

# **Addendum No. 3**

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## **PORT OF BROWNSVILLE ANCHOR PARK**

February 10, 2021

### **1. MODIFICATIONS TO THE BID FORM**

- a.** Attached to this **Addendum No. 3** is a revised **Bid Form**. Please use the attached revised form to submit your bid.

### **2. LANDSCAPING AND IRRIGATION PLANS**

- a.** Attached to this **Addendum No. 3** are two drawings showing the proposed Landscaping Plan and the proposed Irrigation Plan. Bidders are requested to provide a price for these as part of Additive Bid #1. BND will reserve the right to award the project on the basis of the **Base Bid** or to award it on the basis of the **Total Bid** inclusive of **Additive Bid #1**.

### **3. RESPONSES TO BIDDERS' QUESTIONS AND OTHER CLARIFICATIONS**

- a. Additional Documents.** Also attached to this **Addendum No 3** are additional documents answering questions presented by one or more bidders as well as clarifications from the project's design team. The Base Bid price shall include the cost based on these responses as well as these clarifications.
- b. Clarification on Utilities and Water Meter.** Water Distribution and Wastewater Collection services to this project, if and where needed, shall be provided by the Brownsville Navigation District (BND). Contractor shall be responsible for the tap on the water main as detailed in the drawings, including corporation and curb stops. Water Meter shall be installed by the BND at no cost to the contractor. Cost for any and all other utilities tie-ins shall be included in the bid price and shall not be paid for separately.

# Bid Form

## PORT OF BROWNSVILLE ANCHOR PARK

Bid to: Brownsville Navigation District  
20000 S.H. 48  
Brownsville, Texas 78521

Due Date: Before **3:00 P.M. C.S.T. on Tuesday, February 16, 2021.**

Bid by \_\_\_\_\_ hereinafter called BIDDER, a corporation organized and existing under the laws of the State of \_\_\_\_\_, or a partnership or an individual doing business as \_\_\_\_\_.

To: The Brownsville Navigation District, Texas, hereinafter called OWNER.

Gentlemen:

The BIDDER, in compliance with your invitation for bids for the **"PORT OF BROWNSVILLE ANCHOR PARK"** project, having examined the drawings and specifications with related documents and the site of the proposed work, and being familiar with all of the conditions surrounding the construction of the proposed project, including the availability of materials and labor, hereby proposes to furnish all labor, materials and supplies, and to construct the project in accordance with the contract documents, within the time set forth herein, and at the attached unit prices. These price(s) are to cover all expenses incurred in performing the work required under the contract documents, of which this bid is a part. These price(s) are firm and shall not be subject to adjustment provided this Bid is accepted within ninety (90) days after the time set for receipt of bids.

BIDDER hereby agrees to commence work under this contract on or before a date to be specified in a written "Notice to Proceed" to be issued by the OWNER and to fully complete the project within ninety (90) calendar days, as defined in the specifications. BIDDER further agrees to pay as liquidated damages, the sum of five hundred (\$500.00) dollars for each consecutive calendar day thereafter as hereinafter provided in Article 3 of the Agreement.

BIDDER agrees to perform all work for which he contracts as described in the specifications and as shown on the plans, for the attached unit prices:

SUBCONTRACTORS. The undersigned proposes that he will perform the majority of the work at the project site with his own forces and that specific portions of the work not performed by the undersigned will be subcontracted and performed by the following subcontractors.

Work Subcontracted	Name of Subcontractor
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

## PORT OF BROWNSVILLE ANCHOR PARK

BIDDER Agrees to perform all the work described in the Contract Documents  
for the following Unit Prices (which include any and all applicable taxes and fees):

February 10, 2021

### BASE BID – ANCHOR PARK IMPROVEMENTS:

#	DESCRIPTION	EST. QTY.	UNIT COST	AMOUNT
1	PROPOSED IMPROVEMENTS FOR ANCHOR PARK, to include furnishing and installing all work in the construction drawings, to include Earthwork and Site Preparation, sidewalks, pavers, parking areas, drainage pipes, structures and appurtenances, pavement markings and parking signage, ramps, underdrains, Storm Water Pollution Prevention Plan, 2" meter tap with corporation and curb stops, etc., as shown in the drawings, to the lines and grades therein indicated, with all appurtenances and features necessary for proper functioning of all components, SAVE AND EXCEPT work specified in ADDITIVE BID #1 below.	1 LS		
<b>TOTAL BASE BID FOR ANCHOR PARK IMPROVEMENTS:</b>				

### ADDITIVE BID #1 – LANDSCAPING & IRRIGATION:

#	DESCRIPTION	EST. QTY.	UNIT COST	AMOUNT
1	LANDSCAPING as per Landscaping Plan drawing	1 LS		
2	IRRIGATION SYSTEM as per Irrigation Plan drawing	1 LS		
<b>TOTAL ADDITIVE BID #1 FOR LANDSCAPING &amp; IRRIGATION:</b>				
<b>TOTAL BASE BID PLUS ADDITIVE BID #1:</b>				

**NOTE:** Water Distribution and Wastewater Collection services to this project, if and where needed, shall be provided by the Brownsville Navigation District (BND). Contractor shall be responsible for the tap on the water main as detailed in the drawings, including corporation and curb stops. Water Meter shall be installed by the BND at no cost to the contractor. Cost for any and all other utilities tie-ins shall be included in the bid price and shall not be paid for separately.

BIDDER Acknowledges receipt of the following addenda:

**Addendum No. 1 (1/29/2021)**

**Addendum No. 2 (2/03/2021)**

**Addendum No. 3 (2/10/2021)**

In case of discrepancy, the unit price amount shall govern.

The above included prices shall include all labor, materials, excavation, bailing, shoring, removal, backfill, overhead, profit, permits, insurance, etc., to cover the finished work of the several kinds called for.

BIDDER understands that the OWNER reserves the right to reject any or all bids and to waive any informalities in the bidding.

BIDDER agrees that this Bid shall be good and may not be withdrawn for a period of ninety (90) days after the scheduled closing time for receiving bids.

The undersigned hereby declares that only the persons or firms interested in the bid as principal or principals are named herein, and that no other persons or firms than are herein mentioned have any interest in this Bid or in the contract to be entered into; that this Bid is made without connection with any other person, company, or parties likewise submitting a Bid; and that it is in all respects for and in good faith, without collusion or fraud.

Upon receipt of written notice of the acceptance of this Bid, BIDDER will execute the formal contract attached within ten (10) days and deliver the Performance and Payment Bonds and Insurance Certificates as required under the GENERAL CONDITIONS. The Bid security attached in the sum of \_\_\_\_\_

(\$ \_\_\_\_\_) is to become the property of the OWNER in the event the contract, bonds, and insurance certificates are not executed or delivered within the time above set forth, as mutually agreed to liquidated damages and not as a penalty for the delay and additional administrative expense to the OWNER caused thereby; otherwise the Bid security will be returned upon the signing of the contract and delivering the approved bonds and insurance certificates.

Respectfully submitted,

By: \_\_\_\_\_

Signature

Seal affixed here  
if BID is by a  
Corporation

\_\_\_\_\_  
Officer's Name

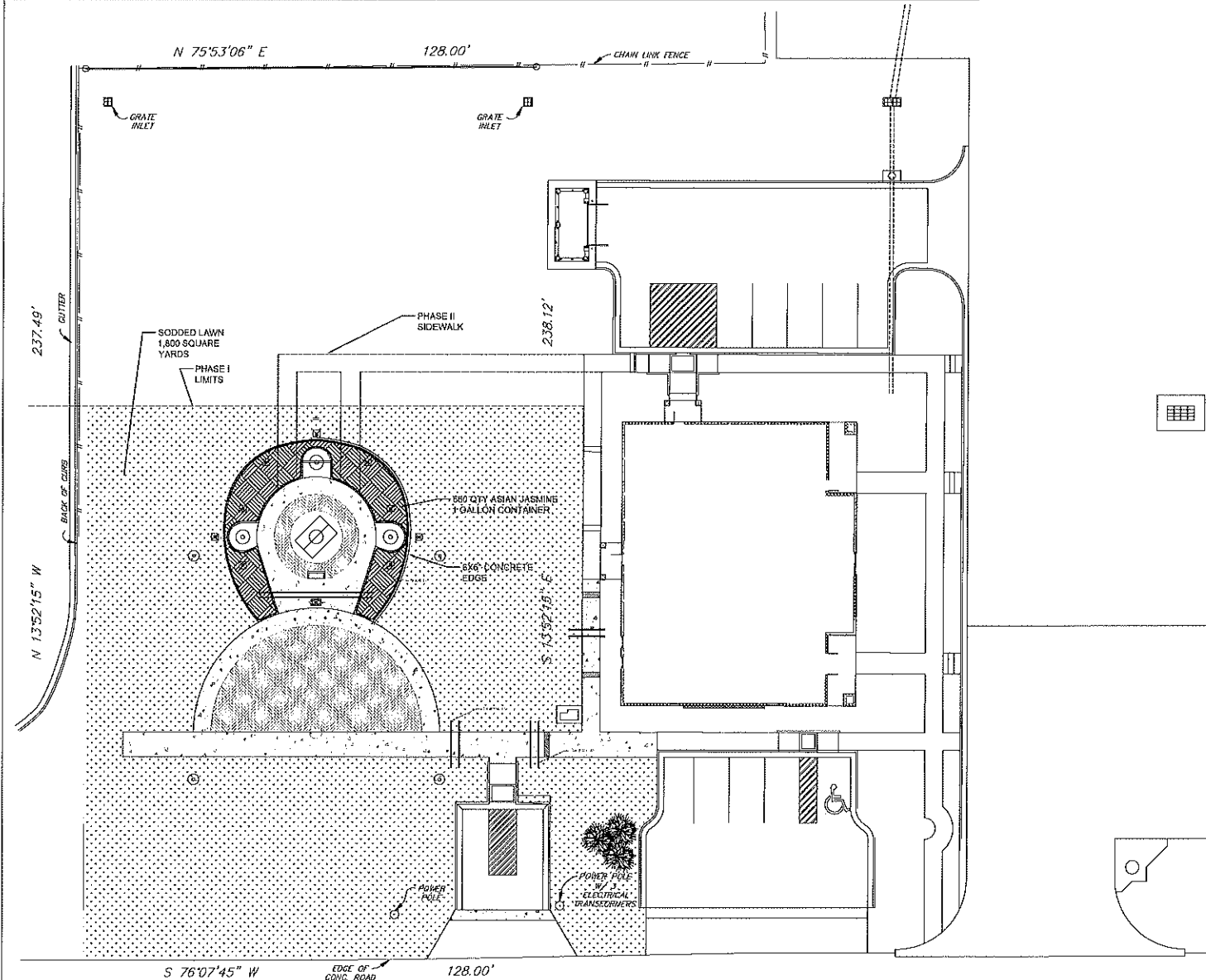
\_\_\_\_\_  
Officer's Title

\_\_\_\_\_  
Address

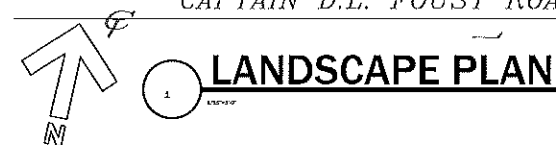
Attest: \_\_\_\_\_

LANDSCAPE SCHEDULE

- ASIAN JASMINE 'TRACHELOSPERMUM ASIATICUM' 1 GALLON CONTAINER 12" D.C. (660 QUANTITY)
- SODDED LAWN 'STENOTAPHRUM SECUNDATUM' 1,800 SQUARE YARDS
- 2,000 SF PLANTING MIX 12" DEEP, COMPOST / TOPSOIL MIX WITH TOP 2" HARDWOOD MULCH DEPTH
- 6X6" REINFORCED EXTRUDED CONCRETE EDGING, TO BE 2" ABOVE FINISHED GRADE
- TREE RINGS AND TREE STAKES PER TREE INSTALLED
- REMOVE ALL CALICHE WITHIN LAWN / BED AREAS REPLACE WITH COMPOST / RIVER SAND MIX (18,000 SQUARE FEET)
- IRRIGATION SYSTEM ADDITIONS / ADJUSTMENTS / SLEEVES / WITH ENOUGH ROOM FOR PHASE II ADDITION



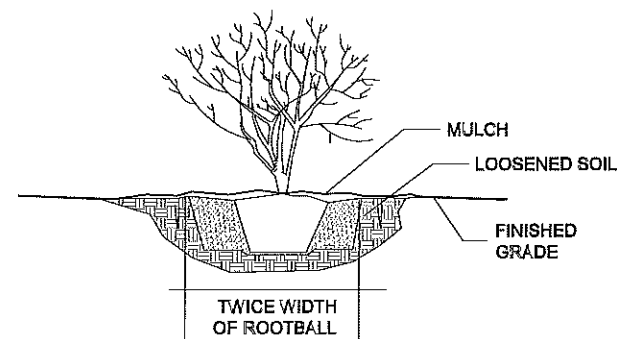
CAPTAIN D.L. FOUST ROAD ( 100 FT. R.O.W )



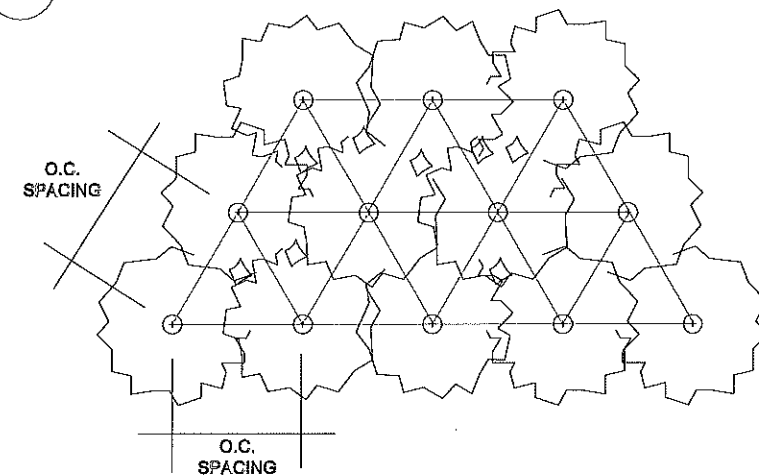
LANDSCAPE PLAN

IRRIGATION NOTE

AUTOMATIC IRRIGATION SYSTEM BY TEXAS LICENSED CONTRACTOR, SHOP DRAWINGS TO BE SUBMITTED BEFORE CONSTRUCTION. 4" SLEEVES INTO ALL LANDSCAPE ISLANDS 24" DEEP



SHRUB PLANTING DETAIL



TRIANGULAR SPACING DETAIL

ADDENDUM NO. 3

SHEET NO. 1 L1

SET NUMBER

DATE: 1/1/21

DRAWN BY: JER

PROJECT NO.:

PROJECT: PORT OF BROWNSVILLE

MARITIME MEMORIAL PARK

OWNER: BROWNSVILLE NAVIGATION DISTRICT

PORT OF BROWNSVILLE

BROWNSVILLE, TEXAS

SHEET TITLE:

LANDSCAPE PLAN

SHEET NO. 1 OF 1

SET NUMBER

REVISED:

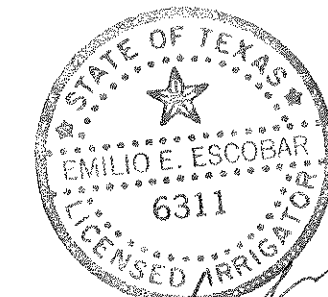
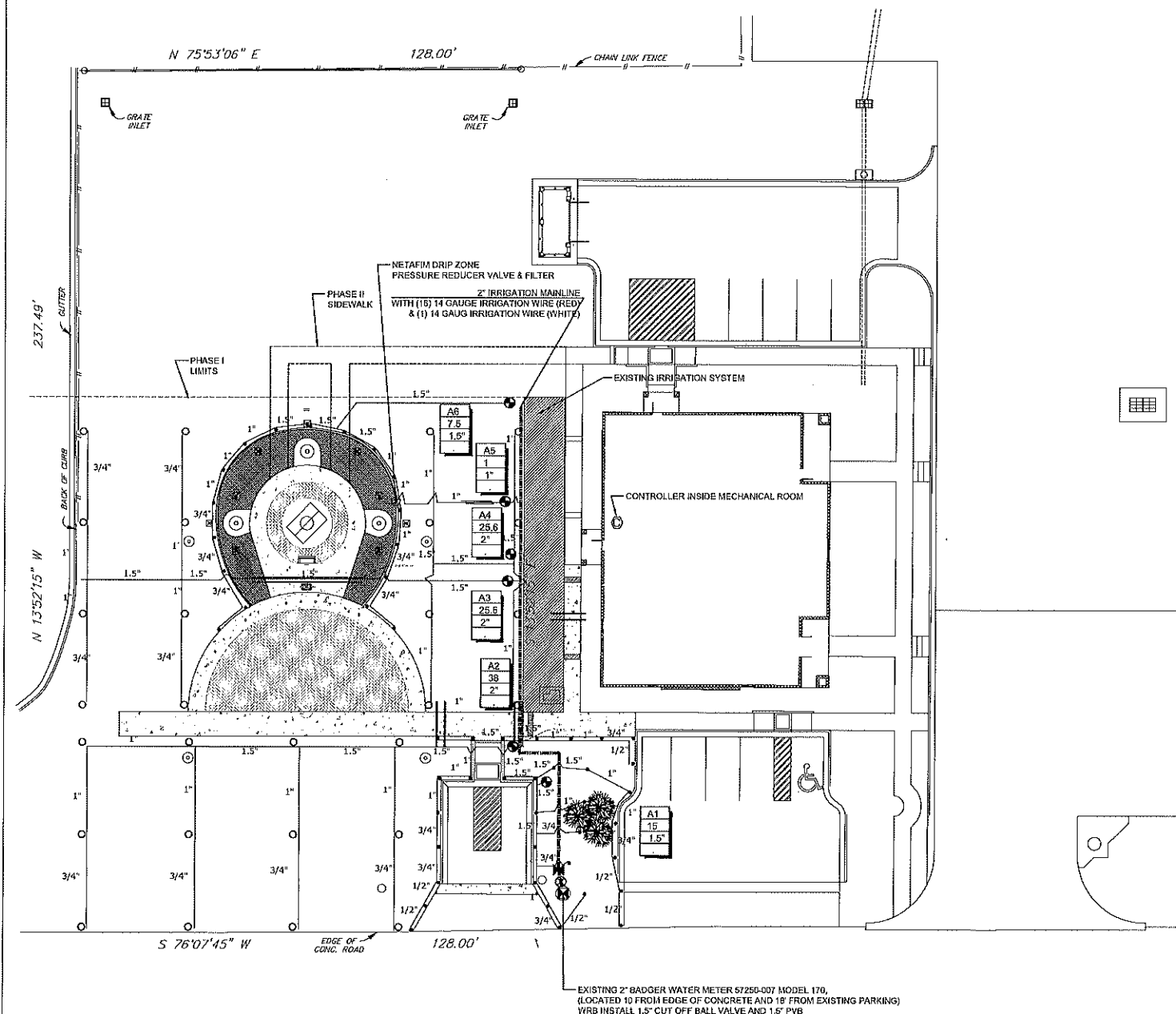
DATE: 1/24/21  
DRAWN BY: JRS  
PROJECT NO.:

Engineering and Design  
1225 West Loop South  
Brownsville, TX 77520 (956) 572-6450  
TEL: (956) 572-6450

PROJECT: PORT OF BROWNSVILLE  
MARITIME MEMORIAL PARK  
OWNER: BROWNSVILLE NAVIGATION DISTRICT  
PORT OF BROWNSVILLE  
BROWNSVILLE, TEXAS

SHEET TITLE:  
IRRIGATION PLAN

L2



LEGEND		QUANTITY	
	EXISTING 2" BADGER WATER METER 57250-007 MODEL 170	1	
	BACKFLOW PREVENTION DEVICE FBECO 1.5"	1	MAINLINE PIPE: CLASS 200 PVC (2 INCH SIZE)
	MAIN SHUT-OFF VALVE 1.5"	1	LATERAL PIPE: CLASS 200 PVC (SIZED AS SHOWN)
	HUNTER PGV VALVES (SIZED AS SHOWN)	6	
	1" DIAMETER NETAFIM DRIPLINE 10GPM	1000 SF	
	NETAFIM DRIP ZONE PRESSURE REDUCER VALVE & FILTER	1	
	HUNTER PRO ROTORS W/14 NOZZLE PRESSURE = 45 PSI RADIUS = 46 FEET FLOW = 3.2 GPM	30	
	RAIN BIRD ESP-LX MODULAR	1	
	HUNTER PRO SPRAYS PRESSURE = 30 PSI RADIUS = 15 FEET FLOW = .45 GPM		
	14 GAUGE CONTROL WIRE		

A1

66

2

INDICATES CONTROLLER AND CONTROLLER STATION NUMBER

INDICATES LATERAL DISCHARGE IN GPM

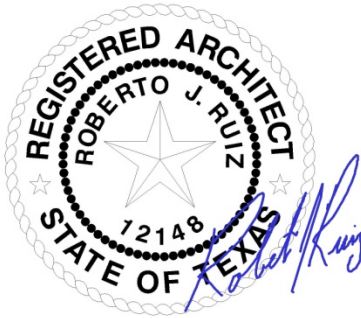
INDICATES REMOTE CONTROL VALVE SIZE

CAPTAIN D.L. FOUST ROAD (100 FT. R.O.W.)

**IRRIGATION PLAN**

ANCHOR PARK  
 Port of Brownville  
 1000 Foust Road  
 Brownsville TX

ADDENDUM NO. 3



02/05/21

ISSUED BY THE OFFICE OF ROBERTO J. RUIZ ARCHITECT, INC. – 02/05/21

The following is an addendum to the Contract Documents dated 12/18/20 for the project named above:

ITEM		
1	QUESTION: Will the existing overhead utility lines on Foust Road interfere with the delivery of the anchor to a location where the crane can pick it up?	
	RESPONSE: Construction means and methods are the Contractor's responsibility. The anchor will be delivered to the project site by the Port of Brownsville on a flat bed truck. The anchor will be positioned laying flat on the truck bed – it will not be upright. The flat bed truck will back up into the project site between the 2 most eastern utility posts, where the utility line is higher than between any other 2 posts. The truck will continue to back onto the site until it has passed beyond the overhead lines, which will allow for the Contractor's crane to then lift the anchor off of the bed and lower it onto the prepared pad site without contacting the utility lines. SEE PHOTOGRAPHS BELOW.	



*Figure 1 – LOW CABLES*





*Figure 2 – HIGH / LOW CABLES*

END OF ADDEDUM NO. 3



## ADDENDUM #3

Architect: Roberto J. Ruiz Architect, Inc.  
Project Name: Port of Brownsville Anchor Park  
Project Number: 20.3.35  
Date: 2/8/2021

Note: The work shall be carried out in accordance with the following supplemental instructions issued in accordance with the Contract Documents without change in Contract Sum or Contract Time Proceeding with the Work in accordance with these instructions indicates your acknowledgement that there will be no change in the Contract Sum or Contract Time.

I. Specifications:

A. Add section 260923 Lighting Control systems, refer to attachment.

II. General: N/A

III. Mechanical:

IV. Electrical:

- A. Sheet ESP01 – Clarification on location for Panel-An and LCPM shall be located next to the existing electrical service, south west of the building.
- B. Sheet EL01 – Clarification on keyed note#2, lighting control panel "LCP1" shall be "LCPM".
- C. Sheet EL01 – Clarification on all exterior wiring devices(receptacles/data) shall in a corrosion resistant weather proof "in-use" enclosure.
- D. Sheet AEG01.1 – Revise electrical schematic diagram, refer to attached.
- E. Sheet AEG01.2 – Electrical Load Analysis voltage shall be 120/208V and add relay control panel schedule LCPM, refer to attached.
- F. Sheet EG01 – Detail 01 - Trench detail, clarification on the maintain distance horizontally and vertically applies to electrical primary, feeders and branch circuits.
- G. Sheet EG01 – Panel – AN schedule, the nema-3R enclosure shall be stainless steel and the AIC rating shall be 18K. The surge protection devices shall be integral and rated for 100K.
- H. Sheet EG01 – Panel-AN, provide 1-20Amp 1-pole breaker via 2#12, 1#12G, ½"C the duplex GFI receptacle mounted next to the panel, refer to detail #5 electrical schematic diagram.

- I. Sheet EG01 – Panel-AN, provide 1-20Amp 1-pole breaker via 2#12, 1#12G, ½"C for control power to the relay lighting control panel LCPM.
  - J. Sheet EG01 – Luminaire schedule, type AA mode number shall be #ST50CSB/SC-SR-SBZ-30-4-ST50A/SLIP-CJK, 16 watts. All light fixture type AA shall be power up by a remote driver located in the electrical room. Remote driver shall be minimum 200watts and be part of the lighting package. Provide 3#3 in 1" from driver to all the light type"AA" wired in series. Remote driver circuit shall be AN-3 as shown on the plans.
  - K. Sheet EG01 – Luminaire schedule, type BB, shall be 4000k temp., slip fitter, universal voltage and color finish selected by Architect.
- V. Plumbing: N/A
- VI. Fire Protection:

## SECTION 26 09 23

### LIGHTING CONTROL SYSTEM

#### 1. PART 1 - General

##### 1.1 Overview

- 1.1.1 Provide a complete low voltage lighting control system for the building as shown on the plans and specified herein.
- 1.1.2 Lighting control system shall utilize networking technology connecting relay panels, switches and sensors based upon a 2-wire data line providing both power and data to all field devices. The network shall be free topology; therefore a serial loop is not necessary to achieve maximum network distance. The system shall utilize a web server device complete with a touch screen located in a relay panel so that programming and viewing of status can be accomplished at the panel or by any PC connected to the same LAN or via the internet.
- 1.1.3 All relay panel interiors shall be pre-assembled complete with the necessary relays, transformers and devices. Relay panels that are wall mounted shall have interiors separate from enclosure so as to permit easy mounting, conduit installation and wire pull to enclosures. Enclosures mounted in the ceiling space are not required to have separate interiors.

##### 1.2 Manufacturers

- 1.2.1 All components are to be supplied by same manufacturer. Manufacturer to be a supplier of this type of equipment for over 10 years.
- 1.2.2 Lighting control system shall be the Dialog system manufactured by **Douglas Lighting Controls Inc.**

##### 1.3 Prior Approval Submissions

- 1.3.1 Manufacturers wishing to submit quotations on the lighting control system must pre-qualify. Pre-qualification information must be submitted to the electrical consulting engineer not later than ten (10) working days prior to the final closing of tenders for this project.
- 1.3.2 The manufacturer must be prepared to demonstrate the equipment being proposed before the closing of tender.
- 1.3.3 Submit a one-line diagram of the proposed system configuration for review.

##### 1.4 Instruction Manuals

- 1.4.1 Supply manuals on system components to permit ease of installation, system operation and maintenance including, but not limited to the following:
  - Lighting control system step-by-step operating instructions.
  - Relay panel schedules indicating circuits connected, inputs assigned, area controlled, panel location and panel equipment details.

### LIGHTING CONTROL SYSTEM

## 2. PART 2 - Materials

### 2.1 Relays

- 2.1.1 Lighting control relays shall be mechanically latching and shall come complete with a manual ON/OFF switch. The mechanical switch shall continuously display the true state of the relay's internal contacts.
- 2.1.2 Single pole relays shall be rated and UL/CSA listed for 120VAC, 277VAC and 347VAC lighting loads at 20 amps (30A General Use) and have a general, tungsten, standard and electronic ballast rating. Use **Panasonic** WR-6161K-84.
- 2.1.3 Double pole relays shall be rated and UL listed for 208VAC, 240VAC and 480VAC and CSA for up to 347VAC lighting loads at 20 amps and have a general, tungsten, standard and electronic ballast rating. Use **Panasonic** WR-6172.
- 2.1.4 The relays shall have a label indicating the short circuit fault current rating as per the NEC. The relays shall have passed UL 508 short circuit tests at 18,000 amperes.
- 2.1.5 Each lighting control relay shall be capable of controlling incandescent, fluorescent, electronic ballast and H.I.D. lighting loads and have an inrush capability of 3000 amperes. Relays shall be complete with a 5-year Manufacturer's Limited Warranty.
- 2.1.6 Lighting control relays shall include captive screw terminals for both the line voltage and the low voltage connections. Switching the relay shall be accomplished with ONE signal wire and a common return. The signal wire shall be able to signal ON and OFF and shall carry status current that indicates if the relay is ON or OFF.

### 2.2 Pre-assembled Relay Panels: PWEx Series

- 2.2.1 Where indicated on the drawings, provide a factory pre-assembled relay panel. The panel's enclosure shall be for surface or flush installation, with a screw-on cover or a hinged door assembly as required.
- 2.2.2 The panel shall consist of a pre-assembled interior insert; UL/CSA approved **Douglas Lighting Controls** CxxM or WxxM series with capacities for 6, 12, 24, 48 or 72 relays as required. Panel enclosure must be UL/CSA Approved.
- 2.2.3 Panel interior shall have the following pre-assembled and pre-wired:
  - Suitable divider separating class 1 and class 2 compartments.
  - Dual-Tapp Control transformer, UL/CSA approved for class 2 circuits, Douglas Lighting Controls WR-4075-xxx where xxx = primary voltage.
  - Low voltage relays as required by switched circuits shown on plans or schedules.
  - Control devices as required
- 2.2.4 Relay panels shall be CheckLight™ Equipped to support energy measurement and energy management requirements

## **2.3 Energy Measurement and Energy Monitoring – CheckLight™ by Douglas Lighting Controls**

- 2.3.1 The networked lighting control system shall provide energy consumption of the controlled load.
- 2.3.2 The networked lighting control system shall aggregate energy consumption data and present it through a cloud-based Graphical User Interface (GUI).
- 2.3.3 The energy consumption shall present data in time periods of day, week, month, year, as well as offer custom date fields.
- 2.3.4 The energy consumption shall be presentable by zone, multiple-zone, and entire building views.
- 2.3.5 The energy measurement and energy monitoring system shall allow Automated Demand Response (Open ADR) commands to be executed.
- 2.3.6 The energy measurement and energy monitoring system shall allow remote access to the Lighting Control Unit (LCU) for configuration & control of the lighting system.
- 2.3.7 The energy measurement and energy monitoring system shall report system faults by email to a designated person.

## **2.4 Device Network Controls - Lighting Control Unit: WLC-4150**

- 2.4.1 The **Douglas Lighting Controls** Dialog WLC-4150 Lighting Control Unit (LCU) shall be able to operate the local lighting control system on a stand-alone basis. For large installations that require multiple LCUs, all units must be able to operate on a stand-alone basis should they become disconnected from the network.
- 2.4.2 The LCU shall provide the following user interfaces for viewing and editing data:
  - Built-in touch screen with editable IP address field for convenient at panel configuration and providing web accessible configuration.
  - Built-in web server, accessed via TCP/IP connection.
  - LCU shall be accessible via a web browser with no additional software required.
- 2.4.3 Each LCU shall provide the following standard lighting control functions:
  - Program and control up to 252 relays and 252 dimmers.
  - Link Outputs to switches and/or sensors to provide ON/OFF, Preset, or Dim Up/Down commands. In addition, functions such as Flick Warn, Time Out, Natural Daylight, Enable/Disable and Quiet Time can be associated with switches, sensors and relays and have these features scheduled by time-of-day or date.
  - Be able to group Outputs and Inputs to facilitate various control schemes.
  - Be able to program peripheral devices (switches, sensors, etc.) to function differently based on specific situations such as time-of-day, demand response status, user intervention, etc.
  - Photo Sensor to provide Dusk-to-Dawn (switching) and/or Natural Daylight (dimming) with multiple set points to different groups.
  - Astronomic Controls for Dusk-to-Dawn applications not requiring Photo

## **LIGHTING CONTROL SYSTEM**

- Sensor.
- Provide Log Reports for diagnostic and run-time tracking purposes.
- Time Schedule types include: 7-day weekly scheduling, 365-day date specific, Holiday, and event scheduling.
- 2.4.4 The system shall have pre-defined logical applications for lighting controls.
  - Astronomical Time Clock
  - Natural Daylight (CLC) – Open Loop & Close Loop
  - Exterior Threshold Photo Control
  - Time Out (Unoccupied Mode)
  - Quiet Mode
  - Permanent Block
  - Flick Warn
- 2.4.5 The system must shall the ability to operate multiple items and modes with a single action and sequence them with time offsets.
- 2.4.6 **Behaviors:** The system shall have the ability to program multiple actuations and modes with a single activation. Each item must be able to be programmed with a time offset. When the deactivation occurs a separate and unique list of actuations can be programmed.
- 2.4.7 **Triggers:** The system shall be able to utilize the status or the one or many relay/group statuses to send an actuation to the system. The statuses must be able to be programmed in an AND or OR logic.
- 2.4.8 Each LCU shall provide the following system functions:
  - Demand response: connection via contact input.
  - Accept configuration updates via USB port or Ethernet connection.
  - Backup data via Ethernet or USB port
  - The device shall be BACnet Native

## 2.5 Dialog Room Controller: WRC-4244

- 2.5.1 Where indicated on the drawings provide a pre-configured, digitally addressable, plenum-rated room controller.
- 2.5.2 The Dialog Room Controller shall be capable of:
  - Autonomously controlling a space.
  - Networking to a central Dialog control system.
  - Networking to a central BACnet based management system.
- 2.5.3 The Dialog Room Controller shall consist of:
  - A universal voltage type (120VAC/277VAC/347VAC) power supply.
  - Four 20A rated relays complete with manual override. Circuit Load rating dependent on usage. One circuit dedicated for 20A receptacle control.
  - Four 0-10V control channels, each capable of 100mA current sinking
  - A port to connect downstream switches, occupancy sensors and daylight sensors. All downstream devices shall connected via two #18AWG, non-polarized, non-shielded, non-twisted conductors. See Section 3.4 for wiring specifications.
  - A port to connect to an upstream Dialog Lighting Control Unit.
  - A port to connect upstream to BACnet IP building management system.

## LIGHTING CONTROL SYSTEM



The Controller shall communicate using native BACnet command objects appropriate for the application.

- An indicating LED to aid in locating the controller in a darkened ceiling space.
  - Circuit testing buttons
  - Capable of connecting with WUL-4924
  - Output 24Vac 120mA
  - Relay Ratings
    - 20A Suitable for General Purpose Loads @ 120/277/247VAC
    - 20A Suitable for Standard Ballasts and Tungsten Loads @ 120/277VAC
    - 15A Suitable for Standard Ballasts Only @ 347VAC
    - 16A Suitable for Electronic Ballasts @ 120/277VAC
    - 0.5HP @120/277VAC
  - US & Canada Plenum Rated
- 2.5.4 The Dialog Room Controller relays shall be connected such that 120Vac plug load(s) and 277VAC/347VAC lighting loads can be switched by a single Controller with no additional add-ons or remote modules
- 2.5.5 The Dialog Room Controller shall mount to electrical junction box via threaded ½" chase nipple. No other mounting hardware shall be required.

## **2.6 Dialog Room Controller: WRC-4222**

- 2.6.1 Where indicated on the drawings provide a pre-configured, digitally addressable, plenum-rated room controller.
- 2.6.2 The Dialog Room Controller shall be capable of:
- Autonomously controlling a space.
  - Networking to a central Dialog control system.
  - Networking to a central BACnet based management system.
- 2.6.3 The Dialog Room Controller shall consist of:
- A universal voltage type (120VAC/277VAC/347VAC) power supply.
  - Two 20A rated relays complete with manual override. Circuit Load rating dependent on usage.
  - Two 0-10V control channels, each capable of 100mA current sinking
  - A port to connect downstream switches, occupancy sensors and daylight sensors. All downstream devices shall connected via two #18AWG, non-polarized, non-shielded, non-twisted conductors. See Section 3.4 for wiring specifications.
  - A port to connect to an upstream Dialog Lighting Control Unit.
  - An indicating LED to aid in locating the controller in a darkened ceiling space.
  - Circuit testing buttons
  - Capable of connecting with WUL-4924
  - Output 24VAC 120mA
  - Relay Ratings
    - 20A Suitable for General Purpose Loads @ 120/277/247VAC

## **LIGHTING CONTROL SYSTEM**

- 20A Suitable for Standard Ballasts and Tungsten Loads @ 120/277VAC
  - 15A Suitable for Standard Ballasts Only @ 347VAC
  - 16A Suitable for Electronic Ballasts @ 120/277VAC
  - 0.5HP @120/277VAC
  - US & Canada Plenum Rated
- 2.6.4 The Dialog Room Controller relays shall be connected such that 277VAC and 347VAC lighting loads can be switched by a single Controller with no additional add-ons or remote modules
- 2.6.5 The Dialog Room Controller shall mount to electrical junction box via threaded ½" chase nipple. No other mounting hardware shall be required.
- 2.7 Dialog Room Controller UL924 Relay Expansion Pack: WUL-4924**
  - 2.7.1 Where indicated on the drawings provide a 2-relay expansion pack consisting of two independently controllable, 20A relays capable of emergency lighting circuit control.
  - 2.7.2 Expansion pack relays shall force EM lights on when the Dialog Room Controller loses power.
  - 2.7.3 The expansion pack shall connect to the Dialog Room Controller. No wires or tools shall be required to add an expansion pack to a Dialog Room Controller. The Dialog Room Controller will include a means for remote mounting if required.
  - 2.7.4 Circuit testing buttons
  - 2.7.5 Capable of connecting directly to WRC-4244 & WRC-4222
- 2.8 Relay controls installed in relay panels - Relay Drivers: WRD-3408z**
  - 2.8.1 The low voltage relays shall be connected to the Dialog system by a Douglas Lighting Controls WRD-3408z relay driver unit. Each WRD-3408z relay driver has 8 outputs and shall provide enough relay driver units so that each relay in the system is connected to an output.
  - 2.8.2 Relay drivers shall be able to control relays ON and OFF, determine relay status, provide feedback as to whether a relay is connected and be addressable within the Dialog network.
- 2.9 Dimming Ballast Control - Ballast Drivers: WDB-3314**
  - 2.9.1 The Dialog system shall be able to control industry standard 0-10VDC dimming ballasts or 0-10VDC LED drivers by using the **Douglas Lighting Controls WDB-3314 Dimming Ballast Module**. Each WDB-3314 shall have 4 dimming address outputs, be able to support 35 ballasts per output and support sink current of 100mA per output.
- 2.10 Telephone Interface: WTI-3101**
  - 2.10.1 Provide a Douglas Lighting Controls WTI-3101 telephone interface for direct code communication via the regular TOUCHTONE® telephone system, so that dialing a special number and entering a definable code shall allow

## LIGHTING CONTROL SYSTEM

various zone control from any regular push button telephone. A password module shall protect the system from unauthorized access.

## **2.11 BACnet**

- 2.11.1 The LCU shall be BACnet native and have the ability to communicate to a system integrator or other software specialist. It shall be possible to view/control the system via the BACnet integration software through TCP/IP connection. The system shall provide the following features:
- Program and control up to 252 relays and dimming points.
  - Control and receive status for Groups
  - Control and receive status for Presets
  - Receive status from Occupancy Sensors

## **2.12 Global Web Server: GWS-xxxx**

- 2.12.1 The **Douglas Lighting Controls** GWS-xxxx shall be able to operate the entire lighting control system from a single interface.
- 2.12.2 The GWS shall provide the built-in web server interfaces for viewing and editing data, accessed via TCP/IP connection and connect to a PC/laptop using IE9+.
- 2.12.3 The GWS will provide access to up to 25 LCUs and shall provide the following standard lighting control functions within each LCU:
- Program and control up to 252 relays and 252 dimmers.
  - Link Outputs to switches and/or sensors to provide ON/OFF, Preset, or Dim Up/Down commands. In addition, functions such as Flick Warn, Time Out, Natural Daylight, Enable/Disable and Quiet Time can be associated with switches, sensors and relays and have these features scheduled by time-of-day or date.
  - Be able to group Outputs and Inputs to facilitate various control schemes.
  - Be able to program peripheral devices (switches, sensors, etc.) to function differently based on specific situations such as time-of-day, demand response status, user intervention, etc.
  - Photo Sensor to provide Dusk-to-Dawn (switching) and/or Natural Daylight (dimming) with multiple set points to different groups.
  - Astronomic Controls for Dusk-to-Dawn applications not requiring Photo Sensor.
  - Provide log reports for diagnostic and run-time tracking purposes.
  - Time schedule types include: 7-day weekly scheduling, 365-day date specific and event scheduling.
- 2.12.4 The **GWS-xxxx** shall provide the additional following system functions:
- Centralized Programming
  - Synchronization of time clocks
  - Download and upload of all system files
  - OPC Server Deployment
  - The ability to operate with an GUI interactive floor plan

## **LIGHTING CONTROL SYSTEM**

## **2.13 Graphics Package**

- 2.13.1 In normal operation / manual command mode, the computer shall enable the viewing of one or more graphic drawings of the controlled building along with the status of each of the controlled sectors. Using the mouse or optional Touch Screen, the operator can view into various portions of the building and switch relays, groups, presets, and active modes. No special control code memorization shall be necessary.
- 2.13.2 The owner shall provide direction on colors and logos
- 2.13.3 The lighting symbols shall be established by the user through the graphic editor and shall change color in order to display the real time status of that particular relay or zone.
- 2.13.4 The Graphics shall be deployed on the **Douglas Lighting Controls** GWS Global Web Server (GWS) and served up via a mobile app or desktop app.

## **2.14 Dimmer Switch: WSD-3501 series**

- 2.14.1 Dimmer switches shall be **Douglas Lighting Controls** WSD-3501 and connected to the lighting control network via a 2-wire, non-polarized data line. Each switch shall be capable of raising or lowering light levels of individual or groups of lighting fixtures.
- 2.14.2 Switches shall include integral LED indication for light levels as well as a switch for ON/OFF control.
- 2.14.3 Dimmer switch can be programmed with a **Douglas Lighting Controls** WIR-3110 infrared setting unit.

## **2.15 LCD Switch: WSW-LCD**

- 2.15.1 A wall station switch with an LCD graphical user interface shall be **Douglas Lighting Controls** WSW-LCD and connect to the lighting control network via a 2-wire, non-polarized data line and require a 24VAC power supply.
- 2.15.2 The LCD wall station switch shall have a touch screen interface.
- 2.15.3 The LCD wall station switch shall be installed into a two-gang wall station box.

## **2.16 Contact Input WCI-3928**

- 2.16.1 Use a **Douglas Lighting Controls** WCI-3928 when inputs from other devices (including other manufacturers) are required. Each unit shall provide DC power for each sensor and will accept a momentary or maintained contact signal from each sensor that can be assigned to any relay or group. Check with factory to ensure compatibility.
- 2.16.2 Devices connected to WCI-3928 input unit shall include the following features:
  - Adjustable Timeout (3 min to 30 min).
  - Function selection: ON only, OFF only, toggle (ON/OFF)
  - Multiple sensors may work together using either direct connection to sensors or via multi-sensor function built into WCI-3928 units.

## **LIGHTING CONTROL SYSTEM**

## **2.17 Photo Sensor & Daylight Controls - WPS-3741B Exterior Daylight Sensor**

- 2.17.1 Provide where required a **Douglas Lighting Controls** WPS-3714B Exterior Daylight Sensor capable of sensing from 0 to 65,000 lux (0 to 6500 fc) of direct light. The sensor shall derive both its power and data information from the **Dialog** data line.
- 2.17.2 The ambient light level shall be continuously monitored in lux by the sensor. The sensor shall broadcast to the network the existing light level when requested or when there is a change in detected light level.
- 2.17.3 Set point adjustments can be made via a touch screen or web server interface to the **Douglas Lighting Controls** WLC-4150 LCU or on the WLC-4150.
- 2.17.4 Each sensor can be programmed to provide ON/OFF control of relays, raise/lower of 0-10vdc ballasts and LED drivers via a touch screen or web server interface to the **Douglas Lighting Controls** WLC-4150 LCU or on the WLC-4150.
- 2.17.5 One sensor shall permit different outputs to switch and/or control light levels as ambient light changes. Light levels shall be controlled by 'sensor only' or in combination with a time schedule or with a dimming switch.
- 2.17.6 It shall be possible to set a maximum light level which cannot be exceeded during Natural Daylight operations or for non-daylight controlled areas, a permanent or "tuned" light level to maximize energy savings.

## **2.18 Photo Sensor & Daylight Controls - WPP-INT Interior Daylight Sensor**

- 2.18.1 Provide where required a **Douglas Lighting Controls** WPP-INT Interior Daylight Sensor capable of sensing from 0 to 65,000 lux (0 to 6500 fc) of direct light. The sensor shall derive both its power and data information from the **Dialog** data line.
- 2.18.2 The ambient light level shall be continuously monitored in lux by the sensor. The sensor shall broadcast to the network the existing light level when requested or when there is a change in detected light level.
- 2.18.3 Set point adjustments can be made via a touch screen or web server interface to the **Douglas Lighting Controls** WLC-4150 LCU or on the WLC-4150.
- 2.18.4 Each sensor can be programmed to provide ON/OFF control of relays, raise/lower of 0-10vdc type or ballasts and LED drivers via a touch screen or web server interface to the **Douglas Lighting Controls** WLC-4150 LCU or on the WLC-4150.
- 2.18.5 One sensor shall permit different outputs to switch and/or control light levels as ambient light changes. Light levels shall be controlled by 'sensor only' or in combination with a time schedule or with a dimming switch.
- 2.18.6 It shall be possible to set a maximum light level which cannot be exceeded during Natural Daylight operations or for non-daylight controlled areas, a permanent or "tuned" light level to maximize energy savings.

## **2.19 Infrared Setting Unit - WIR-3110**

# **LIGHTING CONTROL SYSTEM**

- 2.19.1 Provide a **Douglas Lighting Controls WIR-3110** Infrared Setting Unit to facilitate the following functions:
- Set input device and address
  - Configure input device presets, group, and individual control
  - Set local or global functionality

### **3. PART 3 - Installation**

#### **3.1 Relay panels and conduit.**

- 3.1.1 Ensure that conduit for line voltage wires enters panel in line voltage areas and conduit for low voltage control wires enters panel on low voltage areas. Check manufacturer's drawings for location of line and low voltage areas.

#### **3.2 Daylight Sensors**

- 3.2.1 Install **Douglas Lighting Controls WPP-INT** or **WPS-3741B** daylight sensors as per manufacturer's recommendations for closed loop and open loop applications. Ensure there is no artificial light shining directly into the sensor head.
- 3.2.2 Adhere to manufacturer's recommendations for wiring and programming.

#### **3.3 Wiring**

- 3.3.1 For low voltage wiring, provide wire type as recommended by the manufacturer.
- 3.3.2 Adhere to manufacturer's recommendations as to maximum wire length and maximum quantity of relays per switch.
- 3.3.3 Dialog Data line shall be single pair #18AWG LVT wire type or equivalent.

#### **3.4 Line Voltage Wiring**

- 3.4.1 Use wire gauges from #12AWG to #14AWG as appropriately sized for the branch circuit.

- 3.5 Training shall be provided for the owner's representative and contractor. Prior to commissioning owner's representative and electrical contractor/distributor shall acknowledge receipt of training agenda. Electrical contractor/distributor shall confirm that specifying engineer has been contacted and been invited to attend the system demonstration and/or training. All product and lighting control system documentation and operation's manuals shall be provided by electrical contractor/distributor at the time of training.
- 3.6 Training is to include, but not be limited to: basic operation of lighting control system, set-up of system and control panels, operation of control stations, programming of system, basic be-bugging, and overall system testing. At completion of training session all in attendance shall sign the commissioning technician's field service report to confirm participation in the training session.
- 3.7 Completed field service report shall be submitted to the electrical contractor/distributor and specifying engineer.

## **LIGHTING CONTROL SYSTEM**

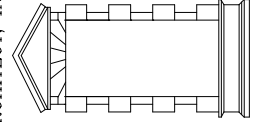
**4. Follow-up Contact**

- 4.1 Approximately 90 days following the commissioning of the lighting control system ERT Lighting shall contact the electrical contractor/distributor to confirm that the system is operating correctly and answer any operational questions that have come-up since commissioning.

**5. Warranty**

- A. Five (5) year 100% parts replacement

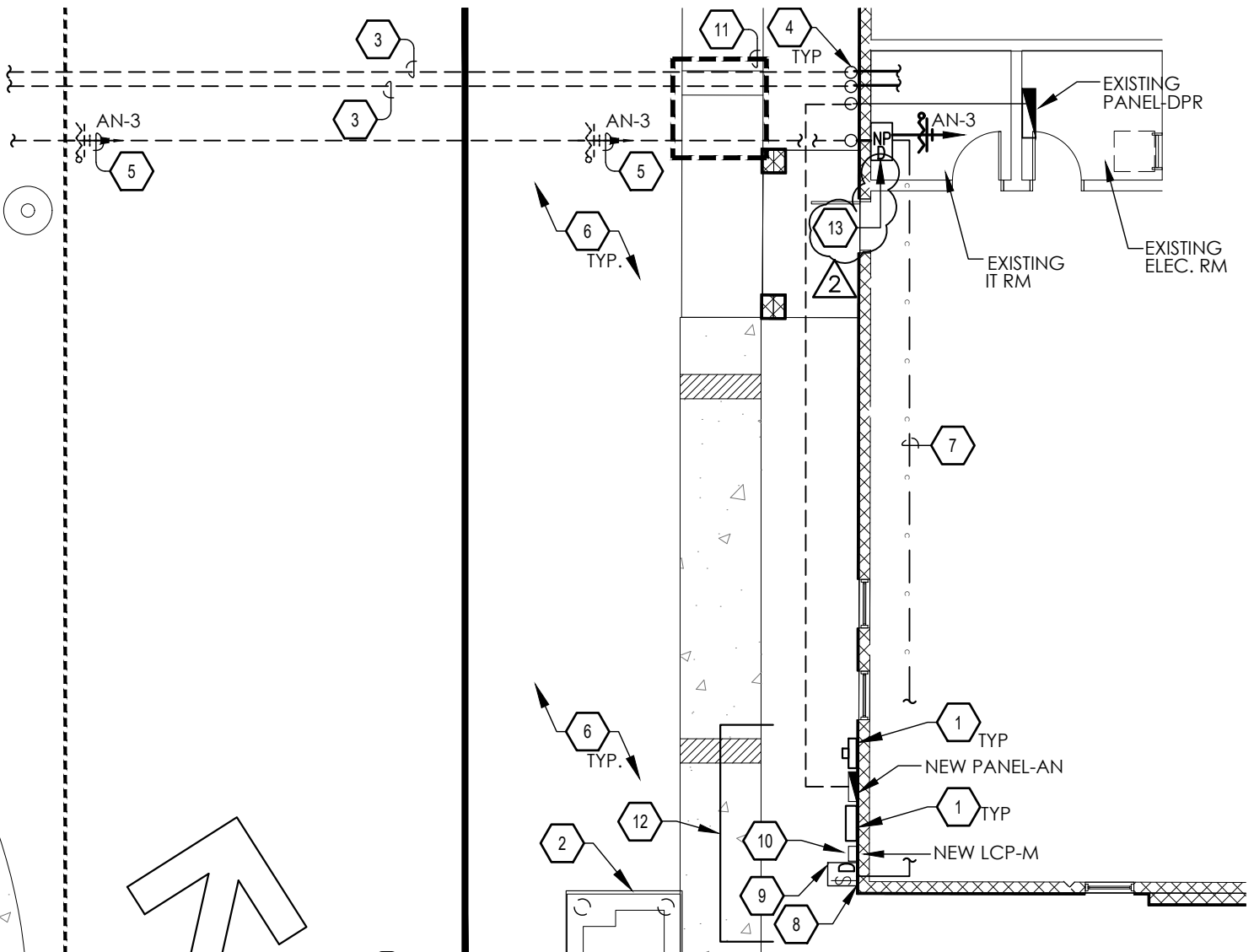
*THE END*



02/08/21

**KEYED NOTES: POWER****TRINITY**  
MEP ENGINEERING3533 Moreland Dr. Ste A | Weslaco, Tx 78596  
p:956.973.0500 | f:956-351-5750  
www.trinitymep.com | Copyright 2021  
Texas Registered Engineering Firm - F10362  
Project number: 20.3.35

- 5 EXTERIOR LIGHTING CIRCUIT TO BE ROUTED TO PANEL-AN VIA DIMMING POWER PACK. PROPOSED CONDUIT PATH SHALL BE COORDINATED PRIOR TO ANY WORK. 2
- 7 ROUTE CONDUIT ABOVE CEILING LEVEL TO EXTERIOR DIMMING SWITCH. (INCLUDE CONTROL CABLE, REFER TO MANUFACTURER) 2
- 10 PROVIDE NEMA-4X ENCLOSURE (STAINLESS STEEL TYPE) 2 FOR RELAY PANEL. COORDINATE LOCATION PRIOR TO ANY WORK.
- 13 DIMMING POWER PACK LOCATED IN IT ROOM. 2

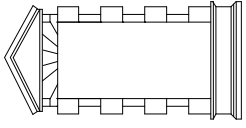



1

**ELECTRICAL SITE PLAN ENLARGEMENT**

SCALE: 1"=10'-0"



SHEET AEG01.1	PROJECT: PORT OF BROWNSVILLE ANCHOR PARK		ROBERTO J. RUIZ ARCHITECT, INC.  615 W. TANDY ROAD BROWNSVILLE, TEXAS 78520 (956) 350-9195 OFFICE (956) 350-9196 FAX ARCHIRUIZ@AOL.COM
	PORT OF BROWNSVILLE BROWNSVILLE, TEXAS		
DRAWN BY: —	REVISED	 ADDENDUM #3	
DATE: 02/08/21			





# TRINITY MEP ENGINEERING

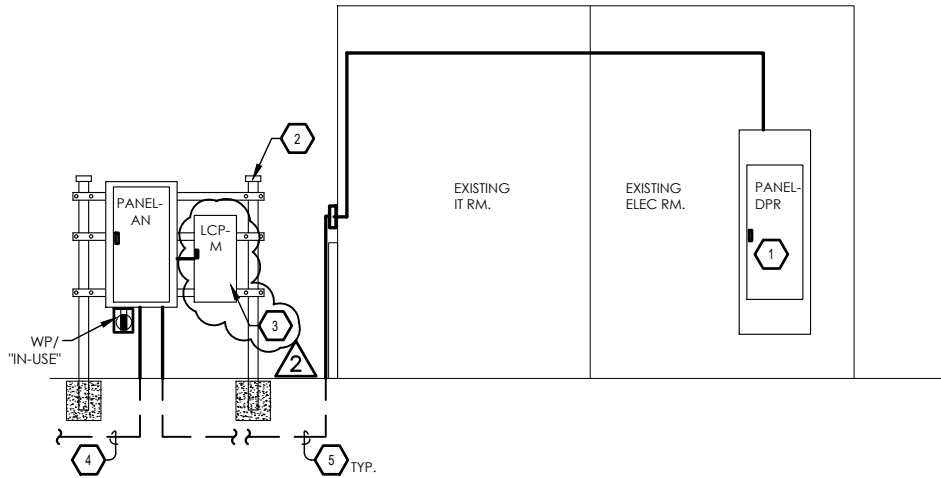
3533 Moreland Dr. Ste A | Weslaco, Tx 78596  
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 Texas Registered Engineering Firm - F10362  
 Project number: 20.3.35

02/08/21



## ELECTRICAL RISER DIAGRAM KEYED NOTES:

-  LIGHTING CONTROL RELAY PANEL IN A NEMA 4X STAINLESS STEEL LOCKABLE ENCLOSURE 
-  LIGHTING CIRCUITS.
-  4#2, 1#8G, 2"C.



## 5 ELECTRICAL ANCHOR PARK SCHEMATIC DIAGRAM SCALE: NTS

SHEET <b>AEG01.2</b>	<b>PROJECT:</b>	PORT OF BROWNSVILLE ANCHOR PARK <hr/> PORT OF BROWNSVILLE BROWNSVILLE, TEXAS	ROBERTO J. RUIZ ARCHITECT, INC.  615 W. TANDY ROAD BROWNSVILLE, TEXAS 77820 (956) 350-9195 OFFICE (956) 350-9196 FAX ARCHIRUIZ@AOL.COM
DRAWN BY: <u>          </u>	<b>REVISED</b>	 <b>ADDENDUM #3</b>	
DATE: <b>02/08/21</b>			

2

**120/208V 3Ø, 4W ELECTRICAL LOAD ANALYSIS**  
DESIGN CONNECTED LOAD

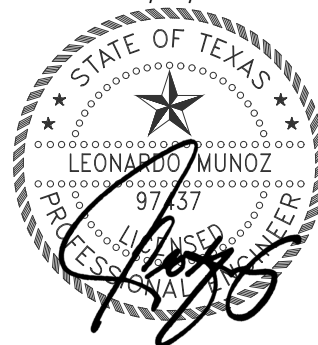
DESCRIPTION	TOTAL KVA
LIGHTING	2
GENERAL POWER	7
TOTAL KVA:	9
TOTAL AMPS:	25
TOTAL AMPS+25%:	31
WIRE SIZE AMPS:	100

## TRINITY

### MEP ENGINEERING

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 Project number: 20.3.35

02/08/21



### RELAY LIGHTING CONTROL PANEL

#### Master CABINET CIRCUIT SCHEDULE

120/208VAC, 1 PHASE

PANEL NAME: LCPM

PANEL LOCATION: EXTERIOR

PANEL DESCRIPTION: NETWORKING 16 Relay Cabinet:

CATALOG NUMBER: XXX

PANEL FEED: AN

PANEL ID: Master

MOUNTING: Surface

NEMA 4X  
(STAINLESS STEEL ENCLOSURE)

RELAY		A	PNL CIRCUIT	LOAD		
NO.	TYPE			VAC	LOAD W/VA	CIRCUIT DESCRIPTION
1	1	20	AN-1	120V	1200	SITE LIGHTING-POLES
3	1	20	AN-3	120V	1200	SITE LIGHTING-FLOODS
5	1	20		120V		SPARE
7	1	20		120V		SPARE

9						SPACE
11						SPACE
13						SPACE
15						SPACE

RELAY		A	PNL CIRCUIT	LOAD		
NO.	TYPE			VAC	LOAD W/VA	CIRCUIT DESCRIPTION
2	1	20	AN-2	120V	1200	SITE LIGHTING-INGRADE
4	1	20		120V		SPARE
6						SPACE
8						SPACE

10						SPACE
12						SPACE
14						SPACE
16						SPACE

#### LEGEND:

1 = RELAY-1-POLE, 20A, UP TO 277VAC  
 2 = RELAY-2-POLE, 2-POLE, 20A, UP TO 480VAC  
 A=AMPS

3 = FAN RELAY 1-POLE, 20AMP, 120V

#### NOTES:

1. INCLUDE EXTERIOR PHOTO CELL, SOFTWARE PROGRAMMING, COMMUNICATION CARD.
2. VERIFY WITH OWNER FOR ALL PROGRAMMING SEQUENCE.
3. REFER TO SPECIFICATION 2609 23.
4. PROVIDE DEDICATED 20AMP 120V FROM NEAREST 120/208V PANEL.

5. INCLUDE ALL TRAINING FOR PROGRAMMING AND STARTUP IN CONTRACT. REFER TO SPECIFICATIONS.
6. INCLUDE REMOTE CONTROL OPTION. OWNER TO PROVIDE DATA INPUT.
7. INCLUDE ASTRONOMICAL TIME CLOCK.

6

## PANEL SCHEDULE: LCP-M

SCALE: NTS

ANCHOR PARK  
 Port of Brownville  
 1000 Foust Road  
 Brownsville TX

ADDENDUM NO. 3



02/10/21

ISSUED BY THE OFFICE OF ROBERTO J. RUIZ ARCHITECT, INC. – 02/10/21

The following is an addendum to the Contract Documents dated 12/18/20 for the project named above:

ITEM		
1	QUESTION: Which primer and marine paint is to be used on the anchor and cleat?	
	RESPONSE: Steelcoast will prime the anchor and cleat. The General Contractor is to provide two (2) coats of marine paint over the primed anchor and cleat. Use the paint product shown in attachment.	

# Kem Bond® HS

## Universal Metal Primer

B50NZ0003 Red Oxide, B50WZ0004 Off White, B50AZ0008 Gray



**SHERWIN  
WILLIAMS.**

### CHARACTERISTICS

**KEM BOND HS** is a fast drying, higher solids, rust inhibitive, universal, phenolic alkyd metal primer. Kem Bond HS can be topcoated with alkyd, acrylic, and high performance coatings. Also suitable as a "barrier" coat over conventional coatings which would normally be attacked by strong solvents in high performance coatings.

**For use on properly prepared:** Steel

#### Features:

- High film build to protect sand blasted steel
- Good corrosion and rust protection
- Universal, can be topcoated with epoxies and urethanes
- Exterior-interior metal primer
- Suitable for use in USDA inspected facilities

#### Recommended for use in:

- Marine application
- Steel pipe
- Maintenance primer
- Hand rail
- Structural steel
- Tanks
- Machinery
- Bar joists

**Color:** Red Oxide, Off White, Gray

**Recommended Spreading Rate per coat:**  
(B50NZ0003 varies by base)

Wet mils: 3.0-8.0  
Dry mils: 1.8-4.9  
Coverage sq. ft. per gallon: 199-543

**Theoretical coverage:** sq. ft. 978  
per gallon @ 1 mil dry

Approximate spreading rates are calculated on volume solids and do not include any application loss. Note: Brush or roll application may require multiple coats to achieve maximum film thickness and uniformity of appearance.

#### Drying Schedule @ 4.0 mils wet, @ 50% RH:

	@40°F	@77°F	@120°F
To touch :	1 hour	30 min.	10 min.
Tack handle:	3 hours	1 hour	15 min.
To recoat:	6 hours	2 hours	1 hour
with itself and alkyds			
To recoat:*	24 hours	24 hours	6 hours
To recoat:	48 hours	24 hours	6 hours
with acrylic latex paints			
Cure time	5 days	2 days	1 day

\* Recoat with hot solvent urethane or epoxies or high performance coatings.

Drying, and recoat times are temperature, humidity, and film thickness dependent.

**Tinting:** Do Not Tint

**Finish:** Flat

#### Red Oxide B50NZ0003

(may vary by color)

#### V.O.C. (less exempt solvents):

321 grams per litre; 2.68 lbs. per gallon  
As per 40 CFR 59.406

**Volume Solids:** 61 ± 2%

**Weight Solids:** 80 ± 2%

**Weight per Gallon:** 13.35 lb

**Flash Point:** 97°F PMCC

**Shelf Life:** 36 months, unopened

### COMPLIANCE

As of 02/11/2020, Complies with:

OTC	Yes
OTC Phase II	No
SCAQMD	No
CARB	No
CARB SCM 2007	No
Canada	Yes
LEED® v4 & v4.1 Emissions	No
LEED® v4 & v4.1 V.O.C.	No
EPD-NSF® Certified	No
MIR-Product Lens Certified	No
MPI	Yes

### APPLICATION

**Temperature:**  
minimum 40°F / 4.4°C  
maximum 120°F / 49°C  
air, surface, and material

At least 5°F above dew point

**Relative humidity:** 85% maximum  
The following is a guide. Changes in pressures and tip sizes may be needed for proper spray characteristics. Always purge spray equipment before use with listed reducer. Any reduction must be compatible with the existing environmental and application conditions.

**Reducer:** No reduction in restricted areas  
Xylene, R2K4

**Airless Spray:**  
Pressure 1800 p.s.i.  
Hose 1/4-3/8 inch I.D.  
Tip .017-.019 inch  
Reduction As needed up to 5%  
by volume

**Conventional Spray:** Not recommended  
**Brush** Natural Bristle  
**Roller Cover** 1/4-3/8 inch woven with solvent resistant core

If specific application equipment is listed above, equivalent equipment may be substituted.

Apply paint at the recommended film thickness and spreading rate as indicated on front page. Application of coating above maximum or below minimum recommended spreading rate may adversely affect coating performance. Spreading rates are calculated on volume solids and do not include an application loss factor due to surface profile, roughness, or porosity of the surface, skill, and technique of the applicator, method of application, various surface irregularities, material lost during mixing, spillage, over thinning, climatic conditions, and excessive film build.

Mix paint thoroughly to a uniform consistency with slow speed power agitation prior to use. Stripe coat crevices, welds, and sharp angles to prevent early failure in these areas. When using spray application, use a 50% overlap with each pass of the gun to avoid holidays, bare areas, and pinholes. If necessary, cross spray at a right angle.

Not recommended for immersion service or exposure to acids, alkalis, or strong solvents. Intimate contact with the steel surface and primer is necessary for adequate rust inhibition and adhesion.

According to American Institute of Steel Construction (AISC), shop coat primers are intended for protection for only a short period of exposure in ordinary atmospheric conditions, and is considered a temporary and provisional coating.

### SPECIFICATIONS

#### Steel:

1 coat Kem Bond HS  
2 coats Topcoat

#### Acceptable Topcoats:

Acrolon 218 HS Polyurethane  
Hi-Solids Polyurethane  
Industrial Enamel  
Macropoxy 646 Epoxy  
Macropoxy HS Epoxy  
Metalatex Semi-Gloss Enamel  
Pro Industrial Acrylic  
Pro Industrial Waterbased Epoxy  
Pro Industrial Waterbased Alkyd-Urethane  
Pro Industrial Multi-Surface Acrylic  
Pro Industrial Pre-Catalyzed Epoxy & Urethane  
Pro Industrial Urethane Alkyd Enamel  
Pro Industrial Waterbased Acrolon 100  
Sher-Cryl  
Silver-Brite Aluminum  
Steel Master 9500  
Tile-Clad HS Epoxy

The systems listed above are representative of the product's use, other systems may be appropriate. Other primers may be appropriate.

# Kem Bond® HS

## Universal Metal Primer

### SURFACE PREPARATION

**WARNING!** Removal of old paint by sanding, scraping or other means may generate dust or fumes that contain lead. Exposure to lead dust or fumes may cause brain damage or other adverse health effects, especially in children or pregnant women. Controlling exposure to lead or other hazardous substances requires the use of proper protective equipment, such as a properly fitted respirator (NIOSH approved) and proper containment and cleanup. For more information, call the National Lead Information Center at 1-800-424-LEAD (in US) or contact your local health authority.

Remove all surface contamination by washing with an appropriate cleaner, rinse thoroughly and allow to dry. Existing peeled or checked paint should be scraped and sanded to a sound surface. Glossy surfaces should be sanded dull. Stains from water, smoke, ink, pencil, grease, etc. should be sealed with the appropriate primer/sealer. Recognize that any surface preparation short of total removal of the old coating may compromise the service length of the system.

**Iron & Steel-** Minimum surface preparation is Hand Tool Clean per SSPC-SP2. Remove all oil and grease from surface by Solvent Cleaning per SSPC-SP1. For better performance, use Commercial Blast Cleaning per SSPC-SP6/NACE 3, blast clean all surfaces using a sharp, angular abrasive for optimum surface profile (2 mils). Prime any bare steel within 8 hours or before flash rusting occurs.

**Previously Painted Surfaces** - If in sound condition, clean the surface of all foreign material. Smooth, hard or glossy coatings and surfaces should be dulled by abrading the surface. Apply a test area, allowing paint to dry one week before testing adhesion. If adhesion is poor, additional abrasion of the surface and/or removal of the previous coating may be necessary. Retest surface for adhesion. If paint is peeling or badly weathered, clean surface to sound substrate and treat as a new surface as above. Recognize that any surface preparation short of total removal of the old coating may compromise the service length of the system.

Other substrates may or may not be appropriate. If a specific substrate is not listed above, consult your Sherwin-Williams representative for more information.

### SURFACE PREPARATION

**Mildew** - Prior to attempting to remove mildew, it is always recommended to test any cleaner on a small, inconspicuous area prior to use. Bleach and bleaching type cleaners may damage or discolor existing paint films. Bleach alternative cleaning solutions may be advised. Mildew may be removed before painting by washing with a solution of 1 part liquid bleach and 3 parts water. Apply the solution and scrub the mildewed area. Allow the solution to remain on the surface for 10 minutes. Rinse thoroughly with water and allow the surface to dry before painting. Wear protective eyewear, waterproof gloves, and protective clothing. Quickly wash off any of the mixture that comes in contact with your skin. Do not add detergents or ammonia to the bleach/water solution.

### PERFORMANCE

Off White B50WZ0004

**System Tested:** (unless otherwise indicated)

**Substrate:** Steel

**Surface Preparation:** SSPC-SP6-NACE 3

**Primer:** 1 coat Kem Bond HS @ 4.5-5 Mils W.F.T.

**Adhesion:**

Method: ASTM D3359

Result: 4B

**Corrosion Resistance:**

Method: ASTM D5894, 1008

Result: Pass

**Dry Heat Resistance**

Method: ASTM D2485

Result: 200°F

**Flexibility:**

Method: ASTM D522, 1/4 inch mandrel

Result: Pass

**Fineness of grind<sup>1</sup>:**

Method: Hegman

Result: 4 Hegman minimum

**Sag Test<sup>1</sup>:**

Method: ASTM D4400

Result: 12 mils minimum

**Viscosity<sup>1</sup>:**

Method: Krebs Units

Result: 95-105 KU

**Water Resistance:**

Result: Pass

<sup>1</sup> Standard test based on Certificate of Analysis

### SAFETY PRECAUTIONS

Before using, carefully read **CAUTIONS** on label. Refer to the Safety Data Sheets (SDSs) before use.

### FOR PROFESSIONAL USE ONLY.

Published technical data and instructions are subject to change without notice. Contact your Sherwin-Williams representative for additional technical data and instructions.

### CLEANUP INFORMATION

Clean spills, spatters & tools with compliant cleanup solvent. After cleaning, flush spray equipment with compliant cleanup solvent to prevent rusting of the equipment. Follow manufacturer's safety recommendations when using solvents.

**DANGER:** Rags, steel wool, other waste soaked with this product, and sanding residue may spontaneously catch fire if improperly discarded. Immediately place rags, steel wool, other waste soaked with this product, and sanding residue in a sealed, water-filled, metal container. Dispose of in accordance with local fire regulations.

HOTW	02/11/2020	B50NZ0003	34 321
HOTW	02/11/2020	B50WZ0004	29 310
HOTW	02/11/2020	B50AZ0008	17 314
FRC			



# Protective & Marine Coatings

## ACROLON™ 218 HS ACRYLIC POLYURETHANE

PART A B65-600 GLOSS SERIES  
PART A B65-650 SEMI-GLOSS SERIES  
PART B B65V600 HARDENER

Revised: January 11, 2021

### PRODUCT INFORMATION

5.22

#### PRODUCT DESCRIPTION

ACROLON 218 HS is a polyester modified, aliphatic, acrylic polyurethane formulated specifically for in-shop applications. Also suitable for industrial applications. A fast drying, urethane that provides color and gloss retention for exterior exposure.

- Can be used directly over organic zinc rich primers (epoxy zinc primer and moisture cure urethane zinc primer)
- Color and gloss retention for exterior exposure
- Fast dry
- Outstanding application properties

#### PRODUCT CHARACTERISTICS

Finish:	Gloss or Semi-Gloss
Color:	Wide range of colors available
Volume Solids:	65% ± 2%, mixed, may vary by color
Weight Solids:	78% ± 2%, mixed, may vary by color
VOC (EPA Method 24):	Unreduced: <300 g/L; 2.5 lb/gal mixed Reduced 10% with R7K15: <340 g/L; 2.8 lb/gal mixed Reduced 9% with MEK, R6K10: <340 g/L; 2.8 lb/gal
Mix Ratio:	6:1 by volume, 1 gallon or 5 gallon mixes premeasured components

#### Recommended Spreading Rate per coat:

	Minimum	Maximum
Wet mils (microns)	4.5 (112.5)	9.0 (225)
Dry mils (microns)	3.0 (75)	6.0 (150)
~Coverage sq ft/gal (m <sup>2</sup> /L)	175 (4.3)	346 (8.5)
Theoretical coverage sq ft/gal (m <sup>2</sup> /L) @ 1 mil / 25 microns dft	1040 (25.5)	

NOTE: Brush or roll application may require multiple coats to achieve maximum film thickness and uniformity of appearance.

#### Drying Schedule @ 6.0 mils wet (150 microns):

	@ 35°F/1.7°C	@ 77°F/25°C 50% RH	@ 120°F/49°C
To touch:	4 hours	1 hour	20 minutes
To handle:	18 hours	9 hours	4 hours
To recoat:			
minimum:	18 hours	8 hours	6 hours
maximum:	3 months	3 months	3 months
To cure:	14 days	7 days	5 days
Pot Life:	4 hours	2 hours	45 minutes

(reduced 5% with Reducer R7K15)

Sweat-in-Time: None

Drying time is temperature, humidity, and film thickness dependent. Paint temperature must be at least 40°F (4.5°C) minimum.

**Shelf Life:** Part A\* - 36 months, unopened  
Part B - 24 months, unopened  
Store indoors at 40°F (4.5°C) to 100°F (38°C).

\*Aluminum (Part A, Rex # B65SW655) has a shelf life of 24 months.

**Flash Point:** 55°F (13°C), Seta, mixed

**Reducer/Clean Up:**

**Spray:** Reducer R7K15, MEK R6K10, R7K111, Reducer #58  
**Brush / Roll:** Reducer #132, Reducer #58, R7K111

#### RECOMMENDED USES

Specifically formulated for in-shop applications.

For use over prepared metal and masonry surfaces in industrial environments such as:

- Structural steel
- Rail cars and locomotives
- Conveyors
- Bridges
- Wind Towers - onshore and offshore
- Offshore platforms - exploration and production
- Suitable for use in USDA inspected facilities
- Conforms to AWWA D102 Outside Coating Systems #4 (OCS-4), #5 (OCS-5) & #6 (OCS-6)
- Conforms to MPI# 72 and MPI# 174
- Acceptable for use in high performance architectural applications
- Acceptable for use over and/or under Loxon S1 and Loxon H1 Caulking
- A component of INFINITANK
- Over FIRETEX® hydrocarbon systems
- Suitable for use in the Mining & Minerals Industry
- Approved topcoat for NEPCOAT System B
- Tank exteriors
- Pipelines
- Ships

#### PERFORMANCE CHARACTERISTICS

**Substrate\*:** Steel

**Surface Preparation\*:** SSPC-SP10/NACE 2

**System Tested\*:**

1 ct. Macropoxy 646 @ 6.0 mils (150 microns) dft

1 ct. Acrolon 218 HS Gloss @ 4.0 mils (100 microns) dft

\*unless otherwise noted below

Test Name	Test Method	Results
Abrasion Resistance <sup>1</sup>	ASTM D4060, CS17 wheel, 1000 cycles, 1 kg load	43 mg loss
Adhesion <sup>3</sup>	ASTM D4541	1976 psi
Corrosion Weathering <sup>2</sup>	ASTM D5894, 27 cycles, 9072 hours	Rating 10 per ASTM D610, for rusting; Rating 10 per ASTM D714, for blistering
Direct Impact Resistance <sup>1</sup>	ASTM D2794	70 in. lb.
Dry Heat Resistance <sup>1</sup>	ASTM D2485, Method A	200°F (93°C)
Flexibility <sup>1</sup>	ASTM D522, 180° bend, 1/8" mandrel	Passes
Humidity Resistance <sup>2</sup>	ASTM D4585, 100°F (38°C), 1500 hours	Rating 10 per ASTM D610, for rusting; Rating 10 per ASTM D714, for blistering
Pencil Hardness	ASTM D3363	3H
Salt Fog Resistance <sup>3</sup>	ASTM B117, 15,000 hours	Rating 10 per ASTM D610, for rusting; Rating 10 per ASTM D714, for blistering

Meets the requirements of SSPC Paint No. 36, Level 3 for white and light colors. Dark colors may require a clear coat.

Complies with ISO 12944-5 C5I and C5M requirements.

#### Footnotes:

<sup>1</sup> Finish coat only tested

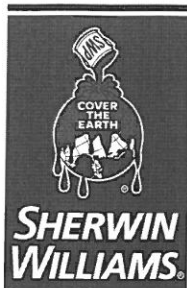
<sup>2</sup> Primer Zinc-Clad II Plus

Intermediate Macropoxy 646

Finish Acrolon 218 HS

<sup>3</sup> Primer Zinc-Clad III HS





# Protective & Marine Coatings

## ACROLON™ 218 HS ACRYLIC POLYURETHANE

PART A B65-600 GLOSS SERIES  
PART A B65-650 SEMI-GLOSS SERIES  
PART B B65V600 HARDENER

Revised: January 11, 2021

### PRODUCT INFORMATION

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#### RECOMMENDED SYSTEMS

		Dry Film Thickness / ct.	
		Mils	(Microns)
<b>Steel:</b>			
1 ct.	Macropoxy 646	5.0-10.0	(125-250)
1-2 cts.	Acrolon 218 HS Polyurethane	3.0-6.0	(75-150)
<b>Steel:</b>			
1 ct.	Zinc Clad II Plus	2.0-4.0	(50-100)
1 ct.	Macropoxy 646	3.0-10.0	(75-250)
1-2 cts.	Acrolon 218 HS Polyurethane	3.0-6.0	(75-150)
<b>Steel:</b>			
1 ct.	Zinc Clad IV	3.0-5.0	(75-125)
or	Zinc Clad 4100	3.0-5.0	(75-125)
1 ct.	Macropoxy 646	3.0-10.0	(75-250)
1-2 cts.	Acrolon 218 HS Polyurethane	3.0-6.0	(75-150)
<b>Steel:</b>			
1 ct.	Zinc Clad IV	3.0-5.0	(75-125)
1-2 cts.	Acrolon 218 HS Polyurethane	3.0-6.0	(75-150)
<b>Steel:</b>			
1 ct.	Corothane I-GalvaPac Zinc Primer	3.0-4.0	(75-100)
1-2 cts.	Acrolon 218 HS Polyurethane	3.0-6.0	(75-150)
<b>Steel:</b>			
1 ct.	Epoxy Mastic Aluminum II	6.0	(150)
1-2 cts.	Acrolon 218 HS Polyurethane	3.0-6.0	(75-150)
<b>Steel:</b>			
1 ct.	Recoat Epoxy Primer	4.0-6.0	(100-150)
1-2 cts.	Acrolon 218 HS Polyurethane	3.0-6.0	(75-150)
<b>Concrete/Masonry:</b>			
1 ct.	Kem Cati-Coat HS Epoxy Filler/Sealer	10.0-20.0	(250-500)
1-2 cts.	Acrolon 218 HS Polyurethane	3.0-6.0	(75-150)
<b>Aluminum/Galvanizing:</b>			
1 ct.	DTM Wash Primer	0.7-1.3	(18-32)
1-2 cts.	Acrolon 218 HS Polyurethane	3.0-6.0	(75-150)

#### FIRETEX ONLY:

#### Finish Coat for FIRETEX Hydrocarbon Systems:

1 ct. Acrolon 218 HS Polyurethane\*

\*Consult FIRETEX PFP Specialist for recommended dft range

The systems listed above are representative of the product's use, other systems may be appropriate.

#### DISCLAIMER

The information and recommendations set forth in this Product Data Sheet are based upon tests conducted by or on behalf of The Sherwin-Williams Company. Such information and recommendations set forth herein are subject to change and pertain to the product offered at the time of publication. Consult your Sherwin-Williams representative to obtain the most recent Product Data Information and Application Bulletin.

#### SURFACE PREPARATION

Surface must be clean, dry, and in sound condition. Remove all oil, dust, grease, dirt, loose rust, and other foreign material to ensure adequate adhesion.

Refer to product Application Bulletin for detailed surface preparation information.

Minimum recommended surface preparation:

- \* Iron & Steel: SSPC-SP6/NACE 3, 1-2 mil (25-50 micron) profile
- \* Galvanizing: SSPC-SP1
- \* Concrete & Masonry: SSPC-SP13/NACE 6, or ICRI No. 310.2R, CSP 1-3
- \* Primer required

#### Surface Preparation Standards

Condition of Surface	ISO 8501-1 BS7079:A1	Swedish Std. SIS055900	SSPC	NACE
White Metal	Sa 3	Sa 3	SP 5	1
Near White Metal	Sa 2.5	Sa 2.5	SP 10	2
Commercial Blast	Sa 2	Sa 2	SP 6	3
Brush-Off Blast	Sa 1	Sa 1	SP 7	4
Hand Tool Cleaning	C St 2	CC St 2	SP 3	-
Pitted & Rusty	D St 3	DC St 3	SP 3	-
Power Tool Cleaning	Rust & Pitted	DC St 3	SP 3	-

#### TINTING

Tint Part A with Maxitoner Colorants.

- Extra white tints at 100% tint strength
- Ultradeep base tints at 150% tint strength

Five minutes minimum mixing on a mechanical shaker is required for complete mixing of color.

#### APPLICATION CONDITIONS

Temperature: 35°F (1.7°C) minimum, 120°F (49°C) maximum (air and surface)  
40°F (4.5°C) minimum, 120°F (49°C) maximum (material)  
At least 5°F (2.8°C) above dew point  
Relative humidity: 85% maximum

Refer to product Application Bulletin for detailed application information.

#### ORDERING INFORMATION

Packaging: 1 gallon (3.78L) mix: 5 gallon (18.9L) mix:  
Part A: .86 gal (3.25L) 4.29 gal (16.2L)  
Part B: .14 gal (0.53L) 0.71 gal (2.7L)  
(premeasured components)

Weight: 11.2 ± 0.2 lb/gal ; 1.3 Kg/L  
mixed, may vary with color

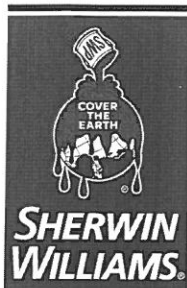
#### SAFETY PRECAUTIONS

Refer to the SDS sheet before use.

Published technical data and instructions are subject to change without notice. Contact your Sherwin-Williams representative for additional technical data and instructions.

#### WARRANTY

The Sherwin-Williams Company warrants our products to be free of manufacturing defects in accord with applicable Sherwin-Williams quality control procedures. Liability for products proven defective, if any, is limited to replacement of the defective product or the refund of the purchase price paid for the defective product as determined by Sherwin-Williams. NO OTHER WARRANTY OR GUARANTEE OF ANY KIND IS MADE BY SHERWIN-WILLIAMS, EXPRESSED OR IMPLIED, STATUTORY, BY OPERATION OF LAW OR OTHERWISE, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.



# Protective & Marine Coatings

## ACROLON™ 218 HS ACRYLIC POLYURETHANE

PART A	B65-600	GLOSS SERIES
PART A	B65-650	SEMI-GLOSS SERIES
PART B	B65V600	HARDENER

Revised: January 11, 2021

### APPLICATION BULLETIN

5.22

#### SURFACE PREPARATIONS

Surface must be clean, dry, and in sound condition. Remove all oil, dust, grease, dirt, loose rust, and other foreign material to ensure adequate adhesion.

##### Iron & Steel

Remove all oil and grease from surface by Solvent Cleaning per SSPC-SP1. Minimum surface preparation is Commercial Blast Cleaning per SSPC-SP6/NACE 3. For better performance, use Near White Metal Blast Cleaning per SSPC-SP10/NACE 2. Blast clean all surfaces using a sharp, angular abrasive for optimum surface profile (1-2 mils / 25-50 microns). Prime any bare steel the same day as it is cleaned or before flash rusting occurs.

##### Aluminum

Remove all oil, grease, dirt, oxide and other foreign material by Solvent Cleaning per SSPC-SP1. Primer required.

##### Galvanized Steel

Allow to weather a minimum of six months prior to coating. Solvent Clean per SSPC-SP1. When weathering is not possible, or the surface has been treated with chromates or silicates, first Solvent Clean per SSPC-SP1 and apply a test patch. Allow paint to dry at least one week before testing adhesion. If adhesion is poor, brush blasting per SSPC-SP7 is necessary to remove these treatments. Rusty galvanizing requires a minimum of Hand Tool Cleaning per SSPC-SP2, prime the area the same day as cleaned or before flash rusting occurs. Primer required.

##### Concrete and Masonry

For surface preparation, refer to SSPC-SP13/NACE 6, or ICRI No. 310.2R, CSP 1-3. Surfaces should be thoroughly clean and dry. Concrete and mortar must be cured at least 28 days @ 75°F (24°C). Remove all loose mortar and foreign material. Surface must be free of laitance, concrete dust, dirt, form release agents, moisture curing membranes, loose cement and hardeners. Fill bug holes, air pockets and other voids with Steel-Seam FT910. Primer required.

##### Follow the standard methods listed below when applicable:

ASTM D4258 Standard Practice for Cleaning Concrete.  
ASTM D4259 Standard Practice for Abrading Concrete.  
ASTM D4260 Standard Practice for Etching Concrete.  
ASTM F1869 Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete.  
SSPC-SP 13/Nace 6 Surface Preparation of Concrete.  
ICRI No. 310.2R Concrete Surface Preparation.

Surface Preparation Standards				
Condition of Surface	ISO 8501-1 BS7079:A1	Swedish Std. SIS055900	SSPC	NACE
White Metal	Sa 3	Sa 3	SP 5	1
Near White Metal	Sa 2.5	Sa 2.5	SP 10	2
Commercial Blast	Sa 2	Sa 2	SP 6	3
Brush-Off Blast	Sa 1	Sa 1	SP 7	4
Hand Tool Cleaning	C St 2	C St 2	SP 2	-
Pitted & Rusted	D St 2	D St 2	SP 2	-
Rusted	C St 3	C St 3	SP 3	-
Power Tool Cleaning	Pitted & Rusted D St 3	D St 3	SP 3	-

#### APPLICATION CONDITIONS

Temperature:	35°F (1.7°C) minimum, 120°F (49°C) maximum (air and surface) 40°F (4.5°C) minimum, 120°F (49°C) maximum (material) At least 5°F (2.8°C) above dew point
Relative humidity:	85% maximum

#### APPLICATION EQUIPMENT

The following is a guide. Changes in pressures and tip sizes may be needed for proper spray characteristics. Always purge spray equipment before use with listed reducer. Any reduction must be compliant with existing VOC regulations and compatible with the existing environmental and application conditions.

##### Reducer/Clean Up:

Spray.....	Reducer R7K15, MEK, Reducer #58, or R7K111
Brush/Roll .....	Reducer #132, R7K132, Reducer #58, or R7K111

If reducer is used, reduce at time of catalyzation.

##### Airless Spray

Pressure.....	2500 - 2800 psi
Hose.....	3/8" ID
Tip .....	.013" - .017"
Filter.....	60 mesh
Reduction.....	As needed up to 10% by volume with R7K15 or R7K111, or up to 9% with MEK, R6K10*

##### Conventional Spray

Gun .....	Binks 95
Cap .....	63P
Atomization Pressure.....	50 - 70 psi
Fluid Pressure.....	20 - 25 psi
Reduction.....	As needed up to 10% by volume with R7K15 or R7K111, or up to 9% with MEK, R6K10*

##### Brush

Brush.....	Natural Bristle
Reduction.....	As needed up to 10% by volume*

##### Roller

Cover .....	3/8" woven with solvent resistant core
Reduction.....	As needed up to 10% by volume*

If specific application equipment is not listed above, equivalent equipment may be substituted.

\* Note: Reducing more than maximum recommended level will result in VOC exceeding 340g/L





## Protective & Marine Coatings

# ACROLON™ 218 HS ACRYLIC POLYURETHANE

PART A	B65-600	GLOSS SERIES
PART A	B65-650	SEMI-GLOSS SERIES
PART B	B65V600	HARDENER

Revised: January 11, 2021

## APPLICATION BULLETIN

5.22

### APPLICATION PROCEDURES

Surface preparation must be completed as indicated.

Mix contents of each component thoroughly with low speed power agitation. Make certain no pigment remains on the bottom of the can. Then combine six parts by volume of Part A with one part by volume of Part B (premeasured components). Thoroughly agitate the mixture with power agitation. Re-stir before using.

If reducer is used, add only after both components have been thoroughly mixed.

Apply paint at the recommended film thickness and spreading rate as indicated below:

#### Recommended Spreading Rate per coat:

	Minimum	Maximum
Wet mils (microns)	4.5 (112.5)	9.0 (225)
Dry mils (microns)	3.0 (75)	6.0 (150)
~Coverage sq ft/gal (m <sup>2</sup> /L)	175 (4.3)	346 (8.5)
Theoretical coverage sq ft/gal (m <sup>2</sup> /L) @ 1 mil / 25 microns dft	1040 (25.5)	

NOTE: Brush or roll application may require multiple coats to achieve maximum film thickness and uniformity of appearance.

#### Drying Schedule @ 6.0 mils wet (150 microns):

	@ 35°F/1.7°C	@ 77°F/25°C	@ 120°F/49°C
		50% RH	
To touch:	4 hours	1 hour	20 minutes
To handle:	18 hours	9 hours	4 hours
To recoat:			
minimum:	18 hours	8 hours	6 hours
maximum:	3 months	3 months	3 months
To cure:	14 days	7 days	5 days
Pot Life:	4 hours	2 hours	45 minutes
(reduced 5% with Reducer R7K15)			
Sweat-in-Time:	None		
<i>Drying time is temperature, humidity, and film thickness dependent.</i>			
Paint temperature must be at least 40°F (4.5°C) minimum.			

Application of coating above maximum or below minimum recommended spreading rate may adversely affect coating performance.

### CLEAN UP INSTRUCTIONS

Clean spills and spatters immediately with Reducer #132, R7K132. Clean tools immediately after use with Reducer #132, R7K132. Follow manufacturer's safety recommendations when using any solvent.

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### PERFORMANCE TIPS

Stripe coat all crevices, welds, and sharp angles to prevent early failure in these areas.

When using spray application, use a 50% overlap with each pass of the gun to avoid holidays, bare areas, and pinholes. If necessary, cross spray at a right angle.

Spreading rates are calculated on volume solids and do not include an application loss factor due to surface profile, roughness or porosity of the surface, skill and technique of the applicator, method of application, various surface irregularities, material lost during mixing, spillage, overthinning, climatic conditions, and excessive film build.

Excessive reduction of material can affect film build, appearance, and adhesion.

Do not apply the material beyond recommended pot life.

Do not mix previously catalyzed material with new.

In order to avoid blockage of spray equipment, clean equipment before use or before periods of extended downtime with Reducer #15, R7K15 or MEK, R6K10.

Mixed coating is sensitive to water. Use water traps in all air lines. Moisture contact can reduce pot life and affect gloss and color.

Quick-Thane Urethane Accelerator is acceptable for use. See data page 5.97 for details.

E-Z Roll Urethane Defoamer is acceptable for use. See data page 5.99 for details.

If maximum recoat time is exceeded, a light abrasion may be necessary to roughen the surface to promote adhesion before recoating.

When over coating for maintenance or covering graffiti, solvent clean with MEK or similar solvent/cleaner prior to overcoating.

Refer to Product Information sheet for additional performance characteristics and properties.

### SAFETY PRECAUTIONS

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### WARRANTY

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