P.S. 43 Annex (Q907)

Flood Emergency Plan

NYC School Construction Authority

NYC Department of Education

The booklet is provided for informational purposes only. It is the client's responsibility to ensure proper maintenance of equipment and premises, staff training, deployment of flood barriers, and continuing the accuracy of the information contained in the booklet. The appendix contains literature provided by the manufacturers. The accuracy of this information and if the literature is up to date cannot be confirmed. Product installers shall coordinate directly with the manufacturer.

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Introduction

This enclosed narrative is a written and diagrammatic representation of the necessary actions to be taken by the client and immediate on-site staff in the event of a declared flood emergency or natural weather event that has the potential to produce a tidal surge or significant amounts of high water over any time duration.

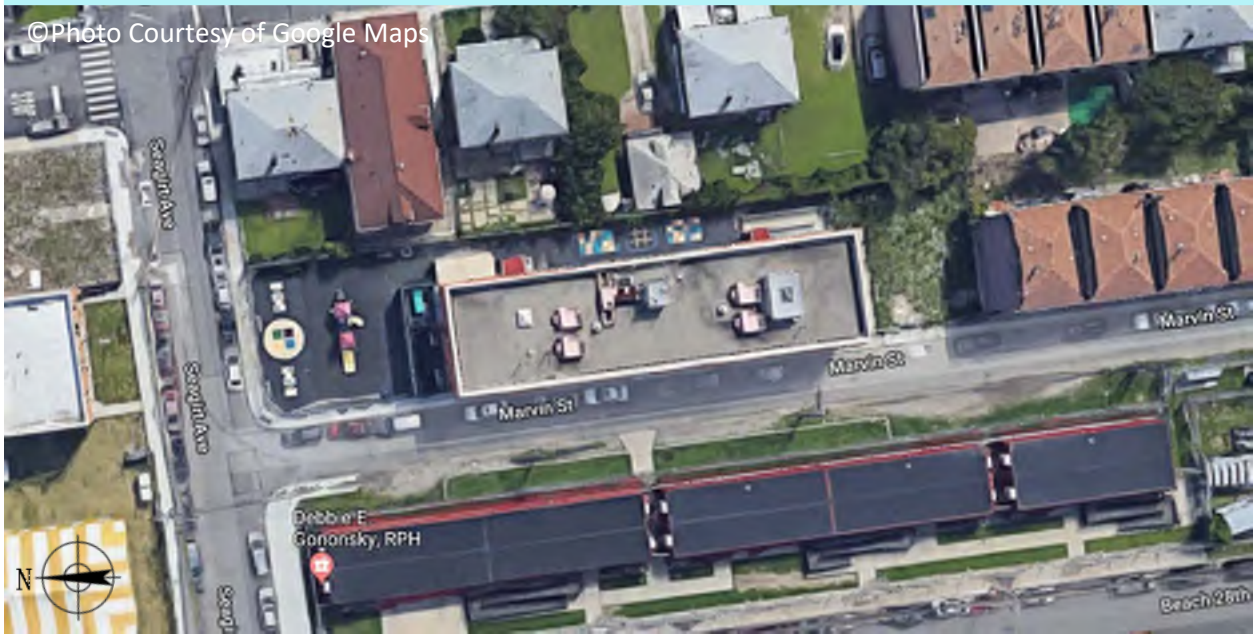
Per the NYC Preliminary FIRM, P.S. 43 Annex lies in Zone AE Elevation 10 NAVD 88, equivalent to Queens Borough Datum of about 8.4 (QBD is 1.6-ft above NAVD). Zone AE represents the area of high flood risk subject to inundation by the 1% annual-chance flood. The design flood elevation, per the building code, is to be 1-ft higher than the 100 year flood plain. Therefore, the building should be flood resistant up to elevation 11 NAVD (9.4 QBD). The first floor elevation of the building is 9.25 NAVD (7.625 QBD).

The flood control systems to be utilized at P.S. 43 Annex are in accordance with the requirements set in NYC Code Appendix G and ASCE 24 for a declared flood emergency. Measures incorporated include the following:

- All exterior walls have received a continuous waterproofing membrane 1-ft above the Design Flood Elevation (DFE). The rear and two side exterior walls have also been reinforced with cast-in place concrete panels anchored to backup walls (Figure 1).

- The west entrance, as well as the entrances located on its east and west sides, will utilize customized Type FB Flood Barriers (stackable flood planks) that form essentially dry barriers or seals. Seepage amounts will vary with conditions.

Location Plan



- All first floor windows, except for those connected to the toilets, will be protected by customized Type FP Flood Panels. Seepage amounts will vary with conditions.

- The new and existing gas meters, located inside a fenced area at the west side yard of the building, will be protected by an enclosure consisting of customized stackable flood planks (Type FB Flood Barriers) and the existing exterior wall of the building have received a continuous waterproofing membrane 1-ft above the Design Flood Elevation (DFE). Seepage amounts will vary with conditions.

- For anticipated water infiltration that may permeate through the dry flood proofing barriers, portable sump pumps have been provided and have been stored in the Utility Room, next to the main entrance of the building.

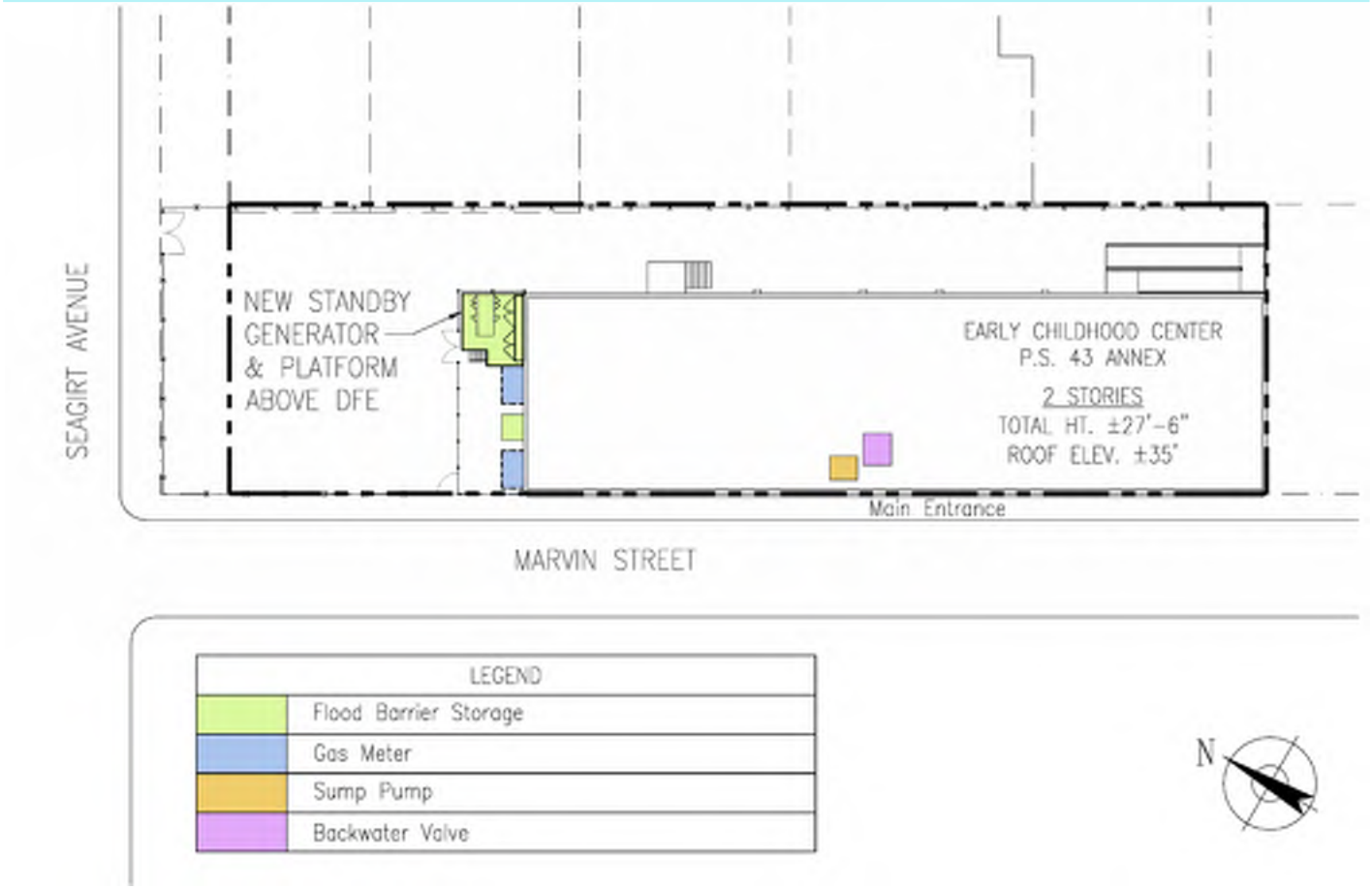
- A gas-fired standby generator along with other components of the emergency power system have been provided; to serve the emergency flood pumps & the Fire Alarm System. The standby generator is located inside a fenced area on the west side yard of the building.

- A backwater valve is located in a floor pit within the Utility Room (Figure 2) to prevent flood water from entering the building from the the public sewer through the floor drains.

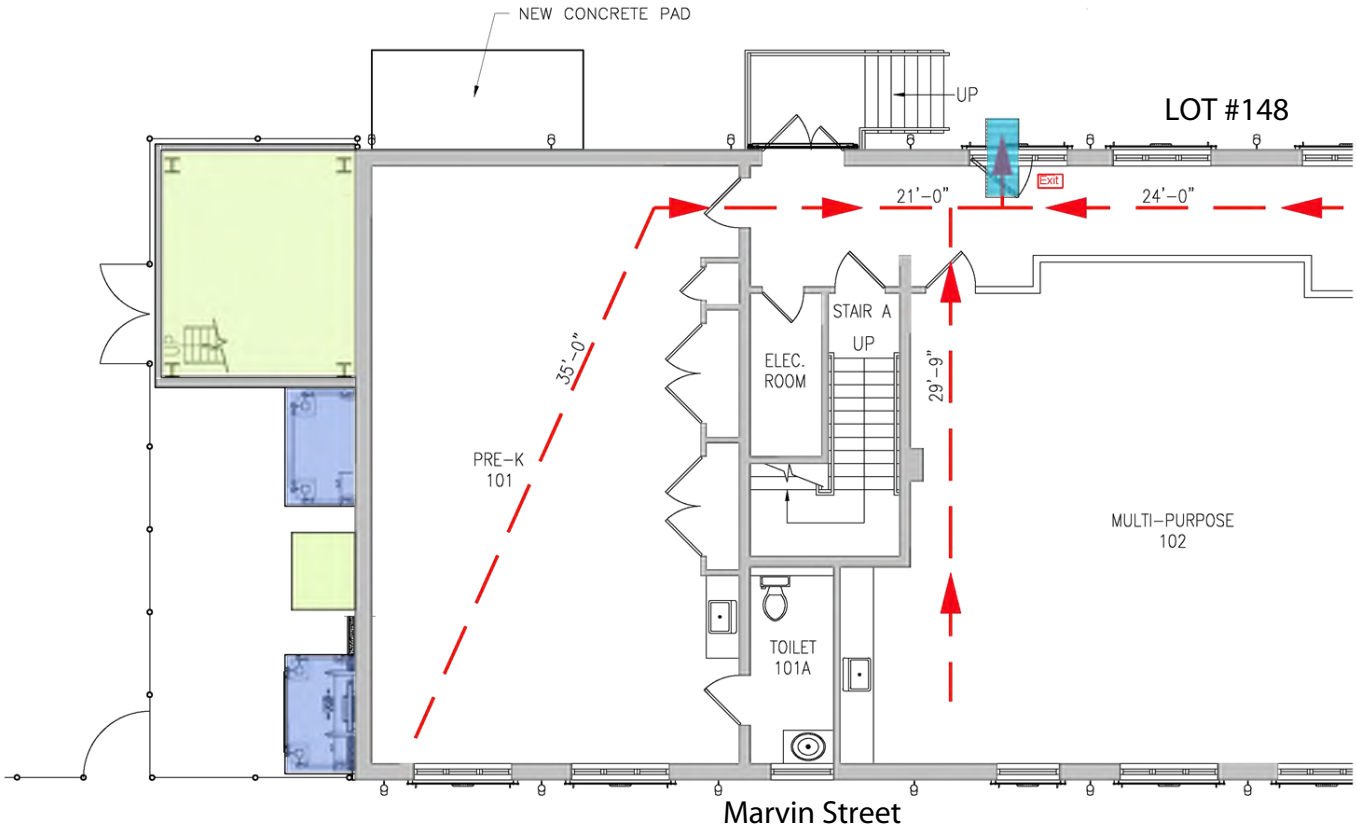
Figure 1: Reinforced Exterior Walls.

Figure 2: Backwater Valve located in the Utility Room.

Site Plan


SEAGIRT AVENUE
NEW STANDBY GENERATOR & PLATFORM ABOVE DFE
EARLY CHILDHOOD CENTER
P.S. 43 ANNEX
2 STORIES
TOTAL HT. ±27'-6"
ROOF ELEV. ±35'
Main Entrance
MARVIN STREET
LEGEND
Flood Barrier Storage
Gas Meter
Sump Pump
Backwater Valve
N

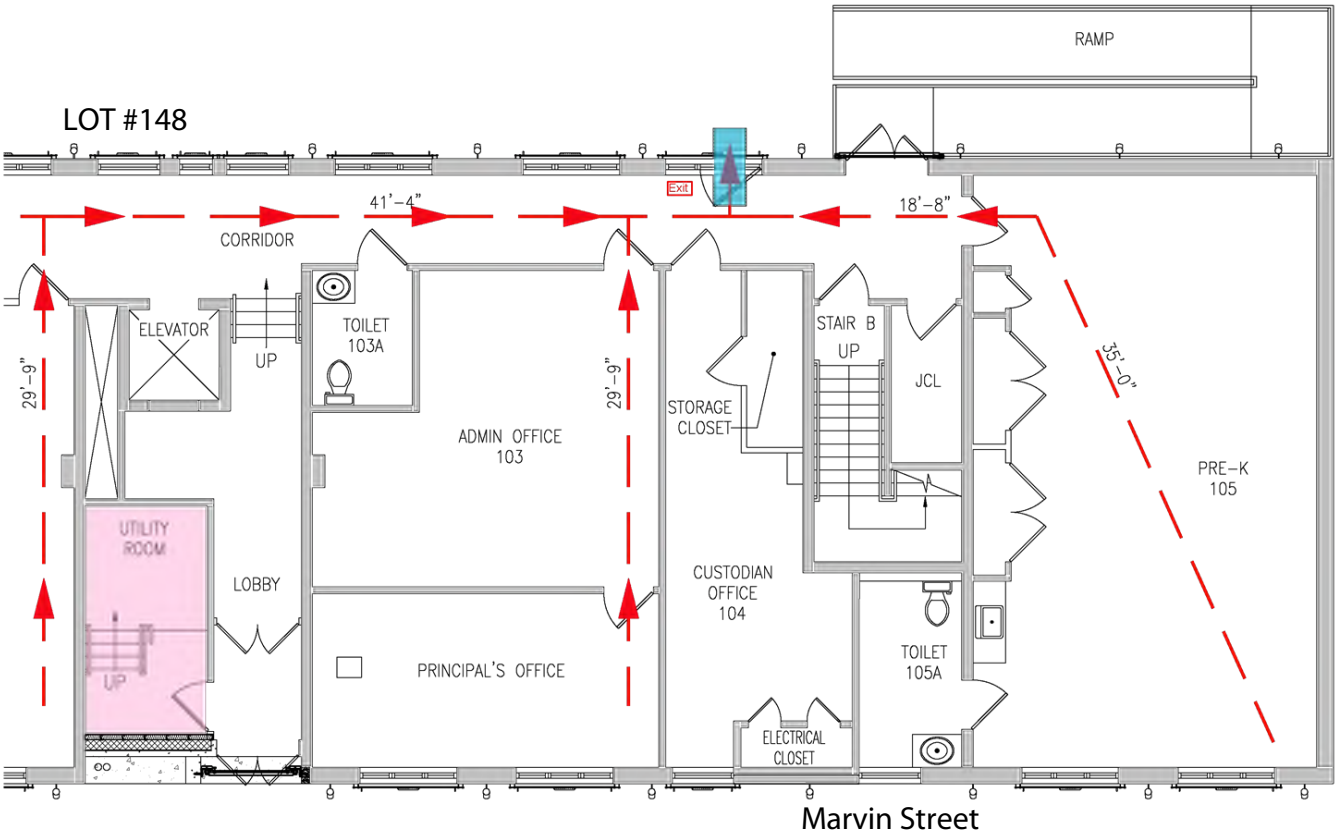
Flood Emergency Egress Plan



Flood Emergency Egress Notes

- Flood Barriers will be deployed after a flood warning alerting potential flood risk has been announced, and they will only be placed when the building is unoccupied.
- Two means of exterior ingress/egress are available for custodial or emergency staff after deployment of the dry floodproofing devices. Clearly visible doors with exit signs have been provided, located on the first floor main corridor. These doors will be accessed through temporary portable metal steps to get over the barriers. They will be installed only for the purpose of supplemental staff ingress/egress before or after conditions of flooding, as specified under 2014 BC, Appendix G, G501 - ASCE 24, subsection 6.2.2.
- Dry floodproofing measures that require limits on human intervention must comply with the 2014 Building Code (Appendix G, G501 - ASCE 24, subsection 6.2.3).

Flood Emergency Egress Plan

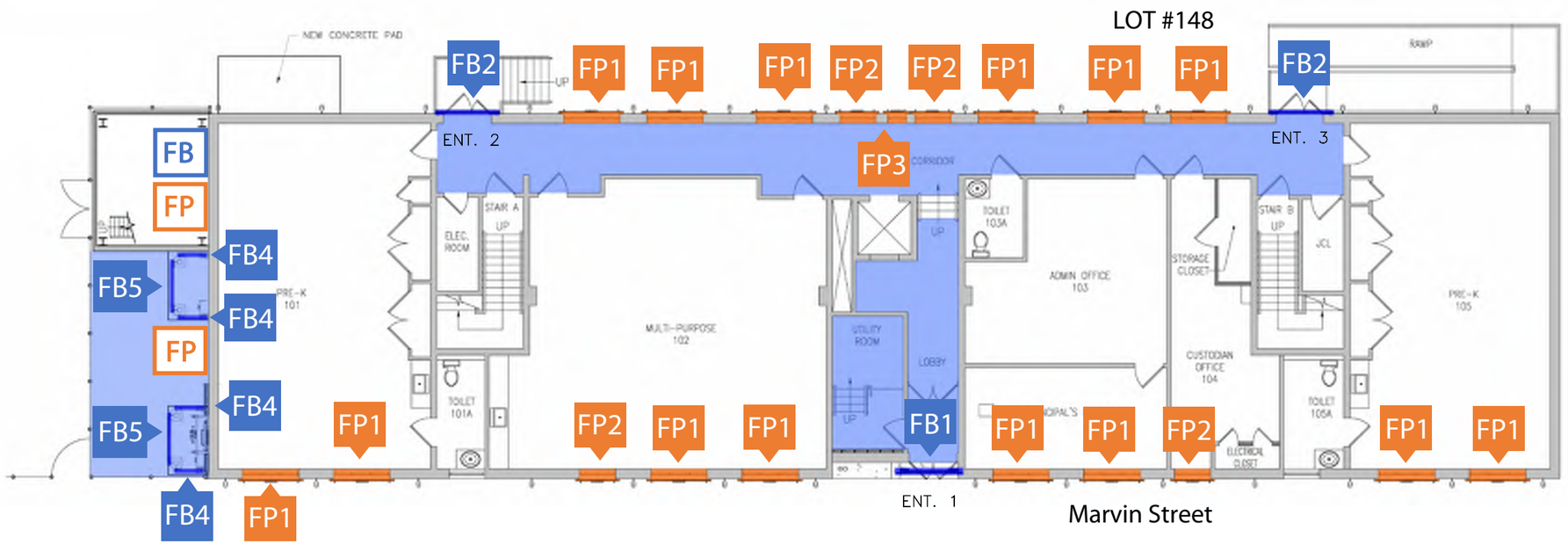


LEGEND	
	Temporary Steps for Custodial Egress
	Flood Barrier Storage
	Gas Meters
	Utility Room
	Egress Route

- Installation of the temporary portable metal steps will follow compliance as described on the 2014 Building Code (Appendix G, G308.7).
- Travel distances do not exceed the maximum allowed by the 1968 Building Code (Section 27-360, Table 6-1).

Refer to the School Safety Plan for additional information regarding relevant emergency site-specific processes and procedures. The School Safety Plan can be obtained from the School Principal.

P.S. 43 Annex (Q907) | Flood Barrier Action Diagram



Generally, a school's Flood Emergency Plan is posted in two conspicious locations as well as in the equipment storage location. Q907's Flood Emergency Plan will be posted in the Custodian Office, Admin Office, and by the storage flood barrier racks, located in the Fenced Area near the Generator Platform.

ENLARGED DETAIL PLANS

EP1 See page 20 for Type FB Flood Barrier Storage Location
EP2 See page 21 for Type FP Flood Panel Storage Location
EP3 See Page 23 for FB1 (Entrance 1)
EP4 See page 24 for FB2 (Entrance 2)
EP5 See page 25 for FB2 (Entrance 3)
EP6 See page 26 for FB4 & FB5 (Existing and New Gas Meter)
EP7 See page 27 for FB1 (Pre-K 101, Multi-Purpose Room, Corridor)
EP8 See page 28 for FB1 (Corridor, Principal's Office, Pre-K 105)
EP9 See page 29 for FB2 (Multi-Purpose Room)
EP10 See page 30 for FB2 (Corridor, Custodian Office)
EP11 See page 31 for FP3

SCA NYC School Construction Authority

NYC Department of Education

Type A: Flood Barriers

THERE ARE (8) DEPLOYMENT POINTS

- FB Storage for Flood Barriers FB1-5: Fenced Area near the Generator Platform
- FB1 Deployment Point: Entrance 1
- FB2 Deployment Points: Entrance 2, Entrance 3
- FB4 Deployment Points: Existing and New Gas Meter Service
- FB5 Deployment Points: Existing and New Gas Meter Service

Type B: Flood Panels

THERE ARE (17) DEPLOYMENT POINTS

- FP Storage for Flood Panels FP1-3: Fenced Area near the Generator Platform
- FP1 Deployment Points: Pre-K 101, Multi-Purpose Room, Corridor, Principal's Office, Pre-K 105
- FP2 Deployment Points: Multi-Purpose Room, Corridor, Custodian Office
- FP3 Deployment Point: Corridor

INSPECTION TYPE AND SCHEDULE

The types and schedules for inspection and deployment of all Flood Mitigation equipment are described in the following pages. They include a series of checklists. One set is for the Spring Inspection, one set is for the Fall Inspection, and one set is for the Annual Deployment Inspection. The Spring and Fall Inspections shall inspect the condition of all equipment, while the Annual Inspection, which is to take place on or about April 15th of each year, shall be for the full deployment and inspection of all Flood Mitigation Equipment. In addition, the inspection of all sumps, pumps and other drainage devices and systems not related to the domestic water system and that are below the flood barriers, is part of the annual inspection.

The following information provided by P.S. Door's Statement of Qualifications can be used to contact the manufacturer:

Terry Smith
National Sales Manager
1150 S. 48th Street
Grand Forks, ND 58201
Phone: (701) 795-6528
Email: tsmith@psdoors.com

INSPECTION CHECKLIST #1: FALL FLOOD EMERGENCY PLAN

DATE: ------

LOCATION :
INSPECTOR :

INVENTORY TYPE : FB – Flood Barriers
SUPERVISOR:

Inspection #1 (Oct. 1st) – Type FB Flood Barriers	Satisfactory/ Unsatisfactory	Follow up Action Items
FB1 – Flood Barrier: (1) Barriers, sized ± 86" W x ± 42" H		
FB2 – Flood Barrier: (2) Barriers, sized ± 64" W x ± 36" H		
FB4 – Flood Barrier: (4) Barriers, sized ± 32" W x ± 84" H		
FB5 – Flood Barrier: (2) Barriers, sized ± 52" W x ± 84" H		
School Maintenance to inspect for damage or misalignment of parts as well as the effectiveness of the sealants used on frames and connections, and to ensure individual parts' proper positioning, compression, original calibration, and structural integrity, as outlined in the manufacter's literature.		

This **Inspection Checklist** is to be posted in the Custodian Office and utilized twice a year for inspections of flood equipment and follow-up action. A copy is to be placed in the Custodian Office's Central Filing System. Training records and certificates should be in the employee file.

Note: Inspection and deployment checklists shall be expanded to include testing of gas generators and sump pumps as applicable to individial building and flood event plans.

INSPECTION CHECKLIST #1: FALL FLOOD EMERGENCY PLAN

DATE: ------

LOCATION :
INSPECTOR :

INVENTORY TYPE : FP – Flood Panels
SUPERVISOR:

Inspection #1 (Oct. 1st) – Type FP Flood Panels	Satisfactory/ Unsatisfactory	Follow up Action Items
FP1 – Flood Panel: (14) Panels, sized ± 36" W x ± 24" H		
FP2 – Flood Panel: (4) Panels, sized ± 48" W x ± 24" H		
FP3 – Flood Panel: (1) Panels, sized ± 24" W x ± 24" H		
School Maintenance to inspect for damage or misalignment of parts as well as the effectiveness of the sealants used on frames and connections, and to ensure individual parts' proper positioning, compression, original calibration, and structural integrity, as outlined in the manufacturer's literature.		

This **Inspection Checklist** is to be posted in the Custodian Office and utilized twice a year for inspections of flood equipment and follow-up action. A copy is to be placed in the Custodian Office's Central Filing System. Training records and certificates should be in the employee file.

Note: Inspection and deployment checklists shall be expanded to include testing of gas generators and sump pumps as applicable to individial building and flood event plans.

INSPECTION CHECKLIST #2: SPRING FLOOD EMERGENCY PLAN

DATE: ------

LOCATION :
INSPECTOR :

INVENTORY TYPE : FB – Flood Barriers
SUPERVISOR:

Inspection #2 (Apr. 1st) – Type FB Flood Barriers	Satisfactory/ Unsatisfactory	Follow up Action Items
FB1 – Flood Barrier: (1) Barriers, sized ± 86" W x ± 78" H		
FB2 – Flood Barrier: (2) Barriers, sized ± 64" W x ± 36" H		
FB4 – Flood Barrier: (4) Barriers, sized ± 32" W x ± 84" H		
FB5 – Flood Barrier: (2) Barriers, sized ± 52" W x ± 84" H		
School Maintenance to inspect for damage or misalignment of parts as well as the effectiveness of the sealants used on frames and connections, and to ensure individual parts' proper positioning, compression, original calibration, and structural integrity, as outlined in the manufacter's literature.		

This **Inspection Checklist** is to be posted in the Custodian Office and utilized twice a year for inspections of flood equipment and follow-up action. A copy is to be placed in the Custodian Office's Central Filing System. Training records and certificates should be in the employee file.

Note: Inspection and deployment checklists shall be expanded to include testing of gas generators and sump pumps as applicable to individial building and flood event plans.

INSPECTION CHECKLIST #2: SPRING FLOOD EMERGENCY PLAN

DATE: ------

LOCATION :
INSPECTOR :

INVENTORY TYPE : FP – Flood Panels
SUPERVISOR:

Inspection #2 (Apr. 1st) – Type FP Flood Panels	Satisfactory/ Unsatisfactory	Follow up Action Items
FP1 – Flood Panel: (14) Panels, sized ± 36" W x ± 24" H		
FP2 – Flood Panel: (4) Panels, sized ± 48" W x ± 24" H		
FP3 – Flood Panel: (1) Panels, sized ± 24" W x ± 24" H		
School Maintenance to inspect for damage or misalignment of parts as well as the effectiveness of the sealants used on frames and connections, and to ensure individual parts' proper positioning, compression, original calibration, and structural integrity, as outlined in the manufacturer's literature.		

This **Inspection Checklist** is to be posted in the Custodian Office and utilized twice a year for inspections of flood equipment and follow-up action. A copy is to be placed in the Custodian Office's Central Filing System. Training records and certificates should be in the employee file.

Note: Inspection and deployment checklists shall be expanded to include testing of gas generators and sump pumps as applicable to individial building and flood event plans.

ANNUAL FULL DEPLOYMENT DRILL CHECKLIST: Q907

DATE: April 15, 20--

INSPECTOR:
ALTERNATE INSPECTOR:
DEPLOYMENT START TIME:

SUPERVISOR
ALTERNATE SUPERVISOR:
DEPLOYMENT COMPLETION TIME:

ANNUAL DRILL (APRIL 15) CHECKLIST – Type FB Flood Barriers stored in 2nd Floor Generator Room	Deployment Points/ Implementation	Satisfactory/ Unsatisfactory	Follow up Action/ Comments
FB1 – Flood Barrier: (1) Barriers, sized ± 86" W x ± 78" H	Deployment Point: Entrance 1 – West Side of the Building, Adjacent to Lobby and Perpendicular to Utility Room		
FB2 – Flood Barrier: (2) Barriers, sized ± 64" W x ± 36" H	Deployment Point: Entrance 2 – Northeast Side of the Building, Adjacent to North Side of Corridor and Across from Stair A; Entrance 3 – Southeast Side of the Building, Adjacent to South Side of Corridor and Across from Stair B		
FB4 – Flood Barrier: (4) Barriers, sized ± 32" W x ± 84" H	Deployment Point: Existing and New Gas Meter Service – North Side of the Building, Within Existing Chain Link Fence outside of the Building		
FB5 – Flood Barrier: (2) Barriers, sized ± 52" W x ± 84" H	Deployment Point: Existing and New Gas Meter Service – North Side of the Building, Within Existing Chain Link Fence outside of the Building		
School Maintenance to inspect for damage or misalignment of parts as well as the effectiveness of the sealants used on frames and connections, and to ensure individual parts' proper positioning, compression, original calibration, and structural integrity, as outlined in the manufacturer's literature.			

A copy of this **Annual Inspection Checklist** is to be placed in the Custodian Office's central filing system. Training records and certificates should be in the employee file.

Note: Inspection and deployment checklists shall be expanded to include testing of gas generators and sump pumps as applicable to individual building flood event plans.

ANNUAL FULL DEPLOYMENT DRILL CHECKLIST: Q907

DATE: April 15, 20--

INSPECTOR:
ALTERNATE INSPECTOR:
DEPLOYMENT START TIME:

SUPERVISOR
ALTERNATE SUPERVISOR:
DEPLOYMENT COMPLETION TIME:

ANNUAL DRILL (APRIL 15) CHECKLIST – Type FP Flood Panels stored in 2nd Floor Generator Room	Deployment Points/ Implementation	Satisfactory/ Unsatisfactory	Follow up Action/ Comments
FP1 – Flood Panel: (14) Panels, sized ± 36" W x ± 24" H	Deployment Point: Pre-K RM 101, Multi-Purpose Room RM 102, Corridor, Principal's Office & Pre-K RM 105 – West and East Sides of the Building, Marvin Street and Lot #148 Facing Windows		
FP2 – Flood Panel: (4) Panels, sized ± 48" W x ± 24" H	Deployment Point: Multi-Purpose RM 102, Corridor– East Side of the Building, Lot #148 Facing Windows; Custodian Office RM 104 – Southwest Side of the Building, Custodian Office, Marvin Street Facing Window;		
FP3 – Flood Panel: (1) Panels, sized ± 24" W x ± 24" H	Deployment Point: Corridor – East Side of the Building, Lot #148 Facing Windows		
School Maintenance to inspect for damage or misalignment of parts as well as the effectiveness of the sealants used on frames and connections, and to ensure individual parts' proper positioning, compression, original calibration, and structural integrity, as outlined in the manufacturer's literature.			

A copy of this **Annual Inspection Checklist** is to be placed in the Custodian Office's central filing system. Training records and certificates should be in the employee file.

Note: Inspection and deployment checklists shall be expanded to include testing of gas generators and sump pumps as applicable to individual building flood event plans.

EP1 | Storage Location for Type FB Flood Barriers: Fenced Area near the Generator Platform

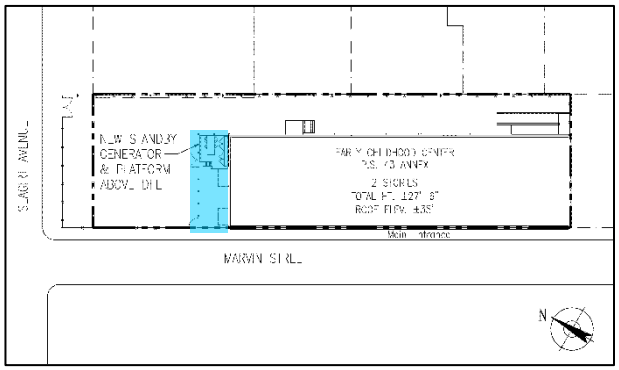
EQUIPMENT TO STORE:
Type FB: Flood Barrier

Flood Barrier **FB1** (1) Barriers, sized ± 86" W x ± 78" H

Flood Barrier **FB2** (2) Barriers, sized ± 64" W x ± 36" H

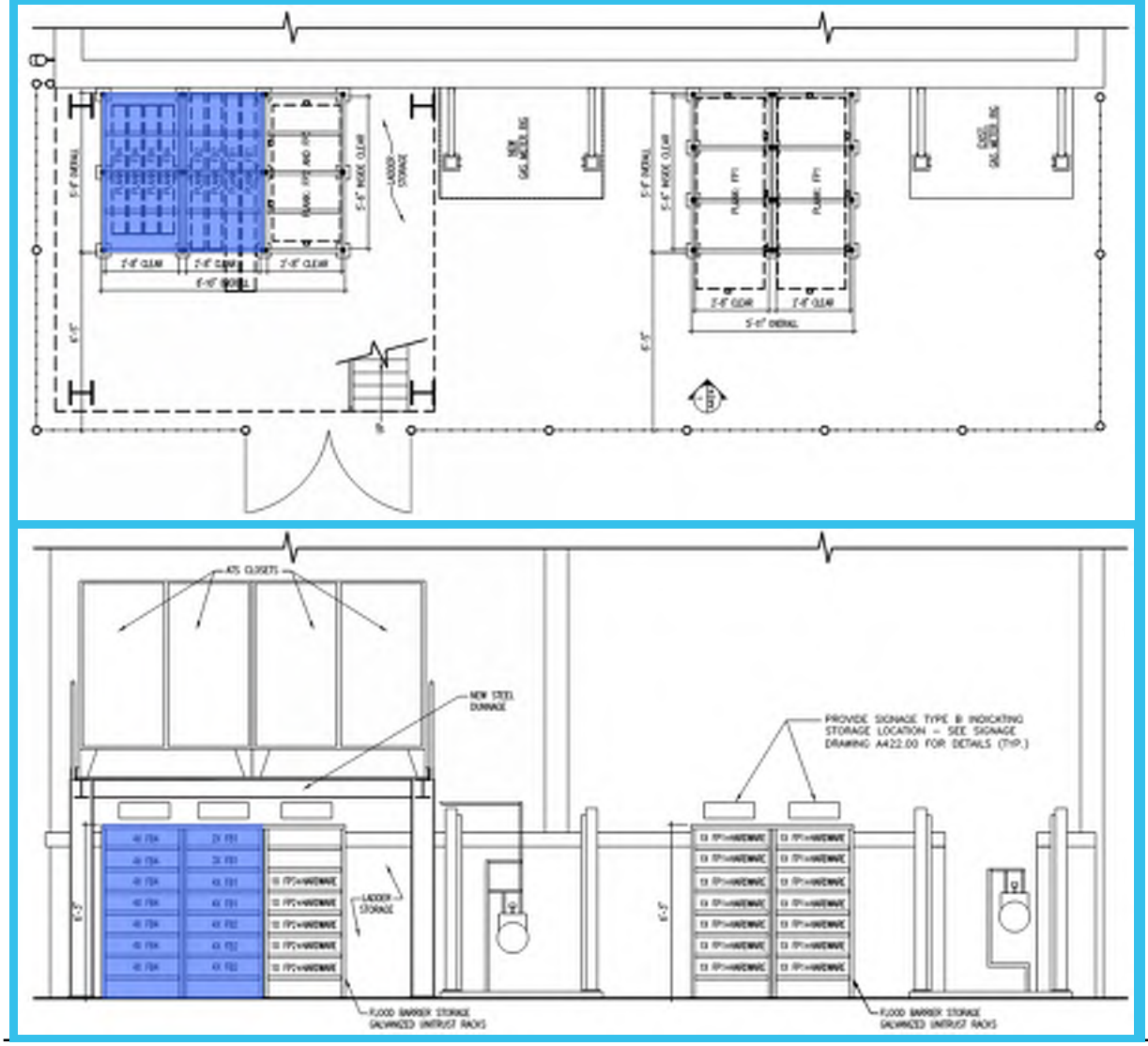
Flood Barrier **FB3** (4) Barriers, sized ± 60" W x ± 42" H

Flood Barrier **FB4** (2) Barriers, sized ± 42" W x ± 36" H



General Notes:
All component quantities and measurements to be field verified.
Flood Barriers are stored in galvanized unistrut racks in two groups of seven, as shown in bottom image.

ENLARGED DETAIL PLAN



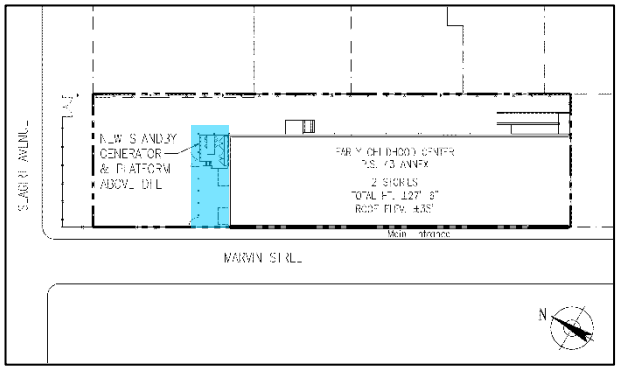
EP2 | Storage Location for Type FP Flood Panels: Fenced Area near the Generator Platform

EQUIPMENT TO STORE:
Type FP: Flood Panels

Flood Panels FB1 (1) Panels, sized ± 86" W x ± 78" H

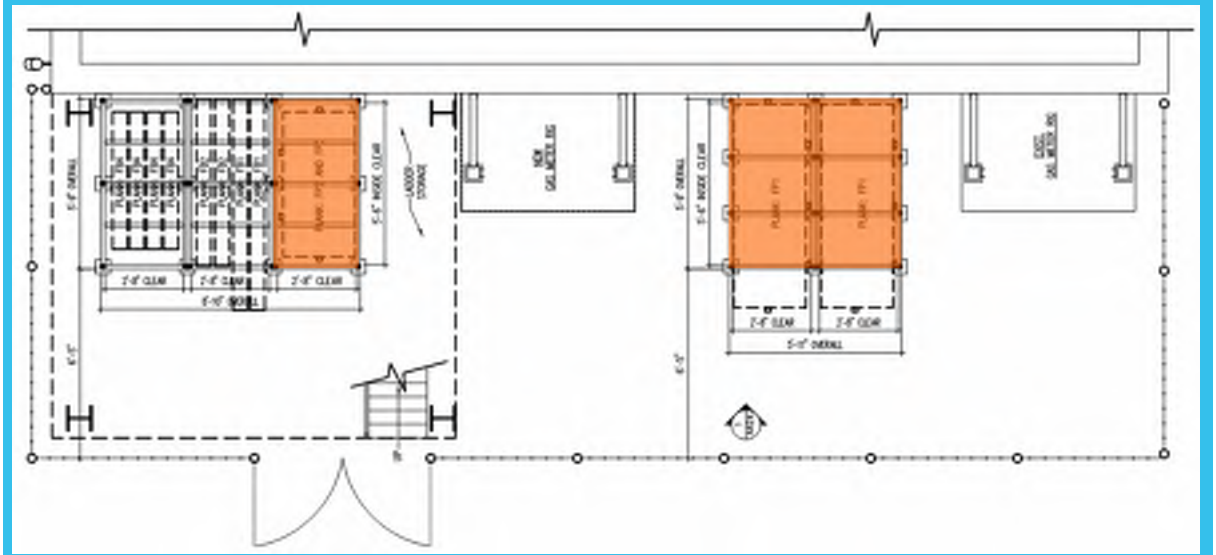
Flood Panels FB2 (2) Panels, sized ± 64" W x ± 36" H

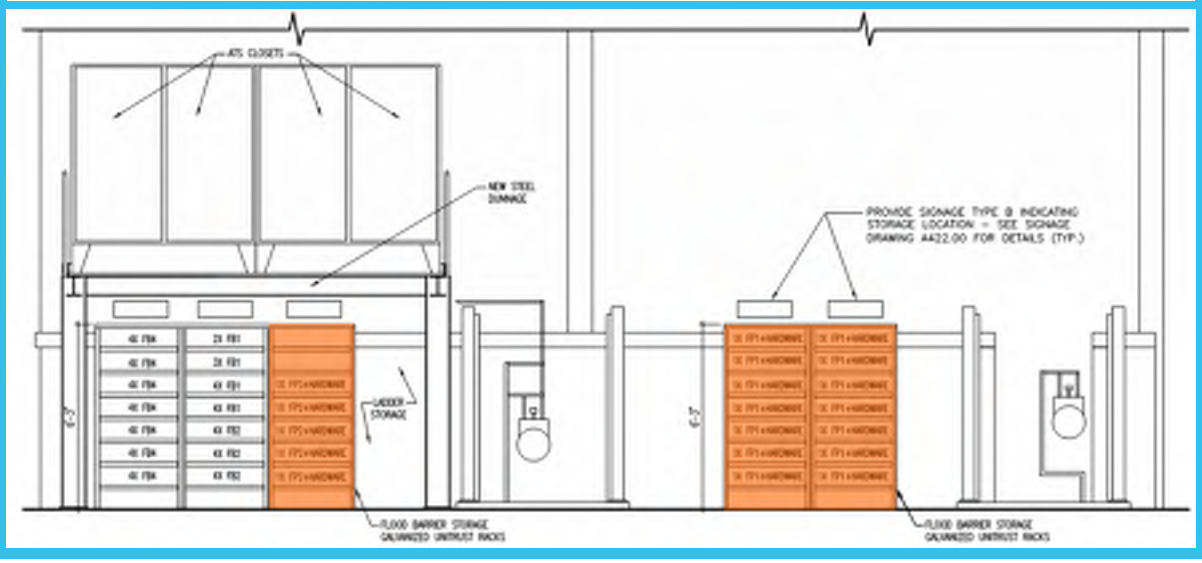
Flood Panels FB3 (4) Panels, sized ± 60" W x ± 42" H



General Notes:
All component quantities and measurements to be field verified.
Type FB1 are stored in galvanized unistrut racks in two groups of seven. Types FB2 and FB3 are stored together in a single galvanized unistrut rack, as shown in bottom image.

ENLARGED DETAIL PLAN





NOTIFICATION, EVACUATION AND FLOOD MITIGATION DEVICE DEPLOYMENT

Activation of the NYC Flood Emergency or the Coastal Storm Emergency Plan will be through NYC Emergency Management and authorities having local jurisdiction. This will trigger a notification from the offices of the DSF to the Field Operations Teams. A determination will be made at the DSF level to activate the Flood Mitigation plans at the local sites based on the NYC activation of these plans.

Flood mitigation plans will only be activated once schools have been closed to students and faculty. The custodial engineer, or their designee will, together with the designated facilities staff, deploy the various flood mitigation devices in their respective locations as outlined in the following deployment plans, with preparations to be completed prior to the actual storm fall.

Upon termination of the storm event as determined by the NYC Flood Emergency, the offices of the DSF will determine when the flood mitigation devices may be safely removed. They will notify the custodial engineer or their designee to remove, clean as required, and store the flood mitigation devices in their designated locations.

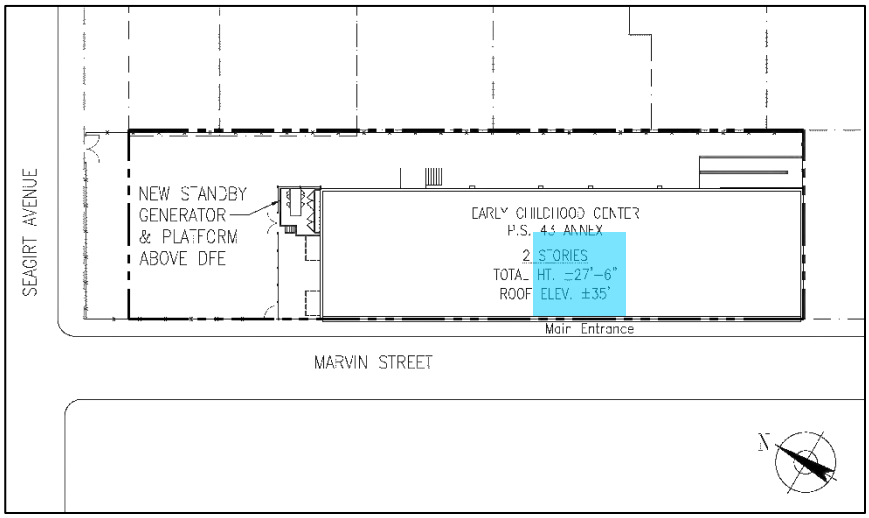
EP3 | Deployment Point FB1: Entrance 1

EQUIPMENT TO DEPLOY:
Type FB: Flood Barrier

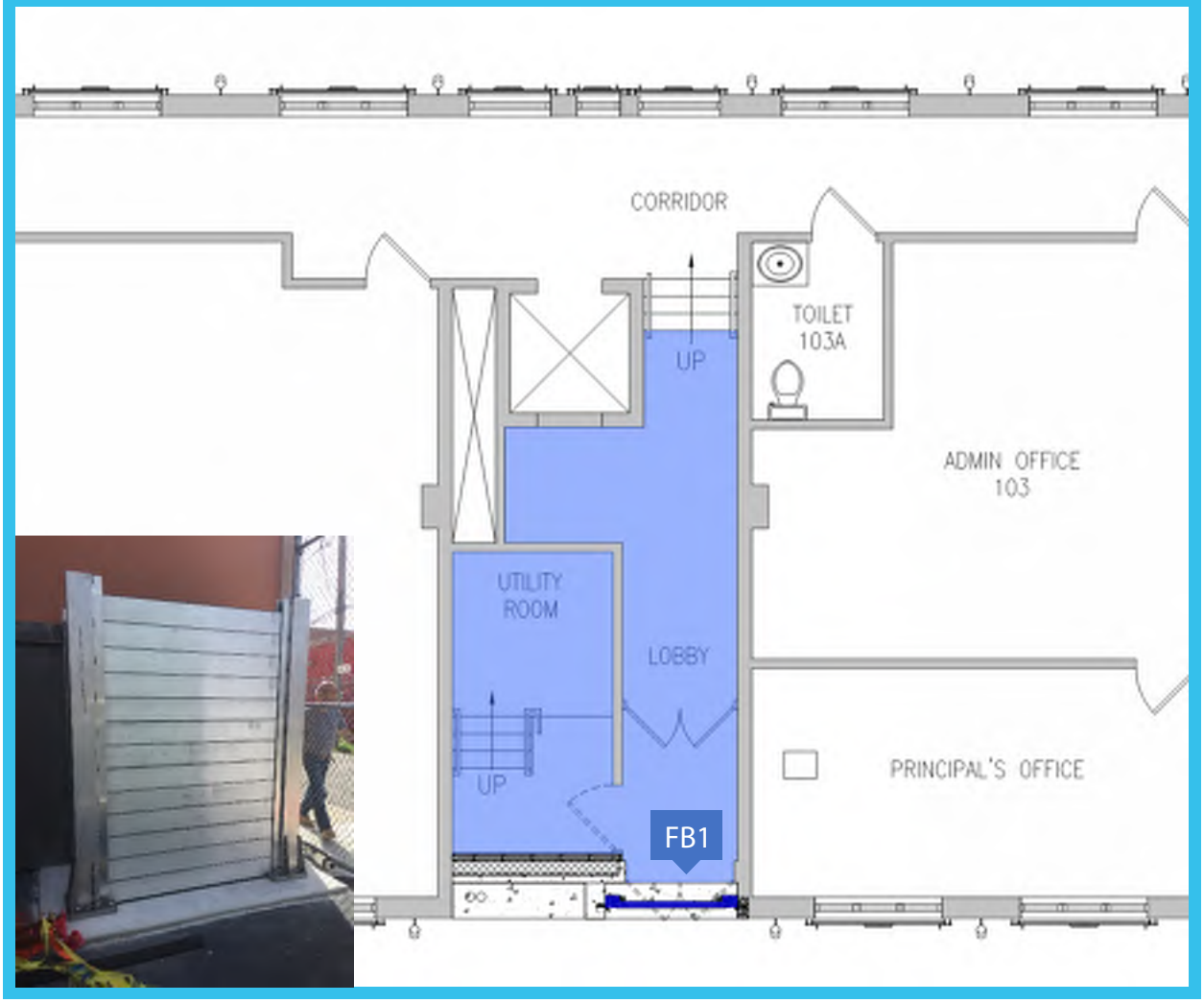
Flood Barrier FB1
(1) Barriers, sized ± 86" W x ± 78" H

General Notes:

All component quantities and measurements to be field verified. Mark all logs with Entrance Number. Portions of existing partitions, jambs, doors, and exterior finishes to remain which are affected by flood mitigation demolition/new work are to be patched. Existing/new finishes shall be worked to match adjacent existing exterior finish.



ENLARGED DETAIL PLAN



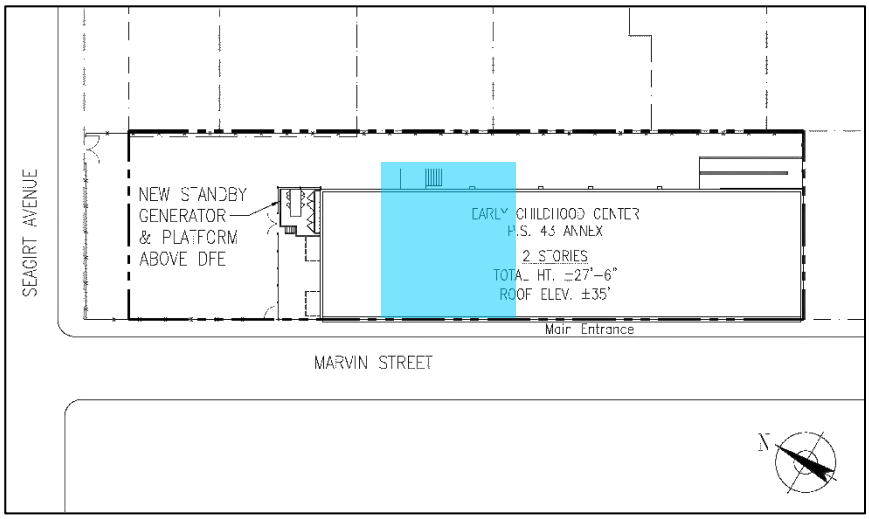
EP4 | Deployment Point FB2: Entrance 2

EQUIPMENT TO DEPLOY:
Type FB: Flood Barrier

Flood Barrier FB2
(1) Barriers, sized ± 64" W x ± 36" H

General Notes:

All component quantities and measurements to be field verified. Mark all logs with Entrance Number. Portions of existing partitions, jambs, doors, and exterior finishes to remain which are affected by flood mitigation demolition/new work are to be patched. Existing/new finishes shall be worked to match adjacent existing exterior finish.



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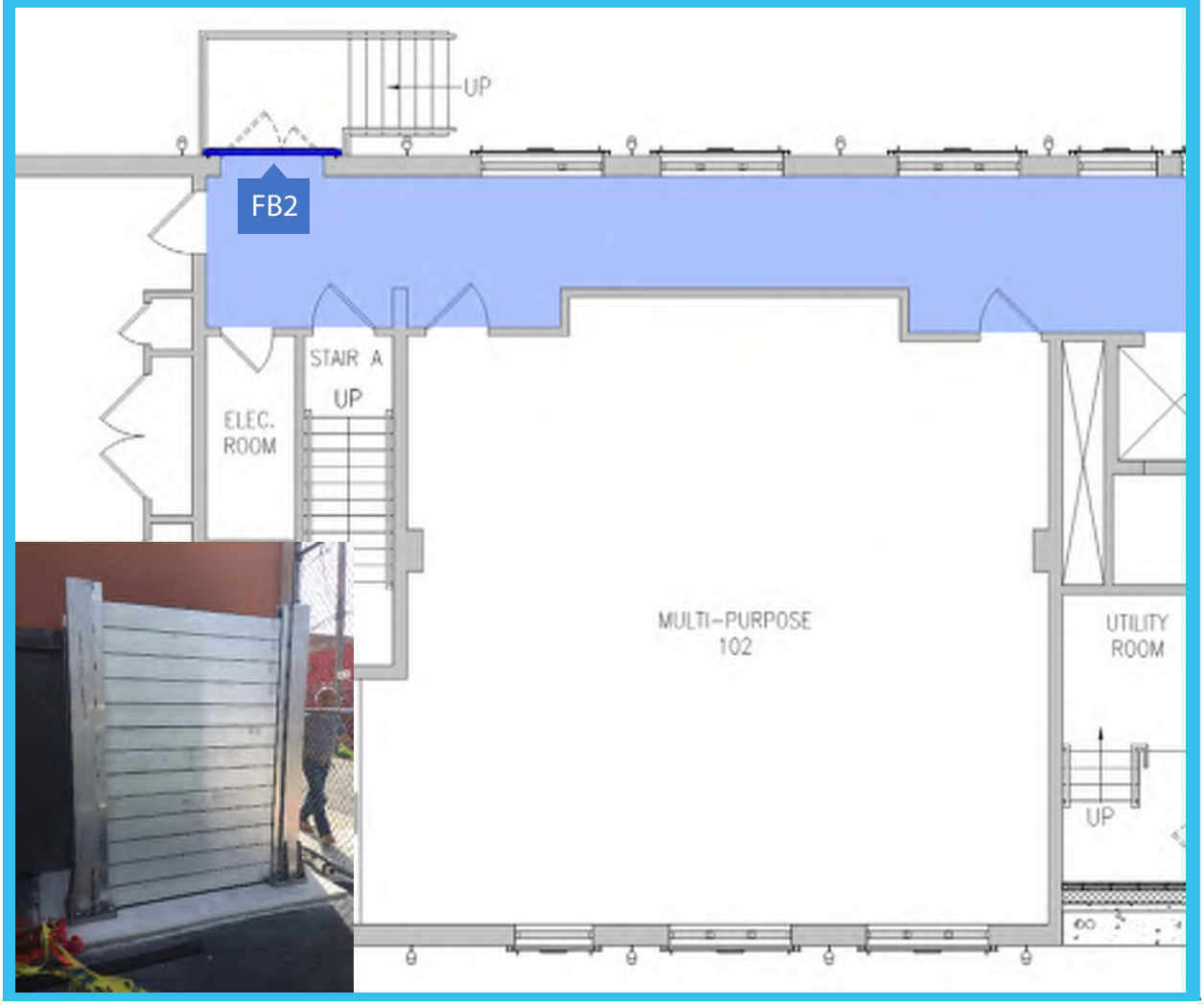


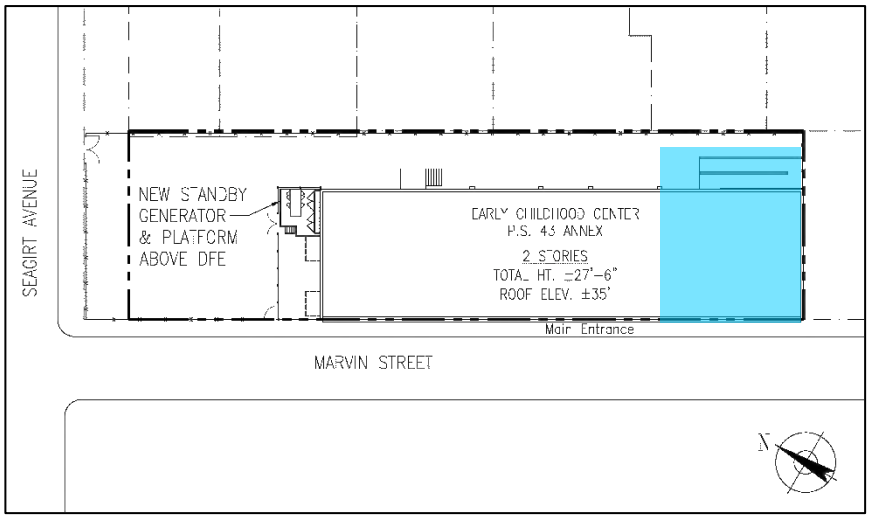
EP5 | Deployment Point FB2: Entrance 3

EQUIPMENT TO DEPLOY:
Type FB: Flood Barrier

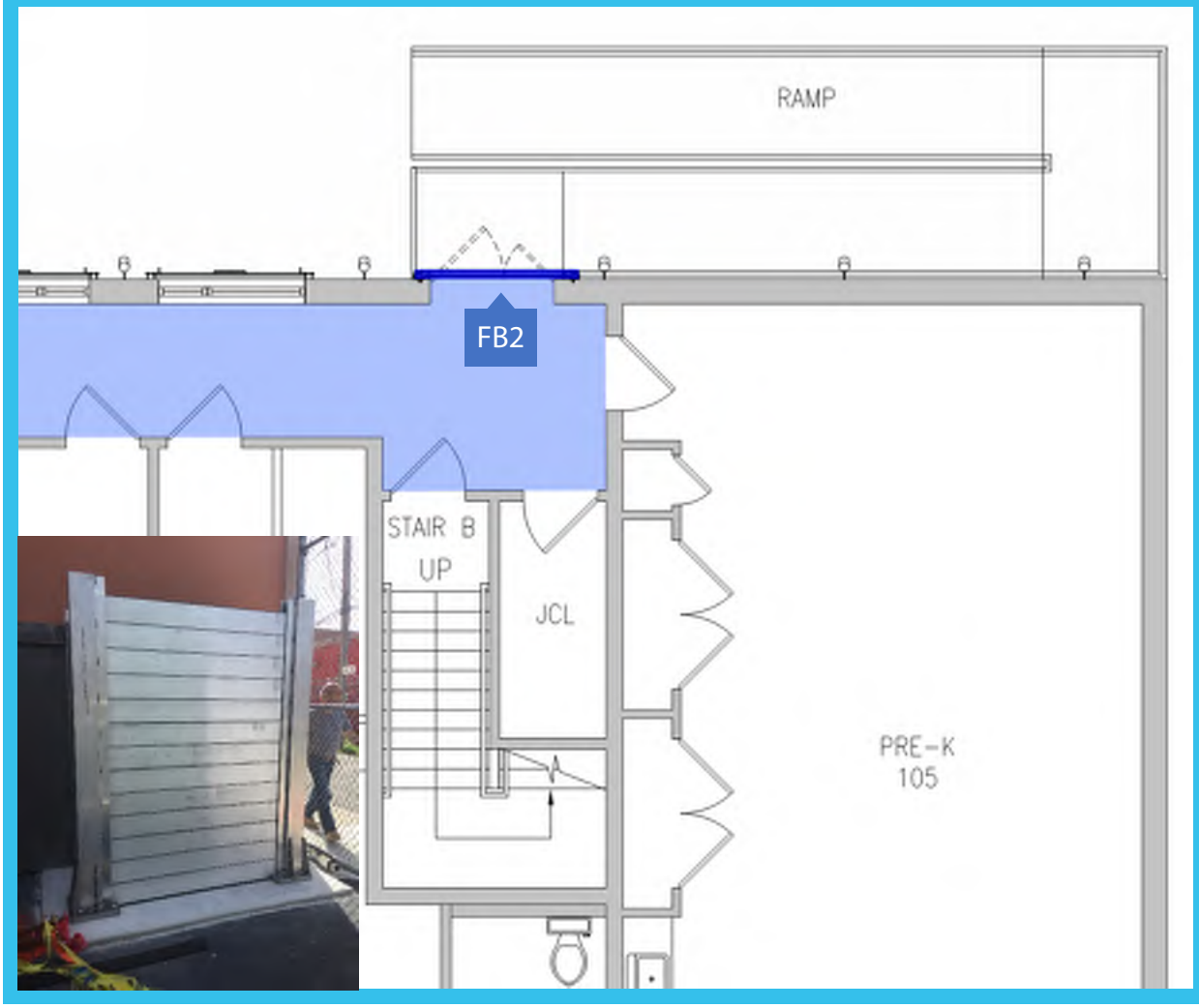
Flood Barrier FB2
(1) Barriers, sized ± 64" W x ± 36" H

General Notes:

All component quantities and measurements to be field verified. Mark all logs with Entrance Number. Portions of existing partitions, jambs, doors, and exterior finishes to remain which are affected by flood mitigation demolition/new work are to be patched. Existing/new finishes shall be worked to match adjacent existing exterior finish.



ENLARGED DETAIL PLAN

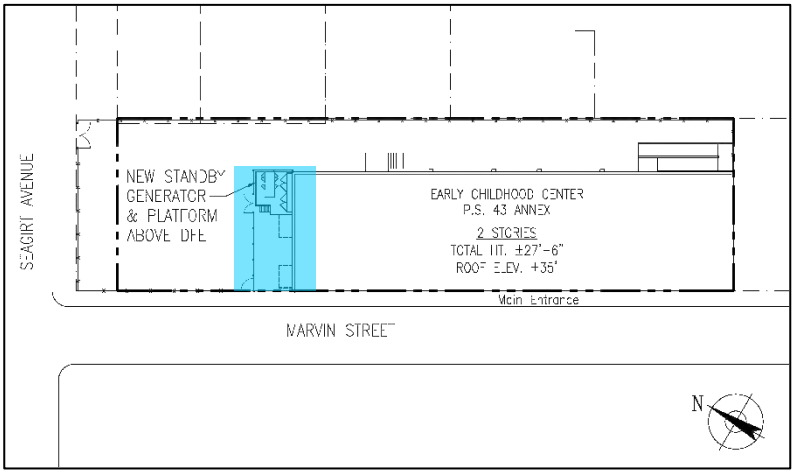


EP6 | Deployment Point FB4: Existing and New Gas Meter
Deployment Point FB5: Existing and New Gas Meter

EQUIPMENT TO DEPLOY:
Type FB: Flood Barrier

Flood Barrier FB4
(4) Barriers, sized ± 60" W x ± 42" H

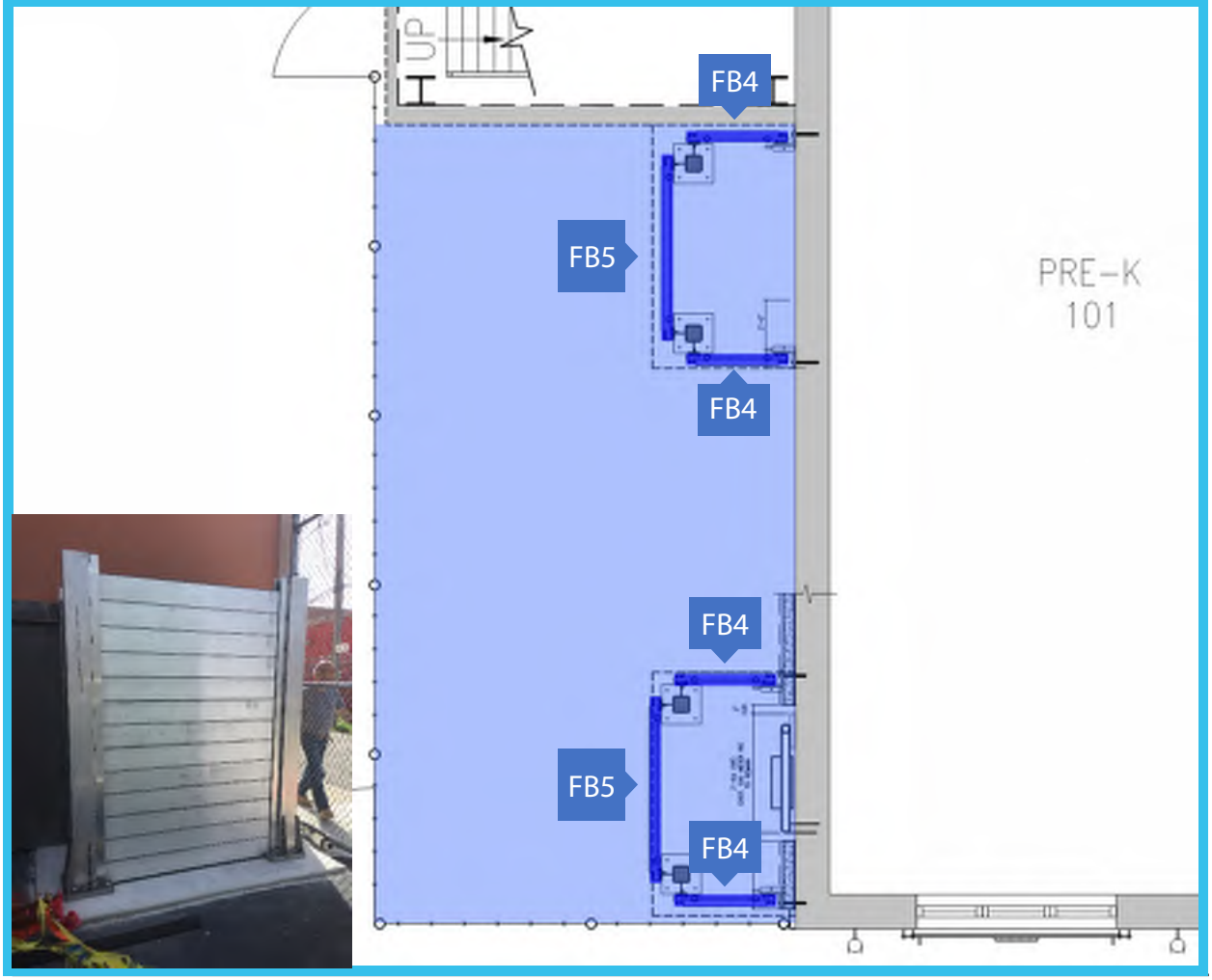
Flood Barrier FB5
(2) Barriers, sized ± 42" W x ± 36" H



General Notes:

All component quantities and measurements to be field verified. Portions of existing partitions, jambs, doors, and exterior finishes to remain which are affected by flood mitigation demolition/new work are to be patched. Existing/new finishes shall be worked to match adjacent existing exterior finish.

ENLARGED DETAIL PLAN

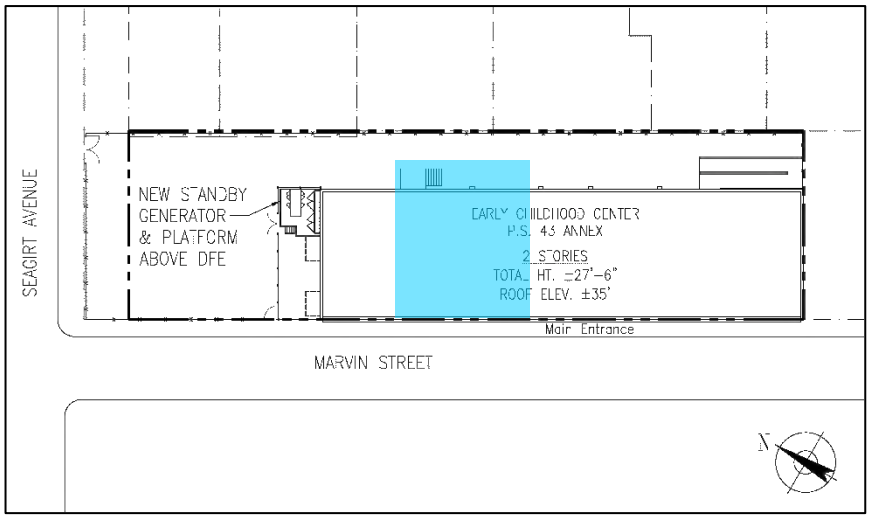


EP7 | Deployment Point FP1: Pre-K RM 101, Corridor, & Multi-Purpose Room

EQUIPMENT TO DEPLOY:
Type FP: Flood Panel

Flood Panel FP1
(7) Panels, sized ± 36" W x ± 24" H

General Notes:
All component quantities and measurements to be field verified. Portions of existing partitions, jambs, doors, and exterior finishes to remain which are affected by flood mitigation demolition/new work are to be patched. Existing/new finishes shall be worked to match adjacent existing exterior finish.



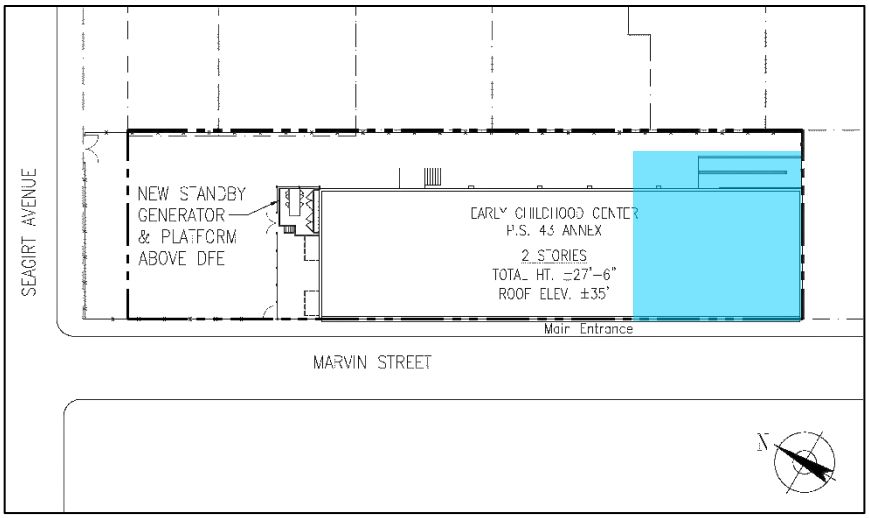
ENLARGED DETAIL PLAN

EP8 | Deployment Point FP1: Corridor, Principal's Office, & Pre-K RM 105

EQUIPMENT TO DEPLOY:
Type FP: Flood Panel

Flood Panel FP1
(7) Panels, sized ± 36" W x ± 24" H

General Notes:
All component quantities and measurements to be field verified. Portions of existing partitions, jambs, doors, and exterior finishes to remain which are affected by flood mitigation demolition/new work are to be patched. Existing/new finishes shall be worked to match adjacent existing exterior finish.

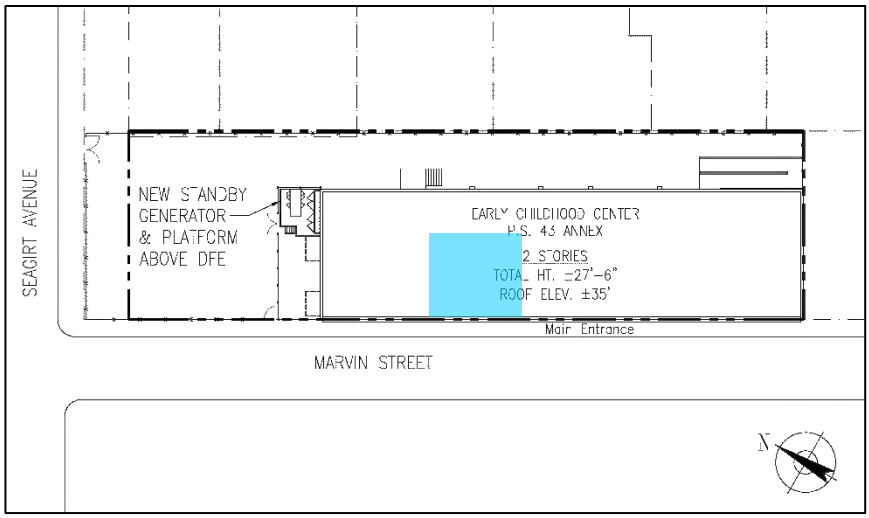


ENLARGED DETAIL PLAN

EP9 | Deployment Point FP2: Multi-Purpose Room

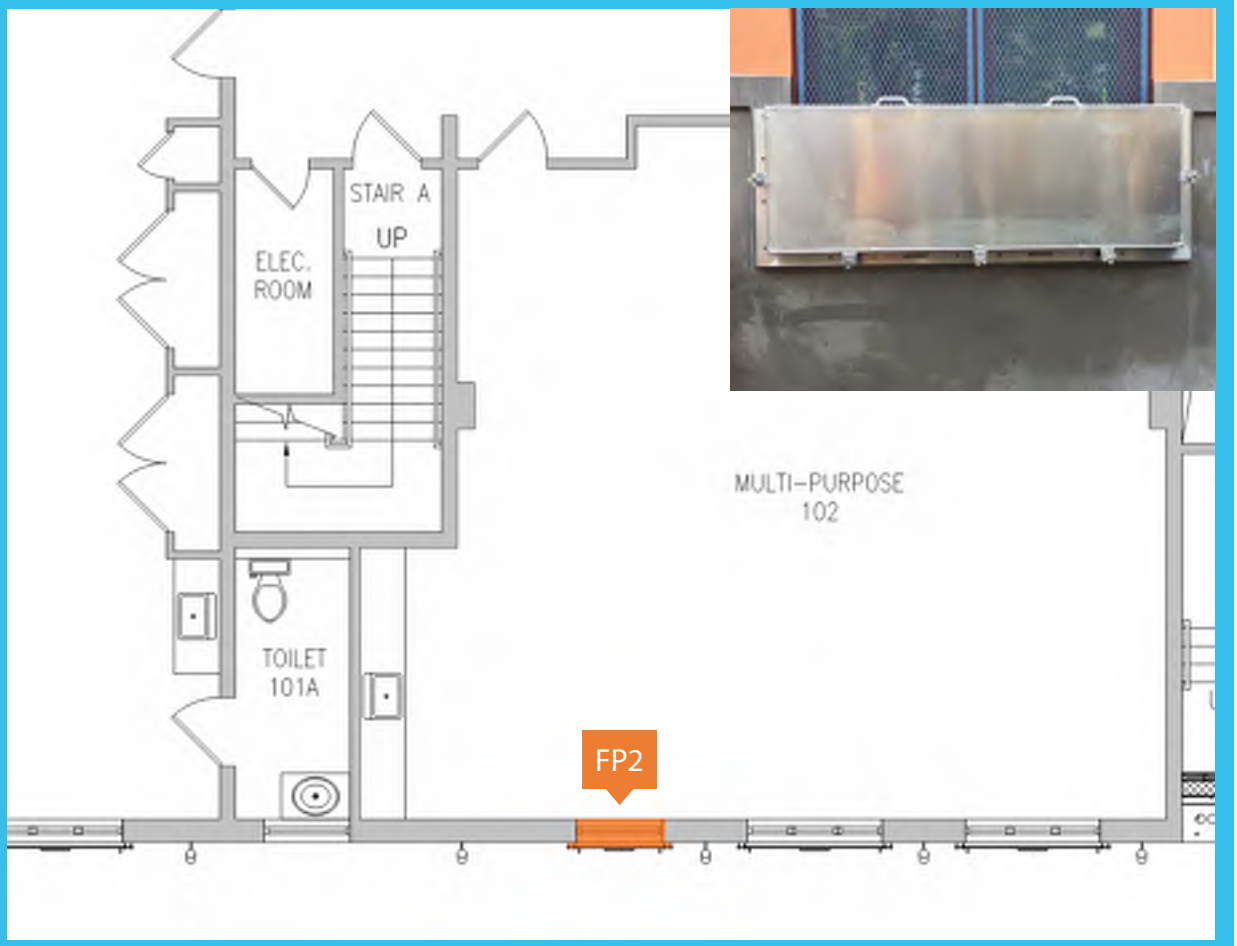
EQUIPMENT TO DEPLOY:
Type FP: Flood Panel

Flood Panel FP2
(1) Panels, sized ± 48" W x ± 24" H



General Notes:
All component quantities and measurements to be field verified. Portions of existing partitions, jambs, doors, and exterior finishes to remain which are affected by flood mitigation demolition/new work are to be patched. Existing/new finishes shall be worked to match adjacent existing exterior finish.

ENLARGED DETAIL PLAN

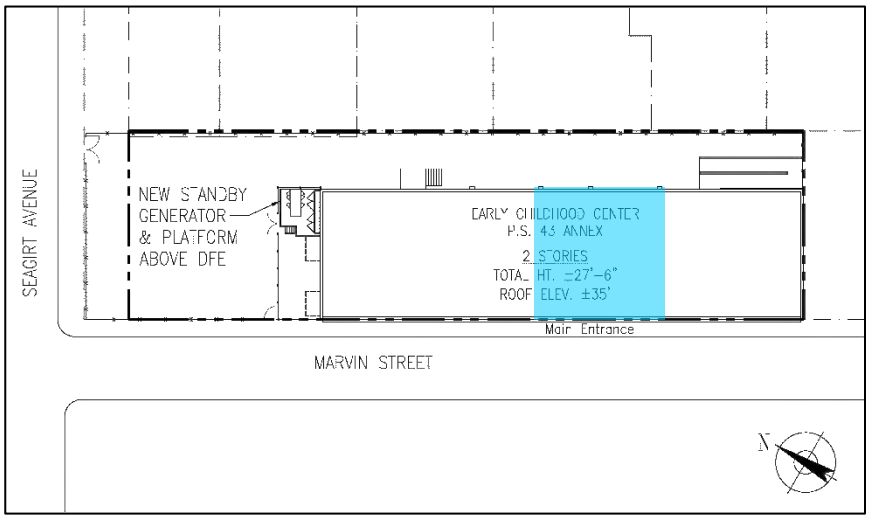


EP10 | Deployment Point FP2: Corridor & Custodian Office

EQUIPMENT TO DEPLOY:
Type FP: Flood Panel

Flood Panel FP2
(3) Panels, sized ± 48" W x ± 24" H

General Notes:
All component quantities and measurements to be field verified. Portions of existing partitions, jambs, doors, and exterior finishes to remain which are affected by flood mitigation demolition/new work are to be patched. Existing/new finishes shall be worked to match adjacent existing exterior finish..



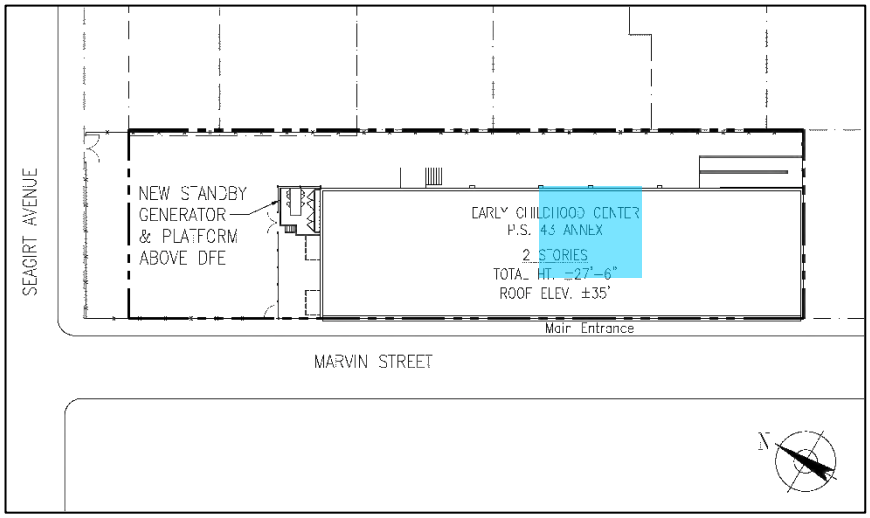
ENLARGED DETAIL PLAN

EP11 | Deployment Point FP3: Corridor

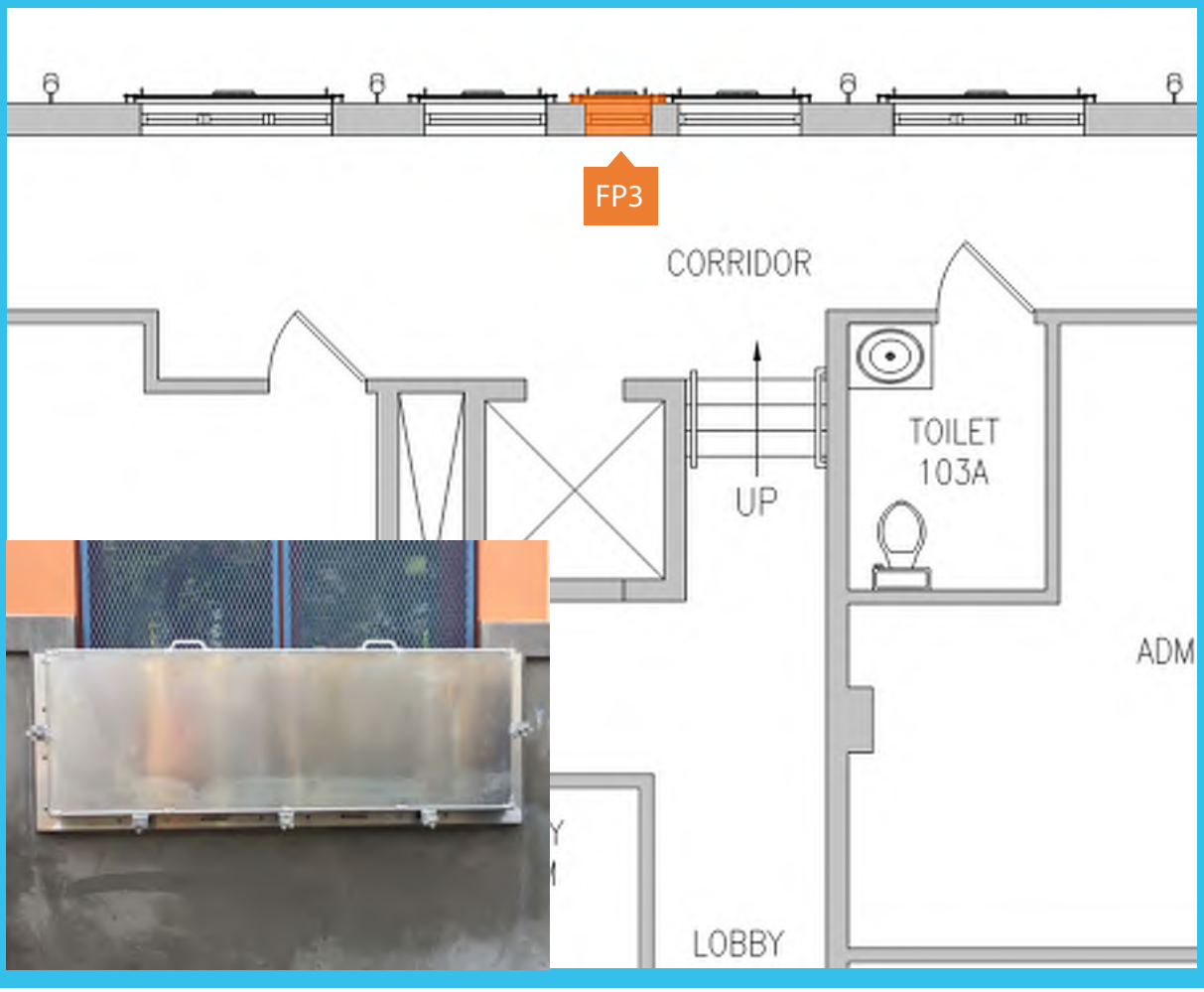
EQUIPMENT TO DEPLOY:
Type FP: Flood Panel

Flood Panel FP3
(1) Panels, sized ± 24" W x ± 24" H

General Notes:
All component quantities and measurements to be field verified. Portions of existing partitions, jambs, doors, and exterior finishes to remain which are affected by flood mitigation demolition/new work are to be patched. Existing/new finishes shall be worked to match adjacent existing exterior finish.



ENLARGED DETAIL PLAN



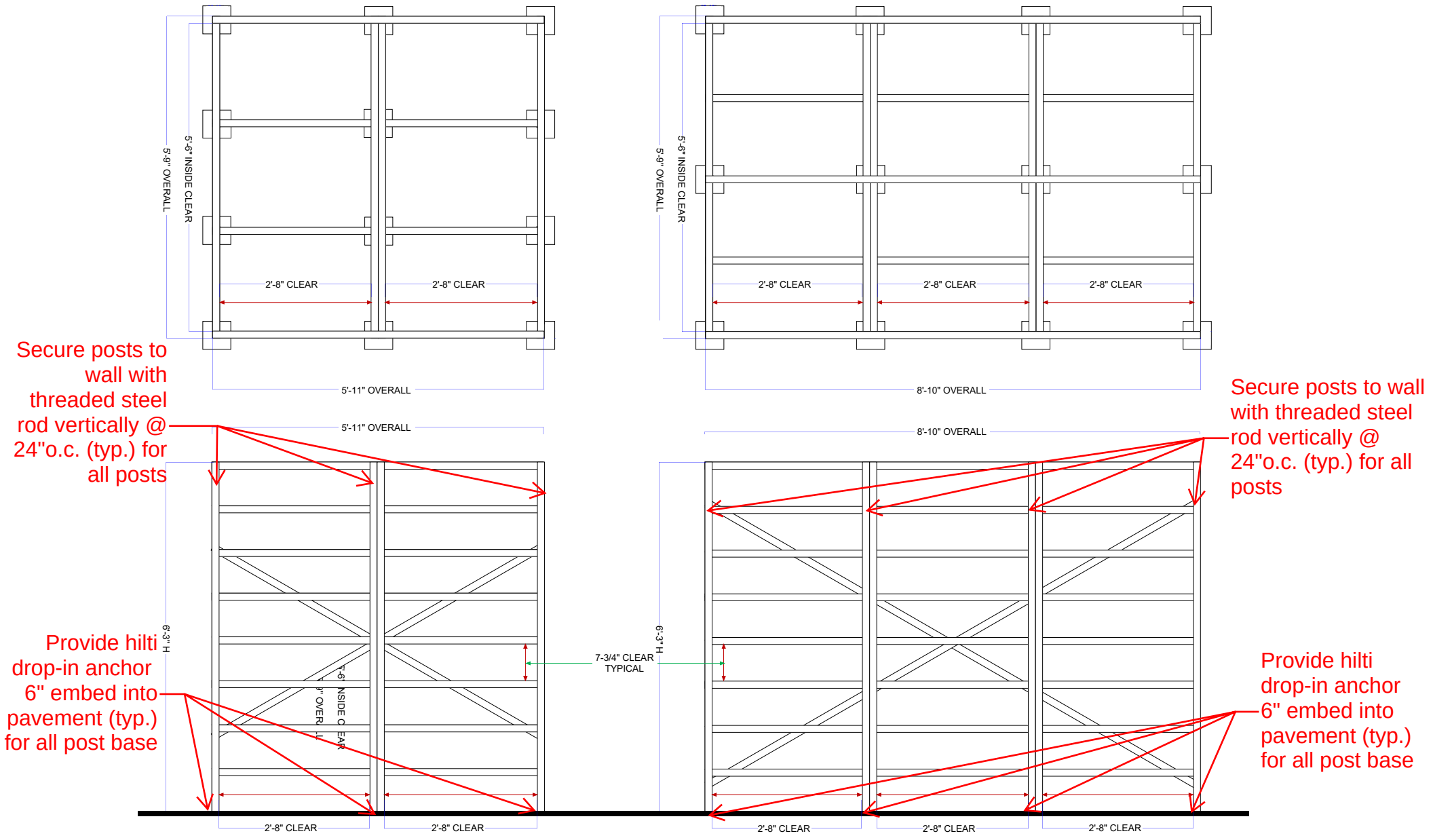
Appendix

1. Flood Barriers
    a. Flood Barriers Storage Shelving System
    b. Flood Plank Installation Instructions/Operation and Maintenance Manual
    c. FB 1 Approval Drawing
    d. FB 2 Approval Drawing
    e. FB 4 New Gas Meter Approval Drawing
    f. FB 5 Existing Gas Meter Approval Drawing
    g. FP 1 Approval Drawing
    h. FP 2 Approval Drawing
    i. FP 3 Approval Drawing
    j. PS Doors Statement of Qualifications

2. Flood Emergency Pumps Description and Specifications

3. Standby Emergency Generator
    k. WA-E Series Enclosures NEMA 12 Multi-Door Freestanding Features-Specifications
    l. Spark-ignited Generator Set Specification Sheet
    m. Tamperproof Thermostats for Enclosure Heaters, DIN Rail Mounted
    n. Fan Heaters for Enclosures, DIN Rail and Screw Mounted
    o. Filter Fan Kits

4. Backwater Valve
    p. Flood-Gate Backwater Valve Drawing
    q. BWV-House Trap Detail



Amscor
Smart Storage Solutions

PROJECT NAME

A QUEST CORP / PS 43 ANNEX

UNISTRUT SHELVING SYSTEM

Project No.	AE-101322
Date	05/15/2018
Revision	0.1
Drawn By	MS

INSPECTION & MAINTENANCE LOG

CRITICAL **Periodic Inspection and Maintenance Required.**

Date Purchased: _____

Product: _____

Model Number: _____

Serial Number: _____

Door Identifier / Number: _____

Location: _____

DATE INSPECTED	INSPECTED BY *(Print & Sign)*	INSPECTION ITEMS NOTED	CORRECTIVE ACTION	CORRECTED BY *(Print & Sign)*

PS430

PS DOORS
FLOOD PRODUCTS GROUP

FLOOD PLANK BARRIER
Installation Instructions and Operators Manual

MODEL

- **FP- 530**

STV Incorporated		
☒ No Exceptions Taken	Exp. Proj. Name: P.S. 43Q-Annex	Submittal No. 08112-004D
☐ Make Corrections Noted	Design/LLW No. D016605	Contract No. C000013782
☐ Rejected – Revise and Resubmit	Date Received 9/26/16	Date Returned 10/31/16
☐ Rejected – Not Acceptable for Review	Reviewed By R. Fouad	

Submittal reviewed as:

☒ Per Spec/ Basis of Design ☐ "Or Equal Substitution"/Non-basis of Design ☐ "Alternate Substitution

CORRECTIONS OR COMMENTS MADE ON THE SHOP DRAWINGS DURING THIS REVIEW DO NOT RELIEVE CONTRACTOR FROM COMPLIANCE WITH REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS. SHOP DRAWING APPROVAL IS ONLY FOR GENERAL COMPLIANCE WITH THE INFORMATION GIVEN IN THE CONTRACT DOCUMENTS. THE CONTRACTOR IS RESPONSIBLE FOR CONFIRMING AND CORRELATING ALL QUANTITIES AND DIMENSIONS, SELECTING FABRICATION, PROCESSES AND TECHNIQUES OF CONSTRUCTION, COORDINATING THE WORK WITH THAT OF ALL OTHER TRADES AND PERFORMING THE WORK IN A SAFE AND SATISFACTORY MANNER.

TABLE OF CONTENTS

To Contact PS DOORS:

By Mail: PS DOORS
Flood Products Group
1150 S. 48th Street
Grand Forks, ND 58201

By Phone: Phone 701.746.4519
Toll Free 877.446.1519

By Fax: 701.746.8340

Website: www.psdoors.com

By Email: 4psinfo@psdoors.com

Hours of Operation: 8:00 am to 5:00 pm (Central Standard Time); Monday thru Friday

IMPORTANT **Read entire Instruction and Operations Manual to become familiar with the product.**

NOTICE This product is a flood protection product. The effectiveness of the product is directly related to the proper installation and operation of this product. Failure to properly maintain this product ***will*** affect performance.

Publication Notice

This manual has been compiled and published covering the latest product descriptions and specifications.

The contents of this manual and the specifications of this product are subject to change without notice.

PS DOORS reserves the right to make changes without notice in the specifications and materials contained herein and shall not be responsible for any damages (including consequential) caused by reliance on the materials presented, including but not limited to typographical and other errors relating to the publication.

LIMITED WARRANTY

PS DOORS warrants this product and components to be free from defects in material and workmanship for a period of one (1) year from date of shipment. If within the term of this warranty, if any Flood Plank Flood Barrier or component is found to be defective upon inspection by an authorized PS DOORS representative, PS DOORS will replace or repair, at PS DOORS' discretion, any part found to be defective. Any field labor charges incurred are the sole responsibility of the customer.

To make a claim under this warranty, contact PS DOORS at the address shown below.

PS DOORS
Attention: Warranty
1150 S. 48th Street
Grand Forks, ND 58201

Toll Free: 877-446-1519
Phone: 701-746-4519
Fax: 701-746-8340
E-mail: 4psinfo@psdoors.com

Unauthorized modification of or to this product voids the PS DOORS Limited Warranty. Accordingly, you can expect any request for warranty repair to be charged to you, if the product requires service after unauthorized modification. Authorized modifications, received in writing from PS DOORS, as long as the modification is accomplished in strict accordance with PS DOORS' instructions, does not void warranty. To request product modifications contact PS DOORS, 1150 S. 48th Street, Grand Forks, ND 58201, phone 877-446-1519, email: 4psinfo@psdoors.com.

PS DOORS SHALL NOT BE LIABLE FOR ANY CONSEQUENTIAL OR INCIDENTAL DAMAGES.

All other warranty's, express or implied including any warranty of merchantability, are expressly excluded. Some states do not allow the exclusion or limitation of consequential or incidental damages, so the above limitation or exclusion may not apply to you.

WARRANTY DOES NOT APPLY TO ANY DAMAGE OR DETERIORATION CAUSED BY MODIFICATION, ABUSE, APPLIED PAINT FAILURE OR FAILURE TO PROVIDE REASONABLE AND NECESSARY MAINTENANCE.

This warranty gives you specific legal rights, and you may also have other rights, which vary, from state to state.

Exclusions:

Seals and/or Gasketing are considered a "wear-item" and are not covered under this warranty.

PS DOORS MANUFACTURING DIVISION

IMPORTANT! ACTION REQUIRED!

In order to Validate your Warranty the following information must be completed and returned to PS DOORS, failure to completely fill out this information, or to return information to PS DOORS may void warranty.

WARRANTY REGISTRATION

Owner Name: _____ Product: _____

Company: _____ Model: _____

Address: _____ Serial Number(s): _____

City: _____ Date Installed: _____

State/Province: _____ Postal Code: _____

Country: _____

Please answer the following questions:

1. *Has the installed product been tested?* ____ *Yes* ____ *No*
2. *Test Witnessed by, Name:* _____ *Date:* _____
3. *Product Initial Inspection by, Name:* _____ *Date:* _____

Warranty Registration must be returned to:

- *Fax: 701-746-8340*
- *Email: 4psinfo@psdoors.com*
- *Mail: PS DOORS*
  1150 S. 48th Street
  Grand Forks, ND 58201

Warranty Registration Information will be used for activation of product warranty only.

Safety precautions

We use the following icons throughout

DANGER Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderated injury.

NOTICE Indicates manufacture's statement of additional information.

IMPORTANT Indicates a required action.

CRITICAL Indicates a vital component to product performance.

FLOOD PLANK; FP-530

The FP-530 is a specially designed Flood Plank Barrier capable of providing flood protection. The FP-530 is specifically manufactured to meet the opening dimensions and Water Protective Height (WPH) of each customers specific site requirements. DUE TO THE CUSTOM NATURE OF EACH FP-530 FLOOD BARRIER, THEY DO NOT ALL LOOK THE SAME, NOR LATCH OR OPERATE EXACTLY THE SAME. REFER TO INSTALLATION AND CONSTRUCTION DRAWINGS FOR YOUR SPECIFIC INSTALLATION AND OPERATION.

Please keep these instructions for later reference and read them before attempting any maintenance or operation of the product.

NOTICE ADDITIONAL INFORMATION

1. Except as otherwise indicated, requirements for flood barriers, terminology, tolerances, standards or performance and workmanship are are those specified as Type 2 closures in Chapter 7, Section 701.2 of the US Army Corps of Engineers, EP 1165-2-314, 15 December 1995.
2. These Type 2 Flood Closures/Barriers shall form essentially dry barriers or seals, allowing only slight seepage during the hydrostatic pressure conditions of flooding to the Regulatory Flood Datum (RFD) or the Design Flood Elevation (DFE). Seepage amounts will vary with conditions encountered. This issue should be addressed by the design professional and usage of sump or bilge type pumps should be used to off set potential water build-up.
3. No additional allowances have been included for hydrodynamic loads, debris impact loads or wave loads, unless specifically detailed in additional documentation provided.
4. All water pressure loads, impact loads, and operating loads are transferred to the building structure. Building structure design, capacity to accept loads from flood barriers, and evaluation of loads to structure is by others.
5. PS DOORS recommends that the owner implement an regular maintenance program to inspect the gaskets and barrier panels. This program may require the replacement of gaskets; touch up painting and accounting for of all the latching devices.
6. If the water height exceeds the level of any door penetrations or water protective design height, leakage will occur.
7. This product is equipped with compressible seals, which are not dependant on inflation devices.
8. PS DOORS recommends a flood preparedness plan be developed, trained on, and implemented to be activated during times of potential flooding conditions.
9. PS DOORS AND/OR ITS RESPECTIVE SUPPLIERS MAY MAKE IMPROVEMENTS AND/OR CHANGES IN THE PRODUCT(S) OR SERVICE(S) OFFERED AND/OR THE PROGRAM(S) AT ANY TIME WITHOUT NOTICE.

Product Description

IMPORTANT!

Read entire Operations & Maintenance Manual to become familiar with the product.

The PS DOORS Flood Plank Barrier system, Model FP-530 is to be constructed in accordance with PS DOORS' standard design, specification, and fabrication methods for Custom Flood Barriers.

The following components, in accordance with description provided, are included:

1. **Flood Barrier Planks:** To be extruded aluminum plank. The Flood Plank system to be designed for maximum water height requested above Finished Floor Elevation (FFE). All loads transferred to adjacent structure. This design is subject to a uniformly increasing fluid pressure (hydrostatic pressure loading of water at 62.5 pcf) with a 2:1 design safety factor based on material yield strengths.
2. **Flood Barrier Jamb:** To be of PS DOORS' design, for field installation on existing structure and/or embedded within structure. Frame members to be fabricated from structural or extruded shapes and formed members. Field grouting is/may by required.
3. **Flood Barrier Mullions and Supports:** Frame members to be fabricated from structural or extruded shapes and formed members. Field grouting is/may by required.
4. **Flood Barrier Embeds: Embeds provided for anchoring and placement of flood barrier mullions and supports - Halfen Anchor**
5. **Gaskets:** To be factory mounted to the flood barrier or frame and planks. Gaskets to be compressible rubber type, field replaceable.
6. **Flood Barrier Panel and Frame Finish:** Finish on all exposed surfaces to be one of the following:
    A. Aluminum, Mill Finish, welds ground not polished.
7. **Latching Hardware:** To be spin-down knob type. Appropriate number of latches for the size, type, and design.
8. **Installation Hardware:** PS DOORS includes all sealants, water-stop, anchors, and hardware necessary for installation, latching and retaining flood barrier as designed. Note: Anchors are engineered for load design and shall not be changed without factory authorization.
9. **Warranty:** PS DOORS warrants this product and components to be free from manufacturing defects for a period of one (1) year from date of shipment. See warranty document on page 3 of this document.

The following information is available upon request:

- Structural Calculations: A copy of PS DOORS' design calculations by a qualified engineer, to verify the flood barrier's ability to withstand the design loading, is available upon request.

The following optional services are available upon request:

- Optional: Registered professional engineer stamped calculations from within the state or territory where the building will be constructed or substantially improved are available at additional cost.

PS DOORS AND/OR ITS RESPECTIVE SUPPLIERS MAY MAKE IMPROVEMENTS AND/OR CHANGES IN THE PRODUCT(S) OR SERVICE(S) OFFERED AND/OR THE PROGRAM(S) AT ANY TIME WITHOUT NOTICE.

NOTICE

This product is a flood protective barrier. The effectiveness of the product is directly related to the proper installation and maintenance of this product. Failure to properly maintain this product ***will*** affect performance.

IMPORTANT! Read entire Operations and Maintenance Manual to become familiar with the product.

NOTICE This product is a flood protective barrier. The effectiveness of the product is directly related to the proper installation and maintenance of this product. Failure to properly maintain this product ***will*** affect performance.

1. GENERAL INFORMATION

This manual contains information regarding operation and maintenance of custom water resistant flood barrier assemblies.

This product is manufactured to specific guidelines. Unauthorized alteration in any way will result in voiding Factory Warranty, and may cause product to fail.

2. OPERATION GUIDELINES

The following procedures and information are supplied for the operation of the FP-530 Flood Plank Barrier assemblies. Operation in a manner other than intended could result in damage or less than acceptable performance at time of need, for which the manufacturer will not be held responsible.

Always plan for potential leakage and condensation that can occur during flooding conditions.

3. SAFETY PRECAUTIONS

- Ensure opening is clear of all obstructions or debris during operation.
- Do not force planks or components if they do not operate freely.
- If removing panels or hardware for maintenance, consult documents for component weights, and use appropriate lifting equipment. Protect all gaskets and hardware. Always consult original factory drawings for all installation dimensions, details, hardware, and specifications.

4. OPERATION UNDER FLOODING CONDITIONS

- **Pre-flooding or Potential Flooding Conditions:**
    - At a minimum, conduct Inspection and Maintenance activities as described in this Operations & Maintenance Manual.
    - Ensure FP-530 Flood Plank system is located near the required area for placement when needed, and is deployed prior to flooding conditions.
- **Flooding Conditions Present:**
    - Ensure FP-530 Flood Plank Barrier is <u>not</u> opened at any time when flooding conditions are present.
    - If feasible, check FP-530 Flood Plank Barrier for leakage or condensation accumulation.

NOTICE Unauthorized modification of this product voids the PS DOORS Limited Product Warranty. Accordingly, you can expect any request for warranty repair to be charged to you, if it requires service after modification. Authorized modifications, received in writing from PS DOORS, as long as the modification is accomplished strictly in accordance with PS DOORS' instructions, does not void warranty. To request product modifications contact PS DOORS.

WARNING The flood protective barrier panels MAY BE heavy, verify panel weights and use appropriate lifting procedures and equipment.

WARNING THIS IS A FLOOD PROTECTION BARRIER. NEVER OPEN DURING ANY FLOODING CONDITIONS AS WATER LEAKAGE WILL OCCUR AND YOU MAY NOT BE ABLE TO RECLOSE THE BARRIER.

- **INTERMEDIATE SUPPORT "A-FRAME" DEPLOYMENT (If Required)**

The Intermediate Support or "A-Frame" is used when the combination of length of the flood plank and the water protective height require additional support to withstand the force exerted by the flood waters. The intermediate support is not required on all FP-530 Flood Plank Systems, consult construction drawings to verify if your opening requires this item.

To deploy the Intermediate Support do the following:

1. Remove covers from the Embedded Anchor Channel and ensure all debris is removed.. *See illustration 1.*

2. Move the Mullion Post into position. Align Shear Lug with embedded anchor channel. *See illustration 2.*

3. Rotate Halfen Anchor 1/4 Turn to engage with embedded channel and tighten anchor nut. *See illustration 3.*

4. Hang tighten Turn-Buckle by raotating body until snug. DO NOT OVER TIGHTEN.

- **PLANK DEPLOYMENT PROCEDURE**

NOTE: All inspections should be conducted well before the need for the flood plank is necessary to allow for repair or replacement activities.

1. Remove protective covers from flood plank Jamb/Mullions.

2. Lube Jamb/Mullion Seals. Using a spray bottle filled with a water-dish soap mixture, spray the jamb/mullion seal to allow flood planks to slide more easily into the jamb/mullion. This may need to be repeated as planks are placed in the jamb/mullion. Keep jamb/mullion gasket moist during plank installation.

3. Locate BOTTOM plank. This is the plank marked "Bottom" and has a thick (1") gasket mounted to the bottom of the plank.

4. Ensure smooth side of flood plank is facing the gasket.

5. Place one corner of the bottom plank into the bottom corner of the jamb/mullion. Angle the opposite end of the plank upward until it clears the opposite jamb/mullion, then slide into the jamb/mullion, taking care to not tear the jamb/mullion gasket. Slide plank down to sill. Center plank equally between the jamb/mullion. *See illustration 5.*

6. Install remaining planks in same manner as the bottom plank ensuring contact with the plank below. *See illustration 6.*

7. Install latching. There are various latching types, please refer to your Approval/Construction drawings to determine the latching for your barrier.

8. Latching types consist of the following:

   A. Standard Jamb/Mullion Mount Latching. *See illustration 7.*
   B. Center Mullion Down Pressure Latch. For use with FP-530 systems with "A" Frame Support Only.
   C. Custom Latching—From time to time it is necessary to provide cus-

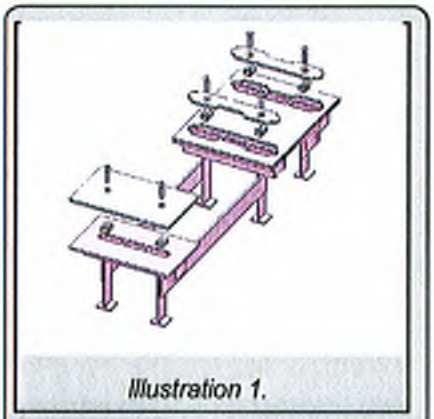


Illustration 1.

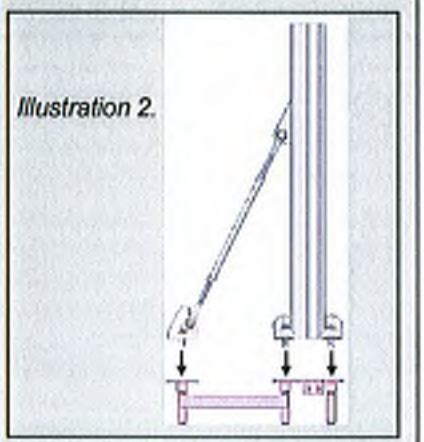


Illustration 2.

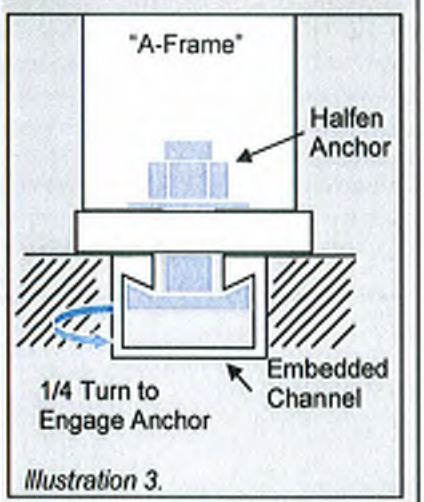


Illustration 3.

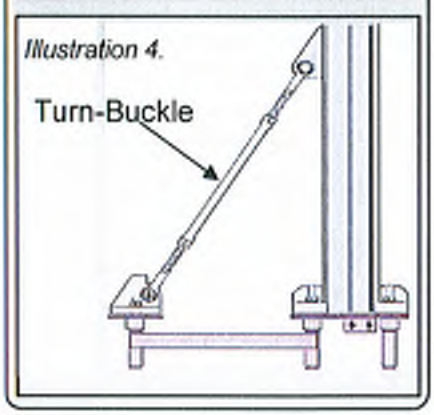
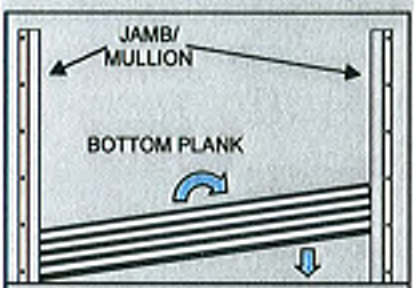


Illustration 4.

tom latching for a project. Refer to your specific construction drawing for custom latching.

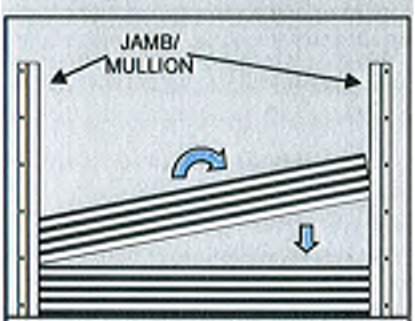
5. INSPECTION AND MAINTENANCE

- **Sills, Frames, and Embedded items:**
  - Inspect items for damage and misalignment. Adjust, repair, or replace as needed, to meet original design tolerances.
  - Check all embedded connections, making sure they meet original design standards (*refer to original product drawings).*
- **Fasteners and mechanical connections:**
  - All fasteners must be in place and adjusted to their original design standards. Replace any damaged components (*refer to original product drawings).*
- **Sealants and Water-stops:**
  - Inspect all sealants used on frames and connections to insure their effectiveness. Replace any cracked, loose, or otherwise non-performing sealants.
  - Use only factory approved/supplied products.
- **Gasketing:** Check all gaskets around perimeter of opening.
  - Inspect for gasket and corner splice damage, and for continuous adhesion to the attached surface.
  - Visually inspect all gaskets for proper positioning and compression.
  - Replace or repair if damage or deterioration to gaskets has occurred.
  - Use only factory approved materials *(refer to installation drawings/information).*
- **Latching:**
  - Operate all latching hardware to ensure smooth, uninhibited movement of all mechanical components.
  - Place flood barrier and check latches for proper engagement. If gaskets are not properly positioned and properly compressed, unlatch barrier panel and adjust latching accordingly.
- **Finishes:**
  - Inspect and clean finishes periodically.
  - Touch-up repair finishes, or refinish as necessary to protect the structural integrity of the product.
- **Labels and Placards:**
  - Inspect all labels and placards. Replace any labels and placards which are unreadable.
- **Housekeeping:**
  - Clean sill and jamb/mullion of any debris and keep the area clean throughout barrier opening.



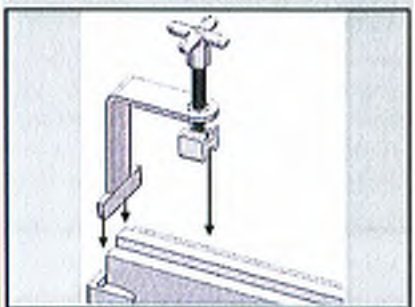
BOTTOM PLANK PLACEMENT

Illustration 5.



ADDITIONAL PLANK PLACEMENT

Illustration 6.



STANDARD MOUNT LATCH

Illustration 7.

08112-0013

NOTES

STORAGE-HANDLING
DO NOT STORE FLOOD BARRIERS IN A MANNER THAT WILL COMPRESS GASKETS OR THAT WILL CAUSE DAMAGE TO GASKETS.

INSTALLATION
REFER TO ALL MANUFACTURERS' INSTALLATION NOTES AND DRAWINGS. INSTALL PLUMB, SQUARE, AND LEVEL INSURING CONTINUOUS AND EVEN GASKET CONTACT. DO NOT DRILL OR PENETRATE ANY SURFACES OF BARRIERS WITHOUT CONSULTING MANUFACTURER. USE ONLY FASTENERS PROVIDED BY THE MANUFACTURER (UNLESS OTHERWISE NOTED). FIELD GROUT AS INDICATED ON DRAWINGS (MATERIAL AND PLACEMENT NOT BY PS DOORS). GROUT TO BE NON-METALLIC, NON-SHRINK TYPE, CAPABLE OF DEVELOPING 3000 PSI COMPRESSIVE STRENGTH AS PLACED.

MAINTENANCE-INSPECTION
PERIODIC INSPECTION AND MAINTENANCE OF FLOOD BARRIER INSTALLATIONS INCLUDING SEALANTS, GASKETS, ANCHORS, AND OPERATING HARDWARE IS THE RESPONSIBILITY OF THE OWNER.

STRUCTURAL REVIEW
STRUCTURAL REVIEW OF ADJACENT STRUCTURE'S CAPACITY TO WITHSTAND ALL FLOOD BARRIER SERVICE LOADS TRANSFERRED TO STRUCTURE IS BY OTHERS (NOT PS DOORS). FIELD CONCRETE DESIGN AT ANY EMBEDDED CONNECTION TO WITHSTAND FLOOD BARRIER SERVICE LOADS IS BY OTHERS (NOT PS DOORS). REVIEW OF EXISTING STRUCTURE'S ABILITY TO WITHSTAND FLOOD BARRIER SERVICE LOADS TRANSFERRED BY ANCHORS IS BY OTHERS (NOT PS DOORS).

PERFORMANCE
FLOOD BARRIERS ARE DESIGNED TO CONTROL SHORT TERM HYDROSTATIC WATER LOADS (64 PCF) UP TO THE DESIGNED WATER HEIGHT NOTED ON THE DRAWINGS. NO ALLOWANCES HAVE BEEN INCLUDED TO CONTROL WAVE SURGE LOADS OR OTHER IMPACT LOADS UNLESS SPECIFICALLY DETAILED ON THE DRAWINGS. ALL LOADS ARE TRANSFERRED TO THE BUILDING STRUCTURE. ALWAYS ALLOW FOR CONTROL OF ANY LEAKAGE AND CONDENSATION THAT WILL OCCUR DURING HIGH WATER SITUATIONS. IN APPLICATIONS WHERE THE FLOOD BARRIER GASKETS CONTACT THE EXISTING BUILDING STRUCTURE, FLOORS, ETC. ALL SURFACES MUST BE SOUND, FLAT/LEVEL, AND WITHOUT BLEMISH FOR BEST PERFORMANCE.

FIELD VERIFICATION IS REQUIRED BY OTHERS (NOT PS DOORS)
1 ALL DIMENSIONS AND INTERFERENCES.
2 JAMB CONDITIONS AND STRUCTURAL CAPACITY OF STRUCTURE.
3 ANCHOR LOCATIONS AND MINIMUM REQUIRED EDGE/END DISTANCES, SPACING, EMBEDMENT DEPTHS, AND INSTALLATION PROCEDURE SPECIFIED IN THE ANCHOR MANUFACTURER'S TECHNICAL INFORMATION MANUAL.

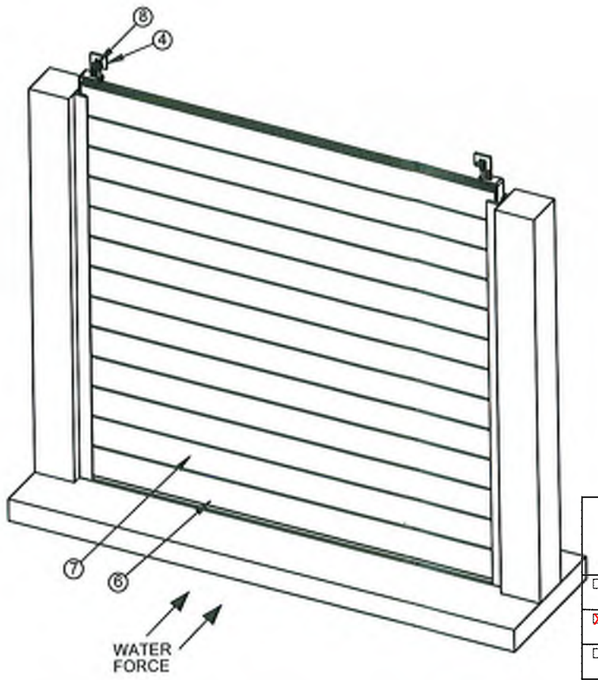
FLOOD BARRIER WAS DESIGNED USING 2:1 FACTOR OF SAFETY BASED ON MATERIAL YIELD STRENGTH AS QUOTED

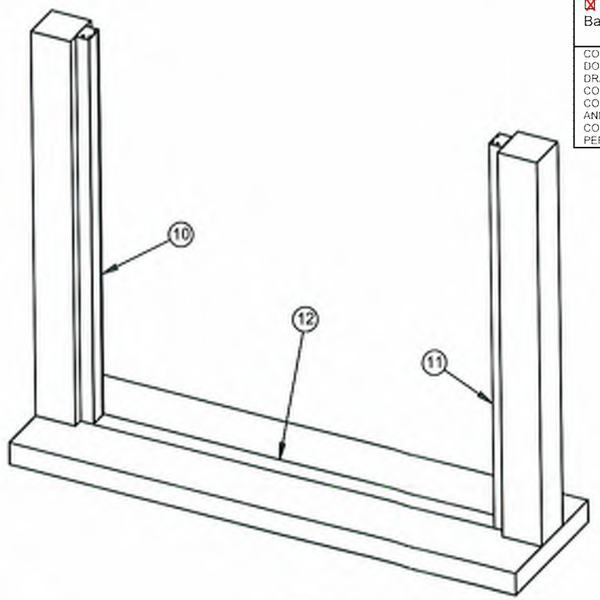
DESIGN CRITERIA

DESIGN LOADS
(ALL LOADS TRANSFERRED TO STRUCTURE)
HYDROSTATIC LOADS TO ELEVATION AS INDICATED ON DRAWINGS BASED ON HYDROSTATIC WATER LOAD (64 PCF). ALL ANCHOR DESIGNS ARE BASED ON ATTACHING TO STRUCTURE CALLED OUT IN DRAWINGS. PS DOORS IS NOT RESPONSIBLE FOR FASTENING OF PRODUCT INTO LESS THAN IDEAL FIELD CONDITIONS OR MOUNTING TO STRUCTURE OTHER THAN WHAT IS DETAILED ON DRAWINGS.

MATERIALS
ALUMINUM: 5052-H32, 6005A-T5, 6061-T6, 6063-T6
MILD STEEL: ASTM A-36, ASTM A-569, ASTM A-527, ASTM A-500, ASTM A-513, ASTM A-1011 CS TYPE B
STAINLESS STEEL: SS304 (UNLESS OTHERWISE NOTED)
FASTENERS: ZINC PLATED (UNLESS OTHERWISE NOTED)
GASKETS: EPDM, NEOPRENE, SILICONE, OR NATURAL RUBBER
FINISHES
FABRICATED STEEL: CHEMICAL CLEAN & RINSE;
PRIMER AND INDUSTRIAL ENAMEL:
PRIME COAT - (1) COAT OF SHERWIN WILLIAMS KEM FLASH PRIMER
TOP COAT - (2) COATS OF SHERWIN WILLIAMS INDUSTRIAL ENAMEL
POWDERCOAT (STEEL ONLY): POWDURA TGIC
ALUMINUM: RAW, MILL FINISH
STAINLESS STEEL: RAW, MILL FINISH
WELDS
EXPOSED, INTERFERING WELDS ARE GROUND, NOT FILLED OR POLISHED
FACTORY WELDS:
ALUMINUM; ELECTRODE ER4043
MILD STEEL; ELECTRODE ER70S-6
STAINLESS STEEL; ER308LSi, ER316LSi, ER317L
FIELD WELDS: ELECTRODE E70-SERIES (FOR MILD STEEL). ALL WELDING SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THE APPLICABLE AWS OR ASME STANDARDS.

REV.	REVISIONS	DATE	REVISED BY	FINISH:
1.1	CHANGED LEFT JAMB FROM FACE MOUNT TO JAMB MOUNT	3/4/16	NJU	





DOOR/OPENING NAME: **FB 1**

SHIP TO: SAK ENTERPRISES

SOLD TO: SAK ENTERPRISES

PROJECT NAME: PS 43Q ANNEX

CUST PO #: 31130

ITEM NO.	PART NO.	DESCRIPTION	QTY
1	509809	SEALANT; POLYURETHANE, GRAY	2
2	500507	SEALANT SWELL PASTE TYPEE 10OZ	1
3	512263	FP;BOT PLANK INSTALL INSTRUCT	1
4	512791	FP;PLANK LATCH LOCK	2
5	512895	FP;PLANK REMOVAL TOOL	1
6	BOT P-05340701	FP;BOTTOM PLANK	1
7	INT P-05340701	FP;INTER. PLANK	12
8	507391	FP;PLANK LATCH ANGLE ASSY	2
9	512235	ANCHOR;SCREW KH-EZ 3/8" X 4"	18
10	JMBASMLH-05340701	FP;LEFT SIDE JAMB ASSY	1
11	JMBASMRH-05340701	FP;RIGHT SIDE JAMB ASSY	1
12	SILL ASM-05340701	FP;EMBED SILL ASM	1

STV Incorporated

☐ No Exceptions Taken	Exp. Proj. Name: P.S. 43Q-Annex	Submittal No. 08112-001E
☒ Make Corrections Noted	Design/LLW No. D016605	Contract No. C000013782
☐ Rejected – Revise and Resubmit	Date Received 9/26/16	Date Returned 10/31/16
☐ Rejected – Not Acceptable for Review	Reviewed By R. Fouad	

Submittal reviewed as:
☒ Per Spec/ Basis of Design ☐ "Or Equal Substitution"/Non-basis of Design ☐ "Alternate Substitution"

CORRECTIONS OR COMMENTS MADE ON THE SHOP DRAWINGS DURING THIS REVIEW DO NOT RELIEVE CONTRACTOR FROM COMPLIANCE WITH REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS. SHOP DRAWING APPROVAL IS ONLY FOR GENERAL COMPLIANCE WITH THE INFORMATION GIVEN IN THE CONTRACT DOCUMENTS. THE CONTRACTOR IS RESPONSIBLE FOR CONFIRMING AND CORRELATING ALL QUANTITIES AND DIMENSIONS. SELECTING FABRICATION, PROCESSES AND TECHNIQUES OF CONSTRUCTION. COORDINATING THE WORK WITH THAT OF ALL OTHER TRADES AND PERFORMING THE WORK IN A SAFE AND SATISFACTORY MANNER.

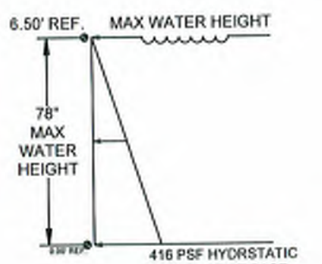
SUBMITTAL REVIEW
APPROVER IS REQUIRED TO ☒ ONE BOX ONLY AND SIGN
☐ APPROVED; PROCEED WITH FABRICATION
☐ APPROVED WITH CORRECTIONS; PROCEED WITH FABRICATION
☐ REVISE AS NOTED & RESUBMIT
☐ REJECTED
Signature Date
Printed Name

THIS SHOP DRAWING REVIEW IS FOR THE LIMITED PURPOSE OF DETERMINING GENERAL COMPLIANCE TO THE INFORMATION CONTAINED IN THE CONTRACT DRAWINGS AND SPECIFICATIONS. THIS REVIEW IS NOT CONDUCTED FOR QUANTITIES, DIMENSIONS, OR FABRICATION OR ERECTION PROCESSES. IT IS THE CONTRACTORS RESPONSIBILITY TO PERFORM COORDINATION OF THE SITE AND BETWEEN TRADES.

SP
SIGNED
03/24/2016
DATE

☑ APPROVED AS SUBMITTED
☐ APPROVED AS NOTED
☐ RESUBMIT WITH REVISIONS
☐ REJECTED
☐ NO ACTION TAKEN

SANDMAN CONSULTING PC



PRESSURE CHART - HYDROSTATIC LOADS ONLY
(WATER @ 64 PCF)

INDIVIDUAL PLANK WEIGHT: 26 LBS

SN: **05340701** SALES ORDER #:4053407 QTY: 1

DWG STATUS:
APPROVAL DRAWING SUBMITTAL 2

ESTIMATED PART/ASSY WEIGHT: 420.72 LBS.

DWG #: GEN-05340701

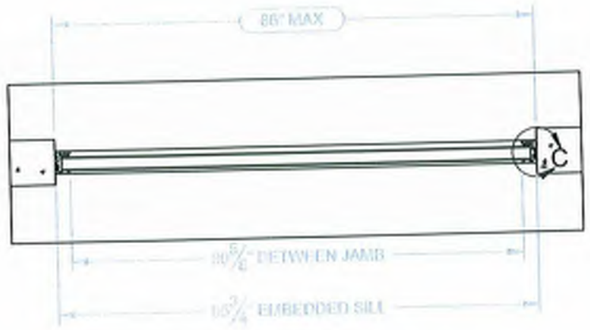
DATE: 3/9/2016
SCALE: NTS
DWG BY: rueland
CHECKED: /

PS DOORS
1150 48th St. S.
GRAND FORKS, ND 58201
PH. 701-746-4519
FAX 701-746-8340

SHEET #:1 OF 2 REV: E

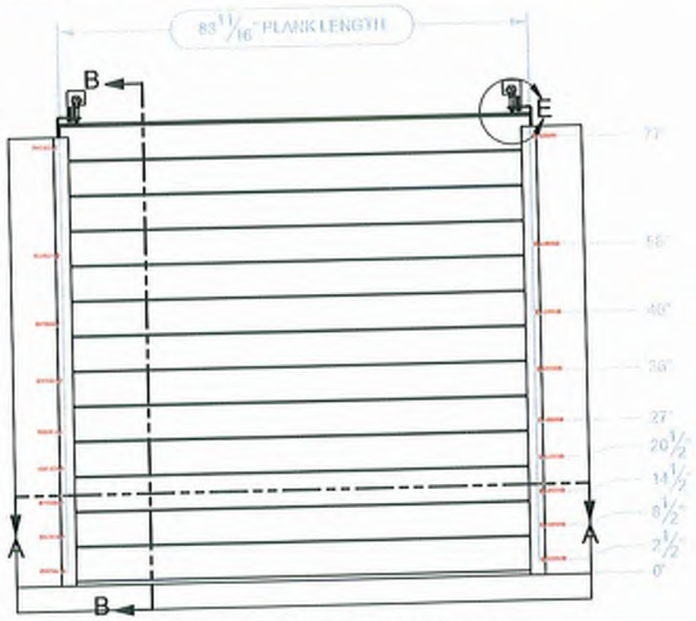
C:\PS DOORS\PROJECTS\BLUE PRODUCTS\PP-530\NOB FOLDER (6-+) (PP-530)\4053407_PS 34Q ANNEX_SAK ENTERPRISES\05340701_86X78_ +FACE MOUNT LEFT JAMB_BETWEEN MOUNTYGEN-05340701; 3/4/2016

Field verify all dimensions.

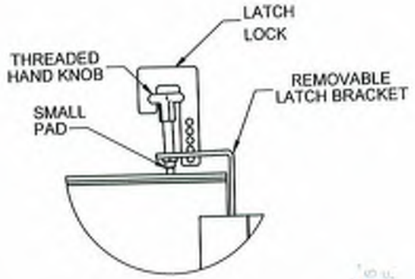


SECTION A-A

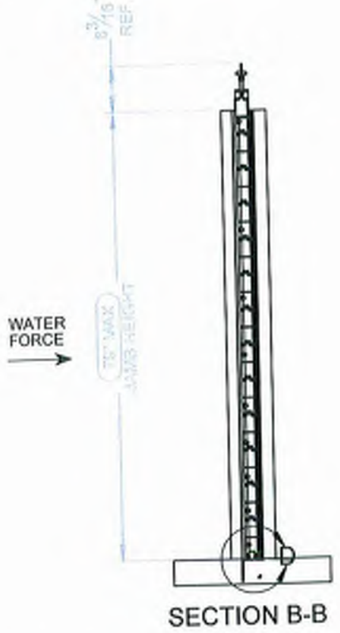
* DUE TO VARIABILITY IN EXISTING MOUNTING STRUCTURE, PS DOORS IS NOT RESPONSIBLE FOR STRUCTURAL FASTENER DESIGN INTO LESS THAN IDEAL FIELD CONDITIONS. PS DOORS' PRODUCT'S FASTENING SYSTEMS ARE **DESIGNED BASED ON CONCRETE (3000 PSI MIN) OR 8" GROUT-FILLED CMU MASONRY (ASTM C90)** MOUNTING STRUCTURE, UNLESS OTHERWISE DEPICTED ON DRAWINGS.
* IF FIELD CONDITIONS DIFFER PS DOORS REQUIRES THAT THE PROVIDED FASTENING SYSTEM IS REVIEWED BY A QUALIFIED LOCAL ENGINEER BASED ON ACTUAL FIELD CONDITIONS, PRIOR TO APPROVING DRAWINGS. REFER TO ANCHOR MANUFACTURER'S TECHNICAL DATA MANUAL FOR INSTALLATION LIMITATIONS AND REQUIREMENTS
* MODIFICATIONS OF MOUNTING STRUCTURE MAY BE REQUIRED (NOT BY PS DOORS) TO ACCOMODATE FASTENERS AND DESIGN LOADS



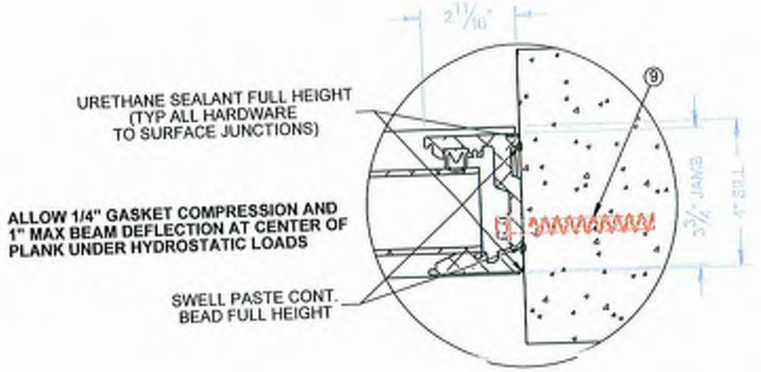
WET SIDE ELEVATION - PLANKS IN PLACE



DETAIL E

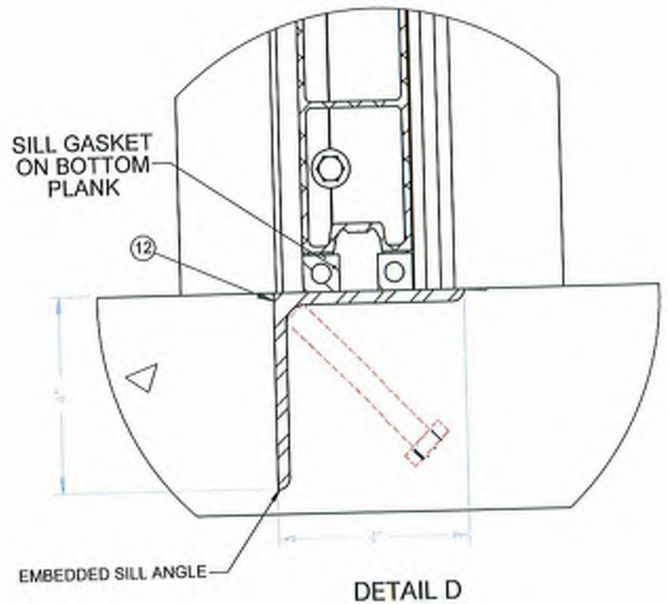


SECTION B-B



DETAIL C

BASE OF JAMB MUST BE SET IN A CONTINUOUS BED OF SEALANT TO CREATE A WATERTIGHT JOINT.



DETAIL D

REV.	REVISIONS	DATE	REVISED BY	FINISH:
1.1	CHANGED LEFT JAMB FROM FACE MOUNT TO JAMB MOUNT	3/4/16	NJU	

DOOR/OPENING NAME: **FB 1**

SHIP TO: SAK ENTERPRISES

SOLD TO: SAK ENTERPRISES

PROJECT NAME: PS 43Q ANNEX

CUST PO #: 31130

SN: **05340701** SALES ORDER #:4053407 QTY: 1

DWG STATUS:
APPROVAL DRAWING SUBMITTAL 2

ESTIMATED PART/ASSY WEIGHT: 420.72 LBS.

DWG #: GEN-05340701

DATE: 3/9/2016
SCALE: NTS
DWG BY: nueland
CHECKED: /

PS DOORS
1150 48th St. S
GRAND FORKS, ND 58201
PH. 701-746-4519
FAX 701-746-8340

SHEET #:2 OF 2 REV: E

C:\PS DOORS\PROJECTS\BLUE PRODUCTS\P-530\JOB FOLDER (E+) (FP-530/4053407_PS 34Q ANNEX_SAK ENTERPRISES\05340701_86X78_-FACE MOUNT LEFT JAMB_BETWEEN MOUNTINGEN-05340701; 3/9/2016

08112-002E

NOTES

STORAGE-HANDLING
DO NOT STORE FLOOD BARRIERS IN A MANNER THAT WILL COMPRESS GASKETS OR THAT WILL CAUSE DAMAGE TO GASKETS.

INSTALLATION
REFER TO ALL MANUFACTURERS' INSTALLATION NOTES AND DRAWINGS. INSTALL PLUMB, SQUARE, AND LEVEL INSURING CONTINUOUS AND EVEN GASKET CONTACT. DO NOT DRILL OR PENETRATE ANY SURFACES OF BARRIERS WITHOUT CONSULTING MANUFACTURER. USE ONLY FASTENERS PROVIDED BY THE MANUFACTURER (UNLESS OTHERWISE NOTED). FIELD GROUT AS INDICATED ON DRAWINGS (MATERIAL AND PLACEMENT NOT BY PS DOORS). GROUT TO BE NON-METALLIC, NON-SHRINK TYPE, CAPABLE OF DEVELOPING 3000 PSI COMPRESSIVE STRENGTH AS PLACED.

MAINTENANCE-INSPECTION
PERIODIC INSPECTION AND MAINTENANCE OF FLOOD BARRIER INSTALLATIONS INCLUDING SEALANTS, GASKETS, ANCHORS, AND OPERATING HARDWARE IS THE RESPONSIBILITY OF THE OWNER.

STRUCTURAL REVIEW
STRUCTURAL REVIEW OF ADJACENT STRUCTURE'S CAPACITY TO WITHSTAND ALL FLOOD BARRIER SERVICE LOADS TRANSFERRED TO STRUCTURE IS BY OTHERS (NOT PS DOORS). FIELD CONCRETE DESIGN AT ANY EMBEDDED CONNECTION TO WITHSTAND FLOOD BARRIER SERVICE LOADS IS BY OTHERS (NOT PS DOORS). REVIEW OF EXISTING STRUCTURE'S ABILITY TO WITHSTAND FLOOD BARRIER SERVICE LOADS TRANSFERRED BY ANCHORS IS BY OTHERS (NOT PS DOORS).

PERFORMANCE
FLOOD BARRIERS ARE DESIGNED TO CONTROL SHORT TERM HYDROSTATIC WATER LOADS (64 PCF) UP TO THE DESIGNED WATER HEIGHT NOTED ON THE DRAWINGS. NO ALLOWANCES HAVE BEEN INCLUDED TO CONTROL WAVE SURGE LOADS OR OTHER IMPACT LOADS UNLESS SPECIFICALLY DETAILED ON THE DRAWINGS. ALL LOADS ARE TRANSFERRED TO THE BUILDING STRUCTURE. ALWAYS ALLOW FOR CONTROL OF ANY LEAKAGE AND CONDENSATION THAT WILL OCCUR DURING HIGH WATER SITUATIONS. IN APPLICATIONS WHERE THE FLOOD BARRIER GASKETS CONTACT THE EXISTING BUILDING STRUCTURE, FLOORS, ETC. ALL SURFACES MUST BE SOUND, FLAT/LEVEL, AND WITHOUT BLEMISH FOR BEST PERFORMANCE.

FIELD VERIFICATION IS REQUIRED BY OTHERS (NOT PS DOORS)
1 ALL DIMENSIONS AND INTERFERENCES.
2 JAMB CONDITIONS AND STRUCTURAL CAPACITY OF STRUCTURE.
3 ANCHOR LOCATIONS AND MINIMUM REQUIRED EDGE/END DISTANCES, SPACING, EMBEDMENT DEPTHS, AND INSTALLATION PROCEDURE SPECIFIED IN THE ANCHOR MANUFACTURER'S TECHNICAL INFORMATION MANUAL.

FLOOD BARRIER WAS DESIGNED USING 2:1 FACTOR OF SAFETY BASED ON MATERIAL YIELD STRENGTH AS QUOTED

DESIGN CRITERIA

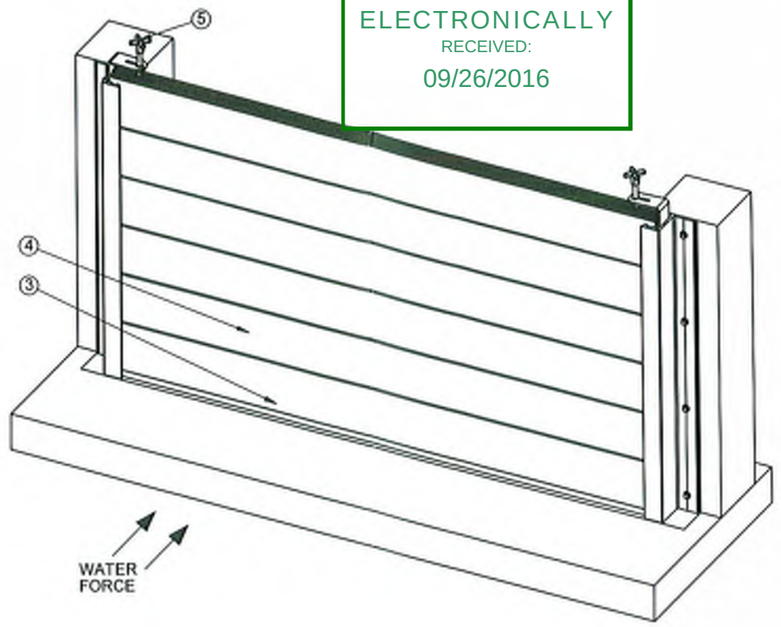
DESIGN LOADS
(ALL LOADS TRANSFERRED TO STRUCTURE)
HYDROSTATIC LOADS TO ELEVATION AS INDICATED ON DRAWINGS BASED ON HYDROSTATIC WATER LOAD (64 PCF). ALL ANCHOR DESIGNS ARE BASED ON ATTACHING TO MINIMUM 3000 PSI COMPRESSIVE STRENGTH CIP CONCRETE (UNLESS OTHERWISE NOTED).

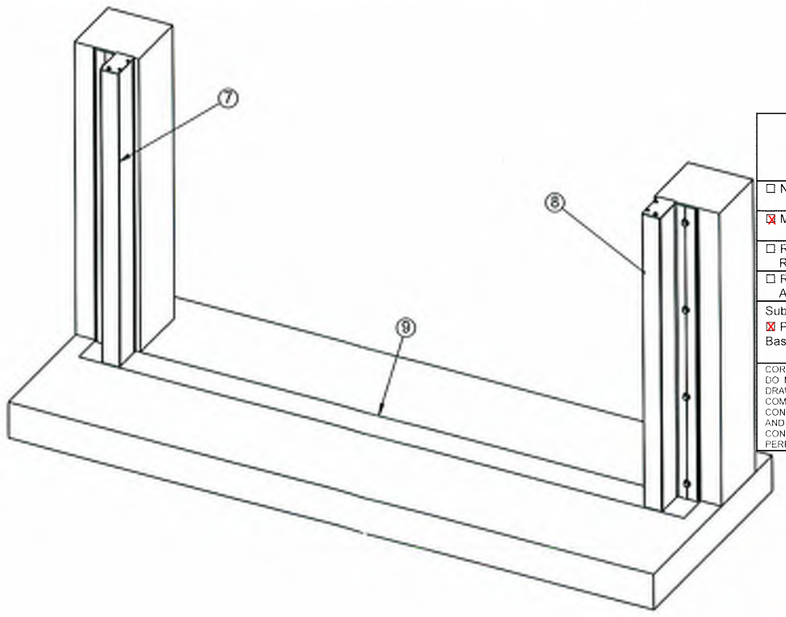
MATERIALS
ALUMINUM: 5052-H32, 6005A-T5, 6061-T6, 6063-T6
MILD STEEL: ASTM A-36, ASTM A-569, ASTM A-527, ASTM A-500, ASTM A-513, ASTM A-1011 CS TYPE B
STAINLESS STEEL: SS304 (UNLESS OTHERWISE NOTED)
FASTENERS: ZINC PLATED (UNLESS OTHERWISE NOTED)
GASKETS: EPDM, NEOPRENE, SILICONE, OR NATURAL RUBBER

FINISHES
FABRICATED STEEL: CHEMICAL CLEAN & RINSE;
PRIMER AND INDUSTRIAL ENAMEL:
PRIME COAT - (1) COAT OF SHERWIN WILLIAMS KEM FLASH PRIMER
TOP COAT - (2) COATS OF SHERWIN WILLIAMS INDUSTRIAL ENAMEL
POWDERCOAT (STEEL ONLY): POWDURA TGIC
ALUMINUM: RAW, MILL FINISH
STAINLESS STEEL: RAW, MILL FINISH

WELDS
EXPOSED, INTERFERING WELDS ARE GROUND, NOT FILLED OR POLISHED

FACTORY WELDS:
ALUMINUM: ELECTRODE ER4043
MILD STEEL: ELECTRODE ER70S-6
STAINLESS STEEL: ER308LSi, ER316LSi, ER317L
FIELD WELDS: ELECTRODE E70-SERIES (FOR MILD STEEL). ALL WELDING SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THE APPLICABLE AWS OR ASME STANDARDS.





ITEM NO.	PART NO.	DESCRIPTION	QTY
1	509809	SEALANT; POLYURETHANE, GRAY	2
2	500507	SEALANT SWELL PASTE TYPEE 10OZ	1
3	BOT P-05340702	FP;BOTTOM PLANK	1
4	INT P-05340702	FP;INTER. PLANK	5
5	507391	FP;PLANK LATCH ANGLE ASSY	2
6	512235	ANCHOR;SCREW KH-EZ 3/8" X 4"	8
7	JMBASMLH-05340702	FP;LEFT SIDE JAMB ASSY	1
8	JMBASMRH-05340702	FP;RIGHT SIDE JAMB ASSY	1
9	SILL ASM-05340702	FP;EMBED SILL ASM	1

SUBMITTAL REVIEW
APPROVER IS REQUIRED TO ☒ ONE BOX ONLY AND SIGN
☐ APPROVED; PROCEED WITH FABRICATION
☐ APPROVED WITH CORRECTIONS; PROCEED WITH FABRICATION
☐ REVISE AS NOTED & RESUBMIT
☐ REJECTED

Signature _____ Date _____

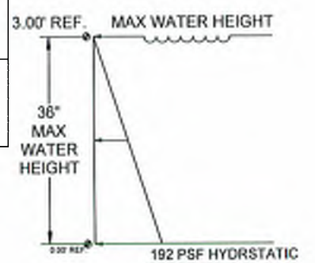
Printed Name _____

STV Incorporated

☐ No Exceptions Taken	Exp. Proj. Name: P.S. 43Q-Annex	Submittal No. 08112-002E
☒ Make Corrections Noted	Design/LLW No. D016605	Contract No. C000013782
☐ Rejected – Revise and Resubmit	Date Received 9/26/16	Date Returned 10/31/16
☐ Rejected – Not Acceptable for Review	Reviewed By R. Fouad	

Submittal reviewed as:
☒ Per Spec/ Basis of Design ☐ "Or Equal Substitution"/Non-basis of Design ☐ "Alternate Substitution

CORRECTIONS OR COMMENTS MADE ON THE SHOP DRAWINGS DURING THIS REVIEW DO NOT RELIEVE CONTRACTOR FROM COMPLIANCE WITH REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS. SHOP DRAWING APPROVAL IS ONLY FOR GENERAL COMPLIANCE WITH THE INFORMATION GIVEN IN THE CONTRACT DOCUMENTS. THE CONTRACTOR IS RESPONSIBLE FOR CONFIRMING AND CORRELATING ALL QUANTITIES AND DIMENSIONS, SELECTING FABRICATION, PROCESSES AND TECHNIQUES OF CONSTRUCTION, COORDINATING THE WORK WITH THAT OF ALL OTHER TRADES AND PERFORMING THE WORK IN A SAFE AND SATISFACTORY MANNER.



PRESSURE CHART - HYDROSTATIC LOADS ONLY
(WATER @ 64 PCF)

INDIVIDUAL PLANK WEIGHT: 21 LBS

REV.	REVISIONS	DATE	REVISED BY

DOOR/OPENING NAME: **FB 2**
PRODUCT: FP-530A; FLOOD PLANK, ALM.
CUSTOMER: SAK ENTERPRISES
CUST PO #: 31150
SALES ORDER NAME: PS 43Q ANNEX

SN: **05340702** SALES ORDER #: 4053407 QTY: 2
DWG STATUS: **APPROVAL DRAWING SUBMITTAL 2** DATE: 3/9/2016
SCALE: NTS
DWG #: GEN-05340702
DWG BY: nueland CHECKED: /

PS DOORS MANUFACTURING DIVISION
1150 48th St. S
GRAND FORKS, ND 58201
PH. 701-746-4519
FAX 701-746-8340

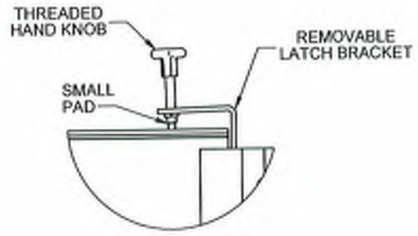
SHEET #:1 OF 2 REV: E

C:\PS DOORS\PROJECTS\BLUE PRODUCTS\FP-530\JOB FOLDER (E+) (FP-530)\4053407_PS 34Q ANNEX_SAK ENTERPRISES\05340702_64X36_ +FACE_HDG EMBEDDED SILL_PS 34Q ANNEX-GEN-05340702 3/9/2016

Field verify all dimensions.

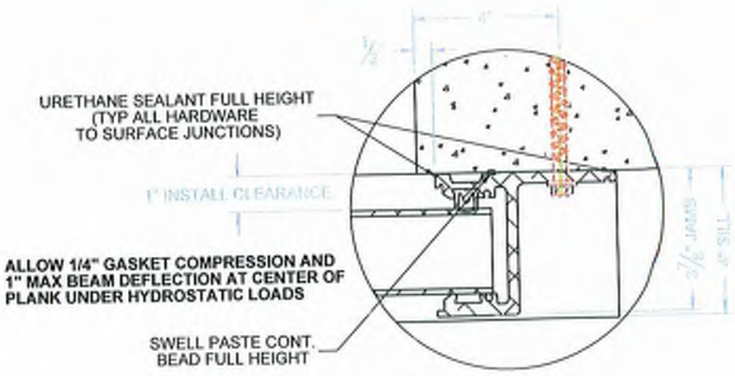
SECTION A-A

* DUE TO VARIABILITY IN EXISTING MOUNTING STRUCTURE, PS DOORS IS NOT RESPONSIBLE FOR STRUCTURAL FASTENER DESIGN INTO LESS THAN IDEAL FIELD CONDITIONS. PS DOORS' PRODUCT'S FASTENING SYSTEMS ARE **DESIGNED BASED ON CONCRETE (3000 PSI MIN.) OR 8" GROUT-FILLED CMU MASONRY (ASTM C90)** MOUNTING STRUCTURE, OR AS DEPICTED ON DRAWINGS.
* IF FIELD CONDITIONS DIFFER PS DOORS REQUIRES THAT THE PROVIDED FASTENING SYSTEM IS REVIEWED BY A QUALIFIED LOCAL ENGINEER BASED ON ACTUAL FIELD CONDITIONS, PRIOR TO APPROVING DRAWINGS. REFER TO ANCHOR MANUFACTURER'S TECHNICAL DATA MANUAL FOR INSTALLATION LIMITATIONS AND REQUIREMENTS.
* MODIFICATIONS OF MOUNTING STRUCTURE MAY BE REQUIRED (NOT BY PS DOORS) TO ACCOMODATE FASTENERS AND DESIGN LOADS.

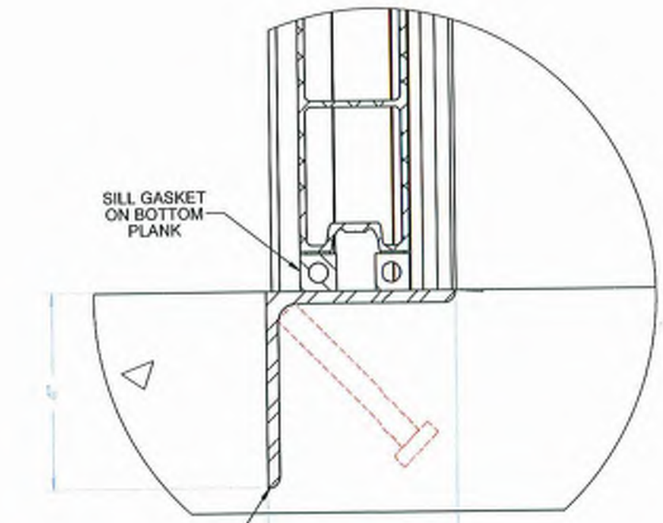


DETAIL E

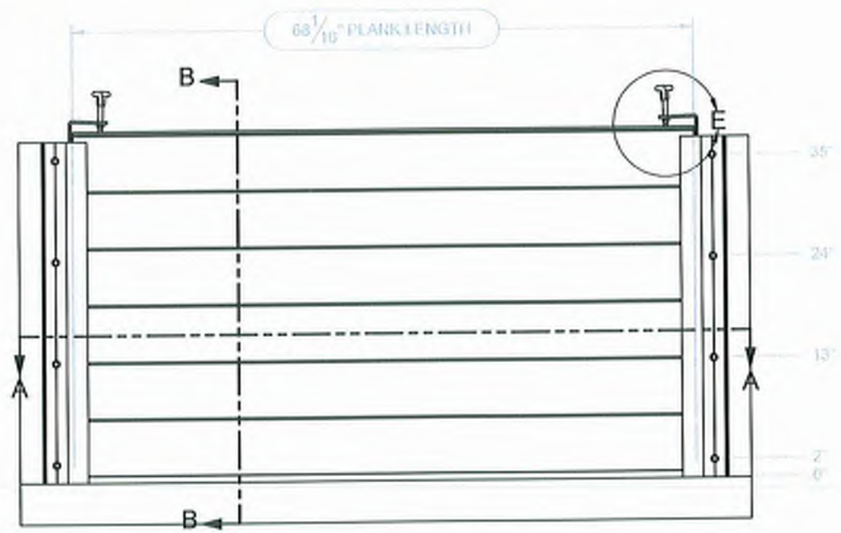
BASE OF JAMB MUST BE SET IN A CONTINUOUS BED OF SEALANT TO CREATE A WATERTIGHT JOINT



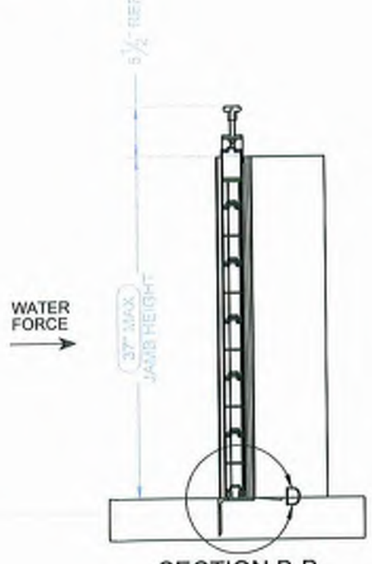
DETAIL C



DETAIL D



WET SIDE ELEVATION - PLANKS IN PLACE



SECTION B-B

REV.	REVISIONS	DATE	REVISED BY

DOOR/OPENING NAME: **FB 2**
PRODUCT: FP-530A; FLOOD PLANK, ALM.
CUSTOMER: SAK ENTERPRISES
CUST PO #: 31130
SALES ORDER NAME: PS 43Q ANNEX

SN: **05340702** SALES ORDER #: 4053407 QTY: 2
DWG STATUS: **APPROVAL DRAWING SUBMITTAL 2** DATE: 3/9/2016
SCALE: NTS
DWG #: GEN-05340702
DWG BY: nueland CHECKED: /

PS DOORS
MANUFACTURING DIVISION
1150 48th St. S
GRAND FORKS, ND 58201
PH. 701-746-4519
FAX 701-746-8340

SHEET #:2 OF 2 REV: E

08113-001C

NOTES

STORAGE-HANDLING
DO NOT STORE FLOOD BARRIERS IN A MANNER THAT WILL COMPRESS GASKETS OR THAT WILL CAUSE DAMAGE TO GASKETS.

INSTALLATION
REFER TO ALL MANUFACTURERS' INSTALLATION NOTES AND DRAWINGS. INSTALL PLUMB, SQUARE, AND LEVEL INSURING CONTINUOUS AND EVEN GASKET CONTACT. DO NOT DRILL OR PENETRATE ANY SURFACES OF BARRIERS WITHOUT CONSULTING MANUFACTURER. USE ONLY FASTENERS PROVIDED BY THE MANUFACTURER (UNLESS OTHERWISE NOTED). FIELD GROUT AS INDICATED ON DRAWINGS (MATERIAL AND PLACEMENT NOT BY PS DOORS). GROUT TO BE NON-METALLIC, NON-SHRINK TYPE CAPABLE OF DEVELOPING 3000 PSI COMPRESSIVE STRENGTH AS PLACED.

MAINTENANCE-INSPECTION
PERIODIC INSPECTION AND MAINTENANCE OF FLOOD BARRIER INSTALLATIONS INCLUDING SEALANTS, GASKETS, ANCHORS, AND OPERATING HARDWARE IS THE RESPONSIBILITY OF THE OWNER.

STRUCTURAL REVIEW
STRUCTURAL REVIEW OF ADJACENT STRUCTURE'S CAPACITY TO WITHSTAND ALL FLOOD BARRIER SERVICE LOADS TRANSFERRED TO STRUCTURE IS BY OTHERS (NOT PS DOORS). FIELD CONCRETE DESIGN AT ANY EMBEDDED CONNECTION TO WITHSTAND FLOOD BARRIER SERVICE LOADS IS BY OTHERS (NOT PS DOORS). REVIEW OF EXISTING STRUCTURE'S ABILITY TO WITHSTAND FLOOD BARRIER SERVICE LOADS TRANSFERRED BY ANCHORS IS BY OTHERS (NOT PS DOORS).

PERFORMANCE
FLOOD BARRIERS ARE DESIGNED TO CONTROL SHORT TERM HYDROSTATIC WATER LOADS (64 PCF) UP TO THE DESIGNED WATER HEIGHT NOTED ON THE DRAWINGS. NO ALLOWANCES HAVE BEEN INCLUDED TO CONTROL WAVE SURGE LOADS OR OTHER IMPACT LOADS UNLESS SPECIFICALLY DETAILED ON THE DRAWINGS. ALL LOADS ARE TRANSFERRED TO THE BUILDING STRUCTURE. ALWAYS ALLOW FOR CONTROL OF ANY LEAKAGE AND CONDENSATION THAT WILL OCCUR DURING HIGH WATER SITUATIONS. IN APPLICATIONS WHERE THE FLOOD BARRIER GASKETS CONTACT THE EXISTING BUILDING STRUCTURE, FLOORS, ETC. ALL SURFACES MUST BE SOUND, FLAT/LEVEL, AND WITHOUT BLEMISH FOR BEST PERFORMANCE.

FIELD VERIFICATION IS REQUIRED BY OTHERS (NOT PS DOORS)
1 ALL DIMENSIONS AND INTERFERENCES.
2 JAMB CONDITIONS AND STRUCTURAL CAPACITY OF STRUCTURE.
3 ANCHOR LOCATIONS AND MINIMUM REQUIRED EDGE/END DISTANCES, SPACING, EMBEDMENT DEPTHS, AND INSTALLATION PROCEDURE SPECIFIED IN THE ANCHOR MANUFACTURER'S TECHNICAL INFORMATION MANUAL.

FLOOD BARRIER WAS DESIGNED USING 2:1 FACTOR OF SAFETY BASED ON MATERIAL YIELD STRENGTH AS QUOTED

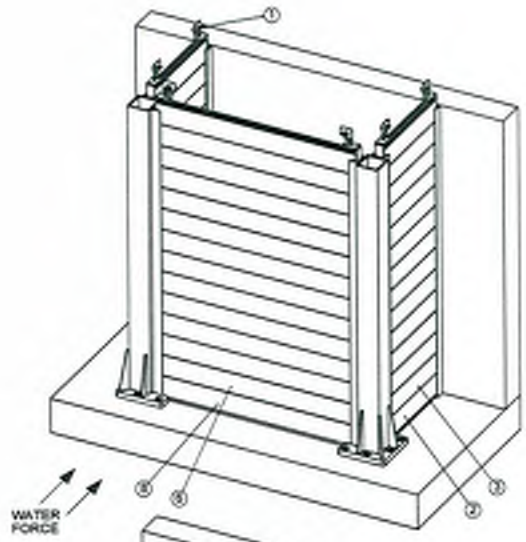
DESIGN CRITERIA

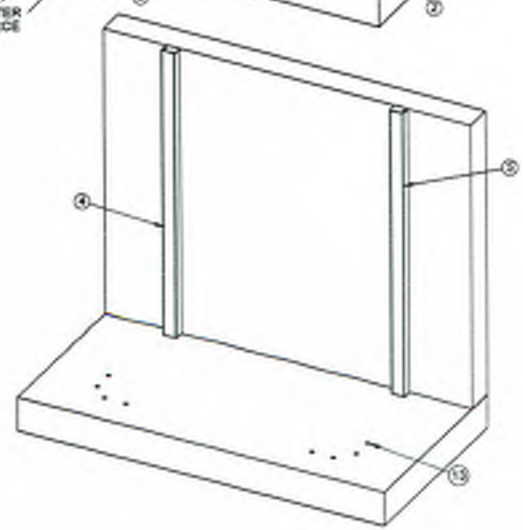
DESIGN LOADS
(ALL LOADS TRANSFERRED TO STRUCTURE)
HYDROSTATIC LOADS TO ELEVATION AS INDICATED ON DRAWINGS BASED ON HYDROSTATIC WATER LOAD (64 PCF). ALL ANCHOR DESIGNS ARE BASED ON ATTACHING TO MINIMUM 3000 PSI COMPRESSIVE STRENGTH CIP CONCRETE (UNLESS OTHERWISE NOTED).

MATERIALS
ALUMINUM: 5052-H32, 6005A-T5, 6061-T6, 6063-T6
MILD STEEL: ASTM A-36, ASTM A-569, ASTM A-527, ASTM A-500, ASTM A-513, ASTM A-1011 CS TYPE B
STAINLESS STEEL: SS304 (UNLESS OTHERWISE NOTED)
FASTENERS: ZINC PLATED (UNLESS OTHERWISE NOTED)
GASKETS: EPDM, NEOPRENE, SILICONE, OR NATURAL RUBBER

FINISHES
FABRICATED STEEL: CHEMICAL CLEAN & RINSE;
PRIMER AND INDUSTRIAL ENAMEL:
PRIME COAT - (1) COAT OF SHERWIN WILLIAMS KEM FLASH PRIMER
TOP COAT - (2) COATS OF SHERWIN WILLIAMS INDUSTRIAL ENAMEL
POWDERCOAT (STEEL ONLY): POWDURA TGIC
ALUMINUM: RAW, MILL FINISH
STAINLESS STEEL: RAW, MILL FINISH

WELDS
EXPOSED, INTERFERING WELDS ARE GROUND, NOT FILLED OR POLISHED
FACTORY WELDS:
ALUMINUM: ELECTRODE ER4043
MILD STEEL: ELECTRODE ER70S-6
STAINLESS STEEL: ER308LSi, ER316LSi, ER317L
FIELD WELDS: ELECTRODE E70-SERIES (FOR MILD STEEL). ALL WELDING SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THE APPLICABLE AWS OR ASME STANDARDS.





ITEM NO.	PART NO.	DESCRIPTION	QTY
1	507391	FP;PLANK LATCH ANGLE ASSY	6
2	BOT P-05340703	FP;BOTTOM PLANK	2
3	INT P-05340703	FP;INTER. PLANK	26
4	JMBASMLH-05340703	FP;LEFT SIDE JAMB ASSY	1
5	JMBASMRH-05340703	FP;RIGHT SIDE JAMB ASSY	1
6	INT P2-05340703	FP;BOTTOM PLANK	13
7	510690-05340703	FP;CORNER MULLION ASSY	2
8	BOT P2-05340703	FP;BOTTOM PLANK	1
9	511844	ANCHOR;HILTI HIS-RN 3/8X4-1/4	16
10	512427	SCREW;SET 3/8"-16 X 3/4" NYLON	16
11	501947	WASHER;FLAT 3/8"ZN	16
12	500400	BOLT;HEX3/8"16X1GR5ZN	16
13	511818	ANCHOR;HILTI HIS-RN 3/4"-8 1/4	8
14	512415	SCREW;SET 3/4"-10 X 1" NYLON	8
15	501942	WASHER;FLAT 3/4"ZN USS	8
16	511444	BOLT;HEX3/4"10X3 1/2,GR5ZN	8
17	512791	FP;PLANK LATCH LOCK	6
18	512348	EPOXY;HYBRID HY 200-R 16.9 OZ.	1
19	512654	SEALANT;REMOVABLE WS	2

SUBMITTAL REVIEW
APPROVER IS REQUIRED TO X ONE BOX ONLY AND SIGN
☐ APPROVED: PROCEED WITH FABRICATION
☐ APPROVED WITH CORRECTIONS: PROCEED WITH FABRICATION
☐ REVISE AS NOTED & RESUBMIT
☐ REJECTED
Signature ______ Date ______
Printed Name ______

PRESSURE CHART - HYDROSTATIC LOADS ONLY
(WATER @ 64 PCF)

INDIVIDUAL PLANK WEIGHT: 18 LBS

REV.	REVISIONS	DATE	REVISED BY
2.1	REMOVED SILLS AND REPLACED MULLION EMBEDS WITH HIS-RN	4/27/16	NJU
2.2	CHANGED ANCHORS FROM KH-EZ TO HIS-RN FOR REMOVABLE JAMBS	4/27/16	NJU

FINISH: MILL FINISH

DOOR/OPENING NAME: **NEW GAS METER**
SHIP TO: SAK ENTERPRISES
SOLD TO: SAK ENTERPRISES
PROJECT NAME: PS 43Q ANNEX
CUST PO #: 31130

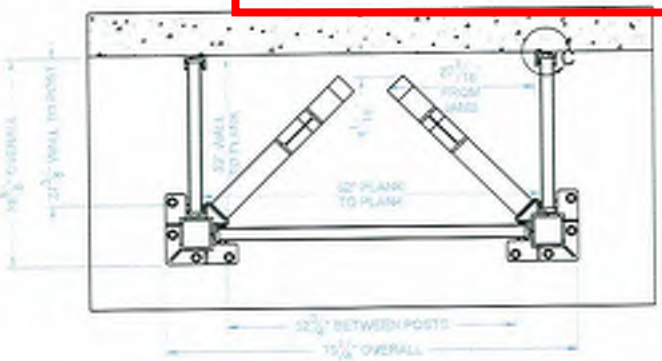
S/N **05340703** SALES ORDER # 4033407
DWG STATUS:
APPROVAL DRAWING SUBMITTAL 3
ESTIMATED PART/ASSY WEIGHT: 942.55 LBS.
DWG #: GEN-05340703

QTY: 1
DATE: 5/11/2016
SCALE: NTS
DWG BY: [illegible]
CHECKED: /

PS DOORS
1150 48th St. S
GRAND FORKS, ND 58201
PH. 701-746-4519
FAX 701-746-8340

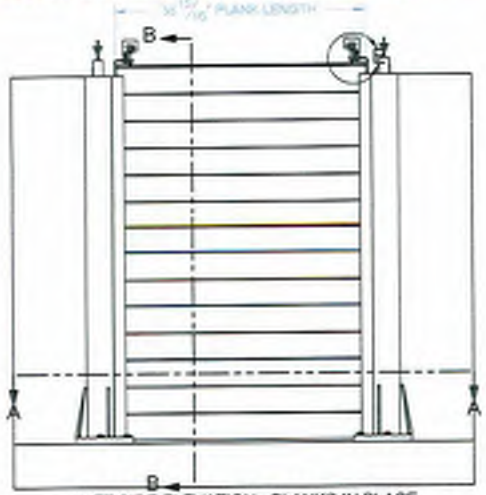
SHEET # 1 OF 3 E

Field verify all dimensions.
Coordinate diagonal bracing with Gas Meter Rig Installation.



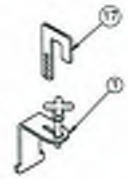
SECTION A-A

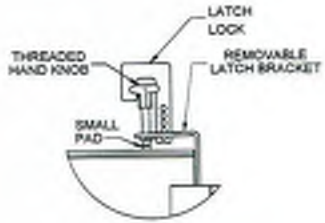
* DUE TO VARIABILITY IN EXISTING MOUNTING STRUCTURE, PS DOORS IS NOT RESPONSIBLE FOR STRUCTURAL FASTENER DESIGN INTO LESS THAN IDEAL FIELD CONDITIONS. PS DOORS' PRODUCT'S FASTENING SYSTEMS ARE DESIGNED BASED ON CONCRETE (3000 PSI MIN.) OR 8" GROUT-FILLED CMU MASONRY (ASTM C90) MOUNTING STRUCTURE, OR AS DEPICTED ON DRAWINGS.
* IF FIELD CONDITIONS DIFFER PS DOORS REQUIRES THAT THE PROVIDED FASTENING SYSTEM IS REVIEWED BY A QUALIFIED LOCAL ENGINEER, BASED ON ACTUAL FIELD CONDITIONS, PRIOR TO APPROVING DRAWINGS. REFER TO ANCHOR MANUFACTURER'S TECHNICAL DATA MANUAL FOR INSTALLATION LIMITATIONS AND REQUIREMENTS.
* MODIFICATIONS OF MOUNTING STRUCTURE MAY BE REQUIRED (NOT BY PS DOORS) TO ACCOMMODATE FASTENERS AND DESIGN LOADS.



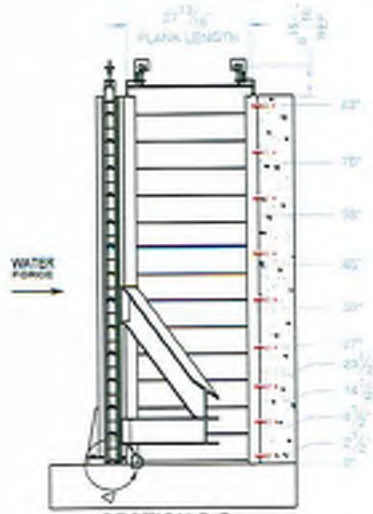
WET SIDE ELEVATION - PLANKS IN PLACE

REV.	REVISIONS	DATE	REVISED BY	FINISH
2.1	REMOVED SILLS AND REPLACED MULLION EMBEDS WITH HIS-RN	4/27/16	NJU	MILL FINISH
2.2	CHANGED ANCHORS FROM KH-EZ TO HIS-RN FOR REMOVABLE JAMBS	4/27/16	NJU	





DETAIL E



SECTION B-B

DOOROPENING NAME: **NEW GAS METER**

SHIP TO: SAK ENTERPRISES

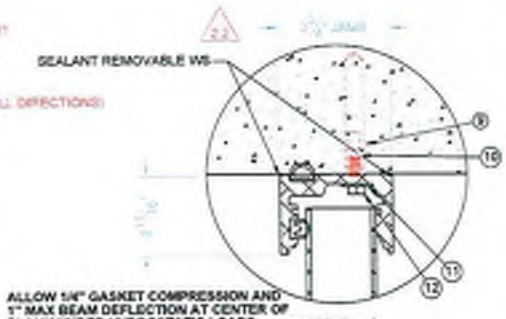
SOLD TO: SAK ENTERPRISES

PROJECT NAME: PS 400 ANNEX

CUST PO #: 31130

BASE OF JAMB MUST BE SET IN A CONTINUOUS BED OF SEALANT TO CREATE A WATERTIGHT JOINT.

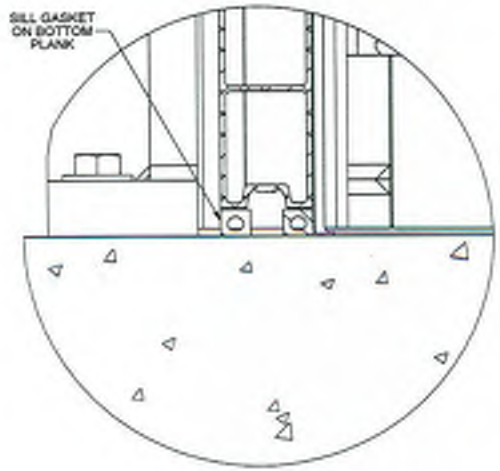
HILTI HIT-HY 200 EPOXY
HILTI HIS-RN 68 3/8" INSERT
MIN 3000 PSI CONCRETE
MIN 6" SLAB THICKNESS
MIN 4.375" EMBED DEPTH
MIN 4" EDGE DISTANCE (ALL DIRECTIONS)



ALLOW 1/4" GASKET COMPRESSION AND 1" MAX BEAM DEFLECTION AT CENTER OF PLANK UNDER HYDROSTATIC LOADS

DETAIL C

NO SILL GASKET PERFORMANCE DEPENDENT ON CONDITION OF FLOOR CONTACT AREA. FLOOR CONTACT AREA SHOULD BE SOUND, FLAT/LEVEL, AND WITHOUT BLEMISH FOR BEST GASKET PERFORMANCE.



DETAIL D

SAK 05340703 SALES ORDER # 4053407 QTY: 1

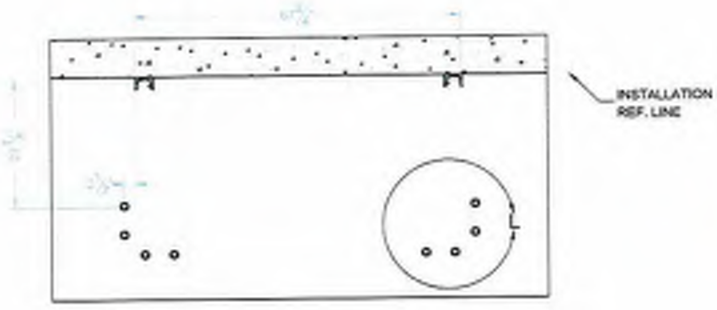
DWG STATUS: **APPROVAL DRAWING SUBMITTAL 3**

ESTIMATED PARTIASSY WEIGHT: 942.55 LBS.

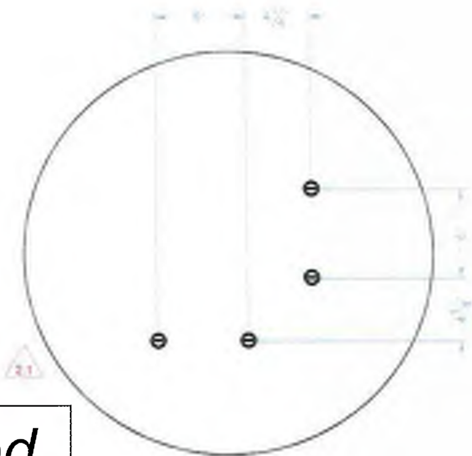
DWG #: GEN-0534070S

DATE: 3/11/2014
SCALE: NTS
DWG BY: nuelland
CHECKED: /
SHEET # 2 OF 3

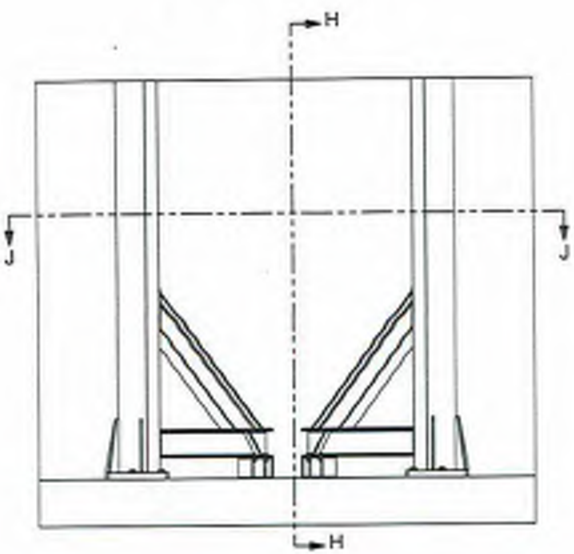
PS DOORS
1130 48th St. S
GRAND FORKS, ND 58201
Ph: 701.746.8819
FAX 701.746.8340



SECTION J-J



DETAIL L



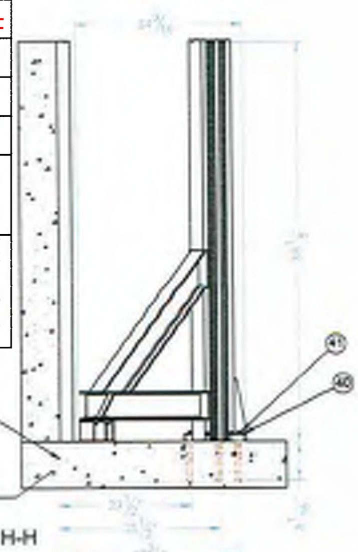
STV Incorporated

☐ No Exceptions Taken	Exp. Proj. Name: P.S. 43Q-Annex	Submittal No. 08113-001F
☒ Make Corrections Noted	Design/LLW No. D016605	Contract No. C000013782
☐ Rejected – Revise and Resubmit	Date Received 9/26/16	Date Returned 10/31/16
☐ Rejected – Not Acceptable for Review	Reviewed By R. Fouad	

Submittal reviewed as:

☒ Per Spec/ Basis of Design ☐ "Or Equal Substitution"/Non-basis of Design ☐ "Alternate Substitution

CORRECTIONS OR COMMENTS MADE ON THE SHOP DRAWINGS DURING THIS REVIEW DO NOT RELIEVE CONTRACTOR FROM COMPLIANCE WITH REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS. SHOP DRAWING APPROVAL IS ONLY FOR GENERAL COMPLIANCE WITH THE INFORMATION GIVEN IN THE CONTRACT DOCUMENTS. THE CONTRACTOR IS RESPONSIBLE FOR CONFIRMING AND CORRELATING ALL QUANTITIES AND DIMENSIONS, SELECTING FABRICATION, PROCESSES AND TECHNIQUES OF CONSTRUCTION, COORDINATING THE WORK WITH THAT OF ALL OTHER TRADES AND PERFORMING THE WORK IN A SAFE AND SATISFACTORY MANNER.



SECTION H-H

REV	REVISIONS	DATE	REVISED BY
2.1	REMOVED SILLS AND REPLACED MULLION EMBEDS WITH HIS-RN	4/27/16	NJU
2.2	CHANGED ANCHORS FROM KH-EZ TO HIS-RN FOR REMOVABLE JAMBS	4/27/16	NJU

FINISH: MILL FINISH

DOOR/OPENING NAME: **NEW GAS METER**

SHIP TO: SAK ENTERPRISES
SOLD TO: SAK ENTERPRISES
PROJECT NAME: PS 43Q ANNEX
CUST PO #: 31130

DWG STATUS:
APPROVAL DRAWING SUBMITTAL 3

ESTIMATED PART/ASSY WEIGHT: 942.50 LBS.
DWG #: GEN-05340703

SN: **05340703** SALES ORDER #: 400340T

QTY: 1
DATE: 5/11/2016
SCALE: NTS
DWG BY: nuelland
CHECKED: /

PS DOORS

1130 48th St. S
GRAND FORKS, ND 58201
PH. 701-746-4519
FAX 701-746-8340

SHEET # 3 OF 3 E

03113-002C

NOTES

STORAGE-HANDLING
DO NOT STORE FLOOD BARRIERS IN A MANNER THAT WILL COMPRESS GASKETS OR THAT WILL CAUSE DAMAGE TO GASKETS.

INSTALLATION
REFER TO ALL MANUFACTURERS' INSTALLATION NOTES AND DRAWINGS. INSTALL PLUMB, SQUARE, AND LEVEL INSURING CONTINUOUS AND EVEN GASKET CONTACT. DO NOT DRILL OR PENETRATE ANY SURFACES OF BARRIERS WITHOUT CONSULTING MANUFACTURER. USE ONLY FASTENERS PROVIDED BY THE MANUFACTURER (UNLESS OTHERWISE NOTED). FIELD GROUT AS INDICATED ON DRAWINGS (MATERIAL AND PLACEMENT NOT BY PS DOORS). GROUT TO BE NON-METALLIC, NON-SHRINK TYPE, CAPABLE OF DEVELOPING 3000 PSI COMPRESSIVE STRENGTH AS PLACED.

MAINTENANCE-INSPECTION
PERIODIC INSPECTION AND MAINTENANCE OF FLOOD BARRIER INSTALLATIONS INCLUDING SEALANTS, GASKETS, ANCHORS, AND OPERATING HARDWARE IS THE RESPONSIBILITY OF THE OWNER.

STRUCTURAL REVIEW
STRUCTURAL REVIEW OF ADJACENT STRUCTURE'S CAPACITY TO WITHSTAND ALL FLOOD BARRIER SERVICE LOADS TRANSFERRED TO STRUCTURE IS BY OTHERS (NOT PS DOORS). FIELD CONCRETE DESIGN AT ANY EMBEDDED CONNECTION TO WITHSTAND FLOOD BARRIER SERVICE LOADS IS BY OTHERS (NOT PS DOORS). REVIEW OF EXISTING STRUCTURE'S ABILITY TO WITHSTAND FLOOD BARRIER SERVICE LOADS TRANSFERRED BY ANCHORS IS BY OTHERS (NOT PS DOORS).

PERFORMANCE
FLOOD BARRIERS ARE DESIGNED TO CONTROL SHORT TERM HYDROSTATIC WATER LOADS (64 PCF) UP TO THE DESIGNED WATER HEIGHT NOTED ON THE DRAWINGS. NO ALLOWANCES HAVE BEEN INCLUDED TO CONTROL WAVE SURGE LOADS OR OTHER IMPACT LOADS UNLESS SPECIFICALLY DETAILED ON THE DRAWINGS. ALL LOADS ARE TRANSFERRED TO THE BUILDING STRUCTURE. ALWAYS ALLOW FOR CONTROL OF ANY LEAKAGE AND CONDENSATION THAT WILL OCCUR DURING HIGH WATER SITUATIONS. IN APPLICATIONS WHERE THE FLOOD BARRIER GASKETS CONTACT THE EXISTING BUILDING STRUCTURE, FLOORS, ETC. ALL SURFACES MUST BE SOUND, FLAT/LEVEL, AND WITHOUT BLEMISH FOR BEST PERFORMANCE.

FIELD VERIFICATION IS REQUIRED BY OTHERS (NOT PS DOORS)
1 ALL DIMENSIONS AND INTERFERENCES.
2 JAMB CONDITIONS AND STRUCTURAL CAPACITY OF STRUCTURE.
3 ANCHOR LOCATIONS AND MINIMUM REQUIRED EDGE/END DISTANCES, SPACING, EMBEDMENT DEPTHS, AND INSTALLATION PROCEDURE SPECIFIED IN THE ANCHOR MANUFACTURER'S TECHNICAL INFORMATION MANUAL.

FLOOD BARRIER WAS DESIGNED USING 2:1 FACTOR OF SAFETY BASED ON MATERIAL YIELD STRENGTH AS QUOTED

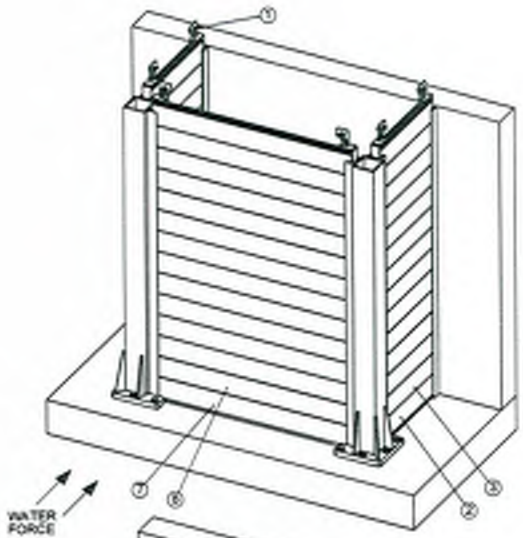
DESIGN CRITERIA

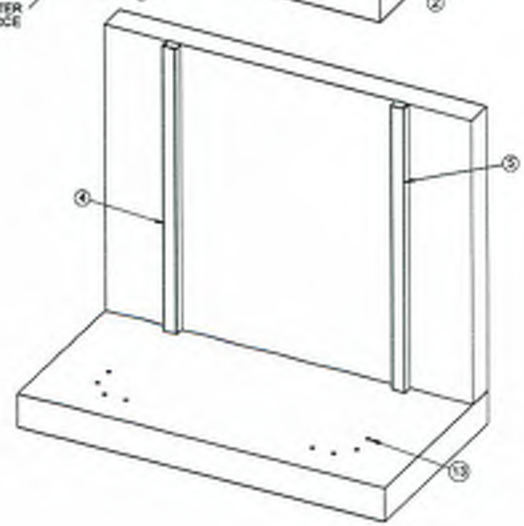
DESIGN LOADS
(ALL LOADS TRANSFERRED TO STRUCTURE)
HYDROSTATIC LOADS TO ELEVATION AS INDICATED ON DRAWINGS BASED ON HYDROSTATIC WATER LOAD (64 PCF). ALL ANCHOR DESIGNS ARE BASED ON ATTACHING TO MINIMUM 3000 PSI COMPRESSIVE STRENGTH CIP CONCRETE (UNLESS OTHERWISE NOTED).

MATERIALS
ALUMINUM: 5052-H32, 6005A-T5, 6061-T6, 6063-T6
MILD STEEL: ASTM A-36, ASTM A-569, ASTM A-527, ASTM A-500, ASTM A-513, ASTM A-1011 CS TYPE B
STAINLESS STEEL: SS304 (UNLESS OTHERWISE NOTED)
FASTENERS: ZINC PLATED (UNLESS OTHERWISE NOTED)
GASKETS: EPDM, NEOPRENE, SILICONE, OR NATURAL RUBBER

FINISHES
FABRICATED STEEL: CHEMICAL CLEAN & RINSE:
PRIMER AND INDUSTRIAL ENAMEL:
PRIME COAT - (1) COAT OF SHERWIN WILLIAMS KEM FLASH PRIMER
TOP COAT - (2) COATS OF SHERWIN WILLIAMS INDUSTRIAL ENAMEL
POWDERCOAT (STEEL ONLY): POWDURA TGIC
ALUMINUM: RAW, MILL FINISH
STAINLESS STEEL: RAW, MILL FINISH

WELDS
EXPOSED, INTERFERING WELDS ARE GROUND, NOT FILLED OR POLISHED
FACTORY WELDS:
ALUMINUM: ELECTRODE ER4043
MILD STEEL: ELECTRODE ER70S-6
STAINLESS STEEL: ER308LSI, ER316LSI, ER317L
FIELD WELDS: ELECTRODE E70-SERIES (FOR MILD STEEL). ALL WELDING SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THE APPLICABLE
AWS OR ASME STANDARDS.





ITEM NO.	PART NO.	DESCRIPTION	QTY
1	507391	FP;PLANK LATCH ANGLE ASSY	6
2	BOT P-05340704	FP;BOTTOM PLANK	2
3	INT P-05340704	FP;INTER. PLANK	26
4	JMBASMLH-05340704	FP;LEFT SIDE JAMB ASSY	1
5	JMBASMRH-05340704	FP;RIGHT SIDE JAMB ASSY	1
6	510690-05340704	FP;CORNER MULLION ASSY	2
7	BOT P2-05340704	FP;BOTTOM PLANK	1
8	INT P2-05340704	FP;BOTTOM PLANK	13
9	511644	ANCHOR;HILTI HIS-RN 3/8X4-1/4	18
10	512427	SCREW;SET 3/8"-16 X 3/4" NYLON	18
11	501947	WASHER;FLAT 3/8"ZN	18
12	500400	BOLT;HEX3/8"16X1GR5ZN	18
13	511818	ANCHOR;HILTI HIS-RN 3/4"-8 1/4	8
14	512415	SCREW;SET 3/4"-10 X 1" NYLON	8
15	501942	WASHER;FLAT 3/4"ZN USS	8
16	511444	BOLT;HEX3/4"10X3 1/2,GR5ZN	8
17	512791	FP;PLANK LATCH LOCK	6
18	512348	EPOXY;HYBRID HY 200-R 16.9 OZ.	1
19	512654	SEALANT;REMOVABLE WS	2

SUBMITTAL REVIEW
APPROVER IS REQUIRED TO ☒ ONE BOX ONLY AND SIGN
☐ APPROVED; PROCEED WITH FABRICATION
☐ APPROVED WITH CORRECTIONS; PROCEED WITH FABRICATION
☐ REVISE AS NOTED & RESUBMIT
☐ REJECTED
Signature Date
Printed Name

PRESSURE CHART - HYDROSTATIC LOADS ONLY
(WATER @ 64 PCF)

INDIVIDUAL PLANK WEIGHT: 18 LBS

REV	REVISIONS	DATE	REVISED BY
2.1	REMOVED SILLS AND REPLACED MULLION EMBEDS WITH HIS-RN	4/27/16	NJU
2.2	CHANGED ANCHORS FROM KH-EZ TO HIS-RN FOR REMOVABLE JAMBS	4/27/16	NJU

FINISH: MILL FINISH

DOOR/OPENING NAME: EXISTING GAS METER
SHIP TO: SAK ENTERPRISES
SOLD TO: SAK ENTERPRISES
PROJECT NAME: PS 43Q ANNEX
CUST PO #: 31136

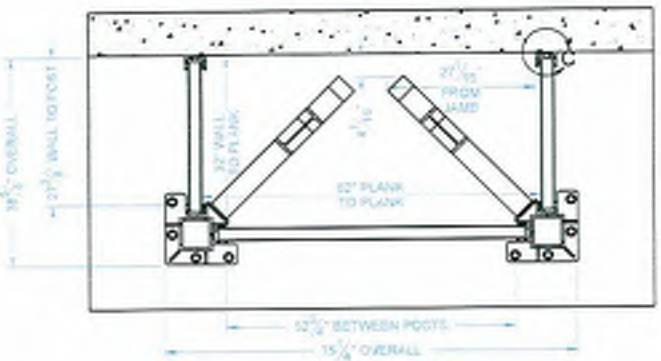
SN: 05340704 SALES ORDER # 405467 QTY: 1
DWG STATUS: APPROVAL DRAWING SUBMITTAL 3
ESTIMATED PART/ASSY WEIGHT: 942.95 LBS.
DWG #: GEN-05340704

DATE: 3/11/2016
SCALE: NTS
DWG BY: nueland
CHECKED: /

PS DOORS
1150 48th St. S
GRAND FORKS, ND 58201
PH: 701-746-4519
FAX: 701-746-8340

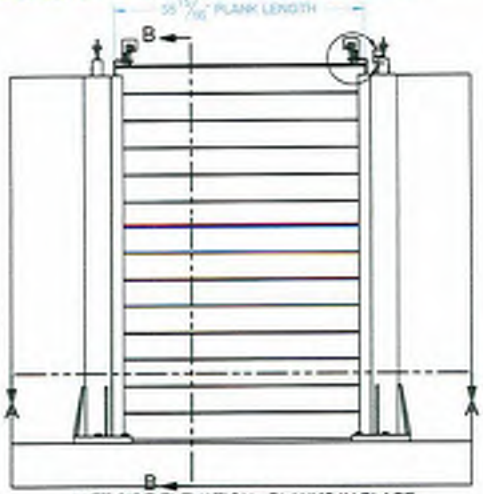
SHEET #: 1 OF 3 E

Field verify all dimensions.
Coordinate diagonal bracing with Gas Meter Rig Installation.



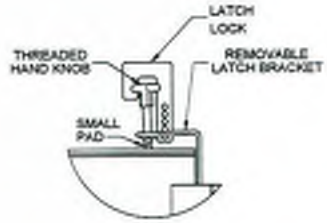
SECTION A-A

* DUE TO VARIABILITY IN EXISTING MOUNTING STRUCTURE, PS DOORS IS NOT RESPONSIBLE FOR STRUCTURAL FASTENER DESIGN INTO LESS THAN IDEAL FIELD CONDITIONS. PS DOORS' PRODUCTS FASTENING SYSTEMS ARE DESIGNED BASED ON CONCRETE (3000 PSI MIN.) OR 8" GROUT-FILLED CMU MASONRY (ASTM C90) MOUNTING STRUCTURE, OR AS DEPICTED ON DRAWINGS.
* IF FIELD CONDITIONS DIFFER PS DOORS REQUIRES THAT THE PROVIDED FASTENING SYSTEM IS REVIEWED BY A QUALIFIED LOCAL ENGINEER BASED ON ACTUAL FIELD CONDITIONS, PRIOR TO APPROVING DRAWINGS. REFER TO ANCHOR MANUFACTURER'S TECHNICAL DATA MANUAL FOR INSTALLATION LIMITATIONS AND REQUIREMENTS.
* MODIFICATIONS OF MOUNTING STRUCTURE MAY BE REQUIRED (NOT BY PS DOORS) TO ACCOMODATE FASTENERS AND DESIGN LOADS.



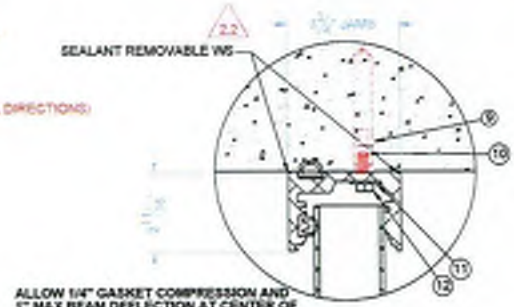
WET SIDE ELEVATION - PLANKS IN PLACE

HILTI HIT-HY 200 EPOXY
HILTI HIS-RN 5/8" 3/8" INSERT
MIN 3000 PSI CONCRETE
MIN 8" SLAB THICKNESS
MIN 4.375" EMBED DEPTH
MIN 4" EDGE DISTANCE (ALL DIRECTIONS)



DETAIL E

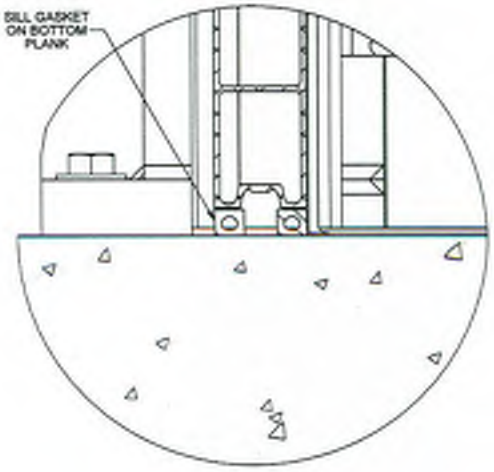
BASE OF JAMB MUST BE SET IN A CONTINUOUS BED OF SEALANT TO CREATE A WATERTIGHT JOINT



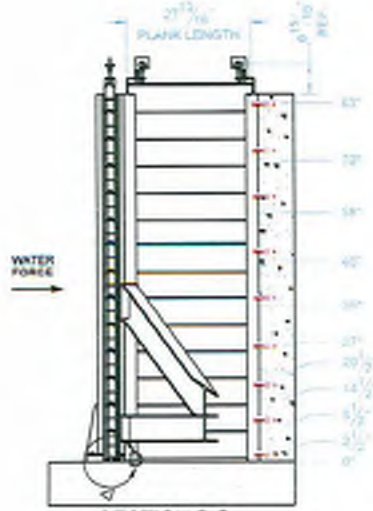
ALLOW 1/4" GASKET COMPRESSION AND 1" MAX BEAM DEFLECTION AT CENTER OF PLANK UNDER HYDROSTATIC LOADS

DETAIL C

NO SILL: GASKET PERFORMANCE DEPENDENT ON CONDITION OF FLOOR CONTACT AREA. FLOOR CONTACT AREA SHOULD BE SOUND, FLAT/LEVEL, AND WITHOUT BLEMISH FOR BEST GASKET PERFORMANCE.



DETAIL D



SECTION B-B

REV	REVISIONS	DATE	REVISED BY	FINISH
2.1	REMOVED SILLS AND REPLACED MULLION EMBEDS WITH HIS-RN	4/27/16	NJU	MILL FINISH
2.2	CHANGED ANCHORS FROM KH-EZ TO HIS-RN FOR REMOVABLE JAMBS	4/27/16	NJU	

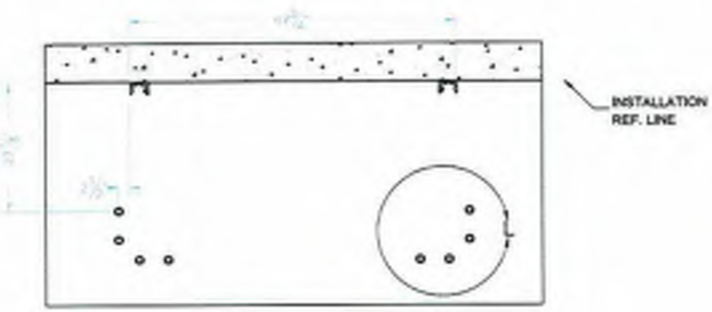
DOOR/OPENING NAME: EXISTING GAS METER
SHIP TO: SAK ENTERPRISES
SOLD TO: SAK ENTERPRISES
PROJECT NAME: PS 402 ANNEX
CUST PO #: 31130

Qty: 05340704 SALES ORDER #: 4050407 QTY: 1

DWG STATUS: APPROVAL DRAWING SUBMITTAL 3
ESTIMATED PARTIASSY WEIGHT: 942.55 LBS.
DWG #: GEN-05340704

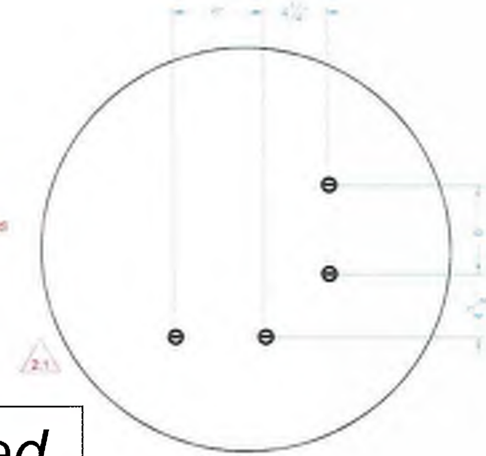
DATE: 5/11/2016
SCALE: NTS
DWG BY:
CHECKED: /
SHEET # 2 OF 3

PS DOORS
1150 48th St. S
GRAND FORKS, ND 58201
PH. 701-746-4319
FAX 701-746-8340

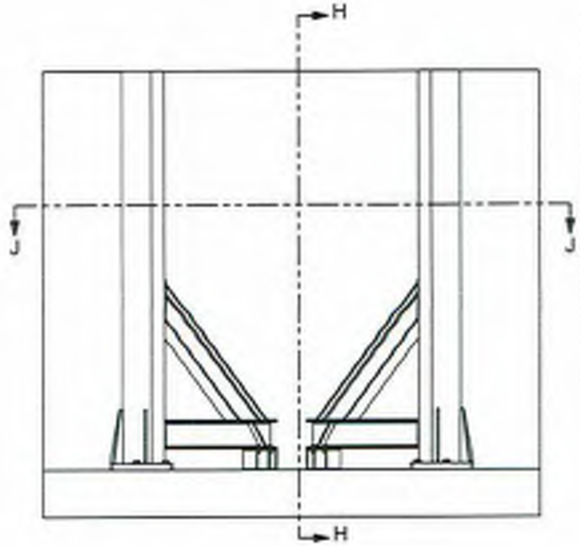


SECTION J-J

HILTI HIT-HY 200 EPOXY
HILTI HIS-RN 5/8 3/4" INSERT
MIN 3000 PSI CONCRETE
MIN 12" SLAB THICKNESS
MIN 5/125" EMBED DEPTH
MIN 16" EDGE DISTANCE ALL DIRECTIONS



DETAIL L



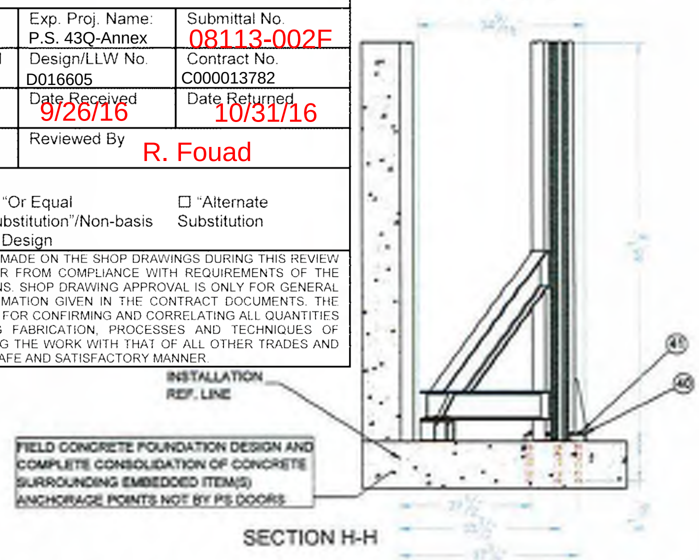
STV Incorporated

☐ No Exceptions Taken	Exp. Proj. Name: P.S. 43Q-Annex	Submittal No. 08113-002F
☒ Make Corrections Noted	Design/LLW No. D016605	Contract No. C000013782
☐ Rejected – Revise and Resubmit	Date Received 9/26/16	Date Returned 10/31/16
☐ Rejected – Not Acceptable for Review	Reviewed By R. Fouad	

Submittal reviewed as:

☒ Per Spec/ Basis of Design ☐ "Or Equal Substitution"/Non-basis of Design ☐ "Alternate Substitution

CORRECTIONS OR COMMENTS MADE ON THE SHOP DRAWINGS DURING THIS REVIEW DO NOT RELIEVE CONTRACTOR FROM COMPLIANCE WITH REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS. SHOP DRAWING APPROVAL IS ONLY FOR GENERAL COMPLIANCE WITH THE INFORMATION GIVEN IN THE CONTRACT DOCUMENTS. THE CONTRACTOR IS RESPONSIBLE FOR CONFIRMING AND CORRELATING ALL QUANTITIES AND DIMENSIONS, SELECTING FABRICATION, PROCESSES AND TECHNIQUES OF CONSTRUCTION, COORDINATING THE WORK WITH THAT OF ALL OTHER TRADES AND PERFORMING THE WORK IN A SAFE AND SATISFACTORY MANNER.



SECTION H-H

REV	REVISIONS	DATE	REVISED BY
2.1	REMOVED SILLS AND REPLACED MULLION EMBEDS WITH HIS-RN	4/27/16	NJU
2.2	CHANGED ANCHORS FROM KH-EZ TO HIS-RN FOR REMOVABLE JAMBS	4/27/16	NJU

FINISH:
MILL FINISH

DOOR/OPENING NAME: EXISTING GAS METER

SHIP TO: SAK ENTERPRISES
SOLD TO: SAK ENTERPRISES
PROJECT NAME: PS 43Q ANNEX
CUST PO #: 31130

DWG STATUS:
APPROVAL DRAWING SUBMITTAL 3

ESTIMATED PART/ASSY WEIGHT: 942.55 LBS.

DWG #: GEN-05340704

SN: 05340704 SALES ORDER #: 405367

QTY: 1
DATE: 3/11/2016
SCALE: NTS
DWG BY: [illegible]
CHECKED: /

PS DOORS

SHEET #: 3 OF 3 E

08113-003C

NOTES

STORAGE-HANDLING
DO NOT STORE FLOOD BARRIERS IN A MANNER THAT WILL COMPRESS GASKETS OR THAT WILL CAUSE DAMAGE TO GASKETS.

INSTALLATION
REFER TO ALL MANUFACTURERS' INSTALLATION NOTES AND DRAWINGS. INSTALL PLUMB, SQUARE, AND LEVEL INSURING CONTINUOUS AND EVEN GASKET CONTACT. DO NOT DRILL OR PENETRATE ANY SURFACES OF BARRIERS WITHOUT CONSULTING MANUFACTURER. USE ONLY FASTENERS PROVIDED BY THE MANUFACTURER (UNLESS OTHERWISE NOTED). FIELD GROUT AS INDICATED ON DRAWINGS (MATERIAL AND PLACEMENT NOT BY PS DOORS). GROUT TO BE NON-METALLIC, NON-SHRINK TYPE, CAPABLE OF DEVELOPING 3000 PSI COMPRESSIVE STRENGTH AS PLACED.

MAINTENANCE-INSPECTION
PERIODIC INSPECTION AND MAINTENANCE OF FLOOD BARRIER INSTALLATIONS INCLUDING SEALANTS, GASKETS, ANCHORS, AND OPERATING HARDWARE IS THE RESPONSIBILITY OF THE OWNER.

STRUCTURAL REVIEW
STRUCTURAL REVIEW OF ADJACENT STRUCTURE'S CAPACITY TO WITHSTAND ALL FLOOD BARRIER SERVICE LOADS TRANSFERRED TO STRUCTURE IS BY OTHERS (NOT PS DOORS). FIELD CONCRETE DESIGN AT ANY EMBEDDED CONNECTION TO WITHSTAND FLOOD BARRIER SERVICE LOADS IS BY OTHERS (NOT PS DOORS). REVIEW OF EXISTING STRUCTURE'S ABILITY TO WITHSTAND FLOOD BARRIER SERVICE LOADS TRANSFERRED BY ANCHORS IS BY OTHERS (NOT PS DOORS).

PERFORMANCE
FLOOD BARRIERS ARE DESIGNED TO CONTROL SHORT TERM HYDROSTATIC WATER LOADS (64 PCF) UP TO THE DESIGNED WATER HEIGHT NOTED ON THE DRAWINGS. NO ALLOWANCES HAVE BEEN INCLUDED TO CONTROL WAVE SURGE LOADS OR OTHER IMPACT LOADS UNLESS SPECIFICALLY DETAILED ON THE DRAWINGS. ALL LOADS ARE TRANSFERRED TO THE BUILDING STRUCTURE. ALWAYS ALLOW FOR CONTROL OF ANY LEAKAGE AND CONDENSATION THAT WILL OCCUR DURING HIGH WATER SITUATIONS. IN APPLICATIONS WHERE THE FLOOD BARRIER GASKETS CONTACT THE EXISTING BUILDING STRUCTURE, FLOORS, ETC. ALL SURFACES MUST BE SOUND, FLAT/LEVEL, AND WITHOUT BLEMISH FOR BEST PERFORMANCE.

FIELD VERIFICATION IS REQUIRED BY OTHERS (NOT PS DOORS)
1 ALL DIMENSIONS AND INTERFERENCES.
2 JAMB CONDITIONS AND STRUCTURAL CAPACITY OF STRUCTURE.
3 ANCHOR LOCATIONS AND MINIMUM REQUIRED EDGE/END DISTANCES, SPACING, EMBEDMENT DEPTHS, AND INSTALLATION PROCEDURE SPECIFIED IN THE ANCHOR MANUFACTURER'S TECHNICAL INFORMATION MANUAL.

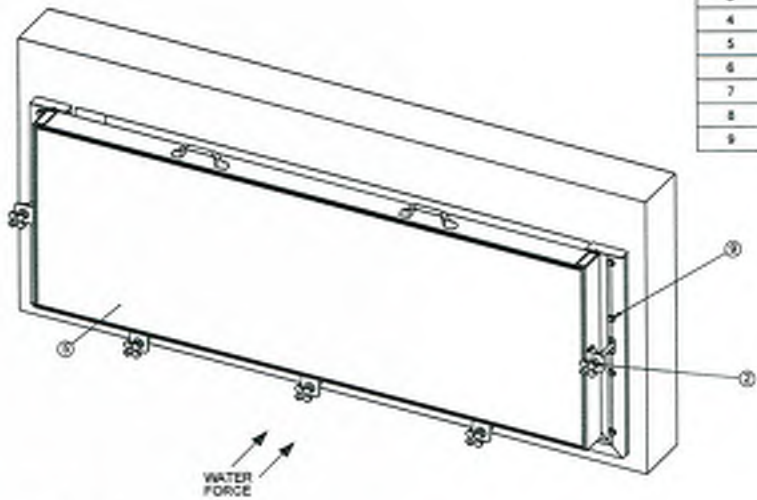
FLOOD BARRIER WAS DESIGNED USING 2:1 FACTOR OF SAFETY BASED ON MATERIAL YIELD STRENGTH AS QUOTED

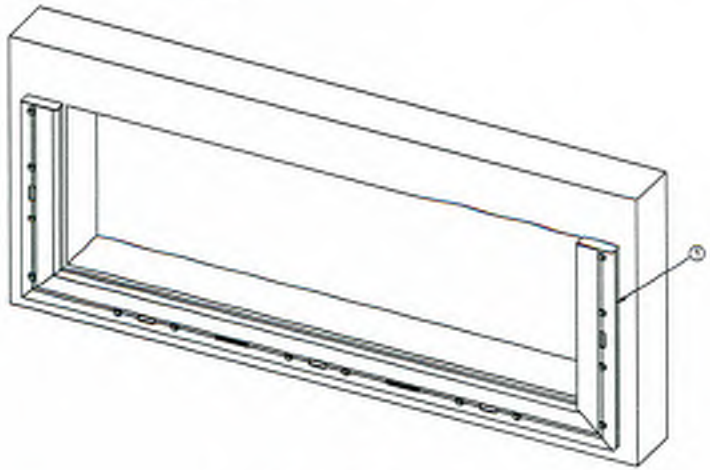
DESIGN CRITERIA

DESIGN LOADS
(ALL LOADS TRANSFERRED TO STRUCTURE).
HYDROSTATIC LOADS TO ELEVATION AS INDICATED ON DRAWINGS BASED ON HYDROSTATIC WATER LOAD (64 PCF). ALL ANCHOR DESIGNS ARE BASED ON ATTACHING TO STRUCTURE CALLED OUT IN DRAWINGS. PS DOORS IS NOT RESPONSIBLE FOR FASTENING OF PRODUCT INTO LESS THAN IDEAL FIELD CONDITIONS OR MOUNTING TO STRUCTURE OTHER THAN WHAT IS DETAILED ON DRAWINGS.

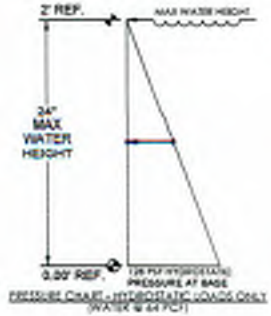
MATERIALS
ALUMINUM: 5052-H32, 6005A-T5, 6061-T6, 6063-T6
MILD STEEL: ASTM A-36, ASTM A-569, ASTM A-527, ASTM A-500, ASTM A-513, ASTM A-1011 CS TYPE B
STAINLESS STEEL: 6S304 (UNLESS OTHERWISE NOTED)
FASTENERS: ZINC PLATED (UNLESS OTHERWISE NOTED)
GASKETS: EPDM, NEOPRENE, SILICONE, OR NATURAL RUBBER
FINISHES
FABRICATED STEEL: CHEMICAL CLEAN & RINSE:
PRIMER AND INDUSTRIAL ENAMEL:
PRIME COAT - (1) COAT OF SHERWIN WILLIAMS KEM FLASH PRIMER
TOP COAT - (2) COATS OF SHERWIN WILLIAMS INDUSTRIAL ENAMEL
POWDERCOAT (STEEL ONLY): POWDURA TGIC
ALUMINUM: RAW, MILL FINISH
STAINLESS STEEL: RAW, MILL FINISH
WELDS
EXPOSED, INTERFERING WELDS ARE GROUND, NOT FILLED OR POLISHED
FACTORY WELDS:
ALUMINUM: ELECTRODE ER4043
MILD STEEL: ELECTRODE ER70S-6
STAINLESS STEEL: ER308LSi, ER316LSi, ER317L
FIELD WELDS: ELECTRODE E70-SERIES (FOR MILD STEEL). ALL WELDING SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THE APPLICABLE AWS OR ASME STANDARDS.

ITEM NO.	PART NO.	DESCRIPTION	QTY
1	FRAMEASM-05340705	EXTRUDED ALUMINUM FRAME	1
2	511552	FLD;1/2"X8" T-BOLT COMP LATCH	5
3	512348	EPOXY;HYBRID HY 200-R 16.9 OZ.	1
4	512654	SEALANT;REMOVABLE WS	2
5	PANELASM-05340705	WELDED ALUMINUM PANEL ASSEMBLY	1
6	511844	ANCHOR;HILTI HIS-RN 3/8X4-1/4	14
7	512427	SCREW;SET 3/8"-16 X 3/4" NYLON	14
8	501947	WASHER;FLAT 3/8"ZN	14
9	500403	BOLT;HEX3/8"16X2 1/2GR5ZN	14





SUBMITTAL REVIEW
APPROVER IS REQUIRED TO X ONE BOX ONLY AND SIGN
☐ APPROVED; PROCEED WITH FABRICATION
☐ APPROVED WITH CORRECTIONS; PROCEED WITH FABRICATION
☐ REVISE AS NOTED & RESUBMIT
☐ REJECTED
Signature Date
Printed Name



PRESSURE CHART - HYDROSTATIC LOADS ONLY
(WATER @ 64 PCF)

REV.	REVISIONS	DATE	REVISED BY	FINISH: MILL FINISH
2.1	CHANGED ANCHORS FROM KH-EZ TO HIS-RN FOR REMOVEABLE JAMB	4/24/16	NJU	

DOOR/OPENING NAME: FP 1
SHIP TO: SAK ENTERPRISES
SOLD TO: SAK ENTERPRISES
PROJECT NAME: PS 430 ANNEX
CUST PO #: 31130

DWG STATUS:
APPROVAL DRAWING SUBMITTAL 3
ESTIMATED PART/ASSY WEIGHT: 122.45 LBS.
DWG #: GEN-05340705

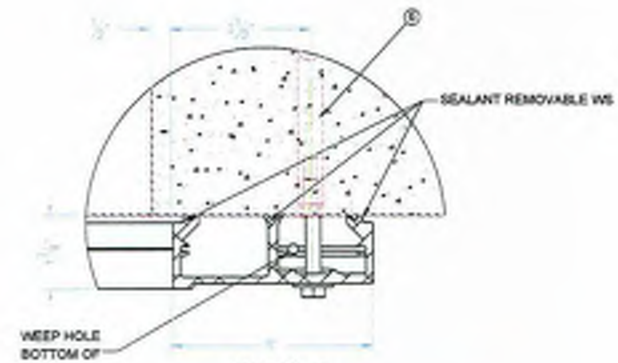
S/N: 05340705 SALES ORDER #: 4553407 QTY: 14
DATE: 5/11/2016
SCALE: NTS
DWG BY: Hubbard
CHECKED:

PS DOORS
1130 48th St. S
Grand Forks, ND 58201
Ph. 701-746-6314
Fax 701-746-8040

SHEET # 1 OF 3 REV: B

Field verify all dimensions.

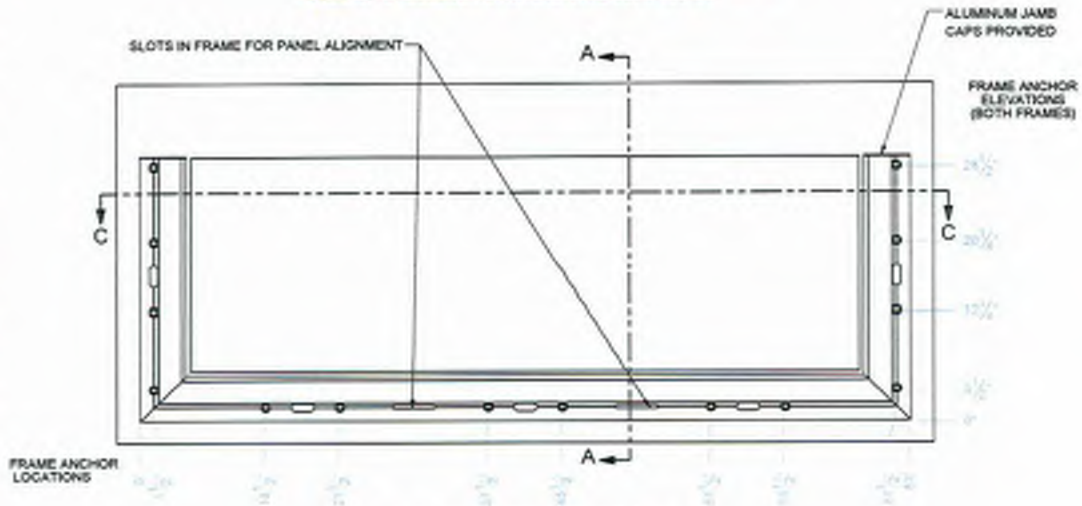
SECTION C-C



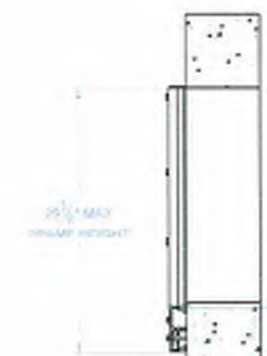
DETAIL D

* DUE TO VARIABILITY IN EXISTING MOUNTING STRUCTURE, PS DOORS IS NOT RESPONSIBLE FOR STRUCTURAL FASTENER DESIGN INTO LESS THAN IDEAL FIELD CONDITIONS. PS DOORS' PRODUCTS FASTENING SYSTEMS ARE **DESIGNED BASED ON CONCRETE (3000 PSI MIN.) OR 8" GROUT-FILLED CMU MASONRY (ASTM C90)** MOUNTING STRUCTURE, OR AS DEPICTED ON DRAWINGS.
* IF FIELD CONDITIONS DIFFER PS DOORS REQUIRES THAT THE PROVIDED FASTENING SYSTEM IS REVIEWED BY A QUALIFIED LOCAL ENGINEER BASED ON ACTUAL FIELD CONDITIONS, PRIOR TO APPROVING DRAWINGS. REFER TO ANCHOR MANUFACTURER'S TECHNICAL DATA MANUAL FOR INSTALLATION LIMITATIONS AND REQUIREMENTS.
* MODIFICATIONS OF MOUNTING STRUCTURE MAY BE REQUIRED (NOT BY PS DOORS) TO ACCOMODATE FASTENERS AND DESIGN LOADS.

HILTI HIT-HY 200 EPOXY
HILTI HIS-RN B8 3/8" INSERT
MIN 3000 PSI CONCRETE
MIN 8" SLAB THICKNESS
MIN 4.375" EMBED DEPTH
MIN 4" EDGE DISTANCE ALL DIRECTIONS



WETSIDE ELEVATION - FRAME ONLY



SECTION A-A

STV Incorporated

☐ No Exceptions Taken	Exp. Proj. Name: P.S. 43Q-Annex	Submittal No. 08113-003E
☒ Make Corrections Noted	Design/LLW No. D016605	Contract No. C000013782
☐ Rejected – Revise and Resubmit	Date Received 9/26/16	Date Returned 10/31/16
☐ Rejected – Not Acceptable for Review	Reviewed By R. Fouad	

Submittal reviewed as:
☒ Per Spec/ Basis of Design ☐ "Or Equal Substitution"/Non-basis of Design ☐ "Alternate Substitution

CORRECTIONS OR COMMENTS MADE ON THE SHOP DRAWINGS DURING THIS REVIEW DO NOT RELIEVE CONTRACTOR FROM COMPLIANCE WITH REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS. SHOP DRAWING APPROVAL IS ONLY FOR GENERAL COMPLIANCE WITH THE INFORMATION GIVEN IN THE CONTRACT DOCUMENTS. THE CONTRACTOR IS RESPONSIBLE FOR CONFIRMING AND CORRELATING ALL QUANTITIES AND DIMENSIONS, SELECTING FABRICATION, PROCESSES AND TECHNIQUES OF CONSTRUCTION, COORDINATING THE WORK WITH THAT OF ALL OTHER TRADES AND PERFORMING THE WORK IN A SAFE AND SATISFACTORY MANNER.

REV	REVISIONS	DATE	REVISED BY	FINISH
2.1	CHANGED ANCHORS FROM KH-EZ TO HIS-RN FOR REMOVEABLE JAMB	4/24/16	NJU	MILL FINISH

DOOR/OPENING NAME: FP 1
SHIP TO: SAK ENTERPRISES
SOLD TO: SAK ENTERPRISES
PROJECT NAME: PS 43Q ANNEX
CUST PO #: 31130

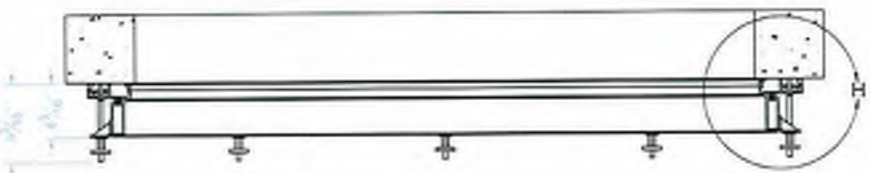
DWG STATUS
APPROVAL DRAWING SUBMITTAL 3
ESTIMATED PART/ASSY WEIGHT: 122.40 LBS.
DWG #: GEN-05340705

SN: **05340705** SALES ORDER #: 405040?

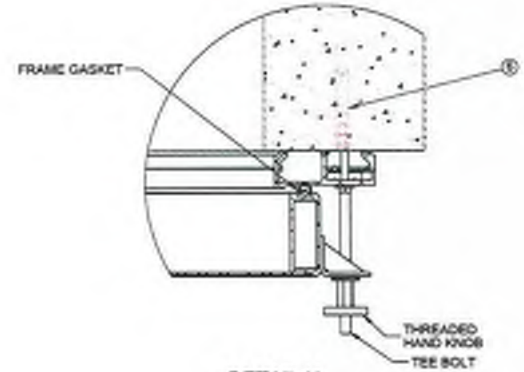
QTY: 14
DATE: 3/11/2016
SCALE: NTS
DWG BY:
CHECKED: /

PS DOORS
GRAND FORKS, ND 58201
PH: 701-746-4519
FAX: 701-746-8340

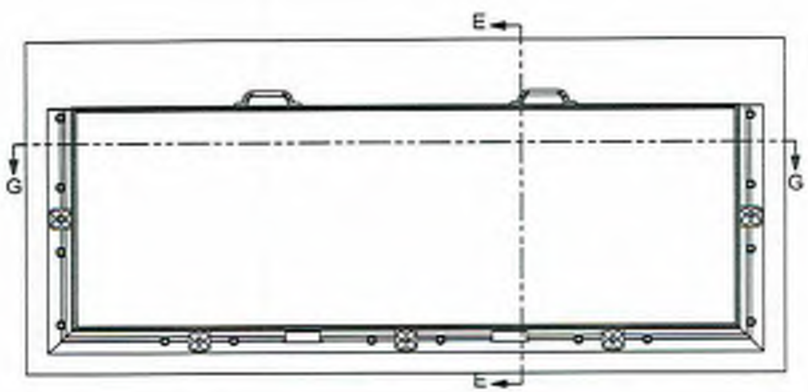
SHEET #: 3 OF 3 REV: B

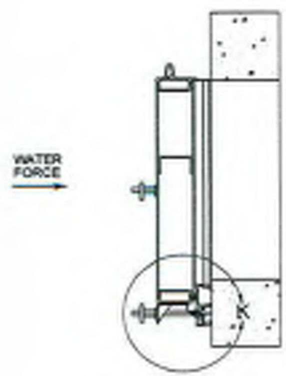


SECTION G-G

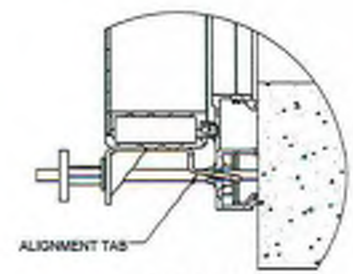


DETAIL H





SECTION E-E



DETAIL K

WETSIDE ELEVATION - CLOSED

APPROXIMATE PANEL WEIGHT: 79.45 LBS

REV.	REVISIONS	DATE	REVISED BY	FINISH
2.1	CHANGED ANCHORS FROM KH-EZ TO HIS-RN FOR REMOVEABLE JAMB	4/24/16	NJU	MILL FINISH

DOOR/OPENING NAME: FP 1

SHIP TO: SAK ENTERPRISES

SOLD TO: SAK ENTERPRISES

PROJECT NAME: PS 450 ANNEX

CUST PO #: 31130

SN: 05340705

SALES ORDER #

DWG STATUS:
APPROVAL DRAWING SUBMITTAL 3

ESTIMATED PART/ASSY WEIGHT: 122.45 LBS.

DWG #: GEN-05340705

QTY: 14

DATE: 3/11/2016

SCALE: NTS

DWG BY:

CHECKED:

PS DOORS

GRAND FORKS, ND

SHEET # 3 OF 3

REV: B

08113-004C

NOTES

STORAGE-HANDLING
DO NOT STORE FLOOD BARRIERS IN A MANNER THAT WILL COMPRESS GASKETS OR THAT WILL CAUSE DAMAGE TO GASKETS.

INSTALLATION
REFER TO ALL MANUFACTURERS' INSTALLATION NOTES AND DRAWINGS. INSTALL PLUMB, SQUARE, AND LEVEL INSURING CONTINUOUS AND EVEN GASKET CONTACT. DO NOT DRILL OR PENETRATE ANY SURFACES OF BARRIERS WITHOUT CONSULTING MANUFACTURER. USE ONLY FASTENERS PROVIDED BY THE MANUFACTURER (UNLESS OTHERWISE NOTED). FIELD GROUT AS INDICATED ON DRAWINGS (MATERIAL AND PLACEMENT NOT BY PS DOORS). GROUT TO BE NON-METALLIC, NON-SHRINK TYPE, CAPABLE OF DEVELOPING 3000 PSI COMPRESSIVE STRENGTH AS PLACED.

MAINTENANCE-INSPECTION
PERIODIC INSPECTION AND MAINTENANCE OF FLOOD BARRIER INSTALLATIONS INCLUDING SEALANTS, GASKETS, ANCHORS, AND OPERATING HARDWARE IS THE RESPONSIBILITY OF THE OWNER.

STRUCTURAL REVIEW
STRUCTURAL REVIEW OF ADJACENT STRUCTURE'S CAPACITY TO WITHSTAND ALL FLOOD BARRIER SERVICE LOADS TRANSFERRED TO STRUCTURE IS BY OTHERS (NOT PS DOORS). FIELD CONCRETE DESIGN AT ANY EMBEDDED CONNECTION TO WITHSTAND FLOOD BARRIER SERVICE LOADS IS BY OTHERS (NOT PS DOORS). REVIEW OF EXISTING STRUCTURE'S ABILITY TO WITHSTAND FLOOD BARRIER SERVICE LOADS TRANSFERRED BY ANCHORS IS BY OTHERS (NOT PS DOORS).

PERFORMANCE
FLOOD BARRIERS ARE DESIGNED TO CONTROL SHORT TERM HYDROSTATIC WATER LOADS (64 PCF) UP TO THE DESIGNED WATER HEIGHT NOTED ON THE DRAWINGS. NO ALLOWANCES HAVE BEEN INCLUDED TO CONTROL WAVE SURGE LOADS OR OTHER IMPACT LOADS UNLESS SPECIFICALLY DETAILED ON THE DRAWINGS. ALL LOADS ARE TRANSFERRED TO THE BUILDING STRUCTURE. ALWAYS ALLOW FOR CONTROL OF ANY LEAKAGE AND CONDENSATION THAT WILL OCCUR DURING HIGH WATER SITUATIONS. IN APPLICATIONS WHERE THE FLOOD BARRIER GASKETS CONTACT THE EXISTING BUILDING STRUCTURE, FLOORS, ETC. ALL SURFACES MUST BE SOUND, FLAT/LEVEL, AND WITHOUT BLEMISH FOR BEST PERFORMANCE.

FIELD VERIFICATION IS REQUIRED BY OTHERS (NOT PS DOORS)
1 ALL DIMENSIONS AND INTERFERENCES.
2 JAMB CONDITIONS AND STRUCTURAL CAPACITY OF STRUCTURE.
3 ANCHOR LOCATIONS AND MINIMUM REQUIRED EDGE/END DISTANCES, SPACING, EMBEDMENT DEPTHS, AND INSTALLATION PROCEDURE SPECIFIED IN THE ANCHOR MANUFACTURER'S TECHNICAL INFORMATION MANUAL.

FLOOD BARRIER WAS DESIGNED USING 2:1 FACTOR OF SAFETY BASED ON MATERIAL YIELD STRENGTH AS QUOTED

DESIGN CRITERIA

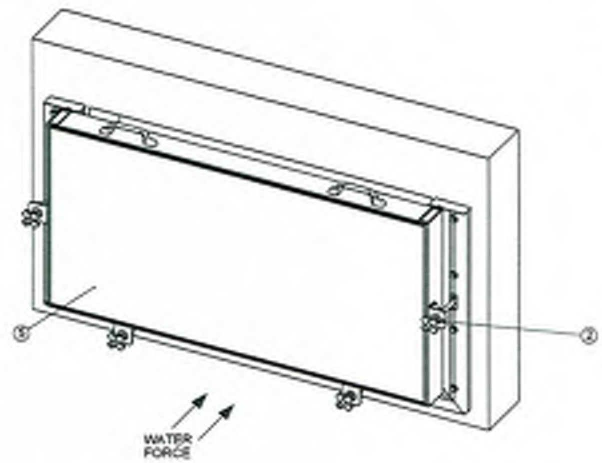
DESIGN LOADS
(ALL LOADS TRANSFERRED TO STRUCTURE)
HYDROSTATIC LOADS TO ELEVATION AS INDICATED ON DRAWINGS BASED ON HYDROSTATIC WATER LOAD (64 PCF). ALL ANCHOR DESIGNS ARE BASED ON ATTACHING TO STRUCTURE CALLED OUT IN DRAWINGS. PS DOORS IS NOT RESPONSIBLE FOR FASTENING OF PRODUCT INTO LESS THAN IDEAL FIELD CONDITIONS OR MOUNTING TO STRUCTURE OTHER THAN WHAT IS DETAILED ON DRAWINGS.

MATERIALS
ALUMINUM: 5052-H32, 6005A-T5, 6061-T6, 6063-T6
MILD STEEL: ASTM A-36, ASTM A-569, ASTM A-527, ASTM A-500, ASTM A-513, ASTM A-1011 CS TYPE B
STAINLESS STEEL: SS304 (UNLESS OTHERWISE NOTED)
FASTENERS: ZINC PLATED (UNLESS OTHERWISE NOTED)
GASKETS: EPDM, NEOPRENE, SILICONE, OR NATURAL RUBBER

FINISHES
FABRICATED STEEL: CHEMICAL CLEAN & RINSE;
PRIMER AND INDUSTRIAL ENAMEL:
PRIME COAT - (1) COAT OF SHERWIN WILLIAMS KEM FLASH PRIMER
TOP COAT - (2) COATS OF SHERWIN WILLIAMS INDUSTRIAL ENAMEL
POWDERCOAT (STEEL ONLY): POWDURA TGIC
ALUMINUM: RAW, MILL FINISH
STAINLESS STEEL: RAW, MILL FINISH

WELDS
EXPOSED, INTERFERING WELDS ARE GROUND, NOT FILLED OR POLISHED
FACTORY WELDS:
ALUMINUM: ELECTRODE ER4043
MILD STEEL: ELECTRODE ER70S-6
STAINLESS STEEL: ER308LSI, ER316LSI, ER317L
FIELD WELDS: ELECTRODE E70-SERIES (FOR MILD STEEL). ALL WELDING SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THE APPLICABLE AWS OR ASME STANDARDS.

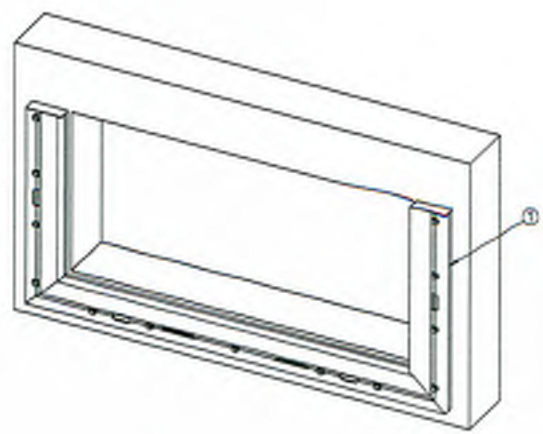
ITEM NO.	PART NO.	DESCRIPTION	QTY
1	FRAMEASM-05340706	EXTRUDED ALUMINUM FRAME	1
2	511552	FLD;1/2"X8" T-BOLT COMP LATCH	4
3	512348	EPOXY;HYBRID HY 200-R 16.9 OZ.	1
4	512654	SEALANT;REMOVABLE WG	2
5	PANELASM-05340706	WELDED ALUMINUM PANEL ASSEMBLY	1
6	511844	ANCHOR;HILTI HIS-RN 3/8X4-1/4	13
7	512427	SCREW;SET 3/8"-16 X 3/4" NYLON	13
8	501947	WASHER;FLAT 3/8"ZN	13
9	500403	BOLT;HEX3/8"16X2 1/2GR5ZN	13

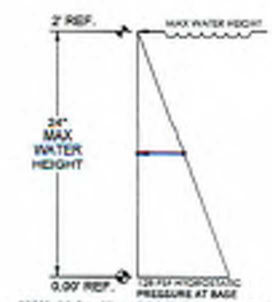


SUBMITTAL REVIEW
APPROVER IS REQUIRED TO ☒ ONE BOX ONLY AND SIGN
☐ APPROVED; PROCEED WITH FABRICATION
☐ APPROVED WITH CORRECTIONS; PROCEED WITH FABRICATION
☐ REVISE AS NOTED & RESUBMIT
☐ REJECTED ____________________

Signature ____________________ Date

Printed Name ____________________





PRESSURE CHART - HYDROSTATIC LOADS ONLY
(WATER @ 64 PCF)

REV.	REVISIONS	DATE	REVISED BY
1.1	CHANGED ANCHORS FROM KH-EZ TO HIS-RN FOR REMOVABLE JAMB	4/27/16	NJU

FINISH: MILL FINISH

DOOR/OPENING NAME: FP 2
SHIP TO: SAK ENTERPRISES
SOLD TO: SAK ENTERPRISES
PROJECT NAME: PS 400 ANNEX
CUST PO #: 31130

DWG STATUS:
APPROVAL DRAWING SUBMITTAL 3
ESTIMATED PART/ASSY WEIGHT: 94.02 LBS.
DWG #: GEN-05340706

SN: 05340706 SALES ORDER #: 4050407

QTY: 4
DATE: 3/11/2016
SCALE: NTS
DWG BY: [illegible]
CHECKED: /

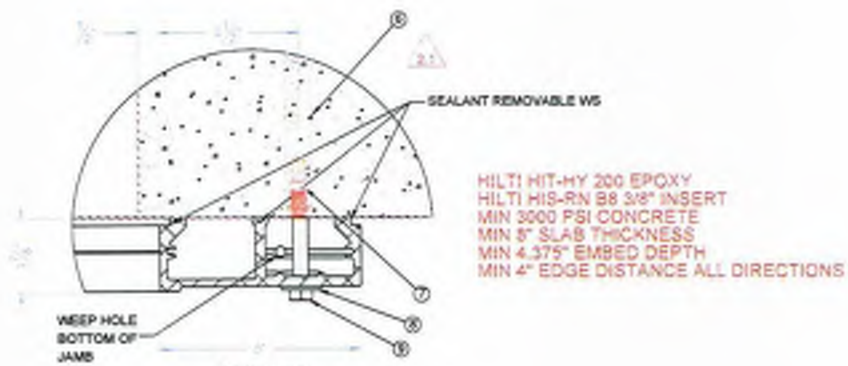
PS DOORS
1100 48th St. S
GRAND FORKS, ND 58201
PH. 701-746-4519
FAX 701-746-8340

SHEET # 1 OF 3 REV: B

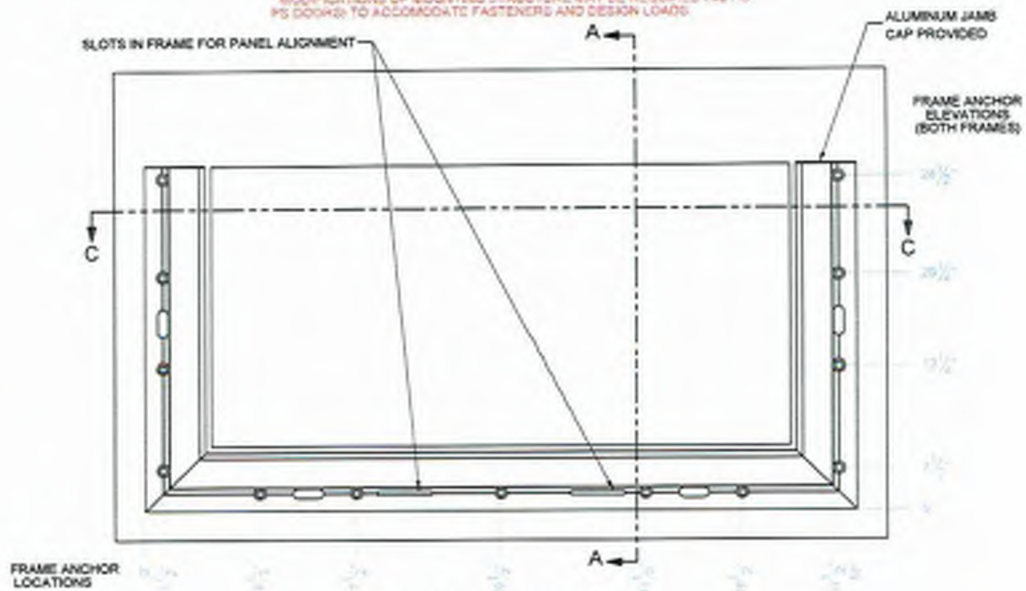
Field verify all dimensions.

SECTION C-C

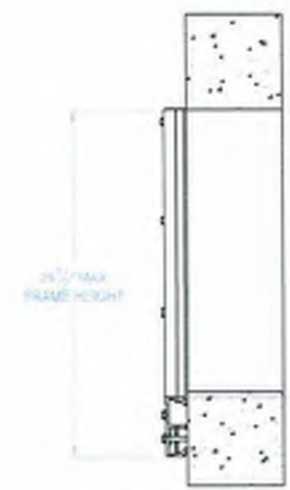
* DUE TO VARIABILITY IN EXISTING MOUNTING STRUCTURE, PS DOORS IS NOT RESPONSIBLE FOR STRUCTURAL FASTENER DESIGN INTO LESS THAN IDEAL FIELD CONDITIONS. PS DOORS' PRODUCT'S FASTENING SYSTEMS ARE **DESIGNED BASED ON CONCRETE (3000 PSI MIN.) OR 8" GROUT-FILLED CMU MASONRY (ASTM C90)** MOUNTING STRUCTURE, OR AS DEPICTED ON DRAWINGS.
* IF FIELD CONDITIONS DIFFER PS DOORS REQUIRES THAT THE PROVIDED FASTENING SYSTEM IS REVIEWED BY A QUALIFIED LOCAL ENGINEER BASED ON ACTUAL FIELD CONDITIONS, PRIOR TO APPROVING DRAWINGS. REFER TO ANCHOR MANUFACTURER'S TECHNICAL DATA MANUAL FOR INSTALLATION LIMITATIONS AND REQUIREMENTS.
* MODIFICATIONS OF MOUNTING STRUCTURE MAY BE REQUIRED (NOT BY PS DOORS) TO ACCOMMODATE FASTENERS AND DESIGN LOADS.



DETAIL D



WETSIDE ELEVATION - FRAME ONLY



SECTION A-A

STV Incorporated

☐ No Exceptions Taken	Exp. Proj. Name: P.S. 43Q-Annex	Submittal No. 08113-004E
☒ Make Corrections Noted	Design/LLW No. D016605	Contract No. C000013782
☐ Rejected – Revise and Resubmit	Date Received 9/26/16	Date Returned 10/31/16
☐ Rejected – Not Acceptable for Review	Reviewed By R. Fouad	

Submittal reviewed as:

☒ Per Spec/ Basis of Design ☐ "Or Equal Substitution"/Non-basis of Design ☐ "Alternate Substitution

CORRECTIONS OR COMMENTS MADE ON THE SHOP DRAWINGS DURING THIS REVIEW DO NOT RELIEVE CONTRACTOR FROM COMPLIANCE WITH REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS. SHOP DRAWING APPROVAL IS ONLY FOR GENERAL COMPLIANCE WITH THE INFORMATION GIVEN IN THE CONTRACT DOCUMENTS. THE CONTRACTOR IS RESPONSIBLE FOR CONFIRMING AND CORRELATING ALL QUANTITIES AND DIMENSIONS, SELECTING FABRICATION, PROCESSES AND TECHNIQUES OF CONSTRUCTION, COORDINATING THE WORK WITH THAT OF ALL OTHER TRADES AND PERFORMING THE WORK IN A SAFE AND SATISFACTORY MANNER.

REV.	REVISIONS	DATE	REVISED BY	FINISH
1.1	CHANGED ANCHORS FROM KH-EZ TO HIS-RN FOR REMOVABLE JAMB	4/27/16	NJU	MILL FINISH

DOOR/OPENING NAME: FP 2
SHIP TO: SAK ENTERPRISES
SOLD TO: SAK ENTERPRISES
PROJECT NAME: PS 43Q ANNEX
CUST PO #: 31130

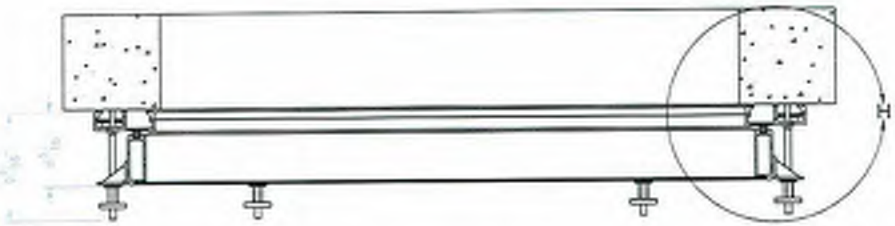
DWG STATUS
APPROVAL DRAWING SUBMITTAL 3
ESTIMATED PART/ASSY WEIGHT: 94.02 LBS.
DWG #: GEN-05340706

SN: **05340706** SALES ORDER #

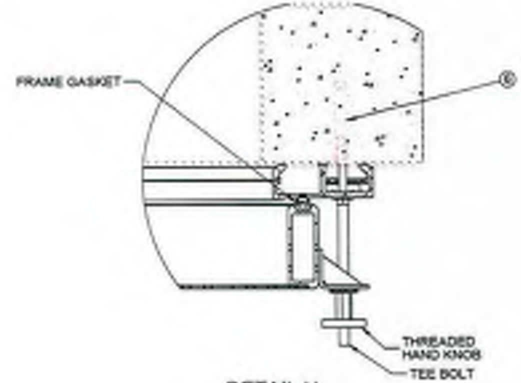
QTY: 4
DATE: 5/11/2016
SCALE: NTS
DWG BY:
CHECKED: /

PS DOORS
GRAND FORKS, ND

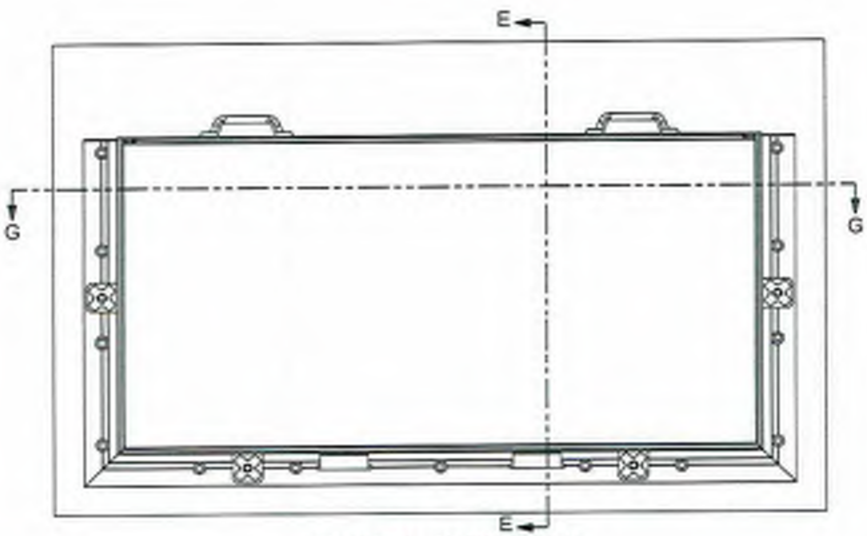
SHEET #: 2 OF 3 REV: B



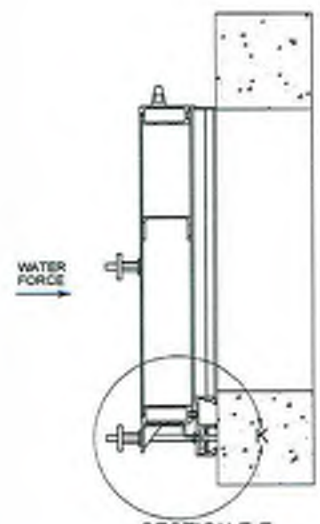
SECTION G-G



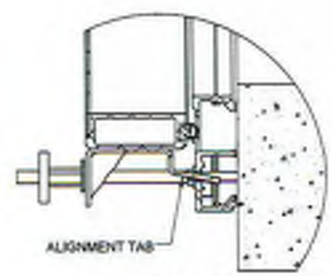
DETAIL H



WETSIDE ELEVATION - CLOSED



SECTION E-E



DETAIL K

APPROXIMATE PANEL WEIGHT: 58.26 LBS

REV	REVISIONS	DATE	REVISED BY	FINISH
1.1	CHANGED ANCHORS FROM KH-EZ TO HIS-RN FOR REMOVABLE JAMB	4/27/16	NJU	MILL FINISH

DOOR/OPENING NAME: FP 2

SHIP TO: SAK ENTERPRISES

SOLD TO: SAK ENTERPRISES

PROJECT NAME: PS 43G ANNEX

CUST PO #: 31130

SN: 05340706 SALES ORDER #

DWG STATUS: APPROVAL DRAWING SUBMITTAL 3

ESTIMATED PART/ASSY WEIGHT: 94.02 LBS.

DWG #: GEN-05340706

QTY: 4

DATE: 3/11/2014

SCALE: NTS

DWG BY:

CHECKED: /

PS DOORS

SHEET # 3 OF 3 REV: B

08113-005C

STV
225 Park Avenue South, NY, NY 10003
ELECTRONICALLY
RECEIVED:
09/26/2016

NOTES

STORAGE-HANDLING
DO NOT STORE FLOOD BARRIERS IN A MANNER THAT WILL COMPRESS GASKETS OR THAT WILL CAUSE DAMAGE TO GASKETS.

INSTALLATION
REFER TO ALL MANUFACTURERS' INSTALLATION NOTES AND DRAWINGS. INSTALL PLUMB, SQUARE, AND LEVEL, INSURING CONTINUOUS AND EVEN GASKET CONTACT. DO NOT DRILL OR PENETRATE ANY SURFACES OF BARRIERS WITHOUT CONSULTING MANUFACTURER. USE ONLY FASTENERS PROVIDED BY THE MANUFACTURER (UNLESS OTHERWISE NOTED). FIELD GROUT AS INDICATED ON DRAWINGS (MATERIAL AND PLACEMENT NOT BY PS DOORS). GROUT TO BE NON-METALLIC, NON-SHRINK TYPE, CAPABLE OF DEVELOPING 3000 PSI COMPRESSIVE STRENGTH AS PLACED.

MAINTENANCE-INSPECTION
PERIODIC INSPECTION AND MAINTENANCE OF FLOOD BARRIER INSTALLATIONS INCLUDING SEALANTS, GASKETS, ANCHORS, AND OPERATING HARDWARE IS THE RESPONSIBILITY OF THE OWNER.

STRUCTURAL REVIEW
STRUCTURAL REVIEW OF ADJACENT STRUCTURE'S CAPACITY TO WITHSTAND ALL FLOOD BARRIER SERVICE LOADS TRANSFERRED TO STRUCTURE IS BY OTHERS (NOT PS DOORS). FIELD CONCRETE DESIGN AT ANY EMBEDDED CONNECTION TO WITHSTAND FLOOD BARRIER SERVICE LOADS IS BY OTHERS (NOT PS DOORS). REVIEW OF EXISTING STRUCTURE'S ABILITY TO WITHSTAND FLOOD BARRIER SERVICE LOADS TRANSFERRED BY ANCHORS IS BY OTHERS (NOT PS DOORS).

PERFORMANCE
FLOOD BARRIERS ARE DESIGNED TO CONTROL SHORT TERM HYDROSTATIC WATER LOADS (64 PCF) UP TO THE DESIGNED WATER HEIGHT NOTED ON THE DRAWINGS. NO ALLOWANCES HAVE BEEN INCLUDED TO CONTROL WAVE SURGE LOADS OR OTHER IMPACT LOADS UNLESS SPECIFICALLY DETAILED ON THE DRAWINGS. ALL LOADS ARE TRANSFERRED TO THE BUILDING STRUCTURE. ALWAYS ALLOW FOR CONTROL OF ANY LEAKAGE AND CONDENSATION THAT WILL OCCUR DURING HIGH WATER SITUATIONS. IN APPLICATIONS WHERE THE FLOOD BARRIER GASKETS CONTACT THE EXISTING BUILDING STRUCTURE, FLOORS, ETC. ALL SURFACES MUST BE SOUND, FLAT/LEVEL, AND WITHOUT BLEMISH FOR BEST PERFORMANCE.

FIELD VERIFICATION IS REQUIRED BY OTHERS (NOT PS DOORS)
1 ALL DIMENSIONS AND INTERFERENCES.
2 JAMB CONDITIONS AND STRUCTURAL CAPACITY OF STRUCTURE.
3 ANCHOR LOCATIONS AND MINIMUM REQUIRED EDGE/END DISTANCES, SPACING, EMBEDMENT DEPTHS, AND INSTALLATION PROCEDURE SPECIFIED IN THE ANCHOR MANUFACTURER'S TECHNICAL INFORMATION MANUAL.

FLOOD BARRIER WAS DESIGNED USING 2:1 FACTOR OF SAFETY BASED ON MATERIAL YIELD STRENGTH AS QUOTED

DESIGN CRITERIA

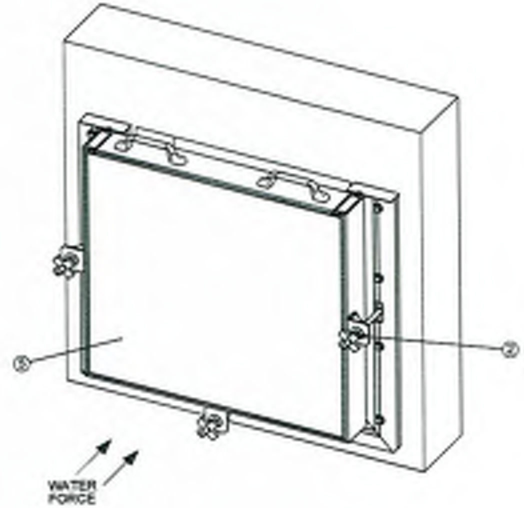
DESIGN LOADS
(ALL LOADS TRANSFERRED TO STRUCTURE)
HYDROSTATIC LOADS TO ELEVATION AS INDICATED ON DRAWINGS BASED ON HYDROSTATIC WATER LOAD (64 PCF). ALL ANCHOR DESIGNS ARE BASED ON ATTACHING TO STRUCTURE CALLED OUT IN DRAWINGS. PS DOORS IS NOT RESPONSIBLE FOR FASTENING OF PRODUCT INTO LESS THAN IDEAL FIELD CONDITIONS OR MOUNTING TO STRUCTURE OTHER THAN WHAT IS DETAILED ON DRAWINGS.

MATERIALS
ALUMINUM: 5052-H32, 6005A-T5, 6061-T6, 6063-T6
MILD STEEL: ASTM A-36, ASTM A-569, ASTM A-527, ASTM A-506, ASTM A-513, ASTM A-1011 CS TYPE B
STAINLESS STEEL: SS304 (UNLESS OTHERWISE NOTED)
FASTENERS: ZINC PLATED (UNLESS OTHERWISE NOTED)
GASKETS: EPDM, NEOPRENE, SILICONE, OR NATURAL RUBBER

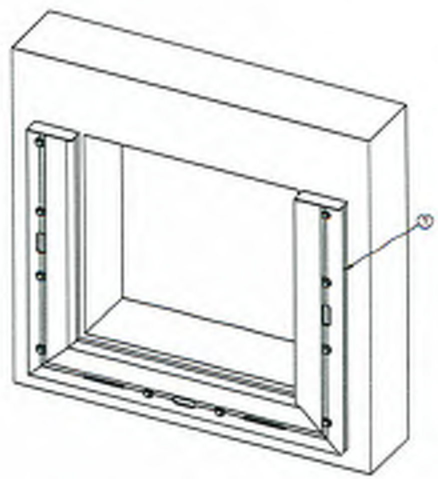
FINISHES
FABRICATED STEEL: CHEMICAL CLEAN & RINSE;
PRIMER AND INDUSTRIAL ENAMEL:
PRIME COAT - (1) COAT OF SHERWIN WILLIAMS KEM FLASH PRIMER
TOP COAT - (2) COATS OF SHERWIN WILLIAMS INDUSTRIAL ENAMEL
POWDERCOAT (STEEL ONLY): POWDURA TGIC
ALUMINUM: RAW, MILL FINISH
STAINLESS STEEL: RAW, MILL FINISH

WELDS
EXPOSED, INTERFERING WELDS ARE GROUND, NOT FILLED OR POLISHED
FACTORY WELDS:
ALUMINUM: ELECTRODE ER4043
MILD STEEL: ELECTRODE ER70S-6
STAINLESS STEEL: ER308LSi, ER316LSi, ER317L
FIELD WELDS: ELECTRODE E70-SERIES (FOR MILD STEEL). ALL WELDING SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THE APPLICABLE AWS OR ASME STANDARDS.

ITEM NO.	PART NO.	DESCRIPTION	QTY
1	FRAMEASM-05340707	EXTRUDED ALUMINUM FRAME	1
2	511552	FLD;1/2"X8" T-BOLT COMP LATCH	3
3	512348	EPOXY;HYBRID HY 200-R 16.9 OZ.	1
4	512654	SEALANT;REMOVABLE WS	2
5	PANELASM-05340707	WELDED ALUMINUM PANEL ASSEMBLY	1
6	511844	ANCHOR;HILTI HIS-RN 3/8X4-1/4	10
7	512427	SCREW;SET 3/8"-16 X 3/4" NYLON	10
8	501947	WASHER;FLAT 3/8"ZN	10
9	500403	BOLT;HEX3/8"16X2 1/2GR5ZN	10



SUBMITTAL REVIEW
APPROVER IS REQUIRED TO ☒ ONE BOX ONLY AND SIGN
☐ APPROVED: PROCEED WITH FABRICATION
☐ APPROVED WITH CORRECTIONS: PROCEED WITH FABRICATION
☐ REVISE AS NOTED & RESUBMIT
☐ REJECTED
Signature / Date
Printed Name



PRESSURE CHART - HYDROSTATIC LOADS ONLY (WATER @ 64 PCF)

REV.	REVISIONS	DATE	REVISED BY
2.1	CHANGED ANCHORS FROM KH-EZ TO HIS-RN FOR REMOVABLE JAMB	4/27/16	NJU

FINISH: MILL FINISH

DOOR/OPENING NAME: FP 3
SHIP TO: SAK ENTERPRISES
SOLD TO: SAK ENTERPRISES
PROJECT NAME: PS 43Q ANNEX
CUST PO #: 31138

DWG STATUS
APPROVAL DRAWING SUBMITTAL 3
ESTIMATED PART/ASSY WEIGHT: 64.79 LBS.
DWG #: GEN-05340707

SN: 05340707 SALES ORDER # 4053407

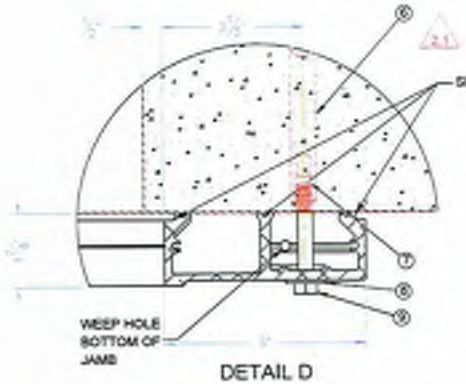
QTY: 1
DATE: 5/11/2016
SCALE: NTS
DWG BY: nueland
CHECKED: /

PS DOORS
1130 48th St. S
GRAND FORKS, ND 58201
PH. 701-746-4379
FAX 701-746-8340
SHEET #: 1 OF 3 REV: B

Field verify all dimensions.

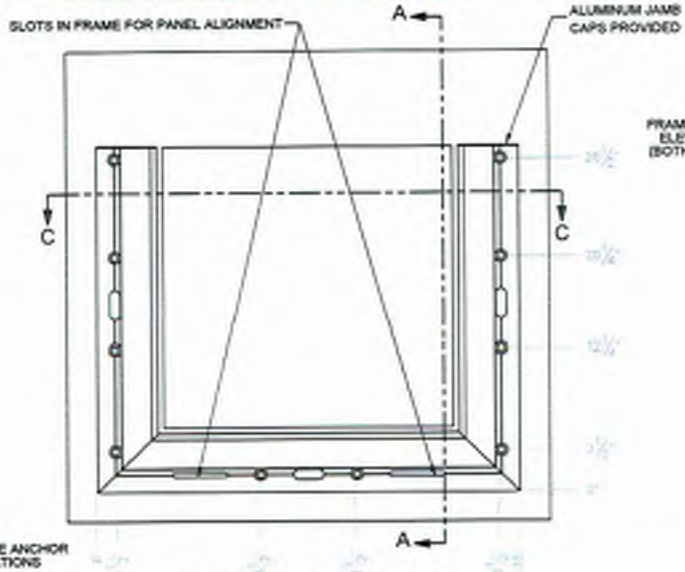
SECTION C-C

* DUE TO VARIABILITY IN EXISTING MOUNTING STRUCTURE, PS DOORS IS NOT RESPONSIBLE FOR STRUCTURAL FASTENER DESIGN INTO LESS THAN IDEAL FIELD CONDITIONS. PS DOORS' PRODUCT'S FASTENING SYSTEMS ARE DESIGNED BASED ON CONCRETE (3000 PSI MIN.) OR 8" GROUT-FILLED CMU MASONRY (ASTM C90) MOUNTING STRUCTURE, UNLESS OTHERWISE DEPICTED ON DRAWINGS.
* IF FIELD CONDITIONS DIFFER PS DOORS REQUIRES THAT THE PROVIDED FASTENING SYSTEM IS REVIEWED BY A QUALIFIED LOCAL ENGINEER BASED ON ACTUAL FIELD CONDITIONS, PRIOR TO APPROVING DRAWINGS. REFER TO ANCHOR MANUFACTURER'S TECHNICAL DATA MANUAL FOR INSTALLATION LIMITATIONS AND REQUIREMENTS.
* MODIFICATIONS OF MOUNTING STRUCTURE MAY BE REQUIRED (NOT BY PS DOORS) TO ACCOMODATE FASTENERS AND DESIGN LOADS.



DETAIL D

HILTI HIT-HY 200 EPOXY
HILTI HIS-RN 88 2/8" INSERT
MIN 3000 PSI CONCRETE
MIN 8" SLAB THICKNESS
MIN 4.375" EMBED DEPTH
MIN 4" EDGE DISTANCE ALL DIRECTIONS



WETSIDE ELEVATION - FRAME ONLY

FRAME ANCHOR ELEVATIONS (BOTH FRAMES)

SECTION A-A

STV Incorporated

☐ No Exceptions Taken	Exp. Proj. Name: P.S. 43Q-Annex	Submittal No. 08113-005E
☒ Make Corrections Noted	Design/LLW No. D016605	Contract No. C000013782
☐ Rejected – Revise and Resubmit	Date Received 9/26/16	Date Returned 10/31/16
☐ Rejected – Not Acceptable for Review	Reviewed By R. Fouad	

Submittal reviewed as:

☒ Per Spec/ Basis of Design ☐ "Or Equal Substitution"/Non-basis of Design ☐ "Alternate Substitution

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REV	REVISIONS	DATE	REVISED BY	FINISH
2.1	CHANGED ANCHORS FROM KH-EZ TO HIS-RN FOR REMOVABLE JAMB	4/27/16	NJU	MILL FINISH

DOOR/OPENING NAME: FP 3

SHIP TO: SAK ENTERPRISES

SOLD TO: SAK ENTERPRISES

PROJECT NAME: PS 43Q ANNEX

CUST PO #: 31138

S/N: 05340707 SALES ORDER #: 4003407 QTY: 1

DWG STATUS: APPROVAL DRAWING SUBMITTAL 3

ESTIMATED PART/ASSY WEIGHT: 84.79 LBS.

DWG #: GEN-05340707

DATE: 5/11/2016

SCALE: NTS

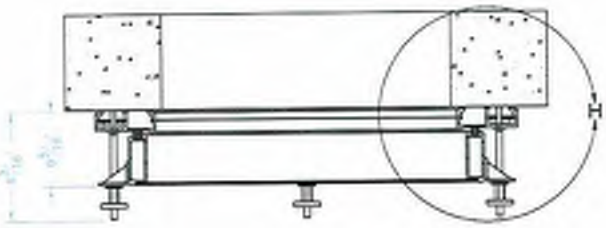
DWG BY: nuelland

CHECKED: /

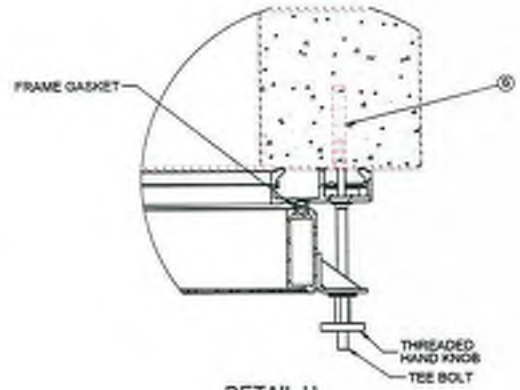
PS DOORS

1130 48th St. S
GRAND FORKS, ND 58201
PH: 701-746-8371
FAX: 701-746-8340

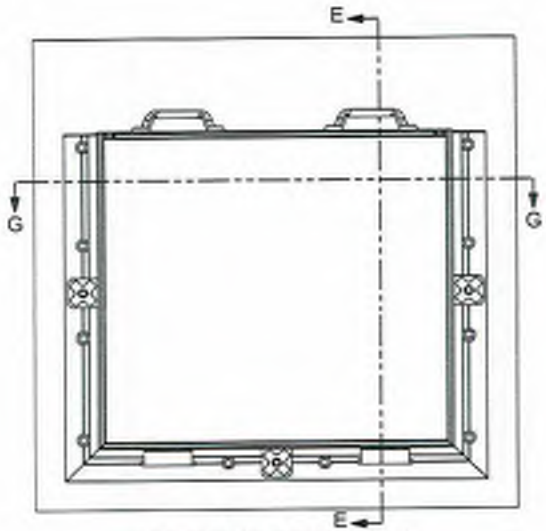
SHEET # 2 OF 3 REV: B



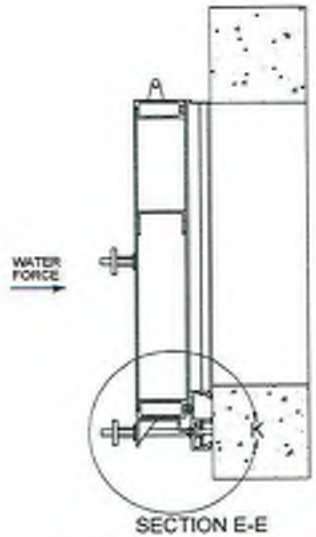
SECTION G-G



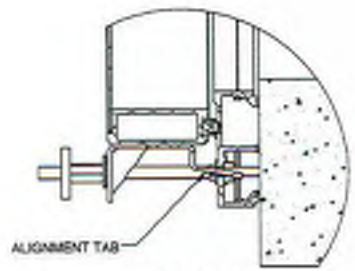
DETAIL H



WETSIDE ELEVATION - CLOSED



SECTION E-E



DETAIL K

APPROXIMATE PANEL WEIGHT: 37.11 LBS

REV	REVISIONS	DATE	REVISED BY	FINISH
2.1	CHANGED ANCHORS FROM KH-EZ TO HIS-RN FOR REMOVABLE JAMB	4/27/16	NJU	MILL FINISH

DOOR/OPENING NAME: FP 3

SHIP TO: SAK ENTERPRISES

SOLD TO: SAK ENTERPRISES

PROJECT NAME: PS 43Q ANNEX

CUST PO #: 31136

SA: 05340707 SALES ORDER # 4003407

DWG STATUS:
APPROVAL DRAWING
SUBMITTAL 3

ESTIMATED PARTIASSY WEIGHT: 64.79 LBS.

DWG #: GEN-05340707

QTY: 1

DATE: 5/11/2016

SCALE: NTS

DWG BY: hueland

CHECKED: /

PS DOORS

1100 48th St. S
GRAND FORKS, ND 58201
PH. 701-746-4319
FAX 701-746-8340

SHEET # 3 OF 3 REV: B

PS DOORS

STATEMENT OF QUALIFICATIONS

STV Incorporated		
☒ No Exceptions Taken	Exp. Proj. Name: P.S. 43Q-Annex	Submittal No. 08112-005A
☐ Make Corrections Noted	Design/LLW No. D016605	Contract No. C000013782
☐ Rejected – Revise and Resubmit	Date Received 6/8/16	Date Returned 6/14/16
☐ Rejected – Not Acceptable for Review	Reviewed By R. Fouad	
Submittal reviewed as: ☒ Per Spec/ Basis of Design ☐ "Or Equal Substitution"/Non-basis of Design ☐ "Alternate Substitution		
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1. INTRODUCTION

Manufacturer Contact: Terry Smith
National Sales Manager
1150 S. 48th Street
Grand Forks, ND 58201
Phone: 701.795.6528
Fax: 701.746.8340
Email: tsmith@psdoors.com

PS DOORS, established in 1974, is an industry leader in design and custom manufacturing of industrial doors, safety products and flood protection barriers. Our focus is on the customer and manufacturing our products to fit the needs of specific applications - ensuring rugged, innovative and safe products.

From start to finish, each design is built the PS DOORS way. Utilizing our certified welders, engineers, 3-D CAD design and fully integrated ERP manufacturing software, we pride ourselves on providing solutions.

PS DOORS has developed relationships with specialty suppliers and services which allows us to capitalize on economies of scale and control lead times. This advantage allows us to manufacture products efficiently and economically for our customers. We perform in-house engineering functions and verify critical designs through a third party engineering review process.

Located in Grand Forks, North Dakota, PS DOORS is capable of supplying products to companies all over the world. Our in-house salespeople and a network of distributors throughout the United States and Canada are capable of assisting customers with their needs.

PS DOORS began manufacturing industrial doors for high pressure applications in the late 1970's, as our company continued to grow we added engineered safety and fall protection products. In the early 1980's, PS DOORS was asked to design a water-tight flood protection barrier for a local lift station. We applied our knowledge of custom manufacturing and rugged design to develop the Lift-Out Flood Barrier. As our customer base grew, PS DOORS began designing and manufacturing flood barriers to protect facilities, critical infrastructure, and assets from devastating flooding. Today PS DOORS manufacturers eleven different base models of flood protection barriers, with multiple variations of each model. Our Pedestrian Flood Door (Model PD-520) and Flood Plank (Model FP-530FM) have undergone third party testing and certification to carry the FM APPROVED Label, the National Flood Barrier Testing & Certification classification.

Below is a sample list of customers PS DOORS has provided flood protection products to;

- NASA, Johnson Space Center, Houston, TX
- Con Edison, Long Island, NY
- School Construction Authority, New York, NY
- Florida Power & Light, FL
- Baylor College of Medicine, Houston, LA
- Miller Coors, Golden, CO
- Department of Homeland Security, Mobile, AL
- Beaumont Health, Grosse Point, MI
- National Archives, Washington, D.C.
- General Mills, Minneapolis, MN
- NYC Sanitation, New York, NY
- Port Authority of NY & NJ, Harrison, NJ
- UMass Memorial Health, Worcester, MA
- United Nations, New York, NY
- Bear Valley Water District, Vallecito, CA
- Bosch Security, Lincoln, NE

2. QULAITY PROCEDURES

PS DOORS is an ISO 9001:2008 Quality Management Certified Company. Certificate and Quality Manual are attached.

3. MANUFACTURER'S QUALIFICATION

- Over 20 years of experience with flood barriers
- 100,000 square foot manufacturing facility.
- 125 Employees
- Certified Welders
- ISO 9001:2008 Quality Management System Certified
- "FM Approved" listed Products per FM 2510 & ANSI 2510 Standards
- A North Dakota Corporation

4. ENGINEERING STANDARDS

PS DOORS engineers its flood protection products in accordance with the International Building Code (IBC) and its referenced standards. Most state and local jurisdictions have adopted and enforce the IBC, and it is heavily referenced by FEMA and the National Flood Insurance Program (NFIP).

5. SUPPORTING DOCUMENTATION & RESOURCES

Additional product detail and information is available on our website at www.psdoors.com or www.flooddoors.com.

6. CONCLUSION

PS DOORS is a leading manufacturer of flood protection products in the United States. All products are 100 percent Made in the USA. We have a full line of flood protection barriers for virtually any flood protection situation necessary and are fully capable of customizing for our customers specific needs.

PS DOORS appreciates your review, consideration and comments. We look forward to answering any questions you may have.

G. A. Fleet Associates, Inc.

G.A. Fleet Assoc., Inc.
P. O. Box 616
Harrison, NY 10528
(914) 835 - 4000
Fax (914) 835 - 1331

Fleet Pump & Service
(914) 835 - 3801
Fax (914) 835 - 2946

Important:
- Drawings are not to scale, use dimensions shown.
- Do not fix foundation bolts rigidly until equipment is in place, since castings vary slightly in dimensions.
- Seismic restraints and or calculations are not provided unless specifically noted below.

Sold To: Varsity Plumbing & Heating Inc.
31-99 123rd Street
Flushing NY 11354

Ship To: Varsity Plumbing & Heating Inc.
C/O PS 43Q – 12 Marvin Street
(Contractor to Confirm)

Engineer: STV Engineers **Date:** 5/11/15 **Customer Order No.** C51109

portable / deployable

System: Duplex Sump Pump **Fleet Order No.**

Marks: PS 43Q – 12 Marvin Street **Sheet:** 1 **Of:** 1 **By:** RMD

Salesperson: Matt Pagano

QTY	DESCRIPTION
	DUPLEX SUMP PUMP SYSTEM – FLOOR MOUNTED NO PERMANENT INSTALLATION
	portable / deployable
2 -	Flygt Model KS-2630 totally submersible floor-mounted sump pumps each rated for 460 GPM at 20' TDH with 5.9 HP, 200/3/60, submersible motors. Each pump furnished with low suction pump-down collar.
1 -	Duplex UL508 control panel with: 2-circuit breaker disconnect switches, 2-magnetic across-the-line type starters with thermal overload protection, 2-control circuit transformers (120 volt and 24 volt) fused on both the primary and secondary sides with individual power available lights, 1-Revere FW-M (FleetWay-Mini) Logic Controller with system status (wet well level & temperature, pump operation, elapsed run time, PAL alternation, Flush-Cleanse and alarms) and adjustment by means of graphical HMI color touch screen, 1-redundant electro-mechanical level control circuit, 2-HOA selector switches, 2-pump run lights, 1-common audio visual alarm with silencing push-button and individual Form "C" ((1-NO, 1-NC) auxiliary alarm contacts for: high level, back-up active / back-up high level, power available and common. All components mounted and prewired in a NEMA-4 enclosure. Panel is field adaptable for either a single common or individual pump power feeds and includes automatic control power transfer relay circuit.
1-	Sets of low pumpdown level controls including: submersible liquid level transducer, 316 stainless steel, 4-20mA; back-up electrode probes, stainless steel, low voltage; factory packaged assembly with wall mounting bracket. Field adjustable lead / lag pump control capable of lead pump start at 2-1/2", stop at 1/4"-1/2", or higher.
1 -	Duplex Subrig factory prepiped assembly consisting of: (2) seamless galvanized steel schedule 40 discharge pipes (2) check valves (2) gate valves (1) galvanized steel true-Y

NOTES:
- Control wiring by others.
- All valves and discharge piping by contractor.
- Auto-dialer by others.

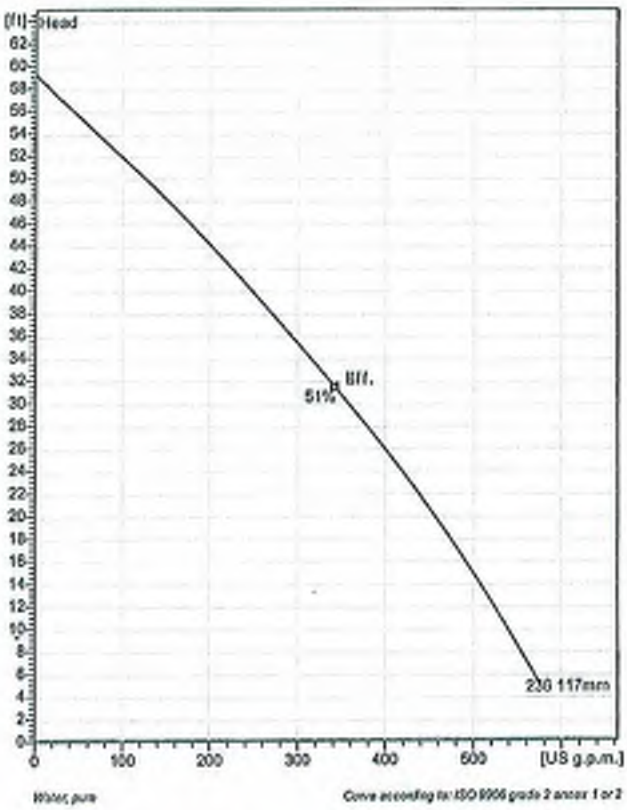
ENGINEER PLEASE CONFIRM / ADVISE: Panel power feed arrangement
Contractor Please schedule equipment start-up two (2) weeks in advance, call Julia French 914381-7921.

xylem
Let's Solve Water

KS 2630 MT 3~ 236

Technical specification

FLYGT



Installation: S - Portable Semi permanent, Wet

Note: Picture might not correspond to the current configuration.

General
Portable pumps ideal for applications in which the water or liquid contains concentrations of abrasives when clogging problems can occur

Impeller

Impeller material	Hard-Iron ™
Discharge Flange Diameter	3 15/16 inch
Suction Flange Diameter	100 mm
Impeller diameter	117 mm
Number of blades	2

Motor

Motor #	K2630.181 15-12-2BB-W 5.9hp
Stator variant	7
Frequency	60 Hz
Rated voltage	200 V
Number of poles	2
Phases	3~
Rated power	5.9 hp
Rated current	17 A
Starting current	127 A
Rated speed	3476 rpm
Power factor	
1/1 Load	0.86
3/4 Load	0.83
1/2 Load	0.71
Efficiency	
1/1 Load	85.5 %
3/4 Load	86.6 %
1/2 Load	86.2 %

Configuration

Project	Project ID	Created by	Created on	Last update
Duplex Sump	PS 43Q - 12 Marvin Street		2015-05-11	2015-05-11

xylem
Let's Solve Water

KS 2630 MT 3~ 236

FLYGT

Performance curve

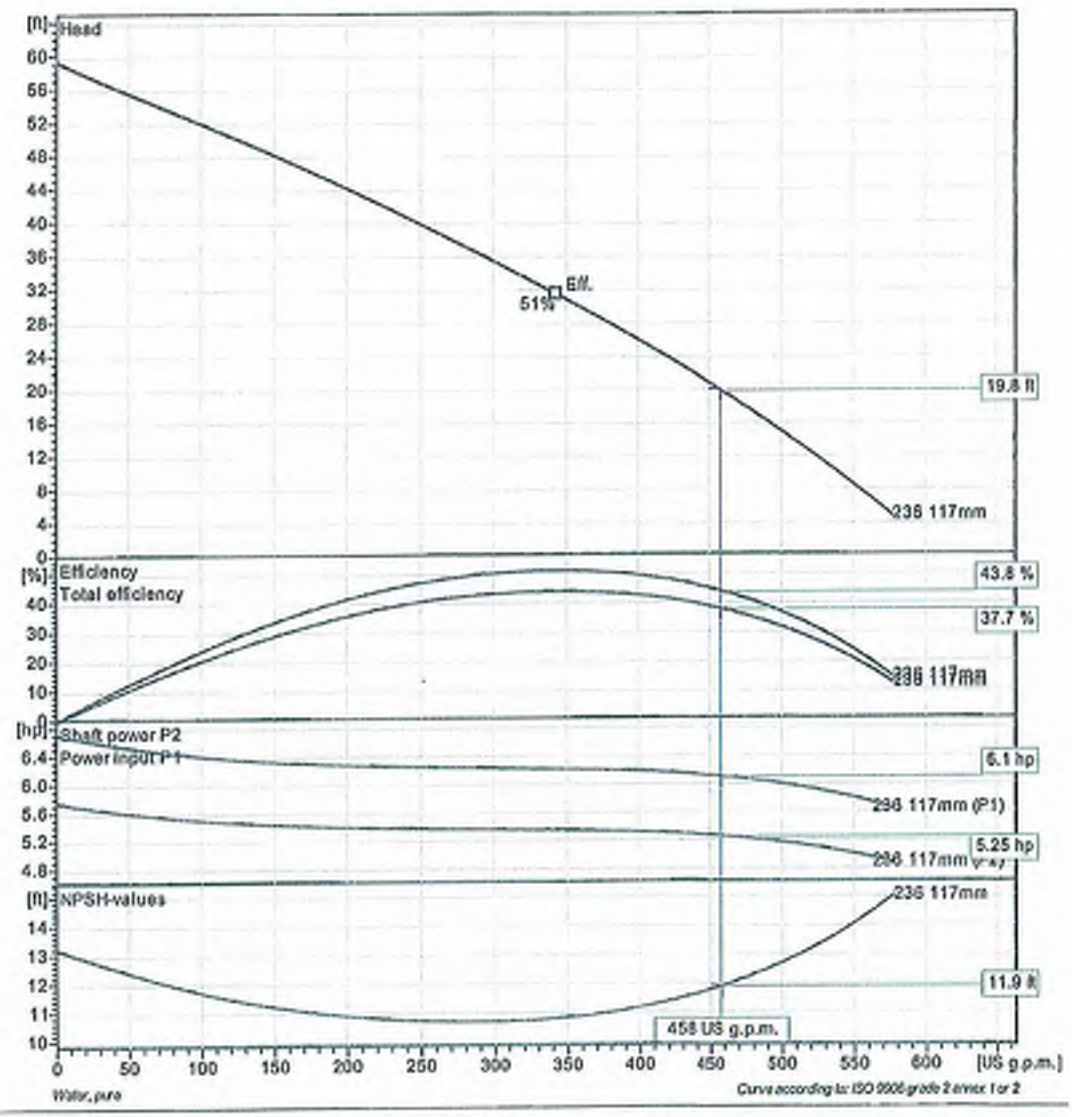
Pump

Discharge Flange Diameter	3 15/16 inch
Suction Flange Diameter	100 mm
Impeller diameter	4¾"
Number of blades	2

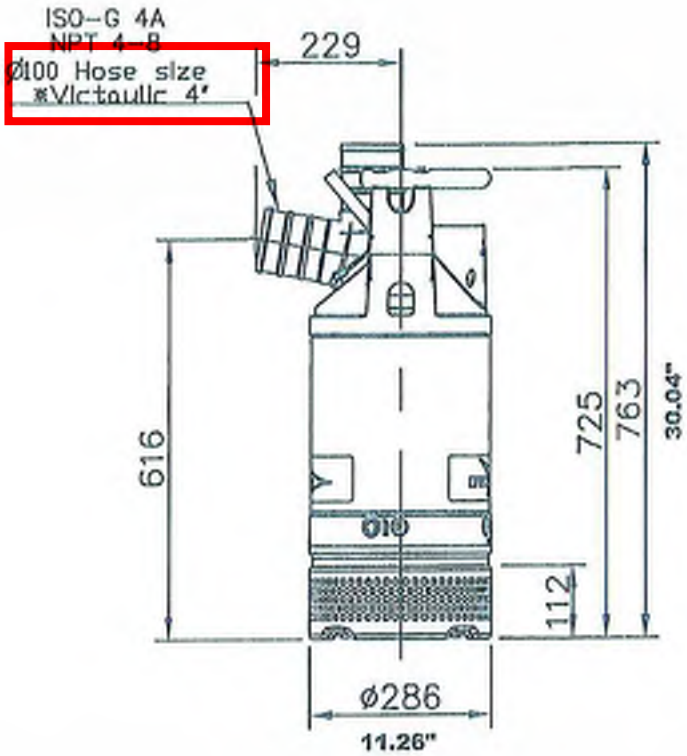
Motor

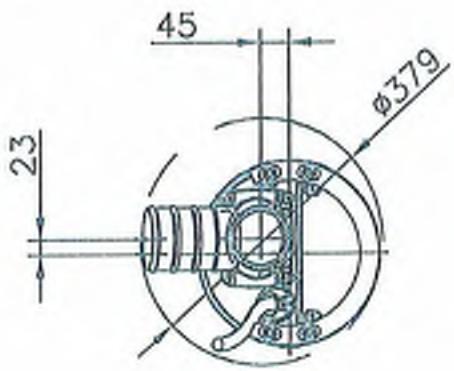
Motor #	K2630.181 15-12-288-W 5.9hp
Stator variant	7
Frequency	60 Hz
Rated voltage	200 V
Number of poles	2
Phases	3~
Rated power	5.9 hp
Rated current	17 A
Starting current	127 A
Rated speed	3475 rpm

Power factor	
1/1 Load	0.88
3/4 Load	0.83
1/2 Load	0.71
Efficiency	
1/1 Load	85.5 %
3/4 Load	86.6 %
1/2 Load	86.2 %



Project	Project ID	Created by	Created on	Last update
Duplex Sump	PS 43Q - 12 Marvin Street		2015-05-11	2015-05-11





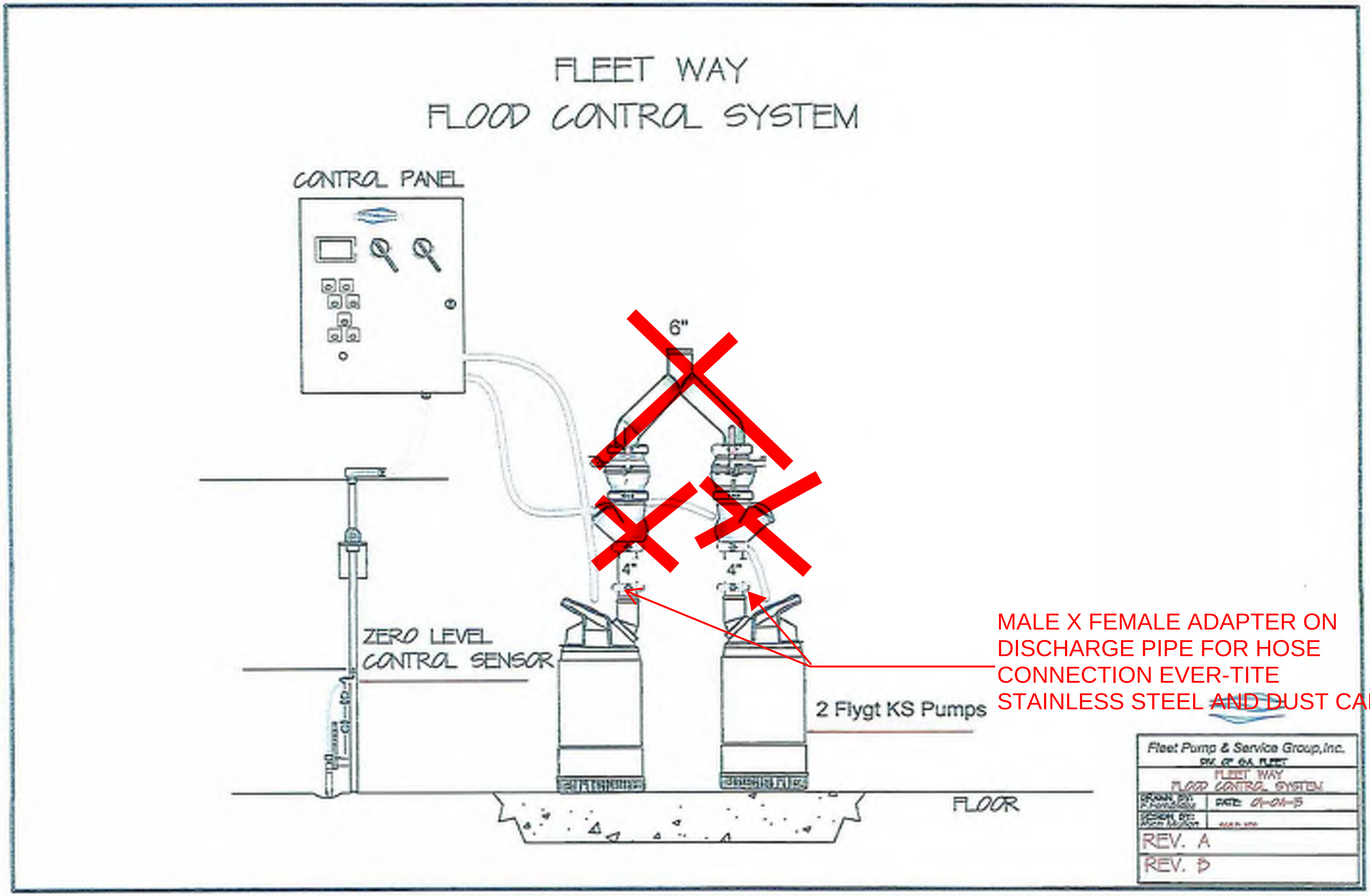
*Designed for "Victaulic Coupling, according to ANSI/AWWA C606-97

SCREEN OPENING Ø 10

Weight (kg)
Pump
48

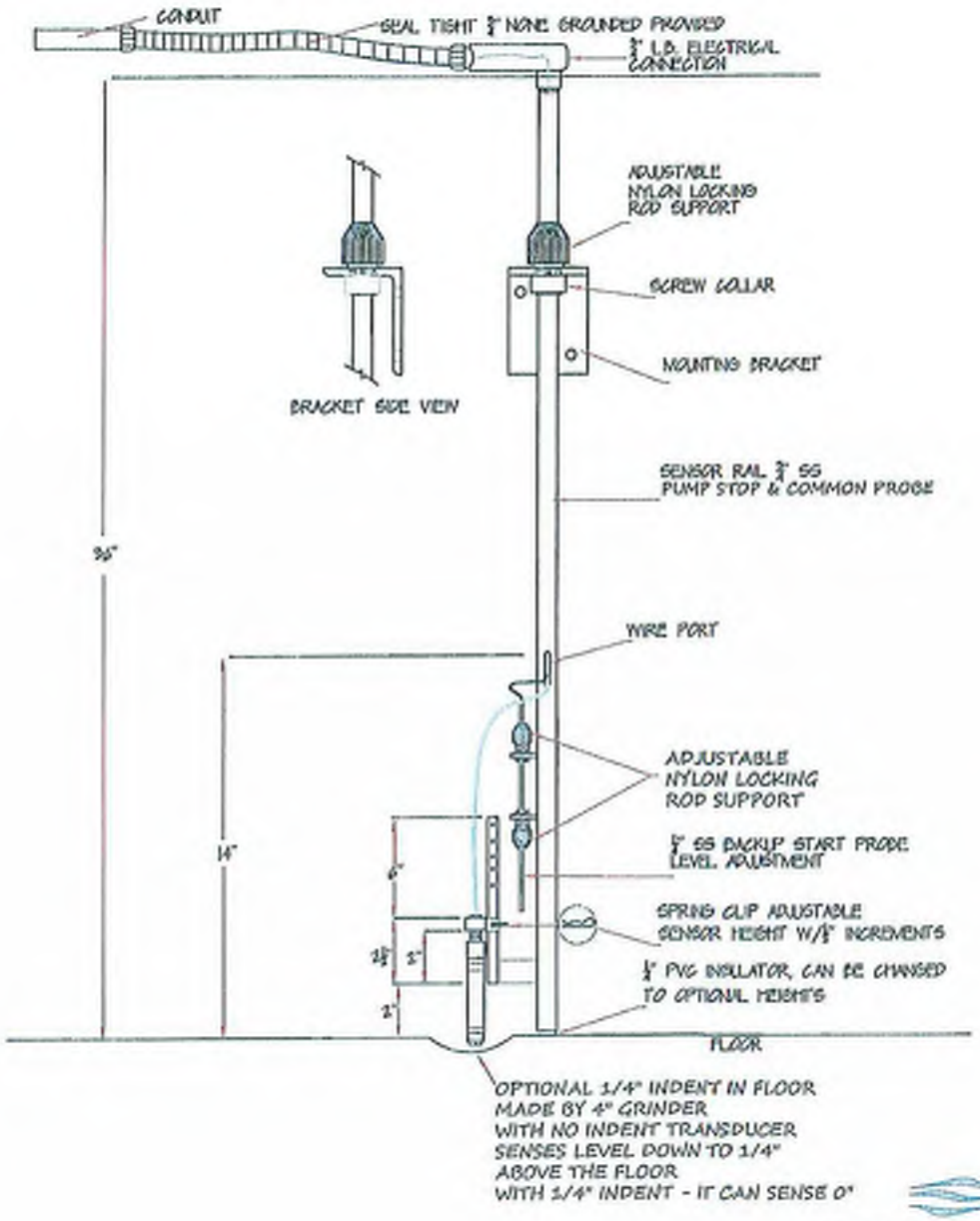
AUTOCAD DRAWING	Description: Dimensional drwg BS,KS 2630.181 MT ISO-G 4A	Drawn by: IW / Checked by:	Date: 121211
		Scale: 1:10	Dwg no: 5399
		7811300	0

ISO-metric


FLEET WAY
FLOOD CONTROL SYSTEM
CONTROL PANEL
6"
4"
4"
ZERO LEVEL
CONTROL SENSOR
MALE X FEMALE ADAPTER ON
DISCHARGE PIPE FOR HOSE
CONNECTION EVER-TITE
STAINLESS STEEL AND DUST CAP
2 Flygt KS Pumps
FLOOR
Fleet Pump & Service Group, Inc.
FLEET WAY
FLOOD CONTROL SYSTEM
DATE: 01-04-15
REV. A
REV. B

ZERO INCH LEVEL SENSOR
WITH BACKUP ASSEMBLY

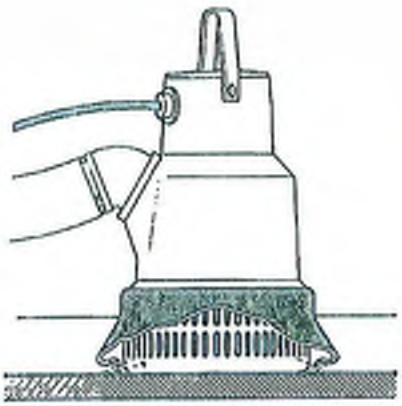
ALL ITEMS PROVIDED
AS SHOWN EXCEPT CONDUIT

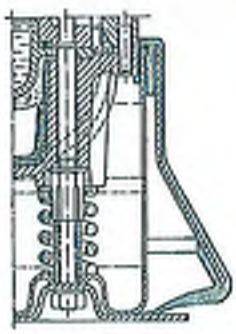


Fleet Pump & Service Group,Inc.
FLEETPAK ZERO LEVEL FLOOR SENSOR
DRAWN BY:	DATE: 03-16-15
DESIGN BY:	SHEET #'S
REV. A
REV. B

Submersible Low-Suction Pumping
(Drains down to floor level)

Accessories





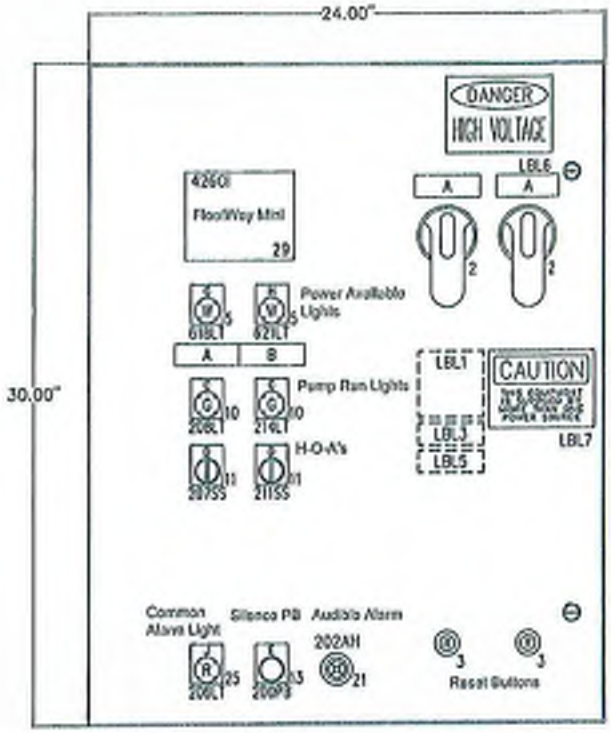
Pump Down Collar for the BS-2102 is shown here. This version simply requires that the strainer be removed, collar placed in position, strainer with collar reinstalled and bottom plate added.

Low Suction Collars for:
Available with Ready 4 & 8 up through KS/BS 2640
Xylem GSP05 - 20

In general, a drainage pump, unless installed in a specially built sump, cannot pump down to floor level. This means that a great deal of water is left on the floor, as would be the case in cellar drainage.

Flygt has several submersible drainage pumps which can be fitted with a rubber pump down collar to insure pump down to floor level. With a reasonably level floor, only a thin film of water will remain.

The rubber collar prevents the pump from sucking air until pumping is finished, at which point it acts as a check valve.



FRONT DOOR LAYOUT
(8" DEEP)

Submittal Drawings - refer to "As-Built" Drawings, inside the panel, for field coordination & installation.

REV.	DESCRIPTION	DATE	BY
1	SUBMITTAL	03/23/15	JEC

FLEETWAY

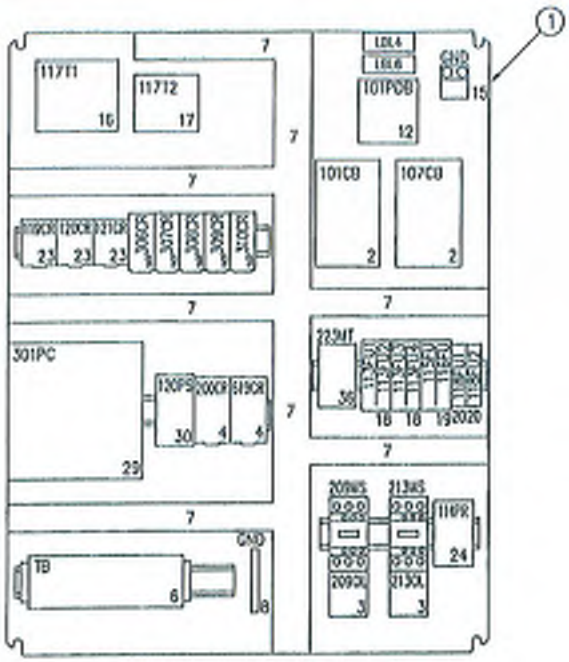
DUPLEX CONTROL PANEL
PANEL LAYOUT

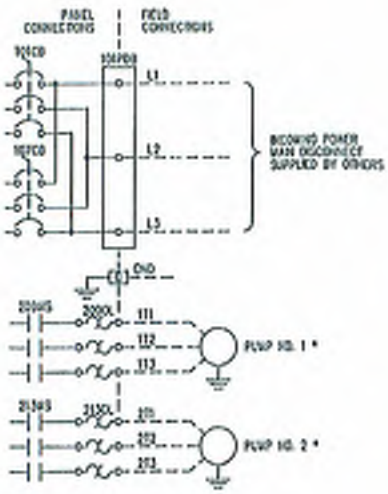
DRAWN BY: JEC	DATE: 3/23/15	P.O.#: PENDING	SHEET
CHECKED BY: RBS	SCALE: 1/8"=1"	RCS: TBD	1/9

G.A. Fleet Associates, Inc.
455 KNOLLWOOD ROAD
WHITE PLAINS, NY 10603

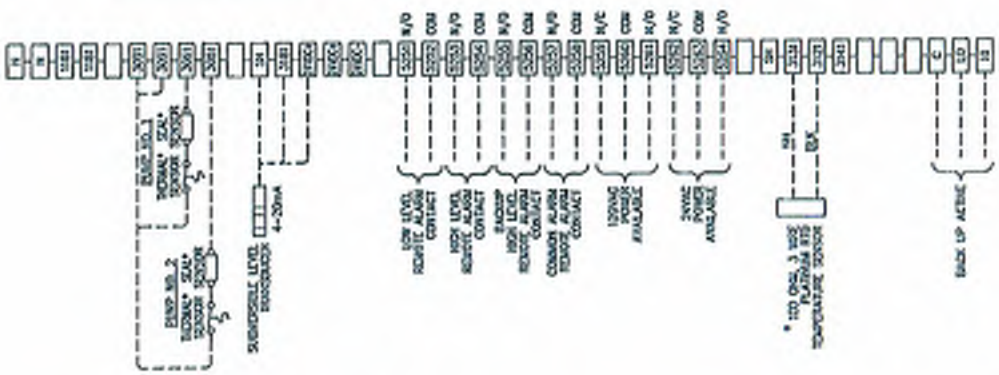
c UL us
MANUFACTURED BY
REVERE CONTROL SYSTEMS, INC.
BIRMINGHAM, AL

Control Panel shall be configured for two individual power feeds.





SUBPANEL LAYOUT



Submittal Drawings - refer to "As-Built" Drawings, inside the panel, for field coordination & installation.

LEGEND:

XXXX	DENOTES A TERMINAL BLOCK POINT
*	DENOTES ITEM REMOTE FROM CONTROL PANEL
- - -	DENOTES WIRING EXTERNAL TO CONTROL PANEL

(1)-PER PHASE

(2)-FOR CORRECT WIRE SIZING, REFER TO THE NATIONAL ELECTRICAL CODE, NFPA 70

WIRE SIZE CU/AL - LINE TERMINALS (1)(2)

TOTAL CONNECTED LOAD	VOLTAGE
	480 OR 208
TBD	#12 AWG

TERMINAL TYPE	WIRE SIZE	TIGHTENING TORQUE
TERMINAL TIGHTENING TORQUE # 9080LOA362104		
POWER TERMINALS TERMINALS	#6-2/0AWG #8AWG #14-10AWG	120 LB.INS. 40 LB.INS. 35 LB.INS.
TERMINAL TIGHTENING TORQUE # 1020080000		
CONTROL AND ALARM TERMINALS	#24-10AWG	9.0 LB.INS.

G.A. Fleet Associates, Inc.
455 HOLLYWOOD ROAD
WHITE PLAINS, NY 10603

c UL us
MANUFACTURED BY
REVERE CONTROL SYSTEMS, INC.
BIRMINGHAM, AL

REV.	DESCRIPTION	DATE	BY
1	SUBMITTAL	03/23/15	JEC

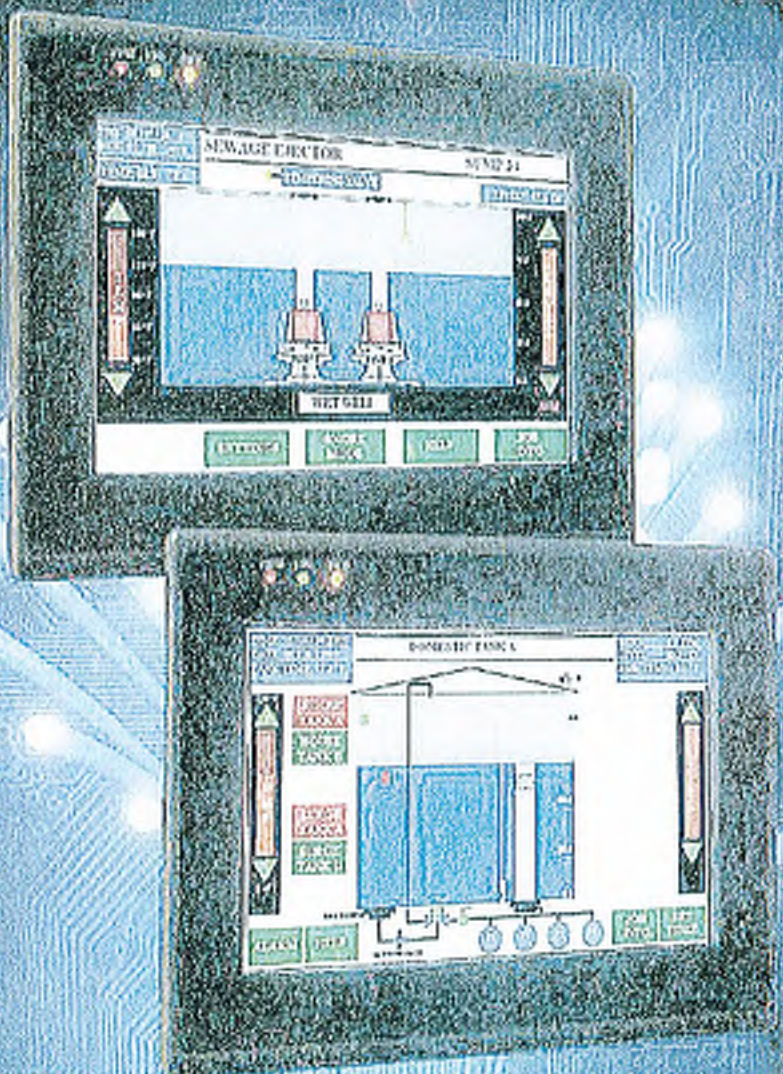
FLEETWAY

DUPLEX CONTROL PANEL
SUBANEL LAYOUT

DRAWN BY: JEC	DATE: 03/23/15	P.O.#: PENDING	SHEET
CHECKED BY: RBS	SCALE: 1/8"=1"	RCS: TBD	2/9

Fleetway™

Water Systems Controller

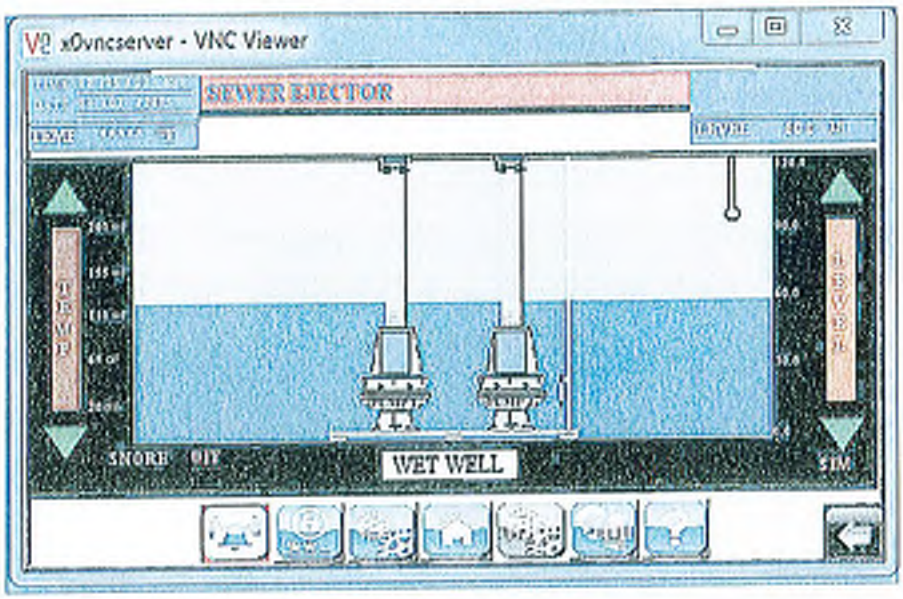


Revere Control Systems

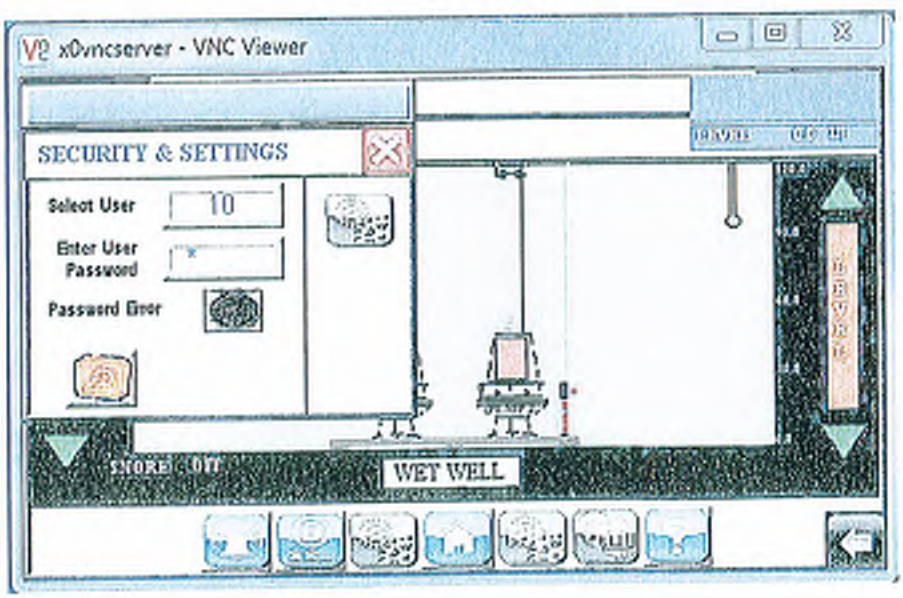
ENGINEERED TO SERVE

FLEETWAY SAMPLE SCREEN SHOTS

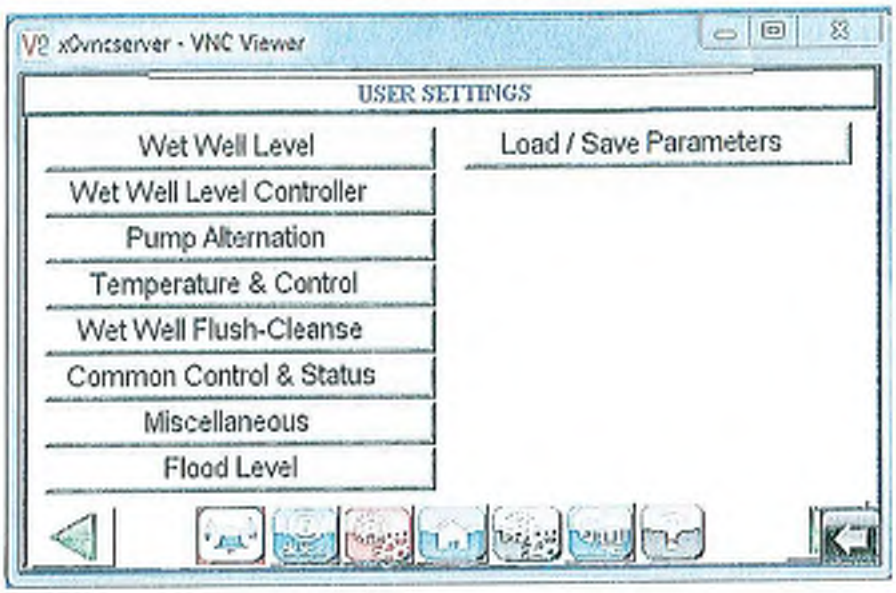
COLOR TOUCHSCREEN WITH GRAPHICAL DISPLAY



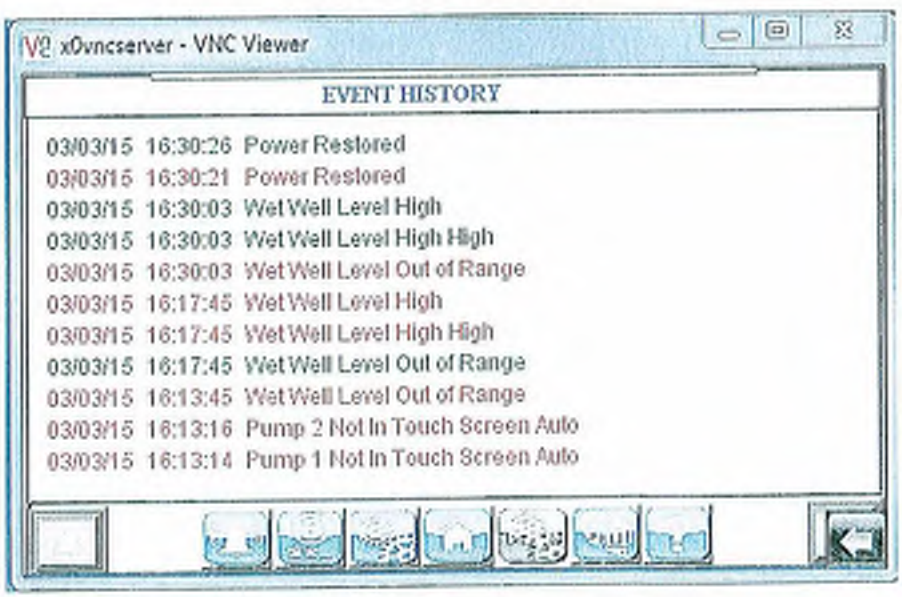
PASSWORD PROTECTION



INTUITIVE SYSTEM SETTINGS



DATA LOGGED EVENT HISTORY



Submersible Pressure Transmitter for Level Measurement
Model LS-10, standard version
Model LH-10, High Performance

WIKA Data Sheet PE 81.09

Applications

- Areas of application are e. g. hydrostatic level measurement in tanks, rivers, drinking water manholes, bore holes and waste water plants.

Special Features

- Pressure ranges from 0 ... 1 mH_2O to 0 ... 250 mH_2O
- Temperature measurement with integrated Pt 100 - element, 4-wire
- Surge protection (lightning protection)
- Maximum tensile strength of the cable 1000 N
- For aggressive media FEP-cable

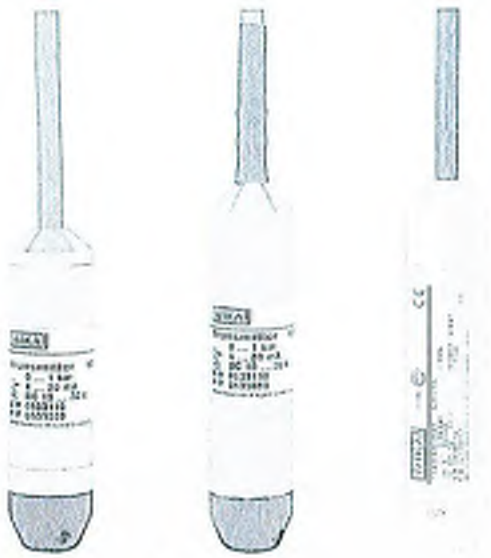


Fig. left Level Probe LS-10
Fig. center Level Probe LH-10
Fig. right Level Probe LH-10 in Hastelloy

Description

Simple measuring tasks

The level probe model LS-10 has been designed for simple, inexpensive level measurements with values you can count on. The output signal is 4 ... 20 mA with an accuracy of 0.5%. The level probe can be operated in water up to a maximum of 100 m depth with an ingress protection of IP 68.

Special demands

With an accuracy better than 0.25 %, the High Performance Level Probe model LH-10 also offers several special options such as temperature measurement, lightning protection and special output signals.
It provides a signal output of 0.5 ... 4.5 V, 3-wire with a current consumption of approx. 2 mA only. For a mains independent service in the field, with batteries, the level probe can be manufactured to operate with a supply voltage of 5 DC V.

The maximum immersion depth of the LH-10 into water is 300 m with an ingress protection of IP 68.

An important advantage of this level transmitter is the longitudinal water resistance, supplied as standard, which guarantees that liquid cannot get into the transmitter even if the cable is damaged. In the case of cable damage, the transmitter will remain completely functional and only the cable needs to be exchanged.

Both probes offer a hermetically sealed, durable stainless steel case.

For hydrostatic pressure measurement the pressure compensation towards the atmosphere is done via the internally vented cable.

Level Probe Intrinsic safe Model IL-10 see data sheet PE 81.23

Specifications		Model LS-10 / LH-10												
Pressure ranges														
➢ LS-10 / (LH-10 with FEP cable)	bar [1]	0.25	0.4	0.6	1	1.6	2.5	4	6	10				
Over pressure safety	bar [1]	2	2	4	5	10	10	10	10	10				
Burst pressure	bar [1]	2.4	2.4	4.8	6	12	12	12	12	12				
Pressure ranges ➢ LH-10	bar [1]	0.1	0.16	0.25	0.4	0.6	1	1.6	2.5	4	6	10	16	25
Over pressure safety	bar [1]	1	1.5	2	2	4	5	10	10	17	35	35	35	35
Burst pressure	bar [1]	2	2	2.4	2.4	4.8	6	12	12	20.5	42	42	42	42

[1] 1 bar = 10.2 mH$_2$O

		Model LS-10	Model LH-10
Materials			
:: Wetted parts		Stainless steel	Stainless steel (Hastelloy)
:: Pressure connection/ flush diaphragm		Stainless steel	Stainless steel (Hastelloy)
:: Protection cap		PA	PA (Stainless steel) (Hastelloy)
:: Cable		PUR	PUR (FEP)
Power supply U_B	U_B in DC V	10 < U_B ≤ 30	10 < U_B ≤ 30 (14 ... 30 with signal output 0 ... 10 V) (5 ... 30 with battery operation, signal output 0.5 ... 4.5 V)
Signal output		4 ... 20 mA, 2-wire	4 ... 20 mA, 2-wire 0 ... 20 mA, 3-wire (0 ... 5 V, 3-wire) (0 ... 10 V, 3-wire) (0.5 ... 4.5 V, 3-wire with battery operation) [2] (Pt 100, 4-wire; IEC 60751)

[2] For pressure ranges ≥ 0 ... 0.25 bar

Pt 100 ➢ only model LH-10			
:: I max	mA		3
:: I meas	mA		1
Maximum load R_A	R_A in Ohm		
:: Current signal output	U_B in DC V	R_A < (U_B - 10 V) / 0.02 A – (0.14 Ohm x cable length in m)	
:: Voltage signal output		-	R_A > 100 kOhm
Dielectric strength	DC V	500 [3]	500 [3]

[3] NEC Class 02 power supply (low voltage and low current max. 100 VA even under fault conditions)

Accuracy	% of span	≤ 0.25 (BFSL)	≤ 0.125 (BFSL)
	% of span	≤ 0.5 [4]	≤ 0.25 [4]

[4] Including non-linearity, hysteresis, non-repeatability, zero point and full scale error (corresponds to error of measurement per IEC 61298-2). Adjusted in vertical mounting position with lower pressure connection.

Non-linearity	% of span	≤ 0.2 (BFSL) according to IEC 61298-2	
1-year stability	% of span	≤ 0.2 (at reference conditions)	≤ 0.2 (at reference conditions)
Permissible temperature of			
:: Medium [5]		-10 ... +50 °C | +14 ... +122 °F	-10 ... +50 °C | +14 ... +122 °F (-10 ... +85 °C with option FEP-cable) (+14 ... +185 °F with option FEP-cable)
:: Storage [5]		-30 ... +80 °C | -22 ... +176 °F	-30 ... +80 °C | -22 ... +176 °F
Compensated temp. range		0 ... +50 °C | +32 ... +122 °F	0 ... +50 °C | +32 ... +122 °F
Temperature coefficient within compensated temp range			
:: Mean TC of zero	% of span	≤ 0.2 / 10 K (< 0.4 for pressure range 0 ... 0.1 and 0 ... 0.16 bar)	
:: Mean TC of range	% of span	≤ 0.2 / 10 K	≤ 0.2 / 10 K
CE-conformity		89/336/EWG interference emission and immunity see EN 61 326 Interference emission limit class A and B	
Wiring protection		Protected against reverse polarity, overvoltage and short circuiting on the instrument side	(Lightning protection EN 61000-4-5; 1.2/)

[5] Also complies with EN 50178, Tab. 7, Operation (C) 4K4H, Storage (D) 1K4, Transport (E) 2K3

Specifications	Model LS-10 / LH-10		
Mass			
:: Level Probe	kg	Approx. 0.18	Approx. 0.20
:: Cable	kg/m	Approx. 0.08	Approx. 0.08
:: Additional mass	kg	Approx. 0.50	Approx. 0.50

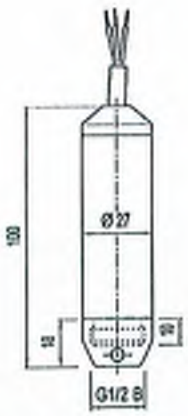
[1] Items in curved brackets are optional extras for additional price.

Dimensions in mm

Ingress Protection IP 68 per IEC 60 529

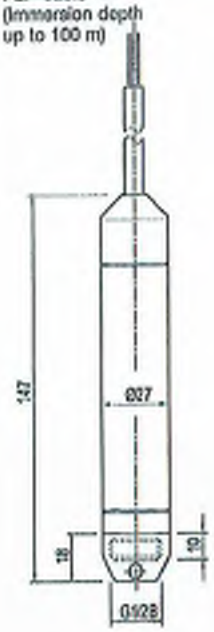
100 mm = 3.937 inch

LS -10
(Immersion depth
up to 100 m)

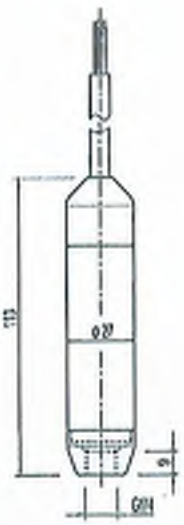


LH-10 with
PUR-cable [1]
(Immersion depth
up to 300 m)

LH-10 with
FEP-cable [1]
(Immersion depth
up to 100 m)



LH-10 with FEP-cable [1]
(Immersion depth
up to 100 m)
(Hastelloy)



[1] FEP-cable and lightning protection EN 61000-4-5: 1.2/ on request

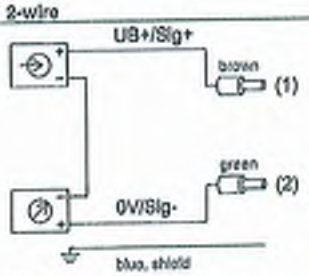
For mounting no additional strain relief required because the cable has a max. tensile strength of 1000 N (500 N with FEP-cable).

For installation and safety instructions see the operating instructions for this product.

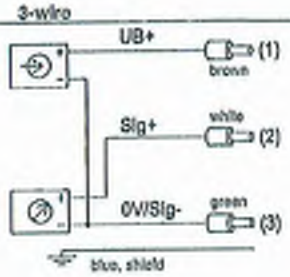
Wiring details

Vented PUR-cable
tensile strength 1000 N
(500 N with FEP-cable)

2-wire

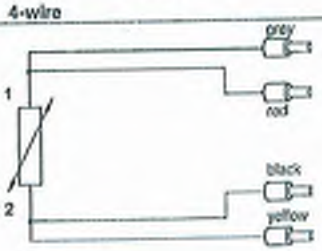


3-wire



Pt 100-element

4-wire



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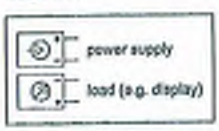

WA-E SERIES ENCLOSURES
NEMA 12 MULTI-DOOR FREESTANDING

WA86M5E

Industry Standards
UL 508, Type 12
CSA Certified, Type 12
NEMA/EEMAC Type 12

UL File E64791

CSA File LL66078

FEATURES-SPECIFICATIONS

Applications
Designed to protect electrical and electronic controls, components, and instruments in typical industrial environments. Enclosure rating protects enclosed equipment from dust, dirt, oil, and dripping water. These enclosures are used in machine tool applications for housing motor starters, drives, contactors, PLC's, as well as a wide variety of other electrical and electronic equipment found in automotive, pulp, and paper, wood products, textile, and similar industries. Select from three, four, and five door options to best meet your application requirements.

Construction
- Bodies and doors fabricated from 10 gauge steel
- Continuously welded seams ground smooth, less holes or knockouts
- Heavy steel stiffeners are welded to enclosure backs maintaining flatness and increasing rigidity
- Heavy duty removable lifting eyes for easy handling are installed
- At two-door openings, the uniquely gasketed, overlapping doors eliminate the need for center posts
- 3 point latching mechanism with padlocking handles hold doors securely shut
- Print pocket and provisions for fluorescent lighting are provided
- Mechanical interlock is standard with right hand door, serving as master door unless otherwise specified. Doors can be closed in any order
- Doors are supported by heavy gauge steel continuous hinges
- Doors are sealed with closed cell neoprene gasket
- Removable 10 gauge back panels and back panel supports are furnished
- Grounding provisions provided

Finish
- ANSI 61 gray polyester powder inside and out over phosphatized surfaces
- Panels are white polyester powder over phoshatized surfaces

Accessories
- See pages J1-J19

WA-E SERIES MULTI-DOOR FREESTANDING ENCLOSURES

CATALOG NUMBER	NO. OF DOORS	BODY/DOOR STEEL GAUGE	ENCLOSURE SIZE H X W X D	BACK PANEL SIZE* A X B		A X B	E	F
WA86M3E	3	10	86.13x112.13x14.13 (2188x2848x359)	(1) 78.00x70.00 (1981x1778)	and	(1) 78.00x34.00 (1981x864)	15.38 (391)	11.94 (303)
WA86M4E	4	10	86.13x149.13x14.13 (2188x3788x359)	(2) 78.00x70.00 (1981x1778)	and	No Panel	15.38 (391)	11.94 (303)
WA86M5E	5	10	86.13x187.13x14.13 (2188x4753x359)	(2) 78.00x70.00 (1981x1778)	and	(1) 78.00x34.00 (1981x864)	15.38 (391)	11.94 (303)
WA86M3E20 •	3	10	86.13x112.13x20.13 (2188x2848x511)	(1) 78.00x70.00 (1981x1778)	and	(1) 78.00x34.00 (1981x864)	21.38 (543)	17.94 (456)
WA86M4E20 •	4	10	86.13x149.13x20.13 (2188x3788x511)	(2) 78.00x70.00 (1981x1778)	and	No Panel	21.38 (543)	17.94 (456)
WA86M5E20 •	5	10	86.13x187.13x20.13 (2188x4753x359)	(2) 78.00x70.00 (1981x1778)	and	(1) 78.00x34.00 (1981x864)	21.38 (543)	17.94 (456)

• NEW PRODUCT IN 2003

*Back panels are furnished with enclosures.

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WA-E SERIES ENCLOSURES
NEMA 12 MULTI-DOOR FREESTANDING

Submit NEMA 4 Enclosure of the same dimensions and multi doors indicated in the Contract Documents.

STV Incorporated

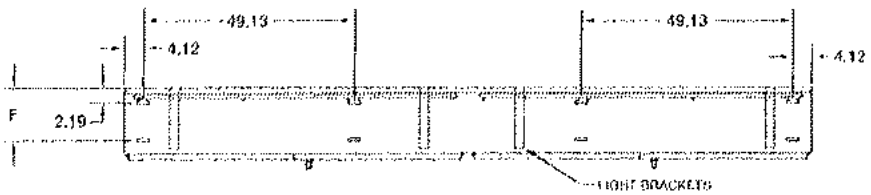
☐ No Exceptions Taken	Exp. Proj. Name: P.S. 43Q-Annex	Submittal No. 16232-002A
☐ Make Corrections Noted	Design/LLW No. D016605	Contract No. C000013782
☒ Rejected – Revise and Resubmit	Date Received 12/30/15	Date Returned 02/02/16
☐ Rejected – Not Acceptable for Review	Reviewed By R. Fouad	

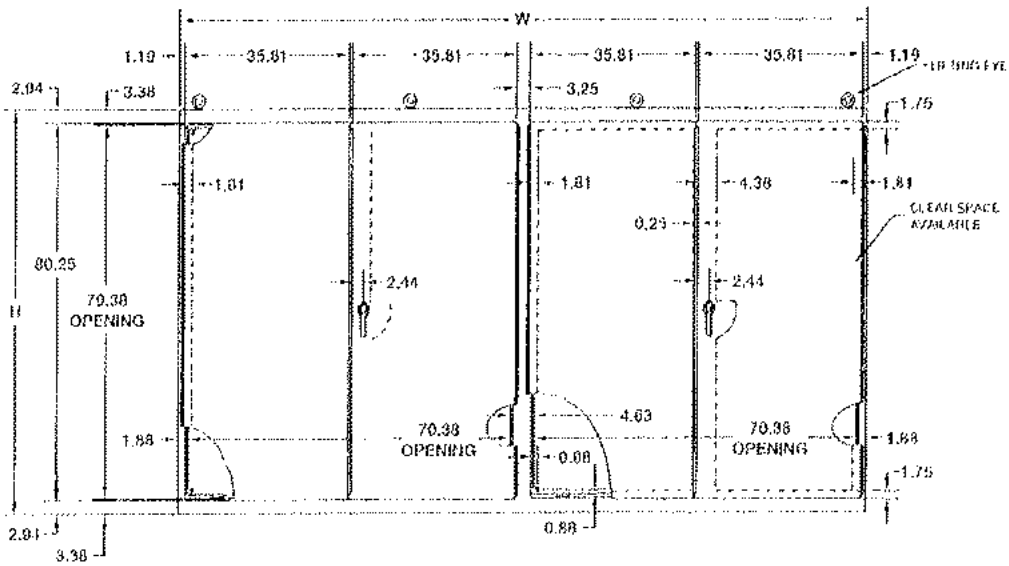
Submittal reviewed as:

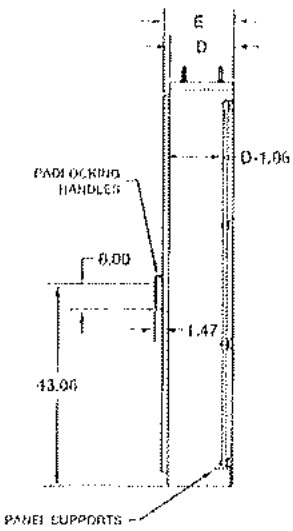
☐ Per Spec/ Basis of Design ☐ "Or Equal Substitution"/Non-basis of Design ☐ "Alternate Substitution

CORRECTIONS OR COMMENTS MADE ON THE SHOP DRAWINGS DURING THIS REVIEW DO NOT RELIEVE CONTRACTOR FROM COMPLIANCE WITH REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS. SHOP DRAWING APPROVAL IS ONLY FOR GENERAL COMPLIANCE WITH THE INFORMATION GIVEN IN THE CONTRACT DOCUMENTS. THE CONTRACTOR IS RESPONSIBLE FOR CONFIRMING AND CORRELATING ALL QUANTITIES AND DIMENSIONS, SELECTING FABRICATION, PROCESSES AND TECHNIQUES OF CONSTRUCTION, COORDINATING THE WORK WITH THAT OF ALL OTHER TRADES AND PERFORMING THE WORK IN A SAFE AND SATISFACTORY MANNER.

4-DOOR







HUBBELL
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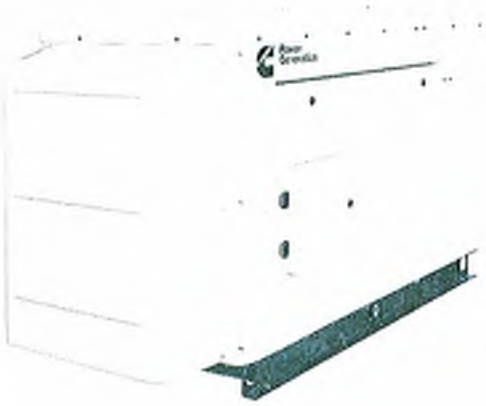
Specification sheet

Spark-ignited generator set

20–40 kW standby
EPA emissions



Description

Cummins Power Generation generator sets are fully integrated power generation systems providing optimum performance, reliability and versatility for stationary standby applications.

Features

Gas engine - Rugged 4-cycle Cummins QSJ2.4 spark-ignited engine delivers reliable power. The electronic air/fuel ratio control provides optimum engine performance and fast response to load changes.

Alternator - Several alternator sizes offer selectable motor starting capability with low reactance 2/3 pitch windings, low waveform distortion with non-linear loads and fault clearing short-circuit capability.

Control system - The PowerCommand® 1.1 electronic control is standard equipment and provides total generator set system integration including automatic remote starting/stopping, precise frequency and voltage regulation, alarm and status message display, output metering, auto-shutdown at fault detection and NFPA 110 Level 1 compliance.

Cooling system - Standard cooling package provides reliable running at up to 50 °C (122 °F) ambient temperature.

Enclosures - The aesthetically appealing enclosure incorporates special designs that deliver one of the quietest generators of its kind. Aluminum material plus durable powder coat paint provides the best anti-corrosion performance. The generator set enclosure has been evaluated to withstand 180 MPH wind loads in accordance with ASCE7-10. The intelligent design has removable panels and service doors to provide easy access for service and maintenance.

NFPA - The generator set accepts full rated load in a single step in accordance with NFPA 110 for Level 1 systems.

Warranty and service - Backed by a comprehensive warranty and worldwide distributor and dealer network.

	Natural Gas		Propane		
	Standby 60 Hz		Standby 60 Hz		Data sheets
Model	kW	kVA	kW	kVA	60 Hz
C20 N6	20	25	20	25	NAD-5693-EN
C25 N6	25	31	25	31	NAD-5695-EN
C30 N6	30	38	30	38	NAD-5696-EN
C36 N6	36	45	36	45	NAD-5697-EN
C40 N6	40	50	40	50	NAD-5698-EN

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Generator set specifications

Governor regulation class	ISO 8528 Part 1 Class G3
Voltage regulation, no load to full load	± 1.0%
Random voltage variation	± 1.0%
Frequency regulation	Isochronous
Random frequency variation	± 0.25% @ 60 Hz
Radio frequency emissions compliance	Meets requirements of most industrial and commercial applications

Engine specifications

Design	Naturally aspirated or turbo charged (varies by generator set model)
Bore	86.5 mm (3.4 in)
Stroke	100.0 mm (3.94 in)
Displacement	2.4 liters (143.5 in^3)
Cylinder block	Cast iron, in-line 4 cylinder
Battery capacity	550 amps at ambient temperature of 0 °F to 32 °F (-18 °C to 0 °C)
Battery charging alternator	50 amps
Starting voltage	12 volt, negative ground
Lube oil filter type(s)	Spin-on with relief valve
Standard cooling system	50 °C (122 °F) ambient cooling system
Rated speed	1800 rpm

Alternator specifications

Design	Brushless, 4 pole, drip proof, revolving field
Stator	2/3 pitch
Rotor	Direct coupled, flexible disc
Insulation system	Class H per NEMA MG1-1.65
Standard temperature rise	120 °C (248 °F) standby
Exciter type	Torque match (shunt) with PMG/EBS as option
Alternator cooling	Direct drive centrifugal blower
AC waveform total harmonic distortion	< 5% no load to full linear load, < 3% for any single harmonic
Telephone influence factor (TIF)	< 50 per NEMA MG1-22.43
Telephone harmonic factor (THF)	3%

Available voltages

1-phase	3-phase			
• 120/240	• 120/208	• 120/240 delta	• 277/480	• 347/600

Generator set options

Fuel system
- ☑ Single fuel - natural gas ~~or propane vapor, field selectable~~
- ☐ Dual fuel – natural gas and propane vapor auto changeover
- ☐ Low fuel gas pressure warning

Engine
- ☑ Engine air cleaner – normal ~~or heavy~~ duty
- ☐ Shut down – low oil pressure
- ☑ Extension – oil drain

Alternator
- ☐ 120 °C (248 °F) temperature rise alternator
- ☑ 105 °C (221 °F) temperature rise alternator
- ☑ Excitation boost system (EBS) ~~or PMG~~
- ☐ Alternator heater, 120V

Control
- ☐ AC output analog meters (bargraph)
- ☑ Stop switch – emergency
- ☐ Auxiliary output relays (2)
- ☐ Auxiliary configurable signal inputs (8) and relay outputs (8)

Electrical
- ☐ Single circuit breaker
- ☐ Dual circuit breakers
- ☐ 80% rated circuit breakers
- ☑ 100% rated circuit breakers

Enclosure
- ☑ Aluminum enclosure Sound Level 1 ~~enclosure~~, with muffler installed, ~~sandstone or~~ green color
- ☐ Open set

Cooling system
- ☑ Shutdown – low coolant level
- ☐ Warning – low coolant level
- ☑ Extension – coolant drain
- ☑ Coolant heater, 1Ph, 120V

Exhaust system
- ☐ Exhaust connector NPT

Generator set application
- ☐ Base barrier – elevated generator set
- ☑ Battery rack
- ☐ Battery rack, larger battery
- ☐ Radiator outlet duct adapter

Warranty
- ☑ Base warranty – 2 year, 400 hour, standby
- ☐ Standby, 3 year, 900 hour, parts
- ☐ Standby, 5 year, 1500 hour, parts
- ☐ Standby, 3 year, 900 hour, parts and labor
- ☐ Standby, 5 year, 1500 hour, parts and labor
- ☐ Standby, 3 year, 900 hour, parts, labor and travel
- ☐ Standby, 5 year, 1500 hour, parts, labor and travel

Note: Some options may not be available on all models - consult factory for availability.

Generator set accessories

- ☐ Coolant heater – 1Ph, 120V
- ☐ Extreme cold weather components
- ☐ HMI211RS in-home display, including pre-configured 12" harness
- ☐ HMI211 remote display, including pre-configured 12" harness
- ☐ HMI220 remote display
- ☑ Auxiliary output relays (2)
- ☐ Auxiliary configurable signal inputs (8) and relay outputs (8)
- ☑ Annunciator – RS485
- ☐ Remote monitoring device – PowerCommand 500
- ☑ Battery charger – stand-alone, 12V
- ☐ Circuit breakers
- ☐ Enclosure Sound Level 1 to Sound Level 2 upgrade kit
- ☐ Enclosure paint touch up kit
- ☐ Base barrier – elevated generator set
- ☐ Mufflers – industrial, residential or critical
- ☐ Alternator excitation boost system (EBS) or PMG
- ☐ Alternator heater
- ☐ Maintenance and service kit
- ☐ Engine lift kit

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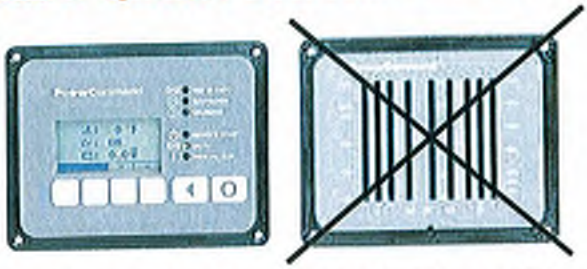
 | NAS-5692c-EN (10/14)

Control system PowerCommand 1.1



PowerCommand control is an integrated generator set control system providing voltage regulation, engine protection, operator interface and isochronous governing (optional). Major features include:

- Battery monitoring and testing features and smart starting control system.
- Standard PCCNet interface to devices such as remote annunciator for NFPA 110 applications.
- Control boards potted for environmental protection.
- Control suitable for operation in ambient temperatures from -40 °C to +70 °C (-40 °F to +158 °F) and altitudes to 5000 meters (13,000 feet).
- Prototype tested; UL, CSA, and CE compliant.
- InPower™ PC-based service tool available for detailed diagnostics.

Operator/display panel

- Manual off switch
- Alpha-numeric display with pushbutton access for viewing engine and alternator data and providing setup, controls and adjustments (English or international symbols)
- LED lamps indicating generator set running, not in auto, common warning, common shutdown, manual run mode and remote start
- Suitable for operation in ambient temperatures from -40 °C to +70 °C
- Bargraph display (optional)

AC protection

- Over current warning and shutdown
- Over and under voltage shutdown
- Over and under frequency shutdown
- Over excitation (loss of sensing) fault
- Field overload

Engine protection

- Overspeed shutdown
- Low oil pressure warning and shutdown
- High coolant temperature warning and shutdown
- Low coolant level warning or shutdown
- Low coolant temperature warning
- High, low and weak battery voltage warning
- Fail to start (overcrank) shutdown
- Fail to crank shutdown
- Redundant start disconnect
- Cranking lockout
- Sensor failure indication
- Low fuel level warning or shutdown

Alternator data

- Line-to-line and Line-to-neutral AC volts
- 3-phase AC current
- Frequency
- Total kVa

Engine data

- DC voltage
- Lube oil pressure
- Coolant temperature
- Engine speed

Other data

- Generator set model data
- Start attempts, starts, running hours
- Fault history
- RS485 Modbus® interface
- Data logging and fault simulation (requires InPower service tool)

Digital governing (optional)

- Integrated digital electronic isochronous governor
- Temperature dynamic governing

Digital voltage regulation

- Integrated digital electronic voltage regulator
- 2-phase line-to-line sensing
- Configurable torque matching

Control functions

- Time delay start and cooldown
- Cycle cranking
- PCCNet interface
- (2) Configurable inputs
- (2) Configurable outputs
- Remote emergency stop
- Automatic transfer switch (ATS) control
- Generator set exercise, field adjustable

Options

- ☑ Auxiliary output relays (2)
- ☑ Remote annunciator with (3) configurable inputs and (4) configurable outputs
- ☐ PMG alternator excitation
- ☐ PowerCommand 500/550 for remote monitoring and alarm notification (accessory)
- ☐ Auxiliary, configurable signal inputs (8) and configurable relay outputs (8)
- ☑ Digital governing
- ☐ AC output analog meters (bargraph)
  - Color-coded graphical display of:
    - 3-phase AC voltage
    - 3-phase current
    - Frequency
    - kVa
- ☐ Remote operator panel

Ratings definitions

Emergency standby power (ESP):

Applicable for supplying power to varying electrical load for the duration of power interruption of a reliable utility source. Emergency Standby Power (ESP) is in accordance with ISO 8528. Fuel Stop power in accordance with ISO 3046, AS 2789, DIN 6271 and BS 5514.

Limited-time running power (LTP):

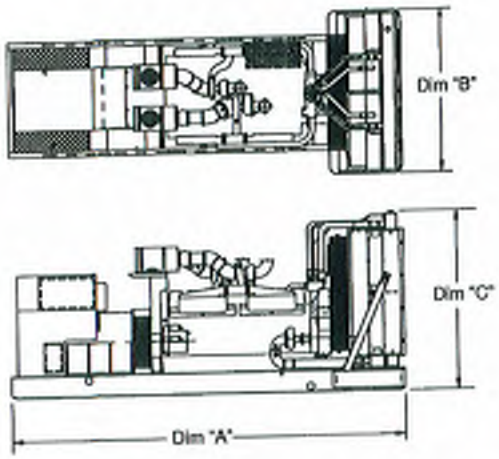
Applicable for supplying power to a constant electrical load for limited hours. Limited Time Running Power (LTP) is in accordance with ISO 8528.

Prime power (PRP):

Applicable for supplying power to varying electrical load for unlimited hours. Prime Power (PRP) is in accordance with ISO 8528. Ten percent overload capability is available in accordance with ISO 3046, AS 2789, DIN 6271 and BS 5514.

Base load (continuous) power (COP):

Applicable for supplying power continuously to a constant electrical load for unlimited hours. Continuous Power (COP) in accordance with ISO 8528, ISO 3046, AS 2789, DIN 6271 and BS 5514.



This outline drawing is for reference only. See respective model data sheet for specific model outline drawing number.

Do not use for installation design

Model	Dim "A" mm (in.)	Dim "B" mm (in.)	Dim "C" mm (in.)	Set Weight*dry kg (lbs)	Set Weight*wet kg (lbs)
Open Set					
C20 N6	1669 (65.7)	864 (34)	1123 (44.2)	423 (933)	440 (969)
C25 N6	1669 (65.7)	864 (34)	1123 (44.2)	441 (972)	457 (1008)
C30 N6	2225 (87.6)	864 (34)	1123 (44.2)	491 (1083)	508 (1119)
C36 N6	2225 (87.6)	864 (34)	1123 (44.2)	520 (1146)	535 (1182)
C40 N6	2225 (87.6)	864 (34)	1123 (44.2)	548 (1208)	564 (1244)
Sound Attenuated Enclosure Level 1					
C20 N6	1829 (72)	864 (34)	1156 (45.5)	469 (1034)	485 (1070)
C25 N6	1829 (72)	864 (34)	1156 (45.5)	487 (1073)	503 (1109)
C30 N6	2388 (94)	864 (34)	1156 (45.5)	542 (1195)	558 (1231)
C36 N6	2388 (94)	864 (34)	1156 (45.5)	571 (1258)	587 (1294)
C40 N6	2388 (94)	864 (34)	1156 (45.5)	599 (1320)	615 (1356)
Sound Attenuated Enclosure Level 2					
C20 N6	2073 (81.6)	864 (34)	1156 (45.5)	474 (1045)	490 (1081)
C25 N6	2073 (81.6)	864 (34)	1156 (45.5)	492 (1084)	508 (1120)
C30 N6	2626 (103.4)	864 (34)	1156 (45.5)	547 (1206)	563 (1242)
C36 N6	2626 (103.4)	864 (34)	1156 (45.5)	576 (1269)	592 (1305)
C40 N6	2626 (103.4)	864 (34)	1156 (45.5)	604 (1331)	620 (1367)

* Weights based on 1-phase generator set. Weights may vary with a different configuration.

Codes and standards

Codes or standards compliance may not be available with all model configurations – consult factory for availability.

	The Prototype Test Support (PTS) program verifies the performance integrity of the generator set design. Cummins Power Generation products bearing the PTS symbol meet the prototype test requirements of NFPA 110 for Level 1 systems.		This generator set is designed in facilities certified to ISO 9001 and manufactured in facilities certified to ISO 9001 or ISO 9002.
			The generator set is available Listed to UL 2200, Stationary Engine Generator Assemblies.
International Building Code	The generator set is certified to International Building Code (IBC) 2012.		All low voltage models are CSA certified to product class 4215-01.
		U.S. EPA	Engine certified to U.S. EPA SI Stationary Emission Regulation 40 CFR, Part 60.

Warning: Back feed to a utility system can cause electrocution and/or property damage. Do not connect to any building's electrical system except through an approved device or after building main switch is open.

North America
1400 73rd Avenue N.E.
Minneapolis, MN 55432
USA

Phone 763 574 5000
Fax 763 574 5298

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Power Generation

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Power Generation

Generator set data sheet

EPA Emissions

Model: C36 N6
KW rating: 36.0 natural gas standby
36.0 propane standby
Frequency: 60 Hz
Fuel type: Natural gas/propane

Exhaust emission data sheet:	EDS-1169
Exhaust emission compliance sheet:	EPA-1239
Sound performance data sheet:	MSP-1165
Cooling performance data sheet:	MCP-253
Prototype test summary data sheet:	PTS-317

Fuel consumption

	Natural gas				Propane			
	Standby kW (kVA)				Standby kW (kVA)			
Ratings	36.0 (45.0)				36.0 (45.0)			
Load	1/4	1/2	3/4	Full	1/4	1/2	3/4	Full
scfh	202.3	292.3	382.3	472.3	79.8	114.1	148.4	182.7
m³/hr	5.73	8.28	10.83	13.38	2.26	3.23	4.20	5.17

Engine

	Natural gas Standby rating	Propane Standby rating
Engine model	QSJ2.4	
Configuration	Cast iron, in-line 4 cylinder	
Aspiration	Turbo with after cooler	
Gross engine power output, kWm (bhp)	52 (70)	52 (70)
BMEP at rated load, kPa (psi)	1480.14 (214.7)	1480.14 (214.7)
Bore, mm (in)	86.5 (3.4)	
Stroke, mm (in)	100.0 (3.94)	
Rated speed, rpm	1800	
Piston speed, m/s (ft/min)	6.0 (1176.38)	
Compression ratio	9.5:1	
Lube oil capacity, L (qt)	4 (4.54)	
Overspeed limit, rpm	2250 ± 4.5	

Fuel supply pressure

Minimum operating pressure, kPa (in H2O)	1.5 (6.0)
Maximum operating pressure, kPa (in H2O)	3.5 (14.0)

Air	Natural gas	Propane
	Standby rating	Standby rating
Combustion air, m^3/min (scfm)	1.9 (67.7)	1.8 (62.5)
Maximum air cleaner restriction, kPa (in H_2O)	0.4 (1.5)	
Alternator cooling air, m^3/min (scfm)	N/A	

Exhaust		
Exhaust flow at rated load, m^3/min (cfm)	7.3 (260.2)	6.3 (225.9)
Exhaust temperature, °C (°F)	632 (1169)	638 (1181)
Exhaust back pressure (maximum allowable at engine), kPa (in H_2O)	5.0 (20)	5.0 (20)
Exhaust back pressure (actual with factory fitted muffler) kPa (in H_2O)	1.47 (5.9)	

Standard set-mounted radiator cooling		
Ambient design, °C (°F)	50 (122)	
Fan load, kW (HP)	2.2 (3.0)	
Coolant capacity (with radiator), L (US gal)	10 (2.7)	
Coolant system air flow, m^3/min (scfm)	144.2 (5150)	
Total heat rejection, MJ/min (Btu/min)	3.3 (3037)	3.3 (3037)
Maximum cooling air flow static restriction, kPa (in H_2O)	0.12 (0.5)	

Weights[2]	
Unit dry weight kgs (lbs)	586 (1294)
Unit wet weight kgs (lbs)	603 (1330)

Notes:
[1] For non-standard remote installations contact your local Cummins Power Generation representative.
[2] Weights represent a set with 1-phase with sound level 1 enclosure.

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Alternator data

Standard alternators		Natural gas/ propane single phase table	Natural gas/propane three phase table			
Maximum temperature rise above 40 °C ambient		**120 °C**	**120 °C**	**120 °C**	**120 °C**	**120 °C**
Feature code		B949-2	B966-2	B946-2	B943-2	B952-2
Alternator data sheet number		ADS-579	ADS-577	ADS-577	ADS-577	ADS-577
Voltage ranges		120/240	120/240	120/208	277/480	347/600
Voltage feature code		R104-2	R106-2	R098-2	R002-2	R114-2
Surge kW		43.0/43.0	43.1/43.1	43.1/43.1	43.1/43.1	43.1/43.1
Motor starting kVA (at 90% sustained voltage)	Shunt	68	86	86	86	86
	EBS	112	135	135	135	135
Full load current amps at standby rating		150	108	125	54	43

Optional alternators for improved motor starting capability		Natural gas/ propane single phase table	Natural gas/propane three phase table			
Maximum temperature rise above 40 °C ambient		**105 °C**	**105 °C**	**105 °C**	**105 °C**	**105 °C**
Feature code		BB96-2	BB94-2	BB93-2	BB95-2	BB92-2
Alternator data sheet number		ADS-580	ADS-579	ADS-579	ADS-579	ADS-579
Voltage ranges		120/240	120/240	120/208	277/480	347/600
Voltage feature code		R104-2	R106-2	R098-2	R002-2	R114-2
Surge kW		41.5/41.5	43.4/43.4	43.4/43.4	43.4/43.4	43.4/43.4
Motor starting kVA (at 90% sustained voltage)	Shunt	76	95	95	95	95
	PMG	120	NA	NA	NA	NA
	EBS	NA	150	150	150	150
Full load current amps at standby rating		150	108	125	54	43

Derating factors

Natural gas/propane	
Standby	Engine power available up to 1005 m (3300 ft) at ambient temperatures up to 40 °C (104 °F). Above these elevations derate at 4% per 305m (1000 ft) and 2% per 10 °C above 40 °C (104 °F).

Ratings definitions

Emergency standby power (ESP):	Limited-time running power (LTP):	Prime power (PRP):	Base load (continuous) power (COP):
Applicable for supplying power to varying electrical load for the duration of power interruption of a reliable utility source. Emergency Standby Power (ESP) is in accordance with ISO 8528. Fuel Stop power in accordance with ISO 3046, AS 2789, DIN 6271 and BS 5514.	Applicable for supplying power to a constant electrical load for limited hours. Limited Time Running Power (LTP) is in accordance with ISO 8528.	Applicable for supplying power to varying electrical load for unlimited hours. Prime Power (PRP) is in accordance with ISO 8528. Ten percent overload capability is available in accordance with ISO 3046, AS 2789, DIN 6271 and BS 5514.	Applicable for supplying power continuously to a constant electrical load for unlimited hours. Continuous Power (COP) is in accordance with ISO 8528, ISO 3046, AS 2789, DIN 6271 and BS 5514.

Formulas for calculating full load currents:

Three phase output

$$\frac{kW \times 1000}{Voltage \times 1.73 \times 0.8}$$

Single phase output

$$\frac{kW \times SinglePhaseFactor \times 1000}{Voltage}$$

Warning: Back feed to a utility system can cause electrocution and/or property damage. Do not connect to any building's electrical system except through an approved device or after building main switch is open.

North America
1400 73rd Avenue N.E.
Minneapolis, MN 55432
USA

Phone 763 574 5000
Fax 763 574 5298

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NAD-5897c-EN (10/14)

Power Generation

cumminspower.com

Power Generation

ALTERNATOR DATA SHEET

Frame Size CA115-V14

CHARACTERISTICS No of Bearings 1

WEIGHTS:

Stator Assembly:	289.5 lb	131.3 kg
Rotor Assembly:	147.8 lb	67 kg
Complete Assembly:	437 lb	198 kg

MAXIMUM SPEED: 2250 rpm

INSULATION SYSTEM: Class H Throughout

	60 Hz Voltage (winding no)				
	208 (311)	600 (17)	480 (41)	240 (06)	240 (311)
EXCITATION CURRENT: Full load	2.12	1.89	2.10	1.47	2.12
EXCITATION CURRENT: No load	0.47	0.45	0.57	0.69	0.47
3 Ø RATINGS (0.8 power factor) (Based on specific temperature rise at 40°C ambient temperature)	208 (311)	600 (17)	480 (41)	240 (06)	240 (311)
120°C Rise Peak Standby Ratings kW	40	40	40		40
kVA	50	50	50		50
105°C Rise Peak Standby Ratings kW	36.6	36.6	36.6		36.6
kVA	45.75	45.75	45.75		45.75
1 Ø RATINGS (1.0 power factor) (Based on specific temperature rise at 40°C ambient temperature)	208 (311)	600 (17))	480 (41))	240 (06)	240 (311)
120°C Rise Peak Standby Ratings kW				36	
kVA				36	
105°C Rise Peak Standby Ratings kW				33	
kVA				33	
REACTANCES (per unit ±30%) (Based on full load at 105°C Rise Rating)	208 (311)	600 (17)	480 (41)	240 (06)	240 (311)
Synchronous	2.02	2.06	2.06	1.22	2.02
Transient	0.12	0.12	0.12	0.10	0.12
Subtransient	0.08	0.08	0.08	0.07	0.08
Negative Sequence	0.16	0.16	0.16	0.16	0.16
Zero Sequence	0.08	0.10	0.09	0.08	0.08
MOTOR STARTING	208 (311)	600 (17)	480 (41)	240 (06)	240 (311)
Maximum kVA (90% Sustained Voltage)					
(At 20°C nominal generator & ambient temperature) (EBS)	150	150	150	112	150
(Shunt)	95	95	95	68	95
TIME CONSTANTS (Sec)	208 (311)	600 (17)	480 (41)	240 (06)	240 (311)
Transient	0.026	0.026	0.026	0.026	0.026
Subtransient	0.006	0.006	0.006	0.006	0.006
Open Circuit	0.62	0.62	0.62	0.52	0.62
DC	0.006	0.005	0.005	0.006	0.006
WINDINGS (@20°C)	208 (311)	600 (17)	480 (41)	240 (06)	240 (311)
Stator Resistance (Ohms per phase)	0.238	0.350	0.518	0.048	0.238
Rotor Resistance (Ohms)	0.944	0.944	0.944	0.944	0.944
Number of Leads	12	12	12	4	12

Power Generation

EPA Exhaust Emission Compliance Statement
C36 N6
standby
60 Hz Spark Ignited Generator Set

Compliance Information:
The engine used in this generator set complies with U.S. EPA emission regulations under the provisions of 40 CFR Part 60, Stationary Emergency Spark-Ignited emissions limits when tested on 6 mode cycle of Part 90.

Engine Manufacturer:	Cummins Inc
EPA Certificate Number:	ECEXB02.4AAA-001
Effective Date:	09/25/2013
Date Issued:	09/25/2013
EPA Engine Family:	ECEXB02.4AAA

Engine Information:

Model: QSJ2.4

Engine Nameplate HP: Natural Gas 70, Propane 70

Bore: 3.41 in. (86.5 mm)

Type: 4 Cycle, In-line, 4 Cylinder

Stroke: 3.94 in. (100 mm)

Aspiration: Turbocharged Aftercooled

Displacement: 146.46 cu. in. (2.4 liters)

Compression Ratio: 9.5:1

Emission Control Device: Electronic Air/Fuel Ratio Control and Closed-Loop Breather System

U.S. Environmental Protection Agency Stationary Emergency SI Emission Limits

Natural Gas and Propane Fuel Emission Limits	Grams per BHP-hr		Grams per kWm-hr	
	NOx + HC	CO	NOx + HC	CO
→ Test Results (**Natural Gas**)	5.04	39.4	6.8	52.8
Test Results (**Propane**)	6.48	51.7	8.7	69.3
EPA Emissions Limit	10.0	387.0	13.4	519.0

Note:
Tests conducted using alternate test methods, instrumentation, fuel or reference conditions can yield different results.
Engine operation with excessive air intake or exhaust restriction beyond published maximum limits, or with improper maintenance, may result in elevated emission levels.

Power Generation

Cooling System Data
C36 N6

High Ambient Air Temperature Radiator Cooling System

	Fuel Type	Duty	Rating (kW)	Max Cooling @ Air Flow Static Restriction, Unhoused (inches water/mm water)					Housed in Free Air, No Air Discharge Restriction	
				0.0/0.0	0.25/6.4	0.5/12.7	0.75/19.1	1.0/25.4	F231	F217
				Maximum Allowable Ambient Temperature, Degree C						
60Hz	NaturalGas	Standby	36	~~55~~	~~55~~	~~55~~	~~N/A~~	~~N/A~~	55	~~55~~

High Ambient Air Temperature Radiator Cooling System

	Fuel Type	Duty	Rating (kW)	Max Cooling @ Air Flow Static Restriction, Unhoused (inches water/mm water)					Housed in Free Air, No Air Discharge Restriction	
				0.0/0.0	0.25/6.4	0.5/12.7	0.75/19.1	1.0/25.4	F231	F217
				Maximum Allowable Ambient Temperature, Degree C						
60Hz	Propane	Standby	36	55	55	55	N/A	N/A	55	55

Notes:

1. Data shown are anticipated cooling performance for typical generator set.
2. Cooling data is based on 1000 ft (305 m) site test location.
3. Generator set power output may need to be reduced at high ambient conditions. Refer generator set data sheet for derate schedules.
4. Cooling performance may be reduced due to several factors including but not limited to: Incorrect installation, improper operation, fouling of the cooling system, and other site installation variables.

Power Generation

Sound Data

C36 N6 60Hz

Sound Pressure Level @ 7 meters, dB(A)

See Notes 1-6 listed below

Configuration		Position (Note 1)								8 Position Average
		1	2	3	4	5	6	7	8	
F217-2 Sound Attenuated Level 2	Mounted	65.4	67.2	64.8	65.7	65.8	66.6	63.8	64.5	65.6
F231-2 – Sound Attenuated Level 1	Mounted	71	68.8	65.2	65.2	65.7	65.8	65	67.6	67.3

Sound Power Level, dB(A)

See Notes 2-4, 7, 8 listed below

Configuration		Octave Band Center Frequency (Hz)								Overall Sound Power Level
		63	125	250	500	1000	2000	4000	8000	
F217-2 Sound Attenuated Level 2	Mounted	78.2	76.7	87.7	89.7	85.9	84.1	81.3	80.3	94.1
F231-2 – Sound Attenuated Level 1	Mounted	77.6	76.7	87.7	90.3	87.8	85.5	84.2	81.9	95

Exhaust Sound Power Level, dB(A)

See Notes 2 , 9 listed below

Open Exhaust (No Muffler) @ Rated Load	Octave Band Center Frequency (Hz)								Overall Sound Power Level
	63	125	250	500	1000	2000	4000	8000	
	81.9	95	104.4	105.6	106.7	108.3	103.6	102.2	113.5

Note:

1. Position 1 faces the Generator front per ISO **8528-10**. The positions proceed around the generator set in a counter-clockwise direction in 45° increments. All positions are at 7m (23 ft) from the surface of the generator set and 1.2m (48") from floor level.
2. Sound levels are subject to instrumentation, measurement, installation and manufacturing variability.
3. Data based on full rated load.
4. Sound data for generator set with infinite exhaust do not include exhaust noise.
5. Sound Pressure Levels are measured per ANSI S1.13 and ANSI S12.18, as applicable.
6. Reference sound pressure is 20 µPa.
7. Sound Power Levels per ISO 3744 and ISO 8528-10, as applicable.
8. Reference power = 1 pw (10^{-12} W)
9. Exhaust Sound Power Levels are per ISO 6798, as applicable.

Power Systems

CUMMINS POWER SYSTEMS, LLC.

POWER GENERATION SYSTEMS

PLANNED MAINTENANCE "CHECK LIST A"

R.O. #

CUSTOMER NAME	PS 43Q	1 year service contract.
ADDRESS	12 Marvin Street	4 visits per year
CITY	Queens, NY 11691	(3 site inspections & 1 annual PM)

O.K.	NEEDS ATTN.	Site Inspection	Annual P.M.	☐ Monthly ☐ Semi ☑ Quartley ☐ Annual	ENGINE MODEL #	ENGINE SERIAL #

O.K.	NEEDS ATTN.	Site Inspection	Annual P.M.	
5.1 ENGINE LUBRICATING SYSTEM				
		X	X	1. Check for leaks
		X	X	2. Check engine oil level _____ & P.S.I. _____
			X	3. Change lubricating oil filter
			X	4. Change engine oil and take oil sample (CC2525)
			X	5. Change hydraulic governor oil and check level
5.2 ENGINE COOLING SYSTEM				
		X	X	1. Check for leaks
		X	X	2. Check radiator air restriction
		X	X	3. Check operation of coolant heater
		X	X	4. Check all hoses and connections
		X	X	5. Check coolant level _____ & Temperature _____
		X	X	6. Check belt condition and tension
		X	X	7. Check antifreeze concentration _____ D.C.A. level _____
			X	8. Change coolant filter
		X	X	9. Check radiator cap and thermostat for operation
5.3 ENGINE AIR INTAKE SYSTEM				
		X	X	1. Check air cleaner element
		X	X	2. Check all intake piping
		X	X	3. Check, clean crankcase breather element
5.4 ENGINE FUEL SYSTEM				
		X	X	1. Check day tank, fuel lines and connections for leaks
			X	2. Change fuel filters
		X	X	3. Check day tank fuel level _____
		X	X	4. Check fuel transfer pump
		X	X	5. Drain water seperators if necessary
		X	X	6. Check governor control linkage
5.5 ENGINE EXHAUST SYSTEM				
		X	X	1. Check for leaks
		X	X	2. Drain exhaust condensation drain trap (if equipped)
5.6 ENGINE ELECTRICAL SYSTEM				
		X	X	1. Check battery electrolyte level and clean terminals
		X	X	2. Check battery charging system D.C. voltage _____ _____
5.7 MAIN GENERATOR				
		X	X	1. A/C VOLTAGE _____
		X	X	2. FREQUENCY _____
5.8 CONTROLS AND SWITCH GEAR				
		X	X	1. Check for operational instrumentation
		X	X	2. Check Automatic Transfer Switch if possible
		X	X	3. Check that all switches are back in Automatic Mode

TECHNICIAN SIGNATURE	SITE REPRESENTATIVES SIGNATURE

Power Systems

Cummins Power Systems Maintenance Procedures

5.1 Engine Lubricating System

5.1.1 Check for leaks — The engine shall be visually inspected for signs of oil leaks at each scheduled service interval.

5.1.2 Check engine oil level and pressure — The engine oil level and oil pressure shall be checked at each scheduled service level. The oil level should be between the "ADD" and "FULL" mark.

5.1.3 CHANGE ENGINE OIL FILTER Remove engine mounted oil filters, replace with new filters.

5.1.4 CHANGE ENGINE OIL AND TAKE SAMPLE — The engine oil shall be changed annually and replaced with the correct grade and type of lubricating oil according to the engine manufacturer's specifications. Prior to changing the oil, a sample should be taken using the procedures outlined by the supplier of the oil sample kit in order to determine the amount of contamination present.

5.1.5 Check hydraulic/mechanical governor oil level — On engines equipped with mechanical or hydraulic governors, the oil level shall be checked at each scheduled service interval. This level should be maintained at the "FULL" mark. Check all mechanical linkage for freeness of movement, dirt, excessive play or looseness, corrosion and proper adjustment. Correct any discrepancies.

5.2 Engine Cooling System

5.2.1 Check for leaks — Visually inspect the cooling system for leaks at each scheduled service interval. Check for puddles on the floor, around the equipment and for drips around the hose connections and tighten if needed.

5.2.2 Check for radiator air restriction — The radiator should be visually inspected at each scheduled service interval and reasonably cleared of any restrictions (dirt, paper, debris, etc.) OSHA Guards not removed.

5.2.3 Check operation of coolant heater — The operation of the coolant heater shall be checked at each scheduled service interval.

5.2.4 Check hoses and connections — All cooling system hoses and connections shall be checked at each scheduled service interval for leaks and/or deterioration such as dry rotting, heat deterioration and ballooning.

5.2.5 Check coolant level and temperature — The coolant level and temperature shall be checked at each scheduled service interval.

5.2.6 Check belt condition and tension — All belts in the cooling system shall be inspected at each scheduled service interval for sign of wearing or cracking or any other sign of deterioration.

5.2.7 **Check antifreeze and additive concentration** — The antifreeze and diesel coolant concentration shall be checked at each scheduled service interval.

5.2.8 CHANGE COOLANT FILTER — **THE DIESEL COOLANT ADDITIVE WATER FILTERS SHALL BE REPLACED AT SCHEDULED SERVICE INTERVAL**

5.2.9 **Check radiator cap and thermostat for operation** — Cap and thermostat shall be inspected at each scheduled service interval for proper operation of cooling system.

5.2.10 **Coolant sampling.** On programs where a coolant sample is required complete this line item.

5.3 *Engine- Air Intake System*

5.3.1 **Clean air cleaner element and housing** — Check air cleaner element and housing at each scheduled service interval. Replacement of air filter elements additional, will be quoted separately.

5.3.2 **Check all piping connections** — Check all piping and connections associated with the air intake system at each scheduled service interval. These components are subject to fatigue caused by engine vibration. Replace or tighten as necessary.

5.3.3 **Clean crankcase breather element** — Remove and clean the crankcase breather element at each scheduled service interval. Clean the vent tube, screens and baffle with a manufacturer's approved cleaning solution. Dry with compressed air and wipe out the breather housing. Reassemble the baffle and screens and install a new gasket.

5.4 Engine Fuel System

5.4.1 **Check fuel lines and connections for leaks** — All fuel lines and connections on the engine itself and in the engine room shall be checked at each scheduled service interval for leaks. Inspect around all fuel filters for leaks and tighten any loose connections.

5.4.2 CHANGE FUEL FILTERS — **REPLACE ALL FUEL FILTERS (ENGINE PRIMARY AND SECONDARY FILTERS) AT EACH SCHEDULED SERVICE INTERVAL.**

5.4.3 **Check day tank fuel level** — At each scheduled service interval, the level of the fuel in the tank shall be checked to ensure it is full.

5.4.4 **Check fuel transfer pump** — Test the operation of the fuel transfer pump at each scheduled service interval by pressing the test button and observing the results. Check for leaks.

5.4.5 **Drain water separators** — Water separators should be drained at each scheduled service interval.

5.4.6 **Check governor control linkage** — The governor linkage shall be checked at each scheduled service interval for tightness and correct adjustment.

5.5 Engine Exhaust System

5.5.1 Check for leaks — Check all exhaust piping and connections for leaks and tighten any loose connections at each scheduled service interval. Visually check exhaust outlet for excessive smoke if possible.

5.5.2 Drain exhaust condensation traps — Drain the exhaust condensation trap at each scheduled service interval.

5.6 Engine Electrical System

5.6.1 Check battery electrolyte level — Check the start battery electrolyte level and voltage at each scheduled service interval. The voltage should read between 13 and 14.2 volts on a 12-volt system and between 25 and 28.4 volts on a 24-volt system. As an alternative, batteries may be checked by means of a load test if the appropriate equipment is available.

5.6.2 Check battery-charging system — Visually check the start battery charger for correct operation at each scheduled service interval. The float charger should be set at 13.8 volts DC on a 12-volt system and 27.6 volts DC on a 24-volt system.

5.7 Main Generator

5.7.1 A/C Voltage - Check and record A/C Voltage

5.7.2 Frequency - Check and record Frequency

5.8 Controls and Switch gear (If located within close proximity of Generator)

5.8.1 Check for operational instrumentation — Check all instrumentation at each scheduled service interval for burned out lights and non-operational gauges.

5.8.2 Check automatic transfer switch — Check the operation of the automatic transfer switch at each scheduled service interval if possible at the direction of the facility engineer. **Total check included not to exceed 30 mins (transfer, re-transfer, and cool down cycles) unless outlined in the scope of work and rate sheets.**

5.8.3 Check all control switches in "AUTO" and circuit breakers closed — Check that all control switches are set to the 'AUTOMATIC" position and all circuit breakers are 'Closed" at each scheduled service interval.

Ensure distributor sticker with phone number is attached to genset.

ITEMS HIGHLIGHTED IN RED / CAPS BOLD OCCUR DURING ANNUAL MAJOR PM.

ALL OTHER ITEMS OCCUR DURING EACH MAJOR, MINOR PM AND (SITE INSPECTION).

Up Date InPower and InSite Calibrations as needed during each service interval.

Batteries and accessories

Quantity: 1; Group: 26-775 Battery

> Specification sheet

Our energy working for you.™

Power Generation

Battery Specifications

Part number	Battery	Cold cranking amps	Voltage	Reserve capacity	Length	Width	Height	Group size	Ship weight lbs	Qts electrolyte
0416-0439	Dry	1400	12	430	20.75	11.00	9.63	8D	110	16.0
0416-0579	Dry	525	12	90	10.25	6.63	8.75	24C-675	20	6.0
0416-0579-01	Wet	525	12	90	10.25	6.63	8.75	24C-675	36	6.0
0416-0796	Wet	725	12	150	13.00	6.88	9.63	31-4	62	4.2
0416-0823	Dry	725	12	150	13.00	6.88	9.63	31-4	42	4.2
0416-0848	Dry	1080	12	270	20.75	8.63	9.63	4D	85	13.0
0416-0980	Wet	1000	12	200	13.00	6.88	9.63	31-5	65	4.2
0416-1040	Dry	800	12	160	13.00	6.88	9.44	31	65	4.2
0416-1051	Wet	530	12	80	8.13	6.63	7.50	26-775	31	3.7
0416-1105	Wet	1400	12	430	20.75	11.00	9.63	8D	125	16.0
0416-1138	Sealed	NA	12	NA	5.88	3.88	3.75	NP12-12	9	4.0
0416-1264	Dry	730	12	420	20.67	10.83	9.45	8D	110	16.0
0416-1291	Sealed	800	12	110	10.00	6.88	7.81	34	38	4.0
0416-1330	Wet	810	12	146	10.25	6.63	8.88	24XL	43	5.9
0416-1332	Dry	420	12	60	9.13	5.25	8.88	22NF	19	4.0

Specification sheet

Power Generation

Battery charger-10 amp

~~A026H213 60 Hz~~

A048G602 60 Hz~~/50 Hz~~

Description

Cummins Power Generation fully automatic battery chargers are constant voltage/constant current chargers incorporating a 4-stage charging algorithm. Designed for use in applications where battery life and reliability are important; these chargers, complete with built-in equalize charge capability, are ideal for stationary or portable starting battery charging service.

To achieve optimum battery life, a 4-stage charging cycle is implemented. The four charging stages are constant current, high-rate taper charge, finishing charge, and maintaining charge. During the constant current cycle the charger operates at maximum possible output in the fast charge mode. During the high-rate taper charge cycle the charger stays at fast charge voltage level until battery current acceptance falls to a portion of the chargers rated output. During the finishing charge cycle the charger operates at the float voltage and completes the battery charge. During the maintaining charge cycle the charger supplies only a few milliamps required by the battery to stay at peak capability.

An optional temperature sensor (A048N240) may be used to adjust charging voltage based on temperature of the battery. Use of a battery temperature sensor helps to increase battery life by preventing over or under charging. The battery temperature sensor also protects the battery from overheating. Temperature compensation is recommended in all applications, but is particularly valuable for generator sets in outdoor applications.

Battery chargers are field-configurable for charging either 12 or 24 VDC battery systems at 60 Hz operation. Simple jumper selectors enable selection of output voltage and battery type.

Features

Protection – Surge protected to IEEE and EN standards. All models include single pole cartridge type fuses mounted on the printed circuit board to protect against input or output overcurrent.

Easy installation – Clearly marked terminal blocks and panel knockouts provide convenient connections of input and output leads.

User display – Output voltage and current, fault information and status are indicated on the front panel. Includes precision ammeter and voltmeter.

Monitoring – Status LED indicators are provided to show the condition of the charger. LED's on the right side of the monitor indicate operational functions for Temperature Compensation active (Green), AC on (Green), Float (Green) or Boost (Amber) mode, as well as Battery Fault (Red). LED's on the left side of the monitor illuminate (in Red) when Charger fail, High or Low VDC or AC fail occur.

Adjustable float voltage – Float voltage can be set, using easy to understand jumpers, for optimum battery performance and life.

Construction – NEMA-1 (IP20) corrosion resistant aluminum enclosure designed for wall mounting.

Faults – The charger senses and annunciates the following fault conditions: AC power loss, battery overvoltage, battery undervoltage, battery fault conditions and charger failure. Includes an individual 30 volt/2 amp isolated contact for each alarm.

Vibration resistant design - complies with UL 991 class B vibration resistance requirements.

Listed – C-UL listed to UL 1236 CSA standard 22.2 no 107.2-M89. Suited for flooded and AGM lead acid and NiCd batteries in generator set installations.

Warranty – 5 year CPG warranty

Specifications

Performance and physical characteristics

Output:	Nominal voltage	12 or 24 VDC
	Float voltage – 12 V batteries	12.87, 13.08, 13.31, 13.50, 13.62, 14.30
	Float voltage – 24 V batteries	25.74, 26.16, 26.62, 27.00, 27.24, 28.60
	Equalize-voltage	6.5% above float voltage sensing
	Output voltage regulation	±0.5% (1/2%) line and load regulation
	Maximum output current	10 A @ 12 VDC nom or 10 A @ 24 VDC
	Equalize charging	Battery interactive autoboost
Input:	Voltage AC	120, 208, 240 ±10%
	Frequency	60 Hz ±5% Part Number A026H213 60/50 Hz ±5% Part Number A048G602
Approximate net weight:		25 lbs (11.36 Kg)
Approximate dimensions: height x width x depth-in(mm)		12.5 x 7.7 x 6.5 (318 x 195 x 165)
Ambient temperature operation: At full rated output		- 4°F to 104 °F (-20 °C to 45 °C)

Americas
1400 73rd Avenue N.E.
Minneapolis, MN 55432 USA
Phone: 763 574 5000
Fax: 763 574 5298

Europe, CIS, Middle East and Africa
Manston Park Columbus Ave.
Manston Ramsgate
Kent CT 12 5BF United Kingdom
Phone 44 1843 255000
Fax 44 1843 255902

Asia Pacific
10 Toh Guan Road #07-01
TT International Tradepark
Singapore 608838
Phone 65 6417 2388
Fax 65 6417 2399

Warning: Back feed to a utility system can cause electrocution and/or property damage. Do not connect generator sets to any building electrical system except through an approved device or after building main switch is open.

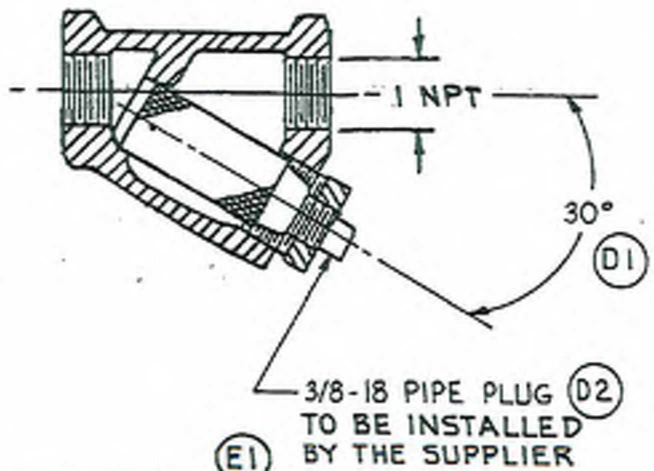
Warning: For professional use only. Must be installed by a qualified service technician. Improper installation presents hazards of electrical shock and improper operation, resulting in severe personal injury and/or property damage.

Power Generation

149-0752 | DWG SIZE A

MICROFILMED

ER NO	LET	NO	REVISION	ENG	CKR	DATE
			REDRAWN W/NO CHNG, OLD DWG DTD			3-12-71
	A		NOTE 3 WAS 30 OR 50 MESH			10-24-73
	A		"WILINER" REMOVED			1-9-74
	A		WAS 40-60 MESH, 1/64 OPEN, .010 WIRE			3-25-74
	A		ADDED NOTE 3-B		HP	10-31-77
73329	B	1	REVISED PER ER		BG	9-4-96
FRD9441	C	1	ADD NOTE 6		BG	11-29-99
FRD7662	D	1	ADDED 30°	BG	BG	01-15-01
		2	ADDED 3/8-18 PIPE PLUG	BG	BG	01-15-01
FRD27096	E	1	ADDED INSTALL NOTE	BG	BG	4-20-06



NOTES:

1. 1" PIPE SIZE
2. MATL-CAST SEMI-STEEL BODY
3. 20 MONEL WIRE MESH (A) (B1)
   A. 20 MESH: .033 OPENING
   B. ALTN MATL: STAINLESS STEEL WIRE MESH
4. SELF CLEANING
5. FOR USE WITH NATURAL GAS
6. PRESSURE DROP AT 10 U.S. GPM TO BE 0.2 PSI OR LESS. (C1)

V.O. DRAWING

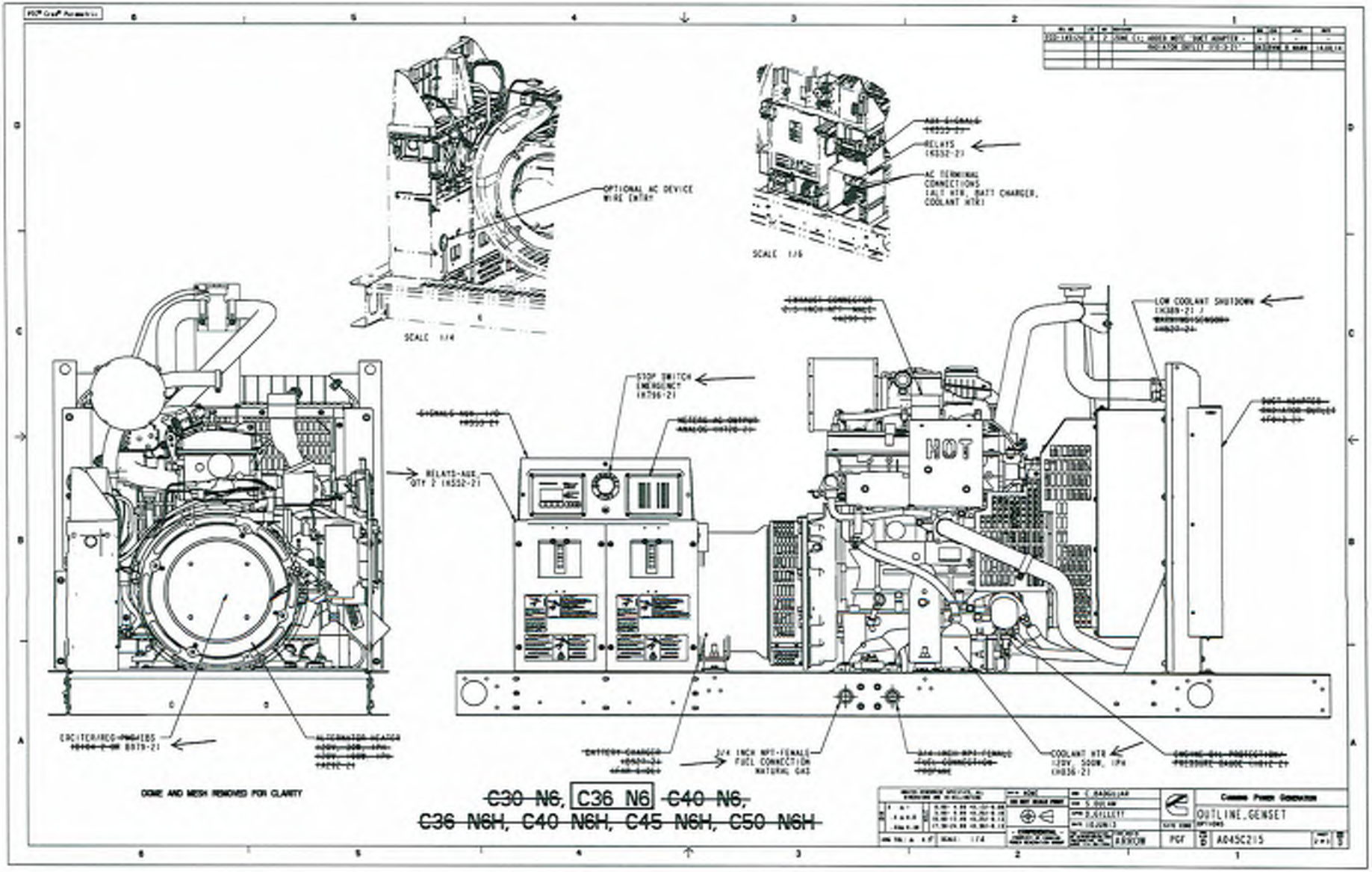
Strainer - Natural Gas

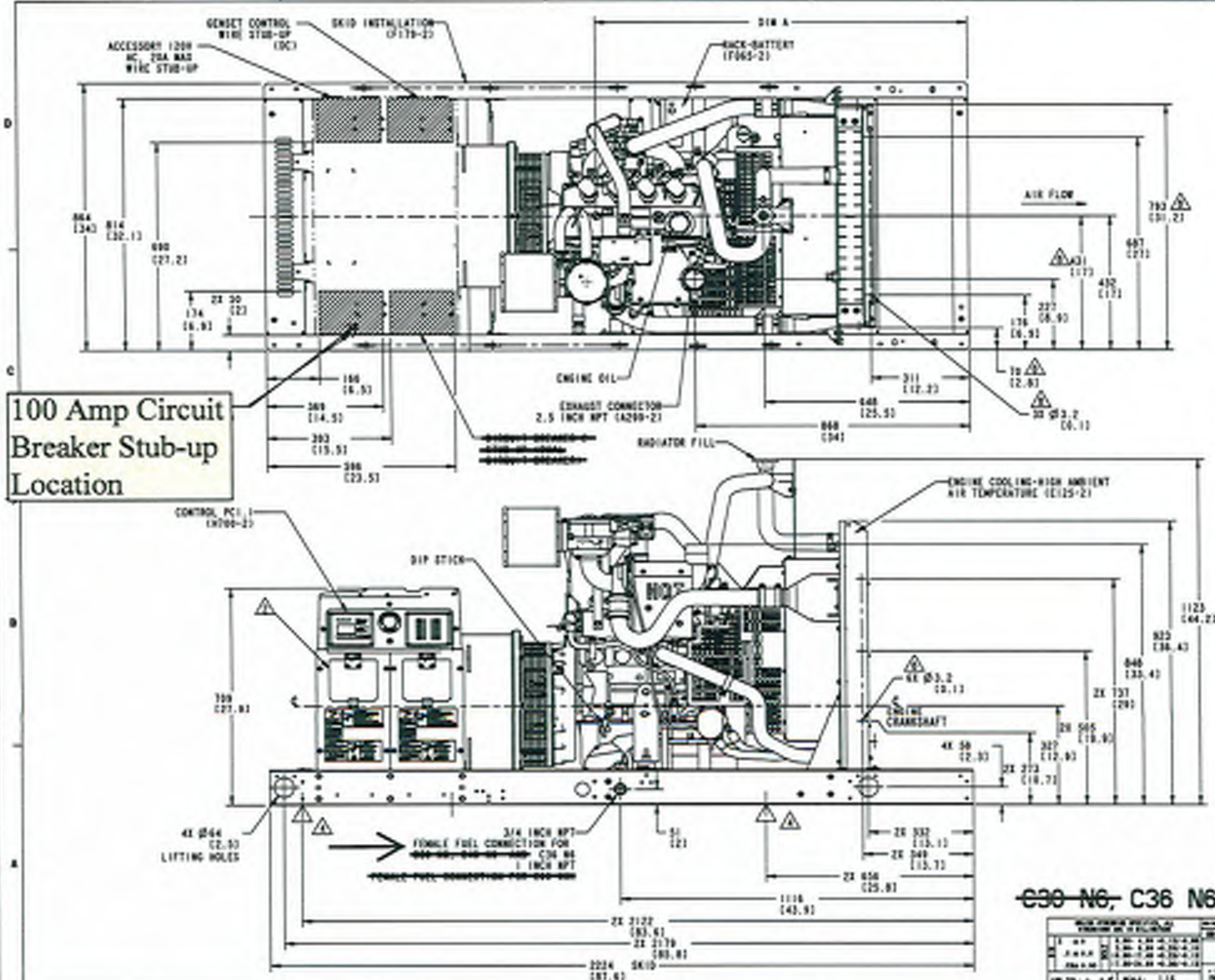
NEXT ASSY	SIMILAR TO	SEPIA FROM	ITEM	PART NO.	DWG SIZE	QTY	BULK	DESCRIPTION OR MATERIAL
TOLERANCES UNLESS OTHERWISE SPECIFIED: FRACTIONS ± ; ANGLES ± ; HOLES +.006 −.002	DECIMALS: 2 PLACE ± ; 3 PLACE ±	DR CTP; CKR; ENGR WW; SAMP REL; PROD REL WW	DATE 6-21-73					Onan DIVISION OF ONAN CORPORATION Minneapolis, Minnesota

STRAINER

149-0752 — DWG SIZE A

FORM 30034


OPTIONAL AC DEVICE WIRE ENTRY
SCALE 1/4
RELAYS (K532-2)
AC TERMINAL CONNECTIONS (ALT HTR, BATT CHARGER, COOLANT HTR)
SCALE 1/6
LOW COOLANT SHUTDOWN (K389-21)
STOP SWITCH EMERGENCY (K796-21)
RELAYS-AUX. QTY 2 (K532-2)
HOT
EXCITER/REG
ALTERNATOR HEATER
BATTERY CHARGER
3/4 INCH NPT-FEMALE FUEL CONNECTION NATURAL GAS
COOLANT HTR 120V, 500W, 1PH (H836-2)
DOME AND MESH REMOVED FOR CLARITY
C30 N6, C36 N6 C40 N6,
C36 N6H, C40 N6H, C45 N6H, C50 N6H
Cummins Power Generation
OUTLINE, GENSET
A045C215

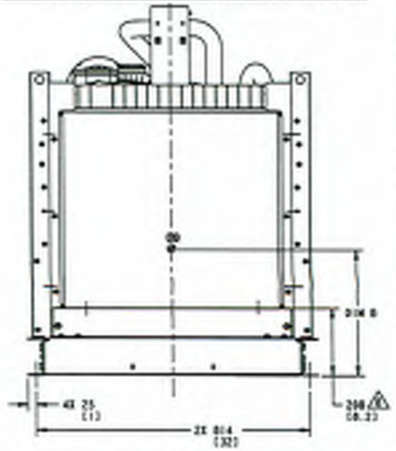


NOTES:

1. DIMENSIONS SHOWN IN ( ) ARE IN INCHES.
2. REFER TO CIRCUIT BREAKER OUTLINE DRAWING FOR ELECTRICAL STUB-UP AREA FOR SPECIFIC BREAKERS.
3. CONTROL INTERFACE CONNECTIONS SHOULD BE MADE WITH FLEXIBLE CONNECTIONS.
4. Ø21 (0.8) HOLES MARKED BY △ FOR SECURING TO MOUNTING SURFACE.
5. OIL DRAIN EXTENSION: 3/8 INCH HOSE ID.
6. FOR IBC SEISMIC CERTIFIED INSTALLATION, SEE GENSET IBC SEISMIC INSTALLATION REQUIREMENT DRAWING.
7. DRY WEIGHT = WET WEIGHT-16 KG (35 LB).
8. Ø3.2 HOLES FOR CUSTOMER-SUPPLIED COOLING EXHAUST AIR DUCT ADAPTER.

TABULATION

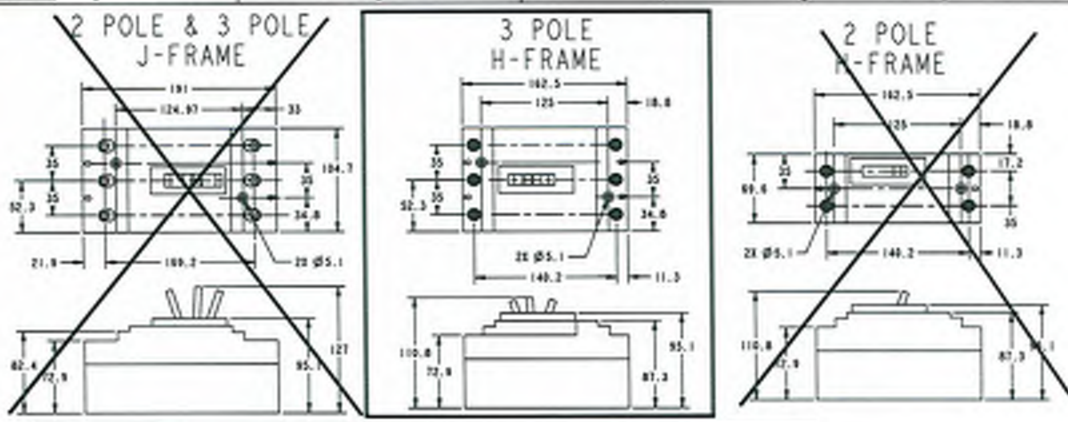
ALT DATA SHEET #	DIM A	DIM B	GENSET WET WEIGHT KG	GENSET WET WEIGHT LB
ADS-574	1140	401	498	1097
ADS-576	1153	384	508	1119
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
ADS-579	1189	395	520	1102
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
ADS-581	1213	391	574	1266
ADS-584	1218	390	597	1317



~~C30 N6,~~ C36 N6, ~~C40 N6, C60 N6H~~

Cummins Power Generation
OUTLINE, GENSET
A045C217

Drawing Name: A045C218 Revision: D
Part Name: A045C217 Revision: D
Sheet 1 of 3



TABULATION							
PART NUMBER	CURRENT ER	AMP_RATING	VOLTS (UL/IEC)	FRAME_TYPE	POLES	BREAKER_TYPE	TRIP
A043E193	ECO-126169	250A	600	J-FRAME	2	JD	THERMAL-MAGNETIC 50-60 Hz
A043E195	ECO-126169	225A	600	J-FRAME	2	JD	
A043E199	ECO-126169	200A	600	J-FRAME	2	JD	
A043E202	ECO-126169	175A	600	J-FRAME	2	JD	
A043L516	ECO-126169	250A	600	J-FRAME	3	JD	
A043L517	ECO-126169	225A	600	J-FRAME	3	JD	
A043L520	ECO-126169	200A	600	J-FRAME	3	JD	
A043L619	ECO-126169	175A	600	J-FRAME	3	JD	
A043C676	ECO-126169	150A	600	H-FRAME	2	HD	
A043D074	ECO-126169	125A	600	H-FRAME	2	HD	
A043D324	ECO-126169	100A	600	H-FRAME	2	HD	
A043D326	ECO-126169	90A	600	H-FRAME	2	HD	
A043D329	ECO-126169	80A	600	H-FRAME	2	HD	
A043E169	ECO-126169	70A	600	H-FRAME	2	HD	
A043E179	ECO-126169	60A	600	H-FRAME	2	HD	
A043E181	ECO-126169	50A	600	H-FRAME	2	HD	
A043E183	ECO-126169	40A	600	H-FRAME	2	HD	
A043E185	ECO-126169	30A	600	H-FRAME	2	HD	
A043E187	ECO-126169	20A	600	H-FRAME	2	HD	
A043E189	ECO-126169	15A	600	H-FRAME	2	HD	
A043E191	ECO-126169	25A	600	H-FRAME	2	HD	
A043R991	ECO-126169	150A	600	H-FRAME	3	HD	
A043R994	ECO-126169	125A	600	H-FRAME	3	HD	
A043R997	ECO-126169	90A	600	H-FRAME	3	HD	
[illegible]	[illegible]	[illegible]	600	H-FRAME	3	HD	
A043L624	ECO-126169	100A	600	H-FRAME	3	HD	
[illegible]	[illegible]	70A	600	H-FRAME	3	HD	
A043L458	ECO-126169	60A	600	H-FRAME	3	HD	
A043L461	ECO-126169	50A	600	H-FRAME	3	HD	
A043L464	ECO-126169	40A	600	H-FRAME	3	HD	
A043L475	ECO-126169	30A	600	H-FRAME	3	HD	
A043L486	ECO-126169	20A	600	H-FRAME	3	HD	
A043L506	ECO-126169	15A	600	H-FRAME	3	HD	
A043L508	ECO-126169	25A	600	H-FRAME	3	HD	
A044C640	ECO-126169	[illegible]	600	J-FRAME	3	JD	ELECTRONIC 50-60 Hz
A047W923	ECO-137891	225A Cu LUG	600	J-FRAME	3	JD	THERMAL-MAGNETIC 50-60 Hz
A050J725	ECO-145094	250A	600	J-FRAME	3	JD	LSI ELECTRONIC TRIP 80%
A050J727	ECO-145094	250A	600	J-FRAME	3	JD	LSI ELECTRONIC TRIP 100%

NOTES:

1. THIS PART IS MANUFACTURER SOURCE CONTROLLED.
2. SUPPLIED WITH LINE & LOAD MECHANICAL LUGS :
   2.1 FOR THERMAL-MAGNETIC TRIP : AL/CU.
   2.2 FOR ELECTRONIC TRIP: CU FOR 90°C.
3.

INTERRUPTING RATINGS		KA
UL/CSA/NOM	240 Vac	25
	480 Vac	18
	600 Vac	14
IEC 947-2 Icu/Ics	220/240 Vac	25/25
	380/440/415 Vac	18/18
	500/525 Vac	14/14

4. H-FRAME: .65" WIRE STRIP LENGTH.
   LUG TORQUE: A : #14-#10 AWG 50 LB-IN,75°C.
   B : #8-3/0 AWG 120 LB-IN,75°C.
5. J-FRAME: 1" WIRE STRIP LENGTH.
   LUG TORQUE: 1/0 AWG- 300 kcmil 250 LB-IN,75°C.

100 Amp Circuit Breaker

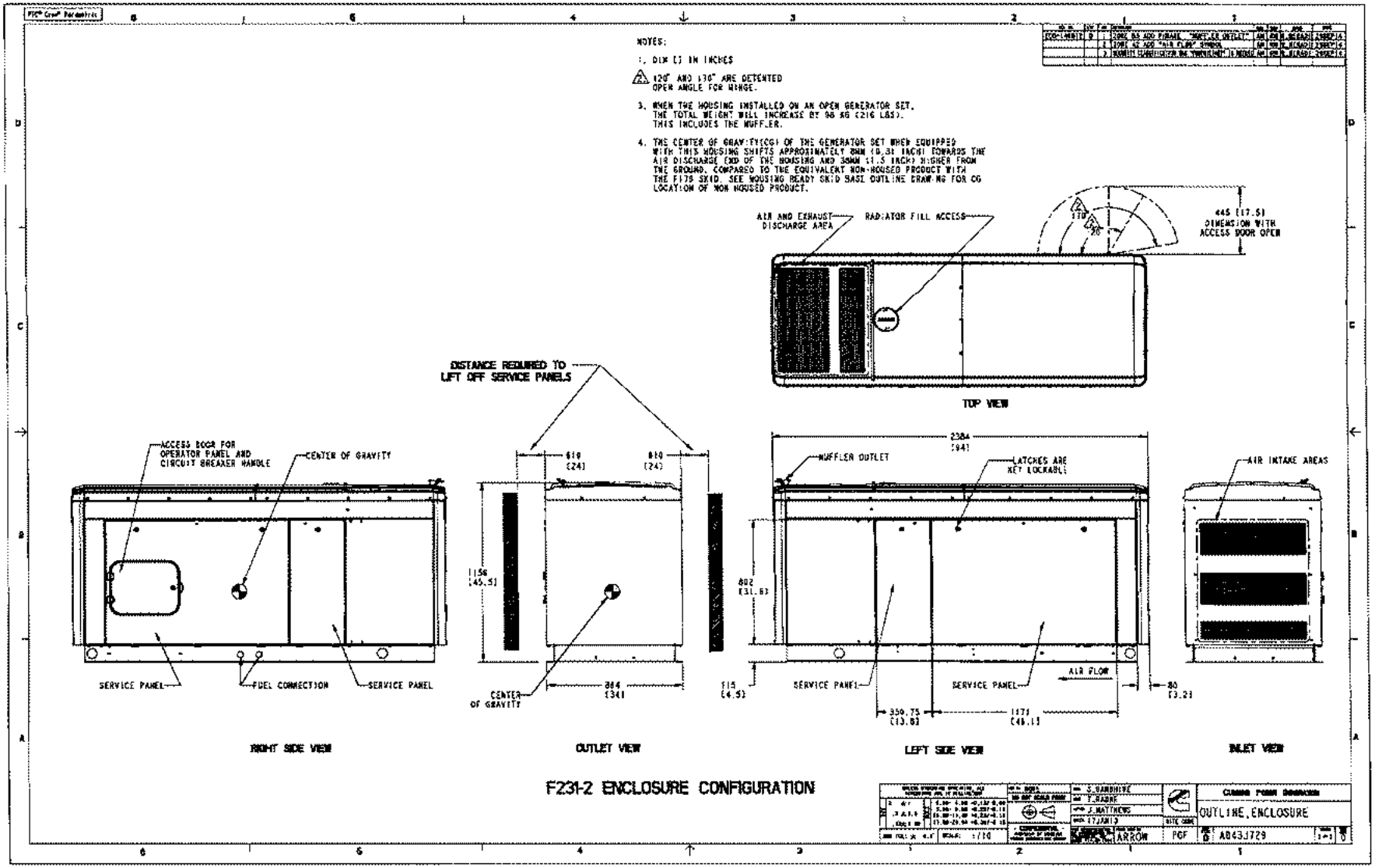
Cummins Power Generation

BREAKER,CIRCUIT

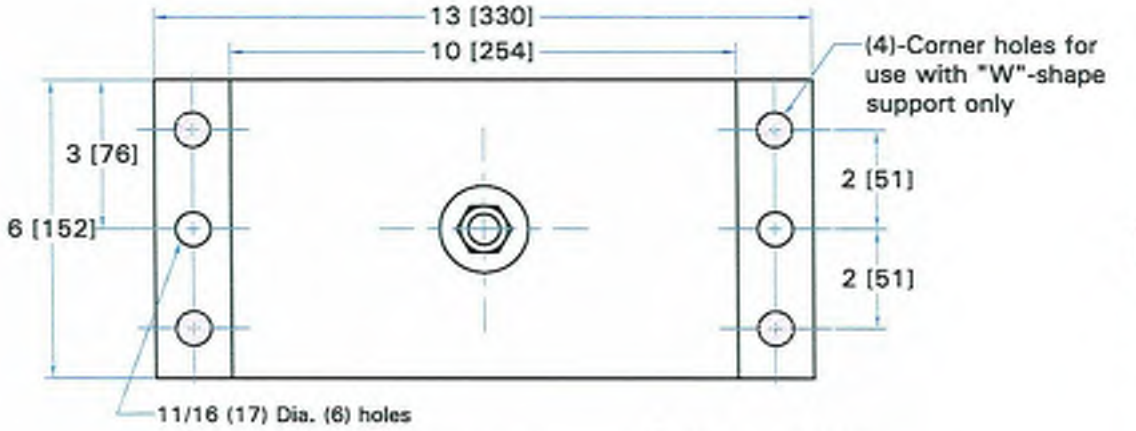
A043W056

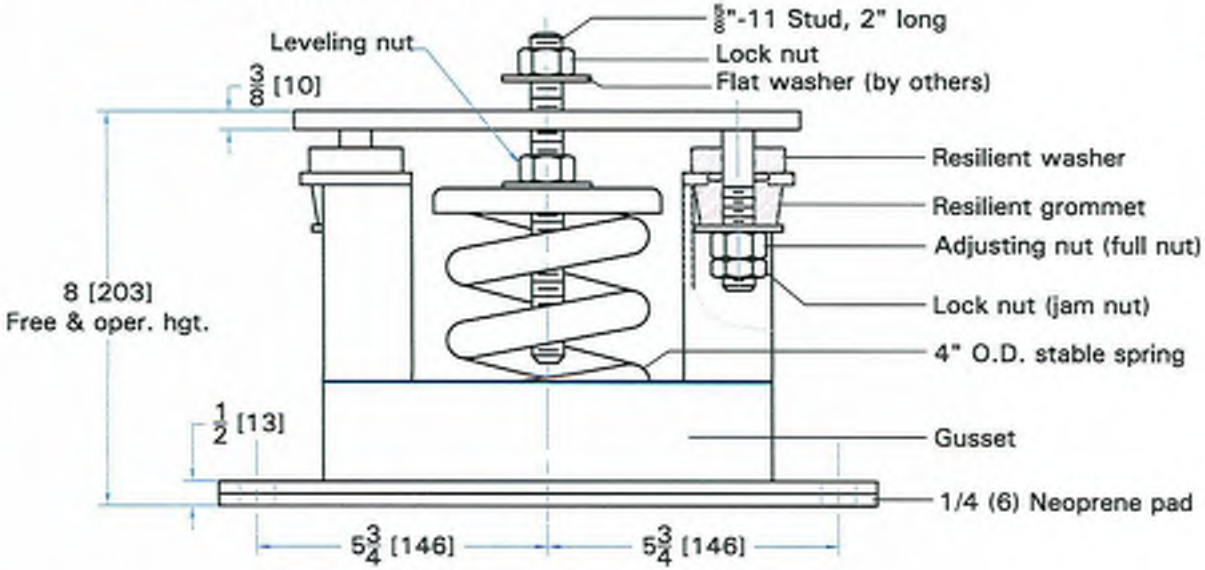
SCALE: 1/2

Drawing Name: A043W056 Revision: C
Part Name: A043C676 Revision: A
Sheet 1 of 2



Drawing Name: A043J730 Revision: D
Part Name: A043J729 Revision: D
Sheet 1 of 3





Type	Color of Spring	Spring Rate lb./in.	Load in Lbs.	
			1.5"	2.0"
A	Gray	75	100	150
B	Tan	125	150	250
C	Yellow	195	290	390
D	Green	220	~~330~~	440
E	Red	300	450	600
F	Silver	350	525	700
G	Brown	425	635	850
H	Black	600	900	1200
J	Brn&Yel*	825	1240	1650
K	Blk&Yel*	1000	1500	2000
P	Black Yellow* White*	1195	1790	2390

*Inner spring

Note: All dimensions are in inches (mm).

REV	DATE	CHANGES
F	11-14-2008	

PURCHASER:
ORDER NO.:
PROJECT:
FILE NO.:

Type "811-2"
1.5" to 2.0" Deflection
Spring Isolator

DWN BY | SCALE None | DATE 8-30-93

ACE MOUNTINGS CO., INC.

DWG NO. 93A-810 | REV F

Power Generation

125 Amp, 208 Volt, 3 Pole, Nema 1 ATS
70 Amp, 208 Volt, 3 Pole, Nema 1 ATS

OTPC transfer switch open ~~and closed~~ transition

Description

OTPC transfer switches are designed for operation and switching of electrical loads between primary power and standby generator sets. They are suitable for use in emergency, legally required and optional standby applications. The switch monitors both power sources, signals generator set startup, automatically transfers power, and returns the load to the primary power source when the utility returns and stabilizes.

OTPC transfer switches are available with closed transition transfer. By briefly connecting the two sources (for 100 msec or less), the transfer from the alternate source back to the normal source occurs without interruption in the power supply to loads.

UL	All switches are UL 1008 Listed with UL Type Rated cabinets and UL Listed CU-AL terminals.
CSA	All switches are certified to CSA 282 Emergency Electrical Power Supply for Buildings, up to 600 VAC.
NEC	Suitable for use in emergency, legally required and standby applications per NEC 700, 701 and 702.
NFPA	All switches comply with NFPA 70, 99 and 110 (Level 1).
NEMA	All switches comply with NEMA ICS 10.
IEEE	All switches comply with IEEE 446 Recommended Practice for Emergency and Standby Power Systems.
ISO 9001	This transfer switch is designed and manufactured in facilities certified to ISO9001.

Features

PowerCommand® control - A fully featured microprocessor-based control with digital display. Controls allow operator to enter settings and make adjustments to software-enabled features easily and accurately. Accommodates up to eight event schedules.

Programmed transition – Open transition timing can be adjusted to completely disconnect the load from both sources for a programmed time period, as recommended by NEMA MG-1 for transfer of inductive loads.

Advanced transfer switch mechanism – Unique bi-directional linear actuator provides smooth, continuous transfer switch action during automatic operation.

Robust control system design - Optically isolated logic inputs and isolation transformers for AC power inputs provide high-voltage surge protection.

Main contacts - Heavy-duty silver alloy contacts with multi-leaf arc chutes are rated for 100% load interruption. They require no routine contact maintenance and provide 100% continuous current ratings.

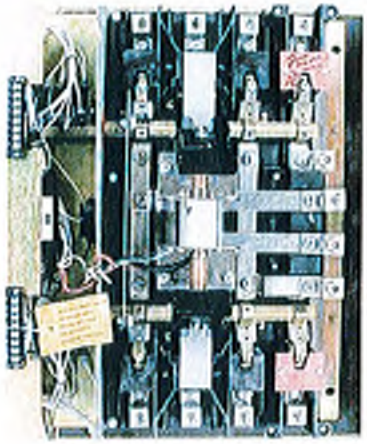
Communications capability - The transfer switch is capable of communicating with other transfer switches, SCADA and remote monitoring systems, or Cummins Power Generation generators utilizing LonWorks® protocol.

Easy service/access - Single-plug harness connection and compatible terminal markings simplify servicing. Access space is ample. Door-mounted controls are field-programmable; not tool is required.

Complete product line - Cummins Power Generation offers a wide range of equipment, accessories and services to suit virtually any backup power application.

Warranty and service - Products are backed by a comprehensive warranty and a worldwide network of distributors with factory-trained service technicians.

Transfer switch mechanism



- Transfer switch mechanism is electrically operated and mechanically held in the Source 1 and Source 2 positions. The transfer switch incorporates electrical and mechanical interlocks to prevent inadvertent interconnection of the sources.
- Independent break-before-make action is used for both 3-pole and 4-pole/ switched neutral switches. This design allows use of sync check operation when required, or control of the operating speed of the transfer switch for proper transfer of motor and rectifier-based loads (programmed transition feature).
- True 4-pole switching allows for proper ground (earth) fault sensing and consistent, reliable operation for the life of the transfer switch. The neutral poles of the transfer switch have the same ratings as the phase poles and are operated by a common crossbar mechanism, eliminating the possibility of incorrect neutral operation at any point in the operating cycle, or due to failure of a neutral operator.
- High pressure silver alloy contacts resist burning and pitting. Separate arcing surfaces further protect the main contacts. Contact wear is reduced by multiple leaf arc chutes that cool and quench the arcs. Barriers separate the phases to prevent interphase flashover. A transparent protective cover allows visual inspection while inhibiting inadvertent contact with energized components.
- Switch mechanism, including contact assemblies, is third party certified to verify suitability for applications requiring high endurance switching capability for the life of the transfer switch. Withstand and closing ratings are validated using the same set of contacts, further demonstrating the robust nature of the design.

Specifications

Voltage rating	600 VAC, 50 or 60 Hz.
Arc interruption	Multiple leaf arc chutes provide dependable arc interruption.
Neutral bar	A full current-rated neutral bar with lugs is standard on enclosed 3-pole transfer switches.
Auxiliary contacts	Two isolated contacts (one for each source) indicating switch position are provided for customer use. Contacts are normally open, and close to indicate connection to the source. Wired to terminal block for easy access. Rated at 10 amps continuous and 250 VAC maximum. UL recognized, and CSA-certified.
Operating temperature	-40 °F (-40 °C) to 140 °F (60 °C)
Storage temperature	-40 °F (-40 °C) to 140 °F (60 °C)
Humidity	Up to 95% relative, non-condensing
Altitude	Up to 10,000 ft (3,000 m) without derating
Surge withstand ratings	Voltage surge performance and testing in compliance with the requirements of IEEE C62.41 (Category B3) and IEEE C62.45.
Total transfer time (source-to-source)	Will not exceed 6 cycles at 60 Hz with normal voltage applied to the actuator and without programmed transition enabled.
Manual operation handles	Transfer switches rated through 1000 amps are equipped with permanently attached operating handles and quick-break, quick-make contact mechanisms suitable for manual operation. Transfer switches over 1000 amps are equipped with manual operators. All switches must be de-energized before manual operation is attempted.

Transition modes

Open transition/programmed: Controls the time required for the device to switch from source to source, so that the load-generated voltages decay to a safe level before connecting to an energized source. Recommended by NEMA MG-1 to prevent nuisance-tripping breakers and load damage. Adjustable 0-60 seconds, default 0 seconds. Programmed transition is standard on 150-1200 amp switches, and optional on 1600-4000 amps.

Open transition/in-phase: Initiates open transition transfer when in-phase monitor senses both sources are in phase. Operates in a break-before-make sequence. Includes ability to enable programmed transition as a back-up. If sources are not in phase within 120 seconds, switches from 40-1200 amps will transfer using programmed transition (not available on open transition switches over 1200 amps).

Closed transition: Used in applications where loads are sensitive to the momentary power interruption that occurs when performing open transition between sources. Closed transition is accomplished by briefly (<100 msec) paralleling two good sources to eliminate the momentary break in the power supply.
Closed transition is only available as an option on OTPC models from 1000-4000 amps.

Genset-to-genset: Either genset can be designated as the lead genset. If the lead genset goes down or is taken offline, the transfer switch starts the second genset and transfers the load. The control can be programmed to alternate between the two gensets at a set interval up to 336 hours (2 weeks).

PowerCommand control

PowerCommand controls are microprocessor based and developed specifically for automatic transfer switch operation. The control includes all of the features and options required for most applications.

- LED lamps indicate source availability, source connected, exercise mode and test mode.
- Flash memory stores the control settings.
- Contents of the memory are not lost even if power to the controller is lost.
- On-board battery maintains the real-time clock setting and the engine start time delay.
- Choice of two control packages allows selection of the most suitable control for the application.

Control functions

Level 1 control (C023)

Open transition (in-phase)
Open transition (programmed)
Utility-to-genset applications
Software adjustable time delays:
Engine start: 0 to 120 sec
Transfer normal to emergency: 0 to 120 sec
Re-transfer emergency to normal: 0 to 30 min
Engine stop: 0 to 30 min
Programmed transition: 0 to 60 sec
Undervoltage sensing: 3-phase normal, 1-phase emergency
Accuracy: =/- 2%
Pickup: 85% to 100% of nominal voltage
Dropout: 75% to 98% of pickup setting
Dropout time delay: 0-4 sec
Overvoltage sensing: 3-phase normal, 1-phase emergency
Accuracy: =/- 2%
Pickup: 95% to 99% of dropout setting
Dropout: 105% to 135% of nominal voltage
Dropout time delay: 0 to 120 sec
Over/under frequency sensing:
Accuracy: ±0.05 Hz
Pickup: ±5% to ±20% of nominal frequency
Dropout: 1-5% beyond pickup
Dropout time delay: 0.1 to 15.0 sec
Programmable genset exerciser: One event/schedule with or w/o load
Basic indicator panel:
Source available/connected LED indicators
Test/exercise/override buttons
Digital display – optional (M018)
Analog bar graph meter display – optional (D009)
Date/time-stamped event recording: 50 events
Load sequencing: Optional with network communications module M031. Provides control for eight steps of load with an adjustable time delay for each step on transfer, re-transfer or both.

Level 2 control (C024)

Open transition (in-phase)
Open transition (programmed)
Closed transition (includes fail-to-disconnect timer to prevent extended paralleling with the utility)
Utility-to-genset applications
Utility-to-utility applications
Genset-to-genset applications
Software adjustable time delays:
Engine start: 0 to 120 sec
Transfer normal to emergency: 0 to 120 sec
Re-transfer emergency to normal: 0 to 30 min
Engine stop: 0 to 30 min
Programmed transition: 0 to 60 sec
Undervoltage sensing: 3-phase normal, 3-phase emergency
Accuracy: +/- 2%
Pickup: 85% to 100% of nominal voltage
Dropout: 75% to 98% of pickup setting
Dropout time delay: 0-4 sec
Overvoltage sensing: 3-phase normal, 3-phase emergency
Accuracy: ±2%
Pickup: 95% to 99% of dropout setting
Dropout: 105% to 135% of nominal voltage
Dropout time delay: 0 to 120 sec
Over/under frequency sensing:
Accuracy: =/- 0.05 Hz
Pickup: ±5% to ±20% of nominal frequency
Dropout: 1-5% beyond pickup
Dropout time delay: 0.1 to 15.0 sec
Voltage imbalance sensing:
Dropout: 2% to 10%
Pickup: 90% of dropout
Time delay: 2.0 to 20.0 sec
Phase rotation sensing:
Time delay: 100 msec
Loss of single phase detection:
Time delay: 100 msec
Programmable genset exerciser: Eight events/schedules with or w/o load
Basic indicator panel:
Source available/connected LED indicators
Test/exercise/override buttons
Digital display – standard
Analog bar graph meter display – optional (D009)
Date/time-stamped event recording: 50 events
Load sequencing: Optional with network communications module M031. Provides control for eight steps of load with an adjustable time delay for each step on transfer, re-transfer, or both.
Genset-to-genset: Same functions as above, for lead and secondary generators.
Utility-to-utility: Same functions as above, for preferred and alternate source.

Time-delay functions

Engine start: Prevents nuisance genset starts due to momentary power system variation or loss. Not included in utility-to-utility systems.

Transfer normal to emergency: Allows genset to stabilize before application of load. Prevents power interruption if normal source variation or loss is momentary. Allows staggered transfer of loads in multiple transfer switch systems. For genset-to-genset applications, delays transfer of load from lead to secondary generator.

Re-transfer emergency to normal: Allows the utility to stabilize before re-transfer of load. Prevents needless power interruption if return of normal source is momentary. Allows staggered transfer of loads in multiple transfer switch systems. For genset-to-genset applications, delays re-transfer of load from secondary back to lead generator.

Engine stop: Maintains availability of the genset for immediate reconnection if the normal source fails shortly after retransfer. Allows gradual genset cool down by running unloaded. Not included in utility-to-utility systems.

Elevator pre-transfer signal: Requires optional relay signal module (M023). Signals elevator system that transfer is pending and delays transfer for pre-set interval of 0-60 seconds to prevent a power interruption during elevator operation.

User interfaces

Basic interface panel

LED indicators provide at-a-glance source and transfer switch status for quick summary of system conditions. Test and override buttons allow delays to be bypassed for rapid system checkout.

Digital display (M018)

The digital display provides a convenient method for monitoring load power conditions, adjusting transfer switch parameters, monitoring PowerCommand network status or reviewing transfer switch events. Password protection limits access to adjustments to authorized personnel. The digital display is optional with the PowerCommand Level 1 control and comes standard with the Level 2 control.

User interface options

Front panel security key (M017)

Locks front panel to prohibit access to digital control settings. Prevents unauthorized activation of transfer or test functions.

Bar graph meter display (D009)

An LED bar graph display provides an easy-to-read indicator of the level of power being supplied to the load. Information displayed includes: 3-phase voltage and current, frequency, power factor, and kilowatts. Green, amber, and red LEDs provide at-a-glance indication of system acceptability. Available as an option with the Level 2 PowerCommand microprocessor control.

Control Options

Relay signal module (M023)

Provides relay output contacts for sending information to the building monitoring and control system. Relay outputs include: Source 1 connected/available, Source 2 connected/available, not in auto, test/exercise active, failed to disconnect, failed to synchronize, failed to transfer/re-transfer, and elevator control pre-transfer signal.

Loadshed (M007)

Removes the load from the emergency power source by driving the transfer switch to the neutral position when signaled remotely. Transfers load back to the emergency source when the signal contacts open. Immediately re-transfers back to the primary source when available. Available for utility-to-genset applications only.

PowerCommand network interface (M031)

Provides connection to the PowerCommand network. LonWorks compatible for integration with building monitoring and control system.

Load power and load current monitoring (M022)

Measures load phase and neutral current, power factor, real power (kW) and apparent power (kVA). Warns of excessive neutral current resulting from unbalanced or nonlinear loads. Minimum current level detection is 3%.

UL withstand and closing ratings

OTPC transfer switches must be protected by circuit breakers or fuses. Referenced drawings include detailed listings of specific breakers or fuse types that must be used with the respective transfer switches. Consult with your distributor/dealer to obtain the necessary drawings. Withstand and closing ratings (WCR) are stated in symmetrical RMS amperes.

	MCCB protection			Special circuit breaker protection		
Transfer switch ampere	**WCR @ volts max with specific manufacturers MCCBs**	**Max MCCB rating**	**Drawing reference**	**With specific current limiting breakers (CLB)**	**Max CLB rating**	**Drawing reference**
40, 70, 125 3-pole	14,000 at 480 14,000 at 600	225 A	A050J441	200,000 at 480 100,000 at 600	225 A	A048J566
40, 70, 125 4-pole	30,000 at 480 30,000 at 600	400 A	A048E949	200,000 at 480 100,000 at 600	400 A	A051D533
150, 225, 260	30,000 at 480 30,000 at 600	400 A	A048E949	200,000 at 480 100,000 at 600	400 A	A051D533
300, 400, 600	65,000 at 480 65,000 at 600	1200 A	A048E951	200,000 at 480 100,000 at 600	1200 A	A048J564
800, 1000 open	65,000 at 480 50,000 at 600	1400 A	A048E953	150,000 at 480 100,000 at 600	1400 A	A048J562
1000, 1200 closed	85,000 at 480 65,000 at 600*	1600 A	0098-7312	85,000 at 480 65,000 at 600	1600 A	0098-7312
1200 open	85,000 at 480 65,000 at 600	1600 A	A048E947	200,000 at 480 200,000 at 600	1600 A	A048P186
1600, 2000	100,000 at 480 85,000 at 600*	4000 A	0098-7311	100,000 at 480 85,000 at 600	4000 A	0098-7311
3000	100,000 at 480 85,000 at 600*	4000 A	0098-7313	100,000 at 480 85,000 at 600	4000 A	0098-7313
4000	100,000 at 480 85,000 at 600*	5000 A	0098-8576	100,000 at 480	5000 A	0098-8576

Fuse protection

Transfer switch ampere	**WCR @ volts max. with current limiting fuses**	**Max fuse, size and type**	**Drawing reference**
40, 70, 125 3- and 4-pole	200,000 at 480 200,000 at 600	200 A Class J, RK1, RK5, T	A050J441
150, 225, 260	200,000 at 480 200,000 at 600	600 A Class J, RK1, RK5 1200 A Class L or T	A048E949
300, 400, 600	200,000 at 480 200,000 at 600	600 A Class, RK1 or RK5 1200 A Class L or T	A048E951
800, 1000 open	200,000 at 480 200,000 at 600	600 A Class, J, RK1 or RK5 1200 A Class T 2000 A Class L	A048E953
1000, 1200 closed	200,000 at 480 150,000 at 600*	3000 A Class L	0098-7312
1200 open	200,000 at 480 150,000 at 600*	3000 A Class L	A048E947
1600, 2000	200,000 at 480 150,000 at 600*	2500 A Class L	0098-7311
3000	200,000 at 480 150,000 at 600*	4000 A Class L	0098-7313
4000	200,000 at 480 150,000 at 600*	6000 A Class L	0098-8576

*CSA only

3-cycle ratings

Transfer switch ampere	WCR @ volts max 3-cycle rating	Max MCCB rating	Drawing reference
1000, 1200 closed	50,000 at 480	1600 A	0098-7312
	42,000 at 600*		
1200 open	50,000 at 480	1600 A	A048E947
	42,000 at 600*		
1600, 2000	100,000 at 480	4000 A	0098-7311
	85,000 at 600*		
3000	100,000 at 480	4000 A	0098-7313
	85,000 at 600*		
4000	100,000 at 480	5000 A	0098-8576
	85,000 at 600*		

Transfer switch lug capacities

All lugs accept copper or aluminum wire unless indicated otherwise.

Amp rating	Cables per phase	Size
40, 70, 125 3-pole	1	#12 AWG-2/0
40 4-pole	1	#14 AWG-2/0
70, 125 4-pole	1	#6 AWG - 300 MCM
150, 225	1	#6 AWG - 300 MCM
260	1	#6 AWG - 400 MCM
300, 400	1	3/0 - 600 MCM
	1 or 2	3/0 - 250 MCM
600	2	250 - 500 MCM
800, 1000 open	4	250 - 500 MCM
1000, 1200 closed	4	#2 AWG to 600 MCM
1200 open	4	0 AWG-750 MCM (Compression lug adaptor Optional)
1600, 2000	8	#2 AWG to 600 MCM (lugs optional)
3000	8	#2 AWG to 600 MCM (lugs optional)
4000	12	1/0 AWG to 750 MCM (lugs optional)

Notes

1. Contact factory for a list of specific lug or compression lugs
2. Select Feature N032-7

Enclosures

The transfer switch and control are mounted in a key-locking enclosure. Switches from 40-1000 amps are wall-mounted. Switches from 1200-4000 amps are floor-mounted. Wire bend space complies with 2009 NEC.

Dimensions - transfer switch in UL type 1 enclosure

Amp rating	Height		Width		Depth				Weight		Outline drawing
					Door closed		Door open				
	in	mm	in	mm	in	mm	in	mm	lb	kg	
40, 70, 125 3-pole	27.0	686	20.5	521	12.0	305	31.5	800	82	37	0310-0544
40, 70, 125 4-pole	35.5	902	26.0	660	16.0	406	41.0	1042	165	75	0500-4896
150, 225	35.5	902	26.0	660	16.0	406	41.0	1042	165	75	0310-0414
260	43.5	1105	28.5	724	16.0	406	43.0	1093	170	77	0310-0540
300, 400, 600	54.0	1372	25.5	648	18.0	457	42.0	1067	225	102	0310-1307
800, 1000 open	68.0	1727	30.0	762	20.6	524	48.5	1232	360	163	0310-0417
1000, 1200 closed	76.3	1937	36.0	915	22.7	577	54.0	1372	450	204	0310-0482
1200 open	90.0	2290	39.0	991	27.5	699	64.7	1644	730	331	A030L605
1600, 2000*	90.0	2290	36.0.	915	48.0	1219	84.0	2134	1100	499	0310-0483
3000*	90.0	2290	36.0	915	48.0	1219	84.0	2134	1250	567	0310-0484
4000*	90.0	2290	46.5	1180	60.0	1520	106	2700	1850	839	0500-4485

Dimensions - transfer switch in UL type 3R, 4 or 12 enclosure

Amp rating	Height		Width		Depth				Weight		Cabinet type	Outline drawing
					Door closed		Door open					
	in	mm	in	mm	in	mm	in	mm	lb	kg		
40, 70, 125 3-pole	34.0	864	26.5	673	12.5	318	36.5	927	125	57	3R, 12	0310-0453
											4	0310-0445
40, 70, 125 4-pole	42.5	1080	30.5	775	16.0	406	44.0	1118	190	86	3R, 12	0500-4896
											4	0500-4896
150, 225	42.5	1080	30.5	775	16.0	406	44.0	1118	215	97	3R, 12	0310-0454
											4	0310-0446
260	46.0	1168	32.0	813	16.0	406	46.0	1168	255	102	3R, 12	0310-0455
											4	0310-0447
300, 400, 600	59.0	1499	27.5	699	18.5	419	41.5	1054	290	132	3R, 12	0310-1315
											4	0310-1316
800, 1000 open	73.5	1867	32.5	826	20.8	529	49.5	1257	410	186	3R, 12	0310-0457
											4	0310-0449
1000, 1200 closed	76.3	1937	36.0	915	22.7	577	54.0	1372	450	204	3R, 12, 4	0310-0482
1200 open	90.0	2290	39.0	991	27.5	699	64.7	1644	730	331	3R, 12	A030L605
											4	A041N372
1600, 2000*	90.0	2290	38.0	826	50.9	1293	80.0	2032	1100	499	3R, 12, 4	0310-0744
3000*	90.0	2290	38.0	965	51.0	1295	84.5	2146	1250	567	3R	0310-0745
4000*	90.0	2290	49.0	1244	60.0	1524	105	2654	1850	839	3R	0500-4486

Dimensions - transfer switch in UL type 4X stainless steel enclosure

Amp rating	Height		Width		Depth				Weight		Cabinet type	Outline drawing
					Door closed		Door open					
	in	mm	in	mm	in	mm	in	mm	lb	kg		
40, 70, 125 3-pole	46.0	1168	32.0	813	16.0	406	46.0	1168	255	102	4X	0500-4184
40, 70, 125 4-pole	46.0	1168	32.0	813	16.0	406	46.0	1168	255	102	4X	0500-4896
150, 225	46.0	1168	32.0	813	16.0	406	46.0	1168	255	102	4X	0500-4184
260	46.0	1168	32.0	813	16.0	406	46.0	1168	255	102	4X	0500-4184
300, 400, 600	73.5	1867	32.5	826	19.5	495	49.5	1257	410	186	4X	0500-4185
800, 1000 open	73.5	1867	32.5	826	19.5	495	49.5	1257	410	186	4X	0500-4185
1000, 1200 closed	70.0	1778	40.0	1016	19.8	502	59.0	1499	450	204	4X	0310-0482
1200 open	90.0	2290	39.0	991	27.5	699	64.7	1644	730	331	4X	A041N372
1600, 2000	90.0	2290	35.5	826	50.9	1293	80.0	2032	1100	499	4X	0310-0744

* Rear and side access is required for installation. Dimensions shown are for 4-pole. For information on 3-pole switches, call factory.

Submittal detail

Amperage ratings
- ☐ 40
- ☑ 70
- ☑ 125
- ☐ 150
- ☐ 225
- ☐ 260
- ☐ 300
- ☐ 400
- ☐ 600
- ☐ 800
- ☐ 1000
- ☐ 1200
- ☐ 1600
- ☐ 2000
- ☐ 3000
- ☐ 4000

Voltage ratings
- ☐ R020 120*
- ☐ R038 190
- ☑ R021 208
- ☐ R022 220
- ☐ R023 240
- ☐ R024 380
- ☐ R025 416
- ☐ R035 440
- ☐ R026 480
- ☐ R027 600

* Single phase connection (not available on 1200-4000 amps)

Pole configuration
- ☑ A028 Poles - 3 (solid neutral)
- ☐ A029 Poles - 4 (switched neutral)

Frequency
- ☑ A044 60 Hertz
- ☐ A045 50 Hertz

Transfer mode
- ☐ A077 Open transition/in-phase
- ☐ A078 Open transition/programmed
- ☐ A079 Closed transition (available 1000-4000 amps, for closed transition below 1000 amps, see CHPC spec sheet S-1437)

Application
- ☑ A035 Utility to genset
- ☐ A036 Utility to utility
- ☐ A037 Genset to genset

System options
- ☐ A041 Single Phase, 2-wire or 3-wire (not available 1200-4000 amps)
- ☑ A042 Three Phase, 3-wire or 4-wire

Enclosure
- ☑ B001 Type 1: Indoor use, provides some protection against dirt (similar to IEC type IP30)
- ☐ B002 Type 3R:Intended for outdoor use, provides some protection from dirt, rain and snow (similar to IEC type IP34)
- ☐ B003 Type 4: Indoor or outdoor use, provides some protection from wind-blown dust and water spray (similar to IEC type IP65)
- ☐ B004 Open Construction: No enclosure - includes automatic transfer switch and controls (call factory for dimensions)
- ☐ B010 Type 12: Indoor use, some protection from dust (similar to IEC type IP61)
- ☐ B025 Type 4X: Stainless steel, indoor or outdoor use, provides some protection from corrosion (similar to IEC Type IP65)

Standards
- ☑ A046 UL 1008/CSA certification
- ☐ A064 NFPA 20 compliant (not available on 1200-4000 amp switches)
- ☐ A080 Seismic certification

Controls
- ☑ C023 PowerCommand control - Level 1
- ☐ C024 PowerCommand control - Level 2

Control options
- ☐ M017 Security key - front panel
- ☑ M018 Digital display
- ☐ M022 Load monitoring (min current level 3%)
- ☐ M023 Relay signal module. Includes pre-transfer module for elevator control
- ☐ M031 LonWorks network communications module (FTT-10)

Meter
- ☐ D009 Analog bar graph meter

Battery chargers
- ☐ K001 2 amps, 12/24 volts
- ☐ KB59 15 amps, 12 volts
- ☐ KB60 12 amps, 24 volts

Protective relays (closed transition)
- ☐ M045 Paralleling timer and lock-out relays, ANSI/IEEE 62PL and 86
- ☐ M046 Paralleling timer, lock-out and reverse power relays, single phase, ANSI/IEEE 62PL, 86 and 32R
- ☐ M047 Paralleling timer, lock-out and reverse power relays, three phase, ANSI/IEEE 62PL, 86 and 32R

Auxiliary relays - Relays are UL listed and factory installed. All relays provide two normally closed isolated and two normally open contacts rated 10 amps at 600 VAC. Relay terminals accept from one 18 gauge to two 12 gauge wires per terminal.
- ☐ L101 24 VDC coil - installed, not wired (for customer use).
- ☐ L102 24 VDC coil - emergency position - relay energized when switch is in Source 2 (emergency) position.
- ☐ L103 24 VDC coil - normal position - relay energized when switch is in Source 1 (normal) position
- ☐ L201 12 VDC coil - installed, not wired
- ☐ L202 12 VDC coil - emergency position - relay energized when switch is in Source 2 (emergency) position
- ☐ L203 12 VDC coil - normal position - relay energized when switch is in Source 1 (normal) position

Miscellaneous options
- ☐ M003 Terminal block - 30 points (not wired)
- ☐ N020 Terminal block – re-transfer inhibit
- ☐ M007 Load shed - from emergency - drives switch to neutral position when remote signal contact closes
- ☐ N009 Power connect - bus stabs (150-1200 amp open construction only)
- ☐ N013 Extension harness (open construction only)

Lug kits (select one)
- ☐ N008 Cable lugs, mechanical, 600 MCM, 8 per pole
- ☐ N032 Lug adapters, compression, ½ stab (1200A only)
- ☐ N045 Cable lugs, mechanical, 600 MCM, 4 per pole (1200A only)
- ☐ N066 Cable lugs, mechanical, 750 MCM, 4 per pole (1200A only)

Warranty
- ☑ G010 Years 0-2: Parts, labor and travel
  Years 3-5: Parts only
  Years 6-10: Main contacts only
- ☐ G013 Years 0-5: Comprehensive
  Years 6-10: Main contacts only

Shipping
- ☐ A051 Packing - export box

Accessories

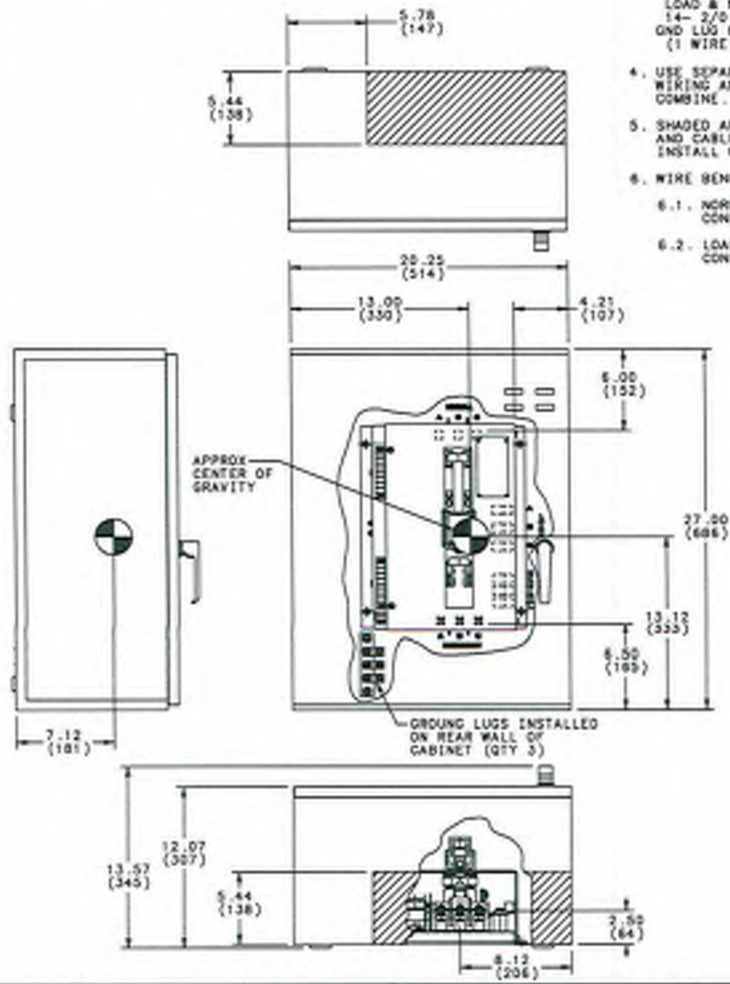
AC-167 Accessories specifications sheet

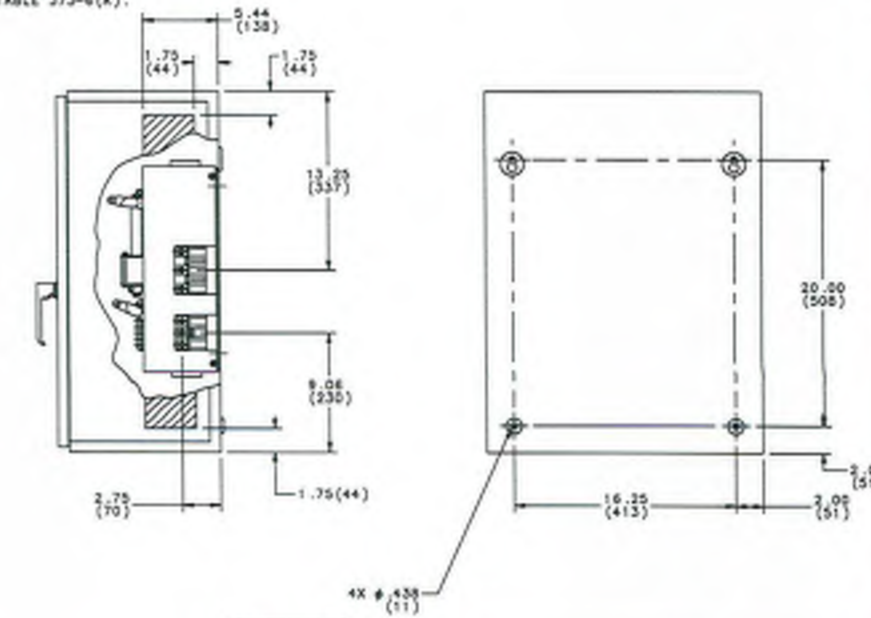
310-0544 D

125 Amp, 208 Volt, 3 Pole, Nema 1 ATS
70 Amp, 208 Volt, 3 Pole, Nema 1 ATS

NOTES:

1. APPROX. WEIGHT: 82 LBS
   MASS: 37 kg
2. DIMENSIONS IN ( ) ARE MILLIMETERS.
3. LUG CAPACITY:
   NORMAL & EMERGENCY LUGS (QTY 1 WIRE)
   12-2/0 MCM (4-50) CU-AL
   LOAD & NEUTRAL LUGS (QTY 1 WIRE)
   14- 2/0 MCM (2.5-50) CU-AL
   GND LUG CAPACITY:
   (1 WIRE) WIRE RANGE 14-1/0 (2.5-50) CU-AL.
4. USE SEPARATE CONDUITS FOR CONTROL WIRING AND POWER WIRING. DO NOT COMBINE.
5. SHADED AREA INDICATES WIRING AND CABLE ENTRANCE AREA DO NOT INSTALL OUTSIDE OF SHADED AREA.
6. WIRE BENDING SPACE:
   6.1. NORMAL & EMERGENCY LUGS: CONFORMS TO NEC TABLE 373-6(B).
   6.2. LOAD & NEUTRAL LUGS: CONFORMS TO NEC TABLE 373-6(A).
7. REFER TO NATIONAL ELECTRIC CODE, ARTICLE 110-16 WHICH STATES THE REQUIREMENT FOR THE MINIMUM CLEAR SPACE IN FRONT OF THIS UNIT.





REVISED DWG

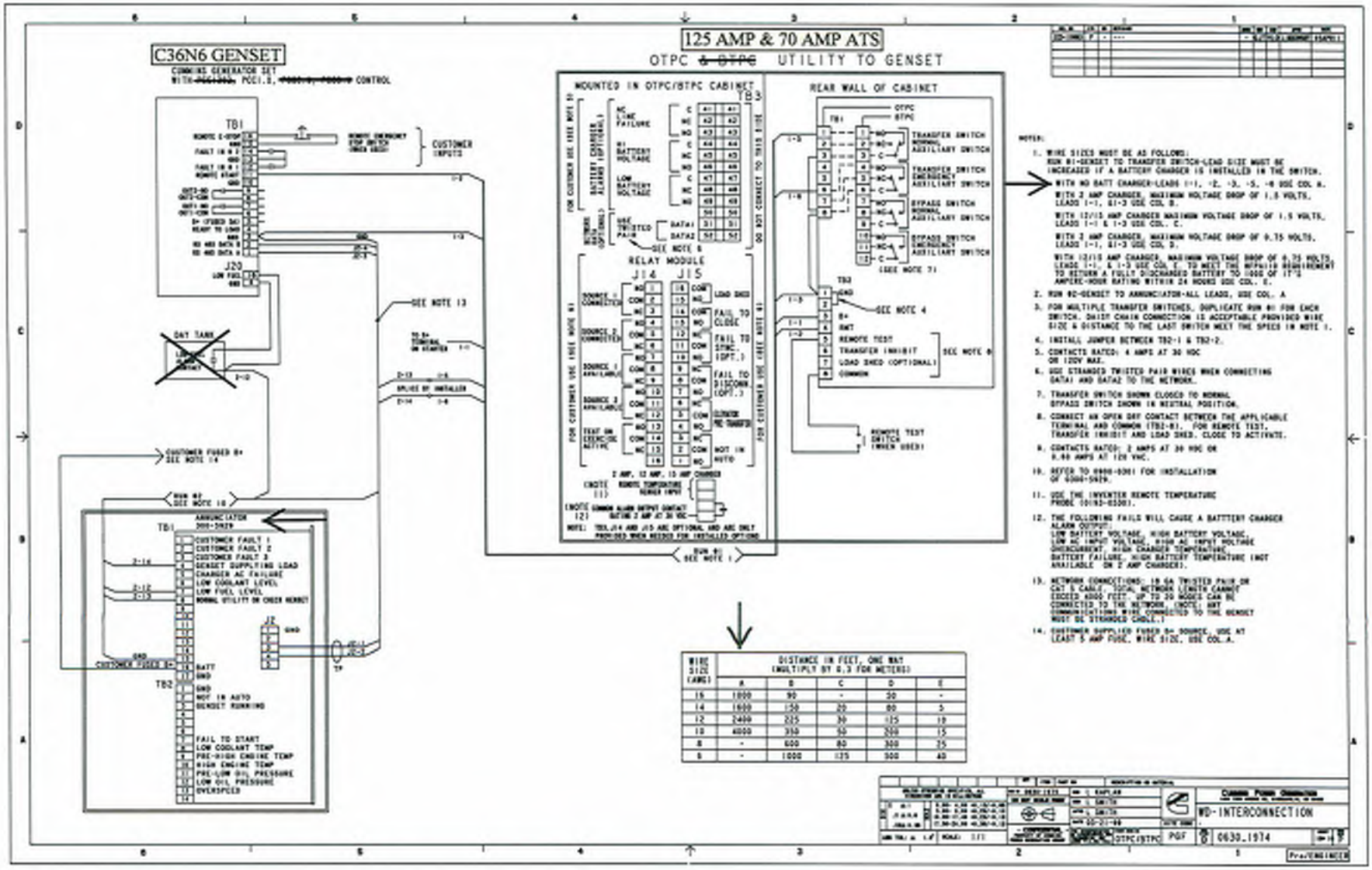
Onan

OUTLINE-CONTROL BOX

40-125 AMP

310-0544

1-1 D



Drawing Name: 0630-1974 Revision: P
Part Name: 0630-1974 Revision: P
Sheet 10 of 11

PowerCommand® Annunciator Discrete Input or PCCNet

> Specification sheet

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Power Generation

Description

The Universal Annunciator Module provides visual and audible indication of up to 20 separate alarm or status conditions, based on discrete (relay) inputs or network inputs. Each LED can be controlled by either a discrete wire input or by a signal on the PCCNet network sent from an external device, such as a PCC1301 or PCC2100 (version 2.4 or later) control.

In addition to the LEDs, the annunciator can control four custom relays based on signals received over the PCCNet. When one of the annunciator's discrete inputs is activated, the annunciator will broadcast that information over the network. By taking advantage of the network, discrete inputs and custom relays, the annunciator can be used as expanded I/O for a genset controller.

Easily installed in a location to give immediate notification of an alarm or warning status. Designed to give operating/monitoring personnel quick-glance status information. The module directly senses battery voltage to provide green/yellow/red alarm and status information for that parameter.

Genset controller complies with NFPA level two requirements when used with the display but without the annunciator panel. When used with the annunciator it meets NFPA level one requirements (emergency and standby power systems). The annunciator module can also be used for monitoring of transfer switch or other equipment status.

Features

- Visual and audible warnings of up to 20 separate alarm or status conditions.
- LEDs can be controlled either via PCCNet or discrete input.
- Status of discrete inputs is broadcast on network.
- Four custom relays can be controlled over the PCCNet network.
- Configurable LED color (red, yellow or green) and selectable horn operation allows maximum flexibility.
- Standard NFPA 110 label, field configurable for other alarm status and conditions.
- Each audible alarm is annunciated, regardless of the number of existing alarm conditions displayed.
- Sealed membrane panel design provides environmental protection for internal components and is easy to clean.
- Configurable for negative (ground) input or positive input.
- Integral DC voltage sensing.
- Flush or surface mount provisions.
- UL Listed and labeled; CSA certified; CE marked.

S-1472e (8/09)

Specifications

Signal requirements

Positive - Input impedance is 1.82 kOhms to ground; maximum input voltage = 31 VDC.

Negative - Input impedance is 1.82 kOhms to Bat+: inputs are at Bat+ level when open.

Sink/source current threshold for detection - 150 uA minimum, 3 mA maximum.

Typical conductor size: 16 ga for 304.8 m (1000 ft)

Max conductor size for terminal: 12 ga

Relay outputs

0.2 A at 125 VAC and 1 A at 30 VDC

Network connections

Use Belden 9729 two pair, stranded, shielded 24 AWG twisted pair cable for all PCCNet connections. Total network length can not exceed 1219 m (4000 ft). Up to 20 nodes can be connected to the network.

Note: Any communications wire connected to the generator set should be stranded cable.

Power

Maximum consumption: 15 watts

Battery voltage

Functional range - Audible and visual conditions operational from 6.5 to 31 VDC.

Low voltage setting - 12.0 VDC for 12 Volt nominal systems; 24.0 for 24 Volt nominal systems.

High voltage setting - 16.0 Volt for 12 Volt nominal systems; 32.0 Volt for 24 Volt nominal systems.

Alarm horn

Sound level: 90 dB at 30 cm

Physical

Weight (with enclosure): 1.4 kg (3.0 lbs)

Temperature

-20 °C to +70 °C (-4 °F to +158 °F)

Humidity

10% to 95% RH (non-condensing)

Default lamp configurations

Can be configured for current NFPA 110 standard or as a replacement for Legacy (pre-2001) NFPA 110 annunciator (300-4510 or 300 4511)

		NFPA 110		
Lamp	**Description**	**Color**	**Horn**	**Flash**
DS1	Customer fault 1	Green	No	No
DS2	Customer fault 2	Amber	No	No
DS3	Customer fault 3	Red	No	No
DS4	Genset supplying load	Amber	No	No
DS5	Charger AC failure	Amber	Yes	No
DS6	Low coolant level	Amber	Yes	No
DS7	Low fuel level	Red	Yes	No
DS8	Check generator set	Amber	No	No
DS9	Not in auto	Red	Yes	Yes
DS10	Generator set running	Amber	No	No
DS11	High battery voltage	Amber	Yes	No
DS12	Low battery voltage	Red	Yes	No
DS13	Weak battery	Red	Yes	No
DS14	Fail to start	Red	Yes	No
DS15	Low coolant temp	Red	Yes	No
DS16	Pre-high engine temp	Amber	Yes	No
DS17	High engine temp	Red	Yes	No
DS18	Pre-low oil pressure	Red	Yes	No
DS19	Low oil pressure	Red	Yes	No
DS20	Overspeed	Red	Yes	No

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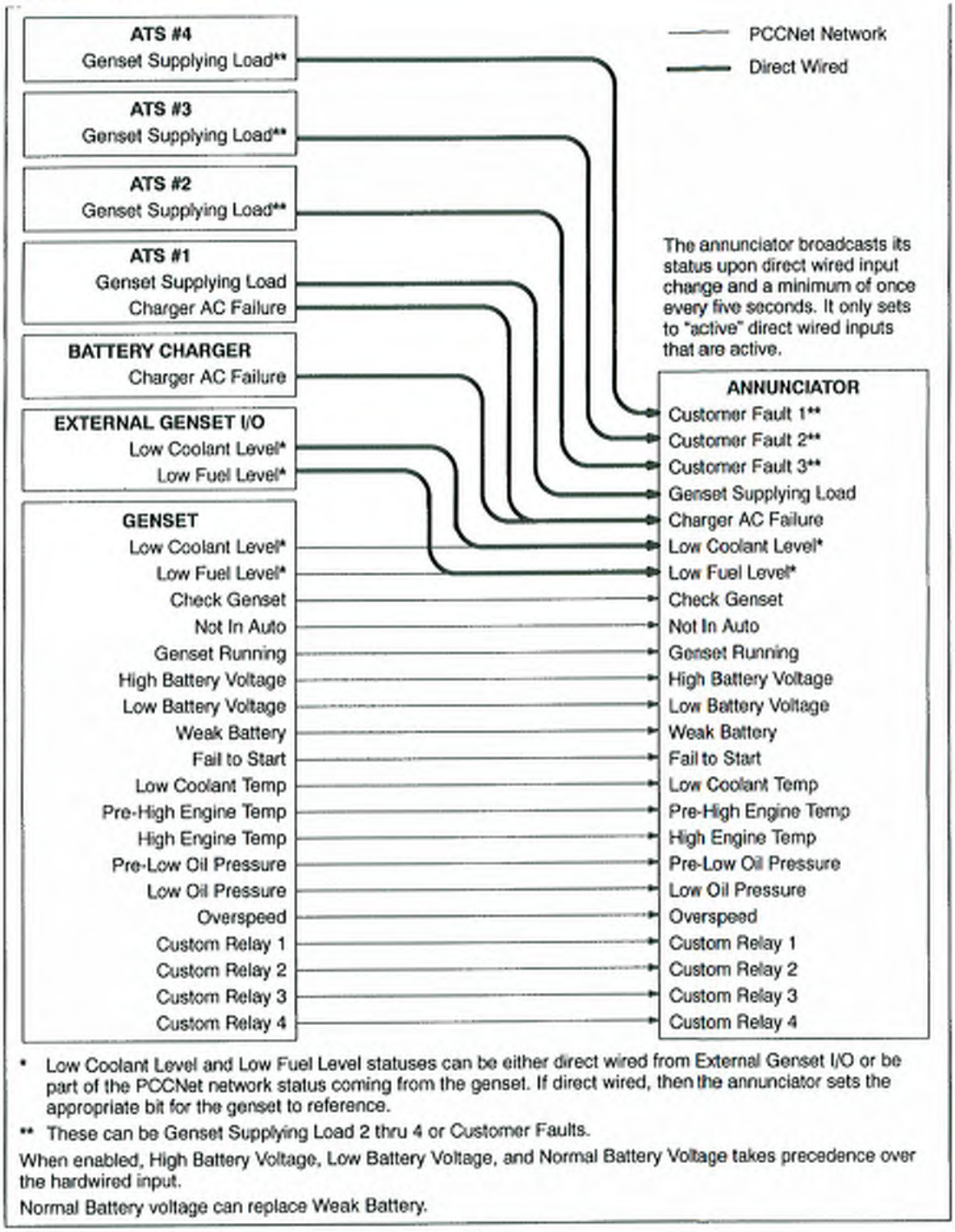
S-1472a (8/09)

Power Generation

Typical installation



* Low Coolant Level and Low Fuel Level statuses can be either direct wired from External Genset I/O or be part of the PCCNet network status coming from the genset. If direct wired, then the annunciator sets the appropriate bit for the genset to reference.

** These can be Genset Supplying Load 2 thru 4 or Customer Faults.

When enabled, High Battery Voltage, Low Battery Voltage, and Normal Battery Voltage takes precedence over the hardwired input.

Normal Battery voltage can replace Weak Battery.

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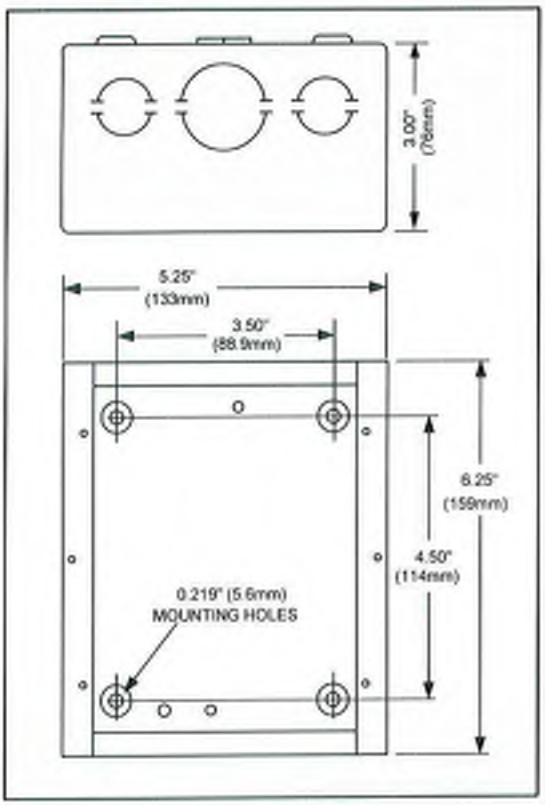
Power Generation

Dimensions



Dimensions: in (mm)

Ordering information

Part number	Description
0300-5929-01	Panel mount
0300-5929-02	Panel with enclosure

PCCNet COMPATIBLE

See your distributor for more information.

Cummins Power Generation

Americas
1400 73rd Avenue N.E.
Minneapolis, MN 55432 USA
Phone: 763 574 5000
Fax: 763 574 5298

Europe, CIS, Middle East and Africa
Manston Park Columbus Ave.
Manston Ramsgate
Kent CT 12 5BF United Kingdom
Phone 44 1843 255000
Fax 44 1843 255902

Asia Pacific
10 Toh Guan Road #07-01
TT International Tradepark
Singapore 608838
Phone 65 6417 2388
Fax 65 6417 2399

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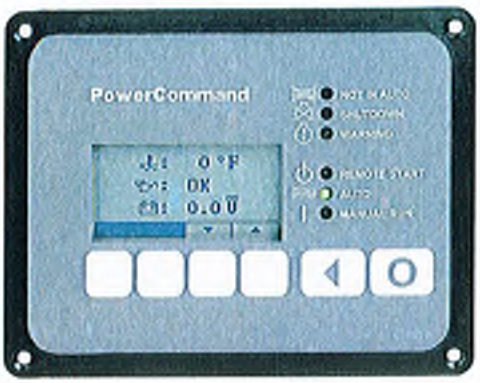
S-1472e (8/09)

Power Generation

PowerCommand®
1.1 control system



> Specification sheet

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Cummins Power Generation

Control system description

The PowerCommand® control system is a microprocessor-based generator set monitoring, metering and control system designed to meet the demands of today's engine driven generator sets. The integration of all control functions into a single control system provides enhanced reliability and performance compared to conventional generator set control systems. These control systems have been designed and tested to meet the harsh environment in which gensets are typically applied.

Features

Easy to view: HMI 211RS for residential use. 128x64 pixel graphic LED backlight LCD.

Easy to use: Tactile buttons for generator set start/stop. Residential standby display for convenient use.

Modbus interface: Eliminates need for MODLON.

Progressive protective functions: Advanced Overcurrent Protection – Generator set monitoring & protection.

Digital voltage regulation: Single phase full wave SCR type regulator compatible with either shunt or PMSG systems.

Digital engine speed governing: Provides isochronous frequency regulation.

12 and 24 VDC battery operation.

Automatic mains failure: Smooth & automatic transfer and re-transfer of load from utility to generator set & vice-versa.

Exerciser clock: Runs generator set exerciser routines for dependability of operation.

Warranty and service: Backed by a comprehensive warranty and worldwide distributor service network.

Certification: Suitable for us on generator sets that are designed, manufactured, tested and certified to relevant UL, NFPA, ISO, IEC Mil Std., CE and CSA standards.

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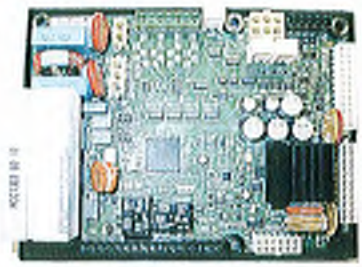
Cummins Power Generation

PowerCommand digital generator set control PCC 1302



Description

The PowerCommand generator set control is suitable for use on a wide range of generator sets in non-paralleling applications. The PowerCommand control is compatible with shunt or PMG excitation style. It is suitable for use with reconnectable or non-reconnectable generators, and it can be configured for any frequency, voltage and power connection from 120-600 VAC line-to-line.

Power for this control system is derived from the generator set starting batteries. The control functions over a voltage range from 8 VDC to 30 VDC.

Features

- 12 and 24 VDC battery operation.
- Digital voltage regulation.
- Digital engine speed governing (where applicable) - Provides isochronous frequency regulation.
- Full authority engine communications (where applicable) - Provides communication and control with the Engine Control Module (ECM).
- Common harnessing - with higher feature Cummins Power Generation controls allows for easy field upgrades.
- Generator set monitoring - Monitors status of all critical engine and alternator functions.
- Digital genset metering (AC and DC).
- Genset battery monitoring system - to sense and warn against a weak battery condition.
- Engine starting - Includes relay drivers for starter, fuel shut off (FSO), glow plug/spark ignition power and switch B+ applications.
- Generator set protection - Protects engine and alternator.
- Advanced serviceability - using InPower™, a PC-based software service tool.
- Environmental protection - The control system is designed for reliable operation in harsh environments. The main control board is a fully encapsulated module that is protected from the elements.
- Exerciser function – Routine exercising of generator set.
- Supports dual fuel control.
- Automatic Mains Failure function built in generator set controller.Modbus interface - for interconnecting to customer equipment.
- Configurable inputs and outputs - Four discrete inputs and two dry contact relay outputs.
- Warranty and service - Backed by a comprehensive warranty and worldwide distributor service network.
- Certifications - Suitable for use on generator sets that are designed, manufactured, tested and certified to relevant UL, NFPA, ISO, IEC, Mil Std., CE and CSA standards.

Base control functions

HMI capability

Operator adjustments - The HMI includes provisions for many set up and adjustment functions.

Generator set hardware data - Access to the control and software part number, generator set rating in KVA and generator set model number is provided from the HMI or InPower.

Data logs - Includes engine run time, controller on time, number of start attempts.

Fault history - Provides a record of the most recent fault conditions with control hours time stamp. Up to 10 events are stored in the control non-volatile memory.

Alternator data

- Voltage (single or three phase line-to-line and line-to-neutral)
- Current (single or three phase)
- KVA (three phase and total)
- Frequency

Engine data

- Starting battery voltage
- Engine speed
- Engine temperature
- Engine oil pressure
- Partial Full Authority Engine (FAE) data (where applicable)

Service adjustments - The HMI includes provisions for adjustment and calibration of generator set control functions. Adjustments are protected by a password. Functions include:

- Engine speed governor adjustments
- Voltage regulation adjustments
- Cycle cranking
- Configurable fault set up
- Configurable output set up
- Meter calibration
- Units of measurement

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Engine control

SAE-J1939 CAN interface to full authority ECMs (where applicable) - Provides data swapping between genset and engine controller for control, metering and diagnostics.

12 VDC/24 VDC battery operations - PowerCommand will operate either on 12 VDC or 24 VDC batteries.

Isochronous governing (where applicable) - Capable of controlling engine speed within +/-0.25% for any steady state load from no load to full load. Frequency drift will not exceed +/-0.5% for a 33 °C (60 °F) change in ambient temperature over an 8 hour period.

Temperature dependent governing dynamics (with electronic governing) - Modifies the engine governing control parameters as a function of engine temperature. This allows the engine to be more responsive when warm and more stable when operating at lower temperature levels.

Remote start mode - Accepts a ground signal from remote devices to automatically start the generator set and immediately accelerate to rated speed and voltage. The remote start signal will also wake up the control from sleep mode. The control can incorporate a time delay start and stop.

Remote and local emergency stop - The control accepts a ground signal from a local (genset mounted) or remote (facility mounted) emergency stop switch to cause the generator set to immediately shut down. The generator set is prevented from running or cranking with the switch engaged. If in sleep mode, activation of either emergency stop switch will wake up the control.

Sleep mode - The control includes a configurable low current draw state to minimize starting battery current draw when the genset is not operating. The control can also be configured to go into a low current state while in auto for prime applications or applications without a battery charger.

Engine starting - The control system supports automatic engine starting. Primary and backup start disconnects are achieved by one of three methods: magnetic pickup, battery charging alternator feedback or main alternator output frequency. The control also supports configurable glow plug control when applicable.

Cycle cranking - Configurable for the number of starting cycles (1 to 7) and duration of crank and rest periods. Control includes starter protection algorithms to prevent the operator from specifying a starting sequence that might be damaging.

Time delay start and stop (cooldown) - Configurable for time delay of 0-300 seconds prior to starting after receiving a remote start signal and for time delay of 0-600 seconds prior to shut down after signal to stop in normal operation modes. Default for both time delay periods is 0 seconds.

Alternator control

The control includes an integrated line-to-line sensing voltage regulation system that is compatible with shunt or PMG excitation systems. The voltage regulation system is full wave rectified and has an SCR output for good motor starting capability. Major system features include:

Digital output voltage regulation - Capable of regulating output voltage to within +/-1.0% for any loads between no load and full load. Voltage drift will not exceed +/-1.5% for a 40 °C (104 °F) change in temperature in an eight hour period. On engine starting or sudden load acceptance, voltage is controlled to a maximum of 5% overshoot over nominal level.

The automatic voltage regulator feature can be disabled to allow the use of an external voltage regulator.

Torque-matched V/Hz overload control - The voltage roll-off set point and rate of decay (i.e. the slope of the V/Hz curve) is adjustable in the control.

Protective functions

On operation of a protective function the control will indicate a fault by illuminating the appropriate status LED on the HMI, as well as display the fault code and fault description on the LCD. The nature of the fault and time of occurrence are logged in the control. The service manual and InPower service tool provide service keys and procedures based on the service codes provided. Protective functions include:

Battle short mode

When enabled and the *battle short* switch is active, the control will allow some shutdown faults to be bypassed. If a bypassed shutdown fault occurs, the fault code and description will still be annunciated, but the genset will not shutdown. This will be followed by a *fail to shutdown fault*. Emergency stop shutdowns and others that are critical for proper operation are not bypassed. Please refer to the Control Application Guide or Manual for list of these faults.

Configurable alarm and status inputs

The control accepts up to four alarm or status inputs (configurable contact closed to ground or open) to indicate a configurable (customer-specified) condition. The control is programmable for warning, shutdown or status indication and for labeling the input.

Power Generation

Emergency stop

Annunciated whenever either emergency stop signal is received from external switch.

General engine protection

Low and high battery voltage warning - Indicates status of battery charging system (failure) by continuously monitoring battery voltage.

Weak battery warning - The control system will test the battery each time the generator set is signaled to start and indicate a warning if the battery indicates impending failure.

Fail to start (overcrank) shutdown - The control system will indicate a fault if the generator set fails to start by the completion of the engine crack sequence.

Fail to crank shutdown - Control has signaled starter to crank engine but engine does not rotate.

Cranking lockout - The control will not allow the starter to attempt to engage or to crank the engine when the engine is rotating.

Hydro mechanical fuel system engine protection

Overspeed shutdown - Default setting is 115% of nominal.

Low lube oil pressure warning/shutdown - Level is preset (configurable with InPower) to match the capabilities of the engine used. Control includes time delays to prevent nuisance alarms.

High lube oil temperature warning/shutdown - Level is preset (configurable with InPower) to match the capabilities of the engine used. Control includes time delays to prevent nuisance alarms.

High engine temperature warning/shutdown - Level is preset (configurable with InPower) to match the capabilities of the engine used. Control includes time delays to prevent nuisance alarms.

Low coolant temperature warning – Indicates that engine temperature may not be high enough for a 10 second start or proper load acceptance.

Sensor failure indication - Logic is provided on the base control to detect analog sensor or interconnecting wiring failures.

Full authority electronic engine protection

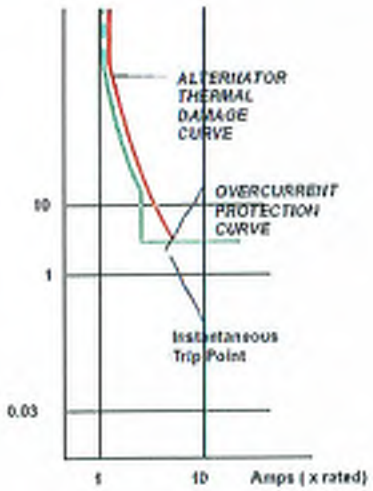
Engine fault detection is handled inside the engine ECM. Fault information is communicated via the SAE-J1939 data link for annunciation in the HMI.

Alternator protection

High AC voltage shutdown (59) - Output voltage on any phase exceeds preset values. Time to trip is inversely proportional to amount above threshold. Values adjustable from 105-130% of nominal voltage, with time delay adjustable from 0.1-10 seconds. Default value is 110% for 10 seconds.

Low AC voltage shutdown (27) - Voltage on any phase has dropped below a preset value. Adjustable over a range of 50-95% of reference voltage, time delay 2-20 seconds. Default value is 85% for 10 seconds.

Overcurrent warning/shutdown - Implementation of the thermal damage curve with instantaneous trip level calculated based on current transformer ratio and application power rating.



Under frequency shutdown (81 u) - Generator set output frequency cannot be maintained. Settings are adjustable from 2-10 Hz below nominal governor set point, for a 5-20 second time delay. Default: 6 Hz, 10 seconds.

Over frequency shutdown/warning (81o) - Generator set is operating at a potentially damaging frequency level. Settings are adjustable from 2-10 Hz above nominal governor set point for a 1-20 second time delay. Default: 6 Hz, 10 seconds, enabled.

Loss of sensing voltage shutdown - Shutdown of generator set will occur on loss of voltage sensing inputs to the control.

Field overload shutdown - Uses field voltage to shutdown generator set when a field overload condition occurs.

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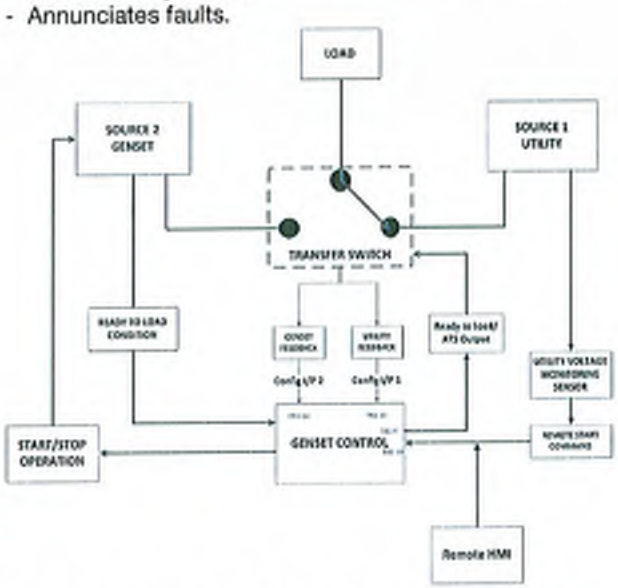
Advanced functions

Automatic mains failure*

The built in AMF feature provides the automatic transfer and re-transfer of the load from utility to generator set and vice-versa.

- Automatically starts-stops the generator set in the event of utility failure.
- Annunciates faults.



* A utility voltage monitoring sensor (as shown in the AMF diagram above) must be connected in order to use the AMF feature on the 1302 control. Use Schneider Electric Relay RSB1A120U7, Socket RSZE1S35M.

Exerciser clock

The exerciser clock runs the generator set exerciser routines for dependability of operation.

Field control interface

Input signals to the base control include:

- Remote start
- Local and emergency stop
- Configurable inputs: Control includes (4) input signals from customer discrete devices that are configurable for warning, shutdown or status indication, as well as message displayed

Output signals from the PowerCommand control include:

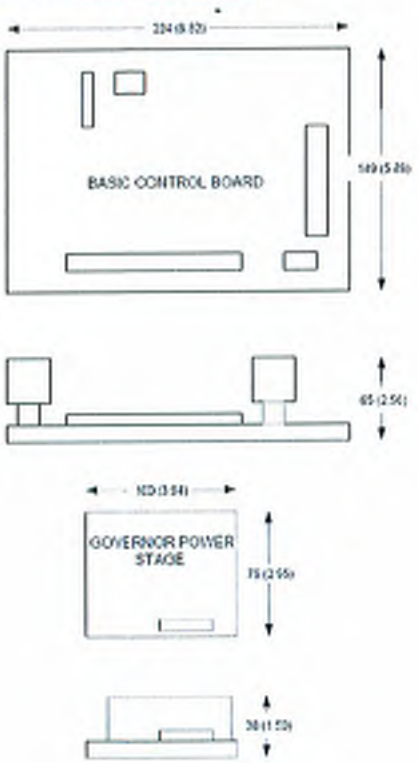
- Configurable relay outputs: Control includes (2) relay output contacts rated at 2 A. These outputs can be configured to activate on any control warning or shutdown fault as well as ready to load, not in auto, common alarm, common warning and common shutdown.
- Ready to load (generator set running) signal: Operates when the generator set has reached 90% of rated speed and voltage and latches until generator set is switched to off or idle mode.

Communications connections include:

- PC tool interface: This RS-485 communication port allows the control to communicate with a personal computer running InPower or PowerCommand for Windows® software.
- Modbus RS-485 port: Allows the control to communicate with external devices such as PLCs using Modbus protocol.

  Note - An RS-232 or USB to RS-485 converter is required for communication between PC and control.
- Networking: This RS-485 communication port allows connection from the control to the other Cummins Power Generation products.

Mechanical drawings



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PowerCommand human machine interface HMI211

Description

This control system includes an intuitive operator interface panel that allows for complete genset control as well as system metering, fault annunciation, configuration and diagnostics. The interface includes five generator set status LED lamps with both internationally accepted symbols and English text to comply with customer needs. The interface also includes an LED backlit LCD display with tactile feel soft-switches for easy operation and screen navigation. It is configurable for units of measurement and has adjustable screen contrast and brightness.

The *run/off/auto* switch function is integrated into the interface panel.

All data on the control can be viewed by scrolling through screens with the navigation keys. The control displays the current active fault and a time-ordered history of the five previous faults.

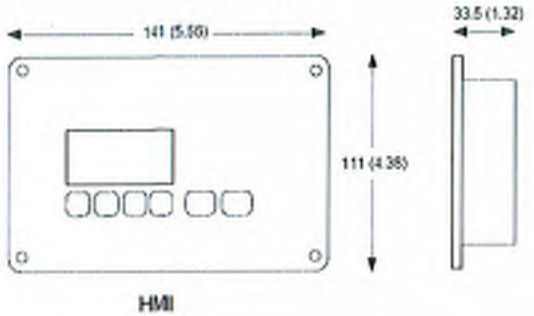
Features

- LED indicating lamps:
  - remote start
  - not in auto
  - shutdown
  - warning
  - auto
  - run
- 128 x 64 pixels graphic LED backlight LCD.
- Four tactile feel membrane switches for LCD defined operation. The functions of these switches are defined dynamically on the LCD.
- Two tactile feel membrane switches dedicated for *off* and *back*.
- Allows for complete genset control setup.
- Certifications: Suitable for use on generator sets that are designed, manufactured, tested and certified to relevant UL, NFPA, ISO, IEC, Mil Std., CE and CSA standards.
- HMI 211RS provides convenience for residential use.

Communications connections

- PC tool interface - This RS-485 communication port allows the HMI to communicate with a personal computer running InPower.
- This RS-485 communication port allows the HMI to communicate with the main control board.

Mechanical drawing



Dimensions: mm (inches)

Software

InPower (beyond 6.0 version) is a PC-based software service tool that is designed to directly communicate to PowerCommand generator sets and transfer switches, to facilitate service and monitoring of these products.

Environment

The control is designed for proper operation without recalibration in ambient temperatures from -40 °C (-40 °F) to +70° C (158 °F), and for storage from -55 °C (-67 °F) to +80 °C (176 °F). Control will operate with humidity up to 95%, non-condensing.

The HMI is designed for proper operation in ambient temperatures from -40 °C* (-40 °F) to +70 °C (158 °F), and for storage from -40 °C* (-40 °F) to +80 °C (176 °F).

The control board is fully encapsulated to provide superior resistance to dust and moisture. Display panel has a single membrane surface, which is impervious to effects of dust, moisture, oil and exhaust fumes. This panel uses a sealed membrane to provide long reliable service life in harsh environments.

The control system is specifically designed and tested for resistance to RFI/EMI and to resist effects of vibration to provide a long reliable life when mounted on a generator set. The control includes transient voltage surge suppression to provide compliance to referenced standards.

* Heater accessory (pn: A040H853) is available for enhanced operation below -20 °C

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Certifications

PowerCommand meets or exceeds the requirements of the following codes and standards:

- NFPA 110 for level 1 and 2 systems.
- ISO 8528-4: 1993 compliance, controls and switchgear.
- CE marking: The control system is suitable for use on generator sets to be CE-marked.
- EN 50081-1,2 residential/light industrial emissions or industrial emissions.
- EN 50082-1,2 residential/light industrial or industrial susceptibility.
- ISO 7637-2, level 2; DC supply surge voltage test.
- Mil Std 202C, Method 101 and ASTM B117: Salt fog test.
- PowerCommand control systems and generator sets are designed and manufactured in ISO 9001 certified facilities.
- UL 508 recognized or Listed and suitable for use on UL 2200 Listed generator sets.
- CSA C282-M1999 compliance.
- CSA 22.2 No. 14 M91 industrial controls.

Warranty

All components and subsystems are covered by an express limited one year warranty. Other optional and extended factory warranties and local distributor maintenance agreements are available.

Accessories

1301-1302 Upgrade Kit (HM)	0541-1431
PowerCommand 500 (LAN)	A040X126
Remote HMI 211	0541-1394
Remote HMI 211RS	A046K103
I/O Expansion (Aux 101)	0541-1291
HMI Heater Accessory Kit	A040H853

Parts ordering information

1302 Control Board	0327-1617-02
1302 control Board – Arrow	A043W505
Aux 104 (Governor Control)	0327-1507
HMI 211 Without Heater	0300-6014
HMI 211 with Heater	A026G237

Additional resources

Resource	Where to Find
1302 Service Manual	QSOL
Accessories Catalog	cumminspower.com
Additional Controls Information	PowerSuite Library

PCCNet COMPATIBLE

See your distributor for more information

Cummins Power Generation

Americas
1400 73rd Avenue N.E.
Minneapolis, MN 55432 USA
Phone: 763 574 5000
Fax: 763 574 5298

Europe, CIS, Middle East and Africa
Manston Park Columbus Ave.
Manston Ramsgate
Kent CT 12 5BF United Kingdom
Phone 44 1843 255000
Fax 44 1843 255902

Asia Pacific
10 Toh Guan Road #07-01
TT International Tradepark
Singapore 608838
Phone 65 6417 2388
Fax 65 6417 2399

Warning: Back feed to a utility system can cause electrocution and/or property damage. Do not connect to any building's electrical system except through an approved device or after building main switch is open.

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Power Generation

Power Systems

SUBMITTAL DRAWINGS FOR:

P.S. 43 Queens
12 Marvin Street
Queens, NY 11691

PREPARED FOR:

G.S.H. Electric, Inc
491 East 166th Street
Bronx, New York 10456
Attention: Mr. Gene Humphreys

PREPARED BY:

Cummins Power Systems, LLC
890 Zerega Avenue
Bronx, New York 10473
Dean A. Bruno / Shannon Vicks

5/13/15

New York Branch
Cummins Power Systems LLC
890 Zerega Avenue
Bronx, NY 10473
Phone: (718) 892-2400
Fax: (718) 892-0055

Power Systems

BILL OF MATERIALS

One (1) new Cummins/Onan model C36N6, rated at 36 KW, 120/208 volt, 3 phase, 4 wire, 60 hertz, 1800 RPM, for operation on natural gas fuel. Package to include our standard accessories plus the following:

- EPA Certified
- Engine starting battery - lead acid type
- Battery rack and cables
- Battery charger, float type, 10 amps, 12 VDC, shipped loose
- Battery charging alternator
- Critical exhaust silencer, set mounted inside enclosure
- Engine jacket water heater, 500 watts, 120 VAC
- Engine mounted radiator and fan
- Vibration isolators, spring type, shipped loose
- Structural steel base rails

Onan PowerCommand Control Panel featuring a microprocessor based digital control system with the following:

- Cyclic cranking control, adjustable
- Self diagnostics with LED's for self test
- Run-off-auto switch
- Menu switch
- Digital engine coolant temperature
- Digital engine RPM (tachometer)
- Digital DC battery voltage
- Digital engine starts counter
- Digital engine running hours
- Low oil pressure shutdown and pre-alarm
- High engine temperature shutdown and pre-alarm
- Overspeed shutdown
- Fail to crank shutdown
- Fail to start (overcrank) shutdown
- Oil pressure sender failure warning
- Water temperature sender failure warning

New York Branch
Cummins Power Systems LLC
890 Zerega Avenue
Bronx, NY 10473
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Fax: (718) 892-0055

Power Systems

- Low battery voltage warning
- High battery voltage warning
- Weak battery warning

- Remote Annunciator
- Generator mainline circuit breaker, 100 amps
- 60 amp fused disconnect switch, NYC approved painted red, NEMA 1 enclosure, shipped loose
- Isochronous electronic governor
- Sound Attenuated Aluminum Enclosure, rated for 67.3 dB/A at 23 feet
- Flexible fuel line
- Strainer, shipped loose
- Two (2) year warranty
- One (1) year service contract (4 visits per year)
- Lube oil and antifreeze
- Factory and field testing
- Startup

Two (2) new automatic transfer switches, one (1) rated 125 amps and one (1) rated 70 amps, 3 pole, 208 volts, 3 phase, 60 Hz, NEMA 1 enclosure, including the following:

- Adjustable undervoltage sensors with dropout time delay
- Start contacts
- Digital display panel
- Microprocessor controlled
- Adjustable time delays stop, transfer, retransfer and stop
- Neutral bar
- Plant exerciser with load selector switch
- Inphase monitor
- Switch position and source available lights
- Two (2) mainshaft auxiliary contacts

Notes:

1. Alternator temperature rise shall be 105 degree C.
2. Standard factory enclosure shall be provided, exception to fireproof materials, 50 lbs/sf roof loading, and nema 3R breakglass switch.

New York Branch:
Cummins Power Systems LLC
890 Zerega Avenue
Bronx, NY 10473
Phone: (718) 892-2400
Fax: (718) 892-0055

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Power Generation

Limited Warranty

Transfer Switch ~~and Paralleling Systems~~

This limited warranty applies to all Cummins Power Generation® branded Transfer Switches, Paralleling Systems and associated accessories (hereinafter referred to as "Product").

This warranty covers any failures of the Product, under normal use and service, which result from a defect in material or factory workmanship.

Warranty Period:

The warranty start date is the date of commissioning†, demonstration or 18 months after factory ship date, whichever is sooner.

† Date of commissioning not to exceed date of Generator Set initial start-up.

Transfer Switch Coverage Duration:

The warranty coverage duration for Transfer Switches is defined in the table below for the different product families:

Product Family	Duration
GTEC, LT, LC, RSS, RST, OTEC	▪ 1 Year: Parts, Labor & Travel
PLTO, PLTH, PLTS, PLTE	▪ 2 Years: Parts, Labor & Travel
Other Power Transfer Devices††	▪ 2 Years: Parts, Labor & Travel
OT, OTPC, BTPC, OHPC, CHPC	▪ Years 0-2: Parts, Labor &Travel ▪ Years 3-5: Parts Only ▪ Years 6-10: Main Contacts Only

†† Devices manufactured by Cummins Power Generation that allow power transfer between two power sources.

Paralleling Systems Coverage Duration:

The warranty coverage duration for Paralleling Systems is for a period of 2 Years from the warranty start date.

Cummins Power Generation® Responsibilities:

In the event of a failure of the Product during the warranty period due to defects in material or workmanship, Cummins Power Generation® will only be responsible for the following costs:

- All parts and labor required to repair the Product†††.
- Reasonable travel expenses to and from the Product site location†††.

††† Years 0-2 only for OT, OTPC, BTPC, OHPC & CHPC family of Transfer Switches.

Owner Responsibilities:

The owner will be responsible for the following:

- Notifying Cummins Power Generation® distributor or dealer within 30 days of the discovery of failure.
- Installing, operating, commissioning and maintaining the Product in accordance with Cummins Power Generation®'s published policies and guidelines.
- Providing evidence for date of commissioning.
- Providing sufficient access to and reasonable ability to remove the Product from the installation in the event of a warrantable failure.

In addition, the owner will be responsible for:

- Incremental costs and expenses associated with Product removal and reinstallation resulting from non-standard installations.
- Costs associated with rental of power generating equipment used to replace the Product being repaired.
- Costs associated with labor overtime and premium shipping requested by the owner.
- All downtime expenses, fines, all applicable taxes, and other losses resulting from a warrantable failure.

Limitations:

This limited warranty does not cover Product failures resulting from:

- Inappropriate use relative to designated power rating.
- Inappropriate use relative to application guidelines.
- Non-conformance to applicable industry standards for installation
- Normal wear and tear.
- Improper and/or unauthorized installation.
- Negligence, accidents or misuse.
- Lack of maintenance or unauthorized repair.
- Noncompliance with any Cummins Power Generation® published guideline or policy.
- Improper storage before and after commissioning.
- Owner's delay in making Product available after notification of potential Product problem.
- Use of steel enclosures within 60 miles of the coast of salt water when aluminum or an alternate non-corrosive material enclosure option is available.
- Replacement parts and accessories not authorized by Cummins Power Generation®.
- Owner or operator abuse or neglect such as: late servicing and maintenance and improper storage.
- Damage to parts, fixtures, housings, attachments and accessory items that are not part of the transfer switch or paralleling system.

This limited warranty does not cover costs resulting from:

- Difficulty in gaining access to the Product.
- Repair of cosmetic damage to enclosures.

Please contact your local Cummins Power Generation® Distributor for clarification concerning these limitations.

CUMMINS POWER GENERATION® RIGHT TO FAILED COMPONENTS:

Failed components claimed under warranty remain the property of Cummins Power Generation®. Cummins Power Generation® has the right to reclaim any failed component that has been replaced under warranty.

Extended Warranty:

Cummins Power Generation® offers several levels of Extended Warranty Coverage. Please contact your local Cummins Power Generation ® Distributor for details.

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THE WARRANTIES SET FORTH HEREIN ARE THE SOLE WARRANTIES MADE BY CUMMINS POWER GENERATION ® IN REGARD TO THE PRODUCT. CUMMINS POWER GENERATION® MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED, OR OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

IN NO EVENT IS CUMMINS POWER GENERATION® LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

This limited warranty shall be enforced to the maximum extent permitted by applicable law. This limited warranty gives the owner specific rights that may vary from state to state or from jurisdiction to jurisdiction.

Product Model Number:_____

Product Serial Number:_____

Date in Service:_____

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Limited Warranty

Commercial Generating Set

This limited warranty applies to all Cummins Power Generation® branded commercial generating sets and associated accessories (hereinafter referred to as "Product").

This warranty covers any failures of the Product, under normal use and service, which result from a defect in material or factory workmanship.

Warranty Period:

The warranty start date[1] is the date of initial start up, first rental, demonstration or 18 months after factory ship date, whichever is sooner. See table for details.

Continuous Power (COP) is defined as being the maximum power which the generating set is capable of delivering continuously whilst supplying a constant electrical load when operated for an unlimited number of hours per year. No overload capability is available for this rating.

Prime Power (PRP) is defined as being the maximum power which a generating set is capable of delivering continuously whilst supplying a variable electrical load when operated for an unlimited number of hours per year. The permissible average power output over 24 hours of operation shall not exceed 70% of the PRP. For applications requiring permissible average output higher than stated, a COP rating should be used.

Limited-Time Running Power (LTP) is defined as the maximum power available, under the agreed operating conditions, for which the generating set is capable of delivering for up to 500 hours of operation per year.

Emergency Standby Power (ESP) is defined as the maximum power available during a variable electrical power sequence, under the stated operating conditions, for which a generating set is capable of delivering in the event of a utility power outage or under test conditions for up to 200 hours of operation per year. The permissible average power output over 24 hours of operation shall not exceed 70% of the ESP.

Base Warranty Coverage Duration (Whichever occurs first)

Rating	Months	Max. Hours
COP	12	Unlimited
PRP	12	Unlimited
LTP	12	500 hrs
ESP	24	400 hrs

[1] Warranty start date for designated rental and oil and gas model Products is determined to be date of receipt of Product by the end customer.

Cummins Power Generation® Responsibilities:

In the event of a failure of the Product during the warranty period due to defects in material or workmanship, Cummins Power Generation® will only be responsible for the following costs:

- All parts and labor required to repair the Product.
- Reasonable travel expenses to and from the Product site location.
- Maintenance items that are contaminated or damaged by a warrantable failure.

Owner Responsibilities:

The owner will be responsible for the following:

- Notifying Cummins Power Generation® distributor or dealer within 30 days of the discovery of failure.
- Installing, operating, commissioning and maintaining the Product in accordance with Cummins Power Generation®'s published policies and guidelines.
- Providing evidence for date of commissioning.
- Providing sufficient access to and reasonable ability to remove the Product from the installation in the event of a warrantable failure.

In addition, the owner will be responsible for:

- Incremental costs and expenses associated with Product removal and reinstallation resulting from non-standard installations.
- Costs associated with rental of generating sets used to replace the Product being repaired.

- Costs associated with labor overtime and premium shipping requested by the owner.
- All downtime expenses, fines, all applicable taxes, and other losses resulting from a warrantable failure.

Limitations:

This limited warranty does not cover Product failures resulting from:

- Inappropriate use relative to designated power rating.
- Inappropriate use relative to application guidelines.
- Normal wear and tear.
- Improper and/or unauthorized installation.
- Negligence, accidents or misuse.
- Lack of maintenance or unauthorized repair.
- Noncompliance with any Cummins Power Generation® published guideline or policy.
- Use of improper or contaminated fuels, coolants or lubricants.
- Improper storage before and after commissioning.
- Owner's delay in making Product available after notification of potential Product problem.
- Use of steel enclosures within 60 miles of the coast of salt water when aluminum or an alternate non-corrosive material enclosure option is available.
- Replacement parts and accessories not authorized by Cummins Power Generation®.
- Use of Battle Short Mode.
- Owner or operator abuse or neglect such as: operation without adequate coolant or lubricants; overfueling; overspeeding; lack of maintenance to lubricating, cooling or air intake systems; late servicing and maintenance; improper storage, starting, warm-up, run-in or shutdown practices, or for progressive damage resulting from a defective shutdown or warning device.
- Damage to parts, fixtures, housings, attachments and accessory items that are not part of the generating set.

This limited warranty does not cover costs resulting from:

- Difficulty in gaining access to the Product.
- Repair of cosmetic damage to enclosures.

Please contact your local Cummins Power Generation® Distributor for clarification concerning these limitations.

CUMMINS POWER GENERATION® RIGHT TO FAILED COMPONENTS:

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Extended Warranty:

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IN NO EVENT IS CUMMINS POWER GENERATION® LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

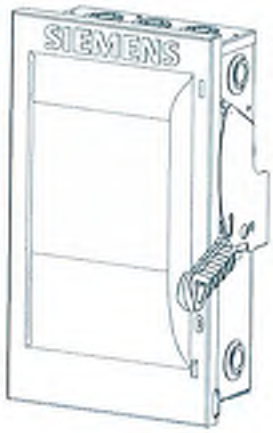
This limited warranty shall be enforced to the maximum extent permitted by applicable law. This limited warranty gives the owner specific rights that may vary from state to state or from jurisdiction to jurisdiction.

Product Model Number:_____

Product Serial Number:_____

Date in Service:_____

60 Amp Fire Alarm Fused Disconnect, Painted Red, NEMA 1 Enclosure, shipped loose



Heavy Duty Safety Switch

Type VBII, 60 Amp & Oversized 30A, Type 1 (Indoor)

Standards and Ratings
- UL Listed under file #E4776
- Meets UL98 for switches and UL 50 for enclosures
- Meets NEMA Standard KS-1 for enclosed switches
- Meets NEC wire bending space requirements
- Rated 10,000 AIC with Class H fuses or 200,000 AIC with Class R and J fuses
- 60A switches rated 10,000 AIC at 600Vdc with Class R or J fuses
- I^2t rated ($Amps^2$ x Seconds = 200,000)
- 12X overload current rating exceeds 10X industry standard
- Suitable for use as service entrance equipment

Features
- Quick-make and break switching action
- Double break visible blade design
- Highly visible ON/OFF indication
- Rugged installer friendly enclosure design
- Modular design allows quick and easy replacement of parts
- Front removable lugs which can easily be converted to copper body or compression type lugs
- Defeatable dual cover interlock

General Information

Catalog Number	Amps	Volts	Description	Shipping Weight (lbs.)
HF361L	30	600	3 Pole, 3 Wire, Fusible	19
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
HF322N	60	240	3 Pole, 4 Wire, Fusible	19
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
HF362	60	600	3 Pole, 3 Wire, Fusible	19
HF362N	60	600	3 Pole, 4 Wire, Fusible	19
HNF262	60	600	2 Pole, 2 Wire, Non-Fusible	19
HNF362	60	600	3 Pole, 3 Wire, Non-Fusible	18

Horsepower Ratings [2] [3] - 240 Volts

Catalog Number	1 Phase, 240V AC Std	1 Phase, 240V AC Max	3 Phase, 240V AC Std	3 Phase, 240V AC Max	250V DC
HF222N	3	10	7½	15	10
HF322N	3	10	7½	15	10

Horsepower Ratings [2] [3] - 600 Volts

Catalog Number	3 Phase, 480V AC Std	3 Phase, 480V AC Max	3 Phase, 600V AC Std	3 Phase, 600V AC Max	600V DC
HF361L	5	15	7½	20	—
HF262 [4]	— [5]	—	—	— [5]	30
HF362 [4]	15	30	15	50	25
HF362N [4]	15	30	15	50	25
HNF262 [4]	— [5]	—	—	— [5]	30
HNF362 [4] [6]	—	50	—	60	25

[1] These switches are UL Listed for application on grounded B phase systems.
[2] Dual horsepower ratings: Std - applies when non-time delay fuses are installed. Max - applies when time-delay fuses are installed.
[3] Horsepower ratings listed also apply to Design E motors with no derating.
[4] 60A switches also rated 10HP at 250V DC.
[5] 60A switches also rated 20HP at 480V and 25HP at 600V, 1 phase.
[6] 60A switches also rated 20HP on 3Ø, 240V AC systems.

Product Specification Sheet HD60.1

Answers for industry.

SIEMENS

Product Specification Sheet #HD60.1 (page 2 of 3)

Accessories

Catalog Number	Description
HA161234	One Normally Open and Closed Auxiliary Switches
HA261234	Two Normally Open and Closed Auxiliary Switches
HA361234	Low Voltage Auxiliary Switch
HG61234	Equipment Ground Lug Kit
HG261234	Isolated Equipment Ground Lug Kit
HP62	Fuse Puller (3 per kit) (HF222N, HF322N, HF262, HF362, HF362N)
HN623	Neutral Kit
HR612 [1]	240 Volt Class R Fuse Clip Kit (3 fuse clips per kit) (HF222N,HF322N)
HR62	600 Volt Class R Fuse Clip Kit (3 fuse clips per kit) (HF262, HF362,HF362N)
HLC612	Copper Lug Kit (9 lugs per kit)
HCL623	Compression Lug Neutral Barrier Kit

Replacement Parts

Catalog Number	Description
HFB22 [1]	Fusible 240 Volt Line Side Replacement Base (HF222N, HF322N)
HBB22 [1]	Fusible 240 Volt Load Side Replacement Base (HF222N, HF322N)
HFB62	Fusible 600 Volt Line Side Replacement Base (HF262, HF362,HF362N)
HBB62	Fusible 600 Volt Load Side Replacement Base (HF262, HF362,HF362N)
HNB623	Non-Fusible 600 Volt Replacement Base (HNF262, HNF362)
HH6123	Replacement Handle/Handle Guard
HL612	Replacement Lugs (3 lugs per kit)
HM6123	Replacement Mechanism
[2]	Replacement Door

Mechanical Lug Wire Ranges (60/75°C, Cu/Al)

Description	Wire Range
Line, Load	#12-2 AWG (Al) or
Neutral	#14-2 AWG (Cu)
Ground	#14-4 AWG

Compression Lugs [3]

Wire Size	Burndy		Thomas-Betts		Ilsco	
	CU Only	CU/AL	CU Only	CU/AL	CU Only	CU/AL
#14-10			256-30695-1352	60097		
#8	YA8C-L1 BOX YA8C-TC14	YA8CA3	54130 54930BE	60102 61102		ACL-8
#6	YA6C-L BOX YA6C	YA6CA1	54105 54905BE	60107 61107	CRB-6 CRB-6L	ACL-6
#4			54106	61112	CRB-4	

[1] Also 30A, 600V for HF361L.
[2] Place "DOOR" at the end of the switch catalog number.
[3] If compression lugs are used for the neutral, order compression lug neutral barrier kit HCL623.

Cummins Power Systems

Power Generation Service
890 Zerega Avenue Bronx, New York 10473
Phone: 718-892-2400 Fax: 718-823-4438

PRE-STARTUP CHECKLIST

To best serve your interest in expediting the startup and testing of the unit you have purchased, the following checklist must be completed **prior** to scheduling with our service department. Startup will be scheduled between **10-14 business days** after checklist has been received, subject to technician availability.

CONTRACTOR INFORMATION

YOUR COMPANY NAME: _____

ADDRESS: _____ CITY _____ STATE _____ ZIP _____

YOUR NAME: _____ PHONE#: _____

FAX#: _____ E-MAIL _____

JOBSITE INFORMATION

NAME OF FACILITY: _____

PS 43Q
12 Marvin Street
Queens, NY 11691

ADDRESS: _____ ATE _____ ZIP _____

BUILDING ENGINEER / SUPER NAME: _____ PHONE#: _____

FAX#: _____ E-MAIL _____

*The following information must be filled out completely or the Equipment will not be eligible for Warranty Coverage and Startup will be delayed.

*WARRANTY REQUIREMENTS

*EQUIPMENT OWNERS NAME _____

*ADDRESS _____ CITY _____ STATE _____ ZIP _____

Power Systems

*CONTACT NAME _____ *PHONE #_____

*FAX#_____ * E-MAIL_____

EQUIPMENT INFORMATION

GENSET

***ENGINE** MAKE_____ *MODEL_____

*ENGINE SERIAL #_____ *SPEC._____

***GENERATOR** MAKE_____ *MODEL_____

*GENERATOR SERIAL #_____ *SPEC._____

***ENGINE** MAKE_____ *MODEL_____

*ENGINE SERIAL #_____ *SPEC._____

***GENERATOR** MAKE_____ *MODEL_____

*GENERATOR SERIAL #_____ *SPEC._____

Transfer Switch / Switchgear

***ATS** MAKE_____ *MODEL_____

*ATS SERIAL #_____ *SPEC._____

***ATS** MAKE_____ *MODEL_____

*ATS SERIAL #_____ *SPEC._____

***OTHER** MAKE_____ *MODEL_____

* SERIAL #_____ *SPEC._____

Power Systems

(Use additional sheet if necessary)

DESCRIPTION OF JOBSITE AND EQUIPMENT LOCATION:

(New construction, existing structure, accessibility problems, etc.)

NO. OF GENSETS _____ & LOCATION: (i.e., Indoor, Outdoor, Roof, Floor Level) Please specify:

_____

_____

NO. OF TRANSFER SWITCHES ____ & LOCATION: (i.e., Basement, Roof, Floor Level) Please specify:

_____

_____

_____

_____

REMOTE ANNUNCIATOR LOCATION: Please specify:

_____

AVAILABILITY OF PARKING: At site ☐ or a parking lot for Commercial Vans nearby ☐

Location of lot if known _____

LOADING DOCK: Yes ☐ No ☐

ELEVATOR: Yes ☐ No ☐ Normal Service Hours _____ to _____

TYPE: Building, ☐ Freight ☐ Construction elevator ☐ and up to what floor? ____

Accessibility for Load Bank: ☐ Can park trailer next to genset within 50 Feet.

☐ Can NOT park trailer next to genset within 50 Feet. Length/ Feet of cable required? _____

☐ Can not use trailer unit. Portable load bank (suitcase) required.

Power Systems

Building Requirements / Restrictions:

_____

_____

_____

_____

INSTALLATION REQUIREMENTS

DIESEL POWERED GENSETS

- ❑ There must be sufficient fuel in the day tank and/or main tank for startup and testing.
  . The Owner/Contractor is responsible for supplying fuel.
- ❑ Day tank to be connected to a live circuit in the Emergency distribution panel. **Do not turn on circuit.**
- ❑ Fuel piping to Generator Set must meet Cummins Power Generation specifications' as per installation manual. Fuel lines from day tank to both main fuel supply tank and engine must be complete. Supply line from main tank to day tank pump should be connected to the pick up tube on main tank. Pick up tube should have a "foot valve". A return line from engine to day tank and day tank to main tank should be in place. Day tank and main tank must be vented. Use only black iron pipe for fuel lines. **Never use copper or galvanized pipe.** Fuel lines from main tank to day tank must be primed.

GASEOUS FUEL POWERED GENSETS

- ❑ If LPG or Natural gas and flex fuel line must be installed.
- ❑ Natural Gas Filter must be installed before flex fuel line. (If not supplied please contact your sales . . engineer)
- ❑ Gas pressures, volumes and pipes sized to meet Cummins Power Generation specifications.
- ❑ Insure Gas Company has turned on supply to the generator.

ALL UNITS

- ❑ Battery Charger installed and connected to live electrical circuit. **Do not energize circuit.**
- ❑ Engine coolant heater connected to live electrical circuit. **Do not energize circuit.**
- ❑ Louvers installed and operational, where applicable.
- ❑ Exhaust system installed and insulated. **Do not insulate exhaust flex.**
- ❑ The flexible exhaust section should not carry any weight nor be distorted in any way.
- ❑ Vibration Isolators are installed where applicable and set to 3/8" gap. **Do not level set with isolators.**
- ❑ Radiator exhaust ducting installed including flexible transition piece.
- ❑ The allowable radiator airflow restriction and minimum air inlet and outlet openings must meet factory specifications and be designed so as to provide adequate airflow.
- ❑ All external piping and conduit connections to generator set must be flexible.
- ❑ All DC control wiring to generator set must be correctly sized, stranded and run in separate conduits from AC wiring.
- ❑ Are batteries located at the site? Yes ☐ No ☐ Nicad Batteries Yes ☐ No ☐ Charged Yes ☐ No ☐

Power Systems

❑ All interconnects AC and DC, between generator(s), transfer switch(es), annunciators, control switchgear or any other supplied devices, is to be completed prior to start-up.
❑ Transfer switch can be tested at time of generator startup? (There will be a power interruption) Yes ☐ No ☐.
❑ If used, Networks must be wired as prescribed in Network Installation and Operators Manual.
❑ Network communication wire to follow spec in the Generator Set Installation Manual.
❑ Area under and around generator is to be cleaned prior to startup. This will prevent damage to radiator by debris being drawn into it and personal injury resulting from flying debris.

SCHEDULING

For startup arrangements contact:
PG Service Manager Arty Schaub at 718-502-1248

START-UP :

DATE REQUESTED: _____ RAIN DATE: _____

LOAD BANK TEST: (WILL NOT BE SCHEDULED SAME DAY AS START UP)

DATE REQUESTED: _____ RAIN DATE: _____

ADDITIONAL REQUIREMENTS (IF ANY:)_____

DATE REQUESTED: _____ RAIN DATE: _____

_____

Acknowledgement: The Contractor/Owner understands that the above items and all items listed in the Cummins installation manual "Installation Checklist" must be completed prior to Startup.

Should additional trips be needed resulting from customer not completing the above requirements, or if Cummins Power Systems service technicians assist in completing any of these tie-ins, the Contractor/Owner will be responsible for the additional Time, Materials & Travel fees incurred.
Any pre-arranged documented exceptions are excluded from the above.
Additional trips resulting from equipment related problems (warranty) will, of course, not be charged.

SIGNED: _____ PRINT NAME: _____

For technical or installation assistance contact your sales engineer:

Name: _____ **Phone #** _____

Power Systems

SALES-SERVICE RECORD

INITIAL START-UP, SYSTEM CHECKOUT AND TEST RECORD

DATE: _____

SOLD TO: _____

_____

_____

OWNER'S NAME & ADDRESS: _____ PS 43Q
12 Marvin Street
Queens, NY 11691

CONTACT NAME & PHONE NUMBER: _____

GENERATOR MODEL NO: _____ SPEC NO: _____

SERIAL NO: _____

ENGINE MODEL NO: _____

ENGINE SERIAL NO: _____

TRANSFER SWITCH MODEL NO: _____ SPEC NO: _____

SERIAL NO: _____

TRANSFER SWITCH MODEL NO: _____ SPEC NO: _____

SERIAL NO: _____

TRANSFER SWITCH MODEL NO: _____ SPEC NO: _____

SERIAL NO: _____

INITIAL START-UP DATE: _____

TYPE FUEL: _____
(Natural Gas, LPG Vapor, LPG Liquid, Gasoline, Diesel)

TYPE OF INSTALLATION: _____
(Indoor/Outdoor)

TYPE OF COOLING: _____
(Radiator, City Water Heat Exchanger, City Water Standpipe,
Remote Radiator, City Water Direct)

INITIAL INSTALLATION & PRESTART CHECKS

OIL SYSTEM

- ☐ ADD ENGINE LUBE OIL & CHECK LEVEL
- ☐ SERVICE AIR CLEANER
- ☐ OIL FILTER
- ☐ GOVERNOR LINKAGE

FUEL SYSTEM

- ☐ NATURAL GAS
- ☐ MANUAL SHUT OFF VALVE
- ☐ PRIMARY GAS PRESSURE REGULATOR
- ☐ GAS VOLUME SURGE TANK
- ☐ DRY FUEL STRAINER
- ☐ GAS SOLENOID VALVE
- ☐ FLEXIBLE FUEL CONNECTION
- ☐ GAS AVAILABLE
- ☐ GASOLINE
- ☐ FLEXIBLE FUEL CONNECTION
- ☐ PRIMER TANK (IF REQUIRED)
- ☐ GASOLINE SOLENOID VALVE - BETWEEN PRIMER TANK & CARBURETOR (IF REQUIRED)
- ☐ GASOLINE AVAILABLE
- ☐ PRIME
- ☐ DIESEL
- ☐ FLEXIBLE FUEL CONNECTIONS (SUPPLY & RETURN)
- ☐ DAY TANK (INSTALLED BELOW FUEL PUMP & INJECTORS)
- ☐ FUEL TRANSFER PUMP
- ☐ DAY TANK FLOAT SWITCH WIRED TO FUEL TRANSFER PUMP (A.C. or D.C.)
- ☐ FUEL RETURN LINE TO MAIN TANK ONE SIZE LARGER
- ☐ DIESEL FUEL SOLENOID VALVE (IF REQUIRED)
- ☐ DIESEL FUEL AVAILABLE
- ☐ BLEED DIESEL

EXHAUST SYSTEM

- ☐ SEAMLESS TUBING
- ☐ EXHAUST CONDENSATION TRAP
- ☐ MUFFLER
- ☐ CORRECT EXHAUST PIPING SIZE
- ☐ LONG-RADIUS EXHAUST ELBOWS
- ☐ EXHAUST THIMBLE

COOLING SYSTEM

- ☐ RADIATOR COOLING
- ☐ ADD COOLANT, ANTIFREEZE & CHECK LEVEL
- ☐ PROPER EXHAUST VENTILATION DUCT & OPENING
- ☐ PROPER INLET VENTILATION OPENING
- ☐ PROPER AIR CIRCULATION
- ☐ CITY WATER COOLING :
  - ☐ STANDPIPE ☐ HEAT EXCHANGER ☐ DIRECT
- ☐ FLEXIBLE WATER LINES
- ☐ WATER SOLENOID VALVE
- ☐ WATER STRAINER
- ☐ WATER AVAILABLE
- ☐ PROPER AIR EXHAUST & INLET VENTILATION
- ☐ PROPER AIR CIRCULATION

MOUNTING

- ☐ SECURED TO LEVEL SURFACE

- ☐ OIL DRAINAGE CLEARANCE
- ☐ VIBRATION ISOLATORS INSTALLED CORRECTLY

ENGINE
- ☐ SPARK PLUGS - CORRECT GAP FOR FUEL USED
- ☐ CHOKE SET FOR FUEL USED
- ☐ BREAKER POINT SET - CORRECT GAP FOR FUEL USED
- ☐ INSPECT BELT, FAN, ALTERNATOR & GOVERNOR

BATTERY
- ☐ PROPER BATTERY SIZE
- ☐ ELECTROLYTE
- ☐ CORRECT POLARITY
- ☐ ISOLATED FROM FLOOR

ELECTRICAL
- ☐ ENGINE WATER JACKET HEATER WIRED TO NORMAL SOURCE
- ☐ FUEL SOLENOID VALVE WIRED TO IGNITION SYSTEM
- ☐ REMOTES START WIRING TO TRANSFER SWITCH
- ☐ OPERATION SELECTOR SWITCH TO PROPER POSITION
- ☐ PROPER GENERATOR A.C. WIRING CONNECTIONS (UR, YD, YB)
- ☐ IS PLANT GROUNDED?_____ ☐ WHERE? _____

AUTOMATIC LOAD TRANSFER SWITCH
- ☐ REMOTE START WIRING TO ENGINE/GENERATOR
- ☐ TRICKLE CHARGER OPERATION & ADJUSTMENT
- ☐ PROPER A.C. LOAD, A.C. GENERATOR & A.C. NORMAL WIRING
- ☐ ADJUST TIME DELAY RELAYS
- ☐ ADJUST CLOCK EXERCISER
- ☐ VISUAL CHECK MAIN CONTACTORS
- ☐ IS CONTACTOR BLOCK REMOVED?

GENERAL INSPECTION
- ☐ WIRING
- ☐ HOSES
- ☐ CLEARANCES
- ☐ SUPPORTS

RECOMMENDATION OR MODIFICATIONS BEFORE PLANT IS STARTED FIRST TIME

_____ _____

_____ _____

☐ MODIFICATIONS COMPLETED ☐ DATE _____

☐ OK FOR START UP

START AND WARM-UP PERIOD (NO LOAD)
- ☐ FIELD CIRCUIT BREAKER "OFF"
- ☐ START ENGINE (SELECTOR SWITCH IN "RUN" POSITION)
- ☐ OIL PRESSURE _____ LBS.
- ☐ WATER TEMPERATURE _____ °F
- ☐ BATTERY CHARGE RATE
- ☐ UNUSUAL NOISES/VIBRATIONS
- ☐ FIELD CIRCUIT BREAKER "ON"
- ☐ CHECK PHASE ROTATION
- ☐ VOLTAGE
- ☐ HERTZ
- ☐ UNUSUAL NOISES/VIBRATIONS
- ☐ ALLOW PROPER NO LOAD WARM-UP

WARM-UP PERIOD (ADD LOAD)

- ☐ SELECTOR SWITCH IN "RUN" POSITION
- ☐ ADD LOAD BY SIMULATING POWER FAILURE (MAIN BREAKER OR TEST SWITCH IN THE AUTOMATIC TRANSFER SWITCH

ENGINE/GENERATOR

- ☐ CARBURETOR ADJUSTMENTS
- ☐ GOVERNOR ADJUSTMENTS
- ☐ CHECK FOR OVERLOAD
- ☐ LOAD PER LEG _____ AMPS _____ AMPS _____ AMPS _____
- ☐ VOLTAGE _____
- ☐ HERTZ_____
- ☐ OIL PRESSURE _____ LBS.
- ☐ WATER TEMPERATURE _____ °F
- ☐ CHECK LOW OIL PRESSURE SAFETY SWITCH
- ☐ CHECK HIGH WATER TEMPERATURE SAFETY SWITCH
- ☐ CHECK ENGINE OVERSPEED SAFETY SWITCH
- ☐ UNUSUAL NOISES/VIBRATIONS

AUTOMATIC LOAD TRANSFER SWITCH

- ☐ TRANSFER TO EMERGENCY OK
- ☐ TIME DELAYS TIMED OUT OK
- ☐ REMOVE LOAD (MAIN BREAKER OR TEST SWITCH IN THE AUTOMATIC LOAD TRANSFER SWITCH)
- ☐ RETRANSFER TO NORMAL OK
- ☐ SHUT DOWN PLANT (SELECTOR SWITCH IN "STOP" POSITION)

COMPLETE AUTOMATIC RESTART PERIOD

- ☐ CHECK OIL & WATER LEVELS
  SELECTOR SWITCH IN "REMOTE"
  SIMULATE POWER FAILURE (MAIN BREAKER DISCONNECT)

ENGINE/GENERATOR

- ☐ ENGINE START OK
- ☐ ENGINE & GENERATOR UNDER LOAD OK
- ☐ UNUSUAL NOISES/VIBRATIONS

AUTOMATIC LOAD TRANSFER SWITCH

- ☐ TRANSFER TO EMERGENCY OK
- ☐ RETURN LOAD TO NORMAL (MAIN BREAKER ON TO RESTORE LINE POWER) (TRANSFER SWITCH)
- ☐ RETRANSFER TO NORMAL OK
- ☐ TIME DELAYS TIMES OUT PROPERLY
- ☐ ENGINE SHUT-DOWN OK

FINAL INSTALLATION RECOMMENDATIONS

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

ONAN WARRANTY INITIATION

ENGINE/GENERATOR DATE _____

AUTOMATIC LOAD TRANSFER SWITCH DATE _____

CHECKOUT & INITIAL START-UP

PERFORMED BY

_____

PERFORMED BY

_____

WITNESSED BY

_____

COMPANY

_____

****

PM / SERVICE PARTS LIST

LUBE FILTER PART # _____ **FUEL FILTER**

#_____

LUBE FILTER PART # _____ **FUEL FILTER**

#_____

AIR FILTER PART # _____ **WATER FILTER**

#_____

BREATHER FILTER # _____ **RACOR SEP. #**

_____

BATTERY TYPE

LEAD ACID _____**VOLTS** **BATTERY SIZE** _____ **QTY.** _____

NICADS _____**VOLTS** **CELL PART #** _____ **QTY.** _____

BATTERY CHARGER MFG. ______________________ A/C VOLTS _______________ D/C VOLTS ____________

JACKET WATER HTR. MFG. ______________________ VOLTS ______________ WATTS ________

OIL CAPACITY/TYPE ______________________________ COOLING SYSTEM/CAPACITY ____________

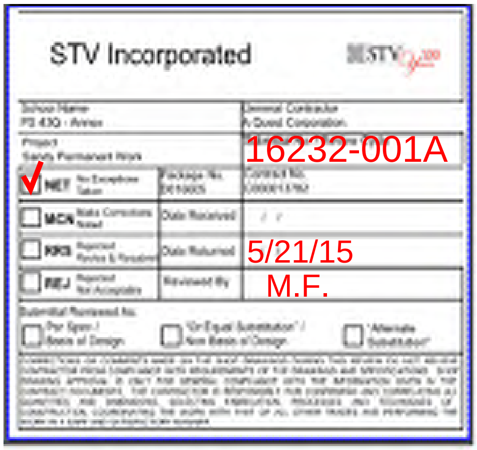
____

_

____

____

__



Tamperproof Thermostats for Enclosure Heaters, DIN Rail Mounted

011600-00 (Red)

011610-02 (Blue)

011630-00

Applications

N.C. Thermostat (red modules):

Tamperproof (pre-set) N.C. Thermostat that opens on temperature rise. Uses may include regulating heaters or switching signal devices when temperature has fallen below the minimum value.

N.O. Thermostat (blue modules):

Tamperproof (pre-set) N.O. Thermostat that closes on temperature rise. Uses may include regulating heat exchangers, filter fans, cooling devices or switching signal devices when temperature exceeds the maximum value.

Features

- Compact design
- Fixed set points
- Color coded modules
- DIN rail mounting

CE cULus RoHS

Tamperproof Thermostats (DIN Rail Mounted) Specifications		
Model	**011600-00, 011600-01 and 011610-02**	**011630-00 and 011640-00**
Sensor Element	Thermostatic bimetal	
Contact Type	Snap-action Contact	
Contact Resistance	<20 mΩ	
Service Life	>100,000 cycles	
Max. Switching Capacity	10A resistive / 2A inductive @ 120 VAC; 5A resistive / 1.6 A inductive @ 240 VAC, DC 30 W	
Max. Inrush Current	AC 16 A for 10 sec.	
Minimum Load	20 mA (all voltages)*	
Connection	2-pole terminal for 14 AWG max. (2.5 mm²), torque 0.8 Nm max.	4-pole terminal for 14 AWG max. (2.5 mm²), torque 0.8 Nm max.
Housing	Plastic, UL 94V-0, light gray	
Mounting	Clip for 35 mm DIN rail, EN 60715	
Mounting Position	Vertical	
Operating Temperature	-40° to 176°F (-40° to 80°C)	
Storage Temperature	-49° to 176°F (-45° to 80°C)	
Weight	0.05 lb (23 g)	0.08 lb (40 g)
Protection Type	IP20	
Approvals	CE, UL Recognized File No. E164102, RoHS compliant	

*Not recommended for low current draw applications in humid or vibrating conditions.

Type	Part Number	Price	Contact Type	Contact Action	Temperature Switch-off	Temperature Switch-on
Single Thermostat	011600-00	$12.00	N.C.	Open on rise	59 ± 9°F (15 ± 5°C)	41 ± 9°F (15 ± 5°C)
	011600-01	$12.00			77 ± 9°F (25 ± 5°C)	59 ± 9°F (15 ± 5°C)
	011610-02	$12.00	N.O.	Close on rise	55 ± 11°F (35 ± 6°C)	77 ± 12.6°F (25 ± 7°C)
Dual Thermostats	011630-00	$22.50	N.C.	Open on rise	59 ± 9°F (15 ± 5°C)	41 ± 9°F (15 ± 5°C)
		$22.50	N.O.	Close on rise	122 ± 11°F (50 ± 6°C)	104 ± 12.6°F (40 ± 7°C)
	011640-00	$22.50	N.O.			
		$22.50	N.O.		140 ± 11°F (60 ± 6°C)	122 ± 12.6°F (50 ± 7°C)

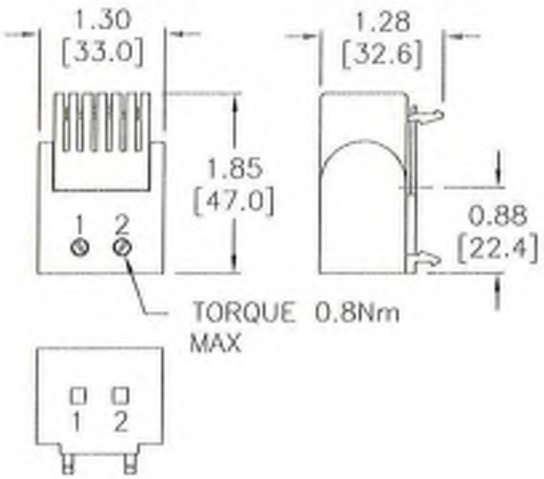
Note: Tolerance is plus or minus (±) the specified number.

Tamperproof Thermostats for Enclosure Heaters, DIN Rail Mounted (continued)

Dimensions

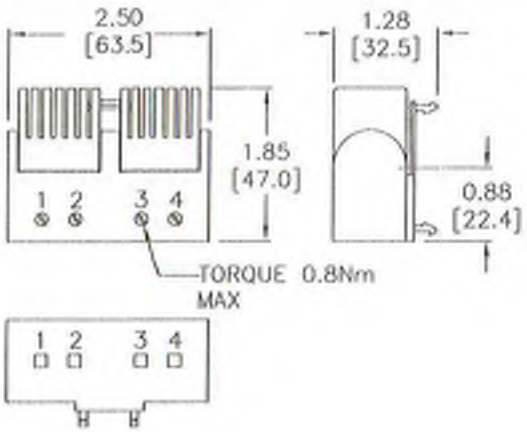
011600-00, 011600-01 and 011610-02

Inches [mm]



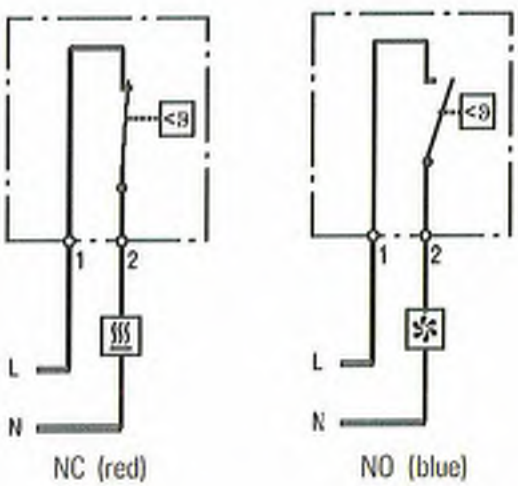
011630-00 and 011640-00

Inches [mm]



Wiring Diagrams

011600-00, 011600-01, 011610-02, 011630-00 and 011640-00



STV Incorporated		
☒ No Exceptions Taken	Exp. Proj. Name: P.S. 43Q-Annex	Submittal No. 16232-004A
☐ Make Corrections Noted	Design/LLW No. D016605	Contract No. C000013782
☐ Rejected – Revise and Resubmit	Date Received 12/30/15	Date Returned 02/02/2016
☐ Rejected – Not Acceptable for Review	Reviewed By R. Fouad	

Submittal reviewed as:

☒ Per Spec/ Basis of Design ☐ "Or Equal Substitution"/Non-basis of Design ☐ "Alternate Substitution

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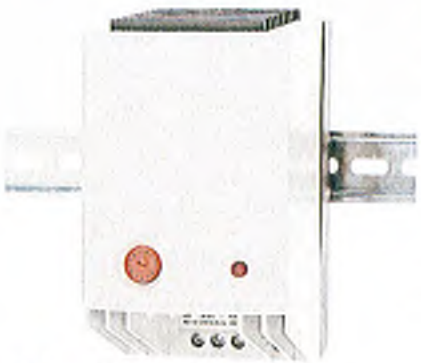
Fan Heaters for Enclosures, DIN Rail and Screw Mounted



027009-00 and 027019-00

028009-01 and 028109-01

028009-00 and 028109-00

Applications

The fan heaters are designed to prevent the formation of condensation and ensure an evenly distributed interior air temperature in enclosures. The heater is connected using the internal terminal connectors. The desired temperature can be set and maintained by the integrated thermostat (where available) or external thermostat and the high-performance axial fan provides forced air circulation. The heater design minimizes side surface temperatures of the housing. The small size of these heaters makes them ideal for use in enclosures where space is at a premium.

Features

- Compact fan heater
- Quiet operation
- Heating power adjusts to ambient temperature
- Integrated adjustable thermostat (027009-00 and 027019-00)
- DIN rail mountable
- Screw mount available (028009-00, 028009-01, 028109-00 and 028109-01)

CE cULus RoHS

Fan Heaters (DIN Rail and Screw Mounted) Specifications			
Model	**027009-00 and 027019-00**	**028009-00 and 028109-00**	**028009-01 and 028109-01**
Heating Element	PTC Resistor - Temperature limiting		
Overheat protection	Built-in temperature limiter		
Axial Fan, Ball Bearing	Service life 50,000h at 77°F (25°C)	Service life 40,000 h at 104°F (40°C)	
Connection	2-pole terminal 14 AWG max. (2.5 mm²), torque 0.8 Nm max.		
Housing	Plastic, UL 94V-0, light gray	Plastic, UL 94V-0, black	
Function Control Light	LED	N/A	N/A
Mounting	Clip for 35 mm DIN rail, EN 60715		Screw mount
Mounting Position	Vertical (exhaust up)		
Recommended Mounting Distance	1.97 in. (50 mm) sides and bottom 3.94 in. (100 mm) above		
Operating/Storage Temperature	-49° to 158°F (-45° to 70°C)		
Protection Class	II (double insulated)		
Protection Type	IP20		
Approvals	CE, UL Recognized File No. E204500, RoHS compliant	CE, UL Recognized File No. E150057, RoHS compliant	

Part Number	Price	Heating capacity (@ 60 Hz)	Operating Voltage	Max. current (inrush)	Airflow, free blowing	Thermostat range	Weight (approx.)
027009-00	$143.75	550 W	100-120 VAC, 50/60 Hz	14.0 A	20 cfm (35 m³/h)	32° to 140°F	2.0 lbs. (907 g)
027019-00	$160.25	650 W		15.0 A	26 cfm (45 m³/h)		2.4 lbs. (1088 g)
028009-00	$86.75	150 W		6.0 A	8 cfm (13.8 m³/h)	N/A	0.66 lb (300 g)
028009-01	$86.75					N/A	
028109-00	$110.00	400 W		9.0 A	32 cfm (54 m³/h)	N/A	1.1 lb (500 g)
028109-01	$110.00					N/A	

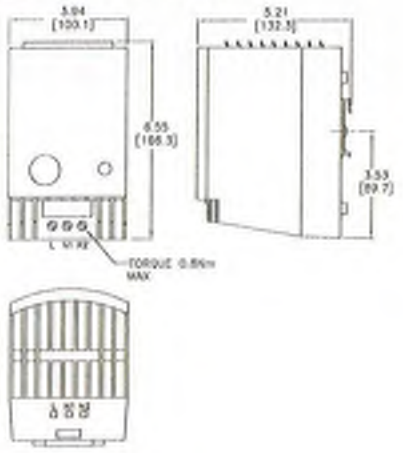
[1] At 68°F (20°C) ambient temperature

Fan Heaters for Enclosures, DIN Rail and Screw Mounted (continued)

Dimensions:

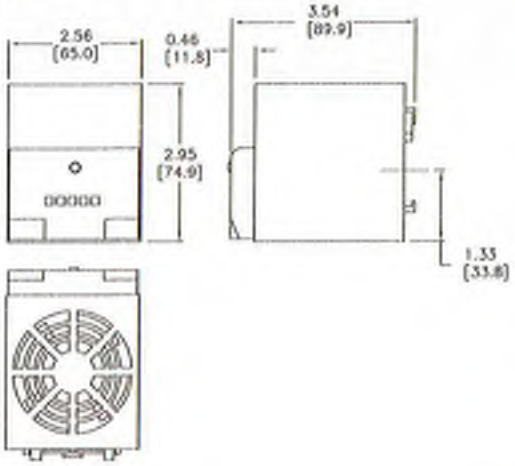
027009-0 and 0270019-00

Inches [mm]



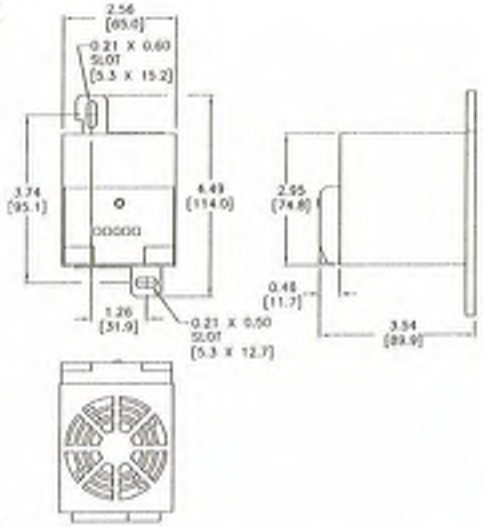
028009-00

Inches [mm]



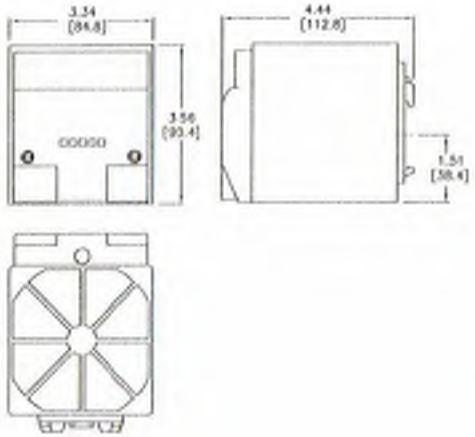
028009-01

Inches [mm]



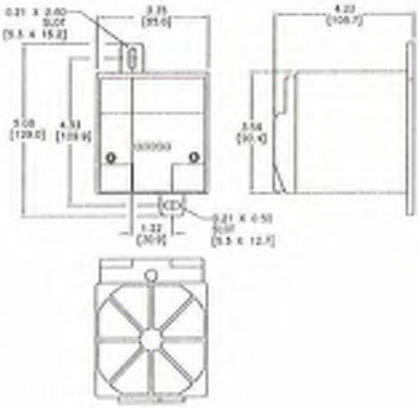
028109-00

Inches [mm]



028109-01

Inches [mm]

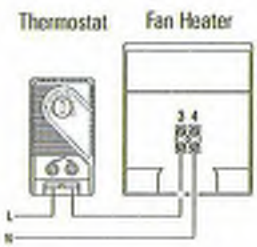


Wiring Diagrams

027009-00 and 027019-00

Wiring note: Only connect the L and N1 terminals - N2 is not used and Grounding is not required.

028009-00, 028009-01, 028109-00 and 028109-01



Enclosure Mounting Types and Surface Area Calculations

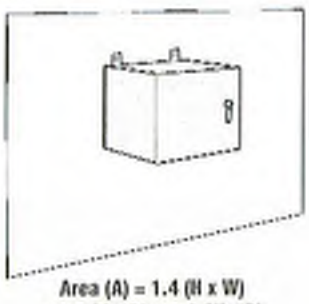
1. Free-Standing

Area (A) = 1.8 (H x W) + 1.8 (H x D) + 1.8 (W x D)

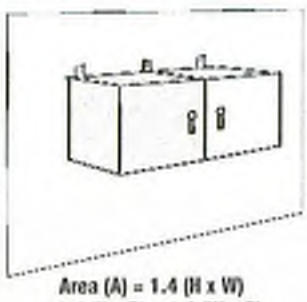
Area (A) = 1.8 (H x W) + 1.4 (H x D) + 1.8 (W x D)

Area (A) = 1.8 (H x W) + (H x D) + 1.8 (W x D)

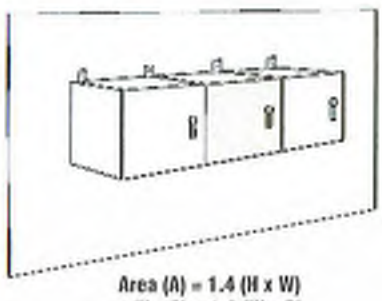
2. Wall-Mounted



Area (A) = 1.4 (H x W) + 1.8 (H x D) + 1.8 (W x D)

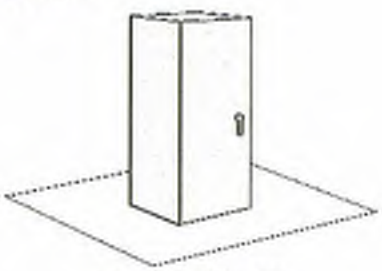


Area (A) = 1.4 (H x W) + 1.4 (H x D) + 1.8 (W x D)



Area (A) = 1.4 (H x W) + (H x D) + 1.8 (W x D)

3. Ground

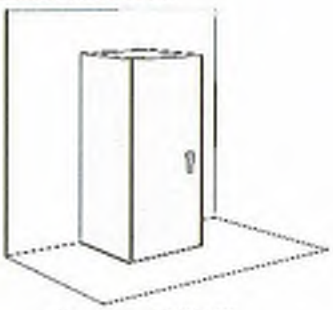


Area (A) = 1.8 (H x W) + 1.8 (H x D) + 1.4 (W x D)

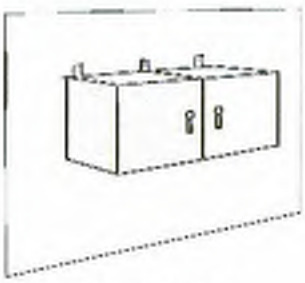
Area (A) = 1.8 (H x W) + 1.4 (H x D) + 1.4 (W x D)

Area (A) = 1.8 (H x W) + (H x D) + 1.4 (W x D)

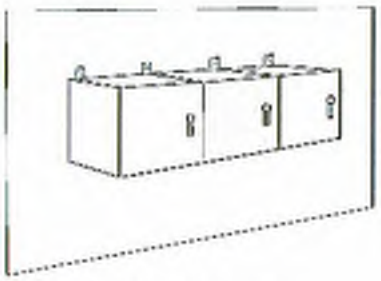
4. Ground and Wall



Area (A) = 1.4 (H x W) + 1.8 (H x D) + 1.4 (W x D)



Area (A) = 1.4 (H x W) + 1.4 (H x D) + 1.4 (W x D)



Area (A) = 1.4 (H x W) + (H x D) + 1.4 (W x D)

Enclosure Heating and Heater Selection

Why Heat an Enclosure?

Today's miniaturization of enclosure components results in high packing densities, which in turn results in higher temperatures within the enclosure. These high temperatures are harmful to electronic components. In response, cooling systems have become standard in many applications. However, just as critical and widely underestimated, are failures caused by the formation of moisture.

Under certain climatic conditions, moisture can build up not only in outdoor or poorly insulated enclosures, but also in highly protected and well-sealed enclosures.

Moisture and Failure

Moisture, especially when combined with aggressive gases and dust, causes atmospheric corrosion and can result in the failure of components such as circuit breakers, busbars, relays, integrated circuit boards and transformers. The greatest danger lies in conditions where electronic equipment is exposed to relatively high air humidity or extreme variations in temperature, such as day-and-night operation or outdoor installation. Failure of components in such cases is usually caused by changing contact resistances, flashovers, creepage currents or reduced insulation properties.

Eliminate Moisture

Moisture and corrosion will remain low if relative air humidity stays below 60%. However, relative humidity above 65% will significantly increase moisture and corrosion problems. This can be prevented by keeping the environment inside an enclosure at a temperature as little as 9°F (5°C) higher than that of the ambient air. Constant temperatures are a necessity to guarantee optimal operating conditions. Continuous temperature changes not only create condensation but they reduce the life expectancy of electronic components significantly. Electronic components can be protected by cooling during the day and heating at night.

Thermal Management

Modern enclosure heaters are designed to protect against condensation. They heat the air inside enclosures, preventing water vapor from condensing on components while providing the greatest possible air circulation and low energy consumption.

Other heating element technology improvements include:

- Longer operating life
- Greater energy efficiencies
- Quick wiring options
- Easier mounting

Heater Location

Ideally, most heaters will perform optimally when mounted near the bottom of an enclosure and used in conjunction with a separate controller such as a thermostat and/or hygrostat. With the controller located in an area of the cabinet that is representative of the average temperature or humidity requirement, the heater should then be placed in a position near the bottom but not directly beneath the controller. This placement will ensure that the controller is not influenced by direct heat from the heater.

Heater Calculation

Follow Steps 1-5 to determine the heating requirement of an enclosure (US units - left column, metric - right)

STEP 1: Determine the Surface Area (A) of your enclosure which is exposed to open air.

Enclosure Dimensions:

height = _____ feet _____ meters

width = _____ feet _____ meters

depth = _____ feet _____ meters

Choose Mounting Option from next page, and calculate the surface area as indicated

A = _____ ft^2 or _____ m^2

STEP 2: Choose the Heat Transmission Coefficient (k) for your enclosure's material of construction.

painted steel =	0.511 W/(ft^2•K)	5.5 W/(m^2•K)
stainless steel =	0.344 W/(ft^2•K)	3.7 W/(m^2•K)
aluminum =	1.115 W/(ft^2•K)	12 W/(m^2•K)
plastic or insulated stainless =	0.325 W/(ft^2•K)	3.5 W/(m^2•K)

k = _____ W/(ft^2•K) or _____ W/(m^2•K)

STEP 3: Determine the Temperature Differential (ΔT).

A. Desired enclosure interior temp. = ____ °F ____ °C

B. Lowest ambient (outside) temp. = ____ °F ____ °C

Subtract B from A = Temp. diff. (ΔT) = ____ °F ____ °C

For these calculations, ΔT must be in degrees Kelvin (K). Therefore, divide ΔT (°F) by 1.8. ΔT = _____ K

STEP 4: Determine Heating Power (P_V), if any (generated from existing components, i.e. transformer).

P_V = _____ W or _____ W

STEP 5: Calculate the Required Heating Power (P_H) for your enclosure based on the above values.

If enclosure is located inside:

$P_H = (A \times k \times \Delta T) - P_V$ = _____ W

If enclosure is located outside:

$P_H = 2 \times (A \times k \times \Delta T) - P_V$ = _____ W

STV Incorporated		
☒ No Exceptions Taken	Exp. Proj. Name: P.S. 43Q-Annex	Submittal No. 16232-005A
☐ Make Corrections Noted	Design/LLW No. D016605	Contract No. C000013782
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Filter Fan Kits

HUBBELL WIEGMANN
Enclosures for Electrical/Electronic Equipment

Features

- All models are 115V with an expected service life of 30,000 hours
- High-performance fan motors and finger guards
- Polycarbonate fire retardant plastic grilles, UL94-VO
- Durable, reusable filter mat included
- Patented "Click and Fit" system allows for rapid filter fan and exhaust filter installation without screws (This time-saving feature cuts installation time by up to 30 minutes when compared to traditional box fan packages)
- Cutout template provided with every unit
- Filter fan or exhaust filter simply snaps into cutout opening
- Connector type: WPF10 Series 2 has 12-inch wires. WPF20-WPF60 Series has terminal strip.

Standards

- cUL Recognized/CSA fan motor
- NEMA 1 (NEMA 12 with optional WPFG series gasket)
- IP43 (IP54 with optional WPFG Series gasket)

Accessories

- Gaskets (WPFG Series) recommended if installing on enclosure with textured finish
- Replacement Filters (WPFM Series)

Applications

- Most innovative technology for fan cooling and pressurizing of industrial enclosures.
- Provides a high quality, economical method of cooling enclosures
- Filtered passive ventilation can be provided by an exhaust filter for either convection cooling or in combination with a fan in forced air cooling
- Slim line design allows grille to protrude from enclosure surface less than one quarter inch
- Maintains aesthetics of enclosure

Part Number	Price	Amps at 50/60 Hz	Rated Voltage	Power Consumption at 50/60 Hz	Free Flow Air Delivery (CFM)[1]	Air Delivery with Exhaust (CFM)[1]	Max. Static Press. (PA)	Ambient Temp. Degree F Max/Min	Filter Density (G/M2)	Filtering Level	Sound Level (dB)	Required Cutout Sizes
WPF10-115BK	<--->	0.15/0.15	115V	12/12 Watts	16	10	29	140/14	150	67%	39	3.62x3.62 (92x92)
WPF20-115BK	<--->	0.25/0.25	115V	19/19 Watts	38	28	69	122/14	350	83%	49	4.92x4.92 (125x125)
WPF25-115BK	<--->	0.25/0.25	115V	18/18 Watts	89	62	57	122/14	350	83%	53	8.78x8.78 (223x223)
WPF30-115BK	<--->	0.5/0.5	115V	43/44 Watts	169	142	89	122/14	350	83%	55	8.78x8.78 (223x223)
WPF50-115BK[2]	<--->	0.6/0.7	115V	63/76 Watts	324	249	206	122/14	350	83%	69	11.46x11.46 (291x291)
WPF60-115BK[2]	<--->	1.2/1.6	115V	122/173 Watts	410	295	225	122/14	350	83%	71	11.46x11.46 (291x291)

Note 1: For operation at 50Hz, reduce CFM by 15%.
Note 2: Intake fan use only
Dimensions in inches (millimeters)

STV RECEIVED:
12/30/2015

STV Incorporated		
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☐ Make Corrections Noted	Design/LLW No. D016605	Contract No. C000013782
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Filter Fan Kit Cutouts and Dimensions

HUBBELL WIEGMANN
Enclosures for Electrical/Electronic Equipment

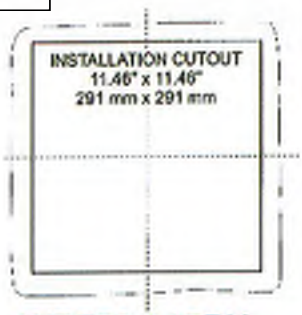
Installation cutouts

WPF10-115BK

WPF20-115BK

WPF25-115BK

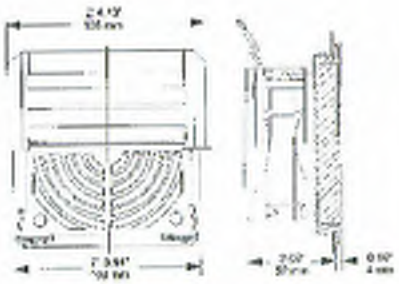
WPF30-115BK



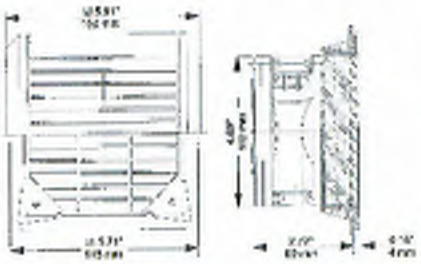
WPF50-115BK

WPF60-115BK

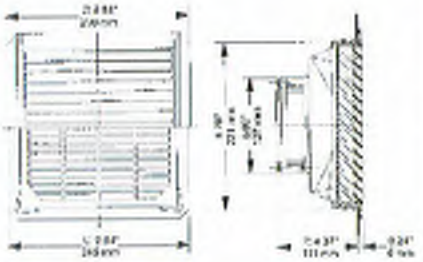
Dimensions



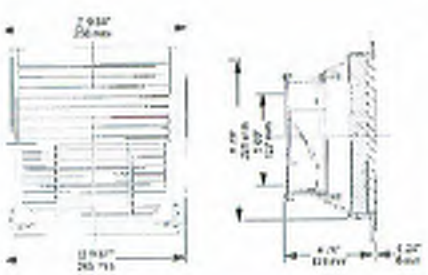
WPF10-115BK



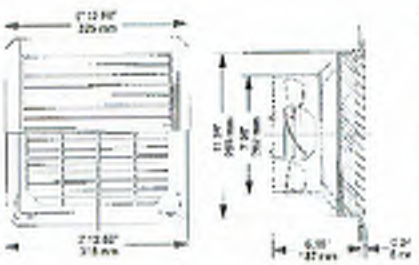
WPF20-115BK



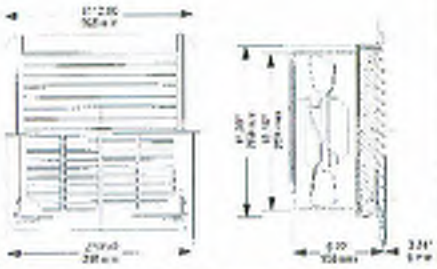
WPF25-115BK



WPF30-115BK



WPF50-115BK



WPF60-115BK

Exhaust Grille and Filter Accessories

HUBBELL WIEGMANN
Enclosures for Electrical/Electronic Equipment


WPFA10BK

Part Number	Price	Filter Density (G/M2)	Mass Filter Level %	Required Cutout Dimensions
WPFA10BK	<--->	150	87%	3.62x3.62 (92x92)
WPFA20BK	<--->	350	83%	4.92x4.92 (125x125)
WPFA25-30BK	<--->	350	83%	6.78x6.78 (223x223)
WPFA50-60BK	<--->	350	83%	11.46x11.46 (291x291)

Dimensions in inches (millimeters)

Exhaust grille

Features

- Polycarbonate fire retardant plastic grilles, UL94-VO
- Durable, reusable filter mat included

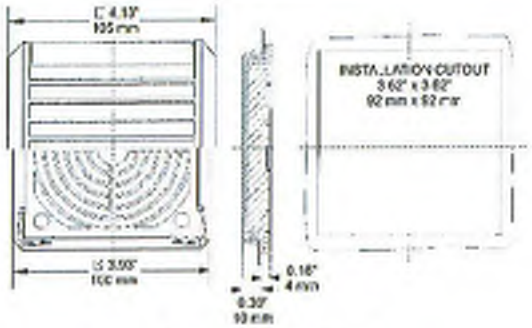
Standards

- NEMA 1 (NEMA 12 with optional WPFG Series gasket)
- IP43 (IP54 with optional WPFG Series gasket)

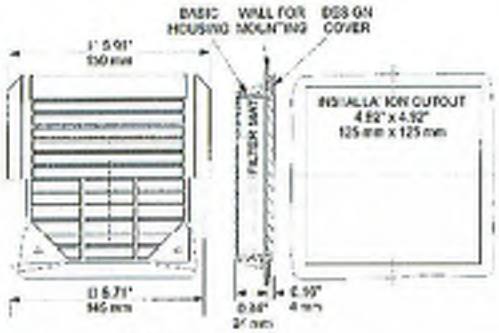
Accessories

- Gaskets (WPFG Series) recommended if installing on enclosure with textured finish

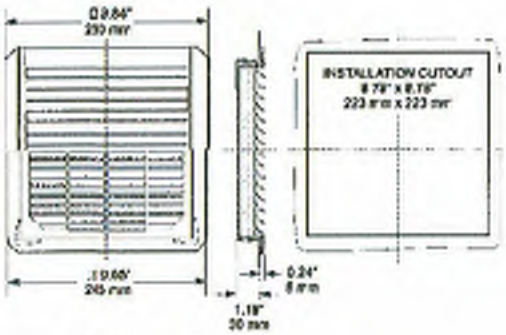
WPFA10BK



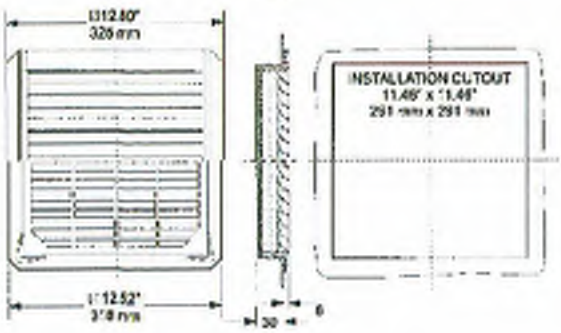
WPFA20BK



WPFA25-30BK



WPFA50-60BK



Exhaust Grille and Filter Accessories

Rubber gaskets for filter fans and exhaust grilles

Features

- Packaged individually
- Provide added sealing protection between enclosure and fan housing
- Recommended when fans or exhaust grilles are installed on enclosures with textured finishes

Standards

- Changes filterfan rating (WPF series) from NEMA 1 to NEMA 12 when installed

Replacement filter mats

Applications

- Replacement filter mats for WPF series filterfans and WPFA series exhaust grilles

Features

- Made of washable synthetic fibers
- Reusable up to 20 times
- 100% resistant to humidity

Replacement Filter Mats

Part Number	Price	Use With This Filterfan Kit Part Number	Price	Use With This Exhaust Grille and Filter Part Number	Price	Mass Filter Layer %	Dimensions H x W
WPFM10	<--->	WPF10-115BK	<--->	WPFA10BK	<--->	67	3.40x3.40 (85x85)
WPFM20	<--->	WPF20-115BK	<--->	WPFA20BK	<--->	83	4.50x4.50 (115x115)
WPFM25-30	<--->	WPF25-115BK WPF30-115BK	<---> <--->	WPFA25-30BK	<--->	83	8.30x8.30 (210x210)
WPFM50-60	<--->	WPF50-115BK WPF60-115BK	<---> <--->	WPFA50-60BK	<--->	83	11x11 (280x280)

Rubber Gaskets

Part Number	Price	Use With Filterfan Kit Part Number	Price	Use With Exhaust Grille Part Number	Price
WPFG10	<--->	WPF10-115BK	<--->	WPFA10BK	<--->
WPFG20	<--->	WPF20-115BK	<--->	WPFA20BK	<--->
WPFG25-30	<--->	WPF25-115BK WPF30-115BK	<---> <--->	WPFA25-30BK	<--->
WPFG50-60	<--->	WPF50-115BK WPF60-115BK	<---> <--->	WPFA50-60BK	<--->

Enclosure Shipping Schedule

Same day	1 - 7 days	1 -10 days

Color indicates shipping lead time in business days

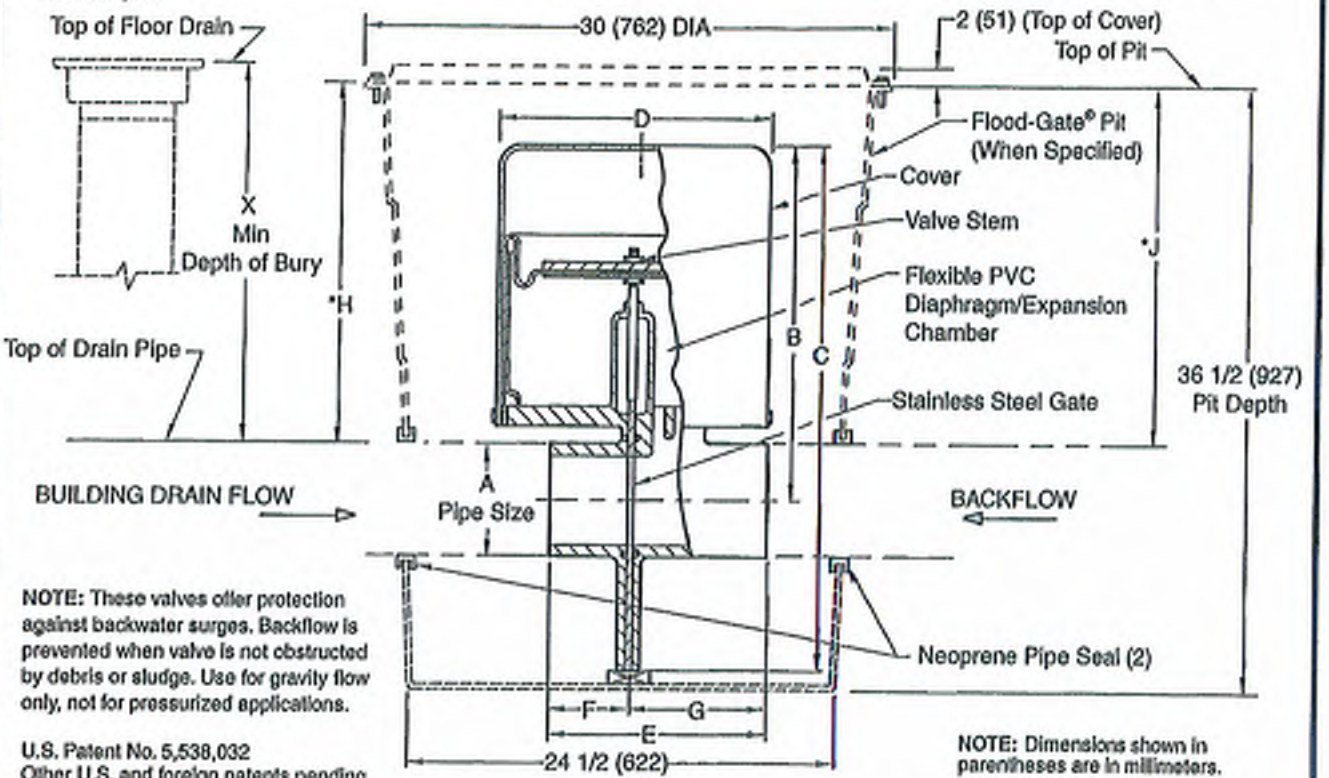
SMITH® JAY R. SMITH MFG. CO.®
DIVISION OF SMITH INDUSTRIES, INC.
POST OFFICE BOX 3237
MONTGOMERY, ALABAMA 36109-0237 (USA)
TEL: 334-277-4520 FAX: 334-272-7398 www.jrsmith.com
CUSTOMER DRIVEN
MEMBER CPI

LOCATION

FLOOD-GATE® BACKWATER VALVE

IN-LINE AUTOMATIC BACKWATER VALVE

FUNCTION: Functions as a drainage control valve providing "closure" protection during emergency storm conditions or when building is completely shut down. The FLOOD-GATE® does not have to be activated as no electronics are required for valve operation. The valve is completely automatic both closing and resetting. Once closed it prevents any leakage beyond the gate. Applications include all commercial, institutional, residential and industrial installations including basements and elevator pits.



NOTE: These valves offer protection against backwater surges. Backflow is prevented when valve is not obstructed by debris or sludge. Use for gravity flow only, not for pressurized applications.

U.S. Patent No. 5,538,032
Other U.S. and foreign patents pending

NOTE: Dimensions shown in parentheses are in millimeters.

A DIA NO-HUB (-Y) IN/OUT SIZE	B CENTERLINE TO TOP	C OVERALL HEIGHT	D DIA WIDTH	E LENGTH	F INLET LENGTH	G OUTLET LENGTH	*H	*J	X MIN BURY DEPTH	BASE WIDTH
04 (100)	15 (380)	22 15/16 (583)	12 5/8 (321)	6 5/8 (168)	2 3/8 (60)	4 1/4 (110)	26 (660)	26 1/2(675)	9 (230)	7 1/2 (190)
06 (150)	20 3/8 (518)	31 1/4 (795)	13 1/4 (335)	8 3/16 (208)	3 3/16 (85)	5 (125)	22 (560)	22 1/2(570)	14 (355)	9 1/2 (240)

*Dimension can be decreased by up to 10 (254) for the 4 (100) size and 3 (76) for the 6 (150) size by cutting the pit and telescoping the 2 sections to meet required depth. See instructions supplied with pit.
See Operation & Maintenance Manual for required maintenance.

REGULARLY FURNISHED:
Duco Coated Cast Iron Body Complete with Stainless Steel Gate and Flexible PVC Diaphragm/Expansion Chamber.

Conforms to ASME A112.14.1
IAPMO Listed, File No. 2696

VARIATIONS:
- ☐ Flood-Gate® Alarm (-FGA, Alarm Control Box, Sensor and 35' Connecting Wire)
- ☐ Flood-Gate® Pits (FOR NON TRAFFIC AREAS ONLY!)
  - (-FGP, Poly Pit, Secured, Gasketed Poly Lid and Hardware)
  - (-FGS, Poly Pit, Secured, Gasketed Steel Cover and Hardware)
  - (-FGSL, Steel Cover only)

REV.	DATE	DESCRIPTION	BY	CKD. BY
P	06/04/10	Added Maintenance Note	JJ	CL
N	09/23/09	15 (380) was 15 15/16 (405)	JJ	CL
M	9-26-06	Revised Table and Changed Note	RN	CL

WEIGHT POUNDS | VOLUME CUBIC FEET | FIGURE NUMBER 7140 Series

FIGURE NUMBER 7140 Series | DRAWN BY: EMB | CHECKED BY: JM | APPROVED BY: SJM | DATE: 8-1-97 | SCALE: NONE | SIZE A | DRAWING NUMBER S7140 Series | P

Remitted Date: March 10, 2016
Remitted By: Varsity Plumbing and Heating, Inc.
Thomas J. Bellini, LMP 1226
General Contractor: A Quest Corporation
Project Name: P.S. 43Q
Contract #: C000013782
LLW#s: 094839, 094838
DOB #: 402896381-01-PL
School Address: 12 Marvin Street, Queens, NY 11691
V-Tracking: SD02 43Q (Aquest) 031016 BWV-House Trap Detail

NOTE:
Couplings shall be heavy duty with shield of 28 gauge 304, 18-8 chromium nickel stainless steel, neoprene gasket and stainless steel bolts and bands and shall conform to ASTM C1540-02.

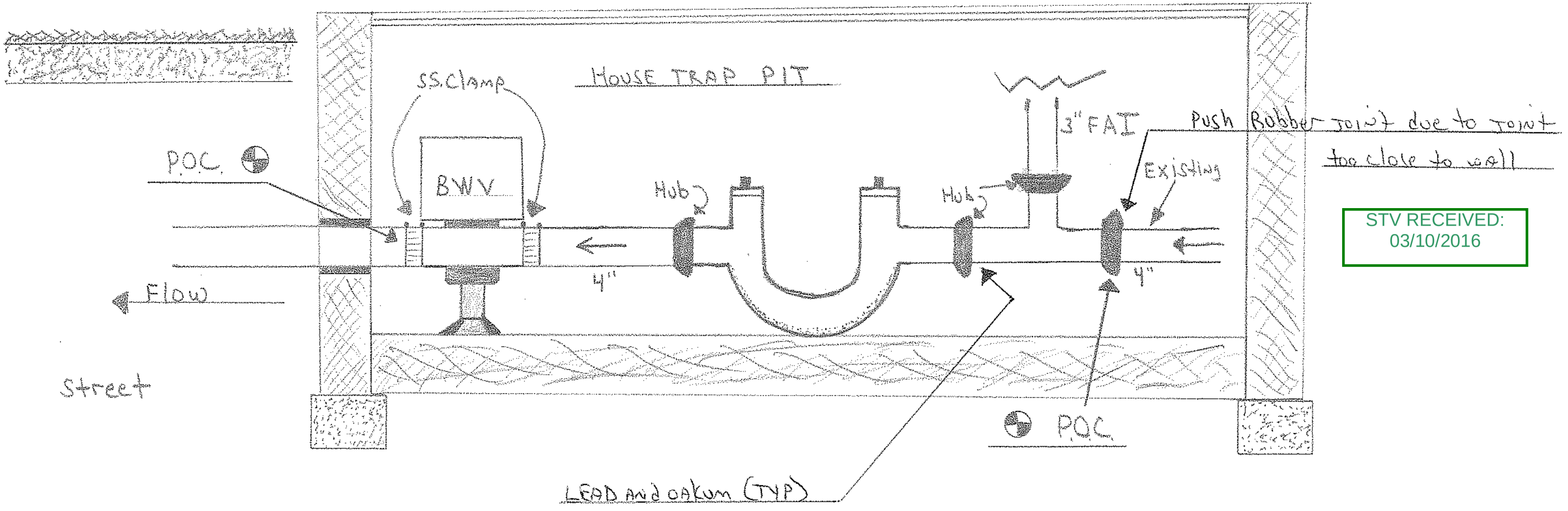
Reason for Submission:
The detail below illustrate the use of NH clamps for the installation of the specified back water valve which is manufactured in NH.

STV Incorporated

☐ No Exceptions Taken	Exp. Proj. Name: P.S. 43Q-Annex	Submittal No. 15415-003A
☒ Make Corrections Noted	Design/LLW No. D016605	Contract No. C000013782
☐ Rejected – Revise and Resubmit	Date Received 3/10/16	Date Returned 03/28/16
☐ Rejected – Not Acceptable for Review	Reviewed By	A.D.

Submittal reviewed as:
☐ Per Spec/ Basis of Design ☐ "Or Equal Substitution"/Non-basis of Design ☐ "Alternate Substitution

CORRECTIONS OR COMMENTS MADE ON THE SHOP DRAWINGS DURING THIS REVIEW DO NOT RELIEVE CONTRACTOR FROM COMPLIANCE WITH REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS. SHOP DRAWING APPROVAL IS ONLY FOR GENERAL COMPLIANCE WITH THE INFORMATION GIVEN IN THE CONTRACT DOCUMENTS. THE CONTRACTOR IS RESPONSIBLE FOR CONFIRMING AND CORRELATING ALL QUANTITIES AND DIMENSIONS, SELECTING FABRICATION, PROCESSES AND TECHNIQUES OF CONSTRUCTION, COORDINATING THE WORK WITH THAT OF ALL OTHER TRADES AND PERFORMING THE WORK IN A SAFE AND SATISFACTORY MANNER.



STV RECEIVED: 03/10/2016