

# CONTRACT CHANGE ORDER FORM

## DEPARTMENT

Contract between the City of Bismarck and **GEA Heat Exchangers - ENEXIO**

Contract Number: 2015-61 Change Order Number: **FM-01**

Project/Subproject: **SANSWRUTIL.TFILTERS.DESIGNCONST**

Original Contract Amt: **\$3,050,000**

Project Description: **Bismarck WWTP Trickling Filters – Media Equipment Procurement**

Previous Contract Amount: **\$3,050,000**

Change Order Amount: **\$0**

Original Contract Date: **Dec 1, 2015** Change in Contract Timeline: **June 15, 2018**

Within Project Scope: Y / N\*      Within Project Funding: Y / N\*\*  
*\*If not within project scope, attach description of change in scope for Board approval.*      *\*\*If not within project funding, attach revised Project Budget for Board approval.*

## Type of Change Order

- Non Design-related Change Order: These change orders include unforeseen conditions, code-related issues, and building inspector changes.
- Design-related Change Order: These change orders include unforeseen conditions that affect the appearance, layout, functionality, dimensions, and/or quality of the project.
- Emergency Field Condition Change Orders: These change orders include any condition that causes an emergency situation where safety or other immediate losses may occur.
- Other: (describe) \_\_\_\_\_

Project Manager Signature: (<\$15,000) \_\_\_\_\_

Department Head Signature: (<\$25,000) Michelle Klove      6/8/16  
Date

## ADMINISTRATION

City Administrator Signature: (<\$50,000) \_\_\_\_\_

Add to Commission Consent Agenda

## COMMISSION APPROVAL

Commission Approval Date: \_\_\_\_\_

Attach minutes for Commission Approval

## FISCAL

Comments: \_\_\_\_\_

Signature      Date Completed

**TO ALL DEPARTMENTS:** Please attach a copy of the change order

# Change Order

No. FM-01

Date of Issuance: June 3, 2016

Effective Date: June 3, 2016

Project: <u>Bismarck WWTP - Trickling Filter Improvements</u>	Owner: <u>City of Bismarck, ND</u>	Owner's Contract No.:
Contract: <u>Trickling Filter Media Procurement</u>		Date of Contract: <u>August 23, 2015</u>
Contractor: <u>ENEXIO</u>		Engineer's Project No.: <u>P00501-2007-017-050</u>

The Contract Documents are modified as follows upon execution of this Change Order:

**Description of Change**

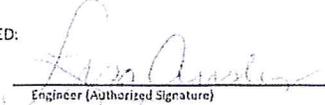
At the request of the Phase I general construction bidders, the completion dates of the Phase I construction contract were pushed back 5 months. Intended delivery of Phase I Trickling Filter Media was originally 7/1/16, which no longer matches the needs of the Phase I general contractor. This change order modifies the delivery date of Trickling Filter media to match the needs of the Phase I general contractor, moving the delivery date for phase I media from 7/1/16, to 10/31/16. Phase Iia and Iib, which has not yet been bid, will require the media delivery date to also move, to accommodate the shift in completion dates of Phase I. Phase Iia and Iib delivery dates have been changed from 3/1/17 and 8/1/17 to 8/15/17 and 3/15/18, respectively.

At the request of ENEXIO (contractor), the postponement of media delivery requires the payment schedule to be modified (refer to Exhibit C). This modification is due to materials cost control, storage costs, and handling costs not originally included in the contract. To assist in covering these additional costs to the contractor, an alternate media support system is also included to offset these additional increases in cost (refer to Exhibit B).

Item	Description	Cost Adjustment
1	<i>Modification of Dates for Delivery of Goods -- See attached Exhibit A</i>	<i>\$0.00</i>
2	<i>Modification of Media Support -- See attached Exhibit B</i>	<i>\$0.00</i>
3	<i>Modification of Progress Payments schedule -- See attached Exhibit C</i>	<i>\$0.00</i>
<b>Total Net Change - CO-FM-01</b>		<b><i>\$0.00</i></b>

Attachments: Exhibit A, Exhibit B, Exhibit C

CHANGE IN CONTRACT PRICE:	CHANGE IN CONTRACT TIMES:
Original Contract Price:  \$ <u>3,050,000.00</u>	Original Contract Times: <input type="checkbox"/> Working days <input type="checkbox"/> Calendar days Substantial completion (days or date): <u>See Exhibit A for revised dates</u> Ready for final payment (days or date): <u>See Exhibit A for revised dates</u>
Increase from previously approved Change Orders No. 0 to No. 0:  \$ <u>\$0.00</u>	Increase from previously approved Change Orders No. 0 to No. 0: Substantial completion (days): <u>See Exhibit A for revised dates</u> Ready for final payment (days): <u>See Exhibit A for revised dates</u>
Contract with [Increase] [Decrease] from previously approved Change Orders  \$ <u>\$3,050,000.00</u>	Contract Times prior to this Change Order: Substantial completion (days or date): <u>See Exhibit A for revised dates</u> Ready for final payment (days or date): <u>See Exhibit A for revised dates</u>
Increase of this Change Order  \$ <u>\$0.00</u>	Increase Time of this Change Order: Substantial completion (days or date): <u>See Exhibit A for revised dates</u> Ready for final payment (days or date): <u>See Exhibit A for revised dates</u>
Contract Price incorporating this Change Order:  \$ <u>\$3,050,000.00</u>	Contract Times with all approved Change Orders: Substantial completion (days or date): <u>See Exhibit A for revised dates</u> Ready for final payment (days or date): <u>See Exhibit A for revised dates</u>

RECOMMENDED: By: <u></u> Engineer (Authorized Signature)	ACCEPTED: By: _____ Owner (Authorized Signature)	ACCEPTED: By: <u></u> Supplier (Authorized Signature)
Date: <u>6/3/2016</u>	Date: _____	Date: <u>6.6.16</u>

## CHANGE ORDER CO-FM-01 — EXHIBIT A

At the request of the Phase I general construction bidders, the completion dates of the Phase I construction contract were pushed back 5 months. Intended delivery of Phase I Trickling Filter Media was originally 7/1/16, which no longer matches the needs of the Phase I general contractor.

Phase IIa and IIb, which has not yet been bid, will require the media delivery date to also move, to accommodate the shift in completion dates of Phase I.

This change order modifies the delivery dates of Trickling Filter media and other corresponding contract dates to match the needs of the Phase I general contractor. ENEXIO is directed to modify contract dates in the specification manual, Section 00 52 00, as follows:

1. Section 00 52 00, Part 5.02 — Contract Times
  - a. **Original Date:** Trickling Filter Media for Phase I (Trickling Filter No. 3) – October 1, 2016
    - i. **Revised Date:** March 31, 2017
  - b. **Original Date:** Trickling Filter Media for Phase IIa (Trickling Filter No. 2) – May 1, 2017
    - i. **Revised Date:** November 15, 2017
  - c. **Original Date:** Trickling Filter Media for Phase IIb (Trickling Filter No. 1) – November 1, 2017
    - i. **Revised Date:** June 15, 2018
2. Section 00 52 00, Part 5.04 — Date for Delivery of Goods
  - a. **Original Date:** Trickling Filter Media for Phase I (Trickling Filter No. 3) – July 1, 2016
    - i. **Revised Dates:** Delivery between October 31, 2016 and November 25, 2016. Delivery rate per contractor's schedule.
  - b. **Original Date:** Trickling Filter Media for Phase IIa (Trickling Filter No. 2) – March 1, 2017
    - i. **Revised Dates:** Delivery between August 15, 2017 and September 11, 2017 (final start and stop dates to be finalized, +/- two weeks to match construction schedule). Delivery rate per contractor's schedule.
  - c. **Original Date:** Trickling Filter Media for Phase IIb (Trickling Filter No. 1) – August 1, 2017
    - i. **Revised Dates:** Delivery between March 15, 2018 and April 11, 2018 (final start and stop dates to be finalized, +/- two weeks to match construction schedule). Delivery rate per contractor's schedule.
3. Section 00 52 00, Part 5.05 — Furnishing Special Services
  - a. **Original Date:** Trickling Filter Media for Phase I (Trickling Filter No. 3) – December 1, 2016
    - i. **Revised Date:** July 1, 2017
  - b. **Original Date:** Trickling Filter Media for Phase IIa (Trickling Filter No. 2) – June 1, 2017
    - i. **Revised Date:** November 15, 2017
  - c. **Original Date:** Trickling Filter Media for Phase IIb (Trickling Filter No. 1) – December 1, 2018<sup>7</sup>
    - i. **Revised Date:** June 15, 2018

## **CHANGE ORDER CO-FM-01 — EXHIBIT B**

At the request of ENEXIO, an alternate media support system has been proposed and is included as part of this change, to offset increased storage and handling costs.

In lieu of the originally specified, submitted, and approved polypropylene PIERdek/Buzon pedestal supports, ENEXIO is directed to provide an alternate support system, consisting of pedestals that combine PVC stanchions and slope correcting base plates. The pedestals will support FRP beams and pultruded FRP grating, the will be held down by stainless steel hardware. Details for this system, including installation instructions, can be found in the attached Exhibit B-1. Per project correspondence, schedule 80 PVC is to be used in lieu of the schedule 40 PVC pipe stanchions noted in the details and installation instructions. All fastening and misc. hardware to be stainless steel, glass-reinforced ABS, or PVC.

### **Attachments:**

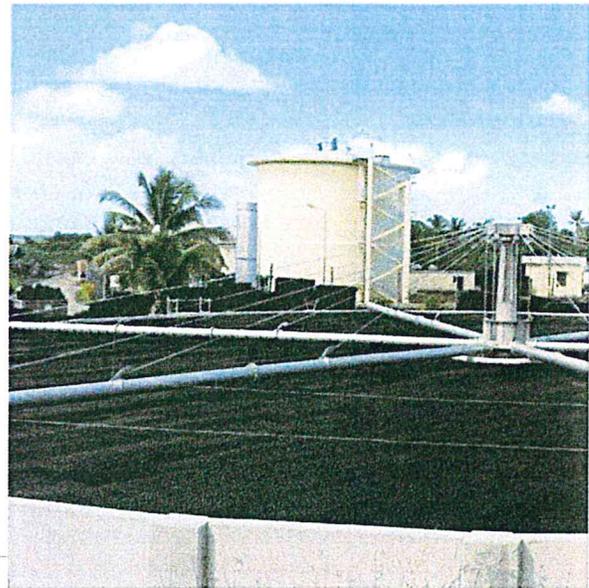
- Exhibit B-1: BIOdek Support System Details

# CHANGING GEA HEAT EXCHANGERS

CO-FM-01 -- Exhibit B-1 -- BIOdek Support System Details

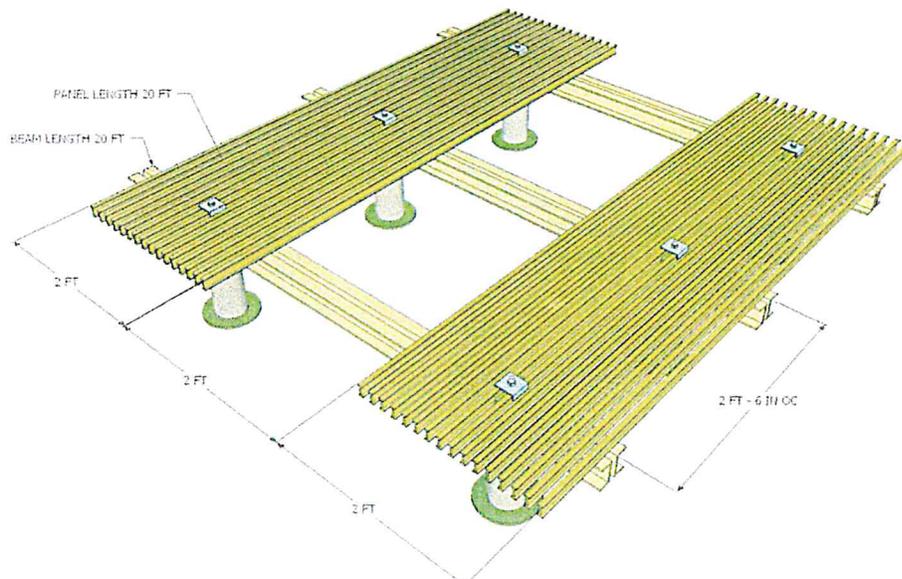
## 2H BIOdek®

### Installation Handbook



For Trickling Filter No 3  
Bismarck, ND

#### Part II – Support structure



# **CHANGING GEA HEAT EXCHANGERS**

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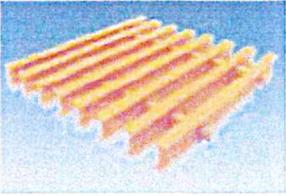
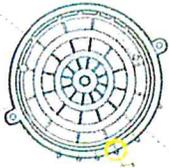
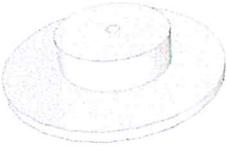
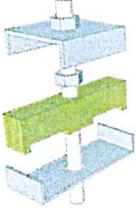
### Section 3 Anchoring of PIERdek Piers

# CHANGING GEA HEAT EXCHANGERS

Support structure components

Following items will be delivered to set-up the support structure

Table 1: Scope of delivery

ITEM	Pcs	Discription	
1		PVC pipe 4' schedule 40, length 20'	
2		Pultruded grating 20' x 2'  Pultruded grating 20' x 1'	
3		FRP beams 20' , channel type	
4		Slope corrector discs for slope adjustment 0% - 4%	
5		Base flange to be glued to PVC pipe	
6		Top disc to be glued to PVC pipe after field cutting	
7		Fixing sets <ul style="list-style-type: none"> <li>• 1 bolt with 2 nuts</li> <li>• 1 lower bracket (SS)</li> <li>• 1 middle bracket (PVC)</li> <li>• 1 upper bracket (SS)</li> </ul>	

# **CHANGING GEA HEAT EXCHANGERS**

## **1.1 Delivery**

Support structure components are delivered on pallets or crates. The support structure components are delivered a minimum of 2 weeks before the fill media to allow sufficient time for installation prior to fill media installation.

## **1.2 Unloading**

The pallets and or crates must be moved to the back of the truck by a pallet jack suitable to move pallets. From the back of the truck, the pallets must be lifted by some sort of a forklift and lowered to the ground.

After unloading the support structure components can be stored or conveyed directly into the filter for installation, see storage and/or installation instructions for details

Unloaded material shall be controlled and checked for the following:

- Do the delivered components and quantities match with the packing list?
- Are there damages?
- Are there other significant observations?

If any of these questions are answered with "YES" , an immediate report shall be issued to GEA with details and photos.

## **1 Storage Instructions for PIERdek Components**

### **1.1 Storage**

PIERdek support structure components can be stored as delivered without further protection.

### **1.2 Preparation work**

The site engineer is to ensure that the filter floor is clean and clear of all construction debris prior to start of media installation.

The site engineer is to ensure that the as-build dimensions match with the construction drawings. Following dimensions are of most importance and were used for support structure design

- Diameter 136 ft
- Max elevation from filter floor to the support level shall be 2'-3". (Center channel area)
- Min elevation at the perimeter at max distance from channel 1'-4 3/8"
- Slope should be even bend-penny shaped
- The edge of the center channel shall be even and without increased slope

Please report any divergences immediately to GEA , since a re adjustment of design components and/or support structure component quantities may become necessary.

## **2.3 Requirements to workers**

# CHANGING GEA HEAT EXCHANGERS

All support structure installations works in the filter is to be undertaken by trained installers or under supervision of 2H until the installers are trained enough. A specific skill is not mandatory.

The installers must be instructed about all applicable safety instructions.

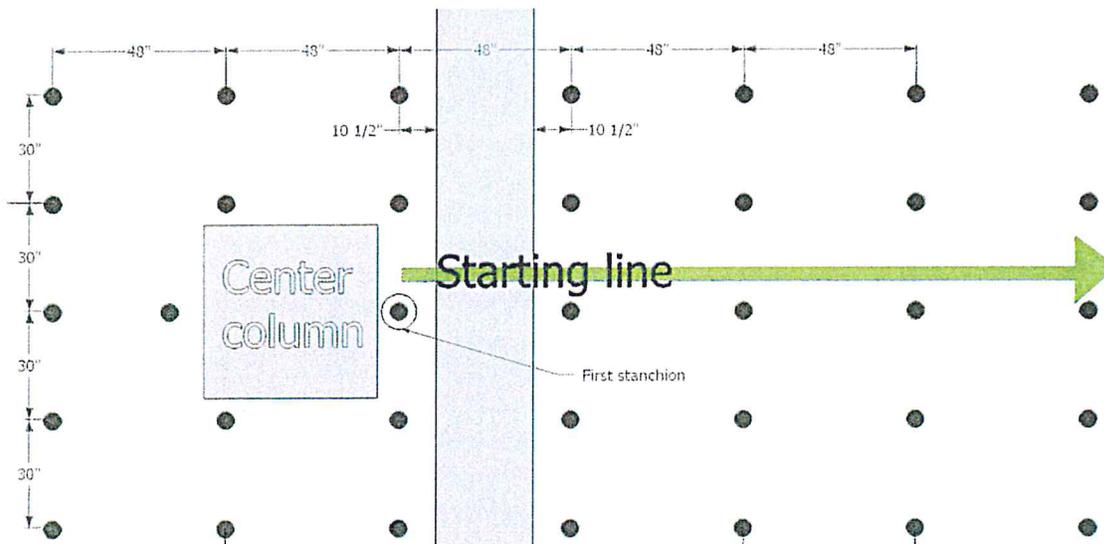
## 2.4 Support Structure Installation

This section refers to the proposed order of installation. A separate instruction is provided for the installation slope adjustment of the piers. These separate instructions shall be followed.

### Step 1: Grit markings

The position of the stanchions shall be marked in accordance with the grit-scheme. For the Bismarck-Trickling filters the position grit is 4' by 2'-6". Since the center channel width is 27", it can be spanned with the 4' distance, when the positions are marked 10-1/2" away from the channel edge.

The installation should start at the center line of the filter perpendicular to the channel.



Once the positions are properly marked, the slope corrector plates shall be placed on its assigned positions. Don't anchor at this step!

### Step 2: Pipe cutting

Cut the PVC pipes to length, if the measure can be clearly defined. Cut the pipes with some extra length, if not. In the second case the pipe need a second cut to gain the correct length.

Note: the pipe itself shall be 138 mm (5-7/16") shorter than the measure from the floor to the upper side of the grating. The max length from floor to upper side of the grating can be found along the channel. Its 2'-8 5/8", thus the PVC pipe need to be ~2'-3 3/16"

### Step 3: Gluing the base

Glue the PVC base flange ( Item 5) into the inner side of the pipe and place the pipe with the base onto the slope corrector

## **CHANGING GEA HEAT EXCHANGERS**

### Step 3: Doublecheck the stanchion height

Doublecheck the stanchion height and re-adjust if necessary. All stanchions should have the same level on the upper side

### Step 4: Glue the upper disc

Glue the upper disc with the thread into the inner part of the pipe. The disc and the upper pipe-cut shall be at the same level.

### Step 5: Start installation of the FRP beams

Screw the bolts (part of the fixing set) into thread of the disc , let ~140mm (5-1/2") out.

Push the lower bracket of the fixing sets over the bolt with the folds reaching upwards.

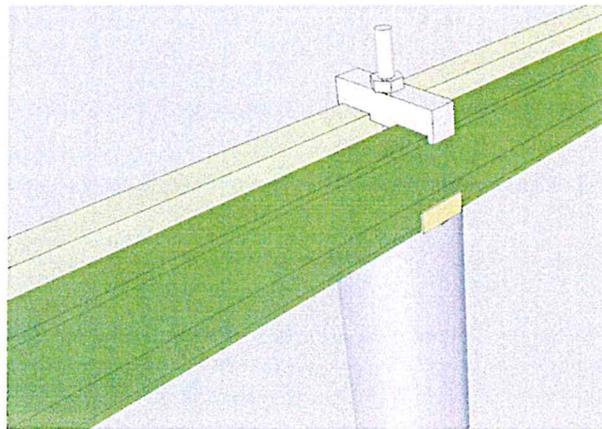
Place a pair of 20ft FRP beams on the lower bracket over 5 stanchions. The ends of the beams shall be in the middle between two stanchions. Place the pairs in a staggered mode

Whenever a row reaches the wall an additional stanchion shall be mounted close to the wall, when the distance of the last regular stanchion to the wall is less then 1'-6"

### Step 5: Tighten the FRP beams

Place the PVC block bracket upon the beam and tighten with a nut. The PVC bracket acts as a guide for the second grating and shall be perpendicular to the FRP beams.

After the entire beam is mounted, the row shall be doublechecked for its position and realigned if neccessary. Every 5<sup>th</sup> Base-plates shall be anchored to the floor. Don't anchor stanchions close to the wall at this point, since the might be re-aligned when the perimeter grating is to be placed



Repeat Step 1 to 5 with the parallel beam rows

### Step 6: Layout of the perimeter grating

Perimeter grating is 1ft width and shall be placed over the the FRP beams along the perimeter. Follow the installation drawing for positioning.

## CHANGING GEA HEAT EXCHANGERS

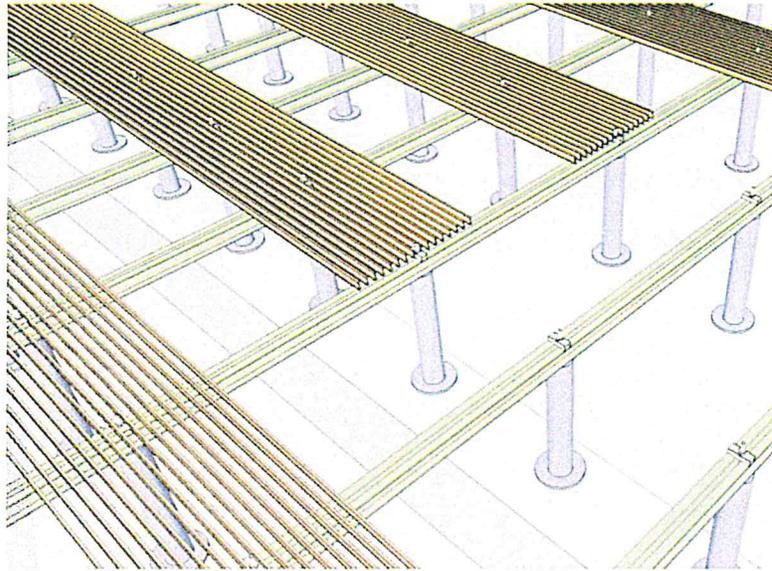
Since the perimeter grating isn't perpendicular to the FRP beams, the middle PVC block bracket cannot be used in the fashion. Wherever this bracket serves as a guide to interlock with the pultruded grating, the block has to be turned upside-down to allow rotation .

### Step 7: Layout of the inner grating

The inner grating is placed over 9 FRP supports. The ends of two adjacent gratings shall meet in the middle of the FRP beam pair.

Gratings shall be placed in a staggered fashion for best results in structural integrity. Wherever a grating meets the wall – the perimeter grating, it shall be field cut to fit.

The pultruded grating are clamped to the stanchion screw the upper steel bracket



## CHANGE ORDER CO-FM-01 — EXHIBIT C

At the request of ENEXIO, postponement of media delivery requires modification of the originally specified payment schedule, to offset increased storage and handling costs, and to help with material cost control.

This change order modifies the originally specified payment schedule, outlined in Section 00 52 00, Part 7.02 — Progress Payments, to allow the following alternate payment schedule, provided media material is produced and properly stored, bonded, and insured.

Original payment schedule is as follows:

1. Section 00 52 00, Part 7.02 — Progress Payments

- a. 10% of contract value 30 days following completion and acceptance of approved shop drawings.
- b. 80% of contract value at delivery of Goods to the Point of Destination for only the equipment delivered in accordance with the schedule for delivery under 5.04 above.
- c. 10% of contract value at Engineer acceptance of installation and performance services for Trickling Filter Media Equipment for only the equipment installed in accordance with the schedule under 5.05 above.

Alternate payment schedule to allow the following:

1. Phase I

- a. 10% of contract value 30 days following completion and acceptance of approved shop drawings. – **NO CHANGE – Already invoiced**
- b. \$500,000 invoice on 6/15/16, pending approval of CO-FM-01 at 6/14/16 Bismarck City Commission meeting.
- c. \$150,000 invoice on 7/15/16
- d. Final Phase I (balance) invoice, following shipment of finished materials to jobsite.

2. Phase IIa

- a. 10% of contract value 30 days following completion and acceptance of approved shop drawings. – **NO CHANGE – Already invoiced**
- b. \$400,000 invoice on original ship date, 3/1/17
- c. Final Phase IIa (balance) invoice, following shipment of finished materials to jobsite, approximately 9/1/18.

3. Phase IIb

- a. 10% of contract value 30 days following completion and acceptance of approved shop drawings. – **NO CHANGE – Already invoiced**
- b. \$400,000 invoice on original ship date, 8/1/17
- c. Final Phase IIa (balance) invoice, following shipment of finished materials to jobsite, approximately 4/1/18.