement offered by the insurer providing coverage with respect to liability arising out of the operations of the Contractor. The endorsement shall read "Palm Beach County Board of County Commissioners". The Contractor

shall agree that the Additional Insured endorsements provide coverage on a primary basis. Endorsement shall be in accordance with all of the limits, terms and conditions set forth herein.

7-13.5 Additional Requirements

7-13.5.1 Waiver of Subrogation

The Contractor agrees, by entering into this Contract, to a Waiver of Subrogation for each required policy providing coverage during the Contract. When required by the insurer or should a policy condition not permit an Insured to enter into a pre-loss agreement to waive subrogation without an endorsement, then the Contractor shall agree to notify the insurer and request the policy be endorsed with a Waiver of Transfer of Rights of Recovery Against Others, or its equivalent. This Waiver of Subrogation requirement shall not apply to any policy, which a condition to the policy specifically prohibits such an endorsement, or voids coverage should the insured enter into such an agreement on a pre-loss basis. The Waiver of Subrogation shall be in accordance with all of the limits, terms and conditions set forth herein.

7-13.5.2 Right to Review & Adjust

The Contractor shall agree, notwithstanding the foregoing, that the Department, by and through its Risk Management Department, in cooperation with the Department, reserves the right to periodically review, reject or accept all required policies of insurance, including limits, coverages, or endorsements, hereunder from time to time throughout the life of this Contract. Furthermore, the Department reserves the right to review and reject any insurer providing coverage because of poor financial condition or because it is not operating legally. In such event, the Department shall provide Contractor written notice of such adjusted limits and Contractor shall agree to comply within thirty (30) days of receipt thereof and to be responsible for any premium revisions as a result of any such reasonable adjustment.

7-13.5.3 No Representation of Coverage Adequacy

The coverages and limits identified in the table have been determined to protect primarily interests of the Department only, and the Contractor agrees in no way should the coverages and limits in the table be relied upon when assessing the extent or determining appropriate types and limits of coverage to protect the Contractor against any loss exposures, whether as a result of the construction project or otherwise.

7-13.5.4 Certificate of Insurance

Certificates of Insurance must provide clear evidence that Contractor's Insurance Policies contain the minimum limits of coverage, cancellation notice, and terms and conditions set forth herein.

In the event the Department is notified that a required insurance coverage will be cancelled or non-renewed during the period of this Contract, the Contractor shall furnish prior to the expiration of such insurance, an additional certificate of insurance as proof that equal and like coverage for the

balance of the period of the Contract and any extension thereof is in effect. Contractor shall not continue to Work pursuant to this Contract unless all required insurance remains in effect.

The Department shall have the right, but not the obligation, of prohibiting Contractor or any Sub-Contractor from entering the project site until such certificates or other evidence that insurance has been placed in complete compliance with these requirements is received and accepted by the Department.

The Department Reserves The Right To Withhold Payment, But Not The Obligation, To Contractor Until Coverage Is Reinstated. If The Contractor Fails To Maintain The Insurance As Set Forth Herein, The Department Shall Have The Right, But Not The Obligation, To Purchase Said Insurance At Contractor's Expense.

7-13.5.4.1 Additional Requirements for Certificates of Insurance

1. Shall clearly identify Palm Beach County, a political subdivision of the State of Florida, its officers, agents and employees as **Additional Insured** for all required insurance coverages, except Workers' Compensation and Business Auto Liability.

2. Shall clearly indicate project name and project number to which it applies.

3. Shall clearly indicate a notification requirement in the event of cancellation or non-renewal of coverage.

4. Evidence of renewal coverage or reinstatement of cancelled coverage must be provided in advance of any policy that may expire during the term of this Contract. Failure to provide such certificate shall result in automatic stoppage of the Work until such time as the renewal certificate is supplied.

5. Within forty-eight (48) hours of a request by the Department, and subsequently, prior to expiration of any of the required coverage throughout the term of this Contract, the Contractor shall deliver to the Department at the address below, unless otherwise directed by the Department, a signed Certificate(s) of Insurance, evidencing that all types and amounts of insurance coverage required by this Contract have been obtained and are in full force and effect. Said Certificate(s) of Insurance shall, to the extent allowable by the insurer, include a minimum thirty (30) days' endeavor to notify due to cancellation (10 days for nonpayment of premium) or non-renewal of coverage. The Certificate Holder shall read:

Palm Beach County Board of County Commissioners
c/o Engineering Department / Roadway Production Division
2300 N. Jog Road
Third Floor, West Wing
West Palm Beach, FL 33411

6. The Certificates of Insurance must be completed in the original and signed and returned to the Department along with Contracts and Sureties.

7-13.5.5 Deductibles, Coinsurance Penalties, & Self-Insured Retention

The Contractor shall be fully and solely responsible for any costs or expenses as a result of a coverage deductible, coinsurance penalty, or self-insured retention; including any loss not covered because of the operation of such deductible, coinsurance penalty, or self-insured retention.

7-13.5.6 Sub-Contractor's Insurance

The Contractor shall agree to cause each Sub-Contractor employed by Contractor to purchase and maintain insurance of the type specified herein, unless the Contractor's insurance provides coverage on behalf of the Sub-Contractor. When requested by the Department, the Contractor shall agree to obtain and furnish copies of certificates of insurance evidencing coverage for each Sub-Contractor.

THIS SPACE INTENTIONALLY LEFT BLANK.

7-13.5.7 Insurance Coverage and Limit Table

The Contractor shall agree to maintain the coverage, endorsements, and limits of liability in accordance with and set forth by the Insurance Coverage & Limit Table as follows:

INSURANCE COVERAGE & LIMIT TABLE		
TYPE OF COVERAGE	**CONTRACTS LESS THAN $500,000**	**CONTRACTS $500,000 OR MORE**
COMMERCIAL GENERAL LIABILITY:		
Limit of Liability not less than:	$500,000 per occurrence	$1,000,000 per occurrence
Additional Insured endorsement required:		
General Aggregate Limit must apply Per Project	Yes	Yes
COMPREHENSIVE AUTO LIABILITY:		
Limit of Liability not less than:	$500,000 per occurrence	$1,000,000 per occurrence
WORKERS' COMPENSATION & EMPLOYER'S LIABILITY:		
Coverage not less than:	Statutory	
Employer's Liability Limits not less than:	$100,000/500,000/100,000	
WATERCRAFT LIABILITY:		
Limit of Liability not less than:	$1,000,000 per occurrence	
Additional Insured endorsement required:	Yes	
AIRCRAFT LIABILITY:		
Limit of Liability not less than:	$5,000,000 per occurrence	
When used to carry passengers (excluding aircrafts crew) coverage for Passenger Liability not less than:	$1,000,000 per passenger	
Additional Insured endorsement required:	Yes	
RAILROAD PROTECTIVE LIABILITY:		
Limit of Liability not less than:	$2,000,000 per occurrence $6,000,000 aggregate	
Additional Insured endorsement required:		
General Aggregate Limit must apply Per Project	Yes	
UTILITY OWNERS PROTECTIVE LIABILITY:		
Limit of Liability not less than:	$1,000,000 per occurrence	
Additional Insured endorsement required:	Yes	

7-14 Contractor's Responsibility for Work ADD THE FOLLOWING AT THE END OF THIS ARTICLE:

In addition to the above, the Contractor will not be held responsible for damage to any landscape items caused by an officially declared hurricane which occurs after the final acceptance of the entire Work (as specified in 580), but during any remaining portion of the 90-day establishment period.

END OF SECTION

SECTION 8
PROSECUTION AND PROGRESS

8-3 Prosecution of Work

8-3.2 Submission of Contract Schedule DELETE AND INSERT THE FOLLOWING:

Provide a schedule that shows the various activities of Work in sufficient detail to demonstrate a reasonable and workable plan to complete the project within the Contract Time. Show the order and interdependence of activities and the sequence for accomplishing the Work. Describe all activities in sufficient detail so that the Engineer can readily identify the Work and measure the progress on each activity. Show each activity with a beginning Work date, a duration, and a monetary value. Include activities for procurement fabrication, and deliver of Materials, plant, and Equipment, and review time for shop drawings and submittals. Include milestone activities when milestones are required by the Contract Documents. In a project with more than one phase, adequately identify each phase and its completion date, and do not allow activities to span more than one phase.

The Engineer will return inadequate schedules to the Contractor for corrections. Resubmit a corrected schedule within 15 Calendar Days from the date of the Engineer's return transmittal.

Submit an updated Work Progress Schedule, for Engineer's acceptance, if there is a significant change in the planned order or duration of an activity. The Engineer will review the updated schedule and respond within 7 Calendar Days of receipt.

By acceptance of the schedule, the Engineer does not endorse or otherwise certify the validity or accuracy of the activity durations or sequencing of activities. The Engineer will use the accepted schedule as the baseline against which to measure the progress.

If the Contractor fails to submit either the corrected or an updated schedule in the time specified, the Engineer will withhold all Contract payments until the Engineer accepts the schedule.

8-3.3 Beginning Work DELETE AND INSERT THE FOLLOWING:

Notify the Engineer not less than five days in advance of the planned start day of work. Upon the receipt of such notice, the Engineer may give the Contractor Notice to Proceed and may designate

the point or points to start the work. In the Notice to Proceed, the Engineer may waive the five day advance notice and authorize the Contractor to begin immediately. Notify the Engineer in writing at least two days in advance of the starting date of important features of the work. Do not commence work under the Contract until after the Department has issued the Notice to Proceed. The Department will issue the Notice to Proceed within 120 calendar days, excluding Saturdays, Sundays and Holidays, after execution of the Contract, unless otherwise mutually agreed by the Contractor and the Department.

8-3.5 Preconstruction Conference DELETE AND INSERT THE FOLLOWING:

After the award of Contract and prior to issuance of the Notice to Proceed a Pre-Construction Conference will be held between the Contractor, representative of the County Engineer's Office, representative of other municipalities concerned, utility companies, other Contractors affected by the Work and any other persons designated by the County Engineer's Office to have a material interest in the Work. The time and place of this conference will be set by the County Engineer's Office. The Contractor shall bring with him to this conference a copy of his proposed Work schedule for the job.

8-6 Temporary Suspension of Contractor's Operations

8-6.1 Authority to Suspend Contractor's Operations ADD THE FOLLOWING TO THE END OF THIS ARTICLE:

In particular, the Engineer reserves the right to suspend Work on the project from December 15th to December 23, inclusive. The Engineer will give a minimum of thirty (30) Calendar Days notice of suspension. Prior to carrying out any Work on the project during the period of suspension, the Contractor shall obtain written approval from the Engineer.

8-6.1.1 State of Emergency DELETE AND INSERT THE FOLLOWING:

The Engineer has the authority to suspend the Contractor's operations, wholly or in part, pursuant to a Governor's Declaration of a State of Emergency. The Engineer will order such suspension in writing, giving in detail the reasons for the suspension. Contract Time will be charged during all suspensions of Contractor's operations. The Department, at its sole discretion, may grant an extension of Contract Time and reimburse the Contractor for specific costs associated with such suspension.

8-6.4 Suspension of Contractor's Operations-Holidays and Special Events DELETE AND INSERT THE FOLLOWING:

Unless the Contractor submits a written request to Work on a Holiday at least ten Calendar Days in advance of the requested date and receives written approval from the Engineer, the Contractor shall not Work on the following days: Martin Luther King, Jr. Day; Memorial Day; the Saturday and Sunday immediately preceding Memorial Day; Independence Day; Labor Day; the Friday, Saturday, and Sunday immediately preceding Labor Day; Veterans Day; Thanksgiving Day; the

Friday, Saturday and Sunday immediately following Thanksgiving Day; and December 24 through January 2, inclusive.

Contract Time will be charged during these Holiday periods regardless of whether the Contractor's operations have been suspended. Contract Time will be adjusted in accordance with 8-7.3.2. The Contractor is not entitled to any additional compensation beyond any allowed Contract Time adjustment for suspension of operations during such Holiday periods.

The Contractor will be allowed additional Contract Time for each Working Day included in the Engineer directed suspension of Work between December 15th and December 23rd.During such suspensions, remove all Equipment and Materials from the clear zone, except those required for the safety of the traveling public and retain sufficient personnel at the job site to properly meet the requirements of Sections 102 and 104. The Contractor is not entitled to any additional compensation for removal of Equipment from clear zones or for compliance with Section 102 and Section 104 during such Holiday periods.

8-7 Computation of Contract Time

8-7.2 Date of Beginning of Contract Time DELETE AND INSERT THE FOLLOWING:

The date on which Contract Time begins is the date stated in the Notice to Proceed.

8-8 Failure of Contractor to Maintain Satisfactory Progress

8-8.1 General: Pursue the Work to Completion DELETE AND INSERT THE FOLLOWING:

Satisfactory progress is an essential element of the Contract and, as Delay in the prosecution of the Work will inconvenience the public, obstruct traffic, and interfere with business, it is important that the Work be pressed vigorously to completion. Moreover, the cost to the Department for the administration of the Contract, including engineering, inspection, and supervision, will be increased as the construction period is lengthened.

8-8.2 Regulations Governing Suspension for Delinquency DELETE AND INSERT THE FOLLOWING:

(a) A Contractor may be declared delinquent because of unsatisfactory progress on a Contract with the Department, when the Contract Time allowed has not been entirely consumed, but the Contractor's progress at any check period does not meet at least one of the following two tests:

(1) The percentage of dollar value of completed Work with respect to the total amount of the Contract is within ten percentage points of the percentage of Contract Time elapsed.

(2) The percentage of dollar value of completed Work is within ten percentage points of the dollar value which should have been performed according to the Contractor's own progress schedule previously approved by the Engineer.

In lieu of the ten percentage points stated in the two preceding paragraphs, twenty (20) percentage points may be allowed for a Contractor who, in the opinion of the Engineer, has adequate organization, Equipment, and financial resources to undertake other contract or subcontract Work without conflict or Delay in prosecuting Work under existing contracts let by the Department.

(b) A Contractor will be declared delinquent because of unsatisfactory progress on the Contract with the Department, under either of the following circumstances:

(1) The Contract Time allowed has been consumed and the Work has not been completed.

(2) The Contract Time allowed has not been entirely consumed the Contractor's progress at any check period does not meet either of the two tests described under the paragraphs headed (a) above (c).

A Contractor declared delinquent under the provisions of 8-8 will be disqualified from further bidding and also will not be approved as a Sub-Contractor so long as the delinquent status exists. Also, any individual, firm, partnership or corporation, affiliated with a delinquent Contractor for either personnel, Equipment or finances, shall likewise be disqualified.

(c) The Contractor may appeal in writing to the Department for relief from disqualification status. The Department will act upon any appeal within thirty (30) Calendar Days after the filing thereof, and will promptly notify the appellant of the action taken.

(d) A Contractor disqualified under the requirements of this Article will be removed from such status upon receipt of evidence from the Construction Coordination Division that his progress is no longer delinquent, provided the Contract Time has not elapsed.

(e) The principal progress check period will occur monthly, upon the Department's receipt of the Contractor's monthly estimates. Postings will generally be completed by the first week of each month, and preliminary notices of delinquency will be sent to the Contractor immediately thereafter, and confirmed by certified mail.

(f) No Contractor given such a preliminary notice of delinquency will be finally declared delinquent until a period of ten Calendar Days after the preliminary notice has elapsed. During this ten-day period, the Contractor may request and provide support for any extensions of time, or other considerations which would affect the delinquency.

(g) Final notification of delinquency will be made and verified by certified mail after the expiration of this ten-day period, provided no extensions of time or other considerations are deemed proper by the County Engineer, and provided the delinquency status has not been corrected.

(h) The Engineer may grant extensions of time during the prosecution of the Work, as allowed under the Contract, regardless of the Contractor's delinquency status.

8-9 Default and Termination of Contract

8-9.2 Termination of Contract for Convenience DELETE AND INSERT THE FOLLOWING:

The Department may, at its option, terminate the Contract, in whole or in part at any time by written notice thereof to Contractor, whether or not Contractor is in default. Upon such notice, Contractor hereby waives any claims for damages from the optional termination, including loss of anticipated profits on account thereof. As the sole right and remedy of Contractor, the Department shall pay Contractor in accordance with Subparagraphs below, provided, however, that those provisions of the Contract which by their very nature survive final acceptance under the Contract shall remain in full force and effect after such termination.

A. Upon receipt of any such notice, Contractor and its Surety shall, unless the notice requires otherwise:

   1. Immediately discontinue Work on the date and to the extent specified in the notice;

   2. Place no further orders or subcontracts for Materials, services, or facilities, other than may be necessary or required for completion of such portion of Work under the Contract that is not terminated;

   3. Promptly make every reasonable effort to obtain cancellation upon terms satisfactory to Department of all orders and subcontracts to the extent they relate to the performance of Work terminated or assign to the Department those orders and subcontracts and revoke agreements specified in such notice;

   4. The Contractor agrees to assign all subcontracts required for performance of this Contract to the Department;

   5. The Contractor shall include in all subcontracts, Equipment leases and purchase order, a provision requiring the Sub-Contractor, Equipment lessor or supplier, to consent to the assignment of their subcontract to the Department;

   6. Assist the Department, as specifically requested in writing, in the maintenance, protection and disposition of property acquired by the Department under the Contract; and

   7. Complete performance of any work which is not terminated.

B. Upon any such termination, the Department will pay to Contractor an amount determined in accordance with the following (without duplication of any item):

   1. All amounts due and not previously paid to Contractor for Work completed in accordance with the Contract prior to such notice, and for Work thereafter completed as specified in such notice.

2. The reasonable cost of settling and paying claims arising out of the termination of Work under subcontracts or orders as provided in Subparagraph A.3. above.

3. The verifiable costs incurred pursuant to Subparagraph A.5. above.

4. Any other reasonable costs which can be verified to be incidental to such termination of Work.

The foregoing amounts will include a reasonable sum, under all of the circumstances, as profit for all Work satisfactorily performed by Contractor.

Contractor shall submit within 30 days after receipt of notice of termination, a proposal for an adjustment to the Contract price including all incurred costs described herein.

The Department shall review, analyze, and verify such proposal, and negotiate an equitable adjustment, and the Contract shall be amended in writing accordingly.

8-10 Liquidated Damages for Failure to Complete the Work

8-10.2.1 Amounts Reasonable/No Penalty ADD THE FOLLOWING SUB-ARTICLE:

The Contractor hereby agrees and affirms that the amounts specified in this section reflect a fair compensable value for damages suffered by Department as a result of Contractor's Delay, and that said amounts are not a penalty nor will ever be contested as reflecting the imposition of a penalty against Contractor.

END OF SECTION

SECTION 9
MEASUREMENT AND PAYMENT

9-2 Scope of Payments

9-2.1.1 Fuels DELETE AND INSERT THE FOLLOWING:

The Department will make no price adjustments for fuels.

9-2.1.2 Bituminous Material DELETE AND INSERT THE FOLLOWING:

Department will adjust the Bid unit price for bituminous material, excluding cutback and emulsified asphalt to reflect increases or decreases in the Asphalt Price Index (API) of bituminous material from that in effect during the month in which Bids were received.

Bituminous adjustments will be made only when the current API (CAPI) varies by more than 5% of the API prevailing in the month when Bids were received (BAPI), and then only on the portion that exceeds 5%.

The Department will determine the API for each month by averaging quotations in effect on the first day of the month at all terminals that could reasonably be expected to furnish bituminous material to projects in the State of Florida.

The API will be available on the Construction Office website before the 15th of each month at the following URL: https://www.fdot.gov/construction/fuel-bit/fuel-bit.shtm

Refer to the "Liquid Asphalt Calculation" table provided in the Special Provisions of these documents.

9-3 Compensation for Altered Quantities

9-3.1 General ADD THE FOLLOWING TO THE END OF THIS ARTICLE:

The Contractor is advised that all items may be increased, decreased or deleted from the Contract, as directed by the Engineer. Whenever change or combination of changes in the Plans results in total elimination or substitution of any item included in the original Contract quantities, no allowance will be made for any loss of anticipated profits because of these changes, decreases or deletions of items.

The Contractor's attention is 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. The unit prices for the items of Work shall include the cost of all labor, Materials, Equipment, transportation, fuel and all other items incidental to or necessary for the completion of the item of Work.

Should the Contractor feel that the cost for any item of Work has not been established by the Bid Form or Basis of Payment, 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.

9-3.2.1 Error in Plan Quantity DELETE IN ITS ENTIRETY

9-5 Partial Payments

9-5.1 General DELETE AND INSERT THE FOLLOWING:

The Contractor will receive partial payments on monthly estimates, based on the amount of Work done or completed (including delivery of certain Materials, as specified herein below). The monthly payments shall be approximate only, and all partial estimates and payments shall be subject to correction in the subsequent estimates and the final estimate and payment.

The amount of such payments shall be the total value of the Work done to the date of the estimate, based on the quantities and the unit prices for all Work performed, less an amount retained and less payments previously made. Except as specified herein, the amount retained shall be 5% of the value of Work completed. This retainage may be reduced to 2.5% of Contract amount at the discretion of the Engineer when the total amount of partial payments exceeds 95% of the Contract amount.

The amount retained on water and sewer construction and adjustments included in the Contract shall be 5% of the monthly estimates until the Work is approved by the permitting agency. The retainage after approval/acceptance by the agency shall be in accordance with 9-5.1.

For contracts in which the amount for landscaping items constitute 50% or more of the original Contract amount, 5% of the value of Work completed shall be retained until the end of the 90-day establishment period for landscaping items or until final acceptance of the Work; whichever occurs last.

Contract amount is defined as the original Contract amount as adjusted by approved Supplemental Agreements.

9-5.5 Partial Payments for Delivery of Certain Materials

9-5.5.1 General ADD THE FOLLOWING TO THE END OF THIS ARTICLE:

(7) Common Carrier Freight Rates. No adjustments shall be made for change in common carrier rates.

9-5.5.2 Partial Payment Amounts DELETE AND INSERT THE FOLLOWING:
Contract amount is defined as the original Contract amount as adjusted by approved Supplemental Agreements.

The following partial payment restrictions apply:

(1) Partial payments for structural steel and precast pre-stressed items will not exceed 85% of the Bid price for the item. Partial payments for all other items will not exceed 75% of the Bid price of the item in which the material is to be used.

(2) Partial payment will not be made for aggregate and base course material received after paving or base construction operations begin except when a construction sequence designated by the Department requires suspension of paving and base construction after the initial paving operations, partial payments will be reinstated until the paving and base construction resumes.

9-9 Interest Due on Delayed Payments DELETE IN ITS ENTIRETY

9-11 Change Order Approvals ADD THE FOLLOWING ARTICLE:

Change Orders shall be approved in accordance with existing Department policy per Resolution #R89-633 dated April 4, 1989 and the current PPM #CWF-050.

Department reserves the right to increase or decrease any of the unit quantities as necessary to complete the Work contracted. Such increases or decreases may be authorized by the Department's Engineer at the unit price(s) as Bid.

END OF SECTION

SECTION 102
MAINTENANCE OF TRAFFIC

102-1 Description ADD THE FOLLOWING AT THE END OF THIS ARTICLE:

All existing signs are the property of the Department. The Contractor shall stockpile the above mentioned signs and contact Traffic Operations (sign supervisor) at 233-3900 for pick-up. Signs must be kept in good condition or be responsible for reimbursement to Palm Beach County Traffic Division.

This section shall be governed by the following standards:

1. Florida Department of Transportation (FDOT) "Standard Specifications for Road and Bridge Construction"

2. "Manual on Uniform Traffic Control Devices for Streets and Highways" (MUTCD)

3. Florida Department of Transportation "Design Standards"

4. Florida Department of Transportation "Plans Preparation Manual"

5. "Manual of Uniform Minimum Standards for Design, Construction and Maintenance of Streets and Highways"

In addition to the above Specifications, the following shall also apply:

Barricades, Lights and Cones

1. All barricades shall be maintained daily.

2. All Type III barricades shall have one Type A flashing light on each barricade. When extremely hazardous conditions exist, two Type B flashing lights shall be used. Extremely hazardous conditions shall be determined by Palm Beach County Engineering Traffic Division. Drums, Type II barricades and barrier walls shall have one Type C steady burning light.

Flag Person and Vests

1. The flagger shall be trained in the proper manner as set forth in the MUTCD and certified as per Section 102 FDOT Specifications for Road and Bridge Construction. Each flagger shall have a certification card with them when flagging. Certification cards shall have the flagger's name, date of certification and expiration date.

   - If the person flagging traffic does not have the Certification, or the name is not on the list of approved flaggers, the flagger shall be replaced immediately with a certified flagger. There will be no lane closure until that time.

   - At the pre-construction meeting, the contractor may submit a list of certified flaggers. This list must include the same information as the flagger(s)' certification card(s).

2. All construction personnel shall wear a retro-reflective orange or strong yellow/green vest/garment during daytime or nighttime operations when working within the Right-of-Way (Class 2 or 3 per MUTCD).

   A. Ensure that these vest/garments be worn whenever workers are within the Right-of-Way. Workers operating machinery or Equipment in which loose clothing could become entangled during operation are exempt from this requirement. Such exempt workers will be required to wear orange shirts or jackets.

   B. Require Contractor personnel to wear retro-reflective orange or strong yellow/green vest/garment during daytime or nighttime operations.

   C. Replace faded vest/garments, as determined by the Inspector.

Flashing Arrow Boards

1. Flashing arrow boards shall be used on any four (4) lane or larger Roadway where traffic is being channelized or diverted, or as directed by the Palm Beach County Traffic Engineering Department. Flashing arrow boards shall conform with Section 6F-56 MUTCD /Type B or C only. Solar arrow boards shall be used.

Traffic Signals

1. A minimum of seventy-two hours notice must be given to Traffic Division (684-4030) prior to Work requiring the realigning of traffic signals.

2. The Department will charge for traffic signals to be realigned to accommodate MOT.

3. No material shall be disturbed within 6' of a traffic pole or within the specified distance of a guy wire and anchor to a depth greater than 2' as shown in Figure 1 in the General Provisions unless approved by and coordinated with Palm Beach County Traffic Operations. Contact

Traffic Operations at (561) 233-3900, 24 hours in advance of any excavation. Failure to comply with the above shall result in the prime contractor incurring all costs incurred as a result of damage to the traffic signal installation. These costs shall be paid 30 days from date of invoice or the following pay estimate will be withheld until payment is made or the cost may be deducted from the pay estimate.

4. Line locates will be given. However, a twenty-four hours' notice must be given.
   If new traffic poles are to be installed it shall be the contractor's responsibility to provide final stabilized grade within 4"-6" along with Right-of-Way locations at the intersection.

   The contractor shall have a 2-hour window for their change-over that is 1 hour before and one hour after the scheduled change-over time. After that the contractor shall be responsible for all cost incurred for the Delay.

102-1.1 General

1. Contractor shall keep sufficient cold patch asphalt on the job site to fill pot-holes and to perform other minor pavement maintenance as needed.

2. All Highway Equipment shall have a Slow Moving Vehicle sign with either a flasher or a beacon operating when the Equipment is operating.

3. During peak hours 7:00 A.M. to 9:00 A.M. and 3:00 P.M. to 7:00 P.M. left turn and through lanes shall not be blocked without permission from the Traffic Engineer.

4. Any manholes/valves in the travel way shall have 50" width of asphalt extending from the edge for every 1" inch of height.

Pedestrians

1. When pedestrian movement through or around a worksite is necessary, the Contractor shall provide a separate, safe footpath without abrupt changes in grade or terrain.

   - If one (1) or two (2) pedestrian ways are provided (exist) prior to the start of a project, only one (1) has to be maintained.

2. Places where pedestrians are judged especially vulnerable to impact by vehicles, all foot traffic should be separated and protected by longitudinal positive barrier systems.

3. Pedestrian detours are not to exceed 300 feet from the closure to a signalized or Palm Beach County approved alternative crossing location. The Contractor is to provide a safe and reasonable alternate route including pedestrian detours, diversions and flaggers to assist pedestrians around the work area when applicable.

4. Sidewalks within school zones/areas shall be maintained during morning start and afternoon dismissal times unless otherwise approved by the Engineer. Otherwise, direct detours shall be

provided such that students will not be diverted for more than 100 feet. Temporary guarded crossings provided by the Contractor shall be utilized when needed.

102-3.2 Worksite Traffic Supervisor ADD THE FOLLOWING AT THE END OF THIS ARTICLE:

Certification must be through American Traffic Safety Services Association (ATSSA) or FDOT approved Advanced Maintenance of Traffic course certification.

102-4 Temporary Traffic Control Plan. (TTCP) DELETE IN ITS ENTIRETY AND INSERT THE FOLLOWING:

The Temporary Traffic Control Plan (TTCP) for traffic control around or through work sites should be developed with safety receiving a high priority. The TTCP should include protection at work sites when Work is in progress and when operations have been halted (such as during the night) or from the time Work is completed until the final. Provisions for the protection of work crews, traffic control personnel, pedestrians, and motorists shall be included.

The temporary traffic control plan shall include the following:

TTCP to be prepared and signed by the Work Site Traffic Supervisor as certified by the American Traffic Safety Services Association or FDOT approved Advanced Maintenance of Traffic course or a Professional Engineer.

1. A copy of the signer's certification, contractor's name, and 24 hour phone number of the work site traffic supervisor shall be on the TTCP.

2. The TTCP shall include: north arrow; drawn by; lane usage; type and location of all signs, lights, barricades, striping, barriers, traffic signals; all side-streets; change-overs; sidewalks; Retro-reflective Pavement Markers (RPM); pavement markings; school zones; crosswalks; Palm Tran bus stop and railroad crossings.

3. Plans may be drawn to scale; however, dimensions shall be shown. Plans that are not drawn to scale must be drawn proportionately and include all areas that will be within the temporary traffic control including signalized and un-signalized intersections. Plans must be legible, easily read and include all lane usage and current geometrics.

4. Variable Message Sign (VMS) and the messages.

    a. Road Closures – VMS boards shall be installed 10 days prior to Work beginning until 10 days after Work completion. If the Road closer is on a thoroughfare Road then the VMS board shall be installed for the entire Contract Time.

    b. Traffic Shifts – VMS boards shall be installed 7 Working Days prior to Work until 7 Working Days after Work completion.

5. Location and geometry for transitions, detours, and diversions (includes buffer space and taper length).

6. No change-overs are allowed on Monday or Friday, the day before a Holiday or during AM or PM peak traffic, and are discouraged at signalized intersections.

7. All Plans shall be submitted through the Palm Beach County Construction Coordination Division.

8. Lane closures in front of schools shall avoid disruption to school traffic during school arrival and dismissal times.

9. The Contractor shall comply with the current MUTCD and FDOT Standard Plan Index 102 series and Palm Beach County Standards for all MOT.

10. The Contractor shall provide MOT for each phase of construction within 60 days of phase implementation.

11. Supporting calculations shall be provided for all proposed horizontal curves.

The TTCP approval is as follows:

A. 1 to 14 days for most Plans

B. 14 days when a signal or flasher is involved

C. 15 days for a traffic switch or for Road closures

Time may vary based on the complexity of the TTCP Consideration should be given to these time frames when scheduling the Work.

Palm Beach County Traffic Engineering Division will handle all news releases, notifying police, fire, etc.

The TTCP is good for 60 days. If the TTCP has not been implemented by then, a new approval will be required.

TTCP must have dates and times of operation requested.

In no case may the contractor begin Work until the TTCP has been approved in writing by the Palm Beach County Traffic Engineering Division. Field modifications may be made with the approval of a representative of the Palm Beach County Traffic Engineering or Construction Coordination Divisions. Failure to comply with the above may result in permanent reduction of the pay item of "Maintenance of Traffic" on a prorated basis or $1,000.00 per day, whichever is higher.

Cost for Temporary Traffic Control Plans shall be made on a Lump Sum basis, and shall include all the above requirements.

Cost for Temporary Traffic Control Plans shall be included in Maintenance of Traffic items and shall include all of the above requirements.

102-5.4 Crossings and Intersections DELETE AND INSERT THE FOLLOWING:

Provide and maintain adequate accommodations for intersecting and crossing traffic. Do not block or unduly restrict any Road or Street unless approved by the Engineer. Maintain all existing actuated or traffic responsive mode signal operations for main and side Street movements for the duration of the Contract. (See 102-7.1)

102-5.7 Flagger DELETE AND INSERT THE FOLLOWING:

Provide trained flaggers in accordance with FDOT and MUTCD requirements.

102-6.2 Construction DELETE AND INSERT THE FOLLOWING:

Plan, construct, and maintain detours for the safe passage of traffic (both vehicular and pedestrian) in all conditions of weather. Provide the detour, to the Department, with all facilities necessary to meet this requirement.

102-6.6 Operation of Existing Movable Bridges DELETE IN ITS ENTIRETY

102-7 Traffic Control Officer DELETE AND INSERT THE FOLLOWING:

Provide uniformed law enforcement officers, including marked law enforcement vehicles, to assist in controlling and directing traffic in the work zone, when the following types of Work are necessary on projects:

1. Traffic control in a signalized intersection when signals are overridden.

2. When Standard Index No. 102-619 is used on Interstate at nighttime and required by the Plans.

3. When Standard Plans, Index 102-655 Traffic Pacing is called for in the Plans or approved by the Department.

4. During the night time milling or paving, if the lane adjacent to the Work area is open to traffic, the Traffic Control Officer shall be present with flashing lights, operating on their vehicle.

5. As required by the Engineer.

6. Provide uniformed laws enforcement officers, including marked law enforcement vehicles, to assist in controlling and directing traffic through the work zone, when authorized and/or directed by the Engineer, and for purposes not covered under the requirements of the

Temporary Traffic Control Plans. The Contractor shall make a request for the use of this item in writing to Construction Coordination Division. The request will be reviewed and responded to in writing. The Contractor shall supply a breakdown of police activity for every 4 hour period.

ADD THE FOLLOWING SUBARTICLE:
102-9.9.1 Portable Changeable (Variable) Message Sign (PCMS) (Non-MOT)

Furnish VMS board in accordance with 102-9.12, when authorized and/or directed by the Engineer, and for purposes not covered under the requirements of the TTCP.

102-9.14 Radar Speed Display Unit (RSDU) DELETE IN ITS ENTIRETY

102-9.15 Temporary Signalization and Maintenance DELETE IN ITS ENTIRETY

102-9.16 Temporary Traffic Detection and Maintenance DELETE IN ITS ENTIRETY

102-10 Work Zone Pavement Marking DELETE AND INSERT THE FOLLOWING:

1. All temporary pavement markings shall be done in a professional manner without weaves and/or bows. No over-painting shall be allowed.

2. Temporary RPM's shall be installed at an 1 inch offset to lane lines, skips, gore or crosshatched area within the work zone. The spacing shall be 40 feet on tangent section and 20 feet on transitions and curves (including edge lines). Damaged or missing R.P.M.'s shall be replaced on a daily basis. The RPM's shall have a maximum width of 5 inches and a maximum height of 0.75 inch. The minimum area of each reflective face shall be 3.50 square inches. RPM's shall be bonded to the pavement or concrete with epoxy, alkyd thermoplastic or bituminous adhesive.

3. Temporary pavement markings shall be applied to the intermediate asphalt course, and shall consist of foil-backed tape, or paint meeting both State and Department Specifications.

4. Temporary pavement markings shall also be applied to the final asphalt course unless otherwise directed by the Department. All final course pavement markings shall consist of foil-backed tape. The temporary pavement markings shall be installed in accordance with the typicals in the General Provisions.

5. All temporary tape skip-line pavement markings shall be at least four (4) feet in length with a maximum gap of thirty-six (36) feet. A two (2) foot stripe with a maximum gap of eighteen (18) feet may be used for Roadways with severe curvature, or as directed by the Department.

6. All painted lines shall conform to size and color requirements of the MUTCD, Part III. The thickness shall not be less than fifteen (15) mils with six (6) to six and one quarter (6 ¼)

pounds of beads per gallon of paint. Both shall be applied uniformly. All painted lines shall be refurbished if at any time the reflectively falls below 150 mini-candles. A normal width line is 6" paint or tape.

7. Black-out shall not be used to obliterate pavement markings. Existing pavement markings that conflict with temporary work zone delineation shall be removed by any method approved by the Engineer.

8. If a school zone exists, it must be maintained including crosswalks, school messages and signs.

9. It shall be the contractor's responsibility to adjust existing signing, add new signing, and remove or add pavement marking on approaches to the project.

10. The last temporary pavement markings for the project's final condition shall be incidental to the Maintenance of Traffic item. They shall be placed in the location of the future permanent pavement markings.

102-10.1 Description DELETE THE LAST PARAGRAPH IN ITS ENTIRETY

102-10.2 Painted Pavement Markings DELETE IN ITS ENTIRETY

102-10.3 Removable Tape DELETE IN ITS ENTIRETY

102-10.3.1 General DELETE IN ITS ENTIRETY

102-10.3.2 Application DELETE IN ITS ENTIRETY

102-10.3.3 Retro-reflectivity DELETE IN ITS ENTIRETY

102-10.3.4 Removability DELETE IN ITS ENTIRETY

102-10.4 Temporary Raised Pavement Markers DELETE AND INSERT THE FOLLOWING:

Apply all markers in accordance with Palm Beach County Typical T-P-21, or as otherwise revised.

102-11 Method of Measurement

102-11.1 General DELETE AND INSERT THE FOLLOWING:

Devices installed/used on the project on any Calendar Day or portion thereof, within the allowable Contract Time, including time extensions which may be granted, will be paid for at the Contract unit price MOT, Lump Sum and shall include all items required to implement the approved Temporary Traffic Control Plan (TTCP).

Unless otherwise specified, all devices / items specified in 102-11 shall be incidental to the pay item: MOT, on a Lump Sum basis.

ADD THE FOLLOWING SUBARTICLE:
102-11.2.1 Traffic Control Officers (Non-MOT)

The quantity to be paid for will be at a unit price per hour (4 hour minimum) for the actual number of officers certified to be on the project site, including any law enforcement vehicle(s).

Payment will be made only for those traffic control officers not incidental to the TTCP requirements and when authorized by the Engineer under the pay item: Traffic Control Officers (Non-MOT) per hour.

102-11.3 Special Detours DELETE IN ITS ENTIRETY

ADD THE FOLLOWING SUBARTICLE:
102-11.15.1 Changeable (Variable) Message Sign (NON-MOT)

The quantity to be paid for will be the number of changeable (variable) message signs certified as installed/used on the project when directed by the Engineer and not a requirement of the TTCP.

Payment will be made for each Changeable (Variable) message sign that is used during the Contract period under the pay item Changeable (Variable) Message Sign (Non-MOT) per each per day.

102-11.18 Temporary Signalization and Maintenance DELETE IN ITS ENTIRETY

102-11.19 Temporary Traffic Detection and Maintenance DELETE IN ITS ENTIRETY

102-11.20 Work Zone Pavement Markings DELETE AND INSERT THE FOLLOWING:

The quantities, furnished and installed shall be those that are required for the project and shall be incidental to MOT, Lump Sum.

102-12.1 Submittal Instructions DELETE IN ITS ENTIRETY

102-12.2 Contractor's Certification of Quantities DELETE AND INSERT THE FOLLOWING:
When requested by the Department, Contractor shall submit a certification of the material used.

Ensure that the certification consists of the following: Project Number, Certification Number, Certification Date and the period that the certification represents.

102-13 Basis of Payment

102-13.1 Maintenance of Traffic (General Work) DELETE AND INSERT THE FOLLOWING:

When an item of Work is included in the Proposal, price and payment will be full compensation for all Work and costs specified under this Section except as may be specifically covered for payment under other items. Maintenance of Traffic (General Work) shall also include all items required to implement the approved Temporary Traffic Control Plans (TTCP).

Unless otherwise specified, all devices / items specified in 102-13 shall be incidental to the pay item: MOT, on a Lump Sum basis.

INSERT THE FOLLOWING SUBARTICLE:
102-13.2.1 Traffic Control Officers (Non-MOT)

Price and payment will be full compensation for the services of the traffic control officers for instances when directed by the Engineer and not a requirement of the TTCP.

102-13.3 Special Detours DELETE IN ITS ENTIRETY

INSERT THE FOLLOWING SUBARTICLE:
102-13.15.1 Changeable (Variable) Message Sign (NON-MOT)

Price and payment will be full compensation for furnishing, installing, operating, relocating, maintaining and removing changeable message signs when directed by the Engineer and not a requirement of the TTCP.

102-13.20 Temporary Raised Rumble Strips DELETE IN ITS ENTIRETY

102-13.21 Temporary Lane Separator DELETE IN ITS ENTIRETY

102-13.22 Temporary Signals for Lane Closures DELETE IN ITS ENTIRETY

102-13.23 Temporary Highway Lighting DELETE IN ITS ENTIRETY

102-13.24 Pedestrian or Bicycle Special Detours DELETE IN ITS ENTIRETY

102-13.25 Type III Barricades DELETE IN ITS ENTIRETY

102-13.26 Payment Items DELETE AND INSERT THE FOLLOWING:

Payment will be made under:

Item No. 102- 1- Maintenance of Traffic - lump sum.
Item No. 102- 14-1 Traffic Control Officers (Non-MOT) - per hour.
Item No. 102- 99-1 Changeable (Variable) Message Sign (Non-MOT) - per each per day.

105-1.2.3 Notification of Placing Order DELETE AND INSERT THE FOLLOWING:

Order materials sufficiently in advance of their incorporation in the work to allow time for sampling, testing and inspection. Notify the Engineer prior to placing orders for materials.

Submit to the Engineer a fabrication schedule for all items requiring commercial inspection at least 30 days before beginning fabrication. Items requiring commercial inspection will be identified in the Plans, Proposal, Special Provisions, Supplemental Specifications, or Technical Special Provisions of the Contract Documents. These items can include steel bridge components, moveable bridge components, pedestrian bridges, castings, forgings structures erected either partially or completely over the travelled roadway or mounted on bridges as overhead traffic signs (some of these may be further classified as cantilevered, overhead trusses, or monotubes) or any other item identified as an item requiring commercial inspection in the Contract Documents.

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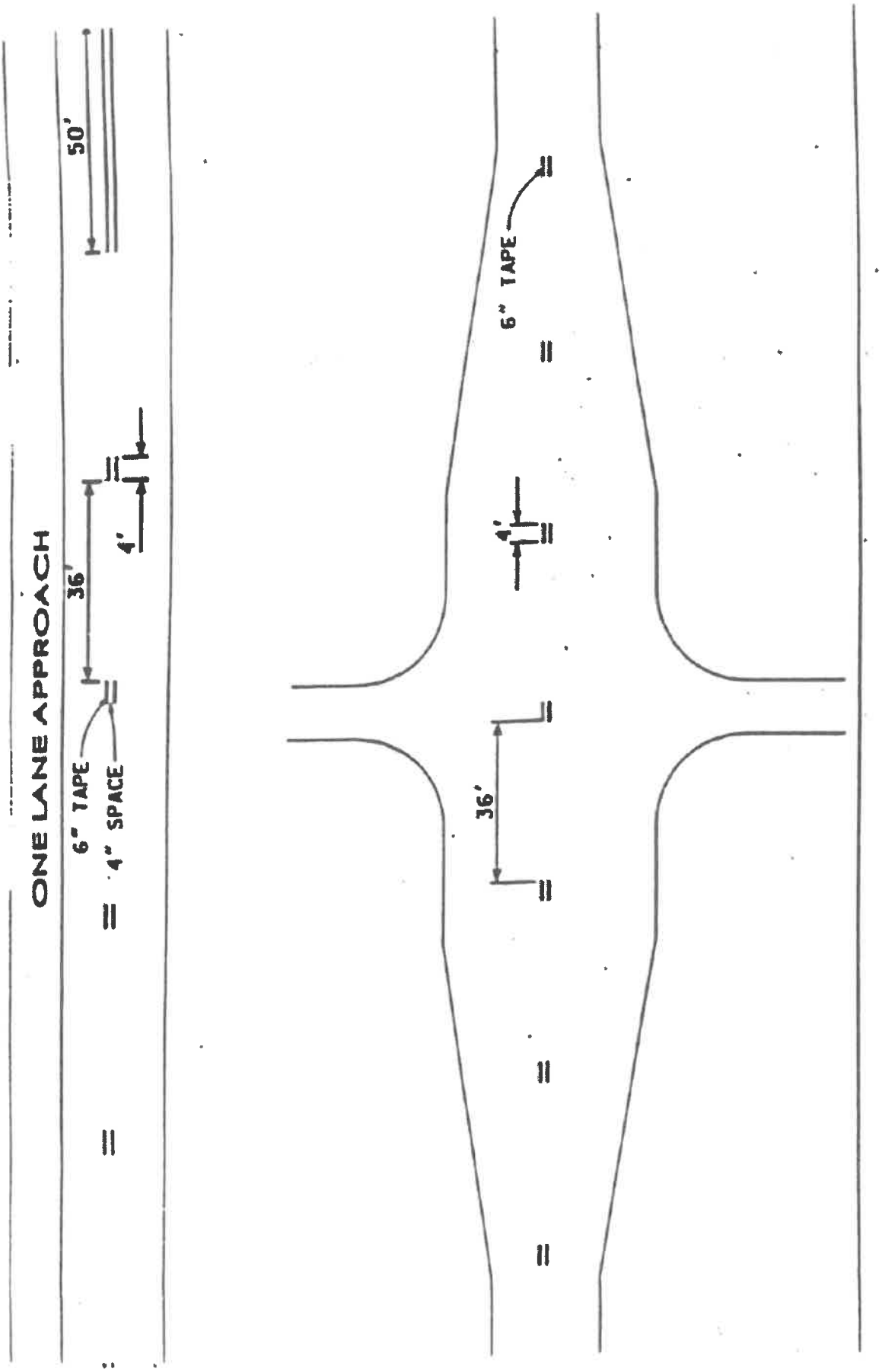
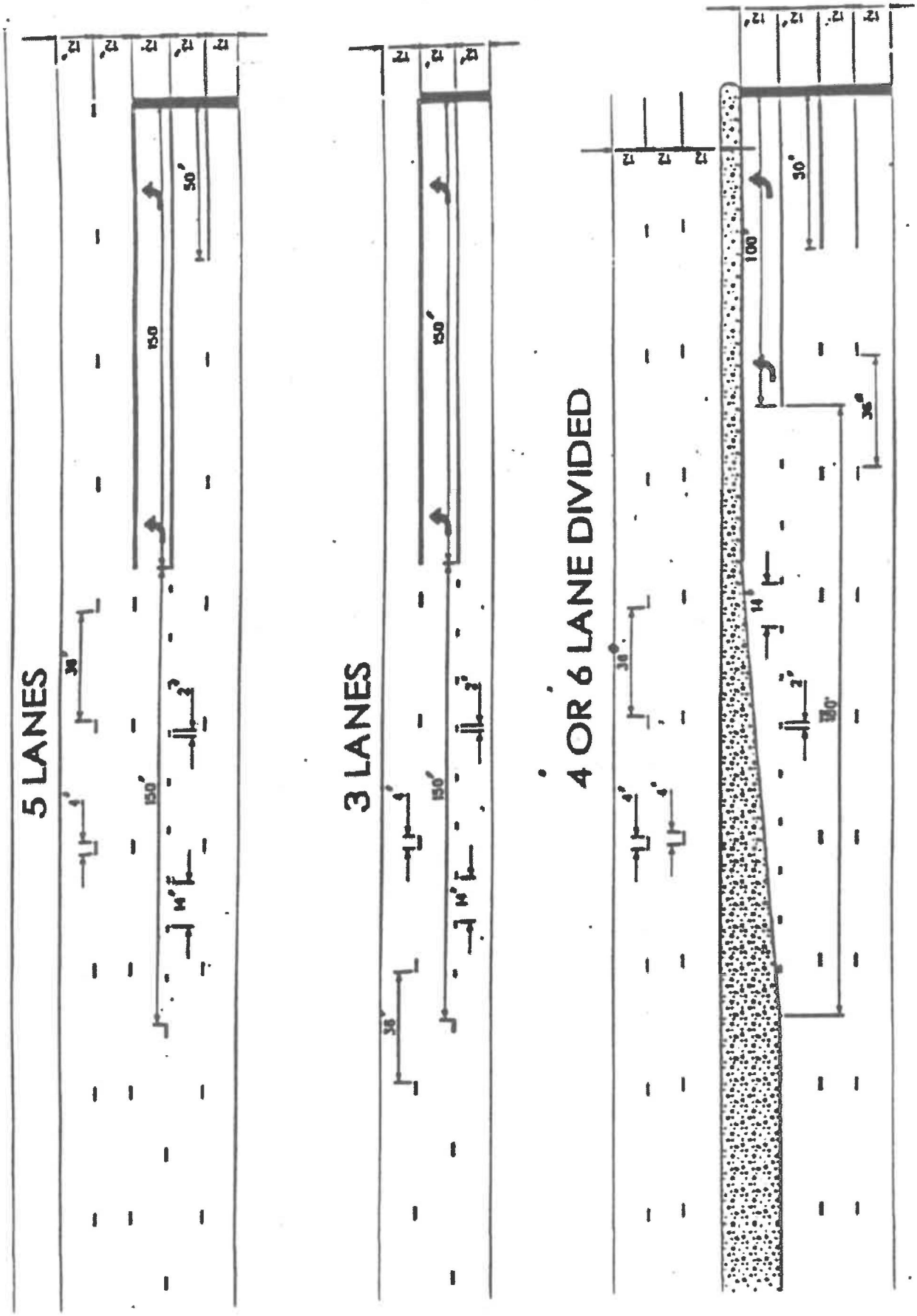
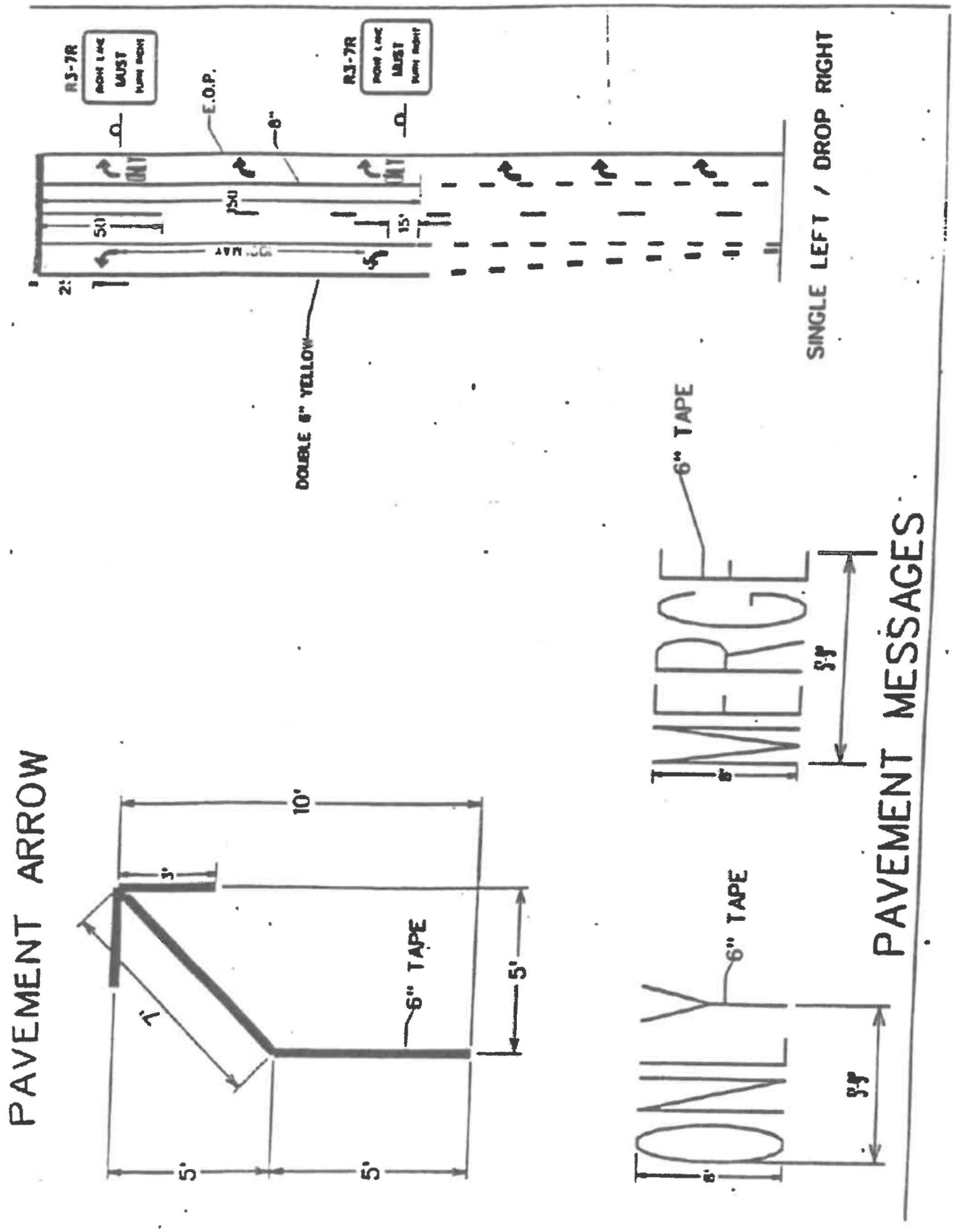
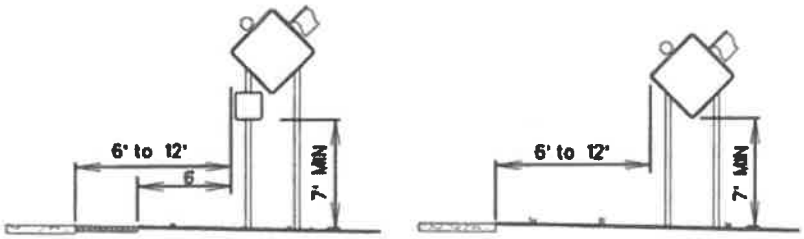

ONE LANE APPROACH
50'
36'
4'
6" TAPE
4" SPACE
6" TAPE
4'
36'


5 LANES
3 LANES
4 OR 6 LANE DIVIDED


R3-7R
E.O.P.
6"
R3-7R
SINGLE LEFT / DROP RIGHT
DOUBLE 6" YELLOW
6" TAPE
MERGE
PAVEMENT MESSAGES
PAVEMENT ARROW
10'
3'
6" TAPE
5'
5'
5'
6" TAPE
ONLY

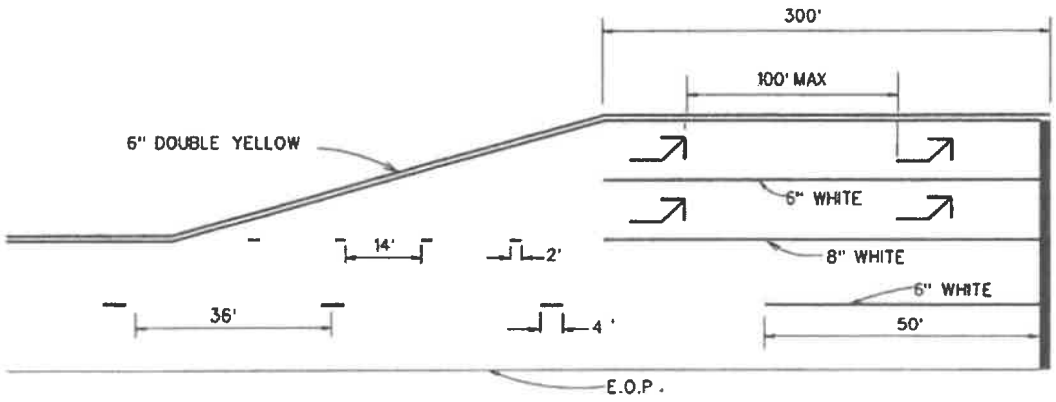
SIGNING FOR LONG TERM STATIONARY PROJECTS



1.) If a separator is to be signed it shall be a minimum of 6 feet wide. The signs shall be erected in such a way that they also conform with the 7 foot minimum.

2.) Other types of operation may be able to use the standard tri-pod or FDOT approved portable traffic control device as long as there is a minimum of 1 foot from the bottom of the sign to the ground.

DUAL LEFTS



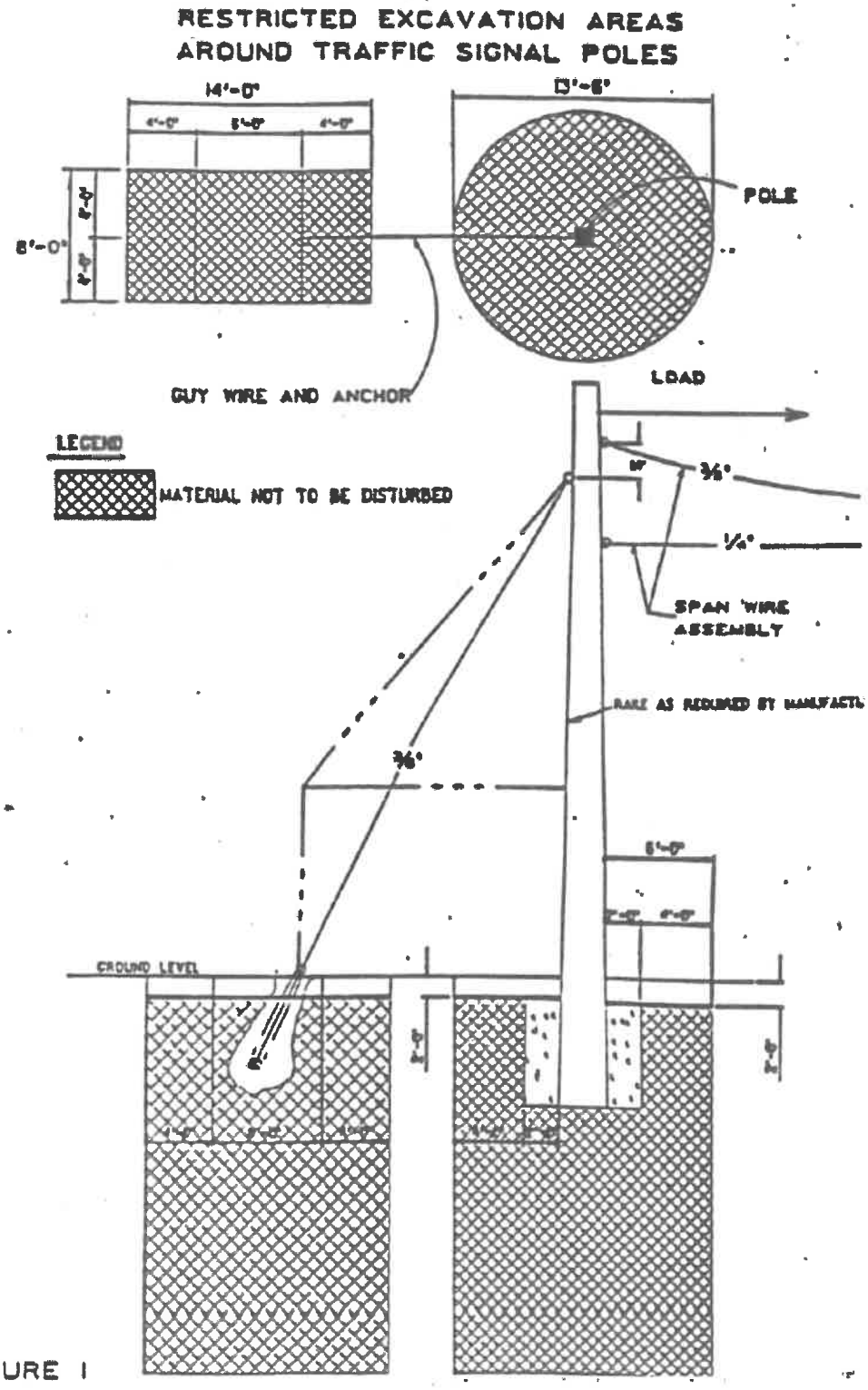


FIGURE 1

END OF SECTION

SECTION 300
PRIME AND TACK COATS

300-2.3 Tack Coat DELETE AND SUBSTITUTE THE FOLLOWING:

Unless the Contract Documents call for a specific type or grade of tack coat, use RA-500 meeting the requirements of 916-2, heated to a temperature of 250 to 300°F or undiluted Emulsified Asphalt Grades RS-1h, RS-2, CRS-1h, or NTSS-1hm meeting the requirements of 916-4. Heat RS-1h, RS-2, CRS-1h and NTSS-1hm to a temperature of 150 to 180°F. The Contractor may use RS-1h modified to include up to 3% naphtha to improve handling of the material during the winter months or at any other time, as approved by the Engineer.

For night paving, use RA-500 tack coat. The Engineer may approve RS-1h, RS-2, CRS-1h, or NTSS-1hm for night paving if the Contractor demonstrates, at the time of use, that the emulsion will break to allow paving in a timely manner and not affect the progress of the paving operation.

300-9 Method of Measurement DELETE AND SUBSTITUTE THE FOLLOWING:

No separate measurement shall be made for prime coat and tack coat material.

300-10 Basis of Payment DELETE AND SUBSTITUTE THE FOLLOWING:

No separate payment will be made for prime coat and tack coat material but the cost of same, including heating, hauling and applying (including sand or screening covering where required), shall be included in the Contract unit price per square yard for base or pavement courses, respectfully.

There is no direct payment for the Work specified in this Section, it is incidental to, and is to be included in the other items of related Work.

END OF SECTION

SECTION 330A
HOT BITUMINOUS MIXTURES –
GENERAL CONSTRUCTION REQUIREMENTS

SECTION 330A IS ADDED TO THIS SPECIFICATION

330A-1 Description

This Section specifies the general construction requirements for all plant-mixed hot bituminous pavements and bases. (More specific requirements pertaining to hot bituminous base and base widening construction are contained in Section 280.) This Section also includes the method of determination of the thickness of pavement to be paid for, when payment is on a square yard basis.

330A-2 Substitution of Types of Hot Bituminous Mixtures

Except for Asphaltic Concrete Friction Courses and other wearing surfaces, the Contractor will be allowed the option of substituting certain types of hot bituminous mixtures as follows:

(1) Type S-I Asphaltic Concrete may be substituted for any other type of mixture where the rate of application is specified to be not less than 75 lbs. per square yard.

(2) Type III Asphaltic Concrete may be substituted for Type n Asphaltic Concrete or Sand-Asphalt Hot Mix and Type II Asphaltic Concrete may be substituted for Sand-Asphalt Hot Mix.

In each case, the stability of the substituted mixture shall be at least as high as that of the mixture specified, and any substitution made shall be at no additional cost to the Department over that which would have accrued had the specified mixture been used.

330A-3 Limitations of Operations

330A-3.1 Weather Limitations

Plant operations shall not begin unless all weather conditions are suitable for the laying operations.

330A-3.2 Limitations of Laying Operations

330A-3.2.1 General

The mixture shall be spread only when the surface, upon which it is to be laid, has been previously prepared, is intact, firm and properly cured, and is dry. Unless otherwise approved by the Engineer, no mixture shall be spread that cannot be finished and compacted during daylight hours. Friction course shall not be placed until the adjacent shoulder area has been dressed and grassed.

330A-3.2.2 Temperature

The mixture shall be spread only when the air temperature (the temperature in the shade away from artificial heat) is 40°F and above for layers greater than one inch (100 lbs. per square yard) in thickness and 45°F and above for layers one inch (100 lbs. per square yard) or less in thickness (this includes leveling courses). No mixture shall be placed when there is evidence that the base is frozen.

330A-3.2.3 Wind

The mixture shall not be spread when the wind is blowing to such an extent that proper and adequate compaction cannot be maintained or when sand, dust, etc., are being deposited on the surface being paved, to the extent that the bond between layers will be diminished.

330A-4 Preparation of Asphalt Cement

The asphalt cement shall be delivered to the asphalt plant at a temperature not to exceed 350 degrees F and the transport tanks shall be equipped with sampling and temperature sensing devices meeting the requirements of 300-3.2 and 300-3.3, respectively. The asphalt cement in storage shall be maintained within a range of 230 degrees F to 350 degrees F in advance of mixing operations. Heating within these limits shall be constant and wide fluctuations of temperature during a day's production will not be permitted.

330A-5 Preparation of Aggregates

330A-5.1 Stockpiles

Each aggregate component sba11 be placed in an individual stockpile, which shall be separated from the adjacent stockpiles, either by space or by a system of bulkheads. The intermingling of different Materials in stockpiles shall be prevented at all times. Each stockpile, including RAP, shall be identified as shown on the Department Mix Designs.

330A-5.2 Prevention of Segregation

Stockpiles shall be formed and maintained in a manner that will prevent segregation. If a stockpile is determined to have excessive segregation, the Engineer will disapprove the material for use on the project until the appropriate action has been taken to correct the problem.

330A-5.3 Blending of Aggregates

Blending or proportioning from railroad cars will not be permitted. All aggregates shall be stockpiled prior to blending or placing in the cold hoppers. All aggregates to be blended or proportioned shall be placed in separate bins at the cold hopper and proportioned by means of securely positioned calibrated gates or other approved devices.

330A-5.4 Cold Bins

330A-5.4.1 Adequacy of Bins

The separate bin compartments of the cold aggregate feeder shall be so constructed as to prevent any spilling or leakage of aggregate from one bin to another. Each bin compartment shall be of such capacity and design as to permit a uniform flow of aggregates. All the bin compartments shall be mounted over a feeder of uniform speed, which shall deliver the specified proportions of the separate aggregates to the drier at all times. If necessary, the bins shall be equipped with vibrators to insure a uniform flow of the aggregates at all times.

330A-5.4.2 Gates

Each bin compartment sha11 be provided with a gate which is adjustable in a vertical direction. The gate shall be so designed that it can be held securely at any specified vertical opening. The

gates shall be equipped with a measuring device for measuring the vertical opening of the gates from a horizontal plane level with the bottom of the feeder.

330A-5.5 Mineral Filler

If mineral filler is required in the mix, it shall be fed or weighed-in separately from the other aggregates.

330A-5.6 Heating and Drying

The aggregates shall be heated and dried before screening. The temperature of the aggregates shall be so controlled that the temperature of the completed mixture at the plant will fall within the permissible range allowed by these Specifications.

330A-5.7 Screening Unit

330A-5.7.1 Oversize Aggregate

Any oversized pieces of aggregate shall be removed by the use of a scalping screen. This oversized material shall not be returned to the stockpile for reuse unless it has been crushed and reprocessed into sizes that will pass the scalping screen.

330A-5.7.2 Screening

Unless otherwise permitted by the Engineer, the quantity of aggregates being discharged onto the screens shall not be in excess of the capacity of the screens to actually separate the aggregates into the required sizes. A maximum of ten percent plus-ten material will be permitted in the minus-ten bin. The maximum amount of minus-ten material allowed in the plus-ten bins will be determined by the Engineer, in accordance with its effect on the uniformity of the mix.

330A-5.8 Mixing Different Materials

Unless written permission is obtained, coarse aggregates of different types shall not be mixed; nor shall coarse aggregates of different types be used alternately in sections less than one mile in length.

330A-6 Preparation of the Mixture

330A-6.1 Batch Mixing

330A-6.1.1 Aggregates

The dried aggregates and mineral filler (if required), prepared in the manner previously described, and combined in batches to meet the job mix formula by weighing each separate bin size, shall be conveyed to the empty mixer.

330A-6.1.2 Bitumen

The hot asphalt cement, accurately measured, shall be introduced into the mixer simultaneously with, or after, the hot aggregates. Mixing shall continue until the mixture is thoroughly uniform, with all particles fully coated.

330A-6.1.3 Mixing Time

The mixing time shall begin when the measuring devices for both the asphalt and the aggregates indicate that all the material is in the mixer, and shall continue until the material begins to leave the mixing unit. The mixing time will vary in relation to the nature of the aggregates and the capacity of the mixer and shall be as designated by the Engineer but in no case shall it be less than 35 seconds.

330A-6.2 Continuous Mixing

The dried aggregates and mineral filler (if required), prepared as specified and proportioned to meet the job mix formula by volumetric measurements, shall be introduced into the mixer in synchronization with the accurate, feeding of the hot asphalt cement. The rate of flow of material to the pugmill shall be such that the maintained depth of the mix will not exceed the tips of the paddles when in the upright position. Mixing shall be sufficient to produce a thoroughly and uniformly coated mixture.

330A-6.3 Mixing Temperature

The ingredients of the mix shall be heated and combined in such a manner as to produce a mixture, which shall be at a temperature, when discharged from the pugmill or surge bin, within the range of 230°F to 310°F and within the tolerance shown in Table 330AA-1.

Table 330A-1
Temperature Tolerance From
Job Mix Formula

Any Single Measurement	+/- 25°F
Average of Any Five Consecutive Measurements	+/- 15°F

Any load or portion of a load of asphalt mix at the plant or on the Road with mix temperature exceeding 335°F shall be rejected for use on the project.

Temperature of the completed mixture shall be determined by a quick-reading thermometer through a hole in the side of the loaded truck immediately after loading. The hole shall be located within the middle third of the length of the body, and at a distance of from six to ten inches above the surfaces supporting the mixture. If a truck body already has a hole located in the general vicinity of the above specified location, this will be acceptable. At the Department's discretion, the temperature of the load may be taken over the top of the truck in lieu of using the hole in the side of the truck.

The mix temperature will be taken at the plant and the Roadway for each day for each design mix on the first five loads and an average of once every five loads thereafter. The temperature measurements at the plant shall be taken and recorded by the Contractor's personnel for review by the Department. The temperature measurements at the Roadway will be taken by the Department's Paving Inspector and be recorded on the backside of the delivery ticket. If the temperature exceeds the specified tolerance, the Contractor will be required to take immediate corrective action.

330A-6.4 Maximum Period of Storage: The maximum time that any mix may be kept in a hot storage or surge bin is 72 hours.

330A-6.5 Contractor's Responsibility for Mixture Requirements: The responsibility for producing a homogeneous mixture, free from moisture and with no segregated Materials, and meeting all requirements of the Specifications for the mixture, including compliance with the design limits, shall lie entirely with the Contractor. These requirements shall apply also to all mixes produced by the drum mixer process and all mixes processed through a hot storage or surge bin, both before and after storage.

330A-7 Transportation of the Mixture:
The mixture shall be transported in tight vehicles previously cleaned of all foreign material. The inside surface of the truck bodies after cleaning shall be thinly coated with soapy water or an approved emulsion containing not over five percent oil. The coating shall be applied prior to the first loading each day and repeated as necessary throughout the day's operations. After the truck bodies are coated and before any mixture is placed therein, they shall be raised to drain out all excess liquids. Each load shall be covered during cool and cloudy weather and at any time there is a probability of rain.

330A-8 Preparation of Application Surfaces

330A-8.1 Cleaning

Prior to the laying of the mixture, the surface of the base or pavement to be covered shall be cleaned of all loose and deleterious material by the use of power brooms or blowers, supplemented by hand brooming, where necessary.

330A-8.2 Patching and Leveling Courses

Where a surface course is constructed on an existing pavement or old base which is irregular, and wherever so indicated in the Plans, the existing surface shall be brought to proper grade and cross section by the application of patching or leveling courses.

330A-8.3 Application over Surface Treatment

Where a surface course is to be placed over a newly constructed surface treatment, all loose material shall be swept from the paving area and disposed of by the Contractor.

330A-8.4 Coating Surfaces of Contacting Structures

All structures which will be in actual contact with the asphalt mixture, with the exception of the vertical faces of existing pavements and curbs or curb and gutter, shall be painted with a uniform coating of asphalt cement to provide a closely bonded, watertight joint.

330A-8.5 Tack Coat

330A-8.5.1 Tack Coal Required

A tack coat, as specified in Section 300, will be required on existing pavements that are to be overlaid with an asphalt mix and between successive layers of all asphalt mixes.

330A.8.5.2 Tack Coat at Engineer's Option

A tack coat will be required on the following surfaces, only when so directed by the Engineer:

(1) Freshly primed bases.

(2) Surface treatment.

330A-9 Placing Mixture

330A-9.1 Requirements Applicable to All Types

330A-9.1.1 Alignment of Edges

All asphaltic concrete mixtures (including leveling courses), other than adjacent to curb and gutter or other true edges, shall be laid by the string-line method, to assure the obtaining of an accurate, uniform alignment of the pavement edge.

330AA-9.1.2 Temperature of Spreading

The temperature of the mix at the time of spreading shall be within +/-25°F of the established mix temperature selected by the Contractor. The minimum frequency for taking mix temperatures on the Road will be an average of one per five trucks. If the temperature fails to fall within the specified tolerance range, corrective action by the Contractor will be required.

330A-9.1.3 Rain, and Surface Conditions

Transportation of asphalt mixtures shall immediately cease from the plant when rain begins at the Roadway. Asphalt mixtures shall not be placed while rain is falling, or when there is water on the surface to be covered. As an exception, mixture caught in transit may be placed at the Contractor's risk if the only option is to waste this mixture, and provided the surface has been tacked (as required) prior to the rain and the surface broomed in front of the spreading operation. Such mixture will be evaluated separately and if it should prove unsatisfactory in any way, in the opinion

of the Engineer, it shall be removed and replaced with satisfactory mixture at the Contractor's expense.

330A-9.1.4 Speed of Spreader

The forward speed of the asphalt spreader shall be as established by the Engineer.

330A-9.1.5 Number of Crews Required

For each paving machine operated, the Contractor will be required to use a separate crew, each crew operating as a full unit. The Contractor's Certified Paving Technician in charge of the paving operations may be responsible for more than one crew but must be physically accessible to Project personnel at all times when mix is being placed.

330A-9.1.6 Checking Depth of Layer

The depth of each layer shall be checked at frequent intervals and adjustments shall be made when the thickness exceeds the allowable tolerance. When an adjustment is made, the paving machine shall be allowed to travel a minimum distance of 32 feet to stabilize before the second check is made to determine the effects of the adjustment.

330A-9.1.7 Hand Spreading

In limited areas where the use of the spreader is impossible or impracticable, the mixture may be spread and finished by hand.

330A-9.1.8 Straight-edging and Back-patching

Straight-edging and back-patching shall be done after initial compaction has been obtained and while the material is still hot.

330AA-9.2 Requirements Applicable to Courses Other Than Leveling

330A-9.2.1 Spreading and Finishing

Upon arrival, the mixture shall be dumped in the approved mechanical spreader and immediately spread and struck-off to the full width required and to such loose depth for each course that, when the Work is completed, the required weight of mixture per square yard, or the specified thickness, will be secured. An excess amount of mixture shall be carried ahead of the screed at all times. Hand raking shall be done behind the machine as required.

330A-9.2.2 Thickness of Layers

Unless otherwise noted in the Plans each course shall be constructed in layers of the thickness shown on Standard FDOT Index No. 513. Type S-III Asphaltic Concrete sball be constructed in layers of the thickness of not less than 3/4 inch nor greater than 1 1/4 inches.

330A-9.2.3 Laying Width

If necessary due to the traffic requirements, the mixture shall be laid in strips in such a manner as to provide for the passage of traffic. Where the Road is closed to traffic, the mixture may be laid to the full width, by machines traveling in echelon.

330A-9.2.4 Correcting Defects

Before any rolling is started the surface sball be checked, any irregularities adjusted, and all drippings, fat sandy accumulations from the screed, and fat spots from any source shall be removed and replaced with satisfactory material. No skin patching shall be done. When a depression is to be corrected while the mixture is hot, the surface shall be well scarified before the addition of fresh mixture.

330A-9.3 Requirements Applicable Only to Leveling Courses

330A-9.3.1 Patching Depressions

Before any leveling course is spread, all depressions in the existing surface more than one-inch deep shall be filled by spot patching with leveling course mixture and then thoroughly compacted.

330A-9.3.2 Spreading Leveling Courses

All courses of leveling shall be placed by the use of two motor graders - one of which is equipped with a spreader box - unless otherwise shown in the Plans. Other types of leveling devices may be used after they have been approved by the Engineer.

330A-9.3.3 Rate of Application

When the total asphalt mix provided for leveling exceeds 50 pounds per square yard, the mix shall be placed in two or more layers, with the average spread of any layer not to exceed 50 pounds per square yard. When Type S-III Asphaltic Concrete is used for leveling, the average spread of a layer shall not be less than 50 pounds per square yard nor more than 75 pounds per square yard. The quantity of mix for leveling shown in the Plans represents the average for the entire project; however, the rate of application may vary throughout the project as directed by the Engineer. When leveling in connection with base widening, the Engineer may require that all the leveling mix be placed prior to the widening operation.

330A-9.3.4 Placing Leveling Course over Existing Pavement

When a leveling course is specified to be placed over cracked concrete pavement (including existing concrete pavement covered with an asphaltic surface), the first layer of leveling shall be placed as soon as possible but no later than 48 hours after cracking the concrete. The remainder of the leveling course shall be placed in the normal sequence of operations.

330A-9.3.5 Removal of Excess Joint Material

Where a leveling course is to be placed over existing concrete pavement or Bridge decks, the excess joint filler in the cracks and joints shall be trimmed flush with the surface prior to placing the first layer of the leveling course.

330A-10 Compacting Mixture

330A-10.1 Provisions Applicable to All Types

330A-10.1.1 Equipment and Sequence

For each paving or leveling train in operation, the Contractor shall furnish a separate set of rollers, with their operators.

The following Equipment, sequence and coverage are suggested for use based on past successful performance; however, when density is required, the Contractor may select his own Equipment, sequence and coverage of rolling to meet the minimum density requirement specified. Regardless of the rolling procedure used, the final rolling must be completed before the internal pavement temperature has dropped below 175°F.

(1) Seal rolling, using tandem steel rollers (either vibratory or static) weighing 5 to 12 tons, following as close behind the spreader as is possible without pickup, undue displacement or blistering of the material. Vibratory rollers shall be used in the static mode for layers of one inch or less in thickness.

(2) Rolling with self-propelled pneumatic-tired rollers, following as close behind the seal rolling as the mix will permit. The roller shall cover every portion of the surface with at least five passes.

(3) Final rolling with the 8 to 12-ton tandem steel roller, to be done after the seal rolling and pneumatic-tired rolling have been completed, but before the internal pavement temperature has dropped below 175°F.

Once the Contractor has selected the Equipment and established the rolling procedures and these have been used for the control strip density determination, then the Contractor must continue to use the same Equipment and rolling procedures for all asphalt mix represented by the control strip. Changes in Equipment or procedures will require a new control strip density determination. The Engineer must be notified prior to changing the rolling process.

When density is not required, as for all patching courses, leveling and intermediate courses less than one-inch thick, overbuild course; of variable thicknesses (when the minimum thickness is less than one-inch) and open-graded friction courses, the compaction will be applied in accordance with the Standard Specifications. The specified rolling procedures must be followed when density determinations will not be made.

When density is not required on those courses indicated in the foregoing paragraph, but the Contractor wants to use other rollers, patterns or sequences than those specified, they may request approval from the Department. Approval may be granted for leveling and intermediate courses 1/2-inch and thicker and overbuild courses when these courses are placed with a paving machine. Density requirements will be in accordance with the provisions of the first paragraph of 330AA-10.3 (Density Control- Nuclear Method), Table 330AA-2 and Table 330AA-3. Approval for a change on patching courses, variable thickness leveling courses placed with motor graders and open-graded friction courses will not be granted.

330AA-10.1.2 Compaction at Crossovers, Intersections, etc.

When a separate paving machine is being used to pave the crossovers, the compaction of the crossovers may be done by one 8- to 10-ton tandem steel roller. If crossovers, intersections and acceleration and deceleration lanes are placed with the main run of paving, a traffic roller shall also be used in the compaction of these areas.

330A-10.1.3 Rolling Procedures

The initial rolling shall be longitudinal. Where the lane being placed is adjacent to a previously placed lane, the center joint shall be pinched or rolled, prior to the rolling of the rest of the lane.

Rolling shall proceed across the mat, overlapping the adjacent pass by at least six inches. The motion of the roller shall be slow enough to avoid displacement of the mixture, and any displacement shall be corrected at once by the use of rakes, and the addition of fresh mixture if required. Final rolling shall be continued until all roller marks are eliminated.

330A-10.1.4 Speed of Rolling

Rolling with the self-propelled, pneumatic-tired rollers shall proceed at a speed of 6 to 10 miles per hour, and the area covered by each roller shall not be more than 4,000 square yards per hour, except that for Type S Asphaltic Concrete, this maximum rate of coverage shall be 3,000 square yards per hour.

330A-10.1.5 Number of Pneumatic-tired Rollers Required

A sufficient number of self-propelled pneumatic-tired rollers shall be used to assure that the rolling of the surface for the required number of passes will not Delay any other phase of the laying operation nor result in excessive cooling of the mixture before the rolling is complete. In the event that the rolling falls behind, the laying operation shall be discontinued until the rolling operations are sufficiently caught up.

330A-10.1.6 Compaction of Areas Inaccessible to Rollers

Areas which are inaccessible to a roller (such as areas adjacent to curbs, headers, gutters, bridges; manholes, etc.) shall be compacted by the use of hand tamps or other satisfactory means.

330A-10.1.7 Rolling Patching and Leveling Courses

Self-propelled pneumatic-tired rollers shall be used for the rolling of all patching and leveling courses. Where the initial leveling course is placed over broken concrete pavement, the pneumatic-tired roller shall weigh at least 15 tons. For Type S-III Asphaltic Concrete leveling courses, the use of a steel-wheeled roller, to supplement the traffic rollers, will be required. On other leveling courses, the use of a steel-wheeled roller will be required on all passes after the first.

330A-10.1.8 Correcting Defects

The rollers shall not be allowed to deposit gasoline, oil or grease onto the pavement, and any areas damaged by such deposits shall be removed and replaced as directed by the Engineer. While rolling is in progress, the surface shall be tested continuously and all discrepancies corrected to comply with the surface requirements. All drippings, fat or lean areas and defective construction of any description shall be removed and replaced. Depressions which develop before the completion of the rolling shall be remedied by loosening the mixture and adding new mixture to bring the depressions to a true surface. Should any depression remain after the final compaction has been obtained, the full depth of the mixture shall be removed and replaced with sufficient new mixture to form a true and even surface. All high spots, high joints and honeycomb shall be corrected as directed by the Engineer. Any mixture remaining unbonded after rolling shall be removed and replaced. Any mixture which becomes loose or broken, mixed or coated with dirt or in any way defective, prior to laying the wearing course shall be removed and replaced with fresh mixture which shall be immediately compacted to conform with the surrounding area.

330A-10.1.9 Use of Traffic Roller on First Overbuild Course

A self-propelled pneumatic-tired roller shall be used on the first overbuild course. Coverage shall be a minimum of five passes.

330A-10.1.10 Use of Traffic Roller on First Structural Layer Placed on a Milled Surface

A self-propelled pneumatic-tired roller shall be used on the first structural layer placed on a milled surface. Coverage shall be a minimum of three passes.

330A-10.2 Provisions Applicable to Shoulder Pavement Only

Shoulder pavements wider than three feet shall be compacted by the use of Equipment of the type required for other asphaltic concrete pavements. Density determinations will be required on shoulder pavements wider than three feet when the thickness is one-inch or greater. These density determinations (including the control strip) will be separate from the pavement lane even when the pavement lane and shoulder are placed in the same pass.

Density determinations will not be required on asphaltic concrete or sand-asphalt hot mix shoulders three feet or less in width. The compactive effort shall be done by the use of tandem steel rollers not exceeding 12 tons in weight. In restricted areas other Equipment that will effectively exert a compactive effort may be approved by the Engineer. The Contractor shall state

what Equipment and compactive effort (coverage) is proposed to be used. This must be approved by the Engineer before the Contractor starts the operation. Where sand-asphalt hot mix shoulders are constructed within the limits of curb and gutter, compaction shall be done by light weight rolling Equipment, approved by the Engineer, which will not displace the previously constructed curb and gutter.

330A-10.3 Density Control

330A-10.3.1 Density Control Nuclear Method

The in-place density of each course of asphalt mix construction, with the exceptions of patching courses, leveling and intermediate courses less than one-inch thick or a specified spread rate less than 100 pounds per square yard, overbuild courses where the minimum thickness is less than one-inch, and open-graded friction courses, shall be determined by the use of the Nuclear Density Backscatter Method as specified by FM 1-T238 (Method B). The required density of a completed course shall be at least 98 percent of the average density of the control strip.

330A-10.3.2 Control Strips

One or more control strips shall be constructed for the purpose of determining the control strip density. A control strip shall be constructed at the beginning of asphalt construction and one thereafter for each successive course. Any change in the composition of the mix will require the construction of a new control strip. The Engineer may require an additional control strip when he deems it necessary to establish a new control strip density or conform the validity of the control strip density being used at that time. The Contractor may request a conformation of the control strip density also. The control strip must be constructed as a part of a normal day's run. The Contractor will not be permitted to construct the control strip separately.

The length of the control strip shall be 300 feet, regardless of the width of the course being laid. When the control strip is to be constructed for the first day of asphalt construction or at the beginning of a new course, it shall be started between 500 and 1,000 feet from the beginning of the paving operation. The thickness of the control strip shall be the same as that specified for the course of which it is a part. The control strip will be constructed using the same mix, the same paving and rolling Equipment and the same procedures as those used in laying the asphalt course of which the control strip is to become a part. Every control strip will remain in place and become a portion of the completed Roadway.

When the compaction of the control strip has been completed, ten density determinations will be made at random locations within the control strip. No determinations will be made within one foot of any unsupported edge. The average of these ten determinations will be the Control Strip Density. For purposes of determining the percent of Laboratory density, as required in Table 330AA-2, a correction factor will be developed from cores or by direct transmission nuclear determination where applicable.

(a) The lab density shall be calculated to the nearest 0.01 percent and rounded to the nearest 0.1 percent.

In the event that a control strip meeting the requirements of Table 330AA-2 is not obtained, and this particular mix, layer, etc., is completed on the project, density shall be evaluated in accordance with FM 5-543 (Determining Density of Asphalt Pavement Layers When a Valid Control strip is not obtained).

Table 330AA-2

Roadway Requirements for Bituminous Concrete Mixes

Mix Type	Density*	Minimum Control Strip Density (%)	Surface* Tolerance
S-I	X	96 Lab. Dens.	X
S-II	X	96 Lab. Dens.	X
S-III	X	96 Lab. Dens.	X
Type II	X	96 Lab. Dens.	X
Type III	X	96 Lab. Dens.	X
SAHM	X	96 Lab. Dens.	X
ABC-1	X	96 Lab. Dens.	**
ABC-2	X	96 Lab. Dens.	**
ABC-3	X	96 Lab. Dens.	**
FC-1	X	96 Lab. Dens.	X
FC-2	No Density Required	96 Lab. Dens.	X
FC-4	X	96 Lab. Dens.	X

*X – Denotes that test is required.

** – Shall meet the straightedge requirements of 200-7.

330A-10.3.3 LOTs

For the purpose of acceptance and partial payment, each day's production will be divided into Lots. The standard size of a Lot shall consist of 5,000 lineal feet of any pass made by the paving train regardless of the width of the pass or the thickness of the course. Pavers traveling in echelon will be considered as two separate passes. When at the end of a day's production or the completion of a given course or at the completion of the project, a partial Lot occurs, then the Lot size will be redefined as follows: If the partial Lot contains one or two sub-lots with their appropriate test results, then the previous full-size Lot will be redefined to include this partial Lot and the evaluation of the Lot will be based on either six or seven sub-lot determinations. If the partial Lot contains three or four sub-lots with their appropriate test results, this partial Lot will be redefined to be a whole Lot and the evaluation of it will be based on the three or four sub-lot determinations.

For the standard size Lot (5,000 lineal feet), five density determinations - one for each sub-lot - will be made at random locations within the Lot. but not to be taken within one foot of any unsupported edge. The random locations will be determined by the use of statically derived random number tables furnished by the Department. These will also be used for partial Lots, For the Contractor to receive full payment for density, the average density of a Lot will be a minimum of

98.0 percent of the control strip density. Once the average density of a Lot has been determined the Contractor will not be permitted to provide additional compaction to raise the average.

330A-10.3.4 Acceptance: The completed pavement will be accepted with respect to density on a Lot basis. Partial payment will be made for those Lot's that have an average density less than 98.0 percent of the Control Strip Density based on the following schedule:

Table 330AA-3	
Payment Schedule for Density	
Percent of Control Strip Density*	**Percent of Payment**
98.0 and above	100
97.0 to less than 98.0	95
96.0 to less than 97.0	90
**Less than 96.0	75

*In calculating the percent of control strip density, *do not round off* the final percentage.

**If approved by the Engineer based on an engineering determination that the material is acceptable to remain in place, the Contractor may accept the indicated partial pay, otherwise the Department will require removal and replacement at no cost. The Contractor has the option to remove and replace at no cost to the Department at any time.

330A-10.3.5 Density Requirements for Small Projects

For projects less than 1,000 linear feet in length and Bridge projects with approaches less than 1,000 linear feet each side, the requirements for control strips and nuclear density determination will not apply. The Contractor will use the standard rolling procedures as specified in 330A-10. The provisions for partial payment do not apply to these small projects.

330A-11 Joints

330A-11.1 Transverse Joints

Placing of the mixture shall be as continuous as possible and the roller shall not pass over the unprotected end of the freshly laid mixture except when the laying operation is to be discontinued long enough to permit the mixture to become chilled. When the laying operation is thus interrupted, a transverse joint shall be constructed by cutting back on the previous run to expose the full depth of the mat.

330A-11.2 Longitudinal Joints

For all layers of pavement except the leveling course, placing of each layer shall be accomplished to cause longitudinal construction joints to be offset 6 to 12 inches laterally between successive layers. The Engineer may waive this requirement where offsetting is not feasible due to the sequence of construction.

330A-11.3 General: When fresh mixture is laid against the opposite edges of joints (trimmed or formed as provided above), it shall be placed in close contact with the exposed edge so that an even, well-compacted joint will be produced after rolling.

330A-12 Surface Requirements

330A-12.1 Contractor Responsibility

The Contractor shall be responsible for obtaining a smooth surface on all pavement courses placed and therefore should straightedge all intermediate and final courses with a I5-foot rolling straightedge. A I5-foot manual straightedge shall be furnished by the Contractor and shall be available at the job site at all times during the paving operation for checking joints and surface irregularities.

330A-12.2 Texture of the Finished Surface of Paving Layers

The finished surface shall be of uniform texture and compaction. The surface shall have no pulled, tom, or loosened portions and shall be free of segregation, sand streaks, sand spots, or ripples. Any area of the surface which does not meet the foregoing requirements shall be corrected in accordance with 330A-12.4.

Unless written permission is obtained, asphalt concrete mixtures containing aggregates which will cause a different color appearance shall not be used in the final wearing surface in sections less than one mile in length.

330A-12.3 Acceptance Testing for Surface Tolerance

330A-12.3.1 General

Acceptance testing for surface tolerance will be applicable to pavement lanes and ramps, where the width is constant, and shall include all construction joints.

Intersections, tapers, crossovers, transitions at beginning and end of project, and similar areas will not be tested for surface tolerance with the rolling straightedge as provided below. However, any individual surface irregularity in these areas in excess of 3/8 inch as determined by a 15-foot straightedge, and deemed by the Department to be objectionable, shall be corrected in accordance with 330A-12.4.

When the Department is ready to perform acceptance testing for surface tolerance, the Contractor shall provide the required traffic control in accordance with standard maintenance of traffic requirements specified in the Contract. The cost of this traffic control shall be included in the Contract Bid prices for the asphalt items.

The Contractor shall also provide a representative to be present during the entire operation of straight edging for acceptance purposes.

330A-12.3.2 Test Method

Acceptance testing shall consist of one pass of a standard IS-foot rolling straightedge operated along the centerline of each lane tested. This does not preclude acceptance testing lit other locations within the lane being tested.

330A-12.3.3 Acceptance Criteria for Last Layer Prior to Friction Course

The Contractor shall furnish and operate an acceptable 15-foot rolling straightedge for testing of the last layer prior to the friction course as directed by the Engineer and supervised by project personnel. All deficiencies in excess of 3/16-inch shall be corrected in accordance with 330A-12.4 and retested as necessary prior to placement of the friction course. Where the final surface is not a friction course, acceptance criteria shall be in accordance with 330A-12.3.4.

330A-12.3.4 Acceptance Criteria for Final Surface or Friction Course

Upon completion of the final surface or friction course, district Materials personnel will test the finished surface with a 15-foot rolling straightedge. All deficiencies in excess of 3/l6th inch shall be corrected in accordance with 330A-12.4, except that correction by overlaying will not be permitted when the final surface is a friction course.

The Engineer may waive corrections specified above if an engineering determination indicates that the deficiencies are sufficiently separated so as not to significantly affect the ride quality of the pavement and corrective action would unnecessarily mar the appearance of the finished pavement.

Where the Engineer elects to waive correction and the finished pavement surface is a friction course, the pay quantity for Asphaltic Concrete Friction Course will be reduced by the amount of friction course which would have been removed and replaced if the correction had been made (100 ft. X lane width).

Where the Engineer elects to waive a correction and the finished pavement surface is other than a friction course, the appropriate pay quantity for Asphaltic Concrete shall be reduced by the equivalent quantity of Materials which would have been removed and replaced if the correction had been made.

(a) Where the pay quantity is in square yard, the reduction is based on the area which would have been removed (100 feet X lane width) multiplied by the ratio of the layer thickness to the total thickness of the type of mix specified.

(b) Where the pay quantity is in tons, the reduction is based on the volume which would have been removed (100 feet X lane width X layer thickness) multiplied by the Laboratory density for the mix.

330A-12.4 Correcting Unacceptable Pavement

The Contractor has the option of selecting one of the following methods unless overlaying is prohibited in accordance with 330A-12.3.4:

(a) Removing and Replacing: If correction is made by removing and replacing the pavement, the removal must be for the full depth of the course and extend at least SO feet on either side of the defective area, for the full width of the paving lane.

(b) Overlaying: If correction is made by overlaying, the overlay shall cover the length of the defective area and taper uniformly to a featheredge thickness at a minimum distance of SO feet on either side of the defective area. The overlay shall extend full width of the Roadway. Care shall be taken to maintain the specified cross slope. The mix used for the overlay may be adjusted as necessary for this purpose by the District Bituminous Engineer.

(c) Other Methods: For courses which will not be the final pavement surface, correction of minor straightedge deficiencies by methods other than specified above shall be approved by the District Bituminous Engineer.

The cost of all corrective Work, either by removing and replacing or by overlaying, shall be borne by the Contractor.

330A-13 Protection or Finished Surface

Sections of newly compacted asphaltic concrete which are to be covered by additional courses shall be kept clean until the successive course is laid.

No dumping of embankment or base material directly on the pavement will be permitted. Dressing of shoulders shall be completed before placement of the friction course on adjacent pavement.

Blade graders operating adjacent to the pavement during shoulder construction shall have a two-inch by eight-inch (or larger) board (or other attachment providing essentially the same results) attached to their blades in such manner that it extends below the blade edge, in order to protect the pavement surface from damage by the grader blade.

To prevent rutting or other distortion, sections of newly finished dense-graded friction course and the last structural layer prior to the friction course shall be protected from traffic until the surface temperature has cooled below 160°F.

The Contractor may use artificial methods to cool the pavement to expedite paving operations. The Department may direct the Contractor to use artificial cooling methods when, in the opinion of the Engineer, maintenance of traffic requires opening the pavement to traffic at the earliest possible time.

330A-14 Correcting Deficient Thickness

330A-14.1 Allowable Deficiencies

When the pavement is to be paid for on a square yard basis, the thickness shall be determined from the length of the co-borings, as specified in 330A-15.1. The maximum allowable deficiency from the specified thickness shall be as follows:

(1) For pavement of a specified thickness of 2 1/2 inches or more: 1/2 inch.

(2) For pavement of a specified thickness of less than 2 1/2 inches: 1/4 inch.

330A-14.2 Pavement Exceeding Allowable Deficiency in Thickness

330A-14.2.1 When Deficiency is Seriously in Excess

Where the deficiency in thickness is: (1) in excess of 3/8 inch, for pavement of less than 2 1/2 inches in specified thickness, or, (2) in excess of 3/4 inch, for pavement of specified thickness of 2 1/2 inches or more, the Contractor shall correct the deficiency either by replacing the full thickness for a length extending at least 50 feet from each end of the deficient area, or (when permitted by the Engineer) by overlaying as specified in 330A-14.2.3.

As an exception to the above, pavement outside the main Roadway area (acceleration and deceleration lanes and crossovers) may be left in place, without compensation when 80 permitted by the Engineer, even though the thickness deficiency exceeds the tolerance specified above.

The Contractor will receive no compensation for any pavement removed, nor for the Work of removing such pavement.

330A-14.2.2 When Deficiency is Not Seriously in Excess

When the deficiency in the thickness of the pavement is over 1/4 inch but not more than 3/8 inch, for pavement of specified thickness less than 2 1/2 inches; or when the deficiency in thickness is over 1/2 inch but not more than 3/4 inch, for pavement of specified thickness of 2 1/2 inches or greater; the Contractor will be allowed to leave such pavement in place, but without compensation. The areas of such pavement for which no square yard payment will be made shall be the product of the total distance between acceptable cores, multiplied by the width of the lane which was laid at the particular pass in which deficient thickness was indicated. All costs of the overlaying and compacting sha11 he borne by the Contractor.

330A-14.2.3 Correcting Deficiency by Adding New Surface Material

For any case of excess deficiency of the pavement, the Contractor will be permitted, if approved by the Engineer for each particular location, to correct the deficient thickness by adding new surface material and compacting to the same density as the adjacent surface. The area to f be corrected and the thickness of new material added shall be as specified in 330A-12.3.
All costs of the overlaying and compacting shall be borne by the Contractor.

330A-15 Calculations for Thickness of Pavement to be Paid for (Applicable Only Where the Pavement is to be Paid for by the Square Yard)

330A-15.1 Core Borings

When the Department is ready to core the finished asphalt construction for thickness as required for acceptance testing, the Contractor shall provide the required traffic control in accordance with standard maintenance of traffic requirements specified in the Contract. The cost of this traffic control shall be included in the Contract Bid prices for the asphalt items.

The Contractor shall provide a representative to be present during the entire coring operations for acceptance purposes.

The thickness of the pavement shall be determined from the length of cores, at least two inches in diameter, taken at random points on the cross section and along the Roadway. Each core shall represent a section of Roadway no longer than 200 feet regardless of the number of lanes. Thickness determinations for paved shoulders and widening shall be separate from the mainline Roadway and shall represent a section no longer than 400 feet for each shoulder or- widening. The average thickness shall be determined from the measured thicknesses, and in accordance with the procedure and criteria specified herein.

If the Contractor believes that the number of cores taken by the Department is insufficient to properly indicate the thickness of the pavement, he may request the Department to make additional borings at locations designated by him. The cost of these additional borings shall be deducted from any sums due the Contractor unless such borings indicate that the pavement within the questioned area is of specified thickness.

330A - 15. 2 Criteria for Calculations DELETE AND SUBSTITUTE THE FOLLOWING:

The calculation for asphaltic concrete pavement to be paid for under this section shall be the area in square yards completed and accepted with the length to be used in the calculation being the actual length measured along the surface and the width as shown on the Plans. The thickness to be paid shall be as shown on the Typical Section in the Plans.

Areas of deficient thickness - pavement which is left in place with no compensation (as specified in 330A-14.2), shall not be taken into account in the calculation.

Where areas of defective surface or deficient thickness are corrected by overlaying with additional material, the thickness used in the calculations shall be the thickness specified on the Typical Section for such areas.

END OF SECTION

SECTION 331
TYPE S ASPHALTIC CONCRETE

SECTION 331 IS ADDED TO THIS SPECIFICATION

331-1 Description

This Section specifies the Materials, the composition, and physical test properties for Type S Asphaltic Concrete (Type S-I, Type S-II or Type S-III as specified by the Contract or when offered as alternates. The composition, and physical test properties for all mixes, including Type S Asphaltic Concrete (S-I, S-II and S-III) are shown in the following Table 331-1 and Table 331-2.

Where Type S Asphaltic Concrete is specified in the Contract, if approved by the Engineer, the Contractor may also select Type S-III Asphaltic Concrete as an alternate for the final surface (no friction course specified) and as the final layer of structural course only, prior to the friction course. Type S-II Asphaltic Concrete will not be permitted as the final layer prior to the friction course. Requirements for plant and Equipment shall be as specified in Section 320. General construction requirements shall be as specified in Section 330A.

Table 331-1

Percent By Weight Total Aggregate Passing Sieves*

Type	3/4	½	3/8	No.4	No. 10	No. 40	No. 80	No. 200
S-I	100	88-100	75-93	47-75	31-53	19-35	7-21	2-6
S-II**	83-98	71-87	62-78	47-63	33-49	19-35	9-18	2-6
S-III		100	88-100	60-90	40-70	20-45	10-30	2-12
Type II		100	90-100	80-100	55-90			2-10
Type III		100	80-100	65-100	40-75	20-45	10-30	0-12
SAHM		100						0-12
ABC-1		100						0-12
ABC-2		100			55-90			2-10
ABC-3***	70-100			30-70	20-60	10-40		2-8
FC-1		100			55-85			2-5
FC-2****		100	85-100	10-40	4-12			2-6
FC-4		100			75-90			2-6

*In inches, except where otherwise indicated. Number sieves are U.S. Standard sieve series.
**100% passing 1 1/4-inch sieve and 94-100% passing I-inch sieve.
***100% passing 1 1/2-inch sieve.
****The design range for the No. 10 sieve may be increased for lightweight aggregates.

Table 331-2 Marshall Design Properties for Bituminous Concrete Mixes					
Mix Type	**Minimum Marshall Stability (lbs.)**	**Flow* (0.01 in.)**	**Minimum VMA (%)**	**Air Voids (%)**	**Minimum Effective Asphalt Content (%)**
S-I	1500	8-14	14	3-5	5.0
S-II	1500	8-14	13	3-5	5.0
S- III	1500	8-14	15	3-7	5.5
Type II	500-750	7-16	18	5-16	6.0
Type III	750-1000	7-16	15	5-12	5.5
SAHM	300-500	7-16	15	5-16	6.0
ABC-1	500	7-16	15	5-16	6.0
ABC-2	750	7-16	15	5-14	5.5
ABC-3	1000	8-14	14	3-7	5.0
FC-1	500	7-14	15	8-14	5.5
FC-2	-	-	-	-	-
FC-4	500	7-14	15	12-16	5.0

*The maximum Flow for the mix design shall be one point less than shown in the Table. The maximum Flow values shown apply only during production.

Work will be accepted on a LOT to LOT basis in accordance with the applicable requirements of Sections 5, 6, and 9. The size of the LOT will be as specified in 331-5 for the bituminous mixture produced at the plant and as stipulated in 330A-10 and 330A-12 for the material placed on the Roadway.

331-2 Materials

331-2.1 General Specifications

The Materials used shall conform with the requirements specified in Division III. Specific references are as follows:

(1) Asphalt Cement Viscosity Grade AC-30	916-1
(2) Mineral Filler	917-1 and 917-2
(3) Coarse Aggregate, Stone, Slag or Crushed Gravel	Section 901*
(4) Fine Aggregate	Section 902

*Gravel for use in asphalt concrete mixtures shall be crushed. In addition, the asphalt concrete mixtures containing crushed gravel as the course aggregate component must show no potential for stripping during Laboratory testing, before approval of the mix design.

Reclaimed Portland Cement Concrete Pavement may be used as a coarse aggregate or screenings component subject to meeting all applicable Specifications.

All Materials shipped to the asphalt plant will be sampled at their destination.

331-2.2 Specific Requirements

331-2.2.1 Condition of Aggregate

The aggregate shall be clean and shall contain no deleterious substances. Coarse or fine aggregate containing any appreciable amount of phosphate shall not be used.

331-2.2.2 Fine Aggregate and Mineral Filler

In Laboratory tests, and for the purpose of proportioning the paving mixture, all material passing the No. 10 sieve and retained on the No. 200 sieve, shall be considered as fine aggregate, and the material passing the No. 200 sieve shall be considered as mineral filler.

331-2.2.3 Screenings

Any screenings used in the combination of aggregates shall contain no more than 15 percent of material passing the No. 200 sieve. When two screenings are blended to produce the screening component of the aggregate, one of such screenings may contain up to 18 percent of material passing the No. 200 sieve, as long as the combination of the two does not contain over 15 percent material passing the No.200 sieve. Screenings may be washed to meet these requirements.

331-2.2.4 Use of Reclaimed Asphalt Pavement

Reclaimed asphalt pavement may be used as a component material of the bituminous mixture subject to the following:

1. The Contractor shall be responsible for the design of asphalt mixes which incorporate reclaimed asphalt pavement as a component part.

2. Reclaimed asphalt pavement shall not exceed 60 percent by weight of total aggregates for Asphalt Base Courses nor more than 35 percent by weight of total aggregates for Structural and Leveling Courses, Reclaimed asphalt pavement shall not be used in Friction Courses.

3. A 3 ½" grizzly shall be mounted over the reclaimed asphalt pavement cold bin. If oversize material shows up in the mix, the size of openings shall be reduced.

4. The reclaimed asphalt pavement material as stockpiled shall be reasonably uniform in characteristics and shall not contain aggregate particles which are soft or conglomerates of fines.

331-2.2.5 Recycling Agents

When reclaimed asphalt pavement is approved for use as a component material, a recycling agent meeting the requirements specified in 916A-2 shall be used in the mix.

331-3 Permissible Variation for the Coarse Aggregate

The aggregate or aggregates shipped to the job shall be sized and uniformly graded or combined in such proportions that the resulting mixture meets the grading requirements of the mix design.

331-4 General Composition of Mixture

331-4.1 General

The bituminous mixture shall be composed of a combination of aggregate (coarse, fine or mixtures thereof), mineral filler, if required, and bituminous material. Not more than 20 percent by weight of the total aggregate used shall be silica sand or local Materials as defined in Section 902. The silica sand and local Materials contained in any reclaimed asphalt pavement material, if used in the mix, shall be considered in this limitation. The several aggregate fractions shall be sized, uniformly graded and combined in such proportions that the resulting mixture will meet the grading and physical properties of the approved mix design.
Reclaimed asphalt pavement meeting the requirements of 331-2.2.4 may be approved as a substitution for a portion of the combination of aggregates, subject to all applicable specification requirements being met.

331-4.2 Grading Requirements

In all cases, the job mix formula shall be within the design ranges specified in Table 331-1.

331-4.3 Mix Design

331-4.3.1 General

Prior to the production of any asphaltic paving mixture, the Contractor shall submit a mix design to the Engineer at least two weeks before the scheduled start of production. The following information shall be furnished:

1. The specific project on which the mixture will be used.

2. The source and description of the Materials to be used.

3. The gradation and approximate proportions of the raw Materials as intended to be combined in the paving mixture.

4. A single percentage of the combined mineral aggregate passing each specified sieve.

5. A single percentage of asphalt by weight of total mix intended to be incorporated in the completed mixture.

6. A single temperature at which the mixture is intended to be discharged from the plant.

7. The Laboratory density of the asphalt mixture, for all mixes except Open-Graded Friction Courses.

8. Evidence that the completed mixture will conform to all specified physical requirements.

9. The name of the individual responsible for the Quality Control of the mixture during production.

In lieu of the above, when reclaimed asphalt pavement is approved for use as a component material, the Contractor shall submit to the Engineer at least two weeks before the scheduled start of production in writing a proposed mix design and samples of all material components.
The following information shall be furnished with the proposed mix design for mixes containing reclaimed asphalt pavement:

1. The specific project on which the mixture will be used.

2. The source and description of the Materials to be used.

3. The gradation and approximate proportions of the raw Materials as intended to be combined in the paving mixture.

4. A single percentage of the combined mineral aggregate passing each specified sieve.

5. A single temperature at which the mixture is intended to be discharged from the plant.

6. The name of the individual responsible for the Quality Control of the mixture during production.

331-4.3.2 Revision of Mix Design

The approved mix design shall remain in effect until a change is authorized by the Engineer. A new design will be required for any change in source of aggregate.

331-4.3.3 Resistance to Plastic Flow

The submitted mix design shall include test data showing that the material as produced will meet the requirements specified in Table 331-2 when tested in accordance with FM 1-T245. Further, the bulk specific gravity of the Laboratory compacted bituminous mixture shall be determined in accordance with FM T-T166.

The percent of unfilled voids and the percent of aggregate voids filled with asphalt shall be based on the maximum specific gravity of the bituminous mixture and on the asphalt content of each group of specimens prepared from the same sample. Maximum specific gravity of the bituminous mixture shall be determined by FM 1-T-209.

331-4.4 Contractor's Quality Control

331-4.4.1 Personnel DELETE IN ITS ENTIRETY

331-4.4.2 Extraction Gradation Analysis

The bituminous mixture will be sampled at the plant in accordance with FM 1-T168. The percent bitumen content of the mixture will be determined in accordance with FM 5-544. The percent passing the standard sieves will be determined in accordance with FM 5-545. All test results will be shown to the nearest 0.01. All calculations will be carried to the 0.001 and rounded to the nearest 0.01, in accordance with the Department's rules of rounding.

The Contractor will run a minimum of one extraction gradation analysis of the mixture for each day's or part of a day's production and immediately following any change in the production process. The quality control sample of mixture for the extraction gradation analysis will be taken each day as soon as the plant operations have stabilized and the results will be obtained in a timely manner so that adjustments can be made if necessary.

Extraction gradation analysis will not be required on the days when mix production is less than 100 tons. However, when mix production is less than 100 tons per day on successive days, the test will be run when the accumulative tonnage on such days exceeds 100 tons.

The target gradation and asphalt content shall be as shown on the mix design. Any changes in target will require a change in the mix design in accordance with 331-4.3.2.

If the percentage of bitumen deviates from the optimum asphalt content by more than 0.55 percent, or the percentage passing any sieve falls outside the limits shown in Table 331-3, the Contractor will make the necessary correction. If the results for two consecutive tests deviate from the optimum asphalt content by more than 0.55 percent, or exceeds the limits as shown in Table 331-3 for any sieve, the plant operation shall be stopped until the problem has been corrected.

The Contractor will maintain control charts showing the results of the extraction gradation analysis (bitumen content and sieve analysis).

Table 331-3
Tolerances for Quality Control Tests
(Extraction Gradation Analysis)

Sieve Size	Percent Passing
1"	
7.0	
3/4"	7.0
1/2"	7.0
3/8"	7.0
No. 4	7.0
No. 10	5.5
No. 40*	4.5
No. 80*	3.0
No. 200	2.0

*Does not apply to SAHM, ABC-1 or Type II.

331-4.4.3 Plant Calibration

At or before the start of mix production, a set of hot bin samples for batch or continuous mix plants or belt cut for drum mix plants will be wash graded to verify calibration of the plant. When approved by the Engineer, extraction gradation analysis of the mix may be used to verify calibration of the plant. This extraction gradation analysis may also be used to fulfill the quality control requirements for the first days' production.

331-4.4.4 Viscosity of Asphalt in Mixes Containing Reclaimed Asphalt Pavement

When reclaimed asphalt pavement is a component material, the viscosity of the asphalt material in the bituminous mixture, determined in accordance with FM 1-T202, shall be 6000 +/- 2000 poises. This determination shall be made on samples obtained by the Department on a random basis at a frequency of approximately one per 2000 tons of mix.
If the viscosity is determined to be out of the specified tolerance, the Contractor shall adjust the recycling agent formulation or blend of reclaimed asphalt material used in the mixture to bring the viscosity within tolerance.

331-5 Acceptance of the Mixture
(For This Article, the Term "Lot" Applies to Department Projects)

331-5.1 General

The bituminous mixture will be accepted at the plant, with respect to gradation and asphalt content, on a Lot to Lot basis. The material will be tested for acceptance in accordance with the provisions of 6-4 and the following requirements. However, any load or loads of mixture which, in the opinion of the opinion of the Engineer, are unacceptable for reason of being excessively segregated, aggregates improperly coated, or of excessively high or low temperature shall be rejected for use in the Work.

A standard size Lot at the asphalt plant shall consist of 4000 tons with four equal sub-lots of 1000 tons each.

A partial Lot may occur due to the following:

(1) The completion of a given mix type on a project.

(2) an approved Lot termination by the Engineer due to a change in process, extended Delay in production, or change in mix design.

If the partial Lot contains one or two sub-lots with their appropriate test results, then the previous full size Lot will be redefined to include this partial Lot and the evaluation of the Lot will be based on either five or six sub-lot determinations. If the partial Lot contains three sub-lots with their appropriate test results, this partial Lot will be redefined to be a whole Lot and the evaluation of it will be based on three sub-lot determinations.

When the total quantity of any mix is less than 3000 tons, the partial Lot will be evaluated for the appropriate number of sub-lots from n = 1 to n = 3. When the total quantity of any mix type is less

than 500 tons, the Department will accept the mix on the basis of visual inspection. The Department may run extraction and gradation analysis for information purposes; however, the provisions for partial payment will not apply.

On multiple project contracts, the Lot(s) at the asphalt plant will carry over from project to project.

331-5.2 Acceptance Procedures

The Contractor shall control all operations in the handling, preparation, and mixing of the asphalt mix so that the percent bitumen and percent passing the No.4, 10, 40 and 200 sieves will meet the approved job mix formula within the tolerance shown in Table 331-5.

Table 331-5
Tolerances for Acceptance Tests

Characteristic	Tolerance*
Asphalt Content (Extraction)	+/-0.55%
Asphalt Content (Printout)	+/-0.15%
Passing No. 4 Sieve	+/-7.00%
Passing No. 10 Sieve	+/-5.50%
Passing No. 40 Sieve**	+/-4.50%
Passing No. 200 Sieve	+/-2.00%

*Tolerances for sample size of n = 1. See Table 331-6 for other sample sizes n=2 through n=6.
**Applies only to Type S-I, S-II, S-III, FC-1 and FC-4.

Acceptance of the mixture shall be on the basis of test results on consecutive random samples from each LOT. One random sample shall be taken from each sub-lot. The bituminous mixture will be sampled at the plant in accordance with FM 1-T 168. The percent bitumen content of the mixture will be determined in accordance with FM 5-544. The percent passing the No.4, No. 10, No. 40 and No. 200 sieves will be determined in accordance with FM 5-545.

Calculations for the acceptance test results for bitumen content and gradation (percent passing No.4, No. 10, No. 40 and No. 200) shall be shown to the nearest 0.01. Calculations for arithmetic averages shall be carried to the 0.001 and rounded to the nearest 0.01 in accordance with the Department's rules of rounding.

When the Contractor or Producer chooses to use a storage bin for mix storage overnight or longer, the material processed in this manner will be handled as follows:

The samples of mix taken for acceptance tests on asphalt content must be taken before the mix is placed into the storage bin. Samples of mix for acceptance tests on gradation shall be taken after the mix has been removed from the storage bin.

Payment will be made on the basis of Table 331-6 Acceptance Schedule of Payment. The process will be considered out of control when any individual test result from a LOT exceeds the 90 percent

pay factor limit for the values in the "one test" column of Table 331-6. When this happens, the LOT will be automatically terminated and the percent of payment will be determined from Table 331-6.

Table 331-6						
Acceptance Schedule of Payment - (Asphalt Plant Mix Characteristics)						
Average of Accumulated Deviations of the Acceptance Tests from the Mix Design						
Pay Factor	**1-Test**	**2-Tests**	**3- Tests**	**4-Tests**	**5- Tests**	**6-Tests**
Asphalt Cement Content (Extraction)						
1.00	0.00-0.55	0.00-0.43	0.00-0.38	0.00-0.35	0.00-0.33	0.00-0.31
0.95	0.56-0.65	0.44-0.50	0.39-0.44	0.36-0.40	0.34-0.37	0.32-0.36
0.90	0.66-0.75	0.51-0.57	0.45-0.50	0.41-0.45	0.38-0.42	0.36-0.39
0.80*	Over 0.75	Over 0.57	Over 0.50	Over 0.45	Over 0.42	Over 0.39
Asphalt Cement Content (Printout)						
1.00	0.00-0.15	0.00-0.15	0.00-0.15	0.00-0.15	0.00-0.15	0.00-0.15
0.95	0.16-0.25	0.16-0.25	0.16-0.25	0.16-0.25	0.16-0.25	0.16-0.25
0.90	0.26-0.35	0.26-0.35	0.26-0.35	0.26-0.35	0.26-0.35	0.26-0.35
0.80*	Over 0.35	Over 0.35	Over 0.35	Over 0.35	Over 0.35	Over 0.35
No. 4 Sieve **						
1.00	0.00-7.00	0.00-5.24	0.00-4.46	0.00-4.00	0.00-3.68	0.00-3.45
0.98	7.01-8.00	5.25-5.95	4.47-5.04	4.01-4.50	3.69-4.13	3.46-3.86
0.95	8.01-9.00	5.96-6.66	5.05-5.62	4.51-5.00	4.14-4.58	3.87-4.27
0.90	9.01-10.00	6.67-7.36	5.63-6.20	5.01-5.50	4.59-5.02	4.28-4.67
0.80*	Over 10.00	Over 7.36	Over 6.20	Over 5.50	Over 5.02	Over 4.67
No. 10 Sieve **						
1.00	0.00-5.50	0.00-4.33	0.00-3.81	0.00-3.50	0.00-3.29	0.00-3.13
0.98	5.51-6.50	4.34-5.04	3.82-4.39	3.51-4.00	3.30-3.74	3.14-3.54
0.95	6.51-7.50	5.05-5.74	4.40-4.96	4.01-4.50	3.75-4.18	3.55-3.95
0.90.	7.51-8.50	5.75-6.45	4.97-5.54	4.51-5.00	4.19-4.63	3.96-4.36
0.80*	Over 8.50	Over 6.45	Over 5.54	Over 5.00	Over 4.63	Over 4.36
No. 40 Sieve **						
1.00	0.00-4.50	0.00-3.91	0.00-3.65	0.00-3.50	0.00-3.39	0.00-3.32
0.98	4.51-5.50	3.92-4.62	3.66-4.23	3.51-4.00	3.40-3.84	3.33-3.72
0.95	5.51-6.50	4.63-5.33	4.24-4.81	4.01-4.50	3.85-4.29	3.73-4.13
0.90	6.51-7.50	5.34-6.04	4.82-5.3	4.51-5.00	4.30-4.74	4.14-4.54
0.80*	Over 7.50	Over 6.04	Over 5.39	Over 5.00	Over 4.74	Over 4.54
No. 200 Sieve **						
1.00	0.00-2.00	0.00-1.71	0.00-1.58	0.00-1.50	0.00-1.45	0.00-1.41
0.95	2.01-2.40	1.72-1.99	1.59-1.81	1.51-1.70	1.46-1.63	1.42-1.57
0.90	2.41-2.80	2.00-2.27	1.82-2.04	1.71-1.90	1.64-1.80	1.58-1.73
0.80*	Over 2.80	Over 2.27	Over 2.04	Over 1.90	Over 1.80	Over 1.73

*If approved by the Engineer based on an engineering determination that the material is acceptable to remain in place, the Contactor may, accept the indicated partial pay. Otherwise, the Department will require removal and replacement at no cost. The Contractor has the option to remove and replace at no cost to the Department at any time.

**When there are two or more reduced payments for these items in one LOT of material, only the greatest

reduction in payment will be applied. CAUTION: This rule applies only to these four gradation test results.

Notes:
(1) The No. 40 Sieve applies only to Type S-I, S-II, S-III, FC-1 and FC-4.
(2) Deviations are absolute values with no plus or minus signs.

331-5.3 Automatic Batch Plant with Printout

Acceptance determinations asphalt content for mixtures produced by automatic batch plants with printout will be based on the calculated bitumen content using the printout of the weights of asphalt actually used. Acceptance determinations for gradations (No.4, No. 10, No. 40 and No. 2(0) will be based on the actual test results from extraction gradation analyses. Payment will be made based on the provisions of Table 331-6.

331-5.4 Acceptance on the Roadway

The bituminous mixture will be accepted on the Roadway with respect to compacted density and surface tolerance in accordance with the applicable requirements of 330A-10 and 330A-12.

331-5.5 Additional Tests

The Department reserves the right to run any test at any time for informational purposes and for determining the effectiveness of the Contractor's quality control. The Department will determine the Marshall properties, a minimum of one set per LOT, to determine whether or not the Contractor is meeting the specification requirements. Specimens will be prepared at the plant and transported to the District or Central Lab where they will be tested in accordance with FM 5-511 for Marshall stability and flow, FM 1- T 209 for maximum specific gravity, and FM 1-T166 for density. When the average value of the specimens fails to meet specification requirements for stability or flow, or the air void content is below 3.0 percent (for structural mixes only), the Contractor's plant operations may be stopped until all specification requirements can be met or until another mix design has been approved (any revisions to a mix design shall be made in accordance with 331-4.3.2). When it is determined necessary to cease operations while the problem is being resolved, the approval of the Engineer will be required before resuming production of the mix. At this time the Marshall properties must be verified,

331-6 Compensation

331-6.1 Items for Which Payment Will Be Made

For the Work specified under this Section (including the pertinent provisions of Sections 320 and 330A), payment will be made for the area of the pavement, in square yards (after adjustment to the equivalent area of specified-thickness pavement), or, when so shown, the weight of the mixture, in tons.

331-6.2 Area of Pavement for Which Payment Will Be Made
When the pavement is to be paid for on an area basis, the area to be paid for shall be field measured quantity, omitting any areas not allowed for payment under the provisions of 9-3.2, omitting any areas not allowed for payment under 330A-14.2.

The thickness to be paid for under this section is the thickness shown on the typical section in the Plans.

331-6.3 Payment by Weight of Mixture

Where the pavement is to be paid for by weight, the weight shall be determined as provided in 320-2 (including the provisions for the automatic recordation system).

331-6.4 Bituminous Material DELETE IN ITS ENTIRETY

331-6.5 Work Included in Payment Items

The Contract unit price per ton or per square yard, as applicable, shall be full compensation for all the Work specified under this Section (including the applicable requirements of Sections 320 and 330A).

Payment shall be made under:
Item No. 331-2 – Type S Asphaltic Concrete – per ton.
Item No. 331-72 – Type S Asphaltic Concrete – per square yard.

END OF SECTION

SECTION 334
SUPERPAVE ASPHALT

SECTION 334 SUPERPAVE ASPHALT – DELETE AND SUBSTITUTE THE FOLLOWING:

334-1 Description

334-1.1 General

Construct a Superpave asphalt pavement (consisting of either Hot Mix Asphalt (HMA) or Warm Mix Asphalt (WMA)) based on the type of Work specified in the Contract and the Asphalt Work Categories as defined below. Meet the applicable requirements for plants, Equipment, and construction requirements as defined below. Use an asphalt mix, either HMA or WMA, which meets the requirements of this specification.

334-1.2 Asphalt Work Mix Categories

Construction of asphalt pavement will fall into one of the following Work categories:

334-1.2.1 Asphalt Work Category 1

Includes the construction of shared use paths and miscellaneous asphalt.

334-1.2.2 Asphalt Work Category 2

Includes the construction of new asphalt turn lanes, paved shoulders and other non-mainline pavement locations.

334-1.2.3 Asphalt Work Category 3

Includes the construction of new mainline asphalt pavement lanes, milling and resurfacing.

334-1.3 Mix Types

Use the appropriate asphalt mix as shown in Table 334-1.

Table 334-1 Asphalt Mix Types

Asphalt Work Category	Mix Types	Traffic Level	ESALs (Millions)
1	Type SP-9.5	A	<0.3
2	Structural Mixes: Types SP-9.5 or SP-12.5 Friction Mixes: Types FC-9.5 or FC-12.5	B	0.3 to <3
3	Structural Mixes: Types SP-9.5 or SP-12.5 Friction Mixes: Types FC-9.5 or FC-12.5	C	≥3

A Type SP or FC mix one traffic level higher than the traffic level specified in the Contract may be substituted, at no additional cost (i.e. Traffic Level B may be substituted for Traffic Level A, etc.). Traffic levels are as defined in Section 334 of the Florida Department of Transportation's (FDOT's) Specifications.

334-1.4 Gradation Classification

The Superpave mixes are classified as fine and are defined in 334-3.2.2. The equivalent AASHTO nominal maximum aggregate size Superpave mixes are as follows:

Type SP-9.5, FC-9.5	9.5 mm
Type SP-12.5, FC-12.5	12.5 mm

334-1.5 Thickness

The total pavement thickness of the asphalt pavement will be based on a specified spread rate or plan thickness as shown in the Contract Documents. Before paving, propose a spread rate or thickness for each individual layer meeting the requirements of this specification, which when combined with other layers (as applicable) will equal the plan spread rate or thickness.

When the total pavement thickness is specified as plan thickness, the plan thickness and individual layer thickness will be converted to spread rate using the following equation:

Spread rate (lbs/yd^2) = t x G_{mm} x 43.3

Where: t = Thickness (in.) (Plan thickness or individual layer thickness)
G_{mm} = Maximum specific gravity from the mix design

For target purposes only, spread rate calculations shall be rounded to the nearest whole number.

334-1.5.1 Layer Thicknesses

Unless otherwise called for in the Contract Documents, the allowable layer thicknesses for asphalt mixtures are as follows:

Type SP-9.5, FC-9.5	3/4 to 1-1/2 inches
Type SP-12.5, FC-12.5	1-1/2 to 2-1/2 inches

334-1.5.2 Additional Requirements

The following requirements also apply to asphalt mixtures:

1. When construction includes the paving of adjacent shoulders (less than or equal to 5 feet wide), the layer thickness for the upper pavement layer and shoulder shall be the same and paved in a single pass, unless otherwise called for in the Contract Documents.

2. For overbuild layers, use the minimum and maximum layer thicknesses as above unless called for differently in the Contract Documents. On variable thickness overbuild layers, the minimum allowable thickness may be reduced by 1/2 inch, and the maximum allowable thickness will be as specified below, unless called for differently in the Contract Documents.

Type SP-9.5	3/8 to 2 inches
Type SP-12.5	1/2 to 3 inches

3. Variable thickness overbuild layers may be tapered to zero thickness provided the Contract Documents require a minimum of 1-1/2 inches of mix placed over the variable thickness overbuild layer.

334-1.6 Weight of Mixture

The weight of the mixture shall be determined as provided in 320-3.2 of the FDOT Specifications.

334-2 Materials

334-2.1 Superpave Asphalt Binder

Unless specified elsewhere in the Contract or in 334-2.3.3, use a PG 67-22 asphalt binder from the FDOT's Approved Products List (APL). If the Contract calls for an alternative asphalt binder, meet the requirements of FDOT Specifications Section 336 or 916, as appropriate.

334-2.2 Aggregate

Use aggregate capable of producing a quality pavement. For Type FC mixes, use an aggregate blend that consists of crushed granite, crushed Oolitic limestone, other crushed Materials (as approved by FDOT for friction courses per Rule 14-103.005, Florida Administrative Code), or a combination of the above. Crushed limestone from the Oolitic formation may be used if it contains a minimum of 12% silica material as determined by FDOT Test Method FM 5-510 and FDOT grants approval of the source prior to its use. As an exception, mixes that contain a minimum of 60% crushed granite may either contain:

1. Up to 40% fine aggregate from other sources; or,

2. A combination of up to 20% RAP and the remaining fine aggregate from other.

A list of aggregates approved for use in friction courses may be available on the FDOT's State Materials Office website. The URL for obtaining this information, if available, is: ftp://ftp.dot.state.fl.us/fdot/smo/website/sources/frictioncourse.pdf.

334-2.3 Reclaimed Asphalt Pavement (RAP) Material

334-2.3.1 General Requirements

RAP may be used as a component of the asphalt mixture, provided the RAP meets the following requirements:

1. When using a PG 76-22 (PMA), or PG 76-22 (ARB) asphalt binder, limit the amount of RAP material used in the mix to a maximum of 20% by weight of total aggregate. As an exception, amounts greater than 20% RAP by weight of total aggregate can be used if no more than 20% by weight of total asphalt binder comes from the RAP material.

2. Provide stockpiled RAP material that is reasonably consistent in characteristics and contains no aggregate particles which are soft or conglomerates of fines.

3. Provide RAP material having a minimum average asphalt binder content of 4.0% by weight of RAP. As an exception, when using fractionated RAP, the minimum average asphalt binder content for the coarse portion of the RAP shall be 2.5% by weight of the coarse portion of the RAP. The coarse portion of the RAP shall be the portion of the RAP retained on the No. 4 sieve. The Engineer may sample the stockpile to verify that this requirement is met.

4. Use a grizzly or grid over the RAP cold bin, in-line roller crusher, screen, or other suitable means to prevent oversized RAP material from showing up in the completed recycle mixture. If oversized RAP material appears in the completed recycle mix, take the appropriate corrective action immediately. If the appropriate corrective actions are not immediately taken, stop plant operations.

334-2.3.2 Material Characterization

Assume responsibility for establishing the asphalt binder content, gradation, and bulk specific gravity (G_{sb}) of the RAP material based on a representative sampling of the material.

334-2.3.3 Asphalt Binder for Mixes with RAP

Select the appropriate asphalt binder grade based on Table 334-2. The Engineer reserves the right to change the asphalt binder type and grade during production based on characteristics of the RAP asphalt binder.

Table 334-2 Asphalt Binder Grade for Mixes Containing RAP	
Percent RAP	**Asphalt Binder Grade**
0 - 15	PG 67-22
16 – 30	PG 58-22
> 30	PG 52-28

334-3 Composition of Mixture

334-3.1 General

Compose the asphalt mixture using a combination of aggregates, mineral filler, if required, and asphalt binder material. Size, grade and combine the aggregate fractions to meet the grading and physical properties of the mix design. Aggregates from various sources may be combined.

334-3.2 Mix Design

334-3.2.1 General

Design the asphalt mixture in accordance with AASHTO R 35-12, except as noted herein. Submit the proposed mix design with supporting test data indicating compliance with all mix design criteria to the Engineer. Prior to the production of any asphalt mixture, obtain the Engineer's conditional approval of the mix design. If required by the Engineer, send representative samples of all component Materials, including asphalt binder to a Laboratory designated by the Engineer for verification. As an exception to these requirements, use a currently approved FDOT Mix Design.

Warm mix technologies (additives, foaming techniques, etc.) listed on the Department's website may be used in the production of the mix. The URL for obtaining this information, is: http://www.dot.state.fl.us/statematerialsoffice/quality/programs/warmmixasphalt/index.shtm.

The Engineer will consider any marked variations from original test data for a mix design or any evidence of inadequate field performance of a mix design as sufficient evidence that the properties of the mix design have changed, and at his discretion, the Engineer may no longer allow the use of the mix design.

334-3.2.2 Mixture Gradation Requirements

Combine the aggregates in proportions that will produce an asphalt mixture meeting all of the requirements defined in this specification and conform to the gradation requirements at design as defined in AASHTO M 323-12, Table 3. Aggregates from various sources may be combined.

334-3.2.2.1 Mixture Gradation Classification

Plot the combined mixture gradation on an FHWA 0.45 Power Gradation Chart. Include the Control Points from AASHTO M323-12, Table-3, as well as the Primary Control Sieve (PCS) Control Point from AASHTO M323-12, Table 4. Fine mixes are defined as having a gradation that passes above or through the primary control sieve control point.

334-3.2.3 Gyratory Compaction

Compact the design mixture in accordance with AASHTO T312-12, with the following exceptions: use the number of gyrations at N_{design} as designed in Table 334-3.

Table 334-3 Gyratory Compaction Requirements

Traffic Level	N_{design} Number of Gyrations
A	50
B	65
C	75

334-3.2.4 Design Criteria

Meet the requirements for nominal maximum aggregate size as defined in AASHTO M323-12, as well as for relative density, VMA, VFA, and dust-to-binder ratio as specified in AASHTO M323-12, Table 6. $N_{initial}$ and $N_{maximum}$ requirements are not applicable.

334-3.2.5 Moisture Susceptibility

Test 4 inch specimens in accordance with FDOT Test Method FM 1-T 283. Provide a mixture having a retained tensile strength ratio of at least 0.80 and a minimum tensile strength (unconditioned) of 100 pounds per square inch. If necessary, add a liquid anti-stripping agent from the FDOT's APL or hydrated lime in order to meet these criteria.

In lieu of moisture susceptibility testing, add a liquid anti-stripping agent from the FDOT's APL. Add 0.5% liquid anti-stripping agent by weight of asphalt binder.

334-3.2.6 Additional Information

In addition to the requirements listed above, provide the following information on each mix design:

1. The design traffic level and the design number of gyrations (N_{design}).

2. The source and description of the Materials to be used.

3. The FDOT source number and the FDOT product code of the aggregate components furnished from an FDOT approved source (if required).

4. The gradation and proportions of the raw Materials as intended to be combined in the paving mixture. The gradation of the component Materials shall be representative of the material at the time of use. Compensate for any change in aggregate gradation caused by handling and processing as necessary.

5. A single percentage of the combined mineral aggregate passing each specified. Degradation of the aggregate due to processing (particularly material passing the No. 200 sieve) should be accounted for and identified.

6. The bulk specific gravity (G_{sb}) value for each individual aggregate and RAP component.

7. A single percentage of asphalt binder by weight of total mix intended to be incorporated in the completed mixture, shown to the nearest 0.1%.
8. A target temperature for the mixture at the plant (mixing temperature) and a target temperature for the mixture at the Roadway (compaction temperature). Do not exceed a target temperature of 330°F for PG 76-22 (PMA) and PG 76-22 (ARB) asphalt binders, and 315°F for unmodified asphalt binders.

9. Provide the physical properties achieved at four different asphalt binder contents. One shall be at the optimum asphalt content, and must conform to all specified physical requirements.

10. The name of the mix designer.

11. The ignition oven calibration factor.

12. The warm mix technology, if used.

334-4 Process Control

Assume full responsibility for controlling all operations and processes such that the requirements of these Specifications are met at all times. Perform any tests necessary at the plant and Roadway to control the process.

334-5 General Construction Requirements

334-5.1 Weather Limitations

Do not transport asphalt mix from the plant to the Roadway unless all weather conditions are suitable for the paving operations.

334-5.2 Limitations of Paving Operations

334-5.2.1 General

Spread the mixture only when the surface upon which it is to be placed has been previously prepared, is intact, firm, dry, clean, and the tack, with acceptable spread rate, is properly broken. Ensure all granular base Materials are properly primed and all asphalt base Materials are properly tacked, prior to paving.

334-5.2.2 Air Temperature

Place the mixture only when the air temperature in the shade and away from the artificial heat meets the requirements of Table 334-4. The minimum ambient temperature requirement may be reduced by 5°F when using a warm mix technology, if mutually agreed to by both the Engineer and the Contractor.

Table 334-4 Ambient Air Temperature Requirements for Paving

Layer Thickness or Asphalt Binder Type	N_{design} Number of Gyrations
≤1 inch	50
Any mixture > 1 inch containing a PG asphalt binder with a high temperature designation ≥ 76°C	45
Any mixture > 1 inch containing a PG asphalt binder with a high temperature designation < 76°C	40

334-5.3 Mix Temperature

Heat and combine the ingredients of the mix in such a manner as to produce a mixture with a temperature at the plant and at the Roadway, within a range of plus or minus 30°F from the target temperature as shown on the mix design. Reject all loads outside of this range. For warm mix asphalt, the Contractor may produce the first five loads of the production day and at other times when approved by the Engineer, at a hot mix asphalt temperature not to exceed 330°F for purposes of heating the asphalt paver. For these situations, the upper tolerance of +30°F does not apply.

334-5.4 Transportation of the Mixture

Transport the mix in trucks of tight construction, which prevents the loss of material and the excessive loss of heat and previously cleaned of all foreign material. After cleaning, thinly coat the inside surface of the truck bodies with soapy water or an asphalt release agent as needed to prevent the mixture from adhering to the beds. Do not allow excess liquid to pond in the truck

body. Do not use a release agent that will contaminate, degrade, or alter the characteristics of the asphalt mix or is hazardous or detrimental to the environment. Petroleum derivatives (such as diesel fuel), solvents, and any product that dissolves asphalt are prohibited. Provide each truck with a tarpaulin or other waterproof cover mounted in such a manner that it can cover the entire load when required. When in place, overlap the waterproof cover on all sides so it can be tied down. Cover each load during cool and cloudy weather and at any time it appears rain is likely during transit with a tarpaulin or waterproof cover. Cover and tie down all loads of friction course mixtures.

334-5.5 Preparation of Surfaces Prior to Paving

334-5.5.1 Cleaning

Clean the surface of all loose and deleterious material by the use of power brooms or blowers, supplemented by hand brooming where necessary.

334-5.5.2 Patching and Leveling Courses

As shown in the Plans, bring the existing surface to proper grade and cross-section by the application of patching or leveling courses.

334-5.5.3 Application Over Surface Treatment

Where an asphalt mix is to be placed over a surface treatment, sweep and dispose of all loose material from the paving area.

334-5.5.4 Tack Coat

Use a rate of application as defined in Table 334-5. Control the rate of application to be within plus or minus 0.01 gallon per square yard of the target application rate. The target application rate may be adjusted by the Engineer to meet specific field conditions. Determine the rate of application as needed to control the operation. When using PG 52-28, multiply the target rate of application by 0.6.

Table 334-5 Tack Coat Application Rates

Asphalt Mixture Type	Underlying Pavement Surface	Target Tack Rate (gal/yd^2)
Base Course, Structural Course, Dense Graded Friction Course	Newly Constructed Asphalt Layers	0.03 minimum
	Milled Surface or Oxidized and Cracked Pavement	0.06
	Concrete Pavement	0.08

334-5.6 Placing Mixture

334-5.6.1 Alignment of Edges

With the exception of pavements placed adjacent to curb and gutter or other true edges, place all pavements by the string-line method to obtain an accurate, uniform alignment of the pavement edge. Control the unsupported pavement edge to ensure that it will not deviate more than plus or minus 1.5 inches from the string-line.

334-5.6.2 Rain and Surface Conditions

Immediately cease transportation of asphalt mixtures from the plant when rain begins at the Roadway. Do not place asphalt mixtures while rain is falling, or when there is water on the surface to be covered. Once the rain has stopped and water has been removed from the tacked surface to the satisfaction of the Engineer and the temperature of the mixture caught in transit still meets the requirements as specified in 334-5.3, the Contractor may then place the mixture caught in transit.

334-5.6.3 Checking Depth of Layer

Check the depth of each layer at frequent intervals to ensure a uniform spread rate that will meet the requirements of the Contract.

334-5.6.4 Hand Work

In limited areas where the use of the spreader is impossible or impracticable, spread and finish the mixture by hand.

334-5.6.5 Spreading and Finishing

Upon arrival, dump the mixture in the approved paver, and immediately spread and strike-off the mixture to the full width required, and to such loose depth for each course that, when the Work is completed, the required weight of mixture per square yard, or the specified thickness, is secured. Carry a uniform amount of mixture ahead of the screed at all times.

334-5.6.6 Thickness Control

Ensure the spread rate is within 10% of the target spread rate, as indicated in the Contract. When calculating the spread rate, use, at a minimum, an average of five truckloads of mix. When the average spread rate is beyond plus or minus 10% of the target spread rate, monitor the thickness of the pavement layer closely and adjust the construction operations.

If the Contractor fails to maintain an average spread rate within plus or minus 10% of the target spread rate for two consecutive days, the Engineer may elect to stop the construction operation at any time until the issue is resolved.

When the average spread rate for the total structural or friction course pavement thickness exceeds the target spread rate by plus or minus 50 pounds per square yard for layers greater than or equal to 2.5 inches or exceeds the target spread rate by plus or minus 25 pounds per square yard for

layers less than 2.5 inches, address the unacceptable pavement in accordance with 334-5.10.4, unless an alternative approach is agreed upon by the Engineer.

334-5.7 Leveling Courses

334-5.7.1 Patching Depressions

Before spreading any leveling course, fill all depressions in the existing surface as shown in the Plans.

334-5.7.2 Spreading Leveling Courses

Place all courses of leveling with an asphalt paver or by the use of two motor graders, one being equipped with a spreader box. Other types of leveling devices may be used upon approval by the Engineer.

334-5.7.3 Rate of Application

When using Type SP-9.5 for leveling, do not allow the average spread of a layer to be less than 50 pounds per square yard or more than 75 pounds per square yard. The quantity of mix for leveling shown in the Plans represents the average for the entire project; however, the Contractor may vary the rate of application throughout the project as directed by the Engineer. When leveling in connection with base widening, the Engineer may require placing all the leveling mix prior to the widening operation.

334-5.8 Compaction

For each paving or leveling train in operation, furnish a separate set of rollers, with their operators.

When density testing for acceptance is required, select Equipment, sequence, and coverage of rolling to meet the specified density requirement. Regardless of the rolling procedure used, complete the final rolling before the surface temperature of the pavement drops to the extent that effective compaction may not be achieved or the rollers begin to damage the pavement.

When density testing for acceptance is not required, use a rolling pattern approved by the Engineer.

Use hand tamps or other satisfactory means to compact areas which are inaccessible to a roller, such as areas adjacent to curbs, headers, gutters, bridges, manholes, etc.

334-5.9 Joints

334-5.9.1 Transverse Joints

Construct smooth transverse joints, which are within 3/16 inch of a true longitudinal profile when measured with a 15-foot manual straightedge meeting the requirements of FDOT Test Method FM 5-509. These requirements are waived for transverse joints at the beginning and end of the project

and at the beginning and end of Bridge structures, if the deficiencies are caused by factors beyond the control of the Contractor such as no milling requirement, as determined by the Engineer. When smoothness requirements are waived, construct a reasonably smooth transitional joint.

334-5.9.2 Longitudinal Joints

For all layers of pavement except the leveling course, place each layer so that longitudinal construction joints are offset 6 to 12 inches laterally between successive layers. Do not construct longitudinal joints in the wheel paths. The Engineer may waive these requirements where offsetting is not feasible due to the sequence of construction.

334-5.10 Surface Requirements

Construct a smooth pavement with good surface texture and the proper cross slope.

334-5.10.1 Texture of the Finished Surface of Paving Layers: Produce a finished surface of uniform texture and compaction with no pulled, torn, raveled, crushed or loosened portions and free of segregation, bleeding, flushing, sand streaks, sand spots, or ripples. Correct any area of the surface that does not meet the foregoing requirements in accordance with 334-5.10.4.

In areas not defined to be a density testing exception per 334-6.4.1, obtain for the Engineer, three 6 inch diameter Roadway cores at locations visually identified by the Engineer to be segregated. The Engineer will determine the density of each core in accordance with FDOT Test Method FM 1-T 166 and calculate the percent G_{mm} of the segregated area using the average G_{mb} of the Roadway cores and the representative PC G_{mm} for the questionable material. If the average percent G_{mm} is less than 90.0, address the segregated area in accordance with 334-5.10.4.

334-5.10.2 Cross Slope

Construct a pavement surface with cross slopes in compliance with the requirements of the Contract Documents.

334-5.10.3 Pavement Smoothness

Construct a smooth pavement meeting the requirements of this Specification. Furnish a 15-foot manual and a 15-foot rolling straightedge meeting the requirements of FDOT Test Method FM 5-509.

334-5.10.3.1 Straightedge Testing

334-5.10.3.1.1 Acceptance Testing

Perform straightedge testing in the outside wheel path of each lane for the final (top) layer of the pavement. Test all pavement lanes where the width is constant using a rolling straightedge and document all deficiencies on a form approved by the Engineer. Notify the Engineer of the location and time of all straightedge testing a minimum of 48 hours before beginning testing.

334-5.10.3.1.2 Final (Top) Pavement Layer

At the completion of all paving operations, straightedge the final (top) layer either behind the final roller of the paving train or as a separate operation. Address all deficiencies in excess of 3/16 inch in accordance with 334-5.10.4, unless waived by the Engineer. Retest all corrected areas.

334-5.10.3.1.3 Straightedge Exceptions

Straightedge testing will not be required in the following areas: shoulders, intersections, tapers, crossovers, sidewalks, shared use paths, parking lots and similar areas, or in the following areas when they are less than 250 feet in length: turn lanes, acceleration/deceleration lanes and side Streets. The limits of the intersection will be from stop bar to stop bar for both the mainline and side Streets. In the event the Engineer identifies a surface irregularity in the above areas that is determined to be objectionable, straightedge and address all deficiencies in excess of 3/8 inch in accordance with 334-5.10.4.

334-5.10.4 Correcting Unacceptable Pavement

Correct deficiencies in the pavement layer by removing and replacing the full depth of the layer, extending a minimum of 50 feet on both sides (where possible) of the defective area for the full width of the paving lane, at no additional cost.

334-6 Acceptance of the Mixture

334-6.1 General

The asphalt mixture will be accepted based on the Asphalt Work Category as defined below:

1. Asphalt Work Category 1 – Certification by the Contractor as defined in 334-6.2.

2. Asphalt Work Category 2 – Certification and process control testing by the Contractor as defined in 334-6.3.

3. Asphalt Work Category 3 – Process control testing by the Contractor and acceptance testing by the Engineer as defined in 334-6.4.

334-6.2 Certification by the Contractor

On Asphalt Work Category 1 construction, the Engineer will accept the mix on the basis of visual inspection. Submit a Notarized Certification of Specification Compliance letter on company letterhead to the Engineer stating that all material produced and placed on the project meets the requirements of the Specifications. The Engineer may run independent tests to determine the acceptability of the material.

334-6.3 Certification and Process Control Testing by the Contractor

On Asphalt Work Category 2 construction, submit a Notarized Certification of Specification Compliance letter on company letterhead to the Engineer stating that all material produced and placed on the project meets the requirements of the Specifications, along with supporting test data documenting all process control testing as described in 334-6.3.1. If required by the Contract, utilize an Independent Laboratory as approved by the Engineer for the process control testing. The mix will also require visual acceptance by the Engineer. In addition, the Engineer may run independent tests to determine the acceptability of the material. Material failing to meet these acceptance criteria will be addressed as directed by the Engineer such as but not limited to acceptance at reduced pay, delineation testing to determine the limits of the questionable material, removal and replacement at no cost to the agency, or performing an Engineering analysis to determine the final disposition of the material.

334-6.3.1 Process Control Sampling and Testing Requirements

Perform process control testing at a frequency of once per day. Obtain the samples in accordance with FDOT Method FM 1-T 168. Test the mixture at the plant for gradation (P_{-8} and P_{-200}) and asphalt binder content (P_b). Measure the Roadway density with 6 inch diameter Roadway cores at a minimum frequency of once per 1,500 feet of pavement with a minimum of three cores per day.

Determine the asphalt binder content of the mixture in accordance with FDOT Method FM 5-563. Determine the gradation of the recovered aggregate in accordance with FDOT Method FM 1-T 030. Determine the Roadway density in accordance with FDOT Method FM 1-T 166. The minimum Roadway density will be based on the percent of the maximum specific gravity (G_{mm}) from the approved mix design. If the Contractor or Engineer suspects that the mix design G_{mm} is no longer representative of the asphalt mixture being produced, then a new G_{mm} value will be determined from plant-produced mix, in accordance with FDOT Method FM 1-T 209, with the approval of the Engineer. Roadway density testing will not be required in certain situations as described in 334-6.4.1. Assure that the asphalt binder content, gradation and density test results meet the criteria in Table 334-4.

Table 334-4 Process Control and Acceptance Values

Characteristic	Tolerance
Asphalt Binder Content (percent)	Target ± 0.55
Passing No. 8 Sieve (percent)	Target ± 6.00
Passing No. 200 Sieve (percent)	Target ± 2.00
Roadway Density (daily average)	Minimum 90.0% of G_{mm}

334-6.4 Process Control Testing by the Contractor and Acceptance Testing by the Engineer

On Asphalt Work Category 3, perform process control testing as described in 334-6.3.1. In addition, the Engineer will accept the mixture at the plant with respect to gradation (P_{-8} and P_{-200}) and asphalt binder content (P_b). The mixture will be accepted on the Roadway with respect to density. The Engineer will sample and test the material as described in 334-6.3.1. The Engineer will randomly obtain at least one set of samples per day. Assure that the asphalt content, gradation

and density test results meet the criteria in Table 334-4. Material failing to meet these acceptance criteria will be addressed as directed by the Engineer such as but not limited to acceptance at reduced pay, delineation testing to determine the limits of the questionable material, removal and replacement at no cost to the agency, or performing an Engineering analysis to determine the final disposition of the material.

334-6.4.1 Acceptance Testing Exceptions

When the total quantity of any mix type in the project is less than 500 tons, the Engineer will accept the mix on the basis of visual inspection. The Engineer may run independent tests to determine the acceptability of the material.
Density testing for acceptance will not be performed on widening strips or shoulders with a width of 5 feet or less, variable thickness overbuild courses, leveling courses, any asphalt layer placed on Subgrade (regardless of type), miscellaneous asphalt pavement, shared use paths, crossovers, or any course with a specified thickness less than 1 inch or a specified spread rate less than 100 pounds per square yard. Density testing for acceptance will not be performed on asphalt courses placed on Bridge decks or approach slabs; compact these courses in static mode only. In addition, density testing for acceptance will not be performed on the following areas when they are less than 1,000 feet continuous in length: turning lanes, acceleration lanes, deceleration lanes, shoulders, parallel parking lanes, or ramps. Density testing for acceptance will not be performed in intersections. The limits of the intersection will be from stop bar to stop bar for both the mainline and side Streets. Compact these courses in accordance with a standard rolling procedure approved by the Engineer. In the event that the rolling procedure deviates from the approved procedure, placement of the mix will be stopped.

334-7 Method of Measurement

For the Work specified under this Section, the quantity to be paid for will be the weight of the mixture, in tons.

The Bid price for the asphalt mix will include the cost of the liquid asphalt and the tack coat application as specified in 334-5.5.4. There will be no separate payment or unit price adjustment for the asphalt binder material in the asphalt mix.

334-8 Basis of Payment

334-8.1 General
Price and payment will be full compensation for all the Work specified under this Section.

END OF SECTION

SECTION 570
PERFORMANCE TURF

575-3 CONSTRUCTION METHODS – DELETE AND SUBSTITUTE THE FOLLOWING:

575-3 Construction Methods

Test the area requiring sod per Section 162-5 and forward results to the Engineer. Apply finish soil layer material in accordance with Section162 if determined by the Engineer. Fertilize at the rate as shown in Section 570. If soil layer is not determined to be used on areas to receive sod, scarify or loosen the areas to a depth of 6 inches. On areas where the soil is sufficiently loose, particularly on shoulders and fill slopes, the Engineer may authorize the elimination of the ground preparation. Limit preparation to those areas that can be sodded within 72 hours after preparation. Prior to sodding, thoroughly water areas and allow water to percolate into the soil. Allow surface moisture to dry before sodding to prevent a muddy soil condition.

END OF SECTION

SECTION 580
LANDSCAPE INSTALLATION

SECTION 580 LANDSCAPE INSTALLATION IS ADDED TO THIS SPECIFICATION

580-1.00 General

580-1.01 Scope of Work

Provide all labor, Materials, Equipment and incidentals required to prepare site to final grade, install landscape trees, plants, sod and irrigation systems in accordance with the Plans and as specified. These Specifications are inclusive of a required guarantee, replacements, clean-up, maintenance services, and maintenance of traffic, all of which shall be included in the unit Bid price for each tree. These Specifications apply to all projects throughout Palm Beach County assigned to the Contractor.

580-1.02 Related Work Specified Elsewhere

Section 585 – Site Maintenance: These provisions shall apply to all Work in Section 580 - Landscape Installation as appropriate.

580-1.03 General Requirements

Refer to the Florida Dept. of Transportation Standard Specifications for Road and Bridge Construction, 2021, as the general operating specification document, however Section 580 Landscaping is deleted and replaced with these Specifications for LANDSCAPE

INSTALLATION (SECTION 580) and the SITE MAINTENANCE (SECTION 585). Maintenance of traffic requirements are described in the Contract Documents.

- Comply with all applicable federal, state, county and local codes, ordinances and regulations governing this Work.

- The Work shall be coordinated with other trades to prevent conflicts.

- All planting shall be performed by personnel familiar with planting and maintenance of traffic procedures and under the supervision of a qualified landscape foreman, who shall be on-site at all times during the Work.

- Finish Grade: The Contractor shall verify with the Department that final grade has been achieved and shall perform fine grading if so directed by the Department. The Contractor is responsible for any trees or palms that are planted prior to achieving final grade.

- Prior to commencing Work, the Contractor shall visit the site and ascertain all site conditions, including utilities, structures, slopes, access and available Work space to preclude any misunderstandings and to ensure a trouble-free installation. It shall be the Contractor's responsibility to avoid conflicts with existing underground and overhead utilities and structures. The Contractor shall examine available utility Plans and notify the Department of any conflicts and needed adjustments.

- The Contractor shall notify all utilities servicing the Work area at least 48-hours prior to any excavation so that underground utilities may be located. The Contractor has the responsibility to contact **Sunshine State One-Call of Florida, Inc. at 1-800-432-770** to schedule marking locations of the utilities which subscribe to their service.

- The Contractor shall also call (561) 641-3429 for Palm Beach County Water Utility Locations and call (561) 233-3900 for Palm Beach County Traffic Control Utility Locations. In general, the location of trees will be adjusted rather than adjusting the location of utilities or structures. Refer to 580-3.02 for related requirements.

- Prior to the preparation of planting holes, the Contractor shall ascertain the on-site location of, and take necessary precautions to avoid damage to, all above-ground and underground utilities, underdrain trenches, electrical cables, conduits, utility lines, oil tanks, supply lines, pavement, curbing, traffic control devices, pedestrian signals, building structures, or waterproofing. The Contractor shall properly maintain and protect all such improvements. The Contractor shall be responsible for the cost to repair all damages to such improvements caused by his operations.

- The use of mechanical Equipment within five (5') feet of any building or structure to move plants or Materials shall be approved by the Department prior to its use.

580-1.04 Applicable Documents

A. Plant nomenclature shall conform to the names given in "The New Royal Horticultural Society Dictionary of Gardening", which is the source cited by the current September, 2015 edition of Florida Grades and Standards for Nursery Plants, by the Florida Dept. of Agriculture and Consumer Services, Division of Plant Industry (henceforth called Florida Grades and Standards).

1. Names of varieties not included therein shall conform generally with names accepted in the nursery trade.

2. Substitutions will be permitted only upon submission of proof that any specified plant is not obtainable or suitable for the location as specified on the plan and upon written authorization of the Department.

B. The Contractor is obligated to be familiar with and understand the following documents in order to comply with the requirements therein to properly perform the Work contemplated in this Contract:

1. All Plans and documents within the Bid package set.

2. The Florida Grades and Standards, (September, 2015 edition).

3. The Florida Dept. of Transportation Standard Specifications for Road and Bridge Construction, (2021 edition – as general operating specification document, excluding Section 580, Landscaping).

4. The Florida Dept. of Transportation, Roadway, and Traffic Design Standards, (January, 2021 edition).

5. The Palm Beach County Streetscape Standards Manual, (current edition).

6. The Manual of Uniform Traffic Control Devices for Streets and Highways, by the Federal Highway Administration, (current edition).

7. The State of Florida Manual on Traffic Control and Safe Practices, (current edition).

8. The Manual of Uniform Minimum Standards for Design, Construction, and Maintenance of Streets and Highways, by FDOT (current edition).

9. NCHRP Report 672, Roundabouts: An Informational Guide, (Original Date TRB, 2010; Second Addition August 31, 2020)

580-1.05 Quality Control

A. Substitution of Materials and products specified herein, including those meeting "or accepted equal" clauses, shall not be permitted without written authorization from the Department.

B. Plants shall have a habit of growth that is normal for the species and shall be sound, healthy, vigorous and free from insect pests, fungi plant diseases and injuries. No sod with obvious chinch bug or mole cricket damage will be accepted. Any sod roots that appear to be diseased or the detected presence of grubs or other insects within the soil base will result in the sod being rejected.

C. Trees (other than palms) shall be heavily branched and shall have a dominant leader and no crossing branches.

D. All single-trunked palms shall have straight vertical trunks, not re-curved trunks, unless otherwise specifically directed in writing by the Department.

E. Turf grass to be used is St. Augustine "Floratam" and/or Argentine Bahia, Paspalum notatum 'argentine' as indicated in the Plans and pay item notes. Seed and sod shall conform to Section 981 of the FDOT 2021 Standard Specifications for Road and Bridge Construction. The sod must be obtained from a sod farm that has been inspected and certified by the Florida Dept. of Agricultural and Consumer Services, Division of Plant Industry, as free of burrowing nematodes. The sod must exhibit a dark green color and be free of weeds and foreign matter. It must have a leaf blade density of at least 90% and be free of any diseased or insect-damaged leaf tissue. The soil base of the sod must be a minimum of ¾" thick and a maximum of 2" thick and contain a healthy root system as indicated by turgid feeder roots that are white in color.

   The Contractor shall be responsible to become familiar with the site and shall match adjacent properties with similar species of sod, or as otherwise specified on the Plans. The cost for the varied species of sod will be paid under the unit price for Sodding, SY. Such price and payment shall be full compensation for all Work and Materials (top soil, fertilizer and water) specified in this Section, including the excavation of the trench for the sod, and the satisfactory disposal of excavation material.

F. Plant material shall be Florida Grade No. 1 or better as outlined under the current edition of Florida Grades and Standards.

   1. All plants not listed in Florida Grades and Standards, shall conform to a Florida Grade No. 1 as to: (1) health and vitality; (2) condition of foliage; (3) root system; (4) freedom from pest or mechanical damage; (5) heavily branched and densely foliated according to the accepted normal shape of the species.

   2. Under-sizing plant Materials or substituting one species or cultivar for another are Contract violations, but have no bearing on plant grading. Under-sizing or substituting species or cultivars may be permitted only if authorized by the Department in writing.

3. Verification of specified grades are to be determined at the time of delivery (even for trees inspected, accepted, and tagged by the Contractor with the Department at respective nurseries). Grades determined at the time of delivery inspection or during the course of conducting a regrading inspection shall be based on the growth characteristics and condition of the plant at the time of grading. The grade shall not be based on any future or predicted growth potential of the plant. Each tree shall be maintained by the Contractor to Florida Grade No. 1 standards until the date of written Final Acceptance by the Department for that tree. The Department is the final authority to determine if a tree does or does not meet Florida Grade No. 1 standards, including health and vigor of the tree.

4. If at any time during plant installations, the Department believes that any trees are not of the specified grade, the Department may, at their discretion, request a regrading inspection by the Division of Plant Industry. Upon the findings provided thereby, the Department may seek further remedy by requesting replacement of plant Materials or other corrective actions, including, but not limited to, legal redress.

G. The Department shall have the right, at any stage of the operations, to reject any and all Work and Materials, which, in the Department's opinion, do not meet the requirements of these Specifications or aesthetically do not comply with design intent. Trees that are scarred or damaged during delivery or off-loading will be rejected.

H. Plant Materials, as proposed by the Contractor, are required to be inspected, accepted and tagged at the respective nurseries by the Contractor with the Department prior to any delivery to the project site, unless waived by the Department in writing. If such waiver is granted, the Department will inspect and approve representative plant material samples at the project site or at the respective nurseries prior to delivery to the project site. Waivers will only apply to the specific projects (Work Orders) and species designated by the Department. Certificates of Nursery Origin may be required for plant Materials not tagged by the Contractor with the Department.

580-1.06 Certificate of Inspection:

A. All shipments of plant material shall originate from state registered nurseries which have undergone regular inspections by the authorized State Agencies prior to delivery to the project site.

B. State inspection certificates certifying respective plant nurseries of origin shall accompany the bill of lading or invoices. Any certificates of inspection required by the state for specific species also will be provided additionally. Any required transportation documents are to be submitted with invoices as back-up.

C. Contractor shall furnish the Department with copies of manufacturer's literature, labels, samples, certifications, Material Safety Data Sheets, and Laboratory analytical data for fertilizers, mulch, planting soil backfill mix, chemicals, staking/guying Materials and other products as appropriate, prior to use or application on any project.

D. Monitor turf areas and remove all competing vegetation, pest plants, and noxious weeds (as listed by the Florida Exotic Pest Plant Council, Category I "List of Invasive Species", Current Edition, http://www.fleppc.org). Remove such vegetation regularly by manual, mechanical, or chemical control means, as necessary. When selecting herbicides, pay particular attention to ensure use of chemicals that will not harm desired turf or wildflower species.

580-1.07 Measurements:

A. The minimum acceptable size of all plants measured after pruning, with branches in normal positions, shall conform to the measurements as shown on landscape Plans and conform to the Florida Grades and Standards. Deviations from these measurements must be approved in writing by the Department.

B. The caliper (diameter) of tree trunks is measured six (6") inches above ground level for trees with calipers up to and including four (4") inches in caliper, and twelve (12") inches above the ground for larger trees.

C. The caliper (diameter) of palm tree trunks is to be taken at the widest portion of trunk measured between 1' and 3' above the soil line.

580-1.08 Shipment and Delivery:

A. Contractor shall notify the Department, a minimum of 48-hours in advance (excluding weekends and Holidays), of all plant material deliveries. Contractor shall be responsible for delivery, storage, and security of all Materials specified.

B. Plant Materials shall be protected from sun-scalding and weather and adequately packed to prevent breakage and drying during transit and storage.

C. The Department will exercise its option to inspect, select and assist the Contractor with the tagging of plant Materials at the nursery proposed by the Contractor unless waived as in ITEM 580 -1.05 H.

D. Tamper-resistant identification tags supplied by the Contractor and placed on all trees and palms selected for installation, shall show no evidence of tampering upon inspection for Initial Acceptance (of installation). These tags shall be removed following the Department's Initial Acceptance (of installation).

E. Plants which do not meet Specifications for quality or size herein stated, or plants that show improper handling, or arrive on-site in an unsatisfactory condition (as described in Florida Grades and Standards), will be rejected. Rejected plants shall immediately be removed, disposed of, and replaced with accepted nursery stock of like variety, size, and age. These plants shall be replaced without additional cost to the Department.

F. Initial acceptance of plant material for initial payment will be given only after material is planted and after meeting requirements prescribed herein.

G. Plant materials may be reserved in advance by the Department from nursery sources provided by the Contractor for predetermined amounts of time prior to shipment and delivery. The reserve period will be designated by the County Department issuing the work order and will begin upon the issue date of the work order. Designated time periods will be 1-90 days, 1-180 days, and 1-270 days. The County will compensate the Contractor a percent of the unit price for each unit of plant material reserved in advance of shipment and delivery. This percentage amount is as follows:

Reserve Period	Percent of Unit Price Paid for Reservation of Plant Material
1 - 90 Days	10%
1 - 180 Days	25%
1 - 270 Days	50%

All advance payments shall be applied to the balance owed to the Contractor by the Department upon the completion of any applicable warranty periods. All post- installation guarantees, as specified in ITEM 585 - 1.11, shall apply to all plants held in reserve by the Contractor with no period of reserve time serving as a replacement for any warranty periods specified within the current contract. The Contractor shall select and maintain all plant materials reserved by the Department in a manner and condition designated in ITEM 580 - 1.05. Reserved plant materials shall conform to the type and quality specification listed in ITEM 580 - 2.02. The Department may, at its discretion, reserve plant materials that are less than the caliper, height, spread, clear trunk or root ball size, as designated in the Bid Item description for each unit listed. However, all plant materials must meet the stated specifications prior to shipment and delivery by the Contractor, unless given a written waiver by the Department. The Contractor shall not accept reserve payment for any plant materials that it knowingly cannot provide at the end of the designated reserve period. The Contractor shall notify designated Department representatives within 24 hours if plant materials reserved for any designated period become unavailable. The Contractor shall make available to the Department like species of acceptable specifications if any reserved plant materials are sold to other parties or otherwise rendered substandard during the designated reserve period. In the event that like species of similar quality are not made available by the end of the designated reserve period, the Contractor shall issue a credit or refund any reserve payments for that quantity of plant materials, at the discretion of the Department. The Department shall forfeit any reserve payments made to the Contractor if the Department elects to delay the scheduled shipment and delivery beyond the reserve period contracted for. The Contractor shall grant the Department a reserve time extension, based on additional payment issued within ten (10) days of the end of the contracted reserve period, unless the Contractor can show that any reserved plant materials would exceed the specifications as listed in the Bid Item description for each unit of plant material during the extension of the reserve period.

580-1.09 Tree Transplanting:

A. The Contractor shall provide tree transplanting services as requested by the Department. This service is to be performed by the Contractor within an agreed upon period of receipt of a Work Order. Trees transplanted within 90 days of original installation by the Contractor shall carry the balance of the warranty as specified in ITEM 585 -1.11. No warranties shall apply to trees installed more than 90 days prior to transplantation or trees installed by other parties.

B. Transplanted trees shall be watered for the balance of the warranty period or for a period of 30 days for non-warrantied trees. Watering procedures must adhere to the Specifications designated in ITEM 580 -2.06 and SECTION 585 -SITE MAINTENANCE.

C. Palm tree transplanting procedures include digging, loading, transporting, re-planting with Project Engineer approved backfill material and re-staking. The original planting hole must be backfilled and sodded.

D. Hardwood tree transplanting procedures include root pruning of established trees, digging, loading, transporting, replanting with approved backfill material and re-staking. The original planting hole must be backfilled with suitable material at the direction of the Project Engineer.

E. Use machinery that is designed to root prune tree/palm roots with a clean cut. Do not use machinery that will tear or shred the root system. Cut the root system in quarter sections to allow for new feeder roots to develop. If hand root pruning, use sharp cutting instruments to provide clean cuts (no Tearing or Shredding) to the existing root system. Allow a minimum of 18-24" of space to cleanly cut the roots and fill the root pruned area with proper backfill as specified in 580-2.00 Products, 580-2.01- Subsection A – D (Planting Soil Backfill Mix). Reuse native clean fill mixed with topsoil to promote new root development.

F. Large Hardwoods trees exceeding 8" Cal. shall be transported/moved by the following method.

   To protect the integrity and health of the hardwood to be transplanted, a Certified Arborist or Landscape Architect must be consulted "Prior to Relocation" through the County designated representative to determine the best methodology to relocate the designated transplant material. I.E; "A large Live Oak could be relocated by drilling the trunk with a minimum of a 1-1/2" wood drilling core bit to eliminate damage to the main cambium layer, inserting a 1" solid steel rod through the trunk to attach strapping material to and lifting the tree with no stress on the cambium layer.," or a 90" Tree Spade, or Crane method. These are examples of recommended relocation methods but not inclusive of all methods to relocate material. This is written as a guideline only.

580-2.00 Products

580-2.01 Planting Soil Backfill Mix

A. All planting areas (except as directed by the Project Engineer) shall be backfilled with a mixture of prepared plant soil mix as shown below to be accepted by the Department prior to

use on each project site. Terrasorb AG (super-absorbent water retainer as manufactured by Industrial Services International, Inc.), or similar product accepted in writing by the Department, shall be added to all non-irrigated planting soil backfill mixes at the rate specified by the manufacturer.

B. This Work shall consist of removing surface debris and then excavating a planting hole and blending compost with the excavated soil to improve soil quality and plant growth. The Planting Soil Backfill Mix shall be created on the project site by uniformly mixing compost with the excavated soil of the planting hole at a 1:3 ratio (25% compost: 75% excavated soil). Backfill and firm the soil blend around the root ball within the planting hole, as described under Part III – Execution. This specification applies to all types of containerized and balled and burlapped plant material.

C. Compost shall be a stabilized mixture derived from organic wastes such as food and agricultural residues, animal manure, mixed solid waste and bio-solids (treated sewage sludge) that meet all State Environmental Agency requirements. The product shall be well composted (mature compost, not green compost), free of viable weed seeds and nematodes and contain material of a generally humus nature capable of sustaining growth of vegetation, with no Materials toxic to plant growth.

Compost shall have the following properties:

Parameters	Range
pH	5.5 – 8.0
Moisture content	35% - 55%
C:N ratio	15 – 30:1
Organic matter	> 50%
Particle size	< 1 inch
Soluble salts	< 4.0 mmhos (dS)
Bulk density	< 1000 lbs/cuyd
Foreign matter	< 1% by weight

D. This specification covers the properties of **AllGro ™** as distributed by: **AllGro**, 4 Liberty Lane West, Hampton, NH 03842, telephone (800) 662-2440. The Contractor shall utilize **AllGro** compost, or Department-accepted equal, as directed above.

580-2.02 Plant Material

A. The words "Plant Materials" or "Plants" or "Trees" refer to and include trees and palms. "Plant Materials" shall also refer to accent plants, ground covers and woody ornamentals. When the words "palms" or "palm trees" are utilized, no reference to other tree types is intended. When the words "trees (excluding palms)" are utilized, no other reference to palm trees is intended.

B. Plant species shall conform to those species and cultivars indicated on the Plans and in the Specifications.

C. Plants shall be sound, healthy, vigorous, free from plant diseases, insect pests or their eggs and shall have healthy normal growth and root systems. Tree trunks shall have the specified caliper, straight with no fresh cuts, fissures, scrapes, or scars, and shall have the specified clear trunk height, overall height, spread, and root ball size, as applicable. Container grown plant Materials shall be "Florida Fancy" as described in Florida Grades and Standards , Shrubs, Groundcovers and Vines.

D. The species and varieties furnished by the Contractor shall include those listed below and/or substitutions mutually agreed upon by the Contractor and the Department. The basis to be used for comparison of plants to be substituted in the respective categories shall be plant descriptions and wholesale prices as described in Betrock Information Systems' PlantFinder.

E. Trees are required to be one of the following:

1. Container Grown

   a. Plastic containers: Trees grown in plastic or other rigid containers shall be well established and in the container for at least 60 days, and not root-bound. Minimum container size guidelines will follow those established by Florida Grades and Standards.

   b. Fabric containers: Minimum root ball size will follow the guidelines established in Florida Grades and Standards. Trees grown in fabric bags should be properly root-pruned and hardened-off in the nursery following harvesting for 45-90 days.

   c. All slash pines and wax myrtles are required to be container-grown for entire lives before planting on project sites.

2. Field Grown: Shall have the appropriate root ball size based on the tree's trunk diameter (caliper) and/or height as established by the Florida Grades and Standards. Root ball depth on balled and burlapped (B&B) stock (excluding palms) shall be at least 2/3 of the root ball diameter shown. Field grown trees should be properly root-pruned and hardened-off in the nursery for a period of 45-90 days, and will be inspected by the Department for new root growth.

   a. Field grown balled and burlapped (B&B) trees are usually specified on the unit Bid price plant list, however upon Department approval, well established non-root bound container plants may be substituted for B&B material, when all other requirements, Specifications, and unit Bid prices of B&B trees are adhered to.

   b. Natural fabric burlap is to be utilized. Synthetic woven plastic fabrics and wire baskets are prohibited unless the Department provides written approval.

F. Collected plants shall not be used unless specifically called for in the Specifications or accepted in writing by the Department. The type, size, and availability of specific species will be the basis of selection of any collected plants.

G. All plants for this project are to be secured from state registered nurseries within the south and central Florida areas (as defined by Betrock Information Systems' PlantFinder geographic regions) unless authorized in writing by the Department.

580-2.03 Quantities

A. The quantities shown in the leader call-outs in the Plans govern the required installed quantities. The Plant List summarizing quantities is provided as a reference only. The Contractor is responsible for his own take-off. Discrepancies must be brought to the Department's attention, in writing, at the time of ordering plant Materials.

B. The Department reserves the right to adjust the number and locations of the designated types and species of plants to be used at any of the locations shown. The Department shall make payment based on the actual quantities installed as approved in writing by the Department.

580-2.04 Fertilizer for Plantings

A. Provide commercial grade granular fertilizer uniform in composition, dry and in a free-flowing condition for application by suitable Equipment, delivered in unopened bags or containers, each fully labeled and complying with Florida State fertilizer laws.

B. Provide a complete fertilizer with proper ratio of nitrogen (N), phosphorus (P), and potassium (K) for the species, including micronutrient trace elements of iron, manganese, zinc, copper, and boron. Provide acid-based, slow-release (sulfur coated) formulas with at least 50% slow-release of nitrogen and potassium.

C. For non-flowering trees, use 13-3-13 high sulfur, iron, and potash; and for flowering trees, use 15-4-11 high sulfur, iron, potash, magnesium, and manganese – both to be acid based, slow-release nitrogen (sulfur coated) to include minor elements (or accepted equal).

D. For palm trees use a 'palm special type' 8-4-10 to include minor elements, very high sulfur, manganese, magnesium, and iron; 50% slow-release nitrogen and potassium; and acid-based (sulfur coated) or accepted equal.

E. For accent plants, ground covers and woody ornamentals, use 16-4-8 that includes micro nutrients, 25% sulfur coated area, 50% slow release nitrogen, or accepted equal.

580-2.05 Top Mulch

A. Mulch shall be recycled, not harvested wood, and made entirely from the wood and bark of the Melaleuca quinquenervia tree, eucalyptus tree, cypress tree milling by-product, or mixed hardwoods. NO CYPRESS MULCH SHALL BE USED ON STATE ROADS. The mulch shall be shredded, cleaned, sized, and aged (heated) to destroy weed seeds, pathogens, and insects. It shall not contain more than 10% (by volume) bark. Shredded pieces of mulch shall

not be larger than ¾" diameter and 1-1/2" in length. Mulch shall be free of weeds, seeds (including Melaleuca spp. seeds), soil, and any other organic or inorganic material.

B. Prior to its delivery, mulch shall have been inspected and certified by the Florida Dept. of Agriculture and Consumer Services, Division of Plant Industry, as free of burrowing nematodes. All proof of delivery shall bear official State of Florida stamp of inspection and certification (Grade AA or A). Deliver in bags or bulk by the cubic yard.

C. All material specified shall be processed specifically for use as mulch around trees and plant beds. The use of construction wood or wooden pallets (which do not decompose and/or may harbor pests), the use of fresh-wood mulch (which deprives surrounding plants of nitrogen), or the use of color dyed mulches, is prohibited.

580-2.06 Water

Contractor shall provide water, labor, and Equipment (including a self-canceling nozzle with a diffuser) necessary to distribute water as required for all installed Materials using hand-watering methods. Existing or proposed irrigation systems will not be relied on to provide water for newly planted Materials. Use water free of elements toxic to plant and/or animal life. Refer to SECTION 585 – SITE MAINTENANCE for detailed watering Specifications.

580-2.07 Guying and Staking Material

A. Support stakes, braces, battens, and anchor stakes pads shall be structurally sound, #2 grade, yellow pine, or #2 cedar; free of knot holes, splinters, checks, or cracks, and sized and arranged as per details on plan.

1. Minimum nominal size of vertical stakes: 2"x4" with the length adjusted as appropriate for proper staking relative to tree height or as per Specifications/details.

2. Minimum nominal size of angled braces: 2"x4" with the length adjusted as appropriate for proper staking relative to tree height as per Specifications/details.

3. Anchor stake pads for braces to be 2"x4" and a minimum of 12" long.

4. Battens for braces to be 2"x 4" and a minimum of 12" long.

B. Banding at brace battens for heavy trunked palms and specified trees shall be minimum 1" steel manufactured specifically for banding – minimum two (2) bands per palm. Wrap palm trunks (excluding Washington palms) with minimum of five (5) layers of heavy nursery grade, burlap cloth before installing battens.

C. For small trees using vertical support stakes, trunks shall be secured to such stakes with guying material that is wide, smooth, sturdy and flexible plastic or rubber such as Wellington tape or accepted equal. Guying tape to connect trunk to support stake at 90°. This flexible tape shall

replace the traditional guy wire and hose method in order to avoid damage to trunk and branches.

D. Unless the appropriate painting Bid item is included in the applicable Work Order, then all vertical stakes, angled braces, anchor stake pads, and/or battens shall be provided and installed as natural, unpainted wood. When the appropriate painting Bid item number is included in the applicable Work Order, then the wood for all vertical stakes, angled braces, anchor stake pads, and/or battens shall be painted Forest Green using Behr exterior grade flat latex paint, or accepted equal, such that there is complete coverage of all surfaces. This painting shall be done prior to delivery of the wood staking and bracing material to the planting site. The only painting allowed at the planting site will be minor touch-up by brush only for saw cuts, abrasions, nicks, etc. There shall be no spray painting at the planting site. Care shall be exercised to avoid wet paint coming into contact with the tree/palm, Wellington tape, banding, or burlap.

E. To the extent that painted vertical stakes, angled braces, anchor stake pads, and/or battens are proposed by the Contractor for re-use, then in addition to meeting other specification requirements, they shall receive a fresh, complete coat of the above specified paint. This complete paint coverage shall be maintained in good condition until staking and bracing Materials are removed from the planting site. The Department reserves the right, at its discretion, for the Department to paint staking and bracing material.

580-2.08 Root Barrier Material

The Contractor shall provide and install rigid root barrier, DeepRoot UB 48-2 by Urban Landscape Products, or flexible fabric root barrier, Typar Biobarrier Root Control System as manufactured by Reemay, Inc., or accepted equal, as directed by the Department or as indicated in the Plans or as required by the permitting agencies. All safety precautions and installation procedures prescribed by the manufacturer shall be adhered to.

580-3.00 Execution

580-3.01 General

A. The Contractor's Work shall conform to accepted horticultural practices as used in the trade, unless specifically directed to the contrary by the Contract Documents or otherwise by the Department.

B. Plants shall be protected upon arrival at the site by being thoroughly watered and properly maintained until planted. Plants shall be provided complete shade until installation, unless directed differently by the Department. If a balled and burlapped (B&B) tree is not planted within 12-hours of delivery then the root ball shall be kept covered with a moist material to prevent drying of root growth tips until planting. Plants shall not remain unplanted on-site for a period exceeding 24-hours. All sod must be installed within 72 hours of harvest from the source farm. Any sod which is not planted within 24 hours after cutting shall be stacked in an accepted manner and maintained in a properly moistened condition. Any sod left on the Work

site for more than 48 hours before installation will be rejected. All sod delivered to the Work site will be contained on 48" x 48" wooden pallets and individual pieces be no smaller than 12" x 24".

C. The Contractor shall install and maintain all plants (through final acceptance) in accordance with the requirements of the project Plans, Bid documents/Specifications, and applicable standards as listed under ITEM 580 -1.04 B.

580-3.02 Layout of Planting Holes

A. The approximate location of some existing above-ground and underground utilities, structures, and other improvements are shown on the landscape Plans for general information purposes only, and are not to be relied upon nor regarded as relieving the Contractor of responsibility for verifying exact field locations. All such improvements shall be investigated and verified in the field before starting Work. Refer to ITEM 580 -1.03 F for other applicable requirements.

B. Should the Contractor encounter overhead or underground obstructions, Median modifications, or other conditions which interfere with the specified locations for plantings, then the Contractor shall immediately notify the Department and alternate planting locations or plan modifications will be selected and approved by the Department. Trees which cannot be adjusted to accommodate such conditions and still adhere to clear sight spacing and clear zone requirements, will be eliminated.

C. Before digging of planting holes, the location and arrangement of the planting shall be marked by the Contractor. The Contractor shall notify the Department a minimum of 48-hours in advance (excluding weekends and/or Holidays). The Department shall reserve the right to approve or reject all marked tree locations which shall conform to the requirements of the Specifications, Plans, and details unless otherwise addressed above.

580-3.03 Tree and Palm Installation

A. All planting holes shall be excavated to size and depth specified herein and in accordance with the Plans and details, and backfilled with the prepared Planting Soil Backfill Mix as specified or as directed by the Project Engineer. The general planting procedures for all trees and palms, whether B&B or container grown, are similar except as noted below.

1. Container-grown trees and palms:

(a) Any container-grown (CG) plants which have become pot-bound or for which the top system is too large for the size of the container, shall be rejected.

(b) CG plants shall not be removed from the container until immediately before planting, and with all due care to prevent damage to the root system. At such time, all containers shall be cut and opened fully, in a manner that will not damage the root system.

(c) Trees in containers shall be carefully removed from the pots, cans, boxes, or other containers in a manner not to damage the roots or the root ball of soil formed by the container. Scraping the root ball on the sides and bottom to stimulate new root growth outside of the existing root ball should be performed prior to placement into the hole.

2. Balled and Burlapped Trees and Palms: Always move B&B plants (except heavy trunked palms) by the root ball only. Never use the trunk as a handle to pick up or move these plants. Care should be taken not to disturb the root ball, as this would severely damage the root system. Removal of all the burlap before planting is not necessary (if it is biodegradable fabric), although the top one-third (1/3) of the burlap shall be pulled back and cut off.

   If accepted for use under ITEM 580-2.02 E.2.b, synthetic fabrics and wire baskets require special attention. Remove woven plastic fabrics and nylon twine completely after setting the plant in the hole since such non-degradable Materials can girdle stems and roots as they expand through the material. However, this practice may not be feasible when moving large trees that have been sleeved in woven plastic Materials before being placed in wire baskets. Slice the material through the wire basket and remove as much as possible to facilitate healthy root growth into the landscape soil. Once the tree is set in the planting hole, cut off all of the wire basket (that is not under the root ball) before backfilling.

3. Palms: Generally, procedures for planting balled and burlapped trees are suitable for palms. Palms shall be harvested with a root ball appropriate for the size and species of palm per the current Florida Grades and Standards. Foliage of all palm species except Sabal palmetto shall have the leaves tied with a biodegradable twine or burlap in a bundle around the bud. Fronds shall be untied by the time of the first quarterly inspection, unless the Contractor deems this to be detrimental to the palm. Complete leaf removal at the time of digging is required when planting Sabal palmetto, however, protection is required for heart frond and bud.

B. Circular planting holes with vertical sides shall be excavated for all trees. The diameter of planting holes for all trees shall be a minimum of 1.5 times larger than the root ball, per planting details, unless prevented by site obstructions or otherwise authorized in writing by the Department. The depth of each planting hole shall be not less than 6" deeper than the height of the root ball or container as applicable and as per planting details.

C. Trees shall be set in planting holes on the specified prepared planting soil mix backfilled and brought to a height to permit the top of the root ball to be 2" above the surrounding finish grade at the completion of tree installation. This allows for some settling such that the final planting will be at the same depth the plants grew in the nursery. All trees shall be planted in a vertical position (plumb). All trees shall be handled by a padded nylon strap around the root ball for lifting purposes. Heavy-trunked palms may be lifted by the trunk provided the lifting strap is padded.

D. After placing the tree in the hole, the planting soil specified herein shall be slowly watered into place in layers and then firmly tamped to eliminate voids and air pockets and to ensure the

backfill mixture is surrounding the root ball. Do not overly compact the soil to the point that it would be detrimental to the tree's health. All tamping shall be such that no trees will settle below their original growing height and the surrounding finish grade. Do not mound any soil over the roots.

E. For water retention, a minimum 6" high circular earthen berm (water ring) shall be formed around each tree such that the inside edge is located at the perimeter of the 6' wide planting hole.

F. All trees shall be thoroughly watered at the time of planting and kept adequately watered to ensure healthy Florida Grade No. 1 trees until time of final acceptance. No allowances will be made for tree or palm losses due to lack of adequate or proper watering. Following initial acceptance, the watering requirements of ITEM 585-3.01 C shall be complied with.

G. Pruning shall be done on-site after planting (with due regard to the natural form and growth characteristics of each specie) to remove damaged limbs, to remove branches falling within the required clear site window, or as directed to improve overall plant appearance. Do not remove more than 15% of branches unless otherwise approved by the Department in writing. Pruning methods shall follow standard horticultural practices using appropriate tools. Lopping, shearing, or topping of plant material will be grounds for rejection. Damaged, scarred, frayed, split, or skinned branches, limbs, or roots shall be pruned back to live wood, unless such damage, once so corrected, causes the tree to not meet the Florida Grade No. 1 standard, thus requiring tree replacement at no additional expense to the Department. The central leader or bud shall be left intact unless severely damaged, in which case the tree will be replaced at no additional expense to the Department. Remove any tree leader dowels and fasteners at the time of planting.

H. During the course of planting, excess and waste Materials shall be removed by the end of each day's operations. When planting in an area has been completed, all debris from planting operations shall be removed and the area maintained in this finished state until final acceptance.

580-3.04 Fertilizing

After planting tree, and prior to mulching the saucer, apply the recommended types and quantities of fertilizer appropriate for tree type according to the manufacturer's recommended rate Specifications for new plantings. Apply fertilizer to the soil surface within the saucer area such that the granular fertilizer is mixed into the top 6" of soil around the edge of the root zone to the perimeter of the saucer berm and then watered in. Never allow fertilizer to touch the trunk of the tree to avoid burning by soluble salts. The use of tablet-type fertilizers such as "Agri-Form" or equal, to be placed in the planting hole prior to backfilling is also acceptable.

580-3.05 Mulching

A. Prior to mulching the saucer area around each tree, remove all weeds, debris, and rocks (over 1" diameter), and then level the soil inside the saucer area surrounded by the circular berm without covering the top of the root ball.

B. A 3" layer of the specified biodegradable mulch, suitable to the Project Engineer, shall be placed around all newly planted trees within earth berms surrounding saucers as defined in ITEM 580-3.03 E and as shown on drawings and as specified. For individual plants, the mulch shall be spread to entirely cover the saucer area within the circular earth berm. Mulch shall be installed and maintained a minimum of 3" away from the trunks of all trees. Once in place, the mulch is to be watered until saturated.

C. This 3" mulch layer shall be maintained around each tree by the Contractor until its final acceptance in order to buffer soil temperature, reduce weed competition, conserve moisture, and increase soil nutrient availability.

580-3.06 Guying and Staking

A. Guy and stake plant Materials as specified and detailed to assure upright form, and in accordance with the following:

1. All trees with calipers smaller than 2-1/2" shall be staked with three (3) vertical stakes 120° apart. All trees with calipers between 2-1/2" and 4-1/2" inclusive shall use four (4) vertical stakes 90° apart. All stakes shall be 2"x4" (with length sized relative to tree height such that stakes reach the height of major branching), set vertically at least two (2') feet into the ground, and at least 12" deep into undisturbed soil, and also set against the planting hole wall. The tree shall be centered within the stakes and held firmly in place by Wellington Tape (or accepted equal), and tied to the stake and the tree to prevent slippage. Tighten guying tape as necessary to ensure tree is secured in upright position.

2. Heavy-trunked palm trees and trees with calipers over 4-1/2" shall be braced with a minimum of four (4) 2"x4" wood braces (with length sized relative to tree height), toe-nailed to 2"x4"x12" minimum battens which are tightly secured at two points to the tree (with 1" steel banding), at a point at least 1/3 the clear trunk height. Provide one (1) batten per brace minimum with additional battens as needed to prevent banding from touching trunk. The braces shall be set at an angle between 45° and 60° to the ground. The trunk shall be padded with five (5) layers of burlap under the battens (except for Washington palms). Braces shall be approximately 90° apart and secured underground by 2"x4"x12" minimum anchor stake pads hammered such that the deepest point is at least ten (10") inches below finish grade. Anchor stake pads shall not be exposed more than 2" above finished grade and be located no farther from the trunk than 6" from the outside toe of the earth berm around the saucer. The tree shall be centered within the braces.

B. All trees and palms shall be staked/braced on the same day as installed, and at no time shall any newly planted tree or palm remain without stakes for more than 24-hours after installation. The Department may prohibit completion of any further Work until all plant material has been appropriately staked. The Contractor's guying and staking shall prevent trees from falling or being blown over (including by high winds). The Contractor shall re-straighten, replant, and re-stake all trees which lean or fall, and remove all trees which are damaged due to lack of proper guying and staking within two (2) Working Days of notification by the Department.

The Department will determine if the fallen tree is damaged and is to be replaced. Such decision shall not be cause for additional expense to the Department. Damaged trees shall be replaced and guyed or staked at no additional cost to the Department within 30 Calendar Days of notification occurring at quarterly inspections.

C. All guys and stakes found to be too loose or damaged shall be repaired, tightened, and/or replaced within two (2) Calendar Days of notification by the Department at no cost to the Department. Guys and stakes shall be fully maintained to provide adequate structural support for the plant providing a neat, orderly and clean appearance. In cases of stake or brace damage caused by circumstances beyond those covered in the Contract, such as vehicular accidents, the Contractor shall replace damaged stakes as specified by the Department at Bid price.

D. At the Contractor's discretion, all guying and staking material should be removed between the sixth (6^{th}) and twelfth (12^{th}) months following planting. At the Contractor's option, the anchor stake pads shall be either completely removed or driven into the ground such that the top of the stake is a minimum depth of 4" below grade. The Contractor shall notify the Department fifteen (15) Calendar Days prior to removing guying and staking material. Removal of guying and staking Materials shall not relieve the Contractor of any responsibilities of any warranted Materials that may be in place.

580-3.07 Maintenance Prior to Initial Acceptance (At Installation)

The Contractor's maintenance shall commence after each plant is planted and shall continue until initial acceptance (at installation), after which the formal minimum twelve (12) month maintenance/guarantee period shall commence. All maintenance operations before and after Initial Acceptance (at installation), shall be conducted consistent with Specification SECTION 585 -SITE MAINTENANCE, which includes the guarantee and replacement requirements.

The Contractor shall maintain Florida Grade No. 1 quality until final acceptance. This plant maintenance shall include watering, pruning, weeding, cultivating, mulching, fertilizing, repairing or replacing stakes and guys, replacement of sick or dead plants, resetting plants to proper grades or upright position, restoration of the circular earth berm around the saucer, protection from insects and diseases, and all other care required for proper growth and health of the plants. Proper protection of grassed areas shall be provided and any damages resulting from planting or maintenance operations shall be repaired promptly. If determined to be necessary by the Department, disturbed areas shall be re-sodded to match existing turf at no additional cost to the Department.

580-3.08 Sod Installation and Maintenance Prior to Initial Acceptance

A. Elimination of Existing Turf Cover: Existing vegetation cover is to be sprayed with a non-selective herbicide such as Glyphosate (Roundup) or equivalent. Herbicide is to be applied at a rate of active ingredient per gallon as specified on the product label. All spraying must be done with a low volume / low pressure sprayer and applied in a manner that will minimize drift and contact with adjacent plant Materials or vehicular traffic. No spraying will be allowed under inclement weather conditions or wind in excess of 10 miles per hour. If an indicator dye

is used in the spray mixture, it must not come into contact with the curb, gutter, traffic separator, or other concrete surfaces. The Contractor is responsible for the removal of any stains caused by indicator dyes to these surfaces. The resulting dead vegetation is to be raked and removed.

B. Site Preparation: The site is to be prepared for sodding by the removal of debris such as sticks, rocks, roots and litter and the establishment of final grade. The location of any existing irrigation systems are to be noted and all sprinkler heads flagged prior to the beginning of site preparation Work. All holes and depressions are to be filled with backfill material that consist of 50% sand and 50% organic soil. Existing high spots in the Median surface are to be leveled with the resulting grade facilitating the sheet-flow of water to the curb line. The soil perimeter at the inside curb line is to be excavated to a depth of ¾" to 2" to allow the top of the base of the installed sod to be flush with the top of the curb. Any soil that is spilled outside of the Median must be removed immediately.

C. Sod Installation: The sod is to be placed onto the prepared site in a pattern with staggered seams. All sodding must be done in contiguous areas with no large gaps between planting sites. Each piece of sod must be abutted against the one adjacent to it. All gaps between pieces of sod will be filled with partial sod pieces or topsoil. No gaps greater than ½" in the seams between the individual pieces of sod will be accepted. All parts of the sod must be in firm contact with the soil surface and any corners or edges that overlap other pieces of sod must be trimmed. The sod must be kept 2 feet away from the trunks of any existing trees with a symmetrical circle of bare ground being established around each tree. All sod shall be top dressed with screened soil mixture of 75% organic soil and 25% sand that is free of rocks sticks or other debris. After the topdressing operation is completed the sod is to be compacted with a 1,000 lbs. roller.

D. Site Cleanup: All wooden pallets, partial sod pieces, piles of backfill material, Equipment and debris must be removed from the job site prior to the approval of substantial completion.

E. Irrigation: As soon as the area covered by a single zone of irrigation is sodded, the system should be activated and 0.10" to 0.25" of water applied to the sod. The newly planted sod is to be irrigated twice a day between the hours of 10:00 a.m. and 2:00 p.m., unless watering restrictions are in effect, for a period of 10 days or until a root system has been established as evidenced by substantial resistance when the sod is pulled away from the soil base.

F. Mowing: The Contractor is responsible for an initial mowing of the sod with St. Augustine "Floratam" mowed at 3" and Bahia "Argentine" at 3.5" with a rotary type mower. If the mower is equipped with a side-delivery chute a deflection device should be used to eliminate the discharge of grass clippings into Roadway lanes.

580-3.09 Installation of Accent Plants, Ground Covers and Woody Ornamentals

A. Elimination of Existing Vegetative Cover: shall conform to the Specifications contained within ITEM 580 -3.08 A.

B. Site Preparation of Planting Beds: The site is to be prepared for planting by the removal of debris such as sticks, rocks, roots and litter. The area to be planted shall be excavated to a depth of 18" and backfilled to a level of final grade with a soil mix comprised of 50% sand and 50% screened organic material such as screened muck or compost, guaranteed as weed free. All excavated material is to be removed from the planting site or reused on site at the discretion of the Department.

C. Installation of Plant Materials: Plant Materials shall be removed from containers prior to planting. Any root balls containing regions of compacted or encircling roots shall be loosened by making vertical cuts to the root mass. Plant Materials shall be placed in holes that are slightly larger than the diameter of the root ball with the top of the root ball to be at or slightly above finished grade. "Terrasorb AG", or accepted equal, is to be added to the planting hole at a rate of ¼ oz. (1 tsp.) per gallon of root ball being installed, prior to backfilling. Backfilling shall be made with the specified soil mixture and shall be firmly compacted and watered-in, so that no air pockets remain.

D. Pre-emergent Herbicide Application and Mulching: The planted bed shall receive a pre-emergent granular herbicide application using "Ronstar G", or accepted equal, applied using methods and rates as specified on the manufacturer's label prior to the application of mulch. Mulch products used in bed plantings shall conform to the Specifications as listed in ITEM 580 -2.05.

580-3.10 Basis of Payment

All cost associated with the performance of this Work under this Contract including but not limited to all Materials, labor, and Equipment required to successfully establish the plant material and to complete the incidental Work shall be included in the unit Bid item price for the individual plant material.

Payment for these items shall be on an 'each' basis.

END OF SECTION

SECTION 585
SITE MAINTENANCE SPECIFICATIONS

SECTION 585 IS ADDED TO THIS SPECIFICATION

585–1.00 General

585-1.01 Work Included

A. The maintenance Work consists of providing all labor, Materials, Equipment, permits, maintenance of traffic, and incidentals necessary to perform all required landscape maintenance commencing after each tree is planted and continuing until final acceptance at the

end of the maintenance/guarantee period. These Specifications apply to all projects throughout Palm Beach County assigned to the Contractor.

B. Grassed areas beyond the perimeter of the earth berm/watering saucers will be maintained by others.

585-1.02 Related Work Specified Elsewhere

Section 580 – Landscape Installation: These provisions shall apply to all Work in Section 585 Site Maintenance as appropriate.

585-1.03 General Operating Specification

Refer to the Florida Department of Transportation Standard Specifications for Road and Bridge Construction, (2021 edition), as the general operating specification document, however Section 580, Landscaping is deleted and replaced with the Specifications for LANDSCAPE INSTALLATION (SECTION 580) and the SITE MAINTENANCE (SECTION 585) herein. Maintenance of traffic requirements are described in the Contract Documents.

585-1.04 Protection

Protect all plants, wildlife, site furniture, paved surfaces, and buildings during maintenance procedures and the application of chemicals. When using Equipment and chemicals, use according to manufacturer's directions and Specifications. Repair or replace any items damaged through improper use of Equipment or application of chemicals at no cost to the Department. Contractor shall submit a copy of the applicable pest control licenses to the Department and Material Safety Data Sheets for all products to be used for this Work. Apply all chemicals after 48-hours' notice to the Department and at a time and in such a manner that the public will not be in contact with nor have any real or imagined harm done to them by the application including, but not limited to, herbicides, insecticides, and fungicides.

585-1.05 Coordination of Maintenance Schedule

Coordinate and schedule all Work through the Department. The Contractor shall submit a detailed maintenance schedule for the minimum twelve (12) month maintenance/guarantee period (divided into anticipated quarterly Work Plans) to the Department for review within fifteen (15) Calendar Days of receipt of Work Order and before Initial Acceptance (of installation).

585-1.06 Quality of Operation

Provide the maintenance services in a professional manner and keep all areas in a clean, orderly, and safe condition, satisfactory to the Department at all times. Abide by all applicable federal, state, and local laws, ordinances, and regulations.

585-1.07 Personnel

A. During all maintenance Work hours, provide a qualified, English speaking and competent person in the Work area who is authorized to supervise the maintenance operations and to represent and act for the Contractor.

B. All personnel shall be required to wear proper attire which, as a minimum, includes a standard shirt carrying company name and/or logo, present a good appearance and maintain a professional code of conduct.

C. All personnel shall take lunch breaks and use restroom facilities in appropriate areas off site.

585-1.08 Equipment

A. All vehicles shall be maintained in good working order, affixed with a company name/logo, painted, with no visible rust and shall be parked on pavement in public areas only. Provide protection of paving from loading ramps. Use tarps/plywood to protect from oil.

B. Fueling mowers, edgers, etc. shall be completed prior to unloading Equipment. Re-fueling, addition of oil, etc. shall be done with care and preferably over concrete. Any damage to asphalt or sod/planted areas from gas, oil or chemical spills shall be fully corrected by Contractor.

C. No storage or provision for storage shall be made on site for maintenance Equipment or Materials. Contractor shall be responsible for transporting Equipment and Materials to the site and off site in sealed or secured containers and vehicles as required, unless specifically allowed by written agreement.

585-1.09 Monthly Reports

On or before the tenth day of each month, submit for approval a written report describing in detail all Work performed by the Contractor under this Contract during the past month (including replacement, mulching, fertilizing, pruning, and chemical application activities). The report shall also include: dates of site inspection(s) by qualified personnel as described in ITEM 585 -1.07; observations of the general health and vitality of all plantings; the locations and severity of any pests encountered; detailed descriptions of all chemical treatments applied; the general condition of areas maintained; descriptions of damage and vandalism; repair or maintenance recommendations; and the proposed general and landscape maintenance program to be performed by the Contractor during the next month. Department shall approve format of monthly reports, and require revised formats as necessary.

585-1.10 Routine Quarterly Inspections

During the minimum twelve (12) month maintenance period, the Contractor will be required to make maintenance inspections with the Department on a quarterly basis for weeks number 13, 26, and 39 from the date of Initial Acceptance (at installation) at a time scheduled by the Department. Problems identified during these inspections and corrective actions to be taken (with time frames)

will be listed by the Contractor and be incorporated into an amended version of the upcoming quarter's Work plan, unless otherwise indicated by the Department.

585-1.11 Guarantee, Replacement, and Final Inspections

A. Guarantee: All Work shall be guaranteed during the minimum twelve (12) month maintenance/guarantee period during which all plants are to be maintained to meet Florida Grade No. 1 as per Florida Grades and Standards for Nursery Plants, by the Florida Dept. of Agriculture and Consumer Services (henceforth referred to as Florida Grades and Standards). All trees shall be alive, healthy, and in satisfactory growth throughout the guarantee period.

B. Replacements: The Department will be the authority to determine which "Replacement Category" described below applies to each tree and what, if any, action is to be taken.

1. If, at any time during the minimum twelve (12) month maintenance/guarantee period, the Department identifies trees that are substandard, unhealthy, dead, damaged or otherwise in unsatisfactory condition, then such trees shall be removed and replaced/staked by the Contractor as per the following at no additional cost to the Department.

    a. Remove such trees within fifteen (15) Calendar Days of written notification by the Department, and fill planting holes immediately with soil to finish grade level. This notification may occur at any time in addition to quarterly inspections.

    b. Replace such trees within thirty (30) Calendar Days after the written notification occurring at quarterly inspections.

    c. The Department reserves the right to remove any unhealthy, substandard, damaged, or dead trees with prior notification to the Contractor, however, the Contractor shall replace such trees as per these Specifications.

2. Fallen or leaning trees shall be removed (if damaged or otherwise substandard) or up-righted/re-staked (if apparently healthy and meeting Florida Grade No. 1).

    a. Those trees requiring removal shall be removed within two (2) Working Days of written notification by the Department. Planting holes of removed trees shall be immediately filled with soil to finish grade level.

    b. Those trees requiring up-righting/re-staking shall be corrected within 12 hours notification by the Department. The Department, without prior notification to the Contractor, reserves the right to remove, reposition, any fallen or leaning tree encroaching into a vehicular travel lane or creating any other situation affecting public health, safety, welfare.

3. Trees showing clear evidence of being damaged or knocked down by vehicular accidents will be removed by the Department and replaced by the Contractor on a unit cost basis

within thirty (30) Calendar Days after the written notification occurring at quarterly inspections.

4. The Contractor shall notify the Department in writing of each successfully completed tree removal and/or replacement and each shall be identified by station number location shown on the planting Plans.

5. All replacement trees shall become guaranteed for a minimum of twelve (12) months from the date of their initial acceptance for replacement installation, and follow the same maintenance/guarantee period requirements specified herein for originally planted trees.

C. Final Acceptance:

1. The Contractor shall notify the Department in writing fifteen (15) Calendar Days prior to presumptive completion of maintenance/guarantee period in order for the Department to schedule a semi-final inspection. Said maintenance/guarantee period shall be continued until the final inspection is complete and the final acceptance of the project is granted by the Department.

2. Within seven (7) Calendar Days of the notice in ITEM 585 -1.11 C.1, a semi-final inspection will be scheduled by the Department with the Contractor. Following the semi-final inspection, the Department will provide the Contractor with a list of deficiencies including necessary replacements and required time frames for completion. Replacements, including those in ITEM 585 -1.10 B, shall occur prior to final inspection and before final acceptance is granted. When the Work specified by the Contract is found to be completed to the Department's satisfaction, the semi-final inspection shall constitute a final inspection.

3. Upon satisfactory replacement of material and performance of required Work by the Contractor, another semi-final inspection shall be made. If the required material is found to have been replaced and the Work completed satisfactorily, then this shall constitute the final inspection.

4. When, upon completion of the final inspection, the Work is found to be completed satisfactorily, the Department shall give the Contractor written notice of final acceptance.

5. Notwithstanding the above, the Department reserves the right to accelerate the date of any final acceptance (thereby ending the maintenance/guarantee period) when the Department deems such action is in the Department's best interest.

6. Earth berm rings utilized to retain water within the saucer area of each tree (located at the perimeter of the planting hole, 1.5 times larger than the root ball) must be maintained at minimum 6" height throughout the entire guarantee period, but are to be knocked down to level grade just before the semi-final inspection for each tree. The grassed areas affected by the reshaped mulched areas shall be treated with an herbicide as per manufacturer's Specifications for weed-removal before applying mulch. A 3" layer of mulch shall be

applied by the Contractor to the entire eye-shaped area before final acceptance. The mulch area of trees that are clustered in tight groupings may be merged to form one mulch bed if approved in writing by the Department.

585-2.00 Products

585-2.01 Landscape Maintenance Materials

A. Water: Use water free of elements toxic to plant and/or animal life. Contractor shall provide (within the unit cost for each tree) labor and Equipment necessary to distribute water as required for all installed Materials using hand-watering methods. Existing or proposed irrigation systems should not be relied on to provide water for newly planted Materials.

B. Replacement Trees: Conform to the type, species, grade, standard, size and method of installation as originally specified unless otherwise directed in writing by the Department. For replacement trees which differ from the original plants, the Contractor must obtain prior written approval by the Department, and submit a credit/debit statement, as appropriate.

C. Planting Soil Backfill Mix: As specified in SECTION 580 -LANDSCAPE INSTALLATION.

D. Fertilizer: As specified in SECTION 580 -LANDSCAPE INSTALLATION.

E. Top Mulch: As specified in SECTION 580 -LANDSCAPE INSTALLATION.

F. Herbicides: Use herbicides recommended for the control of the types of weeds encountered as recommended by the University of Florida Cooperative Extension Service.

G. Insecticides: Use insecticides recommended for the control of the types of insect pests encountered. Insecticides shall be EPA approved.

H. Fungicides: Use fungicides recommended for the control of the types of fungi encountered. Fungicides shall be EPA approved.

585-3.00 Execution

585-3.01 Landscape Maintenance

General: Maintain all plantings in a healthy, vigorous and attractive condition so as to maintain the required Florida Grade No. 1 for all plantings as per Florida Grades and Standards, commencing after each tree is planted and continuing until final acceptance at the end of the maintenance/guarantee period.

A. Tree and Palm Maintenance:

1. Pruning and Trimming:

a. Trees (excluding palms): Prune all trees to remove dead, broken, or infected branches, suckers, vines and dead or decaying stumps and all other undesirable growth. Perform pruning to maintain Florida Grade No. 1 growth habit. To enhance the appearance of specific trees, the Department may request additional pruning. Perform all pruning in accordance with American Association of Arborists standards and recommendations and also those of Florida Grades and Standards. Do not remove more than 15% of branches unless otherwise approved in writing by the Department. Buckhorning (also called 'hat-racking') of any tree is not permitted.

b. Palms: Prune all palms to remove dead or substantially brown fronds only.

c. Debris Removal: Remove and properly dispose of off-site all clippings, leaves, branches, sticks, and twigs after each pruning.

2. Fertilization: Apply specified complete fertilizers that are accepted by the Department at manufacturer's recommended rates. Notify the Department 48-hours in advance of applications. Consistent with Contractor's submitted detailed maintenance schedule in ITEM 585 -1.05, fertilize all trees two (2) times per year between March and October (no closer than four (4) months apart). Broadcast fertilizer inside saucer area around the edge of the root zone. Fertilizer must not be allowed to touch the trunk.

3. Mulching:

   a. Maintain a three foot (3') radius ring with a three (3") inch layer of mulch in all plant beds around all trees. Replenish to specified depth prior to each quarterly inspection during the minimum 12-month maintenance/guarantee period. Maintain mulch at 3" clear from all tree trunks. Apply mulch after fertilizing, never before.

   b. The Contractor shall be responsible for re-mulching activities (including re-establishment of earth berm of saucer) necessitated by washouts, foot traffic, automobile damage or unforeseen circumstances.

4. Weed Control: On a monthly basis, remove weeds mechanically or by spot treatment with accepted herbicide in all plant beds (including the mulched saucer area and the surrounding earth berm). All herbicides, including pre-emergents, are to be used according to label Specifications during the maintenance period. All planting areas/mulched areas shall be weed-free for the final inspection.

5. Sucker Removal: Remove sucker growth monthly from all areas of the trunk, its base, and root zone.

6. Insect Control: Control insect pests which infest plant Materials, and control ant mounds which may occur in landscape areas. Record insecticides and other remedies on the monthly Work report.

7. Plant Replacement: Refer to ITEM 585 -1.11 B.

B. Watering:

1. All installed trees shall be hand-watered over the entire root zone with a slow soaking at 4-gallons per minute for deep root penetration and protection of surface roots, mulch, and earth berm around saucer. Contractor shall be responsible for adequate watering of all installed trees from the time of planting until final acceptance at the completion of the minimum twelve (12) month maintenance/guarantee period.

2. The following water guidelines have been established for Contractor's information only and shall be considered only as an estimate of water need. Depending on climate, rainfall, soil, and plant conditions, the Contractor shall adjust the water schedule and amount per application to meet optimum plant growth conditions. The Contractor shall be responsible for monitoring climate and plant soil moisture conditions, and determining if watering beyond or less than the watering guideline described below shall be applied. Water shall not be paid for separately, but shall be included in the unit cost per tree.

Water Use Guidelines			
Amount of Water Applied: Trees and Palm Trees: Apply a minimum of 15-gallons water per tree at each application. Water applied should be a slow soaking at 4-gallons per minute maximum.			
Minimum Frequency Guidelines for Hand-Watering:			
Material	Day	Frequency	No. Applications
Trees	1 – 30	Daily	30
"	31 – 180	Every 3rd Day	50
"	181 – 325	Every 7th Day	20
"	326 – 361	Every 12th Day	3

3. Frequency and number of applications may vary due to climate, rainfall, soil, and plant conditions. Less water may be used during wet, cool periods whereas more water may be needed during hot, dry periods. Contractor shall adjust as needed for optimum plant health. The minimal frequencies suggested above shall not limit the Contractor's responsibility for providing adequate watering and acclimation for the proper establishment of all trees.

4. Damage resulting from erosion, gullies, washouts, or other causes shall be repaired by the Contractor by filling with topsoil, reshaping earth berm and saucer, tamping to re-stabilize slopes, and replacing lost fertilizer and mulch at no additional cost to the Department.

5. Contractor to use a self-canceling nozzle with a spray diffuser on the end of the hose to ensure water is applied gently so as not to displace mulch or expose root systems.

6. Proof of watering, in the form of receipts, meter readings or other written documentation, shall be presented with the Contractor's monthly reports.

C. Monthly Reports: Complete monthly reports as described in ITEM 585-1.09.

D. All cost associated with the performance of Work under this Contract including but not limited to all Materials, labor, and Equipment shall be included in the unit Bid item price for each tree, shrub and or ground cover/turf.

END OF SECTION

SECTION 590
IRRIGATION SYSTEM CONSTRUCTION

SECTION 590 IS ADDED TO THE SPECIFICATION AS FOLLOWS:

590–1.00 General

590-1.01 Scope of Work

A. Irrigation systems shall be constructed using sprinklers, valves, piping, fittings, controllers, wiring, etc. of sizes and types as shown on the drawings and as called for in these Specifications. The system shall be constructed to grades and conform to areas and locations as shown on the drawings.

Sprinkler lines, valves, piping, wiring, etc. are essentially diagrammatic. Minor adjustments in location to suit field conditions are anticipated. Major relocations shall have prior approval of the Department.

Unless otherwise specified or indicated on the drawings, construction of the irrigation system shall include furnishing, installing and testing of all mains, laterals and fittings, furnishing and installing of sprinkler heads, gate valves, control valves, controllers, and control wires, etc.; all necessary specialties and accessories such as backflow preventers, pump stations, excavation and backfill, and all other Work in accordance with the Plans and Specifications as required for a complete system.

B. The Contractor shall obtain all permits and pay required fees to any governmental agency having jurisdiction over the Work. Inspections required by local ordinances shall be arranged as required. Upon completion of the Work, satisfactory evidence that all Work has been installed in accordance with the ordinances and code requirements shall be furnished to the Department.

C. While working on Medians or on the roadside, proper traffic control shall be used to protect workers and the public. Traffic control operations for installation and for future maintenance

shall be in accordance with the Palm Beach County Streetscape Standards Manual, current edition, and as stated in the Maintenance of Traffic Section in these Contract Documents. All Work shall be done in accordance with all local and state codes and standards. All above ground apparatus and structures that are installed shall be kept a minimum of 6' from the adjacent travel lane.

590–2.00 Products

590-2.01 General

All Materials to be incorporated in this system shall be new and without flaws or defects and of the quality and performance as specified and meeting the requirements of this section. All material to be incorporated into an irrigation system that utilizes re-use water shall have the appropriate labels and bear the proper color (lavender) as required by the service provider. All material overages at the completion of the installation are the property of the Contractor and are to be removed from the site.

590-2.02 Pipe and Fittings

Pipe sizes shall conform to those shown on drawings. No substitutions of smaller pipe sizes will be permitted but substitutions of larger sizes may be approved. All pipe damaged or rejected because of defects shall be removed from the site at the time of said rejection.

A. Polyvinyl Chloride (PVC)

1. All plastic pipe shall be continuously and permanently marked with the following information:
   a. manufacturer's name
   b. pipe size
   c. schedule number, class or SDR number
   d. type of material
   e. code number

2. Unless otherwise noted on the drawings, all plastic pipe fittings shall be Schedule 80 polyvinyl chloride free from manufacturing defects.

3. Solvents used for joining must comply with the requirements of ASTM-D-2466 and be recommended by the manufacturer of the plastic pipe used.

4. All PVC main lines 2 ½" or larger shall have provision for expansion and contraction provided in the joints. All joints shall be designed for push-on connection. A push-on joint with a coupling manufactured as an integral part of the pipe barrel consisting of a thickened section with an expanded bell with a groove to retain a rubber sealing ring of uniform cross section similar and equal to Johns-Manville Ring-Tite and Ethyl Bell Ring or made with a separate twin gasket coupling similar and equal to Certainteed Fluid-Tite are acceptable. Circular gaskets shall conform to the requirements of ASTM designation F477. All O-ring pipe shall be Class 200.

5. All tees and elbows connecting to the O-ring mainline shall be ductile iron manufactured for use with PVC O-ring pipe, Harco or accepted equal.

6. Underground detectable marking tape shall be Line Guard or accepted equal.

7. When directional bore is chosen as the method by which to install sleeves, the main line pipe shall be smooth continuous HDPE SDR 11 with appropriate fittings for connection to Rigid PVC O-ring main line. Manufacturer shall be KAF-FLEX, (800) 451-7646 or accepted equal.

8. Main line, 2" or smaller, shall be Schedule 40 PVC or HDPE with Schedule 80 PVC fittings.

9. All lateral lines shall be Schedule 40 PVC.

B. Galvanized Steel: Galvanized steel pipe shall conform to the requirements of ASTM Designation A 120, Schedule 40. At threaded joints between PVC and metal pipes, the metal shall contain the socket end and the PVC side, the spigot. A metal spigot shall not, under any circumstances, be screwed into a PVC socket.

C. HDPE SDR 11: HDPE SDR 11 shall conform to the requirements of ASTM, ANSI, AWWA, etc., standard specification is incorporated by reference in these Specifications, the reference standard shall be the latest edition and revision

590-2.03 Risers

A. All sprinklers shall have a flexible riser assembled by the use of flexible polyethylene pipe. The inside diameter of the polyethylene pipe shall be the same diameter as the sprinkler head inlet.

B. Swing joints used with rotor and spray bodies shall be by Lasco or accepted equal.

590-2.04 Valves

A. Backflow Preventer (used only for potable water supply): The backflow preventer shall be a Reduced Pressure Zone (RPZ) type, as accepted by Palm Beach County Water Utilities Department, capable of having a flow rate that is greater than or equal to that which comes from the meter.

   The backflow preventer body shall be constructed of bronze and the internal parts of stainless steel. A backflow preventer is not required for reclaimed water (gray water), but a check valve of the same size as the delivery line is required.

B. Manual Valves: All zone shut-off valves of sizes 2" or smaller shall be all bronze double disc wedge type with integral taper seats and non-rising stem. Those in-ground shall be installed in a separate valve box. Gate valves shall be NIBCO, T-113-K or equal American made, conforming to MSS SP-80 @ 200psi/13.8 Bar

C. Automatic Control Valves: Shall be Irritrol 100P-1.5 FC with omni-reg pressure regulator, Toro P-220-27-0-6 (pressure-regulated angle type), or accepted equal. All remote control valves are to have standard solenoid to be compatible with the Two-Wire control system and the irrigation controller, as per plans, details and specifications. All control valves shall be provided with an equal sized gate valve installed upstream from the control valve and included in the same valve box.

D. Pressure Relief Valves: The pressure relief valve shall maintain constant upstream pressure by passing or relieving excess pressure, and shall maintain close pressure limits without causing surges. The pressure relief valve shall be a fast opening, slow closing, 125 class flanged globe type valve. See Plans for size (1" minimum) and opening pressure.

E. Air/Vacuum Relief Valves: The air/vacuum relief valve shall be a 2" AR Series Combination Air and Vacuum Release Valve by BERMAD, or accepted equal. Install a 1" gate valve to allow isolation of relief valve for periodic cleaning and maintenance. The relief valve shall be installed in an approved valve box on a 1 2/" 'swing joint' vertical riser affixed to a saddle tap at the top of the mainline at the highest location in the system in both directions from the source or as directed. Install in a traffic rated valve box per section 590-2.05.

590-2.05 Valve Box

To be polymer concrete with fiberglass reinforcement with a minimum "Tier 15" or Tier 22 traffic rated cover, embossed with the word 'Irrigation", as certified by the manufacturer. Recommended

manufacturers are CDR systems Corp., Ormond Beach Florida and Quazite, Lenoir City, Tennessee, or accepted equal. Optional sizes shall be a minimum of 18" X 12"x12" or 18" X 18"x12" or larger if more than 1 ACV is to be installed with cover (no metal). The appropriate valve zone numbers shall be tagged or stenciled on the underside of the lids. Color of valve box to correspond with type of water used.

590-2.06 Sprinkler Heads

A. Quick Coupler Valves: Quick coupler valves shall be two-piece heavy duty brass with locking vinyl cover. Rainbird Model #33 DL RC or accepted equal to be used where specified on the drawings. Provide (2) Model 2049 cover keys with (2) swivel hose ell adapters, Model SH-O or those suitable for use with equal manufacturer. Any quick-couples used with reclaimed water or surface water must be permanently labeled "Do Not Drink" in English and in Spanish.

B. Sprinkler Heads: Toro 570Z PRX, or accepted equal shall be provided where specified on the drawings. Rotor heads shall be Hunter I-20 with stainless steel risers, K-Rain Pro-Plus, Toro EZ Adjust, or accepted equal. All heads located on slopes shall be equipped with a Check Valve Seal.

C. Bubbler Heads: Bubbler heads shall be adjustable with a full circle delivery pattern. Rainbird 1300 A-F, Toro 514-20, Irritrol 533 or accepted equal, shall be provided where specified on the drawings.

590 - 2.07 Electrical Control Wiring

All electrical control wiring shall be UF which has been approved for direct underground burial.

A. Ground/common wire shall be American wire gauge size 12.

B. Control wire shall be American wire gauge size 12, or as specified on the drawings.

C. Electrical control wire Two-Wire system cable decoder cables between the controllers and the decoders shall be Hunter 1D1 GRY, 1D1PUR, 1D1YWL, 1D1ORG, 1D1BLU and/or 1D1TAN Twisted Blue and Red insulated solid copper conductors, 14 Gauge, 14/2 AWG A.K.A Paige P7313D Direct Burial Decoder Cable Part Number 1701116RB with high density polyethylene insulation as manufactured by Paige, Two-Wire Control System wiring between the single decoders and the zone valve shall be 14/2 AWG Paige DTS Cable.

D. Insulation shall be 075" thick minimum covering for positive waterproof protection of 14/2 AWG.

E. Waterproof 3M DBY and DBR-6 wire connectors shall be used for all wire connections per the details.

590-2.08 Pump Station

A. Pump shall be as specified on the drawings.

1. Submersible pump requires the following:

a. A cased well of appropriate size and depth as specified on the drawings to accept the specified pump and motor (see well Specifications).

b. A submersible pump and motor as specified in the drawings ranging from 2 HP to 10 HP. Pump shall be Goulds, Sta-Rite, Aerometer or accepted equal to be installed with a pressure relief valve. Submit performance curves prior to installation.

c. One 6" thick concrete, below-ground vault, Model #PB4848-48 by Oldcastle Precast, Inc., or accepted equal. Required inside dimensions shall 48" x 48" x 48" deep. Vault shall have a concrete bottom containing drain hole(s) and an Aluminum 48" x 48" cover. 300 PSF load rating, Model #ADP300 by U.S.F. Fabrication, Inc., or accepted equal. The vault shall be core drilled as necessary to connect tanks to discharge pipe (see Item d below).

d. One rust control tank and one fertigation tank. Tanks shall be 55-gallon capacity, 20" dia. x 38" deep seamless molded plastic, minimum 1/8" thick, Model # TC2038IA by Chem Tainer Inc., or accepted equal. Tanks shall have piped connections to two injector pumps then to the discharge side of the pump. Injector pumps shall be wired to pump control and be capable of delivering between 10 and 100 parts per million. Pumps shall be a solenoid driven metering pump by LMI Unidose, Model # UO42-281, or accepted equal.

e. Electrical Equipment shall be mounted on an aluminum, unistrut rack (3" x 1'-4" U-Channel uprights with 2" x ¼" L- Channel cross braces). The rack shall contain the irrigation controller and motor control/starter in a NEMA 4x enclosure, injector pumps (see Item d above) and a NEMA 4x circuit breaker panel with manual shut-off. A rain switch, Rainsensor Series # RS1000 by Irritrol, or accepted equal shall be required. Connection from the irrigation controller to the rain switch shall be via a conduit adapter mounted on a pole, per code, or through the integration of a wireless rain cut-off. All electrical Work must be performed by a licensed electrician. Electrical service meter shall be mounted 36" above grade on its own unistrut rack at the base of the pole

where the riser has been installed and provided with a 2P3W Fused NEMA 4X rated stainless steel Manual Disconnect with UL Class RK-5 Fuses, all sized per applicable codes for the pump being installed.

f. For pumps 5 HP and larger, an Ames C1a Valve, or accepted equal pressure regulating and pressure sustaining valve, pressure gauge followed by a gate valve, both of the same size as the main line.

g. A Coast Guard shack cage fabricated from expanded steel, or accepted equal, to enclose the well head and both valves, mounted on a concrete pad as per the manufacturer's Specifications.

h. Concrete vaults shall contain sump pumps wired to the power panel. Pumps shall be ¼ hp, Myers, Model # 525VI, 115 V, or accepted equal. Install PVC discharge pipe just below grade for a minimum distance of ten feet with a 4" PVC pop-up discharge blow off cover by NDS or accepted equal.

2. Centrifugal pump station requires the following:

a. A cased well of appropriate size and depth as specified in the drawings (see well Specifications).

b. A centrifugal pump and motor as specified in the drawings ranging from 2 HP to 10 HP. Pump shall be Flint & Walling with brass impeller (for all 3hp or smaller pumps), Goulds, Sta-Rite, Sullivan Electric or accepted equal, to be installed with a pressure relief valve and Hot Stop or similar emergency shut-off device. Submit performance curves prior to installation.

c. Concrete vault as described in Item 2.08-A1c above.

d. Rust control and fertigation tanks as described in Item 2.08-A1d above.

e. Electrical Equipment and mounting as described in Item 2.08-A1e above.

f. Pressure regulating valve with a pressure gauge as described in Item 2.08-A1f above.

g. A pump enclosure, Canal Screens, Inc., or accepted equal, sized to house the pump and the pressure regulating valve and gate valve if applicable, set on an aluminum skid and anchored to a concrete pad of the size recommended by the enclosure manufacturer.

h. A check valve on the intake side of the pump of the same size as the intake pipe installed either inside or outside of the pump enclosure.

3. Potable, reuse or surface water supplies require the following:

   a. Plans shall be submitted to the appropriate water utility for review. Contractor shall pay any plan review fees. Palm Beach County will arrange for water service and tap, and will pay any service initiation fees.

   b. An RPZ backflow preventer, as accepted by Palm Beach County Water Utilities Department, Ames Cla Valve or accepted equal, pressure regulating and pressure sustaining valve, pressure gauge followed by gate valve installed by a licensed plumber beyond the water meter.

4. When reclaimed water is used, the requirements are the same as those for potable water, except that a check valve shall be installed instead of the RPZ backflow preventer.

5. When the water source is surface water such as a lake or canal, the requirements are the same as those for a centrifugal pump station except for the well. In addition, the suction pipe shall be fitted with a Plum Creek, Aqua Queen or accepted equal, self-cleaning intake screen installed as per manufacturer's Specifications.

B. Pipes, valves, fittings, etc., shall be galvanized steel in sizes and locations as shown on the Plans. No PVC shall be used above ground.

590-2.09 Controller

Shall be Sentinel Field Satellite as manufactured by Toro, or accepted equal, in stainless steel wall-mounted cabinet, mounted on an aluminum unistrut (see Item 2.08-A1e above). Provide an additional 120V, 15 AMP electrical outlet for auxiliary power and a Data Industrial Model IR-PR flow sensor (size determined by size of mainline). Flow sensor shall be located as indicated in details within a 11" x 11" x 18" polymer concrete box with fiberglass reinforcement and fitted with a locking traffic rated cover. Provide each satellite controller with a hand held radio and radio port, one surge protection board, antenna or Aircard, U.L. approved ground rod/plate protection (separate grounding protection is required from the pump station) and pump start. Contractor shall be responsible for hook up and verification of positive connection to Central Controller. Pump controls shall be mounted on aluminum unistrut with fused shut-off, meter and rain sensor. Electrical service shall be U.L. approved, installed by a licensed electrician and provided with a molded breakaway plug and connector installed in a traffic rated approved in ground pull box.

Toro Sentinel "Water Management System" central controller, or approved equal. This unit shall communicate with the central, and have a mother-board and one 96 Station daughter-board which is compatible with a two-wire communication path with Toro ISP decoders.

For information and prices, contact Hector Turf at (954)429-3200.

590-2.10 Communication Tower

Shall be a freestanding tripod G-25 by ROHN, or accepted equal, with 12" spacing. Antenna shall be installed per manufacturer's directions in the location indicated in the Plans or as directed by Department personnel. The number of sections required to provide positive communications shall be determined at the time of installation.

590–3.00 Execution

590-3.01 Surface Conditions

A. Inspection

1. Prior to all irrigation Work, the Contractor shall carefully inspect the installed Work of all other trades and verify that all such Work is complete to the point where this installation may properly commence.

2. The Contractor shall coordinate Work with electrical and paving Contractors, as needed.

3. The Contractor shall verify that irrigation system may be installed in strict accordance with all pertinent codes and regulations, the original designs, the referenced standards, and the manufacturers' recommendations.

4. The Contractor shall call Sunshine State One-Call of Florida, Inc. at 1-800-432-770 to verify utility locations at least 48 hours prior to digging. The Contractor shall be responsible for contacting or locating other utilities. The Palm Beach Water Utilities Department also must be contacted at (561) 641-3429, or the appropriate water utility having jurisdiction over the project area, to verify locations and depths of underground utilities.

5. If the irrigation system is damaged as a result of improper construction or coordination on the part of the Contractor, the damage shall be repaired by the Contractor at no expense to the Department.

B. Discrepancies

1. In the event of a discrepancy, the Contractor shall immediately notify the Department. 100% coverage and 100% overlap is required regardless of any site changes.

2. The Contractor shall not proceed with the installation in areas of discrepancy until such discrepancies have been fully resolved in writing by the Department.

590-3.02 Field Measurements

The Contractor shall make all necessary measurements in the field to insure precise fit of items in accordance with the Specifications found in the drawings. The final layout of the project must be approved by the Department before any Work commences.

590-3.03 Trenching and Backfilling

A. Trenching for plastic pipe shall be excavated to sufficient depth and width to permit proper handling and installation of pipe and fittings. The backfill shall be thoroughly compacted and leveled off to adjacent soil level. The backfill shall contain no lumps or rocks larger than 3 inches. The top six inches of backfill shall be free of rocks larger than 1", subsoil or trash. Pipe trench shall be sodded if placed in an existing sodded area and shall not settle after backfilling.

B. Minimum Depth of Cover:

1. The minimum depth of cover for main lines shall be 24" with a layer of Line Guard installed at a depth of 6".

2. For lateral lines on the discharge side of the E.R.C.V., minimum depth of cover shall be 18".

3. For Line Guard (main lines only), minimum depth of cover shall be 6".

4. Requirements of the FDOT Utility Accommodation Manual and the specific Utility Permit Conditions shall take precedence over the above standards for work in State Roads

590-3.04 Installation of Piping

A. Inspection of Pipe and Fittings

The Contractor shall carefully inspect all pipe and fittings before installation, removing all dirt, scale, and burrs, and reaming as required. Install all pipe with all markings up for visual inspection and verification.

B. The Contractor shall coordinate Work with Site Contractor to locate sleeves of size and location as shown on the drawings.

C. Plastic Pipe

1. The Contractor shall exercise care in handling, loading, unloading, and storing plastic pipe and fittings; store plastic pipe and fittings under cover until ready to install; transport plastic pipe only on a vehicle with a bed long enough to allow the pipe to lay flat to avoid bending and concentrated external load.

2. The Contractor shall repair all dented and damaged pipe by cutting out the dented or damaged section and rejoining with a coupling.

3. In joining, use only the specified solvent and make all joints in strict accordance with the manufacturer's recommended methods. Give solvent welds at least 15 minutes set up time before moving or handling and 24 hours curing time before filling with water.

4. For plastic-to-steel connections, Work the steel connection first; use a non-hardening pipe dope on all threaded plastic-to-steel connections and use only light wrench pressure.

D. Galvanized Pipe

1. Make all cuts to galvanized pipe square with all cuts thoroughly reamed and all rough edges or burrs removed.
2. Make all pipe threads sound, clean-cut, and well fitting.

3. Use pipe dope on male fittings only.

4. Make all screwed joints tight with all the necessary wrenches, but without handle extensions.

E. Pavement Crossings:

1. Sleeves under decorative paving or sidewalks are to be HDPE or Schedule 40 PVC and installed at depth of 24".

2. Sleeves under vehicular paving are to be HDPE or Schedule 80 PVC or hot-dipped galvanized steel with a minimum wall thickness of .237" and installed at a depth of 36" of cover on County roads and per the FDOT Utility Accommodation Manual on State roads .

3. Installation under existing pavement is to be by jack and bore or directional bore. Ends of the bore shall be marked with 3 M detectable 'buttons' to assist future locations. Upon completion of the bores, the Contractor shall provide documentation of the bore construction by means of bore logs and in addition, on State Roads, plan and profile sheets. Any pavement, curb, sidewalk, or other surface damaged during boring shall be replaced to Palm Beach Department and F.D.O.T. Specifications.

4. The contractor shall provide the GPS State Plane Coordinates for location of all landscape irrigation sleeve (Both Active & Abandoned) ends and provide plan, & profile as-builts, bore logs, and install 3M Electronic markers at the sleeve ends during construction.

590-3.05 Installation of Equipment

A. Manual Control Valves and Electric Remote Control Valves

The Contractor shall install manual and electric remote control valves in control boxes where indicated on the drawings, a minimum of 18" from back of curb, in accordance with the manufacturer's recommendations.

B. Motor, Pump, Pressure Control Valves, Check Valves and Main Shut-off Gate Valves

Install where indicated in the drawings, in accordance with drawings and with manufacturer's recommendations.

C. Air Relief Valves

Install where indicated on the drawings at highest elevation, in accordance with manufacturer's recommendations.

D. Pressure Relief Valves

Install where indicated in the drawings, in accordance with drawings and with manufacturer's recommendations.

E. Sprinkler Heads

Installation of Irrigation Heads: Heads shall be placed to finished grades. Locate sprinkler heads a minimum of 12" from back of curb. Upon installation heads shall be flagged by colored markers for positive identification in field. Prior to operation of heads, the Contractor will lay an area 2' x 2' of sod around each head. Sod shall be laid so that it is even with the finished grade. Heads must be firmly set so as to withstand being driven over with soft tire Equipment without damage. Rotor heads require swing joint assemblies.

F. Thrust Blocking

1. In general, thrust blocks are required on the main line at the following locations:

    a. Where the pipe changes direction of the water (i.e., ties, elbows, crosses, wyes and tees).
    b. Where the pipe size changes (i.e., ties, elbows, crosses, wyes and tees)
    c. At the end of the pipeline (i.e., caps and plugs).
    d. Where there is an in-line valve.

2. Blocks shall be concrete, having a calculated compressive strength of 3,000 psi. Install as shown on details.

G. Controllers

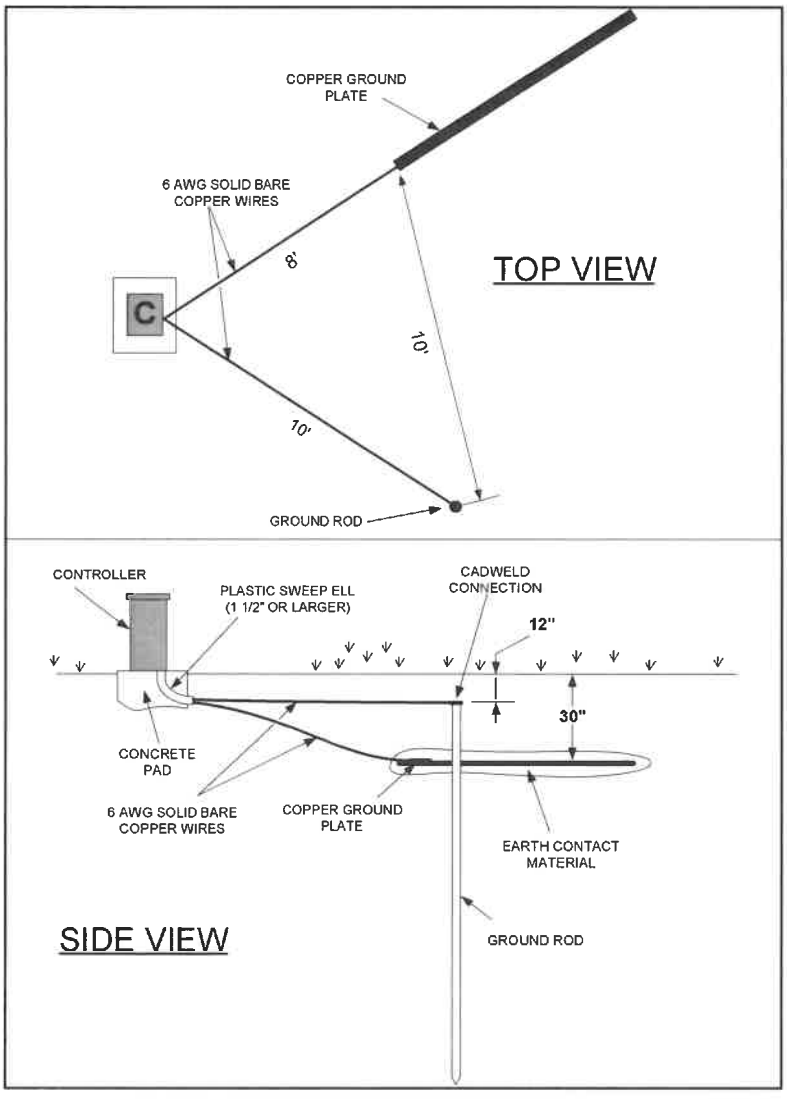
The Contractor shall install controllers at locations as shown on plan according to manufacturer's recommendations.

H. Lightning Arrestor

The Contractor shall install an arrestor at each controller location shown on the plans to provide lightning protection on both primary and secondary sides of all controllers in accordance with Article 250 of the National Electrical Code (NEC.) Grounding, bonding, and shielding components will include the items described in the following paragraphs, at a minimum.

EARTH GROUNDING

Use grounding electrodes that are UL listed or manufactured to meet the minimum requirements of Article 250-52 of the 2002 edition of the NEC. At the very minimum, the grounding circuit will include a copper clad steel ground rod, a solid copper ground plate and 100 pounds of PowerSet® earth contact material, as defined below and per the following detail. This detail is the minimum requirement for supplementary grounding of any electronic equipment. Other details, for a multitude of field situations, are available from the American Society of Irrigation Consultants, ASIC Guideline 100-2002 (www.asic.org, "Design Guides".)



Ground rods are to have a minimum diameter of 5/8" and a minimum length of 10 feet. These are to be driven into the ground in a vertical position or an oblique angle not to exceed 45 degrees at a location 10 feet from the electronic equipment, the ground plate, or the wires and cables connected to said equipment, as shown in the detail above. The rod is to be stamped with the UL

logo [Paige Electric part number 182007.] A 6 AWG solid bare copper wire (about 12 feet long) shall be connected to the ground rod by the installer using a Cadweld GR1161G "One-Shot" welding kit [Paige Electric part number 1820037.] This wire shall be connected to the electronic equipment ground lug as shown in the detail above.

The copper grounding plate assemblies [Paige Electric part number 182199L] must meet the minimum requirements of Article 250-52(d) of the 1999 NEC. They are to be made of a copper alloy intended for grounding applications and will have minimum dimensions of 4" x 96" x 0.0625". A 25-foot continuous length (no splices allowed unless using exothermic welding process) of 6 AWG solid bare copper wire is to be attached to the plate by the manufacturer using an approved welding process. This wire is to be connected to the electronic equipment ground lug as shown in the detail of page 1. The ground plate is to be installed to a minimum depth of 30", or below the frost line if it is lower than 30", at a location 8 feet from the electronic equipment and underground wires and cables. Two 50-pound bags of PowerSet® [Paige Electric part number 1820058] earth contact material must be spread so that it surrounds the copper plate evenly along its length within a 6" wide trench. Salts, fertilizers, bentonite clay, cement, coke, carbon, and other chemicals are not to be used to improve soil conductivity because these materials are corrosive and will cause the copper electrodes to erode and become less effective with time.

Install all grounding circuit components in straight lines. When necessary to make bends, do not make sharp turns. To prevent the electrode-discharged energy from re-entering the underground wires and cables, all electrodes shall be installed away from said wires and cables. The spacing between any two electrodes shall be as shown in the detail of page 1, so that they don't compete for the same soil.

The earth-to-ground resistance of this circuit is to be measured using a Megger®, or other similar instrument, and the reading is to be no more than 10 ohms. If the resistance is more than 10 ohms, additional ground plates and PowerSet® are to be installed in the direction of an irrigated area at a distance of 10', 12', 14', etc. It is required that the soil surrounding copper electrodes be kept at a minimum moisture level of 15% at all times by dedicating an irrigation station at each controller location. The irrigated area should include a circle with a 10-foot radius around the ground rod and a rectangle measuring 1-foot X 24-feet around the plate.

All underground circuit connections are to be made using an exothermic welding process by utilizing products such as the Cadweld "One-Shot" kits. Solder shall not be allowed to make connections. In order to ensure proper ignition of the "One-Shot", the Cadweld T-320 igniter must be utilized [Paige Electric part number 1820040.] The 6 AWG bare copper wires are to be installed in as straight a line as possible, and if it is necessary to make a turn or a bend it shall be done in a sweeping curve with a minimum radius of 8" and a minimum included angle of 90°.

Mechanical clamps shall be permitted temporarily during the resistance test process, but are to be replaced with Cadweld "One-Shot" kits immediately thereafter.

Proof of effectiveness of lightning arrestor shall be in accordance with manufacturer's guidelines. A maximum of 10 ohms of resistance is allowable.

I. Backflow Preventer

RPZ Backflow Preventer shall be installed by licensed plumber in a location approved by the appropriate water utility department.

590-3.06 Electrical Control Wiring

A. Installation of electrical control cable shall be of the size specified and shall be taped to the bottom of the main line. Expansion joints in the wire to be provided at 200-feet intervals by making 5 to 6 turns of the wire around a piece of ½" pipe. Where it is necessary to run wire in a separate trench, the wire shall be within a PVC sleeve and have a minimum cover of twelve (12) inches.

B. All wire connections at remote control valves, within valve boxes, and at all wire splices, shall be left with a 6' minimum "slack" so that in case of repair, the valve bonnet or splice may be brought to the surface without disconnecting the wires. Waterproof splice to be Rainbird or equal

C. All pump station wiring shall be done by a licensed electrician.

D. All electric control wire shall be sized as recommended by the controller, valve, Two-wire control system and grounding manufacturer, except as otherwise specified. It shall be encased in an orange 1-1/4" HDPE pipe conduit installed in the piping trenches wherever possible and be placed along side of the main line. All Two-Wire cable between decoders/electric wire boxes, along the entire wire paths and into the bottom of the controller or control wire junction box at edge of the pump station shall be encased in the orange HDPE pipe conduit.

E. At all wire connections at remote control valves, decoders and at all wire splices, the wire shall be left with sufficient slack so that in case of repair the valve bonnet, decoder or splice may be brought to the surface without disconnecting the wires. See Zone Valve/Decoder Wiring/Grounding Detail for lengths (30"-60"). All splicing of wire shall take place in valve boxes. All splicing of wires shall be made using UL listed waterproof wire connectors as recommended by the wire manufacturer and per the valve and decoder details which specify 3M BDY and DBR-6 waterproof wire connectors.

F. Each remote control valve shall be connected to a single station decoder shall have wire sizes and coded colors per the Zone Control Valve/Decoder Wiring/Grounding Detail and as recommended by the manufacturer, except as otherwise specified. All decoders, which are connected to the same controller, shall be connected to the Two-Wire path Control System using Decoder Wire, which shall be Hunter 1D1GRY, 1D1PUR, 1D1YWL, 1D1org, 1D1tan Twisted blue and red insulated solid copper conductors, 14 Gauge, 14/2 AWG Paige P7313D Direct Burial Decoder Cable part Number 170116RB with high density polyethylene insulation as manufactured by Paige. Each individual controller shall have a separate Two-Wire Path/s wire control system entirely independent any wire system of all other controllers. Only those remote control valves, which are being controlled by one specific controller, shall be connected to that controller's two-wire control system.

G. Two-Wire Control System wiring between the single decoders and the zone valves shall be 14/2 AWG Paige DTS Cable, color coded with each pair being different colors than the other solenoid wires within the group of solenoids per the Zone Control Valve/Decoder Wiring/Grounding Detail. The decoders shall be installed in a Gray rectangular valve box with "Electric" logo per the Remote Control Valve/Decoder Wiring/Grounding Detail.

590-3.07 Testing and Inspection

A. Closing in Uninspected Work

The Contractor shall not allow or cause any of the irrigation Work to be covered or enclosed until it has been inspected, tested, and approved by the Department. Any Work which has been covered shall be exposed for inspection.

B. Flushing

Before backfilling the main line, and with all control valves in place before lateral pipes are connected, completely flush and test the main line and repair all leaks; flush out each section of lateral pipe before sprinkler heads are attached.

C. Testing

1. Make all necessary provisions for thoroughly bleeding the line of air and debris.

2. Before testing, fill the line with water for a period of at least 24 hours.

3. After valves have been installed, test all main lines for leaks at a pressure of 100 psi for a period of 4 hours with all couplings exposed and with all pipe sections center-loaded. No more than 5 psi loss will be acceptable.

4. Furnish all necessary testing Equipment and personnel.

5. Correct all leaks and re-test until accepted by the Owner.

D. Final Inspection:

1. The Contractor shall thoroughly clean, adjust and balance all systems.

2. The Contractor shall demonstrate the entire system to the Department, proving that all remote control valves are properly balanced, that all heads are properly adjusted for radius arc of coverage and overspray, and that the installed system is workable, clean, and efficient. No irrigation water shall enter the Roadway.

590-3.08 Instructions

A. Remote Control Legend: Attach a typewritten legend inside each controller door that states the areas covered by each remote control valve.

B. Maintenance Personnel: After the system has been completed, inspected and approved, the Contractor shall instruct the Owner's maintenance personnel in the operation and maintenance of the irrigation system.

C. Provide all manuals, product literature, Warranty Certificates, keys, etc. to the Department - Streetscape Section.

590-3.09 Plans

Substantial deviations from piping layout (2' or more) shall be recorded as Work progresses and an as-built plan of the sprinkler system shall be furnished to the Owner as a condition of completion of Work. Forward all bore logs and profiles, tests results and permit copies to the Department - Streetscape Section.

590-3.10 Guarantee

All equipment, material, and labor shall be guaranteed by the Contractor for a period of one (1) year after substantial completion of the project. Any defects found, either in Materials or workmanship, during the period shall be immediately corrected at the Contractor's expense.

590–3.11 Basis of Payment

Irrigation system shall include all labor and material cost to install and restore a fully functional irrigation system, provide and install ground rod protection to the satellite controller(s) and pump station(s). Cost shall include the protection and rehabilitation of any existing wells and service points, establishing service points, satellite controllers, pump stations and wells as indicated in the Plans and per Palm Beach County Streetscape Section's Specifications, or approved equals. Cost shall include the integration of the system into the central universal interface software program operated by the Palm Beach County streetscape section including all designated frequencies and the providing of manuals, keys, hand held remotes (two per installed station) and ancillary items required for a fully functional irrigation system with 100% coverage and 100% overlap. Irrigation system shall be paid as a LUMP SUM basis.

END OF SECTION

SECTION 595
IRRIGATION WELL CONSTRUCTION

SECTION 595 IS ADDED TO THIS SPECIFICATION

595–1.00 General

595-1.01 Related Documents and General Conditions

Drawings and General Provision of Contract, including General Supplementary Conditions apply to Work of this Section. The Contractor shall keep a copy of all Contract Documents on-site at all times including drawings, all Specifications and Codes mentioned above, and copies of all logs, and correspondence. All Work shall be done in accordance with all applicable ordinances, laws, codes and regulations. Any changes required by these ordinances, laws, codes and regulations shall be made at no additional expense to the Owner.

595-1.02 Scope of Work

The Work covered by this Section of the Specifications shall include, but not be limited to, the following:

A. All labor, Equipment, material, and operations necessary for construction, development, and testing of the proposed 5" well (see SECTION - 590 IRRIGATION SYSTEM CONSTRUCTION SPECIFICATIONS).

B. All labor and Materials necessary to connect 5" well to a specified pump (see SECTION - 590 IRRIGATION SYSTEM CONSTRUCTION SPECIFICATIONS).

C. Drill well to a depth as necessary to achieve the required water flow and water quality.

D. The Contractor shall apply for and pay for all permits and licenses required for execution of the Work. Any required signatures by Department officials will be provided. The Contractor shall arrange for, and be present during, all required inspections. Any required additional Work or Materials resulting from inspections under the above permits shall be provided at no cost to the Owner.

595-1.03 Quality Assurance

A. The Contractor shall inspect the site to determine conditions to be encountered during construction noting all existing and /or proposed utilities (see SECTION–590 IRRIGATION SYSTEM CONSTRUCTION SPECIFICATIONS for underground utility location procedures).

B. The Contractor shall be responsible for any damage that occurs as a result of the construction. This shall include, but not be limited to, the Owner's property, underground utilities, and vehicular traffic. The Contractor shall keep the Work area neat and orderly, continually removing rubbish, waste material and temporary structures.

C. Protecting Water Quality

Take precautions to prevent contaminated water or water having undesirable physical or chemical characteristics from entering the stratum from which well is to draw its supply. Prevent contaminated water, gasoline, etc., from entering well, either through the opening or by seepage through ground surfaces.

If well becomes contaminated or water having undesirable physical or chemical characteristics enters the well due to neglect, provide casings, seals, sterilizing agents or other Materials to eliminate contamination or shut off undesirable water. Provide remedial Work at no cost to the Owner.

Exercise care in performance of Work to prevent breakdown or caving-in of strata overlaying that from which water is to be drawn. Develop, pump or bail well until water pumped from the well is substantially free from sand.

Protect Work to prevent either tampering with the well or entrance of foreign matter during well development. Upon completion, provide a temporary well cap.

D. Driller's Requirements: An experienced foreman or driller who has authority to take orders from the Department is to be constantly in control of the well site. Upon request, the driller shall furnish well drilling information desired by the Department.

E. The Contractor shall guarantee the water well for one (1) year from the date of initial acceptance by the Department. This shall include all material, workmanship, and well performance.

595-1.04 Abandonment of Drilling

A. If it becomes necessary to abandon drilling operations before completion of a water producing well, the Contractor shall follow all regulations for abandonment of the well as required by local authorities having jurisdiction.

B. Should abandonment of drilling be necessary due to poor workmanship or negligence on the part of the Contractor, no compensation will be allowed.

C. Should abandonment of drilling be necessary due to inadequate water supply or for another reason that is deemed to be no fault of the Contractor by the Department, payment for the Work shall be based upon the actual vertical footage completed and shall be paid at the Contract Unit Price for Additional Well Depth In Excess Of Base Depth, or as agreed upon.

595-1.05 Submittals

A. Prior to starting construction of the well, the Contractor shall submit to the Department for approval an estimated schedule of the Work to be accomplished and a description of the methods and Equipment to be used during construction. The description shall include methods he will use to drill, develop and test the well.

B. The Contractor shall keep accurate logs of the irrigation well and samples of Materials drilled through. Take samples of substrata formation at ten foot intervals and/or changes in formation throughout the entire depth of the well.

Provide the following information to the Department for record purposes:

1. Casings: Diameter, thickness, weight per foot of length, depth below grade.

2. Pumping Test: Static water level, maximum safe yield, drawdown at a maximum yield.

3. Drilling Log: Log indicating strata encountered.

4. Alignment: Certification that the well is aligned and plumb within specified tolerances.

The Contractor shall keep an accurate record of the order, number, size and length of the individual pieces of pipe as assembled in the well. The records shall be delivered to the Department upon completion of the Work.

C. The Contractor shall provide to the Department a physical and chemical analysis of water from the finished well. Make the analysis, certified by an approved testing Laboratory, in accordance with local requirements, to include the following: total dissolved solids, silica, iron, pH, sulfur, chloride, and salt content.

595–2.00 Products

595-2.01 Materials

A. Casings

The irrigation well casing shall be new black steel pipe, Schedule 40, minimum of 6" opening, or as specified in the drawings. The joints may be welded or threaded coupling.

B. Grout

Grout shall be ANSI/ASTM C150, type shall suit project conditions.

595–3.00 Execution

595-3.01 Well Construction

A. Annular space shall be continuously filled with grout, with process being completed in a single operation. Subsequent Work in the well, such as drilling or other operations, shall be suspended for 72 hours after grouting of casing. The only exception shall be when quick-setting cement is used, when Work may proceed after 24 hours.

B. Install permanent casing with a temporary well cap. Installation of the well cap shall be coordinated with the pump system installer.

C. The well shall be of sufficient size to produce a continuous supply of water at an acceptable quality and specified capacity.

D. If subterranean formations/conditions require, the well shall be supplied with an alternate gravel pack with 20' minimum of stainless steel slotted screen and TREMI piped gravel pack.

595-3.02 Well Development

A. The well shall be developed by such methods that will effectively extract, from a water bearing formation, the maximum practical quantity of sand, drilling mud and other fine Materials in order to bring the well to maximum yield per foot of drawdown and to a sand-free condition. This Work shall be performed in a manner that does not cause any undue settlement or disturbance of the strata above the water bearing formation, nor disturb the seal around the well casing, thereby reducing the sanitary protection otherwise afforded by the seal.

B. Development of the well shall continue until water pumped from the well, at a maximum test pumping rate, is clear and free from sand and other debris that is larger than 0.030" in diameter. The water shall be considered sand-free when no samples taken during the test pumping contain more than 2 parts per million of suspended solids per weight. The Contractor shall submit to the Department certification from an approved testing Laboratory that indicates the results of the "Non-Filterable Residual" (total suspended solids) test, as specified in the EPA Manual, Section 160.2. A sufficient amount of water to insure a detection limit of less than 2 PPM (mg/L) must be filtered.

595-3.03 Testing of Well for Plumbness and Alignment

A. Set casing plumb and true to line. At a minimum, tests for plumbness and alignment shall be made after construction of the well and before its acceptance. Additional tests may be required during the performance of the Work.

B. Test alignment of the well by lowering a pipe approximately 40 feet in length to a depth of 90 feet. The pipe used for the alignment test shall be not more than ½" smaller in diameter than the portion of casing or hole being tested at the time. The pipe must pass freely through the casing or hole.

C. The well casing shall not be out of plumb more than 2/3 of the diameter of the casing per 100' of length. If the well does not pass this test, the Contractor shall be responsible for repair or replacement of the well.

595-3.04 Testing Well for Yield and Drawdown

I. Final pumping tests shall be conducted only after the well has been fully constructed, cleaned out and depth of well accurately measured.

II. A variable capacity test pump shall be provided that has a minimum capacity of the maximum expected yield at total head equal to drawdown in the well, plus the head loss in the pump column and discharge piping.

III. The Contractor shall provide enough discharge piping for pumping unit to conduct water to a point of disposal that will avoid a nuisance or endangerment to adjacent property. Provide and maintain any Equipment needed for measuring flow of water such as a weir box, orifice or water meter. The elevation of the water level in the well will then be measured.

IV. All labor, power and other necessary Materials, Equipment and supplies required to operate the pumping unit shall be supplied by the Contractor. The final testing for each well shall consist of four (4) hours of continuous pumping after maximum drawdown has been reached. After completion of the final test, foreign matter such as sand, stones or other debris shall be removed from the well by bailing, sand pumping or other approved methods.

V. After the test pump and auxiliary Equipment have been installed, the Department shall be notified a minimum of 3 days prior to the start of any test pumping. Conduct test pumping as follows:

1. Record initial water elevations in the well.

2. Start test pump and make adjustments to bring pump to required pumping rate.

3. Record readings of water level in the well and pumping rate at 30 minute intervals.

4. Water samples shall be taken for analysis at the beginning and at the end of the pump test.

VI. Upon completion of the pumping test, record the returning levels in the well at 15 minute intervals until 95% of the well capacity is reached. Prepare notations so that a curve of the recovery rate may be plotted.

VII. Provide all test results and other required submittals to the Department.

595-3.05 Disinfection of Well

A. Use disinfection procedures as required by local government agencies. The well must be cleaned of foreign substances after all development Work has been completed and it has been satisfactorily tested. Casings should be swabbed, using alkalis if necessary, to remove foreign substances.

B. The well shall be disinfected with a chlorine solution of sufficient strength to provide a minimum chlorine to water ratio of 100 parts per million within the well. The chlorine solution shall be introduced into the well using gravity, pump or drop feeder. A contact period of 24 hours shall be attained; then the well shall be pumped until the chlorine residual is less than 0.2 parts per million.

END OF SECTION

SECTION 800
SPECIAL CONDITIONS – ASBESTOS –
PROCEDURES FOR DEMOLITION OF STRUCTURES –
ASBESTOS MATERIAL REMOVAL

SECTION 800 IS ADDED TO THIS SPECIFICATION
General

This Section is included for the removal and disposal requirements of asbestos material encountered during construction, whether or not it is indicated on the Plans. The following are special conditions and procedures for the Demolition of Structures and handling and disposal of asbestos cement pipe.

SECTION 1 OF 3: ASBESTOS NOTIFICATION

Federal and state asbestos regulations require, prior to demolition of any structure:

1. An inspection for asbestos-containing Materials (ACM)

2. Removal of specified ACM, and

3. An asbestos notification of demolition received at least ten (10) business days prior to demolition.

To meet requirements #1 and #2 above, the Department has surveyed the structure(s) in this Bid/Work Order for the presence of ACM and every effort has been made to remove Regulated Asbestos-Containing Material (RACM) and Category II Non-Friable ACM (e.g., asbestos-cement board and shingles) before releasing this project to the Contractor. Verification of this Work is attached to this Bid/Work Order. If not attached, it is the Contractor's responsibility to contact the Project Manager of the department overseeing this Bid/Work Order, or the Department's Risk Management / Loss Control section to obtain:

1. A copy of the pre-demolition asbestos inspection report; and

2. A copy of Risk Management/Loss Control's memo of approval to proceed to next phase addressed to the County department overseeing the project.

To meet requirement #3 above, the Contractor is responsible for submitting a complete and accurate asbestos notification of demolition form, titled "Notice of Asbestos Removal Project" (i.e., NESHAP notification, 40 CFR Part 61.145(b)), for each separate address to be demolished to the below listed agencies at least 10 business days prior to demolition. The forms are available from the Florida Department of Environmental Protection (DEP) and Loss Control.

SEND ORGINAL TO:

Asbestos Coordinator
Florida Dept. of Environmental Protection
400 N. Congress Avenue
West Palm Beach, FL 33401

SEND COPY TO:

PBC Risk Management/Loss Control
160 Australian Avenue, Suite 401
West Palm Beach, FL 33416-1229
Fax: 561-233-5440

The Contractor must immediately notify the Project Manager of the County department overseeing the project and Loss Control [phone 561-233-5430] if the demolition Start Date changes. No demolition may begin before the Start Date on the NESHAP notification, and no demolition may occur without a notice to proceed from the County department. It is the responsibility of the Contractor to call and submit revised NESHAP notifications to the above listed agencies, adhering to required NESHAP timeframes.

The Contractor is responsible for physically checking the structure(s) before submitting the NESHAP notification to ensure that all RACM and Category II ACM, as identified in the pre-demolition asbestos inspection report, have been removed. If RACM or Category II ACM is

discovered, or is in poor condition (i.e. not intact), immediately contact the Department's Project Manager or Loss Control.

SECTION 2 OF 3: WORK PRACTICES

Compliance with the following regulations is the demolition Contractor's responsibility:

1. Environmental Protection Agency (EPA) NESHAP 40 CFR Part 61 Subpart M – National Emission Standard for Hazardous Air Pollutants, updated August 2004;

2. Occupational Health and Safety Administration (OSHA) Construction Industry Standard, 29 CFR 1926.1101;

3. EPA "A Guide to Normal Demolition Practices Under the Asbestos NESHAP", September 1992;

4. Asbestos NESHAP "Adequately Wet Guidance", December 1990; and

5. OSHA Standard Interpretation, dated August 13, 1999, "Requirements for demolition operations involving Materials containing <1% asbestos".

The above regulations include utilizing wet demolition methods and prohibition of recycling the Substructure with presumed or confirmed Category I ACM. Written permission from Palm Beach County to the Contractor is needed for said recycling.

SECTION 3 OF 3: COMPETENT PERSON

The Contractor must have a competent person on-site who: (1) is capable of identifying existing asbestos hazards in the workplace, (2) is capable of selecting the appropriate control strategy for asbestos exposure, and (3) has the authority to take prompt corrective action to eliminate them. This person must be trained in accordance with OSHA and EPA.

END OF SECTION

SECTION 987
SOIL LAYER MATERIALS

DELETE SECTION 987 IN ITS ENTIRETY AND SUBSTITUTE THE FOLLOWING:

987-1 Description

All material shall be suitable for plant growth. The organic matter content of the prepared soil layer after mixing shall be a minimum of 2.5%, a maximum of 10%, in accordance with FM 1-T 267 and shall have a pH value of 6.0 or greater and less than or equal to 7.5 as determined in accordance with FM 5-550. The organic matter content shall be created using any of the following Materials.

987-2 Materials

Prepared soil layer Materials may be obtained from either, or a combination of the following sources:

(1) Excavation within the limits of construction on the project. Such material may be stockpiled or windrowed on the project in areas approved by the Engineer.

(2) Designated borrow pits for the project.

(3) From other sources of organic soil Materials provided by the Contractor.

987-2.1 Organic Soil

This may consist of muck, mucky peat and peat and shall have an organic matter content of 30% or more if the mineral fraction is more than 50% clay, or more than 20% organic matter if the mineral fraction has no clay.

987-2.2 Blanket Material

Meet the material classification shown on the Plans and Design Standards, Index No. 505.

987-2.3 Compost

Meet the requirements of Florida Department of Environmental Protection Rule 62.709.550 Type Y (yard waste), Type YM (yard waste and manure), Type A (municipal solid waste compost) or Rule 62.640.850 Type AA (composted bio-solids) and have unrestricted distribution.

987-2.3.1 Compost for Use as a Soil Amendment

If the electrical conductivity (EC) value of the compost exceeds 4.0dS (mmhos/cm) based on the saturated paste extract method, the compost shall be leached with water prior to application.

987-2.3.2 Compost for Use as a Mulch

The compost shall contain no foreign matter, such as glass, plastic or metal shards. The compost shall be slightly coarse to coarse in nature (over half of the solids shall be from particles 1/2 inch in size and no greater than 6 inches). Preference shall be given to compost or mulch made from uncontaminated woody waste Materials.

END OF SECTION

DRIVEWAY CONSTRUCTION RELEASE

The Contractor shall have the included "Right of Entry and Release Agreement for Road and Driveway Construction" form executed by each property owner where driveway construction is required.

The Contractor shall be responsible for all coordination with the property owners for this construction. The Contractor shall provide the County with copies of these executed agreements.

These driveways shall be constructed in accordance with the Plans and the Specifications or as directed by the Engineer. The quantities are included in the 6" concrete sidewalk (driveways) item, 6" base item and asphaltic concrete item for the construction of these driveways.

SPECIAL DRIVEWAY NOTES AND SPECIFICATIONS

1. Contractor shall work in conjunction with the engineer in contacting and coordinating with property owners of parcels bordering this Roadway, as directed by the Engineer.

2. Contractor shall obtain written permission from property owners for driveway construction and for approval of driveway staking.

3. Property owners shall have the option of selecting a circular driveway, a "T" type driveway or other modification as approved by the engineer. The selection is subject to existing site conditions and compatibility to existing driveways.

4. The driveway construction shall consist of 6" concrete on a compacted Subgrade or Type S-1 asphaltic concrete surface course on a 6" base, as directed by the engineer, to match the existing driveway.

5. If the asphaltic concrete option is required, the entire driveway may be resurfaced.

6. During driveway construction, temporary access and parking may be provided.

7. Items incidental to driveway construction shall be included in the square yard price for the items listed above. Such items include clearing and grubbing, excavation earthwork, grading, restoration of sodding, landscaping, sprinkler systems and all other Work that may be required to complete driveway construction.

RIGHT OF ENTRY AND RELEASE AGREEMENT FOR ROAD AND DRIVEWAY CONSTRUCTION

PROJECT NAME: Annual Traffic Signal Construction Contract
PROJECT NO.: 2022052
PROPERTY ADDRESS: _____
PROPERTY OWNER: _____
CONTRACTOR: _____

THIS AGREEMENT entered into this _____day of_____, 20___, by and between Palm Beach COUNTY (hereinafter referred to as COUNTY), its Contractor and _____ (herein referred to as OWNER), provides as follows:

WHEREAS, the COUNTY is desirous of completing the construction of _____, and as part of this project is willing to construct circular driveway and/or driveway modifications on OWNER'S land to aid in OWNER'S ingress and egress; and

WHEREAS, in order to construct said driveways it is necessary for the COUNTY to enter upon the above described property of OWNER and to perform various excavating and constructing tasks thereon;

WHEREAS, the COUNTY agrees to construct the driveway and/or driveway modification for the benefit of the OWNER, the COUNTY wishes the OWNER to assume full responsibility for design, location, maintenance, and liability for driveway improvements and/or modifications upon completion of the construction.

NOW, THEREFORE, in witness of the above, and in consideration of the COUNTY agreeing to construct said driveway improvements, and for other good and valuable consideration in hand received, OWNER hereby grants unto COUNTY, their Employees, Agents, Contractors, Sub-contractors, and/or Assigns the license and right to enter upon said land of OWNER for the purpose of constructing circular driveway and/or driveway modifications for the undersigned OWNER.

IT IS FURTHER AGREED that the previously referenced considerations, OWNER, hereby releases and holds the COUNTY harmless from any damages that result or might result to OWNER'S property as a result of the COUNTY, the Employees, Agents, Contractors, Sub-contractors and/or Assigns coming upon said land for the purposes previously stated.

IT IS FURTHER AGREED that the license and rights granted herein shall cease upon completion and finalization of the Contract upon which said construction is performed.

IT IS FURTHER UNDERSTOOD AND AGREED that upon completion of construction, OWNER assumes ownership and responsibility for driveway location, maintenance and liability regarding said driveway improvements and agrees to indemnify, and hold the COUNTY harmless from all claims and liabilities that may arise out of the design, existence, location, or maintenance of said driveway.

_____ _____
WITNESS (Signature) OWNER/AGENT (Signature)

_____ _____
WITNESS (Print Name) OWNER/AGENT (Print Name)

PERMITS

The Contractor is advised that the following pages are copies of the applicable permits for this project. If a permit document includes copies of plan sheets, those pages may not be included herein, but are available from the Department upon request or from the permitting agency.

All general and special conditions required by specific permit(s) shall be executed accordingly and it is the Contractor's responsibility to ensure compliance with said conditions.

Any permits requiring "as-built" information and/or certification shall be prepared by a professional engineer or land surveyor licensed in the state of Florida and shall be the responsibility of the Contractor.

The Contractor is responsible for assuring the completion of appropriate construction certifications, and submittal of the construction completion certifications to permitting agencies as required by each permit referenced in these documents.

All costs associated with meeting said requirements, if not included in a bid item, shall be incidental to the Project and no compensation, either monetary or time, shall be considered.

The Contractor agrees that the entirety of the permits listed below shall govern.

Contract Permits

Permit Number	Permitting Agency	Location of Full Permit Documents
TBD	TBD	*TBD*

Office of
Equal Business Opportunity
50 South Military Trail, Suite 202
West Palm Beach, FL 33415
(561) 616-6840
www.pbcgov.com/oebo

INTER-OFFICE MEMORANDUM

Date: Thursday, January 20, 2022

To: David L. Ricks, County Engineer
Engineering and Public Works

From: Tonya Davis Johnson, Director
Office of Equal Business Opportunity

Re: Approval of Request for Waiver of API Requirements for Annual Traffic Signal Construction Contract Palm Beach County Project #2022052

Your Request for Waiver of API Requirements for the above named project was received on Thursday, January 06, 2022 and has been reviewed. It is the determination of the Office of Equal Business Opportunity (OEBO) that the request for Waiver of API Requirements is **APPROVED**.

The OEBO is granting this waiver based upon the determination that sufficient qualified S/M/WBEs providing the goods or services required by the contract are unavailable in Palm Beach County despite every reasonable attempt to locate them.

If you have any questions, please contact Allen Gray at 561-616-6842 or email at agray@pcgov.org.

Thank you.

cc: Allen Gray, Manager

EBO FORMS

OEBO SCHEDULE 1

LIST OF PROPOSED CONTRACTOR/CONSULTANT AND SUBCONTRACTOR/SUBCONSULTANT PARTICIPATION

SOLICITATION/PROJECT/BID NAME: Annual Traffic Signal Construction Contract

SOLICITATION/PROJECT/BID No.: 2022052

NAME OF PRIME RESPONDENT/BIDDER: Horsepower Electric Inc.

ADDRESS: 8105 W 20 Ave Hialeah FL 33014

CONTACT PERSON: Michael Martinez

PHONE NO.: 305-819-4060 E-MAIL: mike@horsepowerelectric.com

SOLICITATION OPENING/SUBMITTAL DATE: 03/15/2022

DEPARTMENT:

PLEASE LIST THE DOLLAR AMOUNT OR PERCENTAGE OF WORK TO BE COMPLETED BY THE PRIME CONTRACTOR/CONSULTANT ON THIS PROJECT. PLEASE ALSO LIST THE DOLLAR AMOUNT OR PERCENTAGE OF WORK TO BE COMPLETED BY ALL SUBCONTRACTORS/SUBCONSULTANTS ON THE PROJECT.

Name, Address and Phone Number	(Check all Applicable Categories) Non-SBE	M/WBE Minority/Women Business	SBE Small Business	DOLLAR AMOUNT OR PERCENTAGE OF WORK Black	Hispanic	Women	Caucasian	Other (Please Specify)
1. AUM Construction 3054564848 8950 NW 119 ST Hialeah Gardens FL	☐	☐	☒		25%			
2. Horsepower Electric Inc 8105 W 20 Ave Hialeah 3058194060	☒	☐	☐		75%			
3.	☐	☐	☐					
4.	☐	☐	☐					
5.	☐	☐	☐					
Total								

(Please use additional sheets if necessary)

Total Bid Price $ 13,404,295.00

Total SBE - M/WBE Participation 25%

I hereby certify that the above information is accurate to the best of my knowledge.

Signature

President

Title

Note:
1. The amount listed on this form for a Subcontractor/subconsultant must be supported by price or percentage listed on the properly executed Schedule 2 or attached signed proposal.
2. Firms may be certified by Palm Beach County as an SBE and/or an M/WBE. If firms are certified as both an SBE and/or M/WBE, please indicate the dollar amount under the appropriate category.
3. Modification of this form is not permitted and will be rejected upon submittal.

https://discover.pbcgov.org/oebo/Pages/Documents.aspx

REVISED 02/28/2019

EBO FORMS

OEBO LETTER OF INTENT – SCHEDULE 2

A completed Schedule 2 is a binding document between the Prime Contractor/consultant and a Subcontractor/subconsultant (for any tier) and should be treated as such. The Schedule 2 shall contain bolded language indicating that by signing the Schedule 2, both parties recognize this Schedule as a binding document. All Subcontractors/subconsultants, including any tiered Subcontractors/subconsultants, must properly execute this document. Each properly executed Schedule 2 must be submitted with the bid/proposal.

SOLICITATION/PROJECT NUMBER: 2022052

SOLICITATION/PROJECT NAME: Annual Traffic Signal Construction Contract

Prime Contractor: Horsepower Electric Inc Subcontractor: AUM Const.

(Check box(s) that apply)

☐ SBE ☐ WBE ☒ MBE ☐ M/WBE ☐ Non-S/M/WBE Date of Palm Beach County Certification (if applicable): 7-9-21

The undersigned affirms they are the following (select one from each column if applicable):

Column 1	Column 2	Column 3
☒ Male ☐ Female	☐ African-American/Black ☐ Asian American ☐ Caucasian American ☒ Hispanic American ☐ Native American	☐ Supplier

S/M/WBE PARTICIPATION – S/M/WBE Primes must document all work to be performed by their own work force on this form. Failure to submit a properly executed Schedule 2 for any S/M/WBE participation may result in that participation not being counted. Specify in detail, the scope of work to be performed or items supplied with the dollar amount and/or percentage for each work item. S/M/WBE credit will only be given for the areas in which the S/M/WBE is certified. A detailed proposal may be attached to a properly executed Schedule 2.

Line Item	Item Description	Unit Price	Quantity/ Units	Contingencies/ Allowances	Total Price/Percentage
	Traffic Signal Work				25%

The undersigned Subcontractor/subconsultant is prepared to self-perform the above-described work in conjunction with the aforementioned project at the following total price or percentage: 25%

If the undersigned intends to subcontract any portion of this work to another Subcontractor/subconsultant, please list the business name and the amount below accompanied by a separate properly executed Schedule 2.

Name of 2nd/3rd tier Subcontractor/subconsultant Price or Percentage:

Horsepower Electric Inc	AUM Construction, Inc
Print Name of Prime	Print Name of Subcontractor/subconsultant
By:	By:
Authorized Signature	Authorized Signature
Michael Martinez	Humberto Ortiz
Print Name	Print Name
President	President
Title	Title
Date: 3/15/22	Date: 3/15/2022

https://discover.pbcgov.org/oebo/Pages/Documents.aspx

Revised 09/17/2019

Office of Equal Business Opportunity
Good Faith Efforts Form

PRIME CONTRACTOR GOOD FAITH EFFORTS

Prime Contractor Name: _____ **Project Name:** _____

Project No.: _____ **Date Submitted:** _____

The Prime Contractor has to demonstrate "Good Faith Efforts" to meet the S/M/WBE goal, which includes the accurate preparation and submittal of this form, and other efforts described in Section 2-80.27 (1.c) of the Equal Business Opportunity Ordinance.

When submitting a Subcontracting Goal - Waiver Request Form, please submit documentation of your efforts indicated below 7 days prior to bid opening or proposal due date. The fields below will serve as a guide for the Office of Equal Business Opportunity (OEBO) to evaluate your Good Faith Efforts toward meeting subcontracting goals. We ask that this form is utilized in order to provide uniformity to our process; additional documents can be submitted as support for efforts made. For any questions regarding this document, please contact the Office of EBO at 561-616-6840.

THE PRIME CONTRACTOR SHOULD ONLY SUBMIT THIS INFORMATION IF THE PARTICIPATION PLAN DOES NOT MEET THE CONTRACT GOAL. FAILURE TO SUBMIT THIS INFORMATION MAY RESULT IN THE BID AND/OR PROPOSAL FOUND AS NON-RESPONSIVE TO THE ENTIRE SOLICITATION. PLEASE NOTE THAT METHODS OF CONTACT CANNOT BE THE SAME ON MULTIPLE ATTEMPTS.

Scope of Service	Line Item No.	SMWBE Type for Goal	Certified Firm Name, Address, Phone, Email and Contact Person	Methods of Contact	Number of times contacted	Contact Date(s)	Certified Firm Response	Results of Contact (why suitable or not suitable for work)
		☐ SBE		☐ Phone				
		☐ MBE		☐ E-mail				
		☐ WBE		☐ Fax				
		☐ SMWBE		☐ Pre-Bid				
		☐						

Authorized Signature: _____ **Date:** _____ **Phone:** _____

Print Name: _____ **Email Address:** _____

Palm Beach County

Office of Equal Business Opportunity

Subcontracting Goal – Waiver Request Form

PROJECT NAME:		DATE:	
COMPANY NAME:		CONTACT NO.:	
CONTACT PERSON:		CONTACT EMAIL:	

In the sections below, points will ONLY be awarded if the firm has fully satisfied the criteria. More information regarding Subcontracting Goal-Waiver Request Evaluation Criteria. Contractors/Consultants must obtain a total of **80 or more points** to receive a waiver approval. Vendor Directory is accessible through the Office of Equal Business Opportunity website https:/www.pbcgov.org/pbcvendors .

PART I: Sufficient Commercially Useful Work Identified to Meet Subcontracting Goal

Points: ____

Please provide documentation and supporting evidence to show how the criteria was fulfilled. ***15 points possible:***

- ☐ List the specific scope of work identified for each of the S/M/WBEs contacted
- ☐ Ensure the scope of work identified for S/M/WBEs is greater than or equal to the subcontracting goal(s)
- ☐ Additional comments, if any

PART II: Initial Communications to Potential S/M/WBE Subcontractors Using EBO Portal / Website Posting of Subcontractor Solicitations/Outreach Efforts

Points: ____

Please provide documentation and supporting evidence to show how the criteria was fulfilled. ***40 points possible:***

- ☐ Contact at least three (3) S/M/WBEs in the EBO Vendor Directory for each scope of work identified to be subcontracted in Part I (emails/call logs/fax), one (1) week prior to pre-bid meeting date.
- ☐ Include current documentation of searches from the EBO Vendor Directory.
- ☐ Notify S/M/WBEs within at least 2 (two) weeks prior to the bid opening date, using at least three (3) digital media outlets (e.g. website, newspaper, trade association, publication, minority focus media)
- ☐ Additional comments, if any

PART III: Follow-up Communications & Bid Negotiations with Potential Subcontractors

Points: ____

Please provide documentation and supporting evidence to show how the criteria was fulfilled. ***30 points possible:***

- ☐ Promptly follow-up with S/M/WBEs after the initial solicitation at least 2 (two) weeks prior to the bid opening date, during normal business hours by telephone, email, or fax.
- ☐ Include a written statement with contact information on all subcontractors contacted to include the following:
  - ☐ Name of the subcontractor/firm and the contact person(s)
  - ☐ Telephone and Email address
  - ☐ Scope of work the subcontractor indicated they would perform
  - ☐ Notes regarding the outcome of the contact
  - ☐ Dates of contact and Dates of Negotiations

- ☐ The negotiated price
- ☐ Bids received from subcontractors that could provide a commercially useful function

☐ Additional comments, if any

PART IV: Attendance at Pre-Bid Meeting **Points: ____**

County staff maintains documentation regarding attendance at the pre-bid meeting. ***5 points possible:***

☐ Below list the individuals from your staff/firm that attended the pre-bid meeting

PART V: Offer Assistance in Securing Financing, Insurance, or Competitive Supplier Pricing **Points: ____**

Please provide documentation and supporting evidence to show how the criteria was fulfilled. ***10 points possible:***

- ☐ Provide easy access to plans and specifications for S/M/WBEs
- ☐ Provide competitive pricing
- ☐ Make efforts to assist interested business in obtaining financing, bonds, and insurance required for the County project/bid
  - ☐ Provide written documentation of the type of assistance offered
  - ☐ Company name, contact person and telephone number
  - ☐ Name of person who provided the assistance
- ☐ Provide the name, contact person, contact information the competitive pricing offered by the Supplier.
- ☐ Other efforts (if any, list below)

CONTRACTORS/CONSULTANTS MUST OBTAIN A **TOTAL OF 80 OR MORE POINTS** TO RECEIVE A WAIVER APPROVAL. CONTRACTORS/CONSULTANTS WILL BE CONSIDERED NON-RESPONSIVE TO THE ENTIRE SOLICITATION UPON DENIAL OF THE SUBCONTRACTING WAIVER REQUEST. FOR MORE INFORMATION OF THE SUBCONTRACTING WAIVER CRITERIA OR FOR ASSISTANCE ON COMPLETING THE SUBCONTRACTING WAIVER REQUEST FORM, PLEASE CONTACT THE OFFICE OF EQUAL BUSINESS OPPORTUNITY AT (561) 616-6840.

THE UNDERSIGNED AFFIRMS/CERTIFIES THAT ALL INFORMATION CONTAINED IN THIS FORM IS ACCURATE AND COMPLETE; I UNDERSTAND THAT IF THIS REQUEST FOR WAIVER IS DENIED AND I FAIL TO MEET THE REQUIREMENTS OF THIS SOLICITATION, MY RESPONSE TO THIS SOLICITATION WILL BE DEEMED NON-RESPONSIVE TO THE ENTIRE SOLICITATION.

Signature	Print Name/Title

	___ Approved ___ Denied

TOTAL SCORE: _____/100

Director, Office of Equal Business Opportunity

https://discover.pbcgov.org/oebo/Pages/Documents.aspx

Revised 5/2019

REQUEST FOR SBE OR M/WBE SUBSTITUTION/MODIFICATION/REMOVAL

INSTRUCTIONS FOR SECTIONS 1 TO 3: PRIME CONTRACTOR COMPLETES ALL SECTIONS AS APPLICABLE AND SUBMITS TO DEPARTMENT PROJECT MANAGER AND OEBO OFFICE FOR APPROVAL.

Section 1: Prime Contractor/ Consultant Information

Name of Prime | **Contact Person** | **Phone Number**

Project Name | **Bid/Proposal/Project No.**

Original Contract Amount | **SBE Goal** | **MBE Goal**

Section 2: SBE or M/WBE MODIFICATION*

Name of Subcontractor/Sub-Consultant | **Contact Person** | **Phone**

Original Subcontract Amount | **Percent of Contract**

Amendment/Change Order/Contingencies/Allowances (if Applicable)

New Contract Amount | **Percent of Contract**

Section 3: SBE or M/WBE REMOVAL OR SUBSTITUTION*

Please attach a completed Palm Beach County S/M/WBE Subcontractor/Sub-Consultant's Performance Report and Good Faith Efforts documentation.

***A separate and properly executed Schedule 2 (Letter of Intent) is required to support any changes submitted on this form, when applicable.**

Approvals:

Dept. Project Manager		Signature:		Date	
OEBO Representative		Signature:		Date	

PROPOSAL FORM

Horsepower Electric Inc
(COMPANY NAME)

8105 W 20 Ave
(COMPANY ADDRESS)

Hialeah FL
(COMPANY CITY & STATE)

33014
(COMPANY ZIP CODE)

CONTACT NAME Michael Martinez

PHONE NUMBER 305-819-4060

FACSIMILE NUMBER 305-819-4222

EMAIL ADDRESS mike@horsepowerelectric.com

59-2502221
FEDERAL TAX I.D. #

03/15/2022
DATE SUBMITTED

FOR THE CONSTRUCTION OF: **ANNUAL TRAFFIC SIGNAL CONSTRUCTION CONTRACT PALM BEACH COUNTY PROJECT NO. 2022052**

TO THE BOARD OF COUNTY COMMISSIONERS OF
PALM BEACH COUNTY, FLORIDA:

We, the undersigned (Contractor), hereby declare that no person or persons, firm or corporation, other than the undersigned, are interested in this Proposal as principals, and that this Proposal is made without collusion with any person, firm, or corporation, and that we are not on the Scrutinized Companies List as stated on page SC-1, and we have carefully and to our full satisfaction examined the Contract Documents, and that we have made a full examination of the location of the proposed Work and the source of supply of Materials, and we hereby agree to furnish and pay for all necessary labor, Equipment, Materials and services, fully understanding that the quantities shown herein are approximate only and that we will fully complete all Work in accordance with the Contract Documents and the requirements under them of the Engineer, within the time limit specified in this Proposal for the following unit prices, to wit:

BID PROPOSAL
ANNUAL TRAFFIC SIGNAL CONSTRUCTION
CONTRACT
PBC PROJECT #2022052

ITEM #	ITEM DESCRIPTION	QTY	UNITS	F,I,R	UNIT PRICE	AMOUNT
102-1-A	General Maintenance of Traffic	1,000	HR	F&I	$ 55.00	$ 55,000.00
102-1-B	Maintenance of Traffic (Securing Signal Pole)	24	HR	F&I	$ 125.00	$ 3,000.00
102-1-C	Maintenance of Traffic (Utility Location, Soft Dig Up to 6 Feet)	50	HR	F&I	$ 125.00	$ 6,250.00
102-1-C1	Maintenance of Traffic (Utility Location, Soft Dig Up to 10 Feet)	400	HR	F&I	$ 130.00	$ 52,000.00
102-1-D	General Maintenance of Traffic (Night Operation)	4	EA	F&I	$ 75.00	$ 300.00
102-14	Maintenance of Traffic (Traffic Control Officer)	48	HR	F&I	$ 75.00	$ 3,600.00
102-99	Portable Changeable - Variable Message Sign (Temporary)	20	ED	F&I	$ 30.00	$ 600.00
455-142	Crosshole Sonic Logging/ Drill Shaft Testing Testing	4	EA	F&I	$ 3,000.00	$ 12,000.00
455-147-1	Thermal Integrity Testing, Up to 4' Shaft Diameters	4	EA	F	$ 5,000.00	$ 20,000.00
455-147-2	Thermal Integrity Testing, 4.5' to 6' Shaft Diameters	5	EA	F	$ 5,500.00	$ 27,500.00
522-1	Concrete Sidewalk and Driveways 4" Thick	20	SY	F&I	$ 72.00	$ 1,440.00
522-2	Concrete Sidewalk and Driveways 6" Thick	20	SY	F&I	$ 86.40	$ 1,728.00
620-1-1	Grounding Electrode	100	EA	F&I	$ 100.00	$ 10,000.00
630-2-11-2	2" PVC (Sch 40) Underground Conduit	3,000	LF	F&I	$ 30.00	$ 90,000.00
630-2-11-2A	Additional 2" PVC (Sch 40) Conduit, in Open Trench	2,600	LF	F&I	$ 5.00	$ 13,000.00
630-2-12-2-1	1-2" (HDPE SDR 11) Under Pavement Conduit (Directional Bore)	1,280	LF	F&I	$ 36.00	$ 46,080.00
630-2-12-2-2	2-2" (HDPE SDR 11) Under Pavement Conduit (Directional Bore)	1,870	LF	F&I	$ 38.40	$ 71,808.00
630-2-12-2-3	3-2" (HDPE SDR 11) Under Pavement Conduit (Directional Bore)	2,520	LF	F&I	$ 42.00	$ 105,840.00
630-2-12-2-4	4-2" (HDPE SDR 11) Under Pavement Conduit (Directional Bore)	1,600	LF	F&I	$ 44.40	$ 71,040.00
630-2-12-2-5	5-2" (HDPE SDR 11) Under Pavement Conduit (Directional Bore)	1,856	LF	F&I	$ 45.60	$ 84,633.60
630-2-14-1	1" Rigid Conduit Hot Dipped Galvanized Conduit Surface Mounted	425	LF	F&I	$ 30.00	$ 12,750.00
630-2-14-2	2" Rigid Conduit Hot Dipped Galvanized Conduit Surface Mounted	930	LF	F&I	$ 38.00	$ 35,340.00
630-3	Rodding and Cleaning Out Existing Conduit Any Type	100	LF	F&I	$ 1.50	$ 150.00
632-7-1-19	Signal Cable - 19 Conductor	1,440	LF	F&I	$ 25.00	$ 36,000.00
632-7-1-19A	Signal Cable (Span Length 0' - 250')	2	PI	F&I	$ 12,000.00	$ 24,000.00
632-7-1-19B	Signal Cable (Span Length 251' - 350')	1	PI	F&I	$ 13,000.00	$ 13,000.00
632-7-1-19C	Signal Cable (Span Length 351' - 450')	4	PI	F&I	$ 14,000.00	$ 56,000.00
632-7-1-19D	Signal Cable (Span Length 451' - 550')	3	PI	F&I	$ 15,000.00	$ 45,000.00
632-7-1-19E	Signal Cable (Span Length 551' - 650')	6	PI	F&I	$ 16,000.00	$ 96,000.00
632-7-1-19F	Signal Cable (Span Length 651' - 750')	6	PI	F&I	$ 17,000.00	$ 102,000.00
632-7-1-19G	Signal Cable (Span Length 751' - Greater)	6	PI	F&I	$ 18,000.00	$ 108,000.00
632-7-1-4	Signal Cable - 4 Conductor	1,000	LF	F&I	$ 15.00	$ 15,000.00
632-7-1-4A	Pedestrian Signal Cable - 4 Conductor	25	PI	F&I	$ 4,500.00	$ 112,500.00
632-7-1-7	Signal Cable - 7 Conductor	1,000	LF	F&I	$ 20.00	$ 20,000.00
632-7-1-7A	Pedestrian Signal Cable - 7 Conductor	25	PI	F&I	$ 7,500.00	$ 187,500.00
632-7-6	Signal Cable, Remove - in Intersection	10	PI	R	$ 500.00	$ 5,000.00
632-7-7	Signal Cable, Remove - in Intersection	530	LF	R	$ 2.00	$ 1,060.00
634-4-153-1A	Span Wire Assembly (⅜") (Span Length 0' - 250')	2	PI	F&I	$ 5,400.00	$ 10,800.00
634-4-153-1B	Span Wire Assembly (⅜") (Span Length 251' - 350')	1	PI	F&I	$ 6,000.00	$ 6,000.00
634-4-153-1C	Span Wire Assembly (⅜") (Span Length 351' - 450')	4	PI	F&I	$ 6,500.00	$ 26,000.00
634-4-153-1D	Span Wire Assembly (⅜") (Span Length 451' - 550')	2	PI	F&I	$ 7,000.00	$ 14,000.00
634-4-153-1E	Span Wire Assembly (⅜") (Span Length 551' - 650')	2	PI	F&I	$ 7,500.00	$ 15,000.00
634-4-153-1F	Span Wire Assembly (3/8") (Span Length 651' - 750')	1	PI	F&I	$ 8,000.00	$ 8,000.00
634-4-153-2E	Span Wire Assembly (7/16") (Span Length: 551' - 650')	4	PI	F&I	$ 7,000.00	$ 28,000.00
634-4-153-2F	Span Wire Assembly (7/16") (Span Length 651' - 750')	1	PI	F&I	$ 7,500.00	$ 7,500.00
634-4-153-2G	Span Wire Assembly (7/16") (Span Length 751' - Greater)	1	PI	F&I	$ 8,000.00	$ 8,000.00
634-4-153-3F	Span Wire Assembly (½") (Span Length 651' - 750')	1	PI	F&I	$ 8,500.00	$ 8,500.00
634-4-153-3G	Span Wire Assembly (1/2") (Span Length 751' - Greater')	2	PI	F&I	$ 9,000.00	$ 18,000.00
634-4-153-5G	Span Wire Assembly (3/4") (Span Length 751' - Greater')	1	PI	F&I	$ 10,000.00	$ 10,000.00
634-31-405	Mast Arm Double Arm, 60' and 70.5' on Existing Foundation	1	EA	F&I	$ 75,000.00	$ 75,000.00

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634-5-1	Fiberglass insulator (to insulate Power Lines)	20	LF	F&I	$ 50.00	$ 1,000.00
635-2-10	Pull Box (11" x 18" x 12"D) Heavy Duty Covers (Tier 15)	100	LF	F&I	$ 1,300.00	$ 130,000.00
635-2-11	Pull Box (13" x 24" x 12"D) Heavy Duty Covers (Tier 15)	46	LF	F&I	$ 1,680.00	$ 77,280.00
635-2-12	Pull Box (24" x 36" x 12"D) Heavy Duty Covers (Tier 15)	100	EA	F&I	$ 1,800.00	$ 180,000.00
635-2-12-A	Pull Box (17" x 30" x 12"D) Heavy Duty Covers (Tier 15)	170	EA	F&I	$ 2,000.00	$ 340,000.00
635-2-12-B	Pull Box, (24" x 36" x 24"D) Fiberglass, Heavy Duty Covers (Tier 15)	2	EA	F&I	$ 2,500.00	$ 5,000.00
635-2-12-C	Pull Box (30" x 48" x 24"D) Heavy Duty Split Covers (Its) (Tier 15)	12	EA	F&I	$ 3,500.00	$ 42,000.00
635-2-12-D	Pull Box (17" x 30" x 24"D) Heavy Duty Split Covers (Its) (Tier 15)	10	EA	F&I	$ 2,200.00	$ 22,000.00
639-1-111	Electrical Power Service with Meter Base (Overhead) Meter Furnished By Power Company	2	AS	F&I	$ 3,500.00	$ 7,000.00
639-1-113	Electrical Power Service No Meter Base (Overhead)	2	AS	F&I	$ 3,400.00	$ 6,800.00
639-1-121	Electrical Power Service with Meter Base (Underground) Meter Furnished By Power Company	14	AS	F&I	$ 6,000.00	$ 84,000.00
639-1-123	Electrical Power Service No Meter Base (Underground)	10	AS	F&I	$ 4,000.00	$ 40,000.00
639-1-610	Remove Power Service (Overhead)	2	EA	R	$ 360.00	$ 720.00
639-1-620	Remove Power Service (Underground)	2	EA	R	$ 480.00	$ 960.00
639-2-1-3	Electrical Service Wire (Sigle Phase 3-Wire, Triplex)	1,866	LF	F&I	$ 13.00	$ 24,258.00
639-2-1-2	Electrical Service Wire (Sigle Phase 2-Wire, Duplex)	1,000	LF	F&I	$ 12.00	$ 12,000.00
639-3-11	Electrical Service Disconnect (Breaker Box, Sheet T 6.2 of PBC StandarDS)	10	EA	F&I	$ 1,500.00	$ 15,000.00
639-3-60	Electrical Service Disconnect, Remove	3	EA	R	$ 175.00	$ 525.00
641-1-1	Guying Concrete Strain Poles (1-Guy Wire Per Pole)	1	EA	F&I	$ 1,500.00	$ 1,500.00
641-1-2	Guying Concrete Strain Poles (2-Guy Wire Per Pole)	1	EA	F&I	$ 1,600.00	$ 1,600.00
641-2-12-12	Prestressed Concrete Pole (12' Type P-II)	14	EA	F&I	$ 3,000.00	$ 42,000.00
641-2-15-44	Prestressed Concrete Pole (44' Type P-V)	4	EA	F&I	$ 9,000.00	$ 36,000.00
641-2-16-44	Prestressed Concrete Pole (44' Type P-VI)	4	EA	F&I	$ 9,300.00	$ 37,200.00
641-2-16-46	Prestressed Concrete Pole (46' Type P-VI)	8	EA	F&I	$ 10,000.00	$ 80,000.00
641-2-17-44	Prestressed Concrete Pole (44' Type P-VII)	8	EA	F&I	$ 9,600.00	$ 76,800.00
641-2-17-46	Prestressed Concrete Pole (46' Type P-VII)	8	EA	F&I	$ 11,000.00	$ 88,000.00
641-2-17-50	Prestressed Concrete Pole (50' Type P-VII)	4	EA	F&I	$ 12,000.00	$ 48,000.00
641-2-17-52	Prestressed Concrete Pole (52' Type P-VII)	4	EA	F&I	$ 13,000.00	$ 52,000.00
641-2-17-54	Prestressed Concrete Pole (54' Type P-VII)	2	EA	F&I	$ 14,000.00	$ 28,000.00
641-2-17-60	Prestressed Concrete Pole (60' Type P-VII)	2	EA	F&I	$ 15,000.00	$ 30,000.00
641-2-18-50	Prestressed Concrete Pole (50' Type P-VIII)	8	EA	F&I	$ 16,000.00	$ 128,000.00
641-2-18-52	Prestressed Concrete Pole (52' Type P-VIII)	22	EA	F&I	$ 16,500.00	$ 363,000.00
641-2-19-60	Prestressed Concrete Pole (60' Type P-Custom Design)	2	EA	F&I	$ 18,000.00	$ 36,000.00
641-2-30A	Prestressed Concrete Pole (Install Only - V, VI, VII, or VIII Up to 10' Deep)	2	EA	I	$ 10,000.00	$ 20,000.00
641-2-60	Concrete Pole Removal - Shallow (Includes Pole and Buried Attachments to A Depth of 4 Feet Below Existing Grade) Includes Disposal of Pole When instructed by Engineer	8	EA	R	$ 1,500.00	$ 12,000.00
641-2-70	Concrete Pole Removal - Shallow (Includes Pole and Buried Attachments to A Depth of 4 Feet Below Existing Grade) Includes Disposal of Pole When instructed by Engineer	8	EA	R	$ 1,920.00	$ 15,360.00
641-2-80	Concrete Pole Removal - Deep (Includes Pole and Complete Removal of The Pole Foundationd Depth of Up to 25 Feet) Includes Disposal of Pole When instructed by Engineer	6	EA	R	$ 2,160.00	$ 12,960.00
641-30B	Additional Depth for Concrete Pole Burial Deeper than 10 Feet	114	LF	F&I	$ 250.00	$ 28,500.00
641-99-1	Fdot Type 3/4" Eyebolt	1	EA	F&I	$ 250.00	$ 250.00
641-99-2	PBC Type 3/4" Eyebolt	1	EA	F&I	$ 250.00	$ 250.00

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643-1-1	Guiying Wood Pole (1-Guy Wire Per Pole)	2	EA	F&I	$ 1,100.00	$ 2,200.00
643-1-2	Guiying Wood Pole (2-Guy Wire Per Pole)	2	EA	F&I	$ 1,200.00	$ 2,400.00
643-150	Wood Strain 50' Pole (Burried Up to 10' Deep) Direct Burial	2	EA	F&I	$ 1,800.00	$ 3,600.00
643-155	Wood Strain 55' Pole (Burried Up to 10' Deep) Direct Burial	2	EA	F&I	$ 1,900.00	$ 3,800.00
643-300	Wood Strain Pole (Install Only, Burried Up to 10' Deep) Direct Burial	2	EA	I	$ 1,400.00	$ 2,800.00
643-600	Remove Wood Strain Pole (Complete)	10	EA	R	$ 720.00	$ 7,200.00
646-1-11	Aluminum Signals Pole, Pedestal with Transformer Base (8 Feet Above Ground)	76	EA	F&I	$ 3,500.00	$ 266,000.00
646-1-12	Aluminum Signals Pole, Pedestrian Detector Post (5.5-Ft Above Ground) with Transformer Base	2	EA	F&I	$ 1,500.00	$ 3,000.00
646-1-12-A	Aluminum Signals Pole, Pedestrian Detector Post (5.5-Ft Above Ground) without Transformer Base	10	EA	F&I	$ 1,000.00	$ 10,000.00
649-22-1	Mast Arm Assembly, Furnish and Install on Existing Foundation, Single Arm 30' (A30/S-P1/S)	10	EA	F&I	$ 30,000.00	$ 300,000.00
649-22-1L	Mast Arm Assembly with Street Light, Furnish and Install on Existing Foundation, Single Arm 30' (A30/S-P1/S/L)	2	EA	F&I	$ 35,000.00	$ 70,000.00
649-22-3	Mast Arm Assembly, Furnish and Install on Existing Foundation, Single Arm 40' (A40/S-P2/S)	6	EA	F&I	$ 36,000.00	$ 216,000.00
649-22-3L	Mast Arm Assembly with Street Light, Furnish and Install on Existing Foundation, Single Arm 40' (A40/S-P2/S/L)	2	EA	F&I	$ 42,000.00	$ 84,000.00
649-22-6	Mast Arm Assembly, Furnish and Install on Existing Foundation, Single Arm 50' (A50/S-P3/S)	10	EA	F&I	$ 41,000.00	$ 410,000.00
649-22-6L	Mast Arm Assembly with Street Light, Furnish and Install on Existing Foundation, Single Arm 50' (A50/S-P3/S/L)	4	EA	F&I	$ 46,000.00	$ 184,000.00
649-22-10	Mast Arm Assembly, Furnish and Install on Existing Foundation, Single Arm 60' (A60/S-P4/S)	10	EA	F&I	$ 47,000.00	$ 470,000.00
649-22-10-HD	Mast Arm Assembly, Furnish and Install on Existing Foundation, Single Arm 60' Heavy Duty (A60/S-P4/S-HD)	6	EA	F&I	$ 48,000.00	$ 288,000.00
649-22-10L	Mast Arm Assembly with Street Light, Furnish and Install on Existing Foundation, Single Arm 60' (A60/S-P4/S/L)	6	EA	F&I	$ 53,000.00	$ 318,000.00
649-22-10L-HD	Mast Arm Assembly with Street Light, Furnish and Install on Existing Foundation, Single Arm 60' Heavy Duty (A60/S-P4/S/L-HD)	4	EA	F&I	$ 54,000.00	$ 216,000.00
649-22-15	Mast Arm Assembly, Furnish and Install on Existing Foundation, Single Arm 70' (A70/S-P5/S)	4	EA	F&I	$ 54,500.00	$ 218,000.00
649-22-15-HD	Mast Arm Assembly, Furnish and Install on Existing Foundation, Single Arm 70' Heavy Duty (A70/S-P5/S-HD)	4	EA	F&I	$ 55,000.00	$ 220,000.00
649-22-15L	Mast Arm Assembly with Street Light, Furnish and Install on Existing Foundation, Single Arm 70' (A70/S-P5/S/L)	5	EA	F&I	$ 58,000.00	$ 290,000.00
649-22-15L-HD	Mast Arm Assembly with Street Light, Furnish and Install on Existing Foundation, Single Arm 70' Heavy Duty (A70/S-P5/S/L-HD)	5	EA	F&I	$ 59,000.00	$ 295,000.00
649-22-21	Mast Arm Assembly, Furnish and Install on Existing Foundation, Single Arm 78' (A78/S-P6/S)	4	EA	F&I	$ 59,000.00	$ 236,000.00
649-22-21-HD	Mast Arm Assembly, Furnish and Install on Existing Foundation, Single Arm 78' Heavy Duty (A78/S-P6/S-HD)	4	EA	F&I	$ 62,000.00	$ 248,000.00
649-22-21L	Mast Arm Assembly with Street Light, Furnish and Install on Existing Foundation, Single Arm 78' (A78/S-P6/S/L)	5	EA	F&I	$ 68,000.00	$ 340,000.00
649-22-21L-HD	Mast Arm Assembly with Street Light, Furnish and Install on Existing Foundation, Single Arm 78' Heavy Duty (A78/S-P6/S/L-HD)	4	EA	F&I	$ 69,000.00	$ 276,000.00
649-2-12-40	Drilled Shaft Foundation Assembly, 12' Deep and 4.0' Diameter, Furnish and Install (DS/12/4.0)	10	EA	F&I	$ 22,000.00	$ 220,000.00
649-2-12-40-AD	Additional Depth for Drilled Shaft Foundation Assembly, 12' Deep and 4.0' Diameter, Furnish and Install (DS/12/4.0)	5	LF	F&I	$ 1,500.00	$ 7,500.00

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649-2-12-45	Drilled Shaft Foundation Assembly, 12' Deep and 4.5' Diameter, Furnish and Install (DS/12/4.5)	2	EA	F&I	$ 22,500.00	$ 45,000.00
649-2-12-45-AD	Additional Depth for Drilled Shaft Foundation Assembly, 12' Deep and 4.5' Diameter, Furnish and Install (DS/12/4.5)	5	LF	F&I	$ 1,800.00	$ 9,000.00
649-2-14-45	Drilled Shaft Foundation Assembly, 14' Deep and 4.5' Diameter, Furnish and Install (DS/14/4.5)	4	EA	F&I	$ 23,000.00	$ 92,000.00
649-2-14-45-AD	Additional Depth for Drilled Shaft Foundation Assembly, 14' Deep and 4.5' Diameter, Furnish and Install (DS/14/4.5)	5	LF	F&I	$ 2,000.00	$ 10,000.00
649-2-14-50	Drilled Shaft Foundation Assembly, 14' Deep and 5.0' Diameter, Furnish and Install (DS/14/5.0)	10	EA	F&I	$ 24,000.00	$ 240,000.00
649-2-14-50-AD	Additional Depth for Drilled Shaft Foundation Assembly, 14' Deep and 5.0' Diameter, Furnish and Install (DS/14/5.0)	5	LF	F&I	$ 2,200.00	$ 11,000.00
649-2-16-45	Drilled Shaft Foundation Assembly, 16' Deep and 4.5' Diameter, Furnish and Install (DS/16/4.5)	8	EA	F&I	$ 25,000.00	$ 200,000.00
649-2-16-45-AD	Additional Depth for Drilled Shaft Foundation Assembly, 16' Deep and 4.5' Diameter, Furnish and Install (DS/16/4.5)	11	LF	F&I	$ 2,500.00	$ 27,500.00
649-2-16-50	Drilled Shaft Foundation Assembly, 16' Deep and 5.0' Diameter, Furnish and Install (DS/16/5.0)	2	EA	F&I	$ 26,000.00	$ 52,000.00
649-2-16-50-AD	Additional Depth for Drilled Shaft Foundation Assembly, 16' Deep and 5.0' Diameter, Furnish and Install (DS/16/5.0)	9	LF	F&I	$ 2,600.00	$ 23,400.00
649-2-18-50	Drilled Shaft Foundation Assembly, 18' Deep and 5.0' Diameter, Furnish and Install (DS/18/5.0)	4	EA	F&I	$ 27,000.00	$ 108,000.00
649-2-18-50-AD	Additional Depth for Drilled Shaft Foundation Assembly, 18' Deep and 5.0' Diameter, Furnish and Install (DS/18/5.0)	5	LF	F&I	$ 2,700.00	$ 13,500.00
649-2-20-50	Drilled Shaft Foundation Assembly, 20' Deep and 5.0' Diameter, Furnish and Install (DS/20/5.0)	2	EA	F&I	$ 28,000.00	$ 56,000.00
649-2-20-50-AD	Additional Depth for Drilled Shaft Foundation Assembly, 20' Deep and 5.0' Diameter, Furnish and Install (DS/20/5.0)	2	LF	F&I	$ 2,800.00	$ 5,600.00
649-2-RA-11	Furnish and Install Additional Weight of Rebar for for Non-Standard Drill Shaft Foundation as Directed by the Engineer	50	LBS	F&I	$ 12.00	$ 600.00
649-23-11	Steel Mast Arm Assembly, Install to Existing Foundation	1	EA	I	$ 8,500.00	$ 8,500.00
649-23-21	Steel Mast Arm Assembly, Relocate to Existing Foundation	1	EA	R&I	$ 10,000.00	$ 10,000.00
649-25-03	Steel Mast Arm Assembly, Replace Arm on Existing Pole, 40'	1	EA	R&I	$ 5,000.00	$ 5,000.00
649-25-06	Steel Mast Arm Assembly, Replace Arm on Existing Pole, 50'	1	EA	R&I	$ 7,000.00	$ 7,000.00
649-25-10	Steel Mast Arm Assembly, Replace Arm on Existing Pole, 60'	1	EA	R&I	$ 9,000.00	$ 9,000.00
649-25-15	Steel Mast Arm Assembly, Replace Arm on Existing Pole, 70'	1	EA	R&I	$ 11,000.00	$ 11,000.00
649-25-21	Steel Mast Arm Assembly, Replace Arm on Existing Pole, 78'	1	EA	R&I	$ 13,000.00	$ 13,000.00
649-26-01	Steel Mast Arm Assembly, Remove, Pole Only-Entire Foundation Remains	1	EA	R	$ 2,400.00	$ 2,400.00
649-26-03	Steel Mast Arm Assembly, Remove, Shallow Foundation-Bolt on Attachment	1	EA	R	$ 4,800.00	$ 4,800.00
649-26-05	Steel Mast Arm Assembly, Remove, Deep Foundation-Bolt on Attachment	1	EA	R	$ 7,500.00	$ 7,500.00
649-26-07	Steel Mast Arm Assembly, Remove, Arm and Attachments; Pole Remains	1	EA	R	$ 2,400.00	$ 2,400.00
649-28-02	Painting New Mast Arm Assembly, Manufacturer Applied Powder Coating	1	EA	F&I	$ 15,000.00	$ 15,000.00
649-40-000-A	Mast Arm Repair (Shorten and Cap Upright)	1	EA	F&I	$ 4,500.00	$ 4,500.00
649-40-000-B	Mast Arm Repair (Shorten and Cap Arm)	1	EA	F&I	$ 3,500.00	$ 3,500.00
649-40-000-C	Raise Mast Arm Foundation (Raise Foundation)	1	EA	F&I	$ 10,000.00	$ 10,000.00
649-40-000-D	Mast Arm Nut Cover	2	EA	F&I	$ 350.00	$ 700.00
649-40-000-E	Additional Depth for Mast Arm Assembly Foundation (When Specified by Engineer)	2	LF	F&I	$ 3,000.00	$ 6,000.00
649-40-000-F	Repair Existing Damaged Mast Arm Foundation	1	EA	F&I	$ 1,250.00	$ 1,250.00
649-40-000-L	Mast Arm Terminal/ Hand Hole Cover	2	EA	F&I	$ 350.00	$ 700.00

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649-40-000-M	Provide Telescopic Lift for Mast Arm Installation (Per Intersection Project)	2	EA	F&I	$ 5,600.00	$ 11,200.00
649-40-2	Steel Mast Arm Assembly, Replace Hand Hole Cover on Existing Pole	2	EA	R&I	$ 100.00	$ 200.00
649-40-3	Steel Mast Arm Assembly, Replace Pole Cap on Existing Pole	2	EA	R&I	$ 175.00	$ 350.00
649-99-1	Terminal Block in Mast Arm Upright	14	EA	F&I	$ 500.00	$ 7,000.00
649-99-2	Terminal Block in Mast Arm Upright-Remove Existing	14	EA	R	$ 25.00	$ 350.00
650-1-13	Traffic Signal Head Aluminum (3-Section, 1-Way) Includes Backplates	320	AS	F&I	$ 1,800.00	$ 576,000.00
650-1-14	Traffic Signal Head Aluminum (4-Section, 1-Way) Includes Backplates	20	AS	F&I	$ 1,920.00	$ 38,400.00
650-1-15	Traffic Signal Head Aluminum (5-Section, 1-Way) Includes Backplates	30	AS	F&I	$ 2,280.00	$ 68,400.00
650-1-16	Traffic Signal Head Aluminum (3-Section, 2-Way) Includes Backplates	10	AS	F&I	$ 2,100.00	$ 21,000.00
650-1-24	Traffic Signal Head Polycarbonate with Aluminum top Section (4-Section, 1-Way) Includes Backplates	8	AS	F&I	$ 1,800.00	$ 14,400.00
650-1-25	Traffic Signal Head Polycarbonate with Aluminum top Section (5-Section, 1-Way) Includes Backplates	10	AS	F&I	$ 2,200.00	$ 22,000.00
650-1-33	Traffic Signal Head Polycarbonate (3-Section, 1-Way) Includes Backplates	10	AS	F&I	$ 1,700.00	$ 17,000.00
650-1-53	Traffic Signal Head (3-Section, 1-Way) Install Only	8	AS	I	$ 1,000.00	$ 8,000.00
650-1-54	Traffic Signal Head Aluminum (4-Section, 1-Way) Install Only	4	AS	I	$ 1,050.00	$ 4,200.00
650-1-55	Traffic Signal Head (5-Section, 1-Way) Install Only	1	AS	I	$ 1,100.00	$ 1,100.00
650-1-60	Traffic Signal Head Assembly, Removal	144	EA	R	$ 50.00	$ 7,200.00
653-191	Pedestrian Signal - Count Down (1-Way) Aluminum	94	EA	F&I	$ 1,440.00	$ 135,360.00
653-192	Pedestrian Signal - Count Down (2-Way) Aluminum	26	EA	F&I	$ 2,040.00	$ 53,040.00
653-1-60	Pedestrian Signal, Remove Ped Signal	20	EA	R	$ 30.00	$ 600.00
654-2-11	Rectangular Rapid Flashing Beacon, AC Powered, Single Direction	2	AS	F&I	$ 10,000.00	$ 20,000.00
654-2-12	Rectangular Rapid Flashing Beacon, AC Powered, Back to Back	2	AS	F&I	$ 11,000.00	$ 22,000.00
654-2-21	Rectangular Rapid Flashing Beacon, Solar Powered, Single Direction	2	AS	F&I	$ 12,000.00	$ 24,000.00
654-2-22	Rectangular Rapid Flashing Beacon, Solar Powered, Back to Back	3	AS	F&I	$ 13,000.00	$ 39,000.00
654-2-60	Rectangular Rapid Flashing Beacon, Remove Complete Sign Assembly	3	AS	R	$ 600.00	$ 1,800.00
660-2-102	Loop Assembly 6'X6' (Type B)	20	EA	F&I	$ 960.00	$ 19,200.00
660-2-106-A	Loop Assembly (Type F - 26')	60	EA	F&I	$ 1,800.00	$ 108,000.00
660-2-106-B	Loop Assembly (Type F - 46')	48	EA	F&I	$ 2,000.00	$ 96,000.00
660-3-60	Vehicle Detection System-Microwave, Remove	1	EA	R	$ 250.00	$ 250.00
660-4-10-B1	Video Image Detection 1 - Camera System (Iteris) Complete	1	EA	F&I	$ 20,000.00	$ 20,000.00
660-4-10-B2	Video Image Detection 2 - Camera System (Iteris) Complete	1	EA	F&I	$ 25,000.00	$ 25,000.00
660-4-10-B3	Video Image Detection 3 - Camera System (Iteris) Complete	1	EA	F&I	$ 32,400.00	$ 32,400.00
660-4-10-B4	Video Image Detection 4 - Camera System (Iteris) Complete	2	EA	F&I	$ 42,000.00	$ 84,000.00
660-4-30-B1	Video Image Detection 1 - Camera System (Iteris)	6	EA	I	$ 5,000.00	$ 30,000.00
660-4-30-B2	Video Image Detection 2 - Camera System (Iteris)	2	EA	I	$ 10,000.00	$ 20,000.00
660-4-30-B3	Video Image Detection 3 - Camera System (Iteris)	2	EA	I	$ 15,000.00	$ 30,000.00
660-4-30-B4	Video Image Detection 4 - Camera System (Iteris)	2	EA	I	$ 18,000.00	$ 36,000.00
660-4-60	Vehicle Detection System-Video, Remove	4	EA	R	$ 250.00	$ 1,000.00
660-5-30	Wireless Magnetometer Vehicle Detector Assembly Complete Assembly	3	AS	I	$ 2,500.00	$ 7,500.00
660-6-121	Vehicle Detection System - AVI Bluetooth- Cabinet Processing Equipment	2	AS	F&I	$ 2,500.00	$ 5,000.00
660-6-122	Vehicle Detection System - AVI Bluetooth- Above Ground Equipment - Antennas	2	AS	F&I	$ 8,500.00	$ 17,000.00
665-1-11	Pedestrian Detector (Push Button)	20	EA	F&I	$ 350.00	$ 7,000.00

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665-1-31	Pedestrian Detector (Push Button) - Install Only	120	EA	I	$ 150.00	$ 18,000.00
665-1-12-A	Pedestrian Detector- Accessible - Cabinet Equipment - Cabinet interface Hardware	2	EA	F&I	$ 3,000.00	$ 6,000.00
665-1-12-B	Pedestrian Detector Assembly- Accessible one-Crossing (2-Push Button Assemblies Per Crossing) Push Button Only	16	EA	F&I	$ 1,800.00	$ 28,800.00
670-5-110-A	Traffic Controller Assembly (Type 5) as Per Naztec	1	AS	F&I	$ 38,000.00	$ 38,000.00
670-5-110-B	Traffic Controller Assembly (Type 6) as Per Naztec	2	AS	F&I	$ 39,000.00	$ 78,000.00
670-5-110-C	Traffic Controller Assembly (Type 4) as Per Naztec	1	AS	F&I	$ 33,000.00	$ 33,000.00
670-5-110-D1	Traffic Controller Assembly (ATC) Dual Single Door as Per Naztec	1	AS	F&I	$ 65,000.00	$ 65,000.00
670-5-110-D2	Traffic Controller Assembly (ATC) Dual Double Door as Per Naztec	1	AS	F&I	$ 70,000.00	$ 70,000.00
670-5-310-A	Traffic Controller Assembly (Type 4, 5, 6 - Install Only)	12	AS	I	$ 12,000.00	$ 144,000.00
670-5-310-B	Traffic Controller Assembly (ATC Single Door - Install Only)	1	AS	I	$ 15,000.00	$ 15,000.00
670-5-310-C	Traffic Controller Assembly (ATC Double Door - Install Only)	1	AS	I	$ 16,000.00	$ 16,000.00
670-5-600	Traffic Controller Assembly, Remove Controller with Cabinet	2	AS	I	$ 500.00	$ 1,000.00
682-1-13	Its CCTV Camera, Dome Encloosure Non-Pressurized	1	EA	F&I	$ 8,000.00	$ 8,000.00
682-1-33	Its CCTV Camera, Dome Encloosure Non-Pressurized (Install Only)	1	EA	I	$ 3,000.00	$ 3,000.00
690-100	Remove Miscellaneous Signal Equipment	40	HR	R	$ 150.00	$ 6,000.00
690-15	Remove internaly Illuminated Sign	8	EA	R	$ 350.00	$ 2,800.00
690-20	Signal Pedestrian Head Assembly, Removal	70	EA	R	$ 100.00	$ 7,000.00
690-31-1	Signal Pedestal, Remove	16	EA	R	$ 150.00	$ 2,400.00
690-34-2C	Remove Pole Wood	8	EA	R	$ 250.00	$ 2,000.00
690-50-0	Remove Controller Assembly Complete with Foundation - Includes Delivery of Removed Controller Equipment	2	EA	R	$ 750.00	$ 1,500.00
690-50-1	Remove Controller Assembly, Leave Foundation in Place - Includes Delivery of Removed Equipment	2	EA	R	$ 500.00	$ 1,000.00
690-70	Remove Pedestrian Detector Assembly	96	EA	R	$ 25.00	$ 2,400.00
690-80	Remove Span Wire Assembly	18	PI	R	$ 1,000.00	$ 18,000.00
690-90	Remove Cabling and Conduit	824	LF	R	$ 0.10	$ 82.40
690-90-1	Remove Cable, Underground	1,800	LF	R	$ 0.10	$ 180.00
690-91	Remove Signal interconnect Cable	200	LF	R	$ 0.10	$ 20.00
690-92	Remove Existing Signal interconnect Cable Aerial (including Spanwire)	100	LF	R	$ 1.00	$ 100.00
690-93	Remove Small Pull Box - Up to 17 x 30	10	EA	R	$ 600.00	$ 6,000.00
690-94	Remove Large Pull Box - Up to 30 x 60	2	EA	R	$ 840.00	$ 1,680.00
700-12-12	Ground Mount AC-Powered Sign Beacon (Two Beacons)-including School Zone Flashers	2	AS	F&I	$ 12,000.00	$ 24,000.00
700-12-22	Ground Mount Solar-Powered Sign Beacon (Two Beacons) - including School Zone Flashers	3	AS	F&I	$ 15,000.00	$ 45,000.00
700-12-32-1	Overhead Mount AC-Powered Sign Beacon (Two Beacons) - including School Zone Flashers	2	AS	F&I	$ 10,000.00	$ 20,000.00
700-12-32-2	Overhead Mount Solar-Powered Sign Beacon (Two Beacons) - including School Zone Flashers	2	AS	F&I	$ 12,000.00	$ 24,000.00
700-3-2-04	Overhead Sign Panel - 31 to 50 Square Feet	10	EA	F&I	$ 2,000.00	$ 20,000.00
700-5-21	Internally Illuminated Sign (6') Fluorescent	4	EA	F&I	$ 3,600.00	$ 14,400.00
700-5-22	Internally Illuminated Sign (8') Fluorescent	8	EA	F&I	$ 4,200.00	$ 33,600.00
700-5-41	Internally Illuminated Sign (6') Install Only	6	EA	I	$ 1,500.00	$ 9,000.00
700-5-42	Internally Illuminated Sign (8') Install Only	52	EA	I	$ 1,800.00	$ 93,600.00
700-6-13	LED Blank-Out Sign (30" x 30")	1	EA	F&I	$ 6,500.00	$ 6,500.00
700-6-21	Highlighted Sign Ground Mounted (Solar Powered) - Up to 12 Sq Ft	2	EA	F&I	$ 5,500.00	$ 11,000.00
700-6-22	Highlighted Sign Ground Mounted (Solar Powered) - 12-20 Sq Ft	2	EA	F&I	$ 7,500.00	$ 15,000.00

BID PROPOSAL
ANNUAL TRAFFIC SIGNAL CONSTRUCTION
CONTRACT
PBC PROJECT #2022052

715-11-500	Luminaire, Remove	5	EA	R	$ 150.00	$ 750.00
715-1-12	Conductor (No. 8 to No. 6)	1,500	LF	F&I	$ 3.60	$ 5,400.00
715-1-13	Conductor (No. 4 to No. 2)	100	LF	F&I	$ 5.00	$ 500.00
715-21-2	Lighting Retrofits, LED Retrofit Kit for Existing Luminaires	54	EA	F&I	$ 1,500.00	$ 81,000.00
715-4-13	Standard Pole, Standard Foundation (40' Mounting Height)	1	EA	F&I	$ 10,000.00	$ 10,000.00
715-5-11(A)	Luminaire & Bracket Arm Aluminum (8')	30	EA	F&I	$ 1,500.00	$ 45,000.00
715-5-11(B)	Luminaire & Bracket Arm Aluminum (12' w/36"Rise)	2	EA	F&I	$ 2,000.00	$ 4,000.00
715-5-11(C)	Luminaire & Bracket Arm Aluminum (15' w/36"Rise)	1	EA	F&I	$ 2,500.00	$ 2,500.00
715-5-31-A	Luminaire & Bracket Arm Aluminum (8' w/36"Rise)-Install Only	1	EA	I	$ 500.00	$ 500.00
715-5-31-B	Luminaire & Bracket Arm Aluminum (12' w/36"Rise)-Install Only	1	EA	I	$ 600.00	$ 600.00
715-5-31-B1	Luminaire & Bracket Arm Aluminum (12' w/84"Rise) -Install Only	3	EA	I	$ 700.00	$ 2,100.00
715-5-31-C	Luminaire & Bracket Arm Aluminum (15' w/36"Rise)-Install Only	3	EA	I	$ 800.00	$ 2,400.00
715-5-31-C1	Luminaire & Bracket Arm Aluminum (15' w/84"Rise)-Install Only	2	EA	I	$ 900.00	$ 1,800.00
715-5-32	Luminaire and Bracket Arm - Galv Steel	10	EA	F&I	$ 3,500.00	$ 35,000.00
715-5-51	Luminaire and Bracket Arm - Remove	10	EA	R	$ 100.00	$ 1,000.00
715-11-211-L1	Furnish and Install 175 Watt LED Cobrahead Luminaire	50	EA	F&I	$ 1,200.00	$ 60,000.00
715-11-211-L2	Furnish and Install 263 Watt Cobrahead LED Luminaire	400	EA	F&I	$ 1,250.00	$ 500,000.00
715-11-500	Remove Luminaire Roadway (All Types)	5	EA	R	$ 100.00	$ 500.00
					TOTAL BID	**$ 13,404,295.00**

THE COUNTY DOES NOT GUARANTEE THE ACCURACY OF THE FORMULAS AND EXTENSIONS USED IN THIS SPREADSHEET.

THE ITEMS AND QUANTITIES ABOVE, SHALL GOVERN OVER THE PLANS.

PAY ITEM FOOTNOTES IN CONSTRUCTION PLANS SHALL ALSO BE INCLUDED IN ITEM UNIT PRICE.

Note #	PAY ITEM FOOTNOTES
1	All costs for Maintenance of Traffic (MOT) and mobilization not included in items 102-1-A through 102-99 per the special bid item notes in the TSP's shall be considered incidental to, and shall be included in, unit prices for the pay items.
2	All items shall include cost to furnish and install unless otherwise noted.
3	Mobilization: Includes NPDES Erosion Control Measures.
4	Maintenance of Traffic: Includes all provision and maintenance of necessary signs, advanced warning, variable message boards, all detour signs and barricades, and any railroad MOT required for the duration of the project. MOT shall include the cost of any temporary pavement, temporary concrete barriers, temporary wire faced wall, etc. as required.
5	Curb and gutter shall be incidental when related to ADA ramp applications.
6	Clearing and grubbing to include all necessary curb and gutter and sidewalk removal.
7	Definitions:

LF - Linear Feet	ED - Each Day
SF - Square Feet	WK - Per Week
SY - Square Yard	LS - Lump Sum (Complete)
AS - Assembly	F&I - Furnish & Install
PI - Per Intersection	F - Furnish Only
EA - Each	I - Install Only
HR - Per Hour	R - Remove
MH - Man Hour	

PROPOSAL FORM

PROJECT NO. **2022052**

TOTAL BID
$ 13,404,295.00
IN FIGURES

The Contractor acknowledges that Addenda 1 thru 1 have been received and that related costs are reflected in the submitted bid. Contractor has committed to 25 ***% SBE participation*** as set forth on the Schedule 1 and Schedule 2 that are completed and submitted by Contractor. Contractor shall comply with said goal if awarded the Contract.

The Contractor hereby certifies and agrees that the following information is correct: In preparing its response to the Solicitation, the Contractor has considered all proposals submitted from qualified, potential Sub-Contractors and suppliers, and has not engaged in "discrimination" as defined in the County's Commercial Nondiscrimination Policy as set forth in Resolution 2017-1770 as amended, to wit: discrimination in the solicitation, selection or commercial treatment of any Sub-Contractor, vendor, supplier or commercial customer on the basis of race, color, national origin, religion, ancestry, sex, age, marital status, familial status, sexual orientation, gender identity or expression, disability, or genetic information, or on the basis of any otherwise unlawful use of characteristics regarding the vendor's, supplier's or commercial customer's employees or owners; provided that nothing in this policy shall be construed to prohibit or limit otherwise lawful efforts to remedy the effects of discrimination that have occurred or are occurring in the County's relevant marketplace of Palm Beach County. Without limiting the foregoing, "discrimination" also includes retaliating against any person or other entity for reporting any incident of "discrimination." Without limiting any other provision of the solicitation, it is understood and agreed that, if this certification is false, such false certification will constitute grounds for the County to reject the proposal submitted by the Contractor for this Solicitation, and to terminate any contract awarded based on the response. As part of its proposal, the Contractor shall provide to the County a list of all instances within the immediate past four (4) years where there has been a final adjudicated determination in a legal or administrative proceeding in the State of Florida that the Contractor discriminated against its Sub-Contractors, vendors, suppliers or commercial customers, and a description of the status or resolution of that complaint, including any remedial action taken. As a condition of submitting a proposal to the County, the Contractor agrees to comply with the County's Commercial Nondiscrimination Policy as described in Resolution 2017-1770, as amended.

The Contractor further agrees to perform all force account Work, as provided for in the General Provisions, and to execute the Contract and return to the County, along with a Contract Bond and Certificate of Insurance within **fourteen (14) Working Days** of the date of the Letter of Intent to Award and to commence Work with adequate forces and Equipment within fourteen (14) Calendar Days of the date set forth in the Notice to Proceed and to fully complete all contracted Work under the same in accordance with Contract Documents within the Contract Time.

THE TIMELY COMPLETION OF THIS PROJECT IS CRITICAL TO THE HEALTH, SAFETY AND WELFARE OF THE TRAVELING PUBLIC. It is the desire of Palm Beach County to expedite the construction and opening to traffic of the project. The Contractor shall be required to work such hours, weekends and/or Holidays to meet the required Contract schedules.

PROPOSAL FORM

The Contractor shall complete in full all Work under this Contract in accordance with the Special Provisions. It is further agreed that should the Contractor fail to complete all necessary Work under this Contract within the above referenced time; then, due to the criticalness of the timely completion of this project, liquidated damages for failure to meet these provisions shall be in accordance with Section 8 of the Standard Specifications.

The Contractor further agrees to furnish a sufficient and satisfactory Bond, on the form herein provided, in accordance with Section 3 of the General Provisions.

The Contractor further agrees to bear the full cost of maintaining all Work until the final acceptance, as provided in the Contract Documents.

Accompanying this Proposal is a Proposal Guaranty (Bid Bond) made payable to Palm Beach County, a Political Subdivision of the State of Florida, in the sum of 5% of amount Bid which is to be forfeited as liquidated damages if, in case this Proposal is accepted, the undersigned should fail to execute the attached Contract under the conditions of this Proposal. Otherwise, the Bid Bond is to be returned to the Contractor upon the delivery of a satisfactory Contract Bond.

Company Name: Horsepower Electric Inc.

Authorized Officer: Michael Martinez
(Print)

Address: 8105 W 20 Ave
Hialeah FL 33014

Signature: _____

PROPOSAL FORM

CONTRACTOR CERTIFICATION

PALM BEACH COUNTY

ENGINEERING AND PUBLIC WORKS DEPARTMENT

NPDES GENERAL PERMIT FOR STORM WATER DISCHARGES

FROM

ROADWAY CONSTRUCTION SITES

ANNUAL TRAFFIC SIGNAL CONSTRUCTION CONTRACT

PALM BEACH COUNTY PROJECT NO. 2022052

"I certify under penalty of law that I understand the terms and conditions of the general National Pollutant Discharge Elimination System (NPDES) permit that authorizes the storm water discharges associated with industrial activity from the construction site identified as part of this certification."

Name of Contracting Firm: Horsepower Electric Inc.

By: _____ Date: 03/15/2022

Name and Title: Michael Martinez

Address or P.O. Box: 8105 W 20 Ave

Hialeah	FL	33014
City	State	Zip Code

Telephone: 305-819-4060

Area Code Number

PALM BEACH COUNTY LOCAL PREFERENCE ORDINANCE

In accordance with the Palm Beach County Local Preference Ordinance, a preference will be given to (1) Bidders having a permanent place of business in Palm Beach County; (2) Bidders having a permanent place of business in the Glades that are able to provide the goods or services within the Glades.

1. Local Preference means that if the lowest responsive, responsible Bidder is a non-local business, then all Bids received from responsive, responsible local Bidders are decreased by 5%. The original Bid amount is not changed; the 5% decrease is calculated only for the purposes of determining local preference.

2. Glades Local Preference means that if the lowest responsive, responsible Bidder is a non-Glades business, then all Bids received from responsive, responsible Glades Bidders are decreased by 5%. The original Bid amount is not changed; the 5% decrease is calculated only for the purposes of determining local preference. A Bidder who is a local business but not a Glades business and who utilizes Glades Sub-Contractor(s) for a minimum of 15% of the total Bid price, may receive a local preference of three (3) percent, solely for the purpose of determining Bid award. If the Local business utilizes Glades Sub-Contractor(s) for a minimum of 30% of the total Bid price, he may receive a local preference of four (4) percent for the purposes of ranking Bidders.

To receive either a Local Preference or a Glades Local Preference, a Bidder must have a permanent place of business in existence prior to the County's issuance of this Invitation for Bid. A Business Tax Receipt issued by the Palm Beach County Tax Collector is required, unless specifically exempted by law, and will be used to verify the Bidders' permanent place of business. A permanent place of business means that the Bidder's headquarters is located in Palm Beach County or in the Glades, as applicable; or the Bidder has a permanent office or other site in Palm Beach County or in the Glades, as applicable; where the Bidder will produce a substantial portion of the goods or services to be purchased. The Bidder must submit the attached Certification of Business Location at the time of Bid submission. Failure to submit this information will cause the Bidder to not receive a local preference. Palm Beach County may require a Bidder to provide additional information for clarification purposes at any time prior to the award of the Contract.

In procurements where price is the only factor for selection, the above provisions shall not be applied where the application would result in an award which exceeds the otherwise lowest, responsive Bidder by one hundred thousand dollars ($100,000).

The local Bidder may not receive more than one preference. The Glades Local Preference prevails over the Local Preference and the SBE Preference prevails over both the Local and Glades Local Preferences.

CERTIFICATION OF BUSINESS LOCATION

In accordance with the Palm Beach County Local Preference Ordinance, as amended, a preference will be given to: (1) those Bidders having a permanent place of business in Palm Beach County (County); and (2) those Bidders having a permanent place of business in the Glades providing goods or services to be utilized in the Glades. To receive a local preference, an interested Bidder must have a permanent place of business in the County or in the Glades, as applicable, prior to the County's issuance of an invitation for Bid. A Business Tax Receipt issued by the Palm Beach County Tax Collector is required, unless specifically exempted by law, and will be used to verify the Bidders' permanent place of business. The Bidder must submit this Certification of Business Location at the time of Bid submission. This Certification of Business Location is the sole determinant of local preference eligibility. Errors in the completion of this Certification or failure to submit this completed Certification will cause the Bidder to not receive a local preference. Please note that in order to receive a local preference, the name and address on the Business Tax Receipt must be the same name and address that is included in the Bid or Proposal submitted by the Bidder to the County.

1) Bidder is a:

_____ **Local Business** (A local business has a permanent place of business in Palm Beach County)

(Please indicate):
_____ Headquarters located in Palm Beach County.
_____ Permanent office or other site located in Palm Beach County from which a vendor will produce a substantial portion of the goods or services to be purchased.

_____ **Glades Business** (a Glades business has a permanent place of business in the Glades)

(Please indicate):
_____ Headquarters located in the Glades.
_____ Permanent office or other site located in the Glades from which a vendor will produce a substantial portion of the goods or services to be purchased.

✓ **Regional Business** (A regional business is one that has a permanent place of business in Martin, Broward, or Miami Dade County.)

A post office box or location at a postal service center is not acceptable.

2) The attached copy of the Bidder's Palm Beach County Business Tax Receipt verifies the Bidder's permanent place of business.

THIS CERTIFICATION is submitted by Michael Martinez
(Name of Individual)

President, of Horsepower Electric Inc.
(Title/Position) (Firm Name of Bidder/Proposer)

who hereby certifies that the information stated above is true and correct, and that the Bidder has a permanent place of business in Palm Beach County. Further it is hereby acknowledged that any misrepresentation by the Bidder on this Certification will be considered an unethical business practice and be grounds for sanctions against future County business with the Bidder.

Signature

03/15/2022
Date

PALM BEACH COUNTY
LIVING WAGE ORDINANCE

(PBC Ordinance No. 2003-004, as amended by PBC Ordinance No. 2004-002) (a.k.a., Palm Beach County Living Wage Ordinance, hereinafter Ordinance)

Implementation
This information shall serve to notify the Contractor of the Ordinance's implementation requirements as referenced in Section 4 of the Ordinance, as stated below and on the LW pages of this specification. A copy of the Ordinance is available for pickup at the Engineering & Public Works Department (Roadway Production Division).

The costs for implementing these requirements shall be incidental to the cost of the project.

Procurement Specifications
The Ordinance states that the living wage requirement shall be included in the procurement Specifications for all county construction contracts that have a total Contract value exceeding $100,000, and that is not subject to the Davis-Bacon Act or any related act or acts, as amended, that require the payment of Davis-Bacon Act wage rates.

The Ordinance also requires that the prospective non-county employer agree to produce, upon the request of the Construction Coordination Division, or as otherwise provided by the County Administrator through countywide policy, all documents and payroll records required under this Ordinance.

Maintenance of Payroll Records
Each non-county employer shall maintain payroll records and basic records relating thereto for each employee, and shall preserve them for a period of four (4) years, after Project completion date, or such longer time as may be required in other provisions of this Contract. The records shall contain:

(1) Each employee's name and address;
(2) Each employee's job title and classification;
(3) The number of hours worked each day by each employee;
(4) The gross wages and deductions made for each employee; and
(5) Annual wages paid to each employee.

Reporting Payroll
Every six (6) months the non-county employer shall certify and file with the Construction Coordination Division if the non-county employer is a general Contractor, or with the general Contractor if the non-county employer is a Sub-Contractor, certification that all non-county employees who worked on each construction Contract during the preceding six (6) month period were paid the living wage in compliance with this Ordinance. Upon the County's request, the non-county employer shall produce for inspection and copying the payroll records for any or all of its employees for the prior four (4) year period, or such longer time as may be required in other provisions of this Contract.

LIVING WAGE CERTIFICATION

Project: Annual Traffic Signal Construction Contract

Contractor Name: Horsepower Electric Inc.

Contact Person: Michael Martinez

Contractor Address: 8105 W 20 Ave
Hialeah FL 33014

Contractor Phone: 305-819-4060

Amount of Contract: $5,000,000

Please include the following with the Bid submission:

1. Brief description of the service provided under the construction Contract.

2. A statement of wage levels for prospective non-county employees.

3. A commitment to pay each non-county employee the living wage, as adjusted, in accordance with the Palm Beach County Living Wage Ordinance. According to Section 3(B)(2), of the Palm Beach County Living Wage Ordinance, the living wage must be adjusted annually for inflation, and this adjustment must take effect each October 1st. (See Palm Beach County Code Section 2-149(b)(2).)

The living wage for October 1, 2021, through September 30, 2022, is $12.99/hour.

The contractor/Sub-Contractor(s) shall post a copy of the following Notice to Employees (LW-3) at the work site in a prominent place where it can easily be seen by the employees, or provide a copy with the employee's first paycheck and at least every six (6) months thereafter.

The undersigned hereby certifies that the above and attached information is true and correct.

IN WITNESS THEREOF, the undersigned has set his hand and affixed the Corporate Seal this 15 day of March, 20 22.

(Corporate Seal)

(Authorized Signature)

Michael Martinez, President

(Print Name and Title)

LIVING WAGE ORDINANCE AND CERTIFICATIONS

Notice and Posting

Non-county employers shall post a copy of the following statement at the work site in a prominent place where it can easily be seen by the employees: "NOTICE TO EMPLOYEES: If you are employed to provide certain services to Palm Beach County, your employer may be required by Palm Beach County law to pay you at least **$12.99** per hour. If you are not paid this hourly rate, contact your supervisor or a lawyer." The following statement shall be printed in English, Spanish, and Creole, and shall be printed with black lettering on letter-size, white paper using a Times New Roman 14-point font, Courier New 14-point font, or Arial 14-point font. Posting requirement will not be required if the non-county employer attaches a copy of the following statement to the employee's first paycheck, and to subsequent paychecks at least every six (6) months thereafter. Non-county employers shall supply a copy of the following statement to any employee upon request within a reasonable time. Non-county employers shall forward a copy of the requirements of this ordinance to any person or business submitting a bid for a subcontract on any contract covered by this ordinance.

This notice is provided pursuant to the Palm Beach County Living Wage Ordinance, Section 3 (E), (as amended through January 2004), and reflects the adjusted living wage effective October 1, 2021, through September 30, 2022.

NOTICE TO EMPLOYEES (ENGLISH)

If you are employed to provide certain services to Palm Beach County, your employer may be required by Palm Beach County law to pay you at least $12.99 per hour. If you are not paid this hourly rate, contact your supervisor or Palm Beach County.

NOTIFICACIÓN A PATRONES (ESPAÑOL)

Si usted tiene un empleo por el cual provee ciertos servicios al Condado de Palm Beach, el Condado de Palm Beach puede requerir de su patrón que le pague a usted por lo menos $12.99 por hora. Si a usted no se le paga esta cantidad por hora, póngase en contacto con su supervisor o el Condado de Palm Beach.

AVI POU ENPLWAYE-YO (CREOLE)

Si ke ou enplwaye pou bay kek sévis pou Komin-n Palm Beach-la, Dapré la Lwa, Bos travay-la sipoze peye-w o mwen $12.99 pa lé. Si yo pa peye-w valé sa-a, se pou-w kontakte sipévize-w la o byen Komin-n Palm Beach-la.

(Authorized Signature)

Michael Martinez, President

(Print Name and Title)

CERTIFICATION OF COMPLIANCE WITH THE LIVING WAGE ORDINANCE

The Ordinance states: "Every six (6) months the non-county employer shall certify and file with the Construction Coordination Division if the non-county employer is a general Contractor, or with the general Contractor if the non-county employer is a Sub-Contractor, certification that all non-county employees who worked on each construction Contract during the preceding six (6) month period were paid the living wage in compliance with the Living Wage Ordinance. Upon the County's request, the non-county employer shall produce for inspection and copying the payroll records for any or all of its employees for the prior three (3) year period."

The County further requires that the Contractor submit this certification statement with each pay application, including the final, on company letterhead.

The undersigned authorized person hereby certifies that the above requirements are adhered to and that payroll records are being maintained in accordance with the requirements of LW-1 "Maintenance of Payroll Records".

03/15/2022

Date

Horsepower Electric Inc.

Company Name (Print)

Michael Martinez, President

Authorized Officer: Name/Title (Print)

Signature

SCRUTINIZED COMPANIES

As provided in F.S. 287.135, by entering into this Contract or performing any Work in furtherance hereof, the CONTRACTOR certifies that it, its affiliates, suppliers, Sub-Contractors and consultants who will perform hereunder, have not been placed on the Scrutinized Companies that boycott Israel List, or is engaged in a boycott of Israel, pursuant to F.S. 215.4725. Pursuant to F.S. 287.135(3)(b), if CONTRACTOR is found to have been placed on the Scrutinized Companies that Boycott Israel List or is engaged in a boycott of Israel, this Contract may be terminated at the option of the COUNTY.

When Contract value is greater than $1 million: As provided in F.S. 287.135, by entering into this Contract or performing any Work in furtherance hereof, the CONTRACTOR certifies that it, its affiliates, suppliers, Sub-Contractors and consultants who will perform hereunder, have not been placed on the Scrutinized Companies With Activities in Sudan List or Scrutinized Companies With Activities in The Iran Petroleum Energy Sector List created pursuant to F.S. 215.473 or is engaged in business operations in Cuba or Syria.

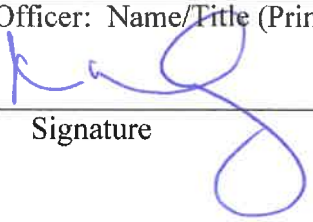
If the County determines, using credible information available to the public, that a false certification has been submitted by CONTRACTOR, this Contract may be terminated and a civil penalty equal to the greater of $2 million or twice the amount of this Contract shall be imposed, pursuant to F.S. 287.135. Said certification must also be submitted at the time of Contract renewal, if applicable.

The undersigned authorized person hereby has read and certifies that the above is adhered to.

03/15/2022
Date

Horsepower Electric Inc.
Company Name (Print)

Michael Martinez, President
Authorized Officer: Name/Title (Print)



Signature

BID BOND

STATE OF FLORIDA)
) ss.
COUNTY OF PALM BEACH)

KNOW ALL MEN BY THESE PRESENTS: That we, **Horsepower Electric, Inc.** (Principal), and **Endurance Assurance Corporation** as Surety (Surety) are held and firmly bound unto Palm Beach County, a Political Subdivision of the State of Florida, (County) in the amount of Five (5%) percent of bid, lawful money of the United States of America, 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;

WHEREAS, the Principal contemplates submitting or has submitted a bid to the Board of County Commissioners, Palm Beach County, Florida, for furnishing and paying for all necessary labor Materials, Equipment, machinery, tools, apparatus, services, all State Workers' Compensation and unemployment compensation taxes incurred in the performance of the Contract, means of transportation for and complete Construction of: **ANNUAL TRAFFIC SIGNAL CONSTRUCTION CONTRACT, PROJECT NO. 2022052,** in the County of Palm Beach, State of Florida; and

WHEREAS, it was a condition precedent to the submission of said bid that a cashier's check or bid bond in the amount of five percent (5%) of the total bid amount be submitted with said bid as a guarantee that the Bidder would, if given a letter of Intent to Award the Contract, enter into a written contract with the County, and furnish a Public Construction Bond as required in sections 3-5 and 3-6 of the General Provisions within fourteen (14) consecutive business days of the date of the letter of the Intent to Award Contract.

NOW, THEREFORE, THE CONDITIONS OF THIS OBLIGATION ARE SUCH, that, if the bid of the Principal be accepted and Principal, within **fourteen (14) consecutive business days** after the date of the Letter of Intent to Award, the letter being written notice of such acceptance, enter into a written contract with Palm Beach County, a Political Subdivision of the State of Florida, and furnish a Certificate of Insurance, and a Public Construction Bond in the form included in the Bid Documents and in an amount equal to One Hundred Per Cent (100%) of the total contract amount satisfactory, to

BID BOND

Palm Beach County, a Political Subdivision of the State of Florida, then this obligation shall be void, otherwise the sum herein stated shall be due and payable to the County, and the Surety agrees to pay said sum immediately upon demand of the County, in good and lawful money of the United States of America, as liquidated damages for failure of the Principal.

IN WITNESS WHEREOF, **Horsepower Electric, Inc.** as Principal herein, has caused these presents to be signed in its name, by its **President**, and attested by its **Secretary**, under its corporate seal, and **Endurance Assurance Corporation**, as Surety herein, has caused these presents to be signed in its name, by its **Attorney-in-Fact**, under its corporate seal, this **14th** day of **March**, A.D., 20**22**.

ATTEST: **(Seal)**

(Signature)

By: _____

(Principal) **Horsepower Electric, Inc.**

Lis Mondelo
(Print Name)

Michael Martinez
(Print Name)

Secretary
(Title)

President
(Title)

ATTEST: **(Seal)**

(Signature)

By: _____

(Surety) **Endurance Assurance Corporation**

Tina Mangum
(Print Name)

Roberto Menendez
(Print Name)

Vice President
(Title)

Attorney-in-Fact
(Title)

SOMPO INTERNATIONAL
INSURANCE

11947

POWER OF ATTORNEY

KNOW ALL BY THESE PRESENTS, that **Endurance Assurance Corporation**, a Delaware corporation, **Endurance American Insurance Company**, a Delaware corporation, **Lexon Insurance Company**, a Texas corporation, and/or **Bond Safeguard Insurance Company**, a South Dakota corporation, each, a "Company" and collectively, "**Sompo International**," do hereby constitute and appoint: **Dirk Douglas DeJong, Roberto Carlos Menendez, Tina Mangum** as true and lawful Attorney(s)-In-Fact to make, execute, seal, and deliver for, and on its behalf as surety or co-surety; bonds and undertakings given for any and all purposes, also to execute and deliver on its behalf as aforesaid renewals, extensions, agreements, waivers, consents or stipulations relating to such bonds or undertakings provided, however, that no single bond or undertaking so made, executed and delivered shall obligate the Company for any portion of the penal sum thereof in excess of the sum of **Ten Million Dollars ($10,000,000.00).**

Such bonds and undertakings for said purposes, when duly executed by said attorney(s)-in-fact, shall be binding upon the Company as fully and to the same extent as if signed by the President of the Company under its corporate seal attested by its Corporate Secretary.

This appointment is made under and by authority of certain resolutions adopted by the sole shareholder of each Company by unanimous written consent effective the 15th day of June, 2019, a copy of which appears below under the heading entitled "Certificate".

This Power of Attorney is signed and sealed by facsimile under and by authority of the following resolution adopted by the sole shareholder of each Company by unanimous written consent effective the 15th day of June, 2019 and said resolution has not since been revoked, amended or repealed:

RESOLVED, that the signature of an individual named above and the seal of the Company may be affixed to any such power of attorney or any certificate relating thereto by facsimile, and any such power of attorney or certificate bearing such facsimile signature or seal shall be valid and binding upon the Company in the future with respect to any bond or undertaking to which it is attached.

IN WITNESS WHEREOF, each Company has caused this instrument to be signed by the following officers, and its corporate seal to be affixed this 15th day of June, 2019.

Endurance Assurance Corporation
By: Richard M Appel
Richard Appel; SVP & Senior Counsel

Endurance American Insurance Company
By: Richard M Appel
Richard Appel; SVP & Senior Counsel

Lexon Insurance Company
By: Richard M Appel
Richard Appel; SVP & Senior Counsel

Bond Safeguard Insurance Company
By: Richard M Appel
Richard Appel; SVP & Senior Counsel

ACKNOWLEDGEMENT

On this 15th day of June, 2019, before me, personally came the above signatories known to me, who being duly sworn, did depose and say that he/they is an officer of each of the Companies; and that he executed said instrument on behalf of each Company by authority of his office under the by-laws of each Company.

By: Amy Taylor
Amy Taylor, Notary Public – My Commission Expires 5/9/23

CERTIFICATE

I, the undersigned Officer of each Company, DO HEREBY CERTIFY that:

1. That the original power of attorney of which the foregoing is a copy was duly executed on behalf of each Company and has not since been revoked, amended or modified; that the undersigned has compared the foregoing copy thereof with the original power of attorney, and that the same is a true and correct copy of the original power of attorney and of the whole thereof;
2. The following are resolutions which were adopted by the sole shareholder of each Company by unanimous written consent effective June 15, 2019 and said resolutions have not since been revoked, amended or modified:

   "RESOLVED, that each of the individuals named below is authorized to make, execute, seal and deliver for and on behalf of the Company any and all bonds, undertakings or obligations in surety or co-surety with others: RICHARD M. APPEL, BRIAN J. BEGGS, CHRISTOPHER DONELAN, SHARON L. SIMS, CHRISTOPHER L. SPARRO, MARIANNE L. WILBERT

   ; and be it further

   RESOLVED, that each of the individuals named above is authorized to appoint attorneys-in-fact for the purpose of making, executing, sealing and delivering bonds, undertakings or obligations in surety or co-surety for and on behalf of the Company."
3. The undersigned further certifies that the above resolutions are true and correct copies of the resolutions as so recorded and of the whole thereof.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the corporate seal this 14th day of March, 2022.

By: Daniel S. Lurie, Secretary

NOTICE: U. S. TREASURY DEPARTMENT'S OFFICE OF FOREIGN ASSETS CONTROL (OFAC)

No coverage is provided by this Notice nor can it be construed to replace any provisions of any surety bond or other surety coverage provided. This Notice provides information concerning possible impact on your surety coverage due to directives issued by OFAC. **Please read this Notice carefully.**

The Office of Foreign Assets Control (OFAC) administers and enforces sanctions policy, based on Presidential declarations of "national emergency". OFAC has identified and listed numerous foreign agents, front organizations, terrorists, terrorist organizations, and narcotics traffickers as "Specially Designated Nationals and Blocked Persons". This list can be located on the United States Treasury's website – https://www.treasury.gov/resource-center/sanctions/SDN-List.

In accordance with OFAC regulations, if it is determined that you or any other person or entity claiming the benefits of any coverage has violated U.S. sanctions law or is a Specially Designated National and Blocked Person, as identified by OFAC, any coverage will be considered a blocked or frozen contract and all provisions of any coverage provided are immediately subject to OFAC. When a surety bond or other form of surety coverage is considered to be such a blocked or frozen contract, no payments nor premium refunds may be made without authorization from OFAC. Other limitations on the premiums and payments may also apply.

CERTIFICATE OF RESOLUTION

The undersigned hereby certifies that the following are true and correct statements:

1. That the undersigned is the President *(insert title)* of Horsepower Electric Inc. *(insert business name)* a corporation *(insert business organization, i.e. corporation, LLC, LLP)*, organized and existing in good standing under the laws of the State of FL *(Firm)*, and that the following Resolutions are true and correct Resolutions adopted by the Director *(insert form of management)* of the Firm on the 23 day of Sept, 2022, in accordance with the laws of the State of FL *(where Firm is organized)* of the Firm, and Division of Corporations *(governing documents)* of the Firm.

RESOLVED, that the Firm shall enter into that certain Contract between Palm Beach County, a political subdivision of the State of Florida, and the Firm, a copy of which is attached hereto, and be it

FURTHER RESOLVED, that Michael Martinez, the President of the Firm, is hereby authorized and instructed to execute such Contract and such other instruments as may be necessary and appropriate for the Firm to fulfill its obligations under the Contract.

2. That the foregoing Resolutions have not been modified, amended, rescinded, revoked or otherwise changed and remain in full force and effect as of the date hereof.

3. That the Firm is in good standing under the laws of the State of Florida or its state of formation, as provided above, and has qualified, if legally required, to do business in the State of Florida and has the full power and authority to enter into such Contract.

IN WITNESS WHEREOF, the undersigned has set his/her hand and affixed the Seal of the Firm the 15 day of March, 2022,

(SEAL)

_____
(Signature)

Michael Martinez, President
(Print Name and Title)

STATE OF FL
COUNTY OF Dade

The foregoing instrument was acknowledged before me by means of ☑ physical presence or ☐ online notarization, this 15 day of March, 2022, by Michael Martinez *(name)* as President *(title)* for Horsepower Electric Inc. *(firm)*, on behalf of the *(choose one)* corporation / company / partnership, who is ☑ personally known to me or ☐ has produced N/A (type of identification) as identification.

LIS MONDELO
Notary Public - State of Florida
Commission # HH 198257
My Comm. Expires Nov 14, 2025
Bonded through National Notary Assn.

_____
(Notary Signature)

(Stamp/Seal)

Notary Public, State of FL

Lis Mondelo
(Print Notary Name)

Commission Number _____
My Commission Expires _____

CONTRACT

STATE OF FLORIDA)

) ss.

COUNTY OF PALM BEACH)

R2022 0792

AUG 2 3 2022

This Contract, made and entered into on _____, by and between PALM BEACH COUNTY, a Political Subdivision of the State of Florida, by and through its Board of County Commissioners (hereinafter "County"), and HORSEPOWER ELECTRIC, INC., Florida, and its heirs, executors, administrators and assigns, (hereinafter "Contractor"):

WITNESSETH: The Contractor agrees with the County, for the consideration herein mentioned at its own proper cost and expense to do all the Work and furnish all necessary labor, Materials, Equipment, machinery, tools, apparatus, services, state Workers' Compensation and unemployment compensation taxes incurred in the performance of the Contract, and means of transportation for the complete construction of:

PROJECT NAME: ANNUAL TRAFFIC SIGNAL CONSTRUCTION CONTRACT

PROJECT NO.: 2022052

IN THE AMOUNTS specified in Work Orders which may be issued by the County. The County is not required to issue any Work Orders hereunder. The total value of Work Orders issued under this Contract shall not exceed **Five Million Dollars ($5,000,000.00)**, except as may be increased according to Section 9-11 of the Contract Specifications.

The Contractor further agrees for the consideration herein mentioned to commence Work with adequate forces and Equipment within five (5) Working Days of the Notice To Commence for the Work Order being issued for a specific project and to fully complete all contracted Work under the same in accordance with Contract Documents. After commencement of the Work, the Work Order shall be properly dispatched toward completion, to the satisfaction of the Engineer, and shall be fully complete within the time limit specified in the Work Order. Should the time limit for completion of the Work Order exceed the expiration date of the Contract, the Work Order Work will continue to completion and the Contractor shall ensure that Bonding and Insurance coverage do not expire until all Work Orders issued prior to the expiration of this Contract are complete and accepted. It is understood and agreed that the time limit for completion of said Work is the essence of the Contract. If Contractor fails to complete the Work within the time limit, it is agreed that for such Calendar Day that any Work provided for in these Contract Documents remain incomplete after the time limit has expired, including any official extension of the time limit, the sum per day given in the contained schedules shall be deducted from monies due the Contractor, not as a penalty, but as liquidated damages and added expense for supervision.

CONTRACT

The Contractor shall take into account all contingent Work which has to be done by other parties arising from any cause whatsoever, and shall not plead its want of knowledge of such contingent Work as an excuse for Delay in a Contractor's Work, or for its non-performance.

IN WITNESS WHEREOF, the Parties have caused this Contract for ANNUAL TRAFFIC SIGNAL CONSTRUCTION CONTRACT, Project No. 2022052 to be executed and sealed the day and year first written above.

OWNER:

APPROVED AS TO TERMS
AND CONDITIONS

By: Katie O'Farrell
for Morton L. Rose, P.E.
Director of Roadway Production

CONTRACTOR:
HORSEPOWER ELECTRIC, INC.

By: _____
(Signature)

Horsepower Electric Inc.
(Corporate Name)

a FL corporation
(insert state of incorporation)

Michael Martinez
(Print signatory's name)

President
(Print signatory's title)

5/9/2022
(Date)

ATTEST WITNESS:

_____
(Witness Signature)

Lis Mondelo
(Print Witness Name)

_____
(Witness Signature)

Julio Mondelo
(Print Witness Name)

(Corporate Seal)

{SIGNATURE PAGES CONTINUED}

ATTEST:

Joseph Abruzzo,
Clerk of the Circuit Court & Comptroller

By: _____
Deputy Clerk

APPROVED AS TO FORM
AND LEGAL SUFFICIENCY

By: _____
Yelizaveta B. Herman
Assistant County Attorney

COUNTY:

R2022 0792
AUG 23 2022

Palm Beach County, a Political Subdivision of the State of Florida, by and through its Board of County Commissioners

By: _____
Robert S. Weinroth, Mayor

PUBLIC CONSTRUCTION BOND

BOND NUMBER: EACX4004435

BOND AMOUNT: $5,000,000.00

CONTRACT AMOUNT: $5,000,000

CONTRACTOR'S NAME: Horsepower Electric, Inc.

CONTRACTOR'S ADDRESS: 8105 W. 20th Avenue
Hialeah, FL 33014

CONTRACTOR'S PHONE: 305-819-4060

SURETY COMPANY: Endurance Assurance Corporation

SURETY ADDRESS: 4 Manhattanville Road, 3rd Floor
Purchase, NY 10577

SURETY PHONE: 615-553-9500

OWNER'S NAME: Palm Beach County

OWNER'S ADDRESS: 2300 North Jog Road, Suite 3W-33
West Palm Beach, FL 33411-2745

OWNER'S PHONE: 561-684-4150

PROJECT NO.: 2022052

DESCRIPTION OF WORK: Countywide traffic signal construction, installation and repairs.

PROJECT LOCATION: Countywide

LEGAL DESCRIPTION: No legal description is available. The best description available is as indicated on the Project Location above.

PUBLIC CONSTRUCTION BOND

This Bond is issued in favor of the County conditioned on the full and faithful performance of the Contract.

KNOW ALL MEN BY THESE PRESENTS: that Contractor (Principal) and Surety, are held and firmly bound unto:

Palm Beach County Board of County Commissioners
301 N. Olive Avenue
West Palm Beach, Florida 33401

As Obligee, herein called County, for the use and benefit of claimant as herein below defined, in the amount of:

$5,000,000.00

For the payment whereof Principal and Surety bind themselves, their heirs, personal representatives, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, Principal has by written agreement dated AUG 2 3 2022, 20____, entered into a Contract with the County for:

Project Name:	ANNUAL TRAFFIC SIGNAL CONSTRUCTION CONTRACT
Project No.:	2022052
Project Description:	See Page PCB-1
Project Location:	See Page PCB-1

in accordance with Design Criteria Drawings and Specifications prepared by:

Name of Engineering/Architectural Firm:	TBD
Location of Firm:	TBD
Phone:	TBD
Fax :	TBD

which Contract is by reference made a part hereof in its entirety, and is hereinafter referred to as the Contract.

THE CONDITION OF THIS BOND is that if Principal:

1. Performs the Contract dated AUG 2 3 2022 between Principal and County for the construction of the project as described above, the Contract being made part of this bond by reference, at the times and in the manner prescribed in the Contract; and

2. Promptly makes payments to all claimants, as defined in Section 255.05, Florida Statutes, supplying Principal with labor, Materials, or supplies, used directly or indirectly by Principal in the prosecution of the Work provided for in the Contract; and

3. Pays County all losses, damages (including liquidated damages), expenses, costs, and attorney's fees, including appellate proceedings, that County sustains because of a default by Principal under the Contract; and

4. Performs the guarantee of all Work and Materials furnished under the Contract for the time specified in the Contract, then this bond is void; otherwise it remains in full force.

PUBLIC CONSTRUCTION BOND

5. Any changes in or under the contract documents and compliance or noncompliance with any formalities connected with the contract or the changes does not affect Surety's obligation under this bond and Surety waives notice of such changes.

6. The amount of this bond shall be reduced by and to the extent of any payment or payments made in good faith hereunder, inclusive of the payment by Surety of construction liens which may be filed of record against said improvement, whether or not claim for the amount of such lien be presented under and against the bond.

7. Principal and Surety expressly acknowledge that any and all provisions relating to consequential, delay and liquidated damages contained in the contract are expressly covered by and made a part of this Performance, Labor and Material Payment Bond. Principal and Surety acknowledge that any such provisions lie within their obligations and within the policy coverages and limitations of this instrument.

8. Section 255.05, Florida Statutes, as amended, together with all notice and time provisions contained therein, is incorporated herein, by reference, in its entirety. Any action instituted by a claimant under this bond for payment must be in accordance with the notice and time limitation provisions in Section 255.05(2), Florida Statutes. This instrument regardless of its form, shall be construed and deemed a statutory bond issued in accordance with Section 255.05, Florida Statutes.

9. Any action brought under this instrument shall be brought in the state court of competent jurisdiction in Palm Beach County and not elsewhere.

(Seal)

ATTEST: _____
(Signature)

Lis Mondelo
(Print Name)

Secretary
(Title)

By: _____
(Principal) Horsepower Electric, Inc.

Michael Martinez
(Print Name)

President
(Title)

(Seal)

ATTEST: _____
(Signature)

Tina Mangum
(Print Name)

Vice President
(Title)

By: _____
(Surety) Endurance Assurance Corporation

Roberto Menendez
(Print Name)

Attorney-in-Fact
(Title)

PUBLIC CONSTRUCTION BOND

PROJECT NO.: 2022052

DESCRIPTION OF WORK: Traffic signal construction, installation and/or repair, on a work order basis, Countywide.

PROJECT LOCATION: Countywide

SURETY COMPANY: Endurance Assurance Corporation

SURETY ADDRESS: 4 Manhattanville Road, 3rd Floor
Purchase, NY 10577

SURETY PHONE: 615-553-9500

BOND NUMBER: EACX4004435

BOND AMOUNT: $5,000,000.00

CONTRACT AMOUNT: $5,000,000

As the Surety Company for Horsepower Electric, Inc. we have executed the captioned bond. Because the contract date is unknown, we have left the bond(s) undated. As a duly authorized Attorney-in-Fact for the Surety, Endurance Assurance Corporation, permission is hereby granted to Palm Beach County to fill in the contract date on the bond(s) and power of attorney when that date is known. Also, the "signed and sealed" date on the bond(s) should be completed.

SOMPO INTERNATIONAL
INSURANCE

11947

POWER OF ATTORNEY

KNOW ALL BY THESE PRESENTS, that **Endurance Assurance Corporation**, a Delaware corporation, **Endurance American Insurance Company**, a Delaware corporation, **Lexon Insurance Company**, a Texas corporation, and/or **Bond Safeguard Insurance Company**, a South Dakota corporation, each, a "Company" and collectively, **"Sompo International,"** do hereby constitute and appoint: **Dirk Douglas DeJong, Roberto Carlos Menendez, Tina Mangum** as true and lawful Attorney(s)-In-Fact to make, execute, seal, and deliver for, and on its behalf as surety or co-surety; bonds and undertakings given for any and all purposes, also to execute and deliver on its behalf as aforesaid renewals, extensions, agreements, waivers, consents or stipulations relating to such bonds or undertakings provided, however, that no single bond or undertaking so made, executed and delivered shall obligate the Company for any portion of the penal sum thereof in excess of the sum of **Ten Million Dollars ($10,000,000.00).**

Such bonds and undertakings for said purposes, when duly executed by said attorney(s)-in-fact, shall be binding upon the Company as fully and to the same extent as if signed by the President of the Company under its corporate seal attested by its Corporate Secretary.

This appointment is made under and by authority of certain resolutions adopted by the sole shareholder of each Company by unanimous written consent effective the 15th day of June, 2019, a copy of which appears below under the heading entitled "Certificate".

This Power of Attorney is signed and sealed by facsimile under and by authority of the following resolution adopted by the sole shareholder of each Company by unanimous written consent effective the 15th day of June, 2019 and said resolution has not since been revoked, amended or repealed:

RESOLVED, that the signature of an individual named above and the seal of the Company may be affixed to any such power of attorney or any certificate relating thereto by facsimile, and any such power of attorney or certificate bearing such facsimile signature or seal shall be valid and binding upon the Company in the future with respect to any bond or undertaking to which it is attached.

IN WITNESS WHEREOF, each Company has caused this instrument to be signed by the following officers, and its corporate seal to be affixed this 15th day of June, 2019.

Endurance Assurance Corporation
By: Richard M Appel
Richard Appel; SVP & Senior Counsel

Endurance American Insurance Company
By: Richard M Appel
Richard Appel; SVP & Senior Counsel

Lexon Insurance Company
By: Richard M Appel
Richard Appel; SVP & Senior Counsel

Bond Safeguard Insurance Company
By: Richard M Appel
Richard Appel; SVP & Senior Counsel

ACKNOWLEDGEMENT

On this 15th day of June, 2019, before me, personally came the above signatories known to me, who being duly sworn, did depose and say that he/they is an officer of each of the Companies; and that he executed said instrument on behalf of each Company by authority of his office under the by-laws of each Company.

By: Amy Taylor
Amy Taylor, Notary Public - My Commission Expires 5/9/23

CERTIFICATE

I, the undersigned Officer of each Company, DO HEREBY CERTIFY that:

1. That the original power of attorney of which the foregoing is a copy was duly executed on behalf of each Company and has not since been revoked, amended or modified; that the undersigned has compared the foregoing copy thereof with the original power of attorney, and that the same is a true and correct copy of the original power of attorney and of the whole thereof;
2. The following are resolutions which were adopted by the sole shareholder of each Company by unanimous written consent effective June 15, 2019 and said resolutions have not since been revoked, amended or modified:

   "RESOLVED, that each of the individuals named below is authorized to make, execute, seal and deliver for and on behalf of the Company any and all bonds, undertakings or obligations in surety or co-surety with others: RICHARD M. APPEL, BRIAN J. BEGGS, CHRISTOPHER DONELAN, SHARON L. SIMS, CHRISTOPHER L. SPARRO, MARIANNE L. WILBERT

   ; and be it further

   RESOLVED, that each of the individuals named above is authorized to appoint attorneys-in-fact for the purpose of making, executing, sealing and delivering bonds, undertakings or obligations in surety or co-surety for and on behalf of the Company."
3. The undersigned further certifies that the above resolutions are true and correct copies of the resolutions as so recorded and of the whole thereof.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the corporate seal this _____ day of _____, 20_____.

By:
Daniel S. Lurie, Secretary

NOTICE: U. S. TREASURY DEPARTMENT'S OFFICE OF FOREIGN ASSETS CONTROL (OFAC)

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In accordance with OFAC regulations, if it is determined that you or any other person or entity claiming the benefits of any coverage has violated U.S. sanctions law or is a Specially Designated National and Blocked Person, as identified by OFAC, any coverage will be considered a blocked or frozen contract and all provisions of any coverage provided are immediately subject to OFAC. When a surety bond or other form of surety coverage is considered to be such a blocked or frozen contract, no payments nor premium refunds may be made without authorization from OFAC. Other limitations on the premiums and payments may also apply.

FRANK H. Furman INC.

INSURANCE
RISK MANAGEMENT
EMPLOYEE BENEFITS

- C. ercial Insurance Programs
- Contractors Insurance Programs
- Captive Insurance Programs
- OSHA Compliance
- Claims Management
- Loss Control
- Human Resources Consulting
- Construction Bonds
- Employee Group Benefits
- Personal Insurance

May 5, 2022

Palm Beach County Board of County Commissioners
c/o Engineering Department
2300 N. Jog Road, 3rd Floor West
West Palm Beach, FL 33411

Re: **Horsepower Electric, Inc.**
8105 W. 20th Avenue
Hialeah, FL 33014
Project #2022052 - Annual Traffic Signal Contract
Contract /Bond Amount: $5,000,000
Bond No. EACX4004435

To Whom It May Concern:

We are the Surety Advisors for Horsepower Electric Inc.'s Surety program handled by Endurance Assurance Corporation.

This letter will serve as written authorization granting Palm Beach County Board of County Commissioners (Owner) to "date" the Surety Performance & Payment Bond and Power of Attorney issued by Endurance Assurance Corporation under Bond No. EACX4004435 for the above referenced contract.

Please feel free to contact me directly if we could be of any further assistance

Sincerely,

Roberto Menendez
Attorney-in-Fact
Roberto@furmaninsurance.com

PC-1

OEBO SCHEDULE 3
SUBCONTRACTOR ACTIVITY FORM

SUBCONTRACTOR ACTIVITY FOR MONTH ENDING _____ PROJECT #: _____

PROJECT NAME _____

PRIME CONTRACTOR NAME _____

PROJECT SUPERVISOR _____

Schedule 3 is used to show the monthly payment activity for work performed by each Subcontractor on the project and in conformity with the Subcontractor(s) submitted on Schedule 2. It also shows approved change orders as they impact all Subcontractors. Schedule 3 is to be submitted by the Prime Contractor with each payment request to Palm Beach County. In the Subcontracting Information section, list the name(s) of each Subcontractor, including each S/M/WBE subcontractor on the project and the total contracted amount for each Subcontractor on the project. As the project proceeds, please complete each column under the Subcontractor Information section. If a subcontractor is an S/M/WBE, please check the appropriate categories applicable.

SUBCONTRACTING INFORMATION								Subcontractor Category (check all applicable)						
Name of Subcontractor(s)	Total Contract Amount	Approved Change Orders	Revised Contract Amount	Amount drawn for Sub this Period	Amount drawn for Sub to Date	Amount Paid to Date for Subcontractor	Actual Starting Date	Minority/ Women Business (√)	Small Business (√)	Black (√)	Hispanic (√)	Women (√)	Caucasian (√)	Other (Please Specify) (√)

I hereby certify that the above information is accurate to the best of my knowledge _____ (Signature) _____ (Title)

Additional Sheets May Be Used As Necessary

NOTE: Firms may be certified as an SBE and/or an M/WBE. If firms are certified as both an SBE and M/WBE, the dollar amount will not be counted twice.

OEBO SCHEDULE 4 – SUBCONTRACTOR/SUBCONSULTANT PAYMENT CERTIFICATION

A properly executed Schedule 4 shall be submitted for each Subcontractor/subconsultant after receipt of payment from the Prime. The Prime shall submit this form with each payment application or invoice submitted to the County when the COUNTY has paid the Prime on the previous payment application for services provided by a Subcontractor/subconsultant. All named Subcontractors/subconsultants on this form must also complete and submit a separate Schedule 4 after receipt of payment. If the Prime is an S/M/WBE, completion of a Schedule 4 is also required to document all portions of work performed by their work force. **A completed release of lien form can be submitted in lieu of a Schedule 4.**

This is to certify that _____ received a
(Subcontractor/subconsultant Name)

(Monthly) or (Final) payment of $ _____ from _____
(Prime Contractor Name)

On _____/_____/_____ for my _____ Invoice for labor and/or materials supplied
MM DD YYYY Month

On _____/_____
(Project Name) (Project No.)

DEPT.: _____ TASK ORDER/WORK ORDER/DELIVERY ORDER/PURCHASE ORDER/ NO.: _____

PRIME CONTRACTOR/CONSULTANT VENDOR CODE: _____

SUBCONTRACTOR/SUBCONSULTANT VENDOR CODE: _____

If the undersigned intends to distribute any portion of this payment to another Subcontractor/subconsultant, please list the business name and the amount below accompanied by a separate properly executed Schedule 4.

_____ Price or Percentage: _____
Name of 2nd/3rd tier Subcontractor/subconsultant

By: _____ _____
(Signature of Subcontractor/subconsultant) (Name & Title of Person executing on behalf of Subcontractor/ subconsultant)

STATE OF FLORIDA
COUNTY OF _____

The foregoing instrument was acknowledged before me by means of ☐ physical presence or ☐ online notarization, this _____ day of _____, _____(year), by _____(name of person acknowledging).

_____
Notary Public, State of Florida

_____
Print, Type or Stamp Commissioned Name of Notary

Personally Known ____ OR Produced Identification _____ Type of Identification _____

Revised 12/31/2019

CERTIFICATION OF SUBLET WORK

PALM BEACH COUNTY ENGINEERING AND PUBLIC WORKS DEPARTMENT

ROADWAY CONSTRUCTION SITES
ANNUAL TRAFFIC SIGNAL CONSTRUCTION CONTRACT
PALM BEACH COUNTY PROJECT NO. 2022052

Pursuant to section 8-1 of the Florida Department of Transportation Standard Specifications for Road and Bridge Construction the Contractor shall "not, sell, transfer, assign or otherwise dispose of the Contract or Contracts or any portion thereof, or of the right, title, or interest therein, without written consent of the Department. If the Contractor chooses to sublet any portion of the Contract, the Contractor must submit a written request to sublet work on the Certification of Sublet Work form developed by the Department for this purpose. With the Engineer's acceptance of the request, the Contractor may sublet a portion of the work, but **shall perform with its own organization work amounting to not less than 40% of the total Contract amount**."

Sub-Contractor Name	Sub-contract to Whom	Work Description	Total Amt. Sublet
AVM Const.	Horsepower	Traffic Signal Work	25 %

All pertinent provisions and requirements of the Contract Documents will be part of any subcontracts. It is agreed that an executed or a certified copy of the subcontract will be submitted upon request, to Palm Beach County (County). All sublets will be in continued compliance with all Contract provisions and that the Contractor will continue to perform the minimum percentage of the Contract Work with its own organization, as required by said Contract. It is recognized and agreed that, as Contractor, the Contractor remains responsible for the proper performance of all requirements of said contract and the County does not relieve or release the Contractor and its Surety or either of them of any liability under the Contract Bond. The Contractor certifies that firms or individuals, debarred or suspended by the FHWA or the County, are not being used as Sub-Contractors. A false statement or omission made in connection with this certification is sufficient cause for suspension, revocation, or denial of qualification to bid, and a determination of non-responsibility, and may subject the person and/or entity making the false statement to any and all civil and criminal penalties available pursuant to applicable Federal and State Law.

Company Name: Horsepower Electric Inc.

Authorized Officer: Michael Martinez
(Print)

Address: 8105 W 20 Ave
Hialeah FL 33014

Signature:

ACORD®

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)
07/15/2022

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

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

PRODUCER Frank H. Furman, Inc. 1314 East Atlantic Blvd. P. O. Box 1927 Pompano Beach FL 33061	**CONTACT NAME:** Roberto Menendez **PHONE (A/C, No, Ext):** (954) 943-5050 **FAX (A/C, No):** **E-MAIL ADDRESS:** roberto@furmaninsurance.com
INSURED Horsepower Electric Inc 8105 W 20th Ave Hialeah FL 33014	**INSURER(S) AFFORDING COVERAGE** — **NAIC #** **INSURER A :** Admiral Insurance Co (rl) — 24856 **INSURER B :** Zurich American Insurance Company — 16535z **INSURER C :** Landmark American Insurance Company — 33138 **INSURER D :** Indian Harbor Insurance Company — 36940 **INSURER E :** **INSURER F :**

COVERAGES **CERTIFICATE NUMBER:** 22 Prof/AU/WC/ 22 GL/UMB **REVISION NUMBER:**

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

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	[X] COMMERCIAL GENERAL LIABILITY [ ] CLAIMS-MADE [X] OCCUR [X] XCU Broad Form PD [X] Contractual Liability Applies GEN'L AGGREGATE LIMIT APPLIES PER: [ ] POLICY [X] PRO-JECT [ ] LOC [ ] OTHER:	Y		CA00003519804	07/16/2022	07/16/2023	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG Employee Benefits	$ 1,000,000 $ 100,000 $ EXCLUDED $ 1,000,000 $ 2,000,000 $ 2,000,000 $ 1,000,000
B	AUTOMOBILE LIABILITY [X] ANY AUTO [ ] OWNED AUTOS ONLY [ ] SCHEDULED AUTOS [ ] HIRED AUTOS ONLY [ ] NON-OWNED AUTOS ONLY			BAP011393607	03/31/2022	03/31/2023	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident) Uninsured motorist	$ 1,000,000 $ $ $ $ 50,000
C	[X] UMBRELLA LIAB [ ] OCCUR [ ] EXCESS LIAB [ ] CLAIMS-MADE [ ] DED [ ] RETENTION $			LHA098752	07/16/2022	07/16/2023	EACH OCCURRENCE AGGREGATE	$ 5,000,000 $ 5,000,000 $
B	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) Y/N: N If yes, describe under DESCRIPTION OF OPERATIONS below	N / A		WC011393508	03/31/2022	03/31/2023	[X] PER STATUTE [ ] OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	 $ 1,000,000 $ 1,000,000 $ 1,000,000
D	Professional Liability & Contractors Pollution Liability			PEC005358203	02/04/2022	02/04/2023	Each Claim Aggregate	$5,000,000 $5,000,000

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

Palm Beach County Board of County Commissioners, A Political Subdivision of The State of Florida, Its Officers, Employees, and Agents is endorsed as an additional insured on commercial general liability (and umbrella liability, if applicable).

Contractual liability coverage is applicable to the indemnification/hold harmless provision of article 7-12.1.

Note: Other entities in the right of way are to be listed individually as additionally insured.
RE: PROJECT#2022052 PROJECT DESCRIPTION: Annual Traffic Signal Contract

CERTIFICATE HOLDER

Palm Beach County Board of County Commissioners c/o Engineering
Dept.Rdway Production Division
2300 N. Jog Road 3rd Flr West
West Palm Beach FL 33411

CANCELLATION

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

AUTHORIZED REPRESENTATIVE

EBIX

Palm Beach County
Compliance Summary Report

Vendor Number	Vendor Name	AM Best Rating	Insurance Carrier	Policy #	Eff. Date	Exp. Date	Coverage	Contract Number	Contract Name
DX00001832	**Horsepower Electric Inc.**		Compliant					2022052	Horsepower Electric Inc.
		A+g , XV	Zurich American Insurance Company	bap011393507	3/31/2022	3/31/2023	Auto Liability		
		A+r , XIV	Landmark American Insurance Company	LHA098752	7/16/2022	7/16/2023	Excess Liability		
		A+r , XV	Admiral Insurance Company	ca00003519804	7/16/2022	7/16/2023	General Liability		
		A+g , XV	Zurich American Insurance Company	WC011393508	3/31/2022	3/31/2023	Workers Comp		

Risk Profile : Standard - Construction Services

Required Additional Insured : Palm Beach County Board of County Commissioners

Ownership Entity :

Participation Form

Small Business Enterprise (SBE)/Affirmative Procurement Initiative (API)/ Minority/Women Owned Business Enterprise (M/WBE)

PROJECT _____

_____

PROJECT NO. _____

The Contractor's proposed Small Business Enterprise (SBE) goal for this project was_____% /Affirmative Procurement Initiative (API) placed on this contract was_____%.

The Contractor achieved a Small Business Enterprise (SBE) participation/Affirmative Procurement Initiative (API) of _____% at the end of this project.

The Contractor's proposed Minority/Women Owned Business Enterprise (M/WBE) goal for this project was_____%.

The Contractor achieved a Minority/Women Owned Business Enterprise (M/WBE) participation of _____% at the end of this project.

CONTRACTOR: _____

BY: _____

PRINT NAME: _____

DATE: _____

CHANGE ORDER

___ Owner Initiated
___ Differing Site Conditions
___ Zoning/Code/Ordinance Changes
___ Errors/Omissions/In Design
___ Quantity Overruns/Underruns
___ Request By Another Agency/Outside Party:
_____
___ A. Reimbursable ___ B. Non-Reimbursable
___ Other:

PROJECT:
(Name)
TO:
(Contractor)

CHANGE ORDER NO:
COUNTY PROJECT NO:
CONTRACT DATE:
RESOLUTION NO:
DISTRICT NO:

You are directed to make the following changes in this Contract:

The original Contract Sum was	$
Net change by previous Change Orders	$
The Contract Sum prior to this Change Order was	$
The Contract Sum will be increased by this Change Order . . .	$
The new Contract Sum including this Change Order will be . .	$
The Contract Time will be increased by.	( ) Days
The Date of Completion including this Change Order therefore is . .	

EXECUTION OF THIS CHANGE ORDER ACKNOWLEDGES FINAL SETTLEMENT OF, AND RELEASES ALL CLAIMS FOR, COSTS AND TIME ASSOCIATED, DIRECTLY OR INDIRECTLY, WITH THE ABOVE-STATED MODIFICATION(S). INCLUDING ALL CLAIMS FOR CUMULATIVE DELAYS OR DISRUPTIONS RESULTING FROM, CAUSED BY, OR INCIDENT TO, SUCH MODIFICATION(S), AND INCLUDING ANY CLAIM THAT THE ABOVE-STATED MODIFICATION(S) CONSTITUTES, IN WHOLE OR PART, A CARDINAL CHANGE TO THE CONTRACT.

_____
CONTRACTOR

_____
Address

_____

NAME: _____

SIGNATURE: _____

TITLE: _____

DATE: _____

PALM BEACH COUNTY BOARD OF COUNTY COMMISSIONERS
ENGINEERING & PUBLIC WORKS DEPARTMENT
P. O. BOX 21229, WEST PALM BEACH, FL 33416-1229

REQUEST:
- ☐ WORK ORDER NO. _____
- ☐ NEW AUTHORIZATION
- ☐ CHANGE ORDER NO. _____
- ☐ SUPPLEMENTAL NO. _____
- ☐ OTHER: _____

REQUESTING DIVISION:
- ☐ ROAD & BRIDGE
- ☐ TRAFFIC
- ☐ ROADWAY PRODUCTION
- ☐ CONSTRUCTION COOR.
- ☐ STREETSCAPE

INFORMATION:
DATE _____
REQUESTOR _____
COMMISSION DISTRICT NO: _____
RESOLUTION NO: _____
PBC PO NUMBER: _____

PROJECT LOCATION/LIMITS: _____

PROJECT NUMBER: _____ **BUDGET LINE ITEM:** _____
CONTRACT NO: _____ **CONTRACT DATE:** _____

CONTRACTOR/CONSULTANT/VENDOR: _____ **VENDOR #** _____
CONTACT: _____ **CONTACT PHONE NUMBER:** _____

Details: _____

The total amount of this request, per the attached documentation, is not to exceed $ _____

The Contractor's proposed Small Business Enterprise (SBE) goal for this project was _____%.
The Affirmative Procurement Initiative (API) placed on this contract was _____% .
The estimated SBE participation/API for this request is _____%.
The cumulative SBE participation/API to date for this Contract including this request is _____%.

The Minority/Women Owned Business Enterprise (M/WBE) API for this contract is _____ %. The estimated M/WBE participation for this request is _____ %. The cumulative M/WBE participation to date for this Contract including this request is _____ %.

Palm Beach County Engineering and Public Works Contact:

Albert W. Hoffman	Director, Construction Coordination	561-684-4180
Name	Title	Telephone Number

CONTRACTOR/CONSULTANT/VENDOR APPROVALS
Please indicate your receipt of this request by signing and returning this original document to our office.

_____ _____
Signature Date

_____
Print Name and Title

Please sign below and submit with invoice at the completion of the project. Project completed in compliance with Contract and Project Specifications.

_____ _____
Signature Date

_____
Print Name and Title

PALM BEACH COUNTY APPROVALS

BOARD APPROVAL? No **Date:** _____

_____ _____
Division Approval Date

_____ _____
Deputy County Engineer Date

_____ _____
Budget Approval Date

_____ _____
Contract Review Committee (when required) Date

FORM OF GUARANTEE

BOND NO. EACX4004435

GUARANTEE FOR (Contractor and Surety Name) Horsepower Electric Inc. and Endurance Assurance Corporation

We the undersigned hereby guarantee that the Annual Traffic Signal Construction _____ (Project), Project Number 2022052, Palm Beach County, Florida, which we have constructed and bonded, has been done in accordance with the plans and specifications; that the work constructed will fulfill the requirements of the guaranties included in the Contract Documents. We agree to repair or replace any or all of our work, together with any work of others which may be damaged in so doing, that may prove to be defective in the workmanship or materials within the warranty period of one year from the date of Final Completion of all the above named work by the County of Palm Beach, State of Florida, without any expense whatsoever to said County of Palm Beach, ordinary wear and tear and unusual abuse or neglect excepted by the County. When correction work is started, it shall be carried through to completion.

In the event of our failure to acknowledge notice, and commence corrections of defective work within five (5) calendar days after being notified in writing by the Board of County Commissioners, Palm Beach County, Florida, we, collectively or separately, do hereby authorize Palm Beach County to proceed to have said defects repaired and made good at our expense and we will honor and pay the costs and charges therefore upon demand.

County and (contractor, engineer, architect as applicable) agree that the provisions of Florida Statute Chapter 558 shall not apply to this contract.

Dated 07/15/2022
(notice of completion filing date)

SEAL AND NOTARIAL ACKNOWLEDGEMENT OF SURETY

Horsepower Electric Inc. (Seal)
(Contractor)

By: _____ Michael Martinez, President
(Signature) (Printed Name and Title)

Endurance Assurance Corporation (Seal)
(Surety)

By: _____ Roberto Menendez, Attorney-In-Fact
(Signature) (Printed Name and Title)

CONSENT OF SURETY FOR FINAL PAYMENT

BOND NUMBER: _____

PROJECT NAME: _____

PROJECT LOCATION: _____

PROJECT NUMBER: _____ CONTRACT NUMBER: _____

CONTRACT DATE: _____

In accordance with the provisions of the above named Contract between the County and the Contractor, the following named Surety Company:

_____

[name and address of Surety]

On the PUBLIC CONSTRUCTION BOND of the following named Contractor:

_____

[name and address of Contractor]

hereby approves of final payment by County to the Contractor, and further agrees that said final payment to the Contractor shall not relieve the Surety Company named herein of any of its obligations to the Palm Beach County, Board of County Commissioners, 301 N. Olive Avenue, West Palm Beach, Florida 33401, as set forth in said Surety Company's bond:

_____

IN WITNESS WHEREOF, the Surety Company has hereunto set its hand and seal this _____ day of

_____, 20_____.

_____ _____

(Attest) Witness Signature (Name of Surety Company)

_____ _____

(Witness Printed Name) (Signature of Surety's Authorized Representative)

(Seal) _____

(Printed Name and Title)

FINAL WAIVER AND RELEASE OF CLAIM

KNOW ALL BY THESE PRESENTS, that the undersigned, to induce the final payment in the sum of $_____, and other valuable considerations and benefits to the undersigned accruing does upon receipt of payment waive, release and quit claim all claims or demands of every kind whatsoever against the project, commonly known as _____"Project", and Palm Beach County, Florida, on account of work and labor performed, and/or materials furnished in connection with the above described Project, or any part thereof.

It being understood that this is a Final Waiver and Release of Claim, and the undersigned warrants that no assignment of said claim, nor the right to perfect a claim against any real estate by virtue of the accrual of said payment, has or will be made, and the undersigned has the right to execute this Final Waiver and Release, and that all laborers employed by the undersigned in connection with the Project, to the extent of the payment herein referred to, have been fully-paid and all materials, supplies and personnel are free and clear of conditional bill of sale and/or retain title contracts.

IN WITNESS WHEREOF, I have hereunto set my and seal and I hereby acknowledge that the foregoing statements are true and correct this _____ day of _____, 20 ____.

WITNESS:

_____
Signature

_____
Print Name

CONTRACTOR

_____
Company Name

BY_____
Signature

_____
Print Name

_____
Title

STATE OF FLORIDA
COUNTY OF _____

The foregoing instrument was acknowledged before me by means of ☐ physical presence or ☐ online notarization, this ___ day of _____, 20___, by _____

as _____ for _____, on behalf
(title of officer/member/partner) *(name of corporation/company/partnership)*

of the _____, who is ☐ personally known to me or has
[choose one] corporation/company/partnership

produced _____(type of identification) as identification.

_____
(Signature of Notary Public - State of Florida)

_____
(Print, Type, or Stamp Commissioned Name of Notary Public)

Form 1

STATE OF FLORIDA
COUNTY OF _____

Before me the undersigned authority in said county and state, personally appeared _____, who being first duly sworn, deposes and says that he is:

_____ (a) President (or Vice President) of _____ corporation authorized to do business under the laws of Florida and which Corporation is the contractor;

OR

_____ (b) a partner of the firm of _____ composed of _____ and _____, doing business under the name of _____, which firm is the contractor;

OR

_____ (c) the individual who, doing business under the trade name of _____ is the contractor, on project No. _____, Road _____ in _____ County, Florida, under Resolution No. _____ with the County of Palm Beach dated the _____ day of _____ 20____; that the deponent knows of his own knowledge that:

1. The said contract has been complied with in every particular by said contractor and that all parts of the work have been approved by the Director of Construction Coordination of the County of Palm Beach.

2. The contractor has not offered or made any gift or gratuity to, or made any financial transaction of any nature with, any employee of the Department in connection with obtaining or performing said contract.

3. All amounts payable for labor, materials or otherwise, in connection with said contract and work, have been paid except for normal sub-contract retainages, which will be satisfied upon payment and/or release of retainage withheld under this contract.

4. There are no claims or suits pending against said contractor or anyone in connection with the work done, materials furnished or otherwise under said contract, except as listed below. As to any such exception listed below, the contractor has stated the name of the entity making claim, the name of the entity against whom the claim is being made, and demonstrated below good cause as required by Section 337.11(10)(b), Florida Statutes.

(Affix Corp. Seal)

_____
(Deponent)

_____
(Print Name)

_____
(Title)

CONTRACTOR: _____

PROJECT: _____

Form 2

We, the _____, having heretofore executed a performance and payment bond for the above named contractor covering the project and road described above hereby agree that the County of Palm Beach may make full payment of the final estimate, including the retained percentage, to said contractor.

It is fully understood that the granting of the right of the County of Palm Beach to make the payment of the final estimate to said contractor and/or his assignee, shall in no way relieve the surety company of its obligations under its bond, as set forth in the specifications and contract, including an amendments hereto, pertaining to the above project and road.

IN WITNESS WHEREOF, the _____ has caused the Instrument to be executed on its behalf by its _____ and/or its duly authorized attorney in fact, and its corporate seal to be hereto affixed, all on this _____ day of _____, A.D. 20____.

_____
SURETY COMPANY

(AFFIX SEAL)

BY:_____
Its Attorney in Fact

(Power of Attorney must be attached
if executed by Attorney in Fact)

STATE OF FLORIDA
COUNTY OF _____

The foregoing instrument was acknowledged before me by means of ☐ physical presence or ☐ online notarization, this ____ day of _____, 20___, by _____ as _____ _____ for _____,
(e.g. attorney in fact) (name of Surety)
on behalf of said surety, and who is ☐ personally known to me or has produced _____(type of identification) as identification, and who acknowledges that [circle one] he/she executed said instrument for the purpose therein expressed and that [circle one] he/she has due and legal authority to execute the same on behalf of said surety

_____
(Signature of Notary Public - State of Florida)

_____
(Print, Type, or Stamp Commissioned Name of Notary Public)

Countersignature: _____
Required ONLY if executed by Non Florida Resident Agent

RECORD OF CONSTRUCTION MATERIALS
AFFIDAVIT

I_____,_____
(NAME) (TITLE)

OF_____
(NAME OF FIRM)

I solemnly swear and affirm, that as Prime Contractor, the work under the above-named contract and all amendments thereto have been completed and materials supplied in accordance with the requirements of said contract. I have preserved in my files, for inspection by the Department, all invoices and records of materials as required by Article 9-7 of the applicable specifications. These records include all materials purchased by Sub-Contractors and represent all commercial construction materials used in the construction of Project No. _____.

(Contract No. _____) in _____County, and that the information is true and correct.

Signed_____

STATE OF FLORIDA

COUNTY OF _____

The foregoing instrument was acknowledged before me by means of ☐ physical presence or ☐ online notarization, this ___ day of _____, 20___, by _____

as _____ for _____, on behalf
(title of officer/member/partner) (name of corporation/company/partnership)

of the_____, who is ☐ personally known to me or has
[choose one] corporation/company/partnership

produced _____ (type of identification) as identification.

_____
(Signature of Notary Public - State of Florida)

_____
(Print, Type, or Stamp Commissioned Name of Notary Public)

DISBURSEMENT OF PREVIOUS PERIODIC PAYMENTS TO SUB-CONTRACTORS

DATE: _____

PROJECT: _____

_____

PROJECT NO:_____

TO APPLY TO MONTHLY ESTIMATE FOR _____, 20___
(Month)

_____, prime contractor for the above referenced contract, hereby certifies that all Sub-Contractors having interest in this contract have received their pro rata share of all previous periodic payments made by the County for all work completed and materials and equipment furnished under the contract, except for $ _____ which is in dispute with

_____

_____ (leave blank if fully paid) as a result of back charges (attach explanation of back charges, if applicable). The term "Sub-Contractor", as used herein, shall also include persons or firms furnishing materials, or equipment incorporated into the work or stockpiled in the vicinity of the project for which partial payment has been made by the County, and work done under equipment-rental agreements.

THIS AFFIDAVIT IS DONE WITH THE UNDERSTANDING THAT CONTRACT PAYMENTS ARE BASED ON THE TRUTH AND VERACITY OF THIS DOCUMENT AND ANY MISREPRESENTATION HEREUNDER COULD RESULT IN AN ACTION FOR BREACH OF CONTRACT AND/OR LOSS, REDUCTION, OR RETENTION OF FUTURE CONTRACT PAYMENTS.

_____
Contractor

_____
Signature

_____
Print Name

_____
Title

STATE OF FLORIDA
COUNTY OF _____
The foregoing instrument was acknowledged before me by means of ☐ physical presence or ☐ online notarization, this ___ day of _____, 20___, by _____ as _____ for _____, on behalf
(title of officer/member/partner) *(name of corporation/company/partnership)*

of the _____, who is ☐ personally known to me or has
[choose one] corporation/company/partnership

produced _____ (type of identification) as identification.

_____
(Signature of Notary Public - State of Florida)

_____
(Print, Type, or Stamp Commissioned Name of Notary Public)

DISBURSEMENT OF FINAL PAYMENT TO SUB-CONTRACTORS

DATE: _____

PROJECT: _____ PROJECT NO: _____

TO APPLY TO FINAL ESTIMATE NO. _____, _____, 20____.

_____, prime contractor for the above referenced contract, hereby certifies that all Sub-Contractors having interest in this contract have received their pro rata share of all previous periodic payments made by the County for all work completed and materials and equipment furnished under the contract, except for $ _____which is in dispute with _____(leave blank if fully paid) as a result of back charges (attach explanation of back charges if applicable). The term "Sub-Contractor" as used herein shall also include persons or firms furnishing materials, or equipment incorporated into the work for which final payment has been made by the County, and work done under equipment-rental agreements.

The following are to be paid from the final payment:

Sub-Contractor or Supplier	Amount
Sub-Contractor or Supplier	Amount
Sub-Contractor or Supplier	Amount
Sub-Contractor or Supplier	Amount
Sub-Contractor or Supplier	Amount

(Use Attachment for Additional Sub-Contractor or Suppliers)

THIS AFFIDAVIT IS DONE WITH THE UNDERSTANDING THAT CONTRACT PAYMENTS ARE BASED ON THE TRUTH AND VERACITY OF THIS DOCUMENT AND ANY MISREPRESENTATION HEREUNDER COULD RESULT IN AN ACTION FOR BREACH OF CONTRACT AND/OR LOSS, REDUCTION OR RETENTION OF FUTURE CONTRACT PAYMENTS.

_____ _____

Contractor By

_____

Title

STATE OF FLORIDA
COUNTY OF _____

The foregoing instrument was acknowledged before me by means of ☐ physical presence or ☐ online notarization, this ___ day of _____, 20___, by _____

as _____ for _____, on behalf
(title of officer/member/partner) (name of corporation/company/partnership)

of the _____, who is ☐ personally known to me or has
[choose one] corporation/company/partnership

produced _____(type of identification) as identification.

_____
(Signature of Notary Public - State of Florida)

_____
(Print, Type, or Stamp Commissioned Name of Notary Public)

FDOT

Florida Department of Transportation

RON DESANTIS
GOVERNOR

605 Suwannee Street
Tallahassee, FL 32399-0450

KEVIN J. THIBAULT, P.E.
SECRETARY

June 14, 2021

HORSEPOWER ELECTRIC, INC.
8105 W 20 AVE
HIALEAH, FLORIDA 33014

RE: CERTIFICATE OF QUALIFICATION

Dear Sir/Madam:

The Department of Transportation has qualified your company for the type of work indicated below. Unless your company is notified otherwise, this Certificate of Qualification will expire 6/30/2022. However, the new application is due **4/30/2022**.

In accordance with S.337.14 (1) F.S. your next application must be filed within (4) months of the ending date of the applicant's audited annual financial statements.

If your company's maximum capacity has been revised, you can access it by logging into the Contractor Prequalification Application System via the following link: HTTPS://fdotwp1.dot.state.fl.us/ContractorPreQualification/

Once logged in, select "View" for the most recently approved application, and then click the "Manage" and "Application Summary" tabs.

FDOT APPROVED WORK CLASSES:
COMPUTERIZED TRAFFIC CONTROL, DRAINAGE, ELECTRICAL WORK, FENCING, FLEXIBLE PAVING, GRADING, GRASSING, SEEDING AND SODDING, INTELLIGENT TRANSPORTATION SYSTEMS, ROADWAY SIGNING, TRAFFIC SIGNAL

You may apply for a Revised Certificate of Qualification at any time prior to the expiration date of this certificate according to Section 14-22.0041(3), Florida Administrative Code (F.A.C.), by accessing your most recently approved application as shown above and choosing "Update" instead of "View." If certification in additional classes of work is desired, documentation is needed to show that your company has done such work with your own forces and equipment or that experience was gained with another contractor and that you have the necessary equipment for each additional class of work requested.

All prequalified contractors are required by Section 14-22.006(3), F.A.C., to certify their work underway monthly in order to adjust maximum bidding capacity to available bidding capacity. You can find the link to this report at the website shown above.

Sincerely,

Alan D. Autry

Alan Autry, Manager
Contracts Administration Office

AA:cg

Detail by Entity Name

Florida Profit Corporation
HORSEPOWER ELECTRIC INC.

Filing Information

Document Number	M12222
FEI/EIN Number	59-2502221
Date Filed	03/06/1985
State	FL
Status	ACTIVE
Last Event	AMENDMENT
Event Date Filed	09/23/2015
Event Effective Date	NONE

Principal Address

8105 W 20 AVE
HIALEAH, FL 33014

Changed: 04/15/1997

Mailing Address

8105 W 20 AVE
HIALEAH, FL 33014

Changed: 04/17/1998

Registered Agent Name & Address

NUNEZ, RODOLFO, ESQ.
255 UNIVERSITY DRIVE
CORAL GABLES, FL 33009

Name Changed: 09/23/2015

Address Changed: 09/23/2015

Officer/Director Detail

Name & Address

Title PT

MARTINEZ, MICHAEL
8105 W 20 AVE
HIALEAH, FL 33014

Title D

ORTIZ, HECTOR M
8105 W 20 AVE
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Title D

ORTIZ, HECTOR P
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Title V

MONDELO, JULIO
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Annual Reports

Report Year	Filed Date
2019	03/28/2019
2020	06/18/2020
2021	04/07/2021

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Florida Department of State, Division of Corporations

Local Business Tax Receipt

Miami–Dade County, State of Florida

–THIS IS NOT A BILL – DO NOT PAY

LBT

1658047

RECEIPT NO.
RENEWAL
1658047

EXPIRES
SEPTEMBER 30, 2022

Must be displayed at place of business
Pursuant to County Code
Chapter 8A – Art. 9 & 10

BUSINESS NAME/LOCATION
HORSEPOWER ELECTRIC INC
8105 W 20TH AVE
HIALEAH, FL 33014

OWNER
HORSEPOWER ELECTRIC INC

SEC. TYPE OF BUSINESS
196 ELECTRICAL CONTRACTOR

PAYMENT RECEIVED BY TAX COLLECTOR
195.00 07/08/2021
INT-21-329726

Worker(s) 60 EC0001153

This Local Business Tax Receipt only confirms payment of the Local Business Tax. The Receipt is not a license, permit, or a certification of the holder's qualifications, to do business. Holder must comply with any governmental or nongovernmental regulatory laws and requirements which apply to the business.

The RECEIPT NO. above must be displayed on all commercial vehicles – Miami–Dade Code Sec 8a–276.

For more information, visit www.miamidade.gov/taxcollector

MIAMI-DADE COUNTY

Ron DeSantis, Governor

Florida dbpr

STATE OF FLORIDA
DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION

CONSTRUCTION INDUSTRY LICENSING BOARD

THE GENERAL CONTRACTOR HEREIN IS CERTIFIED UNDER THE
PROVISIONS OF CHAPTER 489, FLORIDA STATUTES

MARTINEZ, MICHAEL

HORSEPOWER ELECTRIC INC
8105 WEST 20TH AVENUE
HIALEAH FL 33014

LICENSE NUMBER: CGC1530084

EXPIRATION DATE: AUGUST 31, 2022

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Ron DeSantis, Governor

Halsey Beshears, Secretary

STATE OF FLORIDA
DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION

ELECTRICAL CONTRACTORS LICENSING BOARD

THE ELECTRICAL CONTRACTOR HEREIN IS CERTIFIED UNDER THE PROVISIONS OF CHAPTER 489, FLORIDA STATUTES

ORTIZ, HECTOR P

HORSEPOWER ELECTRIC INC
8105 WEST 20TH AVE
HIALEAH FL 33014

LICENSE NUMBER: EC0001153

EXPIRATION DATE: AUGUST 31, 2022

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