



Western Water Constructors, Inc.  
Submittal Cover

Job no. 16-05



**CONTRACT NAME:** Manteca WQCF Digester Improvements  
**SPEC SECTION:** 13232 Fixed Steel Digester Covers  
**SUBMITTAL TITLE:** Fixed Digester Covers – O&M  
**FILE NAME:** 279-R0\_13232-02\_Fixed Digester Covers-OM

**SUB #:** 279  
**REV #:** 0  
**CODE:** 13232-02  
**DATE:** 2/5/2018

**WWC REVIEW/COMMENTS:**       **NO EXCEPTIONS**       **EXCEPTIONS / DEVIATIONS AS NOTED**

**REVIEWED BY:** ST      **SIGNED:** *Kalief*

**WWC HAS REVIEWED THIS SUBMITTAL FOR CONFORMANCE WITH THE PROJECT PLANS & SPECIFICATIONS.**

**OWNER REVIEW:**

ITEM	DESCRIPTION	REVIEW STATUS				
		A	B	C	D	E
1	Fixed Digester Covers – O&M	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**LEGEND:**      **A** = No Exceptions Taken      **B** = Make Correction Noted      **C** = Correct & Resubmit  
                  **D** = Rejected                                      **E** = Accepted for Record

**OWNER COMMENTS:**

**REVIEWER'S NAME:** \_\_\_\_\_

**REVIEWER'S SIGNATURE:** \_\_\_\_\_ **DATE:** \_\_\_\_\_

EQUIPMENT SUMMARY FORM

1. EQUIPMENT ITEM: Steel Digester Cover Model DCB1
2. MANUFACTURER: WesTech Engineering Inc.
3. EQUIPMENT IDENTIFICATION NUMBER(S): Digesters 1 & 2 (maps equipment number)
4. LOCATION OF EQUIPMENT: Manteca WQCF
5. WEIGHT OF INDIVIDUAL COMPONENTS (OVER 100 POUNDS): 58654 lbs per cover
6. NAMEPLATE DATA: N/A

Horsepower \_\_\_\_\_  
Amperage \_\_\_\_\_  
Voltage \_\_\_\_\_  
Service Factor (S.F.) \_\_\_\_\_  
Speed \_\_\_\_\_  
ENC Type \_\_\_\_\_  
Capacity \_\_\_\_\_  
Other \_\_\_\_\_

7. MANUFACTURER'S LOCAL REPRESENTATIVE Name:

Sandy Clarke - Misco Water  
5976 W Las Positas Blvd #226 Pleasanton, CA 94588  
925.225.1900

8. MAINTENANCE REQUIREMENTS: N/A
9. LUBRICANT LIST: N/A
10. SPARE PARTS (recommendations): N/A
11. COMMENTS: N/A

# Operation and Maintenance Manual

Revision: 0

## For:

Manteca WQCF Digester Improvements Project  
Manteca, CA

## Equipment:

Two (2) 60' Dia. Radial Beam Fixed Digester Covers  
Specification Section: 13232  
Model Number: DCB1

## WesTech Contact:

Project Manager: Cory Shorkey  
Phone: (801) 290-5732  
Email: [cshorkey@westech-inc.com](mailto:cshorkey@westech-inc.com)

WesTech Job Number: 23029A  
December 2017

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#### For:

Manteca WQCF Digester Improvements Project  
Manteca, CA

#### Equipment:

Two (2) 60' Dia. Radial Beam Fixed Digester Covers  
Specification Section: 13232  
Model Number: DCB1

#### Engineer:

Herwit Engineering  
Clayton, CA

#### Contractor:

Western Water Constructors, Inc.  
707 Aviation Boulevard  
Santa Rosa, CA 95403  
Contact: Trish Gallagher  
Phone: (707) 540-9640  
Fax: (707) 540-9641

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Email: dban@miscowater.com

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Salt Lake City, Utah 84115  
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Fax: (801) 265-1080  
24 Hour Emergency Assistance (801) 265-1000

#### WesTech Contact:

Project Manager: Cory Shorkey  
Phone: (801) 265-1000  
Email: cshorkey@westech-inc.com

#### WesTech Job Number: 23029A

December 2017

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# WesTech Corporate Services

## Parts / Field Service / Training

- 24 Hour Hot-Line
- Full Service Parts Department
- Installation and Erection Services
- Mechanical Evaluations / Process Audits
- Operator Training
- Process Training
- Regional Service Technicians
- Service and Maintenance Agreements

## Laboratory and Pilot Plant Testing

- Bench Scale Feasibility Testing
- Field Pilot Testing / Studies
- Plant Process Audits

## Services

- Bench Scale Feasibility Testing
- Field Pilot Studies
- Installation and Erection Services
- Mechanical Evaluations
- Plant Process Audits

## Pilot Rental Equipment

- AERALATER® - Aeration, Detention, and Filtration
- AltaFlo™ High Rate Thickener
- Buoyant Media Clarifier
- CONTRAFAST®- C
- CONTRAFAST®- E
- CONTRAFLO®
- Denitrification Filtration
- Dissolved Air Flotation
- Dual-Column Filtration
- Forced Draft Aerator
- High Rate Thickener
- Horizontal Belt Filter
- Inclined Plate Settler
- Linear Screen
- Microfiltration/Ultrafiltration
- Nanofiltration/Reverse Osmosis
- Paste Thickener
- Precoat Filter
- Pressure and Gravity Filter
- RapiSand™ Ballasted Flocculation solids CONTACT CLARIFIER™
- SuperSand™
- SuperDisc™
- Vacuum Drum Filter
- Trident®, Trident® HS

# WesTech Municipal Water Products

## Aeration

ATOMERATOR™  
Cascade Aerator  
Forced Draft Aerator  
Induced Draft Aerator

## Adsorption

Adsorption Clarifier®  
Cation Exchange Softener  
Granular Activated Carbon (GAC) Contactor

## Covers

Zickert Retractable Membrane Cover

## Electrical Controls

PLC Based Control System  
UL Listed Panels (UL508A/UL698)

## Flocculation

Horizontal Paddle Wheel Flocculator  
Vertical Paddle Wheel Flocculator

## Granular Media Filtration

ANTHRA/SAND™ Manganese Removal Media  
CENTROL® LP Cluster Filter  
Circular and Rectangular Open Top Gravity Filter  
ESSD™ Filter Trough  
MULTIWASH® Filtration Process  
MULTIBLOCK® Underdrain  
MULTICRETE™ II Underdrain  
Multi-Tech™ Multiple Barrier Filtration System  
Horizontal Pressure Filter  
Vertical Pressure Filter

## Membrane Filtration

Microfiltration/ Ultrafiltration  
Nanofiltration/Reverse Osmosis  
VersaFilter™

## Residuals Handling

Backwash Water Clarifier  
Decanter Mechanism  
Gravity Sludge Thickener  
SuperSettler™ Inclined Plate Settler  
Vacuum Drum Filter

## Package Treatment Plants

AERALATER® Iron and Manganese Removal Plant  
AltaPac™ Ultrafiltration Membrane System  
Aquarius™ Conventional Package Plant  
Tri-Mite™ Package Plant  
Trident® Package Water Treatment System  
Trident® HS Multi Barrier Package Plant  
Water Boy™ Package Plant

## Sedimentation/Clarification

Adsorption Clarifier®  
Conventional Clarifier  
CONTRAFLO® Solids Contact Clarifier  
CONTRAFAST® High Rate Clarifier/Thickener  
Flocculating Clarifier  
RapiSand™ Ballasted Flocculation  
Sludge Sucker™ Sludge Siphon Clarifier  
solids CONTACT CLARIFIER™  
SPIRACONE™ Clarifier  
SuperSettler™ Inclined Plate Settler  
Trident® HSC Multi-Barrier Clarifier  
Zickert Shark™ Sludge Removal

## Softening

Cation Exchange Softener  
CONTRAFLO® Solids Contact Clarifier  
CONTRAFAST® High Rate Clarifier/Thickener  
solids CONTACT CLARIFIER™

## Tankage

Anchor Channel Tank  
Flat Bottom Tank  
Elevated Tank

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# WesTech Municipal Wastewater Products

## Anaerobic Digestion Equipment

- Cleanergy Biogas Generator
- Digester Cover - Radial Beam Style
- Digester Cover - Truss Style
- DuoSphere™ Dual-Membrane Gas Holder  
Slab and Tank Mount
- Extreme Duty™ Mechanical Sludge Mixer
- Sludge Heating System

## Biological Treatment

- BioDoc™ Rotary Distributor
- ClearLogic™ MBR System
- HydroDoc™ Rotary Distributor
- Landex™ Oxidation Ditch
- OxyStream™ Advanced Oxidation Ditch  
Process
- Package Plants
- RSD1™ Rotary Distributor
- Slow Speed Surface Aerators
- STM-Aerotor™ IFAS Systems

## Clarifiers

- C.O.P™ Clarifier Optimization Package
  - Spiral Blades
  - Sludge Ring
  - Dual Gate EDI
- Conventional Scraper Blade
- RapiSand™ Ballasted Flocculation  
solids CONTACT CLARIFIER™
- Suction Header
- Suction Pipe
- Zickert Shark™

## Combined Sewer Overflow

- ROMAG CSO Screens
- WWETCO FlexFilter™
- WWETCO FlexFlo™ Control Valve

## Dissolved Air Flotation

- Algae Removal
- Pretreatment Clarifiers
- Rectangular & Circular
- Sludge Thickeners

## Electrical Controls

- PLC Based Control Systems
- UL Listed Panels (UL508A/UL698)

## Filters

- CenTROL® LP Cluster Filter
- MULTIWASH® Filtration Process
- SuperSand™ Continuous Backwash Filter
- SuperDisc™ Cloth Media Disc Filter
- Trident® Package Plant
- WWETCO FlexFilter™

## Headworks

- CleanFlo™ Rotoscreen® Fine Screen
- CleanFlo™ Monoscreen® Fine Screen
- CleanFlo™ ALL-IN-ONE (Complete Plant)
- CleanFlo™ Element Continuous Belt Screen
- CleanFlo™ MultiRake
- CleanFlo™ Shear (Internally Fed Rotary Drum  
Screen)
- CleanFlo™ Spiral Screen (Inclined and Vertical)
- CleanWash™ Screw Wash and Counter Pressure  
Screw
- CleanGrit™ Grit Washers
- Gritt Mitt™ Grit Classifiers
- Shaftles Spiral Conveyor and Compactor
- Vortex Grit Separators
- Zickert Shark™ Grit and Grease Removal

## Membrane Filtration

- Microfiltration/Ultrafiltration
- Nanofiltration/Reverse Osmosis
- VersaFilter™

## Rectangular Basin Skimming

- Helical Scum Skimmers
- Rotating Scum Pipes
- Zickert Skimmer

## Replacement Drives

- Adaptable to All Other Manufacturers
- Clarifiers
- Grease Lubricated Option
- Precision Bearing
- Thickeners

## Septage Receiving Station

- Customer Management / Billing Software
- Hauler Access Stations
- Screening and Grit Removal Options

## Tankage

- Field Erection
- Material Supply

## Thickeners

- Center Feed
- CleanFlo™ Rotary Drum Thickener
- DAF Thickening
- Rake Lifting Devices
- Side Feed

# WesTech Industrial Water and Wastewater Products

## Aeration

Cascade Aerator  
Forced / Induced Draft Aerator

## Barrier / Media Filtration

AERALATER® Iron / Manganese Removal  
AltaPac™ Ultrafiltration Package Systems  
Cation Exchange Softeners  
Circular or Rectangular Gravity Filter  
CentROL® LP Cluster Filter  
GAC Contactors  
Microfiltration/ Ultrafiltration  
Multi-Tech™ Multiple Barrier Filtration System  
MULTIWASH® Filtration Process  
Nanofiltration/ Reverse Osmosis  
Pressure Filter (Vertical or Horizontal)  
Self Stored Backwash Filter  
SuperDisc™ Cloth Media Disc Filter  
SuperSand™ Continuous Backwash Filter  
Tri-Mite™ and Trident® Package Treatment  
Trident® HS Package Plant  
VersaFilter™ Membrane Filtration  
Water Boy™ and Aquarius™ Package Plant  
WWETCO FlexFilter™

## Biological Treatment

BioDoc®/ HydroDoc Rotary Distributor  
Biotreater  
Cleanergy Biogas Generator  
ClearLogic MBR Systems  
DuoSphere™ Dual Membrane Gasholder  
Slab or Tank Mount  
HydroDoc™ Rotary Distributor  
Oxidation Ditches  
Slow Speed Surface Aerators  
STM Aerotor™ IFAS Systems  
UASB – Upflow Anaerobic Sludge Blanket

## Clarification / Sedimentation

Backwash Clarifier  
Buoyant Media Clarifier  
Conventional Clarifier  
Cooling Tower Slip Stream Treatment  
COP™ Clarifier  
Draft Tube™ Clarifier  
CONTRAFast® High Rate Clarifier/Thickener  
Flocculating Clarifier  
Metallurgical Contact Clarifier

Rapisand™ Ballasted Flocculation  
Rim Drive Clarifiers  
Scale Pit Scraper/Skimmer  
Sludge Sucker  
SPIRACONE™ Clarifier  
solids CONTACT CLARIFIER™  
Suction Header COP  
Suction Pipe Clarifiers  
SuperSettler™ Inclined Plate Settler  
Traveling Bridge Clarifiers  
Zickert Shark™ Sludge Removal

## Clarifier / Thickener Drives

Bridge Supported Shaft Drive  
Column Supported Cage Drive  
PasteThick™ Drive  
Replacement, Retrofit, and Rebuild Options  
for All Manufacturers  
Titan Traction™ Drive

## Dewatering

Belt Press  
Ceramic Disc Filter  
Horizontal Vacuum Belt Filter  
Precoat Drum Filter  
Recessed Plate Filter Press  
Rotary Vacuum Disc Filter  
Rotary Drum Vacuum Filter  
Tower Press

## Dissolved Gas Flotation

Circular  
Rectangular

## Electrical Controls

PLC Based Control Systems  
UL Listed Panels (UL508A / UL698)

## Oil / Water Separation

DAF Units (Circular or Rectangular)  
DNF Units (Circular or Rectangular)  
Oil / Water Separator (Circular or Rectangular)  
Scale Pit Skimmer/Scraper

## Screens

CleanFlo™ Rotoscreen®  
CleanFlo™ Monoscreen®  
CleanFlo™ ALL-IN-ONE (Complete Plant)  
CleanFlo™ Element Continuous Belt Screen

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CleanFlo™ Shear (Internally Fed Drum Screen)  
CleanFlo™ Spiral Screen (Inclined and Vertical)  
CleanWash™ Screenings Washer / Compactor  
Counter Pressure Screw  
CleanGrit™ Grit Washers  
Gritt Mitt™ Grit Classifiers  
Vortex Grit Separators  
Zickert Shark™ Grit and Grease Removal

### Softening

Cation Exchange Softener  
Cold Lime Softener  
Warm Lime Softener

### Tankage

Anchor Channel Tank  
Elevated Tank  
Steel Bottom Tank  
Supply and / or Field Erection

### Thickeners

AltaFlo™ High Rate Thickener  
Conventional Thickener  
Deep Bed™ Paste Thickener  
HiDensity™ Paste Thickener  
HiFlo™ High Rate Thickener  
Swing Lift Thickener  
Traction Drive Thickener  
TOP™ Thickener Package

# WesTech Industrial Mining and Metallurgical Products

## Clarifiers

- Buoyant Media Clarifier
- Flocculating Clarifier
- Metallurgical Contact Clarifier
- RapiSand™ Ballasted Flocculation
- Solids CONTACT CLARIFIER™
- CONTRAFAST® High Rate Clarifier/Thickener
- SuperSettler™ Inclined Plate Settler

## Heavy Duty Drives

- Bridge Supported Shaft Drive
- Column Supported Cage Drive
- PasteThick™ Drive
- Retrofit and Rebuild Options for All Manufacturers
- Titan Traction™ Drive

## Granular Media Filtration

- CentROL® LP Cluster Filter
- Circular & Rectangular Gravity Filter
- MULTICELL® Horizontal Pressure Filter
- Multi-Tech™ Multiple Barrier Filtration System
- MULTIWASH® Filtration Process
- Self-Stored Backwash Filter
- SuperSand™ Continuous Backwash Filter
- Vertical Pressure Filter
- WWETCO FlexFilter™

## Man Camp Potable Water Treatment

- AltaPac™ Ultrafiltration Package System
- Tri-Mite™ & Trident® Package Plant
- Water Boy™ & Aquarius™ Package Plant

## Man Camp Wastewater Treatment

- BioTreater
- ClearLogic™ MBR System
- STM-Aerotator™ IFAS Package System

## Membrane Filtration

- AltaPac™ Ultrafiltration Package System
- Microfiltration/ Ultrafiltration
- Nanofiltration/ Reverse Osmosis
- VersaFilter™

## Screens

- CIP / CIL, RIP/RIC Media Retention Screen
- Linear Trash Screen
- Screw Classifiers

## Tankage

- Anchor Channel Tank
- Elevated Tank
- Steel Bottom Tank
- Supply and / or Field Erection

## Thickeners

- AltaFlo™ High Rate Thickener
- Conventional Thickener
- Deep Bed™ Paste Thickener
- HiDensity™ Paste Thickener
- HiFlo™ High Rate Thickener
- Swing Lift Thickener
- TOP™ Thickener Package

## Dewatering

- Disc Filter
- Horizontal Belt Filter
- Precoat Drum Filter
- Rotary Drum Filter
- Belt Discharge
- Roll Discharge
- Scraper Discharge
- Tower Press

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## Warning Summary

Read this warning summary page before erecting and operating the equipment. The procedures must be followed as WesTech will not accept responsibility for damage to the equipment which has not been handled in accordance with the manufacturer's instructions. A brief summary of the warnings is listed below. For additional information please refer to the related sections.

Warning: Operating and maintaining this equipment has inherent risks. It is your responsibility to read and understand the Operation and Maintenance Manual prior to working with the equipment. This page is intended to summarize the warnings associated with WesTech's equipment. Where equipment manufactured by others has been provided in conjunction with WesTech equipment, additional warnings specific to that piece of equipment may only be contained in that section of the Manual. Please read and understand all warnings provided in this Manual.

### Section One: General Precautions

Do not store the side sheets so that they are stacked more than four high.

Do not store the roof sections so that they are stacked more than four high.

### Section Two: Paint and Weld Note

Note: Do not weld the digester cover together until side sheets, radial beams, and center ring are all bolted together and final adjustments have been made.

### Section Two: Tank Inspection

It is the contractor's responsibility to confirm that all supplied equipment will fit properly before proceeding with final installation.

Note: Grout and leveling nuts must be used when anchoring the base plates to the top of the wall. See WesTech's General Arrangement drawings for anchor details.

## Section Two: Side Sheets

Note: Do not weld the side sheets together until all bolting and fit-up are complete and final adjustments have been made.

## Section Two: Side Sheets

Note: The vertical weld on the exterior of the side sheet may be omitted if the cover is erected inside the digester tank. Caulk is required to seal the area if the weld is omitted.

## Section Two: Suggested Weld Test

Warning: Before the pressure test, check that the pressure/vacuum relief device is correctly set to relieve at the specified values.

Caution: the digester cover is slippery when wet.

## Section Three: Safety Instructions

1. Only trained operators who have been schooled in safety procedures should be allowed to work on or around this equipment. Exercise caution around moving parts. In general, limit access to authorized personnel.
2. Anyone entering the area should be wearing adequate safety equipment, such as safety glasses, safety shoes, hard hats, etc.
3. Keep hands, clothing, etc., away from moving parts.
4. Never permit people who have been drinking alcohol or using drugs, to maintain or repair unit; also restrict access to any others whose ability may be impaired.
5. Locate "Warning" signs in the area of moving parts and limit access to authorized personnel.
6. Inspect equipment frequently for loose bolts or malfunctioning equipment. Take care of problems at once.
7. Be sure that the pressure relief and vacuum breaker with flame arrester is functioning properly once all seal welding is complete. Also observe the warning signs which are required to be followed when the cover is closed to the atmosphere. The pressure relief valve must be unobstructed to the

digester gas contents when the cover is sealed off to the atmosphere.

8. Observe all No Smoking signs around the digester cover.
9. Make sure all individuals are aware of the explosive potential around a digester. Use only non-sparking tools while working in its vicinity.

## Section Four: Shutdown and Storage Precautions

Warning: Digester gas is explosive when mixed with oxygen! No smoking and only non-sparking tools should be used around the digester.

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# Section One: Equipment Information

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Warranty

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## Two Year Warranty

WesTech equipment is backed by WesTech's reputation as a quality manufacturer, and by many years of experience in the design of reliable equipment.

Equipment manufactured or sold by WesTech Engineering, Inc., once paid for in full, is backed by the following warranty:

For the benefit of the original user, WesTech warrants all new equipment manufactured by WesTech Engineering, Inc. to be free from defects in material and workmanship, and will replace or repair (F.O.B. its factories or other location designated by it) any part or parts returned to it which WesTech's examination shall show to have failed under normal use and service by the original user within two (2) years following initial start-up, or thirty (30) months from shipment to the purchaser, whichever occurs first.

Such repair or replacement shall be free of charge for all items except for those items such as resin, filter media, and the like that are consumable and normally replaced during maintenance, with respect to which, repair or replacement shall be subject to a pro-rata charge based upon WesTech's estimate of the percentage of normal service life realized from the part. WesTech's obligation under this warranty is conditioned upon its receiving prompt notice of claimed defects, which shall in no event be later than thirty (30) days following expiration of the warranty period, and is limited to repair or replacement as aforesaid.

**This warranty is expressly made by WesTech and accepted by purchaser in lieu of all other warranties, including warranties of merchantability and fitness for particular purpose, whether written, oral, express, implied, or statutory. WesTech neither assumes nor authorizes any other person to assume for it any other liability with respect to its equipment. WesTech shall not be liable for normal wear and tear, corrosion, or any contingent, incidental, or consequential damage or expense due to partial or complete inoperability of its equipment for any reason whatsoever.**

This warranty shall not apply to equipment or parts thereof which have been altered or repaired outside of a WesTech factory, or damaged by improper installation, application, or maintenance, or subjected to misuse, abuse, neglect, accident, or incomplete adherence to all manufacturer's requirements, including, but not limited to, Operations & Maintenance Manual guidelines & procedures.

This warranty applies only to equipment made or sold by WesTech Engineering, Inc.

WesTech Engineering, Inc. makes no warranty with respect to parts, accessories, or components purchased by the customer from others. The warranties which apply to such items are those offered by their respective manufacturers.

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## Listing of Principal Components

### Center Dome

The center dome is the large covered cylinder in the middle of the cover. The center dome serves several functions. Initially, the center dome acts as a compression ring for the radial beams during the installation process. Second, this large diameter dome serves as an access port for large equipment components (particularly fans or blowers) that may need to be inserted in the cover over its operational life. Third, the center dome acts as a natural collection point for gas generated in the digester. From here gas withdrawal lines may be attached for removal or recirculation of the digester gas. In some digesters, a separate gas dome is supplied for gas collection and removal.

### Radial Beams

The digester beams support the roof plates during erection of the cover. Once the cover is assembled and completely welded, the roof plates themselves act as the main support for the loads applied to the cover. In certain situations, the beams continue to serve as supports for mixing systems mounted on the cover.

### Side Sheets

The side sheets are designed primarily to maintain a seal between the inside and outside of the cover. Annular seal materials (not by WesTech) are used in conjunction with the side sheet to provide odor control.

### Roof Plates

The roof plates are gas-tight seal welded to provide a structurally sound membrane over the full digester area.

### Pressure Relief Valves

Each cover should be equipped with a pressure relief/vacuum breaker valve. This dual-purpose valve automatically relieves digester gas from the cover when gas pressures exceed preset design levels. As an additional safety precaution, a vacuum breaker is

included within the valve. The valve opens when digester pressure drops below atmospheric pressure.

## Mixing Systems (Optional)

Many digesters are furnished with mixing systems. These systems provide better biological contact within the digester and thus promote a more efficient and rapid digestion process. Several different types of mixing systems are available, some mounting directly on the cover, and other elsewhere in the digester.

## Viewports (Optional)

The viewport is designed to be installed onto a digester cover or other tank cover to visually monitor its contents.

## General Precautions

The erection instructions enclosed herewith are provided to assist in the assembly and adjustment of this mechanism. These procedures are suggested and are not intended to be substituted for the experience of the erector. Read the instructions prior to erecting and assembling the cover.

In the assembling of this equipment, it will be necessary to install, adjust, and maintain certain accessory items which are not manufactured by WesTech Engineering, Inc. This accessory equipment must be stored, handled, adjusted, and maintained in accordance with instructions provided by the manufacturer of that equipment. This is necessary to be assured of prompt and full participation in the warranty protection of the equipment. WesTech Engineering, Inc. will not accept responsibility for damage to equipment which has not been handled in accordance with the manufacturer's instructions.

## Packing List

The Contractor's packing list consists of a sheet containing an itemized listing of parts.

The packing list contains:

1. A description of the part.
2. When applicable, nuts and bolts in bags with item numbers written on bag.
3. The quantity of parts per assembled unit.
4. Total quantity of parts shipped.
5. Name and address of the ship from location.
6. Date and job number of shipment.

The packing list should be kept in a readily accessible and safe place. Many contractors prefer to keep this list in some type of binder for protection and quick reference.

This list is particularly useful during erection for locating small parts and fasteners. When coordinated with the erection drawings, parts list, equipment tagging and piece marking, the contractor's packing list becomes an invaluable erection tool.

## Equipment Tags

Each shipping piece has been tagged or piece marked for convenience. The part number or item number will be marked on fabricated items. Packaged parts will have the part number or item number written on the package. Piece marked items received will have a mark such as "Part No. 1021A or Item 101" which may be cross referenced through the parts list to a general erection drawing bubble number.

## Unloading Equipment

Please handle the equipment properly when unloading and erecting. All cartons, electrical equipment, and gear drives should be stored under cover and protected from moisture, grit, and mud.

## Painting

The material supplied for this job has not received any surface preparation or paint.

## Side Sheets

To maintain the correct curvature of the side sheets, it is critical that only one side sheet is lifted at a time. Also, during storage, the side sheets should have the proper dunnage.

Do not store the side sheets so that they are stacked more than four high.

## Prefabricated Roof Sections

To maintain the correct curvature of the prefabricated roof sections, it is critical that only one roof section is lifted at a time. Also during storage, the roof sections should have the proper dunnage. The dunnage used during shipment may be used by the contractor for proper storage.

Do not store the roof sections so that they are stacked more than four high.

## Fasteners

If stainless steel fasteners are used on this equipment, their threads must be coated with anti-seize before installation. Failure to do so may make installation difficult and future disassembly impossible.

## Foundation Anchor Bolts

Anchor bolts must be placed accurately to avoid future erection difficulties. Remember that the location and projection of all anchorage is critical. The specified amount of projection and location are shown on the general arrangement drawings. After installation of the anchor bolts, apply anti-seize to the projection threads before fastening.

## Safety

This equipment can cause serious injury or death if proper safety and operating procedures are not followed. Be sure that all operation and maintenance personnel have fully reviewed this manual and have been trained on the equipment.

## Operation and Maintenance Manual

Keep an instruction manual in the area where the operators can familiarize themselves with it and have it for reference. This manual is essentially useless if the operator and foreman do not have access to it.

## Further Assistance

If a problem is encountered in installing or operating the equipment, which cannot be solved by referring to this manual, feel free to contact:

WesTech Engineering, Inc.  
3665 South West Temple  
Salt Lake City, Utah 84115  
(801) 265-1000 or Fax (801) 265-1080

## Receiving Equipment

When receiving equipment, it is necessary to properly acknowledge receipt and any damage on the shipping documents. This must be done to allow for as much time as possible to correct any damaged or missing equipment. Prompt reporting also helps assign responsibility for replacement or repair to the proper party.

## Receiving Material

The equipment pieces and components received may have been shipped from:

1. WesTech Engineering in Salt Lake City, Utah.
2. A fabricator acting under WesTech Engineering's instructions.
3. A "buy-out" distributor such as a motor or pump manufacturer.

Since there will often be more than one shipment to the jobsite, it is important to coordinate the receiving and storage of the items accordingly.

Upon receipt of a shipment, check the packing list against the items received and retain this list for future reference. If certain items are missing, make notes of this on the shipping papers to protect all interests. Also, immediately notify WesTech Engineering of this shortage.

All material has been thoroughly checked and inspected before shipment. If the equipment is received in bad condition or if the packages are broken, make a bad order notation on the shipping papers to this effect. This notation will enable filing the proper claims against the freight company. Notify WesTech immediately if any parts are found broken or damaged during shipment.

Please handle the equipment properly when unloading and erecting. All cartons, electrical equipment, and gear drives should be stored under cover and protected from moisture, grit, and mud.

### Shortages or Damage

Notify WesTech within 3 days of receipt of merchandise.

WesTech accepts no liability for shortages or damage if not notified within 3 days of receipt.

## Receiving Procedure

1. Before signing the Bill of Lading in receipt of the goods shown thereon and before the driver leaves, do the following:
  - a. Use the attached/enclosed packing list to further inspect the entire shipment for shortages and/or damage.
  - b. You must notify WesTech within three working days from date of receipt, of any shortages or damage.
  - c. Inspect the shipment. Note any damage or shortages (according to what is listed on the Bill of Lading). Be as detailed as necessary and take pictures.
  - d. Have the driver sign the notation in acknowledgment.
  - e. Retain a copy (of the notated Bill of Lading) for use in filing a freight claim.
  - f. If there is damage, notify WesTech (801) 265-1000 immediately so that arrangements can be made with the carrier, if necessary, to have the damaged goods inspected by their agent.
2. After signing the Bill of Lading and receiving the shipment, do the following:
  - a. Use the attached/enclosed packing list to further inspect the entire shipment for shortages and/or damage.
  - b. You must notify WesTech within three working days from date of receipt, of any shortages or damage.

## Shortages, Discrepancies and Field Charges

Please notify WesTech Engineering, Inc. immediately if there are any apparent manufacturing discrepancies or shortages encountered with machinery, since no field charges for alterations or shortages will be accepted unless authorized in writing by our representative.

Fabricated steel parts and assemblies furnished by WesTech Engineering, Inc. are manufactured following best shop practices and standards of the day. However, some misfits and imperfect work may arise. In such cases, the American Institute of Steel Construction AISC, 14<sup>th</sup> Edition, "Code of Standard Practice for Steel Buildings and Bridges" will apply to erection of this equipment. It reads as follows:

### "7.14. Corrections and Errors

The correction of minor misfits by moderate amounts of reaming, grinding, welding or cutting, and the drawing of elements into line with drift pins, shall be considered to be normal erection operations. Errors that cannot be corrected using the foregoing means, or that require major changes in member or Connection configuration, shall be promptly reported to the Owner's Designated Representatives for Design and Construction and the Fabricator by the Erector, to enable the responsible entity to either correct the error or approve the most efficient and economical method of correction to be used by others."

Company policy dictates that no charges for field work will be allowed without prior written approval. Written authority must be given in the form of a WesTech Inspection and Change Work form with warranty tracking number. The Warranty tracking number will be issued when the extent of such modifications and the price for performing these modifications have been agreed upon.

In general, when parts require replacement, and WesTech agrees that replacement is necessary, WesTech will furnish the parts. The contractor will remove the defective parts and install the replacement parts at a cost agreed upon by WesTech.

# Section Two: Installation Instructions

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## Suggested Erection Sequence

The sequence listed below is suggested only and should not take precedence over the experience of the erector. Special circumstances and equipment availability may require variance from this procedure.

Depending on the size of the cover and the available crane power, the cover can either be erected in place in the tank or on the ground outside the tank.

1. Paint and Weld Note
2. Tank Inspection
3. Install Anchor Bolts and Base Plates
4. Set Center Ring and Side Sheets
5. Install Cover Plate / Radial Beam Assemblies
6. Weld 'Filler' Cover Plates
7. Install Appurtenances
8. Cover Placement
9. Install Seal Plate
10. Suggested Weld Test
11. Alternate Procedure to Test for Gas Tightness

## Reference Drawings:

- 1004 General Notes
- 1011-1 General Assembly
- 1011-2 General Assembly
- 1012 Connection Assembly Details
- 1013 Appurtenance Assembly Details

**Parts List:** 48187

## Paint and Weld Note

### Paint Note:

1. If the cover is erected inside the digester; prepare and paint the outside of the side sheet prior to erection and in accordance with the engineer's plans and specifications.
2. Exercise care in handling painted sections to prevent scratching and chipping.
3. If the cover is erected on the ground outside the tank, all painting should be done upon completion of the assembly.



Figure 2.1 Paint

### Weld Note:

1. Use backstep or skip weld sequence procedure to distribute heat and prevent buckling.
2. All continuous welds must be gas tight. Strictly observe welding symbols shown in the General Assembly Drawings.

Note: Do not weld the digester cover together until side sheets, radial beams, and center ring are all bolted together and final adjustments have been made.



Figure 2.2 Weld

## Tank Inspection

WesTech will not accept charges for equipment modification to accommodate the tank.

It is the contractor's responsibility to confirm that all supplied equipment will fit properly before proceeding with final installation.

Note: Grout must be used when anchoring the base plates to the top of the wall. See WesTech's General Arrangement drawings for anchor details

1. Check the tank for proper diameter, roundness, and plumb at multiple locations. Check the elevations at the top of the wall. The elevations of the base plates bolted to the top of the wall should be +/- 1/2 inch. Use leveling nuts to accommodate irregularities in the surface of the tank wall.
2. The diameter of the tank is to be checked from the top of the wall to the bottom elevation of the side sheet at multiple locations. There should be no protrusions entering the tank between these elevations.
3. Fill in the following information:  
Top of the wall elevation: \_\_\_\_\_  
Wall Thickness at the top of the wall: \_\_\_\_\_  
Minimum diameter field Measured: \_\_\_\_\_

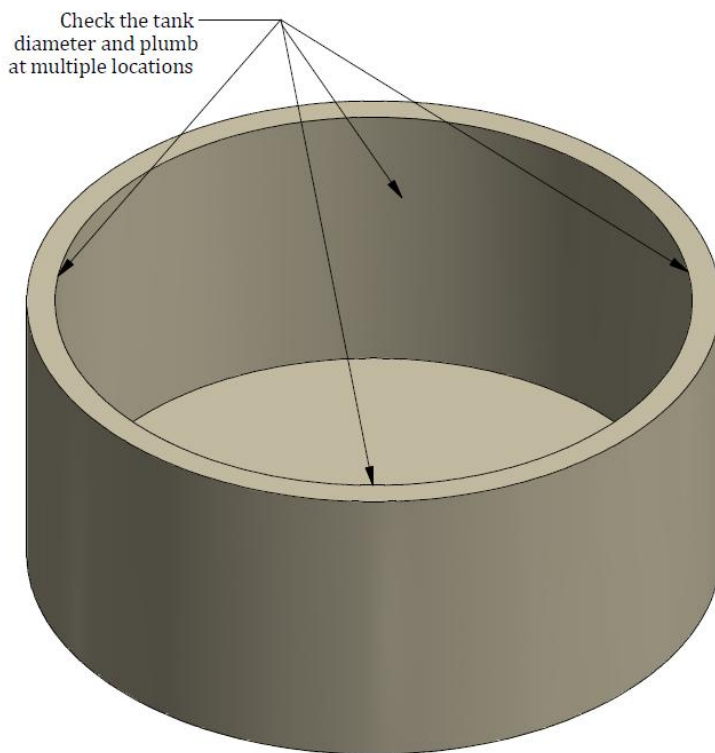


Figure 2.3 Tank Inspection

## Install Anchor Bolt and Base Plate

Install the anchor bolts on the top of the wall. Refer to the General Arrangement drawings for the anchor bolt embedment and location. Anchor bolt installation instructions, can be found in Section 5 of this manual.

After anchors are installed as shown, put one nut and washer on each anchor. Level the hold-down base over the washer as shown.

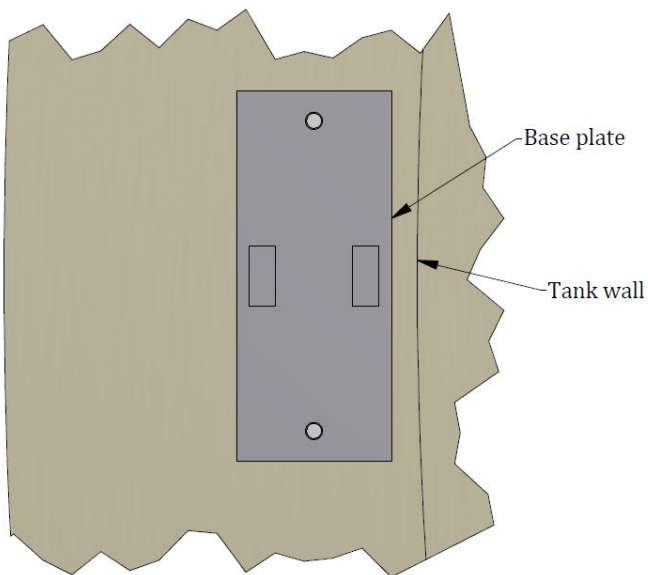


Figure 2.4 Anchor Bolt and Base Plate- Top View

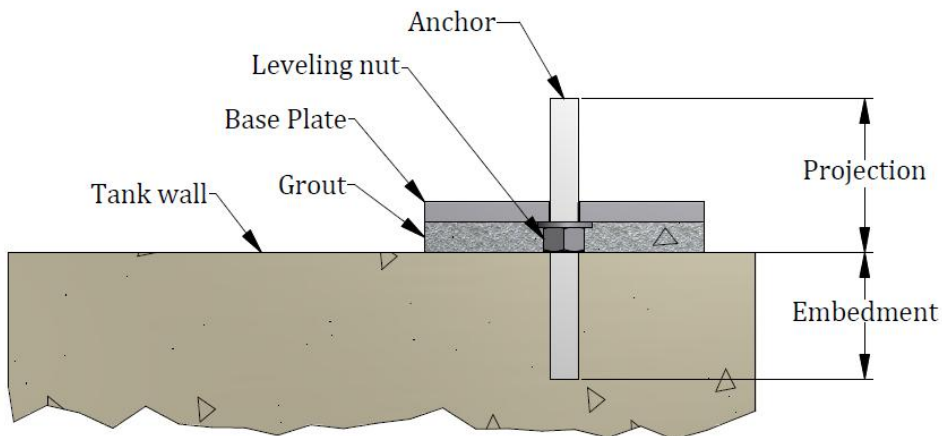


Figure 2.5 Anchor Bolt and Base Plate- Side View

## Set Center Ring and Side Sheets

### Center Ring

*If the cover is being erected inside the tank:*

Position the center ring on supports at the exact center of the digester tank and adjust for level and proper elevation.

*If the cover is being erected outside the tank:*

Set the center ring at the proper height above the bottom of the side sheet. Adjust for level.

Reference the General Assembly Drawings for the proper elevation of the Center Ring. The center ring support must remain in place until the prefabricated radial beam/roof plate sections have been welded to the center ring and side sheets.

WesTech approves the following methods for securing or removing erection fasteners:

1. Remove the A307 assembly fasteners and plug-weld the holes.
2. Remove the A307 assembly fasteners and cut the erection clips off. Then plug weld the holes.
3. Seal weld the A307 assembly fasteners to the center ring and to the beams.

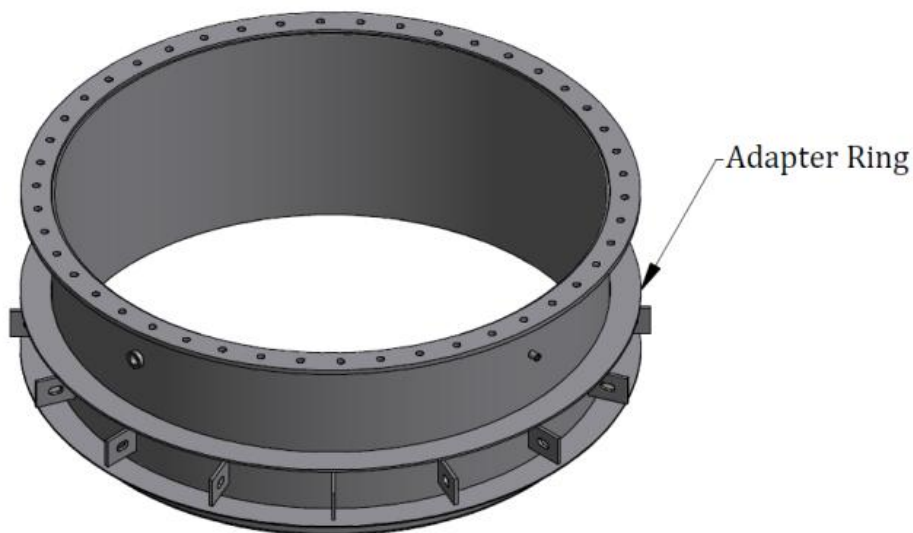


Figure 2.6 Center Ring

## Side Sheets

1. Assemble and true-up the side sheets.
2. Cribbing or scaffolding may be necessary to ensure the side sheet sections are level.
3. The radial measurements from the center dome to the inside of the side sheet should be approximately equal at each beam location (+ ¼ inch). Some pulling of the side sheet sections may be necessary to achieve this tolerance.
4. Confirm the diameter at the top and bottom of the side sheets should be equal to within ¾ inch.
5. Weld side sheets to provide gas tight seal after center ring and radial beam/roof plate sections are in place.
6. Weld on the ring splice to the side sheet using a full penetration weld.

WesTech approves the following methods for securing or removing erection fasteners:

1. Remove the A307 assembly fasteners and plug-weld the holes.
2. Remove the A307 assembly fasteners and cut the erection clips off. Then plug weld the holes.
3. Seal weld the A307 assembly fasteners to the side sheet and to the beams.

Note: Do not weld the side sheets together until all bolting and fit-up are complete and final adjustments have been made.

Note: The vertical weld on the exterior of the side sheet may be omitted if the cover is erected inside the digester tank.

Caulk is required to seal the area if the weld is omitted.

Refer to assembly drawings.

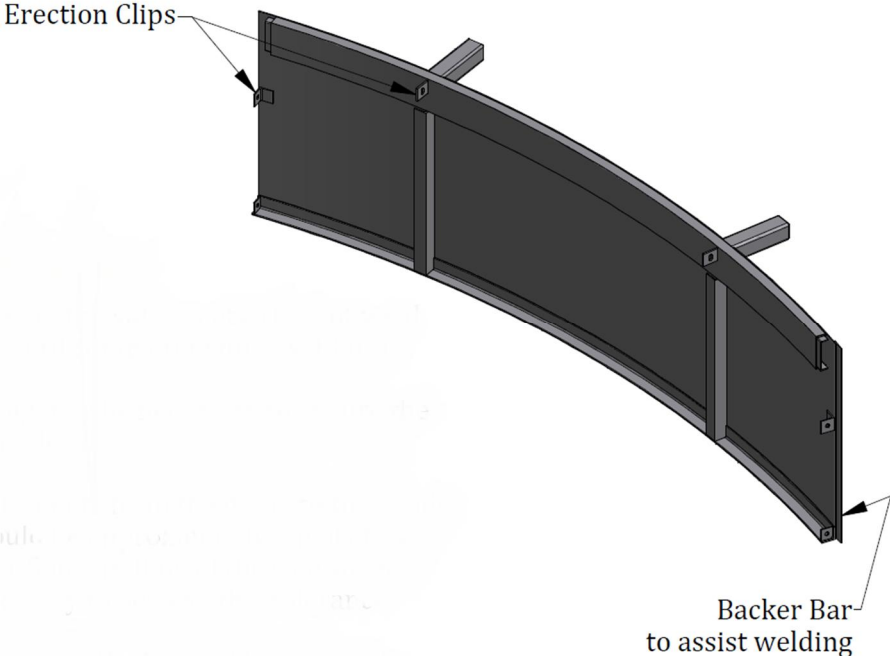


Figure 2.7 Side Sheets

## Install Cover Plate/Radial Beam Assemblies

1. Install the radial beam/roof plate sections at each side sheet. The assemblies cannot span a side sheet splice.
2. Place side sheets along with cover plate/radial beam assemblies 180 degrees apart during installation to ensure the center ring is balanced (Figure 2.8).
3. Continue this process until a full ring is developed (Figure 2.9)
4. This arrangement will result with alternate pie sections of prefabricated roof and side sheet sections. Bolt the radial beams to the center ring and to the side sheet with erection bolts. Make any required adjustments.
5. After final adjustments are made, complete the structural welding as shown on the erection drawings.
6. Seal Weld the radial beams to the center ring and to the side sheet.

WesTech approves the following methods for securing or removing erection fasteners:

1. Seal weld the A307 assembly fasteners to the center dome and to the beams.
2. Remove the A307 assembly fasteners and plug weld the holes.
3. Remove the A307 assembly fasteners and cut the erection clips off. Then plug weld the holes.

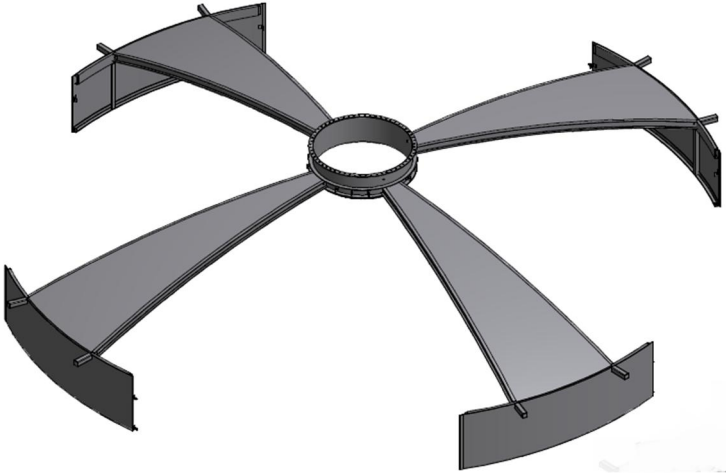


Figure 2.8 Cover Plate/Radial Beam Assemblies

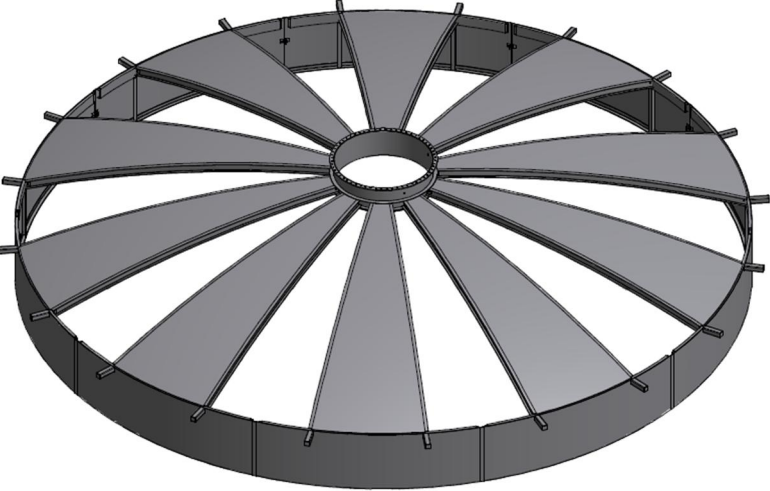


Figure 2.9 Full Ring Development

## Weld 'Filler' Cover Plates

1. Plates are furnished flat and will conform to beam curvature due to their own weight. Some clamping may be required for larger plates.
2. In the case of multiple plates, plate installation should progress from the outer perimeter to the center ring. This assures that the framework is balanced during the welding procedure.
3. The outer portion of the cover plates must come in contact with the side sheet. The inner portion of the cover plates are not required to butt flush with the center ring.
4. Seal weld the filler plates to the radial beams. Use back step or skip weld procedures in order to distribute heat and prevent buckling.
5. The center ring adapter is designed to cover any gaps that exist between the inner most cover plate and the center ring.

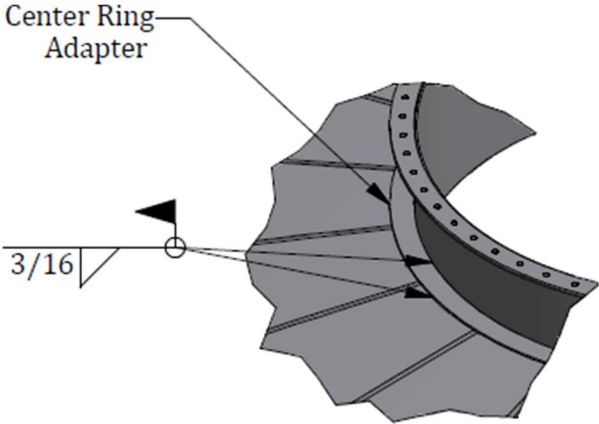


Figure 2.10 Detail A

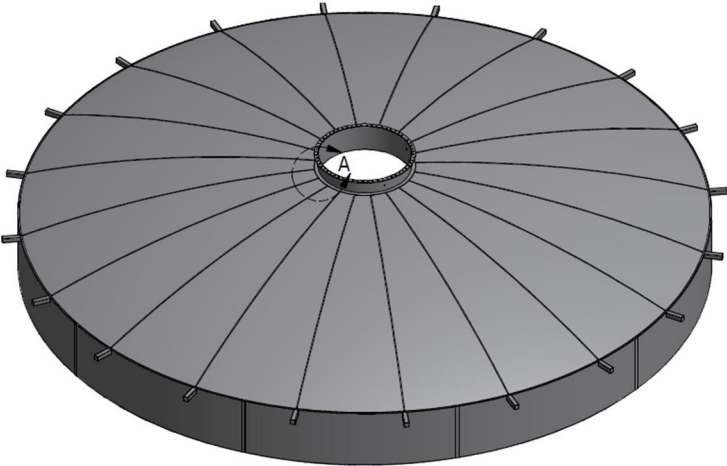


Figure 2.10 Weld 'Filler' Cover Plates

## Install Appurtenances

1. Install manholes and accessories: Refer to the General Assembly Drawings for position of the manholes and accessories. Plumb, level, and tack weld into position. Weld using gas tight welds.
2. Position and weld the adapter plates. Use gas tight welds. The top flange of all cover nozzles, or manholes must be level. Install manhole covers, gas bonnet cover and the quick opening sample hatch cover. Be sure to include the gaskets and to tighten the bolts evenly.
3. Orientation and elevation of the appurtenances are shown in the General Assembly Drawings.
4. Install flame arrester and pressure relief vacuum breaker assembly.

Note: The quantity, location, and types of accessory pieces are custom for each job. Refer to WesTech's general arrangement drawings for actual size and location of accessories.

(Sample tubes, manholes, gas draw off ports, prv ports and gas bonnets are typical items to expect for gasholder digester covers.)

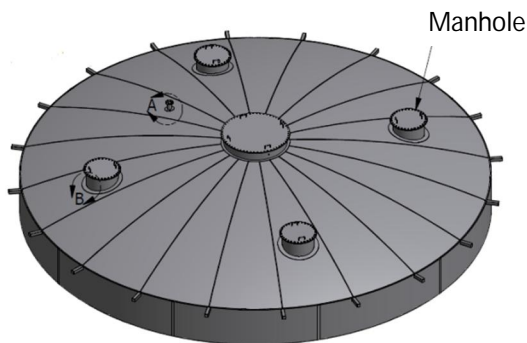


Figure 2.11 Install Manholes and Accessories

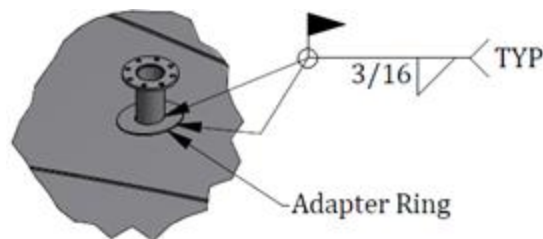


Figure 2.12 Detail A: Typical Nozzle Detail

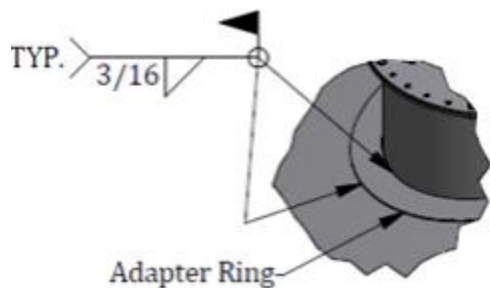


Figure 2.13 Detail B: Typical Manhole Detail

## Cover Placement

### (FOR COVERS ASSEMBLED OUTSIDE OF THE TANK)

**CAUTION:** Do not lift the digester cover until the side sheet, radial beam, and center dome have been permanently welded to each other.

1. At the contractor's option, filler plates may be welded before or after the digester cover is placed in the tank.
2. Lifting lugs or pick points (not provided by WesTech Engineering, Inc.) are to be placed at the connection between radial beams and the side sheet.

The weight of the cover is shown on the general notes drawing.

3. Pick points are to be located at every other beam.
4. In order to prevent excessive compressive stress on the cover, lifting cables must have an angle of inclination of at least 60 degrees from horizontal. (Figure 2.15)
5. Do not raise the cover skewed or sideways. Lift the cover approximately 3 inches off the ground and have the crane operator jiggle the cover to check the cable connections for any lifting problems or excessive stress in the cover. WesTech Engineering, Inc. will not accept back charges for damage to mechanism due to moving.
6. Carefully lower the cover into the tank. Ensure proper orientation. Maintain the specified gap between the side sheet and the tank wall as called out on the General Assembly Drawings.

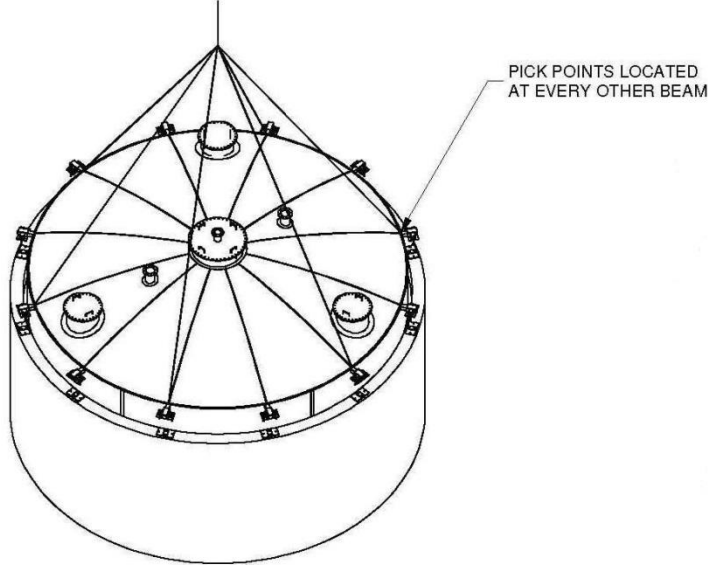


Figure 2.14 Cover Placement

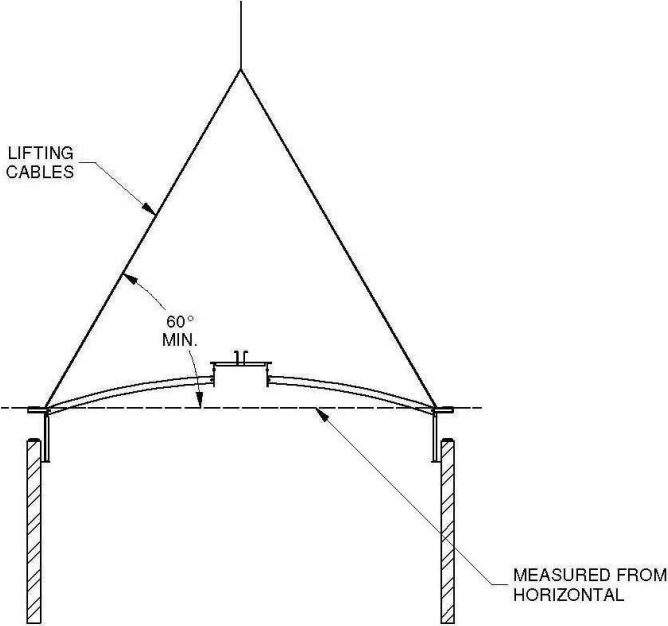


Figure 2.15 Illustrative Section: Rigging Section

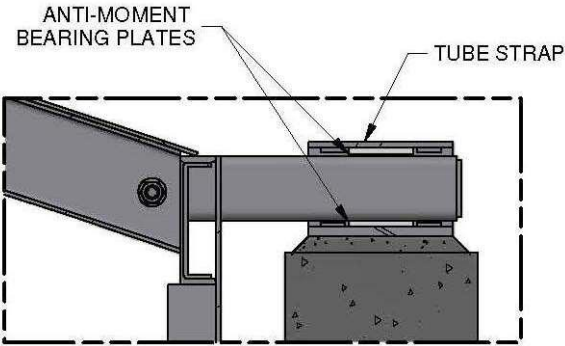


Figure 2.16 Illustrative Section: Through base plate and tube strap

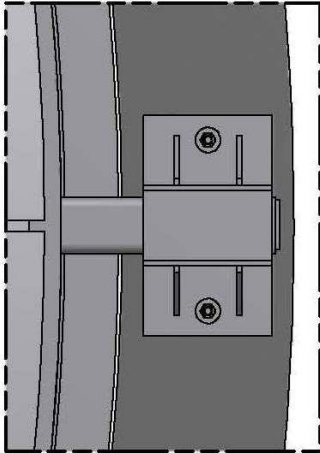


Figure 2.17 Top View

## Install Seal Plate

1. The seal plate is curved to the radius of the inside of the tank wall. Lift the seal plate to the bottom of the side sheet and pull  $\frac{1}{4}$  inch (nominal) away from the tank wall.
2. Tighten bolts/ nuts to fix seal plate in place.

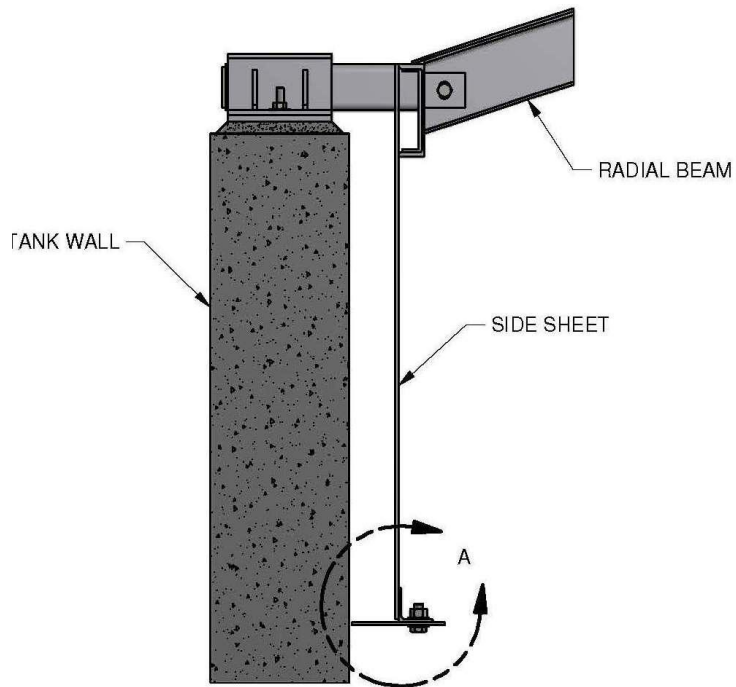


Figure 2.20 Illustrative View

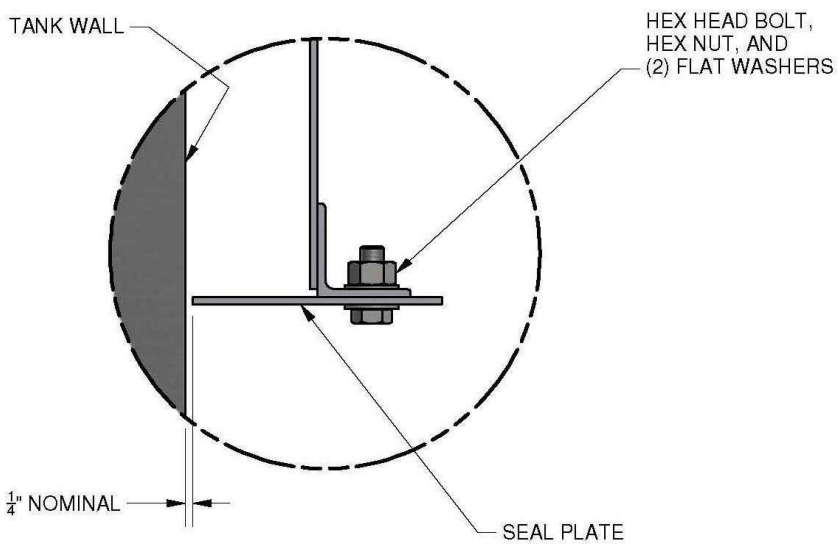


Figure 2.21 Detail A

## Suggested Weld Test

1. All gas tight welds must be tested. To test the cover for gas leaks in the welds the cover must be clean and all debris inside the tank removed before testing.
2. Close all valves (except for the valve located below the pressure/vacuum relief, where utilized) and lines that are connected to the tank and to the cover. Fill the tank with water to a level that is twelve inches above the bottom of the side sheet. Reference the General Arrangement and Assembly Drawings for elevation of the bottom of the side sheet.
3. A water-tight seal is now formed and a natural pressure will develop under the cover as liquid level increases. Add air with an air compressor until the design pressure is reached. (This pressure is normally specified in inches of water column and should be measured with a digital manometer or a "U" tube manometer partially filled with water.)
4. Manometers can be purchased through online retailers and local suppliers. (See Figure 2.22)

Warning: Before the pressure test, check that the pressure/vacuum relief device is correctly set to relieve at values specified. WesTech Engineering, Inc. is not responsible for damage if the cover is subjected to internal or external pressure greater than specified.

Connections:

The center dome is provided with two test connections.

A 1" NPT connection is to be used for adding air to the tank.

A 1/4" NPT connection is to be used to attach the manometer.

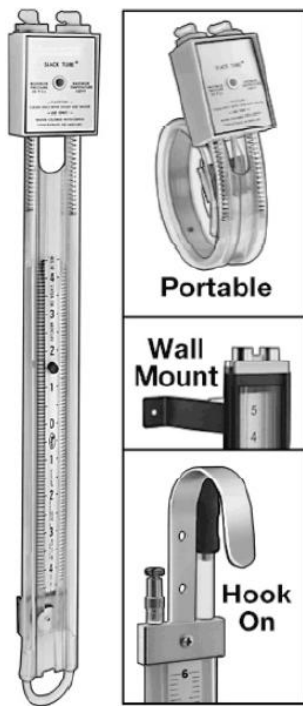


Figure 2.22 Manometer

5. Using a solution of soap and water, spray the solution on all welds. Carefully inspect the cover for any bubbling of the soap solution and any indication of a leaking weld. Check for leaks at all welds and seams.
6. Welds with leaks can be corrected without releasing the air pressure from under the cover.
7. Re-weld any leaks. After weld testing is complete final painting may be completed.

Caution: the digester cover is slippery when wet.

## Alternate Procedure to Test for Gas Tightness

If the digester cover welds are required for gas tightness prior to the cover being installed in the digester tank or to check certain areas of the cover without pressurizing the entire cover, a vacuum box can be used for testing.

The procedure for testing welds for gas tightness is as follows:

1. Apply a soapsuds solution to the outside of the welded seam to be tested.
2. The vacuum box should have a transparent window and be capable of producing a gas tight environment when placed against a plate.
3. Place the vacuum box over a section of the seam and create a vacuum with the box equal to the design pressure.
4. Check through the window for any bubbles which are an indication of leaks in the seal.
5. Follow this procedure along the entire length of the seam.
6. Welds with leaks can be corrected without releasing the air pressure from under the cover.
7. Re-weld any leaks. After weld testing is complete final painting may be completed.

Figure 2.23 and 2.24 are photos of a typical vacuum box arrangement. Vacuum boxes can be found and purchased through Weld Testing Equipment Suppliers, through online retailers or local suppliers. Please contact WesTech Engineering, Inc. for additional information.



Figure 2.23 Vacuum Box



Figure 2.24 Vacuum Box

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## Section Three: Start-up and Operation

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## Safety Instructions

1. Only trained operators who have been schooled in safety procedures should be allowed to work on or around this equipment. Exercise caution around moving parts. In general, limit access to authorized personnel.
2. Anyone entering the area should be wearing adequate safety equipment, such as safety glasses, safety shoes, hard hats, etc.
3. Keep hands, clothing, etc., away from moving parts.
4. Never permit people who have been drinking alcohol or using drugs to maintain or repair unit; also restrict access to any others whose ability may be impaired.
5. Locate "Warning" signs in the area of moving parts and limit access to authorized personnel.
6. Inspect equipment frequently for loose bolts or malfunctioning equipment. Take care of problems at once.
7. Be sure that the pressure relief and vacuum breaker with flame arrester is functioning properly once all seal welding is complete. Also observe the warning signs which are required to be followed when the cover is closed to the atmosphere. The pressure relief valve must be unobstructed to the digester gas contents when the cover is sealed off to the atmosphere.
8. Observe all No Smoking signs around the digester cover.
9. Make sure all individuals are aware of the explosive potential around a digester. Use only non-sparking tools while working in its vicinity.
10. If a problem with the operation of the digester cover occurs, please contact WesTech Engineering immediately.

## Operating Instructions

### Digester Cover

While many factors affect the performance of a digester, including digester temperature, feed rate, sludge composition, and mixing systems, the cover itself is designed mainly to insulate the digester contents and store gas developed during the digestion process. One of the key virtues of a digester cover is its low maintenance performance. In general, an operator need only concern himself with two main aspects of digester cover operation:

1. Monitor digester temperature and pressure. Sudden temperature or atmospheric pressure changes can cause drastic decreases or increases to the digester gas pressure.
2. "Fixed cover digesters require diligent operator attention during sludge additions and withdrawal because the incoming and outgoing flows must equal one another. A sludge addition without an accompanying sludge withdrawal over pressurizes the cover and forces gas to be wasted unnecessarily. When extreme over-pressurization occurs the fixed cover may disengage from the wall mounting.
3. A more severe situation occurs when sludge is withdrawn without making an addition. Under this situation, air is drawn into the digester through the vacuum relief valve and replaces the withdrawn sludge. This air combines with methane under the cover and forms an explosive mixture which may flash or explode in the gas utilization piping system. In some cases, the resulting vacuum causes structural damage to the digester cover."

(1) WPCF, Manual of Practice No.16, Second Edition, Pg. 68

## Emergency Operation

1. If the digester experiences excessive foaming, foam could possibly go through the pressure relief valve. The foaming problem will need to be corrected. Immediate cleaning of the flame arrester bank will be necessary.
2. WesTech can in no way anticipate all problems that could arise at any one particular plant. Plant personnel should monitor the digester on a regular and frequent basis.

## Operator Service Requirement

Pressure Relief/Vacuum Breaker:

Follow manufacturers suggested recommendations.

## Environmental Conditions

This equipment is operational in all weather conditions.

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Start-up Checklist

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## Start-up Checklist for Fixed Digester Covers

Job Name: Manteca Job Number: 23029A

WesTech Service Person: \_\_\_\_\_ Date of Service: \_\_\_\_\_

- Documents required for Start-up:
- O&M Manual
  - Inspection & Change of Work Form (QF-00-002)
  - Field Service Trip Report

Note: Any discrepancies, failures, or observations are to be documented in the comments section on Page 2.

Pass Fail

- 1. Confirm that the digester has been tested for gastightness according to the instructions outlined in the WesTech O&M Manual and/or the design specifications. Have the individual who witnessed the test sign below. This can be the WesTech representative performing start-up (if present during this test) or the contractor (if the test was performed previously).  
Signed: \_\_\_\_\_ Date: \_\_\_\_\_  
 WesTech  Other: \_\_\_\_\_
- 2. Generally check the digester cover to determine if the equipment was built according to the WesTech erection drawings and installation instructions. Refer to the O&M Manual. This is an external visual inspection and does not require entering the digester tank.
- 3. Verify with the contractor that the water level is at least to the minimum design level.
- 4. Confirm proper projection of each visible anchor bolt. Record the measurements in Figure 1, Page 4. Consult with the WesTech Project Manager before leaving the job site if excessive anchor bolt projections are identified.
- 5. Pressurize the digester:
  - A. Remove the weather hood on the pressure/vacuum relief valve. Measure and count the pressure plates. Record the sizes on Page 3.
  - B. Pressurize the digester and record the pressure at which the cover begins to rise.
  - C. Ensure that the pressure/vacuum relief valve is functioning properly. Pressurize the digester to the specified relief pressure to verify that the valve relieves correctly.

## Start-up Checklist for Fixed Digester Covers

- 6. Inspect the anchor bolts and holddowns with the cover at or above operating pressure. Note, measure and photograph any visible changes or problems.
- 7. Verify that all caution/warning signs are properly installed. (Take photos of installed signs.)
- 8. Complete the WesTech Inspection & Change Work Form (QF-00-002) to document any punchlist items (if applicable).
- 9. Perform any additional inspection and training of plant personnel required by the specifications or as directed by the Project Manager.

Explain:

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- 10. Comments:

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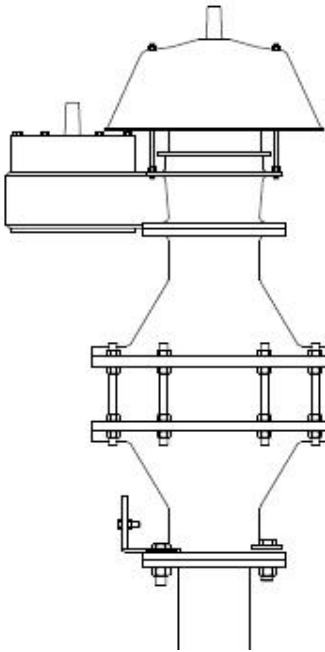
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- 11. Take multiple photos of:

- Anything noteworthy
- Caution Signs
- Pressure/Vacuum Relief Valve and Weights
- Overall Digester Cover (from several angles)
- View of the plant from the cover
- Other Equipment at the plant (if possible, WesTech or otherwise)
- All punch list items

## Start-up Checklist for Fixed Digester Covers

Note: Inspect the pressure/vacuum relief valve(s) to assure there is no foreign material blocking the valve.



A.	Number and size of weights on PRESSURE side of relief valve. Compare to manufacturer data to verify proper set point.	Qty.	Wt. (oz.)	Thk.	Dia.
		_____	_____	_____	_____
		_____	_____	_____	_____
		_____	_____	_____	_____
B.	Inches of W.C. that the gas/air escapes from the pressure relief valve.	Design	Acutal		
		_____	_____	w.c.	w.c.
C.	Number and size of weights on VACUUM side of relief valve. Compare to manufacturer data to verify proper set point.	Qty.	Wt. (oz.)	Thk.	Dia.
		_____	_____	_____	_____
		_____	_____	_____	_____
		_____	_____	_____	_____

NOTE: Do not test the Digester Cover with Vacuum (negative pressure). Contact PM if this is requested.

Note: Before leaving the site, please check the status below and discuss with your onsite contact

- The digester cover has been inspected and is ready for service.
  
- The digester cover is ready for service subject to the punch list items outlined on WesTech form QF-00-002, Inspection & Change Work Form.
  
- The digester cover is not ready for service. WesTech will need to schedule a follow-up trip for further inspection. Refer to WesTech form QF-00-002, Inspection & Change Work Form.

Date: \_\_\_\_\_

\_\_\_\_\_  
WesTech Representative performing Start-up

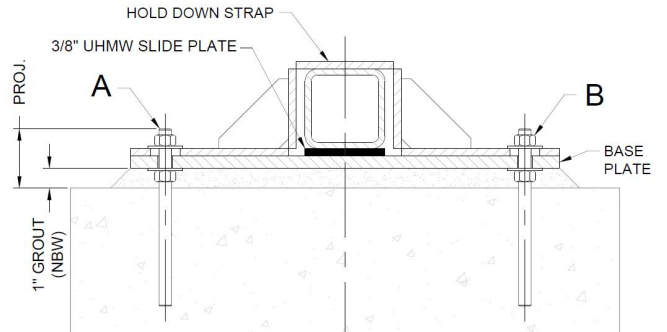
Distribution:  Contractor  PM  Trip Report  File

## Start-up Checklist for Fixed Digester Covers

Figure 1: Anchor Bolt Projection

HD Base = Hold Down Base

HD Base	A	B	HD Base	A	B
1			21		
2			22		
3			23		
4			24		
5			25		
6			26		
7			27		
8			28		
9			29		
10			30		
11			31		
12			32		
13			33		
14			34		
15			35		
16			36		
17			37		
18			38		
19			39		
20			40		



HD Base	A	B	HD Base	A	B
41					
42					
43					
44					
45					
46					
47					
48					
49					
50					

## Start-up Checklist for Fixed Digester Covers

### VAREC PALLET WEIGHTS

- d) **VARIABLE SETTING:** Each lead weight is calibrated from 1" WC increment. (Increments of 1/4" WC and 1/2" WC may be supplied on special order). Those weights necessary for the initial specified setting will be tagged separately from any extra weight provided. Remove the packaging on the weights tagged for the initial specified setting and place the weights on top of the compensating weight and/or pallet. Secure with grip ring. Store remaining weights for future use (in case the setting needs to be increased).
- e) Weigh entire pallet assembly (including installed weights). Using Table 1, confirm that the assembly is the proper weight to achieve the required setting. Allowable weight tolerance is +5%,-5%.

PALLET LOADING (INCLUDES WEIGHT OF PALLET)		
VALVE SIZE	OUNCES OF WEIGHT REQUIRED PER OUNCE OF SETTING	OUNCES OF WEIGHT REQUIRED PER INCH OF WC SETTING
2"	8.3	4.8
3"	16.8	9.7
4"	22.1	12.8
6"	43.4	25.1
8"	72.7	42.0
10"	120.1	69.4
12"	179.9	104.0

Weight tolerance: + 5%/- 5%  
Setting tolerance: + 0%/- 10%

**Table 1 – Pallet Loading**

- f) Remove any remaining packing material from valve body. Wipe pressure seat ring, guide posts and pallet assembly with a soft cloth to remove any material which could affect valve operation.
- g) Place pallet assembly on valve body seat. Ensure that pallet moves freely within guide posts and rests flat on the seat ring.
- h) Replace the weatherhood and tighten nuts uniformly.

## Start-up Checklist for Fixed Digester Covers

### GROTH PALLET WEIGHTS

#### TEST PROCEDURE:

1. A chart showing nominal pallet assembly weights for three common units of pressure is shown below in Table 5. Before starting to reassemble a valve, calculate the nominal pressure and vacuum pallet assembly weights. Weigh both pallet assemblies to ensure the correct settings.
2. After final assembling, mount the valve on a Tank Vent Test Stand (TVTS) and slowly raise the pressure at the flow rate specified below:

Valve Size	Test Flow Rate
2" - 6"	0.5 SCFH
8" - 12"	5.0 SCFH

**ACCEPTANCE CRITERIA:** The pressure gauge shall maintain a pressure equal to or greater than 75% of set pressure for a one minute period while the specified flow rate is maintained.

3. If the valve fails to meet the 75% criteria, it must be disassembled and the seat, pallet, and or diaphragms repaired or replaced.
4. Complete a Test Report indicating the actual pallet assembly weight and the peak pressure achieved at the specified Test Flow Rate.
5. A copy of the Test Report shall be maintained with the Valve Maintenance Records.

**TABLE 5 - Nominal Pallet Assembly Weight Per Unit of Pressure (\*)**

SET	Valve Size													
	2"		3"		4"		6"		8"		10"		12"	
	[Lb.]	[kg]	[Lb.]	[kg]	[Lb.]	[kg]	[Lb.]	[kg]	[Lb.]	[kg]	[Lb.]	[kg]	[Lb.]	[kg]
1.0 OSI	0.41	0.18	0.84	0.38	1.42	0.64	3.04	1.38	5.28	2.40	7.52	3.42	10.1	4.61
1.0 IN WC	0.24	0.11	0.48	0.22	0.82	0.37	1.76	0.80	3.05	1.39	4.35	1.98	5.86	2.67
1.0 mbar	0.09	0.04	0.19	0.09	0.33	0.15	0.71	0.32	1.23	0.56	1.74	0.79	2.35	1.07

Example: Pallet Assembly Weight Calculation (PAW)

6" Valve set at 7.5 OSI      Read weight at 1.0 OSI from table      Weight = 3.04 Lb.  
    Multiple weight by set pressure                              PAW (\*) = 3.04 x 7.5 = 22.8 Lb.

(\*) = Includes pallet, retainer plate, stem, diaphragm, weight plates and fasteners.

The following Table shows the maximum vacuum setting for the weight loaded 1200A and 1300A relief valves that can be achieved without the use of special spacer rings between the cover and body. Consult the factory for higher settings.

**TABLE 6- Maximum Vacuum Settings With Lead Weights & No Spacer Ring**

Valve Size	OSI	IN WC	mbar
2"-3"-4"	10	17	43
6"-8"-10"-12"	16	28	69

**WARNING:** Table 7 on Page 8 shows the maximum envelope dimensions for the weight blocks to ensure that a valve will achieve rated flow capacity. DO NOT exceed these dimensions as pallet lift could be restricted. Pallet lift restriction can cause the tank to be over-pressured to achieve the valves' rated flow capacity.

# Section Four: Maintenance and Parts

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## General Maintenance

As with any piece of quality equipment, maintenance consists mainly of periodic inspection of those items which require painting, as well as those parts which are subject to wear during normal operation. Usually, plants utilizing this type of equipment will schedule regular maintenance periods. These periods can be used for the inspection of maintenance items.

The cover should be periodically inspected for paint integrity.

All bolts and nuts should be kept tight and original elements and adjustments maintained. Inspection should be made at regular intervals. These inspections should occur at least once a year. The gaskets should also be checked yearly to confirm that they are maintaining a gas-tight seal.

To avoid damage to the cover, the pressure relief/vacuum breaker and flame arrester should be inspected regularly, according to the manufacturer's instructions, for proper operation.

The top of the cover should be inspected on an annual basis for leaks. Inspect the underside of the cover every time the cover is taken out of service or at least once every five years.

Caution: Do not remove the pressure/vacuum relief valve without immediately replacing it or constantly monitoring the digester pressure.

## Troubleshooting Guide

TROUBLESHOOTING GUIDE			
Symptoms	Possible Causes	Detection Methods	Possible Solutions
Anchors pulled out	Improper installation Over pressurization Rapid volume expansion	Visual Pullout test	Remove and reinstall anchors
Over pressurization	PRV is plugged Flame arrester is dirty	Over pressure alarm PRV constantly vents Continual relief under the side sheet	Clean pressure relief valve Clean flame arrester
	PRV isolation valve is closed	Visual	Open the isolation valve
Rapid volume expansion	Digester feed rates Digester mixing intensity Power outages Scum addition	Radar liquid level sensor Emergency overflow drains	Monitor digester feed rates Monitor mixing type Provide emergency backup power
Negative pressure	Inlet valve is closed while transferring sludge	Low pressure alarm	Open inlet valve
	Vacuum Relief is plugged	Inspect vacuum relief	Clean vacuum relief
Excessive odor	Annular seal failure	Gas meter	Re-work the annular seal
		Smell	

## Shutdown and Storage Options

If the digester is taken out of service, industry approved procedures should be followed. One such standard is the WPCF (Water Pollution Control Federation) Manual of Practice Number 16 for Anaerobic Sludge Digestion. Safety is of utmost concern due to the explosive potential of digester gas and other operating hazards. Only qualified personnel should perform work around the digester.

Warning: Digester gas is explosive when mixed with oxygen! No smoking and only non-sparking tools should be used around the digester.

Generally speaking, it is preferable to store mechanical and electrical items indoors in a dry, well ventilated enclosure at a constant temperature. The equipment should be adequately supported to prevent distortion and undue stresses. It should be at least six inches off the floor.

Whether stored indoors or outdoors, the steps outlined in the following should be taken:

“Short Term” is from 30 to 120 days,

“Long Term” is 120 days or more.

### Short Term Storage or Shutdown

The following instructions also apply if there is to be a period of time between installation and start-up or between start-up and the equipment going on line. These steps are required to protect against corrosion and assure normal operating conditions.

Cover any electrical or mechanical equipment with a tarpaulin that allows adequate ventilation, drainage, and inspection access in an area protected against wind, direct sunlight, rain, and snow.

### Long Term Storage or Shutdown

In addition to those steps shown under “Short Term”, the following steps should be taken whether storage is indoors or outdoors:

Periodic checks (frequency dependent upon ambient conditions) must be made of painted surfaces for deterioration of paint. Steps should be taken to protect the affected surfaces. Bitumastic coatings tend to become brittle and to chip. Increasing ventilation and reducing humidity are frequently required. Inspection doors, covers, etc. should be blocked open slightly to increase ventilation. Relatively small areas can be coated with a waterproof grease or rust inhibitor

## Explanation of Parts List

### Item Numbers

Item numbers identify a part shown on an erection or assembly drawing. Item numbers are in circles on the drawing with an arrow pointing to the part. On the parts list, item numbers are found in the left most column of the list. Item numbers are three digit numbers.

### Location of Parts Lists

Equipment Parts List is included with Section Six: Enclosures.

Item No.	Qty / Assy	Qty / Order	Units	Part Number	Drawing Number	Dwg Rev	Description of Parts	Material	Weight per Item	Line Rev
101	12	12	EACH	2021A	2021	0	SIDE SHEET	STL	1678	0
102	12	12	EACH	2021B	2021	0	RING SPLICE	STL	9	0
103										
104	1	1	EACH	2022A	2022	A	CENTER RING	STL	994	0
105										
106	1	1	EACH	2023A	2023	0	CENTER RING COVER	STL	1695	0
107										
108	24	24	EACH	2024A	2024	0	RADIAL BEAM (SHOP USE ONLY)	STL	476	0
109										
110	6	6	EACH	2025A	2025	0	SLIDE GUIDE	STL	540	0
111										
112	2	2	EACH	2026A	2026	0	30" MANHOLE W/ ADAPTER	STL	493	0
113										0
114	6	6	EACH	2027A	2027	0	SLIDE BRACKET SUPPORT (TOP)	STL	26	0
115										
116	24	24	EACH	2028A	2028	0	BALLAST SUPPORT	STL	74	0
117	24	24	EACH	2028B	2028	0	BALLAST SUPPORT BRACE	STL	30	0
118										
119	12	12	EACH	2029A	2029	0	FULL COVER PLATE	STL	1129	0
120	12	12	EACH	2029B	2029	0	OUTER COVER PLATE	STL	536	0
121	12	12	EACH	2029C	2029	0	INNER COVER PLATE (SHOP USE ONLY)	STL	599	0
122										
123	12	12	EACH	2030A	2030	0	COVER PLATE/RADIAL BEAM ASSEMBLY	STL		0
124										

Figure 4.1 Example Parts List

## Procedure for Ordering Spare or Replacement Parts

Spare or replacement parts may be ordered from the Aftermarket Sales Department at:

WesTech Engineering, Inc.  
3665 South West Temple  
Salt Lake City, Utah 84115  
Phone: (801) 265-1000  
Fax: (801) 265-1080  
24-hour service/emergency: (801) 265-1000  
Email: [parts@westech-inc.com](mailto:parts@westech-inc.com)  
Web: [www.westech-inc.com](http://www.westech-inc.com)

If you would like to talk directly to an Aftermarket Sales representative during normal business hours (8:00 am to 4:30 pm MST), dial (801) 265-1000 and ask for the Aftermarket Sales Department. You may fax your order to (801) 265-1080.

To use the 24-hour service/emergency line after hours (4:30 pm to 8:00 am), dial (801) 265-1000. Please indicate to the Answering Service Operator whether your facility is Water, Waste Water or Industrial. They will inform you that a WesTech Representative will call and assist you with your problem.

If you would like to e-mail a spare parts order, simply e-mail your request to us at [parts@westech-inc.com](mailto:parts@westech-inc.com) and a WesTech representative will process your order and follow up with an Order Acknowledgment.

Spare parts may also be requested directly from our web page [www.westech-inc.com](http://www.westech-inc.com). Simply go to the web page, click on Parts and Service. If you know the part number and job information you need, you can input it directly. A WesTech Representative will process your request and follow up with a purchase quotation, or a return phone call to confirm that your request has been received.

For convenience, a 'Recommended Spare Parts List' is provided in this manual. This is a guide for the appropriate level of spares to keep on hand minimizing lost time due to unscheduled breakdowns. Each item listed in the Recommended Spare Parts List is identified within one of the following categories:

- Normal maintenance and wear items.
- Long Lead items (minimum downtime).

Should you require further assistance in determining which spare parts are appropriate for your particular situation please contact WesTech's Aftermarket Sales Department.

To avoid unnecessary delays in obtaining the correct spare or replacement parts for your equipment, be sure to give the following information with each order.

1. Identify equipment using the WesTech Job number. Your equipment is identified as follows:  
WesTech Job Number: 23029A  
WesTech Model Number: DCB1
2. Identify the part by name and give the number of the drawing on which this part or assembly appears.
3. Identify the part number.
4. Identify the size and include all pertinent dimensions (such as diameter, length, thickness, bore, pitch, etc.) whenever possible.
5. If parts being ordered are electrical in nature, give all pertinent data such as voltage, amperage, wattage, cycles, speed, power factor, or other information given on the parts nameplate or included in the parts brochure.
6. Submit your written purchase order or request for a quotation, both signing and printing your full name so that WesTech will know whom to contact should further clarification of the inquiry be necessary. All verbal orders must be verified in writing.
7. Give a return address and a shipping address.
8. Give a preferred method of shipping: i.e., UPS, truck freight, rail freight, air express, etc.
9. Indicate the quantity desired.
10. Provide instructions for proper invoicing.

All spare or repair parts orders are subject to a \$100.00 minimum order charge.

## 24 Hour Emergency: (801) 265-1000

To use the 24-hour service line, dial the above number and give the representative your name, phone number and a short explanation of what is wrong. This information will then be forwarded to the right person who will then respond to you within one hour.

## Section Five: Accessory Equipment

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## Epoxy Anchors

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## 1 Identification

- **Product identifier**
- **Trade name:** **Hilti HIT-HY 200-A**
- **Container size:** 330 ml, 500 ml
- **Relevant identified uses of the substance or mixture and uses advised against**
- **Sector of Use** Building and construction work
- **Application of the substance / the mixture** Adhesive anchoring system for rebar and anchor fastenings in concrete.
- **Details of the supplier of the safety data sheet**
- **Manufacturer/Supplier:**  
Hilti, Inc.  
5400 South 122nd East Ave.  
US-Tulsa, OK 74146  
Phone: (800) 879-8000  
Fax: (800) 879-7000  
Español: (800) 879-5000
- **Information department:**  
anchor.hse@hilti.com  
see section 16
- **Emergency telephone number:**  
Chem-Trec  
Tel.: 1 800 424 9300 (USA, PR, Virgin Islands, Canada)  
Tel.: 703 527 3887 (Other countries)

## 2 Hazard(s) identification

- **Classification of the substance or mixture**  
Aquatic Acute 1 H400 Very toxic to aquatic life.  
Eye Irrit. 2A H319 Causes serious eye irritation.  
Skin Sens. 1 H317 May cause an allergic skin reaction.
- **Label elements**
- **GHS label elements** The product is classified and labeled according to the Globally Harmonized System (GHS).
- **Hazard pictograms**



GHS07 GHS09

- **Signal word** Warning
- **Hazard-determining components of labeling:**  
Hydroxypropyl methacrylate  
dibenzoyl peroxide
- **Hazard statements**  
H319 Causes serious eye irritation.  
H317 May cause an allergic skin reaction.  
H400 Very toxic to aquatic life.
- **Precautionary statements**  
P280 Wear protective gloves/protective clothing/eye protection/face protection.  
P262 Do not get in eyes, on skin, or on clothing.  
P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
P333+P313 If skin irritation or rash occurs: Get medical advice/attention.  
P337+P313 If eye irritation persists: Get medical advice/attention.  
P302+P352 If on skin: Wash with plenty of water.
- **Classification system**
- **NFPA ratings (scale 0-4)**



Health = 2  
Fire = 1  
Reactivity = 1

(Contd. on page 2)

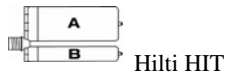
US EN

Trade name: Hilti HIT-HY 200-A

(Contd. of page 1)

- **Other hazards**
- **Results of PBT and vPvB assessment**
- **PBT:** Not applicable.
- **vPvB:** Not applicable.

· **Additional information:**



- **Information pertaining to particular dangers for man and environment: A**  
H317 May cause an allergic skin reaction.

- **Information pertaining to particular dangers for man and environment: B**  
H319 Causes serious eye irritation.  
H317 May cause an allergic skin reaction.  
H400 Very toxic to aquatic life.

**3 Composition/information on ingredients**

- **Chemical characterization: Mixtures**
- **Description:**  
2-Component-Foilpack, contains:  
Component A: Urethane methacrylate resin, inorganic filler  
Component B: Dibenzoylperoxide, phlegmatized

Mixture of the substances listed below with nonhazardous additions.

· **Dangerous components:**

· **Dangerous components A:**

27813-02-1	Hydroxypropyl methacrylate	5-10%
2082-81-7	tetramethylene dimethacrylate	10-15%
14808-60-7	Quartz (SiO <sub>2</sub> )	40-50%
1344-28-1	aluminium oxide	5-10%

· **Dangerous components B:**

94-36-0	dibenzoyl peroxide	10-15%
14808-60-7	Quartz (SiO <sub>2</sub> )	40-50%
1344-28-1	aluminium oxide	15-25%

- **Additional information** For the wording of the listed risk phrases refer to section 16.

**4 First-aid measures**

- **Description of first aid measures**
- **General information** Immediately remove any clothing soiled by the product.
- **After inhalation** Take affected persons into fresh air and keep quiet.
- **After skin contact** Immediately wash with water and soap and rinse thoroughly.
- **After eye contact**  
Rinse opened eye for several minutes under running water. Then consult a doctor.  
Protect unharmed eye.
- **After swallowing**  
Rinse out mouth and then drink plenty of water.  
Seek immediate medical advice.
- **Information for doctor**
- **Most important symptoms and effects, both acute and delayed** Allergic reactions
- **Indication of any immediate medical attention and special treatment needed**  
No further relevant information available.

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(Contd. on page 3)

Trade name: Hilti HIT-HY 200-A

(Contd. of page 2)

## 5 Fire-fighting measures

- **Extinguishing media**
- **Suitable extinguishing agents**  
CO<sub>2</sub>, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- **For safety reasons unsuitable extinguishing agents** Water with full jet.
- **Special hazards arising from the substance or mixture**  
In case of fire, the following can be released:  
Nitrogen oxides (NO<sub>x</sub>)  
Carbon monoxide (CO)  
Carbondioxide (CO<sub>2</sub>)  
In certain fire conditions, traces of other toxic gases cannot be excluded.
- **Advice for firefighters**
- **Protective equipment:** Wear self-contained respiratory protective device.

## 6 Accidental release measures

- **Personal precautions, protective equipment and emergency procedures**  
Wear protective equipment. Keep unprotected persons away.  
Ensure adequate ventilation
- **Environmental precautions:** Do not allow to penetrate the ground/soil.
- **Methods and material for containment and cleaning up:**  
Pick up mechanically.  
Clean the affected area carefully; suitable cleaners are:  
organic solvent  
Ensure adequate ventilation.  
Dispose contaminated material as waste according to item 13.
- **Reference to other sections**  
See Section 7 for information on safe handling  
See Section 8 for information on personal protection equipment.  
See Section 13 for disposal information.

## 7 Handling and storage

- **Handling**
- **Precautions for safe handling**  
Check the expiry date: see imprint on manifold (month/year). Do not use expired mortar!  
The usual precautionary measures for handling chemicals should be followed.
- **Information about protection against explosions and fires:**  
Keep ignition sources away - Do not smoke.  
Protect from heat.
- **Conditions for safe storage, including any incompatibilities**
- **Storage**
- **Requirements to be met by storerooms and receptacles:**  
Keep in a cool, dry and dark place; 41 °F / 5 °C to 77 °F / 25 °C.
- **Information about storage in one common storage facility:** Store away from foodstuffs.
- **Further information about storage conditions:** Protect from heat and direct sunlight.
- **Storage class**  
As per VCI (1991) storage classification concept.  
11
- **Specific end use(s)** Adhesive mortar for anchor and rebar fastenings

## 8 Exposure controls/personal protection

- **Additional information about design of technical systems:** No further data; see item 7.
- **Control parameters**
- **Components with limit values that require monitoring at the workplace:**  
The product has a pasty consistency. Exposure limit values for respirable dusts are not relevant for this product.
- **Additional information:** The lists that were valid during the creation were used as basis.

(Contd. on page 4)

US EN

**Trade name: Hilti HIT-HY 200-A**

(Contd. of page 3)

- **Exposure controls**
- **Personal protective equipment**
- **General protective and hygienic measures**  
 The usual precautionary measures for handling chemicals should be followed.  
 Keep away from foodstuffs, beverages and feed.  
 Wash hands before breaks and at the end of work.  
 Avoid contact with the eyes and skin.  
 Do not eat, drink, smoke or sniff while working.
- **Breathing equipment:** Not required.
- **Protection of hands:**



Protective gloves.

EN 374

Only use chemical-protective gloves with CE-labeling of category III.  
 Avoid direct contact with the chemical/ the product/ the preparation by organizational measures.  
 The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.

- **Material of gloves**  
 Nitrile rubber, NBR  
 Recommended thickness of the material:  $\geq 0.12$  mm
- **Penetration time of glove material**  
 The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.
- **Not suitable are gloves made of the following materials:**  
 Natural rubber, NR  
 Leather gloves  
 Strong gloves
- **Eye protection:**



Tightly sealed goggles.

EN 166 / EN 170

- **Body protection:**



Protective work clothing.

## 9 Physical and chemical properties

- **Information on basic physical and chemical properties**
- **General Information**
- **Appearance:**

Form:	Pasty
Color:	Component A: grey Component B: white
- **Odor:** Ester-like
- **Odour threshold:** Not determined
- **pH-value:**

Componente A:	not applicable
Componente B:	~ 7
- **Change in condition**

Melting point/Melting range:	Not determined.
Boiling point/Boiling range:	undetermined
- **Flash point:**

Component A:	> 109 °C (DIN EN ISO 1523)
Component B:	not applicable
- **Flammability (solid, gaseous)** Not determined

(Contd. on page 5)

US EN

**Trade name: Hilti HIT-HY 200-A**

(Contd. of page 4)

· <b>Ignition temperature:</b>	355 °C (671 °F)
· <b>Decomposition temperature:</b>	Component A: not relevant Component B: SADT 65 °C UN test H4
· <b>Auto igniting:</b>	Product is not selfigniting.
· <b>Danger of explosion:</b>	Product does not present an explosion hazard.
· <b>Explosion limits:</b>	
<b>Lower:</b>	Not determined
<b>Upper:</b>	Not determined
· <b>Vapor pressure at 20 °C (68 °F):</b>	< 0.1 hPa (< 0 mm Hg) (HPMA)
· <b>Density at 20 °C (68 °F):</b>	1.8 g/cm <sup>3</sup> (15.021 lbs/gal) (DIN 51757)
· <b>Relative density</b>	Not determined
· <b>Vapour density</b>	Not determined
· <b>Evaporation rate</b>	Not determined
· <b>Solubility in / Miscibility with Water:</b>	Not miscible or difficult to mix
· <b>Partition coefficient (n-octanol/water):</b>	Not determined
· <b>Viscosity:</b>	
<b>dynamic at 20 °C (68 °F):</b>	50 Pa.s (DIN EN ISO 53019)
<b>kinematic at 20 °C (68 °F):</b>	> 20 s (ISO 2431)
· <b>Solvent content:</b>	
<b>Water:</b>	Component B: ~ 20%
· <b>Other information</b>	VOC Content: 7 g/l (EPA Method 24)

## 10 Stability and reactivity

- **Reactivity**
- **Chemical stability**
- **Thermal decomposition / conditions to be avoided:**  
To avoid thermal decomposition do not overheat.  
No decomposition if used and stored according to specifications.
- **Possibility of hazardous reactions** No dangerous reactions known
- **Conditions to avoid** No further relevant information available.
- **Incompatible materials:** No further relevant information available.
- **Hazardous decomposition products:** No dangerous decomposition products known

## 11 Toxicological information

- **Information on toxicological effects**
- **Acute toxicity:**
- **Primary irritant effect:**
- **on the skin:** No irritant effect.
- **on the eye:** Irritating effect.
- **Sensitization:** Sensitization possible through skin contact.
- **Additional toxicological information:**  
The product shows the following dangers according to the calculation method of the General EU Classification Guidelines for Preparations as issued in the latest version:  
Irritant
- **Carcinogenic categories**

### · NTP (National Toxicology Program)

 14808-60-7 | Quartz (SiO<sub>2</sub>)

K

## 12 Ecological information

- **Toxicity**
- **Aquatic toxicity:** No further relevant information available.

(Contd. on page 6)

US EN

**Trade name: Hilti HIT-HY 200-A**

(Contd. of page 5)

- **Persistence and degradability** No further relevant information available.
- **Behavior in environmental systems:**
- **Bioaccumulative potential** No further relevant information available.
- **Mobility in soil** No further relevant information available.
- **Additional ecological information:**
- **According to the formulation contains the following heavy metals and compounds from the EU guideline NO. 2006/11/EC:**  
None
- **General notes:** The product does not contain organically bounded halogens (AOX-free).
- **Results of PBT and vPvB assessment**
- **PBT:** Not applicable.
- **vPvB:** Not applicable.
- **Other adverse effects** No further relevant information available.

### 13 Disposal considerations

- **Waste treatment methods**
- **Recommendation**  
Full or only partially emptied cartridges must be disposed of as special waste in accordance with official regulations.

- **European waste catalogue:**

08 04 09*	waste adhesives and sealants containing organic solvents or other dangerous substances
20 01 27*	paint, inks, adhesives and resins containing dangerous substances

- **Uncleaned packagings:**
- **Recommendation:** Disposal must be made according to official regulations.

### 14 Transport information

- |   |  |
|---|--|
| · <b>UN-Number</b>  | Void   |
| · <b>DOT, ADR, ADN, IMDG, IATA</b>  | Void   |
| · <b>UN proper shipping name</b>  | Void   |
| · <b>DOT, ADN, IMDG, IATA</b>   | Void   |
| · <b>ADR</b>  | Void   |
| · <b>Transport hazard class(es)</b>   |  |
| · <b>DOT, ADR, ADN, IMDG, IATA</b>  |  |
| · <b>Class</b>  | Void   |
| · <b>Packing group</b>  |  |
| · <b>DOT, ADR, IMDG, IATA</b>   | Void   |
| · <b>Environmental hazards:</b>   |  |
| · <b>Marine pollutant:</b>  | No   |
| · <b>Special marking (ADR):</b>   | None   |
| · <b>Special marking (IATA):</b>  | None   |
| · <b>Special precautions for user</b>   | Not applicable.  |
| · <b>Danger code (Kemler):</b>  | Void   |
| · <b>EMS Number:</b>  | Void   |
| · <b>Segregation groups</b>   | Void   |
| · <b>Transport in bulk according to Annex II of MARPOL/73/78 and the IBC Code</b> | Not applicable.  |
| · <b>Transport/Additional information:</b>  | Not dangerous according to the above specifications.<br>available oxygen content < 1 %           |
| · <b>UN "Model Regulation":</b>   | -  |
| · <b>HS-Code:</b>   | 3214 10 10: Glaziers' putty, grafting putty, resin cements, caulking compounds and other mastics |

-US EN-

(Contd. on page 7)

**Trade name: Hilti HIT-HY 200-A**

(Contd. of page 6)

**15 Regulatory information**

· Safety, health and environmental regulations/legislation specific for the substance or mixture

 · **Section 355 (Extremely hazardous substances):**

None of the ingredients is listed.

 · **Section 313 (Specific toxic chemical listings):**

1344-28-1 aluminium oxide

94-36-0 Dibenzoyl peroxide

 · **TSCA (Toxic Substances Control Act):**

All ingredients are listed.

 · **Proposition 65:**

 · **Chemicals known to cause cancer:**

None of the ingredients are listed.

 · **Carcinogenicity categories**

 · **EPA (Environmental Protection Agency)**

None of the ingredients is listed.

 · **TLV (Threshold Limit Value established by ACGIH)**

14808-60-7	Quartz (SiO <sub>2</sub> )	A2
------------	----------------------------	----

1344-28-1	aluminium oxide	A4
-----------	-----------------	----

94-36-0	Dibenzoyl peroxide	A4
---------	--------------------	----

 · **MAK (German Maximum Workplace Concentration)**

14808-60-7	Quartz (SiO <sub>2</sub> )	1
------------	----------------------------	---

1344-28-1	aluminium oxide	2
-----------	-----------------	---

 · **NIOSH-Ca (National Institute for Occupational Safety and Health)**

14808-60-7	Quartz (SiO <sub>2</sub> )	
------------	----------------------------	--

 · **National regulations**

The product is subject to be labeled according with the prevailing version of the regulations on hazardous substances.

 · **Information about limitation of use:** Employment restrictions concerning young persons must be observed.

 · **Chemical safety assessment:** not required.

**16 Other information**

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

 · **Relevant phrases**

R3 Extreme risk of explosion by shock, friction, fire or other sources of ignition.

R7 May cause fire.

R36 Irritating to eyes.

R43 May cause sensitisation by skin contact.

R50 Very toxic to aquatic organisms.

 -----  
 H241 Heating may cause a fire or explosion.

H317 May cause an allergic skin reaction.

H319 Causes serious eye irritation.

H400 Very toxic to aquatic life.

 · **Department issuing SDS:**

Hilti Entwicklungsgesellschaft mbH

Hiltistrasse 6

D-86916 Kaufering

Tel.: +49 8191 906310

Fax: +49 8191 90176310

e-mail: anchor.hse@hilti.com

 · **Contact:** Mechthild Krauter

 · **Date of preparation / last revision** 05/18/2015 / 2

 · **Abbreviations and acronyms:**

RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)

ICAO: International Civil Aviation Organisation

(Contd. on page 8)

-US EN

**Safety Data Sheet**  
acc. to ISO 11014

Printing date 05/18/2015

Version number 3

Reviewed on 05/18/2015

**Trade name: Hilti HIT-HY 200-A**

(Contd. of page 7)

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)

IMDG: International Maritime Code for Dangerous Goods

DOT: US Department of Transportation

IATA: International Air Transport Association

ACGIH: American Conference of Governmental Industrial Hygienists

EINECS: European Inventory of Existing Commercial Chemical Substances

ELINCS: European List of Notified Chemical Substances

CAS: Chemical Abstracts Service (division of the American Chemical Society)

NFPA: National Fire Protection Association (USA)

Eye Irrit. 2A: Serious eye damage/eye irritation, Hazard Category 2A

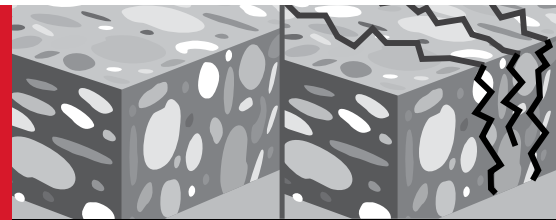
Skin Sens. 1: Sensitisation - Skin, Hazard Category 1

Aquatic Acute 1: Hazardous to the aquatic environment - AcuteHazard, Category 1

· \* **Data compared to the previous version altered.**

US EN

# HILTI



## Hilti HIT-HY 200-A Hilti HIT-HY 200-R

Instruction for use [en](#)

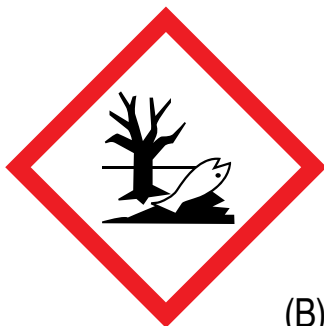
Mode d'emploi [fr](#)

Manual de instrucciones [es](#)

Instruções de utilização [pt](#)



(A, B)



(B)

### Warning



**Contains:** hydroxypropylmethacrylate, (A)  
dibenzoyl peroxide (B)

May cause an allergic skin reaction. (A, B)


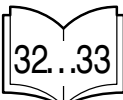
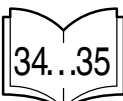
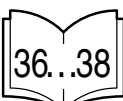
Causes serious eye irritation. (B)

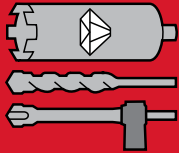
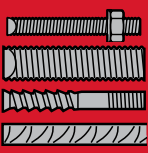

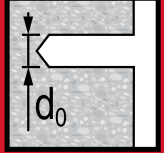
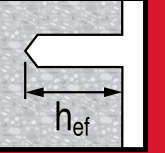

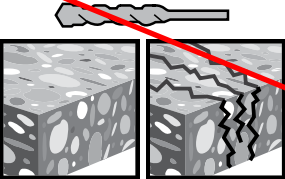

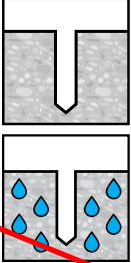

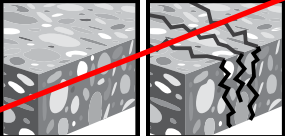

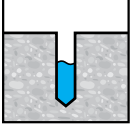

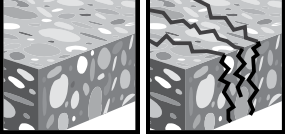




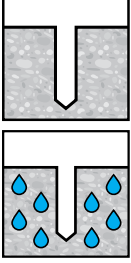

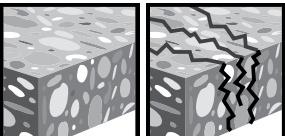



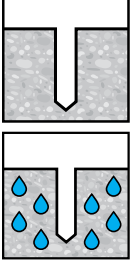

Very toxic to aquatic life. (B)

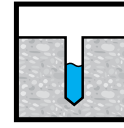
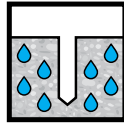
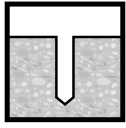


ICC ESR 3187



<p><b>en</b></p>	<p><b>Adhesive anchoring system for rebar and anchor fastenings in concrete.</b>                  Read the safety precautions, safety data sheet, and the product information before use.                  Read the safety precautions and the product information of the accessories before use.</p>	<p>→  30...31</p>
<p><b>fr</b></p>	<p><b>Mortier de scellement pour ancrage d'armatures métalliques et de tiges filetées dans le béton.</b>                  Avant utilisation, bien lire les prescriptions de sécurité, la fiche de données de sécurité ainsi que la fiche d'information produit. Avant d'utiliser l'accessoire, bien lire les prescriptions de sécurité ainsi que la fiche d'information produit.</p>	<p>→  32...33</p>
<p><b>es</b></p>	<p><b>Resina de inyección para barras corrugadas y varilla roscada.</b>                  Lea las indicaciones de seguridad, la hoja de datos de seguridad y la información del producto antes de utilizarlo. Lea las indicaciones de seguridad y la información del producto antes de utilizar los accesorios.</p>	<p>→  34...35</p>
<p><b>pt</b></p>	<p><b>Buchas químicas para ferros de armadura e barras roscadas em betão.</b>                  Antes de utilizar, ler as regras de segurança, a ficha técnica de segurança e os dados informativos sobre o produto. Antes de utilizar os acessórios, ler as regras de segurança e os dados informativos sobre o produto.</p>	<p>→  36...38</p>

						
<b>1</b>		HIT-Z 		$\frac{7}{16}'' \dots \frac{7}{8}''$ 10 ... 22 mm	$2\frac{3}{8}'' \dots 8\frac{1}{2}''$ 60 ... 220 mm	
<b>2</b>		HIT-Z 		$\frac{7}{16}'' \dots \frac{7}{8}''$ 10 ... 22 mm	$2\frac{3}{8}'' \dots 8\frac{1}{2}''$ 60 ... 220 mm	
<b>3</b>		HIT-Z  HIT-V HAS  HIS-N  Rebar 		$\frac{1}{2}'' \dots 1\frac{1}{8}''$ 12 ... 32 mm	$2\frac{3}{8}'' \dots 39\frac{3}{8}''$ 60 ... 1000 mm	
<b>4</b>		HIT-V HAS  HIS-N  Rebar 		$\frac{7}{16}'' \dots 1\frac{1}{2}''$ 10 ... 40 mm	$2\frac{3}{8}'' \dots 75\frac{1}{2}''$ 60 ... 1920 mm	



en

Dry concrete

Water saturated concrete

Waterfilled borehole in concrete

fr

Béton sec

Béton saturé d'eau

Trou dans le béton rempli d'eau

es

Hormigón seco

Hormigón saturado de agua

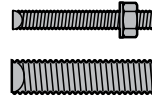
Taladro lleno de agua en hormigón

pt

Betão seco

Betão saturado de água

Furo em betão cheio de água



en

HIT-Z  
HIT-Z-R

Threaded rod  
Threaded sleeve

Rebar

fr

HIT-Z  
HIT-Z-R

Tige filetée  
Douille filetée

Armature métallique

es

HIT-Z  
HIT-Z-R

Varilla roscada  
Manguito roscado

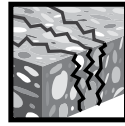
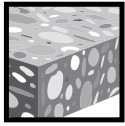
Barras corrugadas para armado

pt

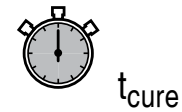
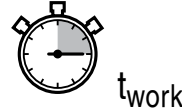
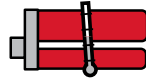
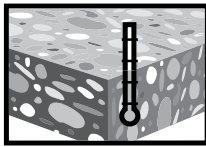
HIT-Z  
HIT-Z-R

Barra roscada  
Casquilho roscado

Ferros de armadura

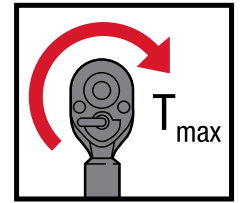
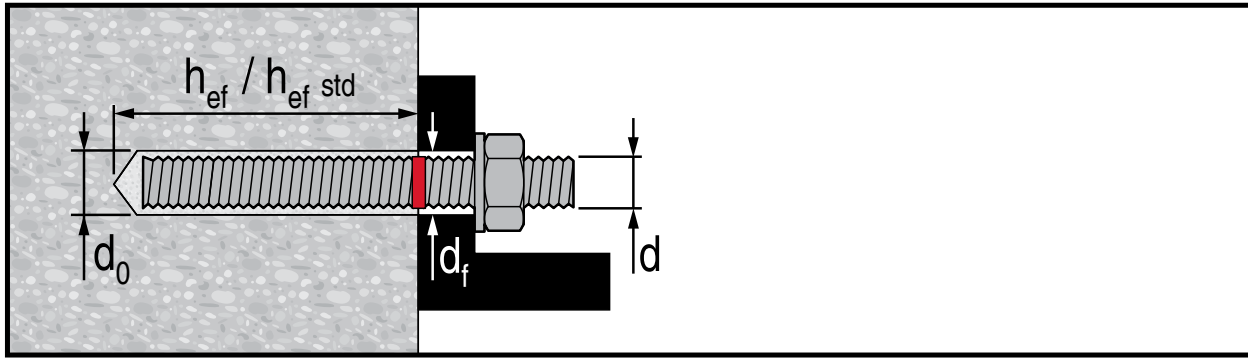



<b>en</b>	Uncracked concrete	Cracked concrete	Hammer drilling	Hollow drill bit	Diamond coring
<b>fr</b>	Béton non lézardé	Béton lézardé	Perçage avec percussion	Foret creux	Forage au diamant
<b>es</b>	Hormigón no fisurado	Hormigón fisurado	Taladro con percusión	Taladro con broca hueca y aspiración	Taladro con diamante
<b>pt</b>	Betão não fissurado	Betão fissurado	Perfurar de martelo	Broca de coroa oca	Perfurar com equipamento diamantado



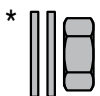
<b>en</b>	Temperature of concrete	cartridge temperature	Working time	Curing time
<b>fr</b>	Température du béton	Température de la cartouche	Temps de manipulation	Temps de durcissement
<b>es</b>	Temperatura del hormigón	Temperatura del cartucho	Tiempo de ajuste	Tiempo de fraguado
<b>pt</b>	Temperatura do betão	Temperatura do cartucho	Tempo de trabalho	Tempo de cura total

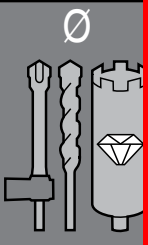
## HAS/HIT-V



	$\varnothing d_0$ [inch]	$h_{ef\ std}$ [inch]	$h_{ef}$ [inch]	$h_{ef}$ [mm]	$T_{max}$ [ft-lb]	$T_{max}$ [Nm]
$\frac{3}{8}$	$\frac{7}{16}$	$3\frac{3}{8}$	$2\frac{3}{8} \dots 7\frac{1}{2}$	60...191	15	20
$\frac{1}{2}$	$\frac{9}{16}$	$4\frac{1}{2}$	$2\frac{3}{4} \dots 10$	70...254	30	41
$\frac{5}{8}$	$\frac{3}{4}$	$5\frac{5}{8}$	$3\frac{1}{8} \dots 12\frac{1}{2}$	79...318	60	81
$\frac{3}{4}$	$\frac{7}{8}$	$6\frac{3}{4}$	$3\frac{1}{2} \dots 15$	89...381	100	136
$\frac{7}{8}$	1	$7\frac{7}{8}$	$3\frac{1}{2} \dots 17\frac{1}{2}$	89...445	125	169
1	$1\frac{1}{8}$	9	4 ... 20	102...508	150	203
$1\frac{1}{4}$	$1\frac{3}{8}$	$11\frac{1}{4}$	5 ... 25	127...635	200	271

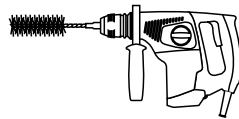
$d_f$ [inch]	HAS/HIT-V	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{4}$
$d_{f1}$		$\frac{1}{2}$	$\frac{5}{8}$	$\frac{13}{16}^*$	$\frac{15}{16}^*$	$1\frac{1}{8}^*$	$1\frac{1}{4}^*$	$1\frac{1}{2}^*$
$d_{f2}$		$\frac{7}{16}$	$\frac{9}{16}$	$\frac{11}{16}$	$\frac{13}{16}$	$\frac{15}{16}$	$1\frac{1}{8}$	$1\frac{3}{8}$


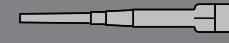
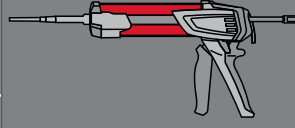


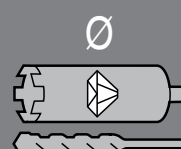
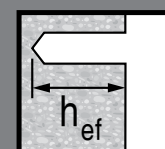
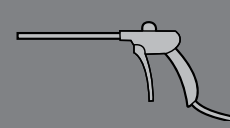
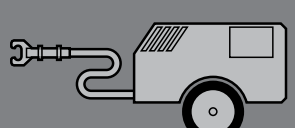
	HAS HIT-V	HIS-N	Rebar	HIT-Z	HIT-RB	HIT-SZ	HIT-DL	HIT-OHC
$d_0$ [inch]		$d$ [inch]			[inch]	[inch]	[inch]	Art. No.
7/16	3/8	-	-	3/8	7/16	-	-	387551
1/2	-	-	#3	-	1/2	1/2	1/2	
9/16	1/2	-	10M	1/2	9/16	9/16	9/16	
5/8	-	-	#4	-	5/8	5/8	9/16	
11/16	-	3/8	-	-	11/16	11/16	11/16	
3/4	5/8	-	15M #5	5/8	3/4	3/4	3/4	387552
7/8	3/4	1/2	#6	3/4	7/8	7/8	7/8	
1	7/8	-	20M #6 #7	-	1	1	1	
1 1/8	1	5/8	#7 #8	-	1 1/8	1 1/8	1	
1 1/4	-	3/4	25M #8	-	1 1/4	1 1/4	1	
1 3/8	1 1/4	-	#9	-	1 3/8	1 3/8	1 3/8	387552
1 1/2	-	-	30M #10	-	1 1/2	1 1/2	1 3/8	

HIT-DL:  $h_{ef} > 10''$

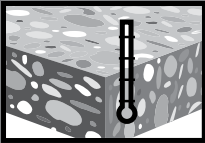


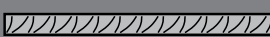





HIT-RB:  $h_{ef} > 20d$



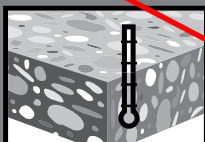


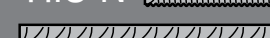





	HIT-RE-M		HIT-OHW
	Art. No.		Art. No.
Hilti VC	337111	HDM 300 HDM 500 HDE 500-A18	387550

			
$d_0$ [inch]	[inch]	Art. No. 381215	
7/16" ... 1 1/8"	2 3/8" ... 20"	✓	≥ 6 bar/90 psi @ 6 m³/h
1 1/4" ... 1 1/2"	4" ... 25"	-	≥ 140 m³/h / ≥ 82 CFM

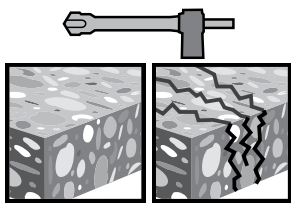
 HIT-HY 200-A

		HIT-V, HAS  HIS-N  Rebar 		HIT-Z 	
[°C]	[°F]	 t <sub>work</sub>	 t <sub>cure</sub>	 t <sub>work</sub>	 t <sub>cure</sub>
-10...-5	14...23	1,5 h	7 h	—	—
-4...0	24...32	50 min	4 h	—	—
1...5	33...41	25 min	2 h	—	—
6...10	42...50	15 min	75 min	15 min	75 min
11...20	51...68	7 min	45 min	7 min	45 min
21...30	69...86	4 min	30 min	4 min	30 min
31...40	87...104	3 min	30 min	3 min	30 min

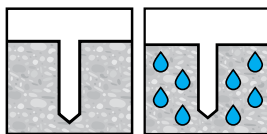
 HIT-HY 200-R

		HIT-V, HAS  HIS-N  Rebar 		HIT-Z 	
[°C]	[°F]	 t <sub>work</sub>	 t <sub>cure</sub>	 t <sub>work</sub>	 t <sub>cure</sub>
-10...-5	14...23	3 h	20 h	—	—
-4...0	24...32	2 h	8 h	—	—
1...5	33...41	1 h	4 h	—	—
6...10	42...50	40 min	2,5 h	40 min	2,5 h
11...20	51...68	15 min	1,5 h	15 min	1,5 h
21...30	69...86	9 min	1 h	9 min	1 h
31...40	87...104	6 min	1 h	6 min	1 h

3

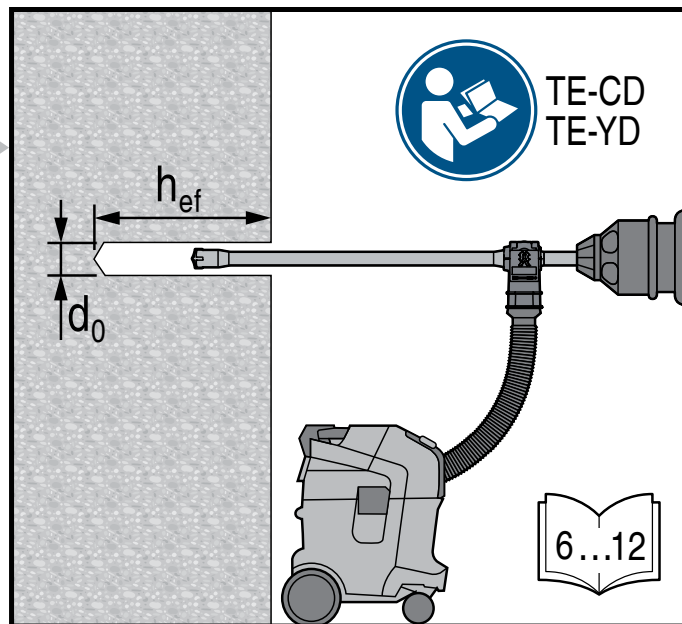


HIT-Z  
 HAS/HIT-V  
 HIS-N  
 Rebar



$d_0$ :  
 1/2" ... 1 1/8"  
 12 ... 32 mm

$h_{ef}$ :  
 2 3/8" ... 39 3/8"  
 60 ... 1000 mm

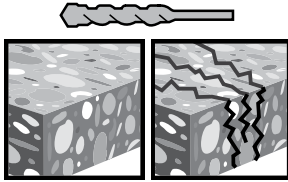


TE-CD  
 TE-YD

6...12

	B	C	D
	2 3/8" ... 9 7/8" 60 ... 250 mm	2 3/8" ... 75 1/2" 60 ... 1920 mm	2 3/8" ... 75 1/2" 60 ... 1920 mm
	26	27	28

4



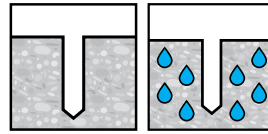
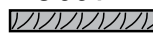
HIT-V  
HAS



HIS-N

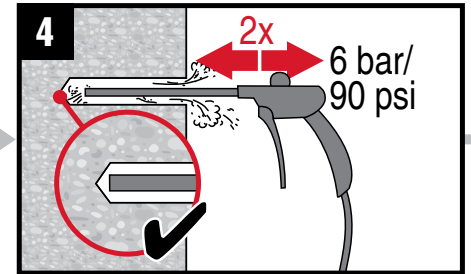
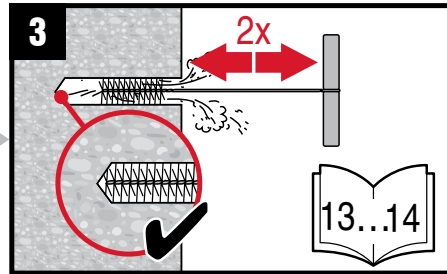
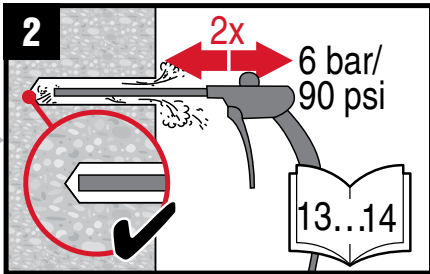
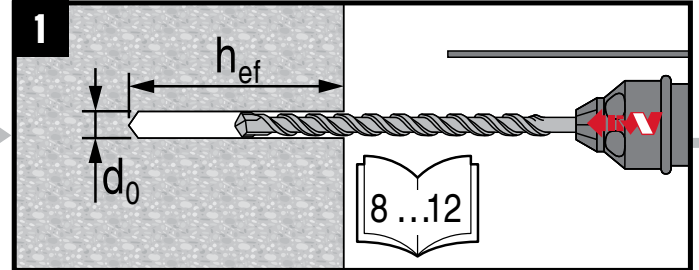


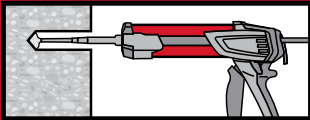
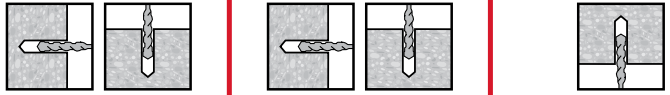
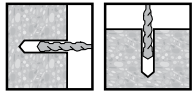
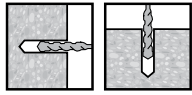

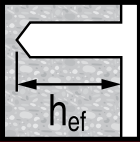




Rebar



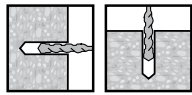
$d_0$ :  
7/16" ... 1 1/2"  
10 ... 40 mm

$h_{ef}$ :  
2 3/8" ... 75 1/2"  
60 ... 1920 mm







	<b>B</b>	<b>C</b>	<b>D</b>
			
	2 3/8" ... 9 7/8" 60 ... 250 mm	2 3/8" ... 75 1/2" 60 ... 1920 mm	2 3/8" ... 75 1/2" 60 ... 1920 mm
			

**B**



$h_{ef}$ :  
2 3/8" ... 9 7/8"  
60...250 mm

HIT-Z   
HAS/HIT-V   
HIS-N   
Rebar 

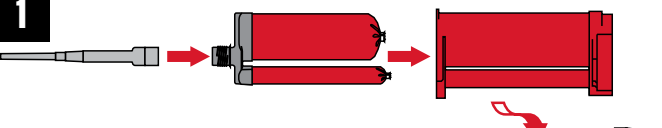


HIT-RE-M




13...14

**1**

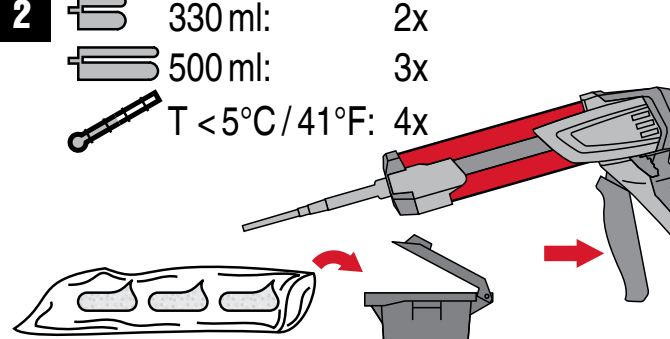


HDM 330  
HDM 500  
HDE 500-A18

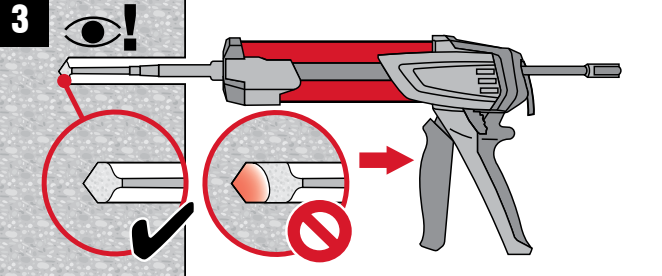


**2**

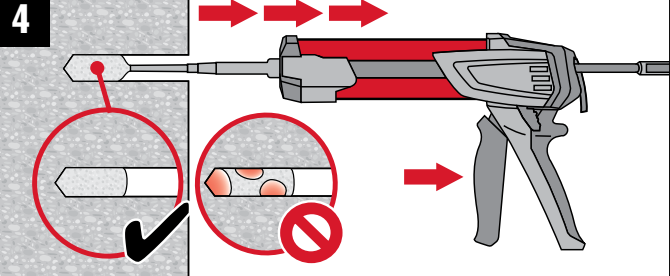
330 ml: 2x  
500 ml: 3x  
T < 5°C / 41°F: 4x



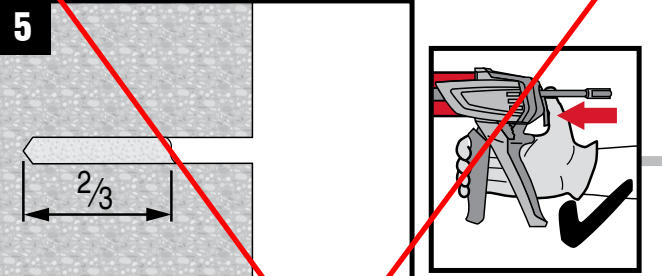
**3**



**4**



**5**

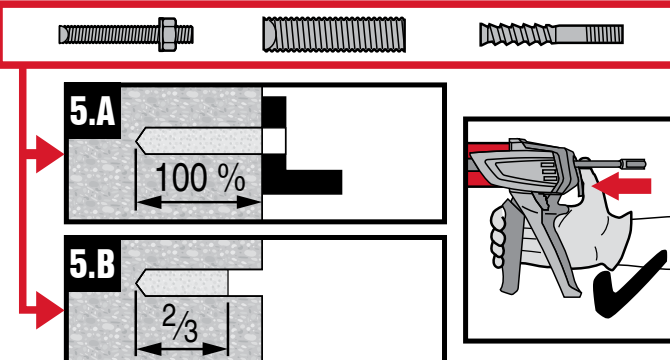


**5.A**

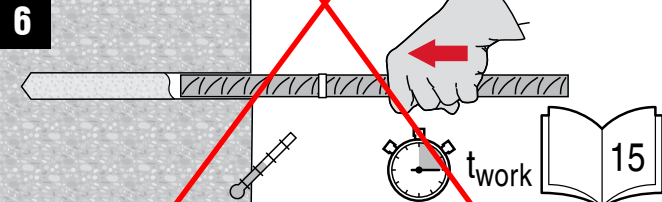
100%

**5.B**

2/3

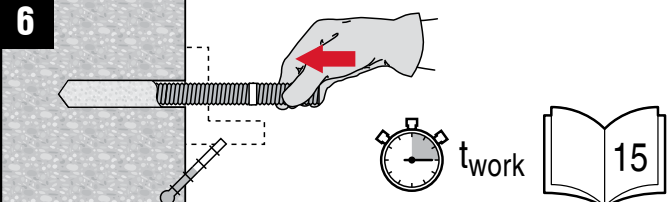


**6**



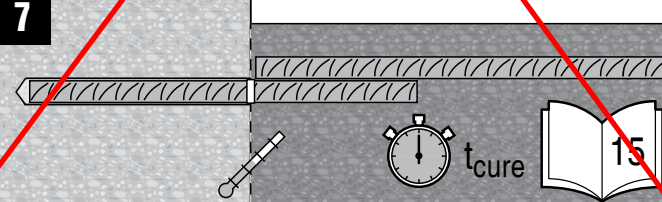
$t_{work}$  15

**6**



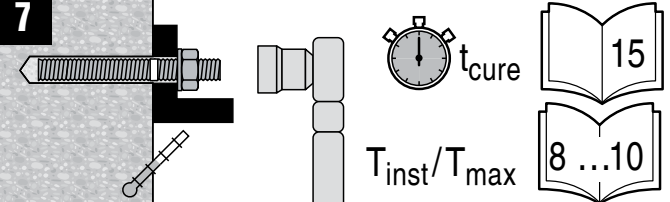
$t_{work}$  15

**7**

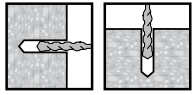


$t_{cure}$  15



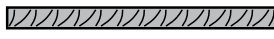
**7**

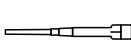
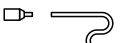



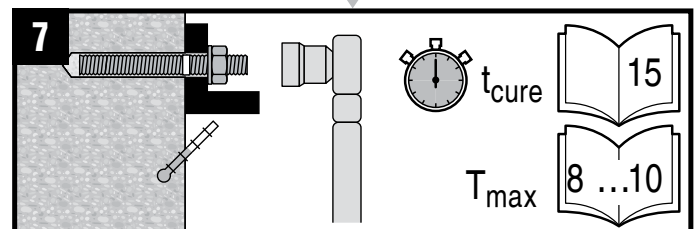
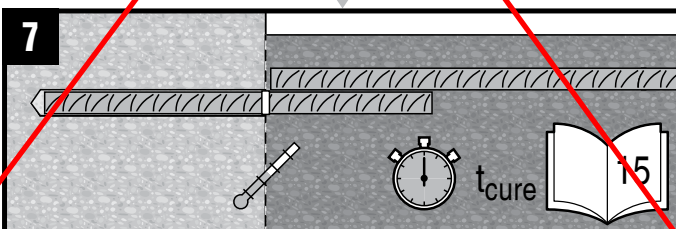
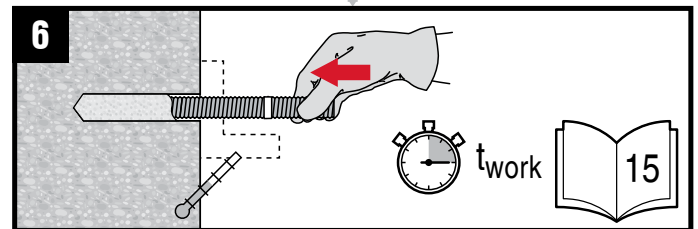
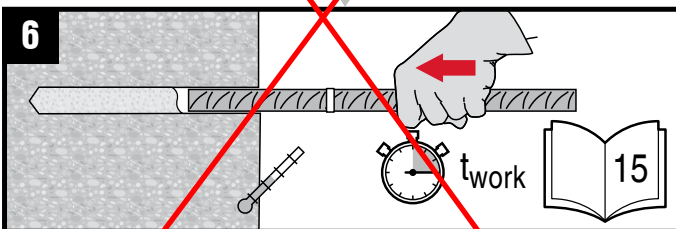
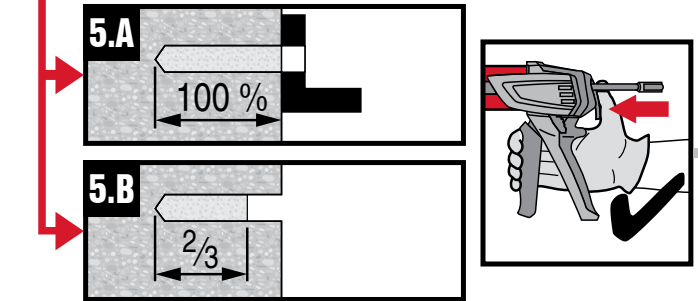
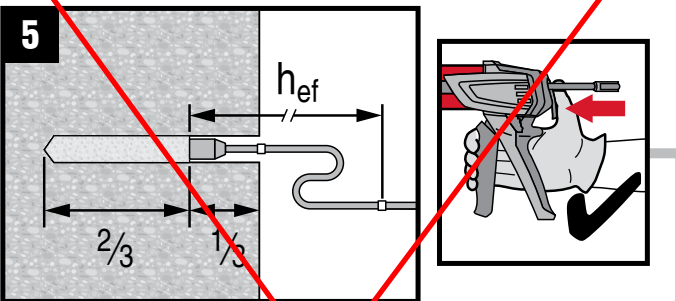
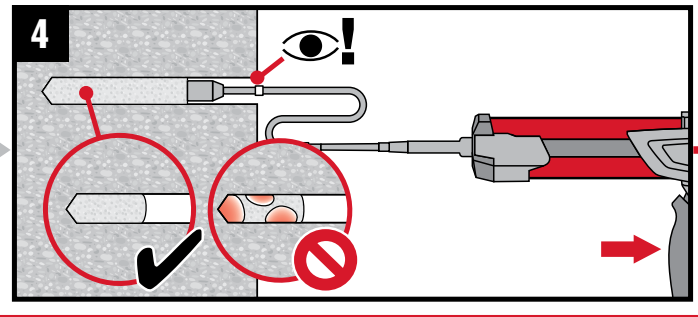
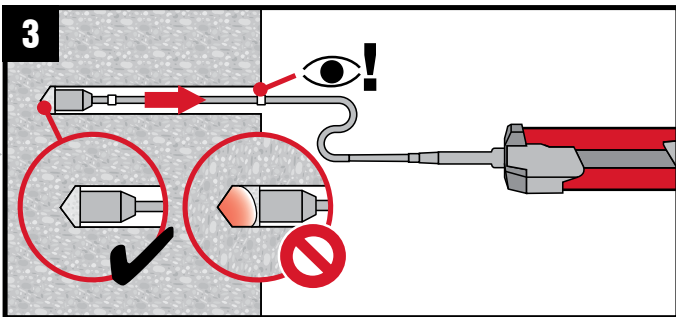
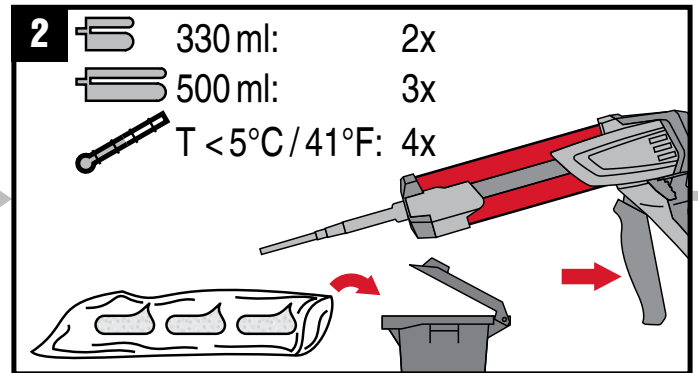
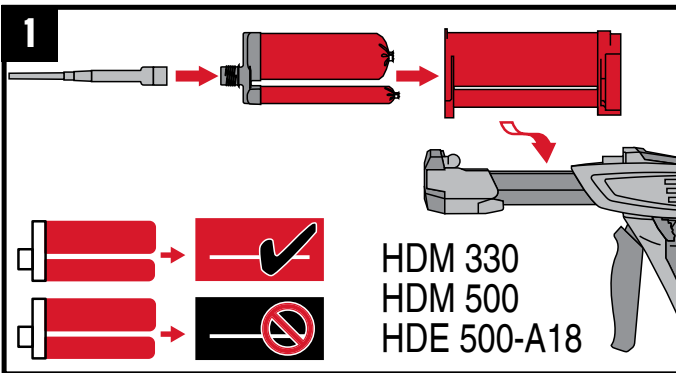
$t_{cure}$  15  
 $T_{inst}/T_{max}$  8...10

**C**

$h_{ef}$ :  
 $2\frac{3}{8}'' \dots 75\frac{1}{2}''$   
 60...1920 mm

HAS/HIT-V   
 HIS-N   
 Rebar 

HIT-RE-M   
 HIT-SZ  →  13...14



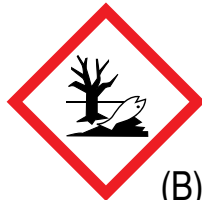
## Adhesive anchoring system for rebar and anchor fastenings in concrete.

### Hilti HIT-HY 200-A

**Contains:** Hydroxypropylmethacrylat (A), Dibenzoylperoxid (B)



(A, B)



(B)



### Warning

H317 May cause an allergic skin reaction. (A, B)  
H319 Causes serious eye irritation. (B)  
H400 Very toxic to aquatic life. (B)

P262 Do not get in eyes, on skin or on clothing.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

P302 + P352 IF ON SKIN: Wash with plenty of soap and water.


P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P333+313 If skin irritation or rash occurs: Get medical advice/attention.

P337+313 If eye irritation persists: Get medical advice/attention.

### Disposal considerations

#### Empty packs:

- ▶ Leave the mixer attached and dispose of via the local Green Dot recovery system 
- ▶ or EAK waste material code: 150102 plastic packaging

#### Full or partially emptied packs:

- ▶ Must be disposed of as special waste in accordance with official regulations.
  - EAK waste material code: 08 04 09\* waste adhesives and sealants containing organic solvents or other dangerous substances.
  - or EAK waste material code: 20 01 27\* paint, inks, adhesives and resins containing dangerous substances.

**Content:** 330 ml / 11.1 fl.oz. 500 ml / 16.9 fl. oz      **Weight:** 590 g / 20.8 oz 890 g / 31.4 oz

Failure to observe these installation instructions, use of non-Hilti anchors, poor or questionable base material conditions, or unique applications may affect the reliability or performance of the fastenings.

## Product Information

- Always keep these instructions together with the product even when given to other persons.
- **Material Safety Data Sheet:** Review the MSDS before use.
- **Check expiration date:** See imprint on foil pack manifold (month/year). Do not use expired product.
- **Foil pack temperature during usage:** 0 °C to 40 °C / 32 °F to 104 °F.
- **Base material temperature at time of installation:**
  - HAS/HIT-V, HIS, Rebar:** between -10 °C and 40 °C / 14 °F and 104 °F.
  - HIT-Z:** between +5°C and 40°C / 41°F and 104°F.
- **Conditions for transport and storage:** Keep in a cool, dry and dark place between 5 °C and 25 °C / 41 °F and 77 °F.
- For any application not covered by this document / beyond values specified, please contact Hilti.
- **Partly used foil packs must remain in the cassette** and has to be used within **4 weeks**. Leave the mixer attached on the foil pack manifold and store within the cassette under the recommended storage conditions. If reused, attach a new mixer and discard the initial quantity of anchor adhesive.

### NOTICE

- ▲ **The surface of the HIT-Z anchor rod must not be altered in any way.**
- ▲ **Improper handling may cause mortar splashes.**
  - Always wear safety glasses, gloves and protective clothes during installation.
  - Never start dispensing without a mixer properly screwed on.
  - Attach a new mixer prior to dispensing a new foil pack (ensure snug fit).
  - Use only the type of mixer (HIT-RE-M) supplied with the adhesive. Do not modify the mixer in any way.
  - Never use damaged foil packs and/or damaged or unclean foil pack holders (cassettes).
- ▲ **Poor load values / potential failure of fastening points due to inadequate borehole cleaning.**
  - The boreholes must be free of debris, dust, water, ice, oil, grease and other contaminants prior to adhesive injection.
  - For blowing out the borehole – blow out with oil free air until return air stream is free of noticeable dust.
  - For flushing the borehole – flush with water line pressure until water runs clear.
  - For brushing the borehole – only use specified wire brush. The brush must resist insertion into the borehole – if not the brush is too small and must be replaced.
- ▲ **Ensure that boreholes are filled from the back of the borehole without forming air voids.**
  - If necessary use the accessories / extensions to reach the back of the borehole.
  - For overhead applications use the overhead accessories HIT-SZ and take special care when inserting the fastening element. Excess adhesive may be forced out of the borehole. Make sure that no mortar drips onto the installer.
- ▲ **Not adhering to these setting instructions can result in failure of fastening points!**

CE  
15  
Hilti AG  
FL-9494 Schaan  
Hilti Werke  
1343-CPR-M 500-10/07.14  
ETA-11/0493  
Notified body 1343  
ETAG 001-1, -5  
Option 1, (Seismic C1)  
www.hilti.com

CE  
15  
Hilti AG  
FL-9494 Schaan  
Hilti Werke  
1343-CPR-M 500-05/07.14  
ETA-11/0492  
Notified body 1343  
ETAG 001-1, -5  
www.hilti.com

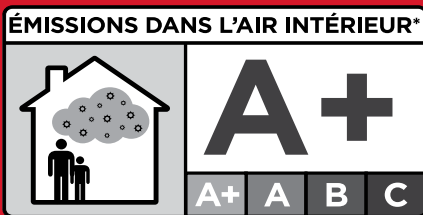
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Hilti Werke  
1343-CPR-M 500-14/07.14  
ETA-12/0006  
Notified body 1343  
ETAG 001-1, -5  
Option 1, Seismic C1, (C2)  
www.hilti.com

CE  
15  
Hilti AG  
FL-9494 Schaan  
Hilti Werke  
1343-CPR-M 500-12/07.14  
ETA-15/0296  
Notified body 1343  
ETAG 001-1, -5  
Option 1, Seismic C1, C2  
www.hilti.com

CE  
15  
Hilti AG  
FL-9494 Schaan  
Hilti Werke  
1343-CPR-M 500-11/07.14  
ETA-12/0084  
Notified body 1343  
ETAG 001-1, -5  
Option 1, (Seismic C1)  
www.hilti.com

CE  
14  
Hilti AG  
FL-9494 Schaan  
Hilti Werke  
1343-CPR-M 500-06/07.14  
ETA-12/0083  
Notified body 1343  
ETAG 001-1, -5  
www.hilti.com

CE  
Hilti AG  
FL-9494 Schaan  
Hilti Werke  
1343-CPR-M 500-15/07.14  
ETA-12/0028  
Notified body 1343  
ETAG 001-1, -5  
Option 1, Seismic C1, (C2)  
www.hilti.com



Certified to  
ANSI-NSF 61



\* Information sur le niveau d'émission de substances volatiles dans l'air intérieur, présentant un risque de toxicité par inhalation, sur une échelle de classe allant de A+ (très faibles émissions) à C (fortes émissions).

[www.hilti.com](http://www.hilti.com)

**Made in Germany**

Hilti = registered trademark of Hilti Corporation, Schaan, Liechtenstein

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2045320 V07-10.2015

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# Section Six: Enclosures

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Parts List

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Description **FIXED DIGESTER COVER**

Parts List Number **48187** Rev. **-**  
 Job Name **MANTECA WQCF DIGESTER**  
 Job Number **23029A**  
 Model No **DCB1**

Quantity **2**  
 Size **60' DIA.**  
 Type **Radial Beam Fixed Covers**  
 Weight **121,986** lbs

Date **7/19/2017**  
 Designer **RI00**  
 Checked **ST20**  
 Approved **EK00**

Item Number	Quantity per Assembly	Quantity per order	Units	Part Number	Document Number	Doc Rev	Description of Parts	Material	Weight per Item	Line Rev
							----REFERENCE----			-
					1001-1,2	C	GENERAL ARRANGEMENT			-
					1002	C	CONNECTION DETAILS			-
					1003	C	APPURTENANCE DETAILS			-
					1004	C	GENERAL NOTES			-
										-
					1011-1,2	-	GENERAL ASSEMBLY			-
					1012	-	CONNECTION ASSEMBLY DETAILS			-
					1013	-	APPURTENANCE ASSEMBLY DETAILS			-
										-
					QR-00-063	C	WESTECH WORKMANSHIP STANDARD			-
										-
							----PARTS----			-
101	12	24	EA	1021A	1021	-	SIDE SHEET	STL	1519	-
102	12	24	EA	1022A	1022	-	RING SPLICE	STL	10	-
103	12	24	EA	1022B	1022	-	RING SPLICE PLATE	STL	4	-
104	1	2	EA	1023A	1023	-	CENTER RING	STL	704	-
105										-
106	1	2	EA	1024A	1024	-	CENTER RING COVER	304L	793	-
107										-
108	24	48	EA	1025A	1025	-	RADIAL BEAM	STL	320	-
109										-
110	12	24	EA	1026A	1026	-	COVER PLATE	STL	1418	-

Printed By: SHOGENSON

Parts List Number 48187

Rev.

Job Number 23029A

Printed On:12/7/2017 3:57:04 PM

1 of 4

QF-00-51A

WesTech Engineering, Inc Telephone: 801.265.1000 Fax: 801.265.1080 www.WesTech-inc.com

Rev. 2013 Jan 17

Item Number	Quantity per Assembly	Quantity per order	Units	Part Number	Document Number	Doc Rev	Description of Parts	Material	Weight per Item	Line Rev
111										-
112	12	24	EA	1027A	1027	-	COVER PLATE (SHIPPED LOOSE)	STL	927	-
113										-
114	12	24	EA	1028A	1028	-	COVER PLATE/RADIAL BEAM ASSEMBLY (REF. 2058 LBS)	STL		-
115										-
116	12	24	EA	1029A	1029	-	SEAL PLATE	STL	131	-
117										-
118	24	48	EA	1030A	1030	-	HOLD-DOWN BASE	STL	26	-
119	24	48	EA	1030B	1030	-	HOLD-DOWN STRAP	STL	30	-
120										-
121	3	6	EA	1031A	1031	-	SAMPLE TUBE W/ ADAPTER	STL-304L	269	-
122	6	12	EA	1033A	1033		SAMPLE TUBE SUPPORT (L 3 X 3 X 1/4 X 6'-8")	304L	33	-
123										-
124	3	6	EA	1032A	1032	-	MANHOLE BARREL	304L	245	-
125	3	6	EA	1032B	1032	-	MANHOLE COVER	304L	154	-
126	3	6	EA	1032C	1032	-	MANHOLE ADAPTER	STL	54	-
127										-
										-
										-
							----BUYOUTS----			-
201	1	2	EA	DC031F	DC031	A	CENTER RING GASKET	NPRN CC		-
202	3	6	EA	DC029A	DC029	0	MANHOLE GASKET	NPRN		-
203										-
204	48	96	EA	----	----		UHMW SLIDE PLATE(5" X 5 X 3/8")	UHMWPE		-
206										-
207	1	2	EA	1-8876	SIT-00008 A	0	NAMEPLATE, WESTECH, LARGE	CAST AL		-
208	1	2	EA	DC006A	DC006	0	NAMEPLATE MOUNTING BRACKET	HDPE		-
209	1	2	EA	DC001A	DC001	0	CAUTION SIGN	ACRYLIC		-

Item Number	Quantity per Assembly	Quantity per order	Units	Part Number	Document Number	Doc Rev	Description of Parts	Material	Weight per Item	Line Rev
210	1	2	EA	DC013A	DC013	0	CAUTION SIGN MOUNTING BRACKET - 6" PRV	HDPE		-
										-
							----FASTENERS----			-
301	1	2	EA	BO			ANTI-SEIZE COMPOUND 10 oz. - NICKEL BASED (USE ON ALL SS FASTENERS)	---		-
302										-
303	1	2	EA	BO			SQUARE HEAD 1" PIPE PLUG (CENTER RING)	BRS		-
304	1	2	EA	BO			SQUARE HEAD 1/4" PIPE PLUG (CENTER RING)	BRS		-
305										-
306	48	96	EA	BO			ALL THREAD 1" X 11" (TUBE STRAP/BASE PLATE)	316		-
307	96	192	EA	N316-100			HEX NUT 1" (TUBE STRAP/BASE PLATE)	316		-
308	96	192	EA	WFL316-100			FLAT WASHER, 1" (TUBE STRAP/BASE PLATE)	316		-
309										-
310	72	144	EA	BO			H.H. BOLT, FULL THREAD, 3/4" X 3 1/2" (SIDE SHEET SPLICES)	A307		-
311	72	144	EA	N307-075			HEX NUT 3/4" (SIDE SHEET SPLICES)	A307		-
312	72	144	EA	BO			FLAT WASHER 3/4" (SIDE SHEET SPLICES)	A307		-
313										-
314	24	48	EA	BHH307-075C0200			CAPSCREW HEX HD 3/4" X 2" (BEAMS TO SIDE SHEET)	A307		-
315	24	48	EA	N307-075			HEX NUT 3/4" (BEAMS TO SIDE SHEET)	A307		-
316	24	48	EA	BO			FLAT WASHER 3/4" (BEAMS TO SIDE SHEET)	A307		-
317										-
318	24	48	EA	BHH307-075C0200			CAPSCREW HEX HD 3/4" X 2" (BEAMS TO CENTER RING)	A307		-
319	24	48	EA	N307-075			HEX NUT 3/4" (BEAMS TO CENTER RING)	A307		-
320	48	96	EA	BO			FLAT WASHER 3/4" (BEAMS TO CENTER RING)	A307		-

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Parts List Number 48187

Rev.

Job Number 23029A

Printed On:12/7/2017 3:57:04 PM

3 of 4

QF-00-51A

WesTech Engineering, Inc Telephone: 801.265.1000 Fax: 801.265.1080 www.WesTech-inc.com

Rev. 2013 Jan 17

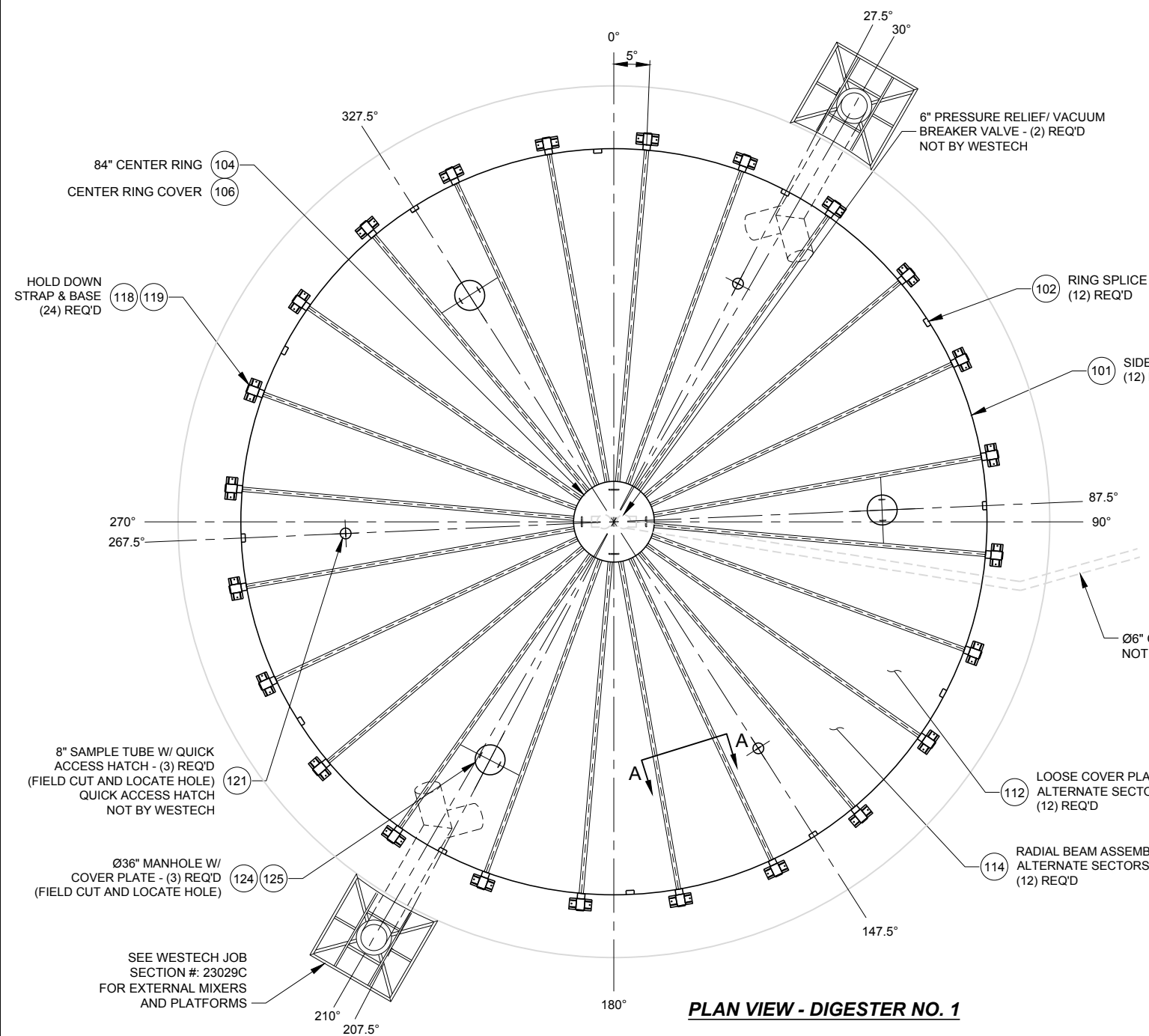
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321										-
322	70	140	EA	BHH316-062C0250			CAPSCREW HEX HD 5/8" X 2 1/2" (CENTER RING)	316		-
323	70	140	EA	N316-062			HEX NUT 5/8" (CENTER RING)	316		-
324	70	140	EA	WFL316-062			FLAT WASHER, 5/8" (CENTER RING)	316		-
325										-
326	96	192	EA	BHH316-062C0200			CAPSCREW HEX HD 5/8" X 2" (MANHOLE)	316		-
327	96	192	EA	N316-062			HEX NUT 5/8" (MANHOLE)	316		-
328	96	192	EA	WFL316-062			FLAT WASHER, 5/8" (MANHOLE)	316		-
329										-
330	4	8	EA	BHH316-025C0125			CAPSCREW HEX HD 1/4" X 1 1/4" (NAME PLATE, CAUTION SIGN)	316		-
331	4	8	EA	N316-025			HEX NUT 1/4" (NAME PLATE, CAUTION SIGN)	316		-
332	4	8	EA	WFL316-025			FLAT WASHER, 1/4" (NAME PLATE, CAUTION SIGN)	316		-
333										-
334	84	168	EA	BHH316-050C0150		-	CAPSCREW HEX HD 1/2" X 1 1/2" (SEAL PLATE)	316		-
335	84	168	EA	N316-050			HEX NUT 1/2" (SEAL PLATE)	316		-
336	168	336	EA	WFL316-050			FLAT WASHER, 1/2" (SEAL PLATE)	316		-
337										-
338										-
339	1	1	EA	BO			HYBRID ADH HY 200-A 11.1 fl oz/330 ml 1MC + HDM (25 PER PACKAGE + DISPENSER)	---		-
340	1	1	EA	BO			MANUAL BRUSH T-HANDLE HIT-RBH	---		-
341	1	1	EA	BO			ROUND BRUSH HIT-RB 1 1/8"	---		-
342	1	1	EA	BO			BLOW OUT PUMP			-
343										-
							----END----			-

Drawings

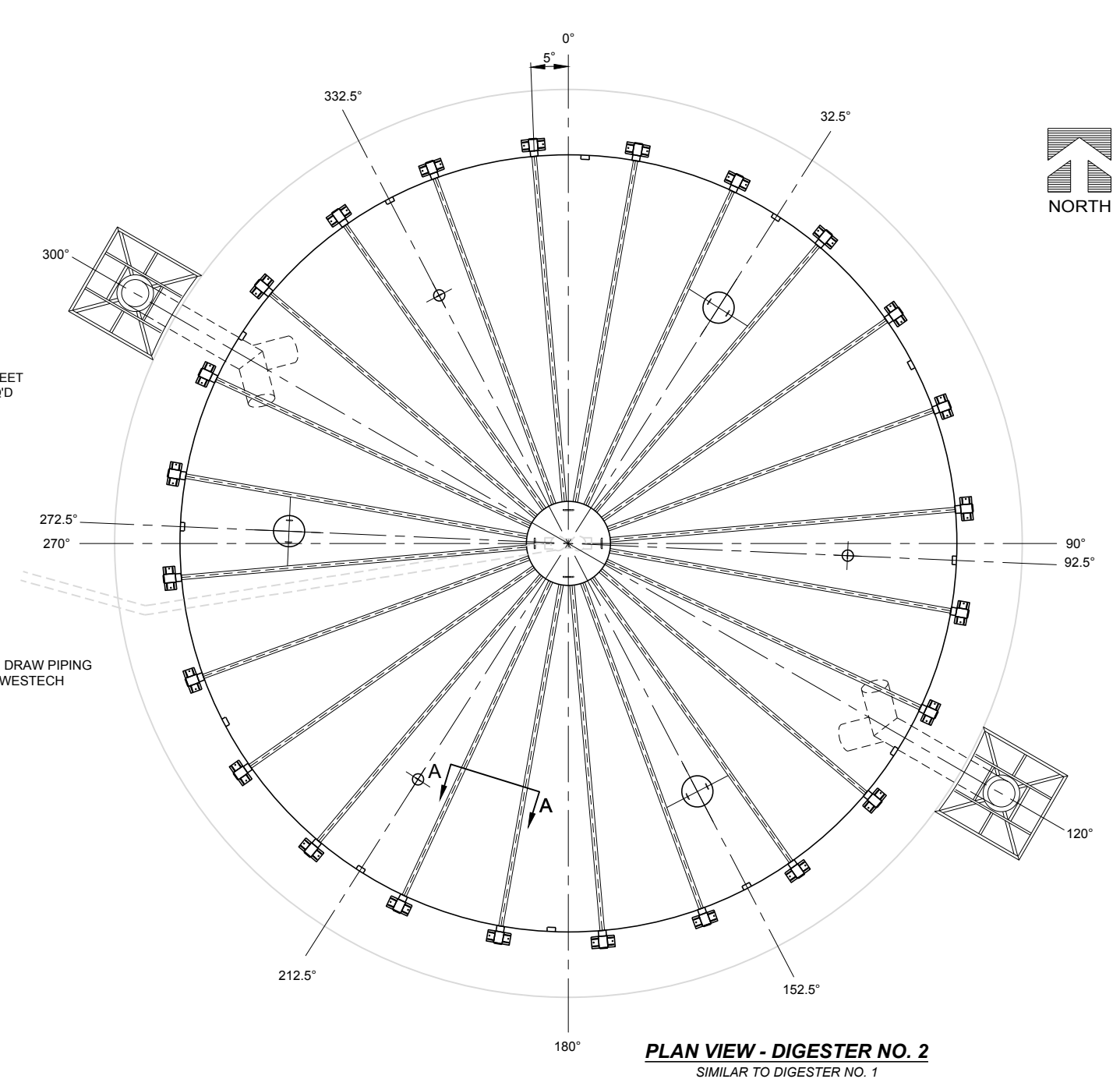
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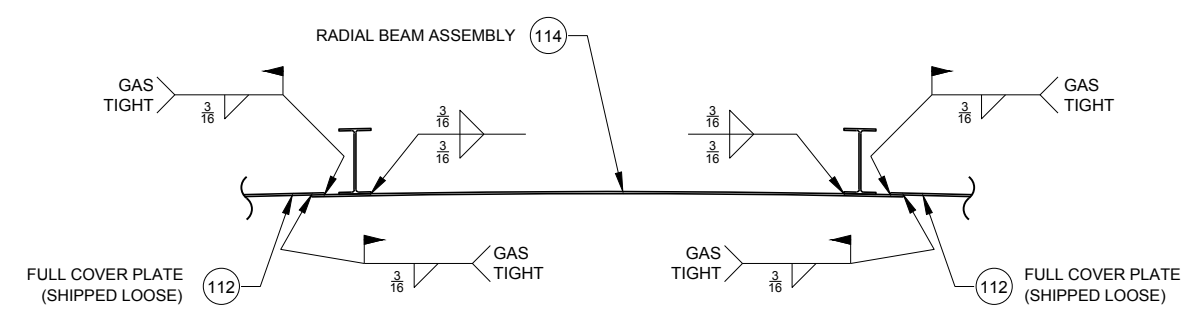


**PLAN VIEW - DIGESTER NO. 1**



**PLAN VIEW - DIGESTER NO. 2**

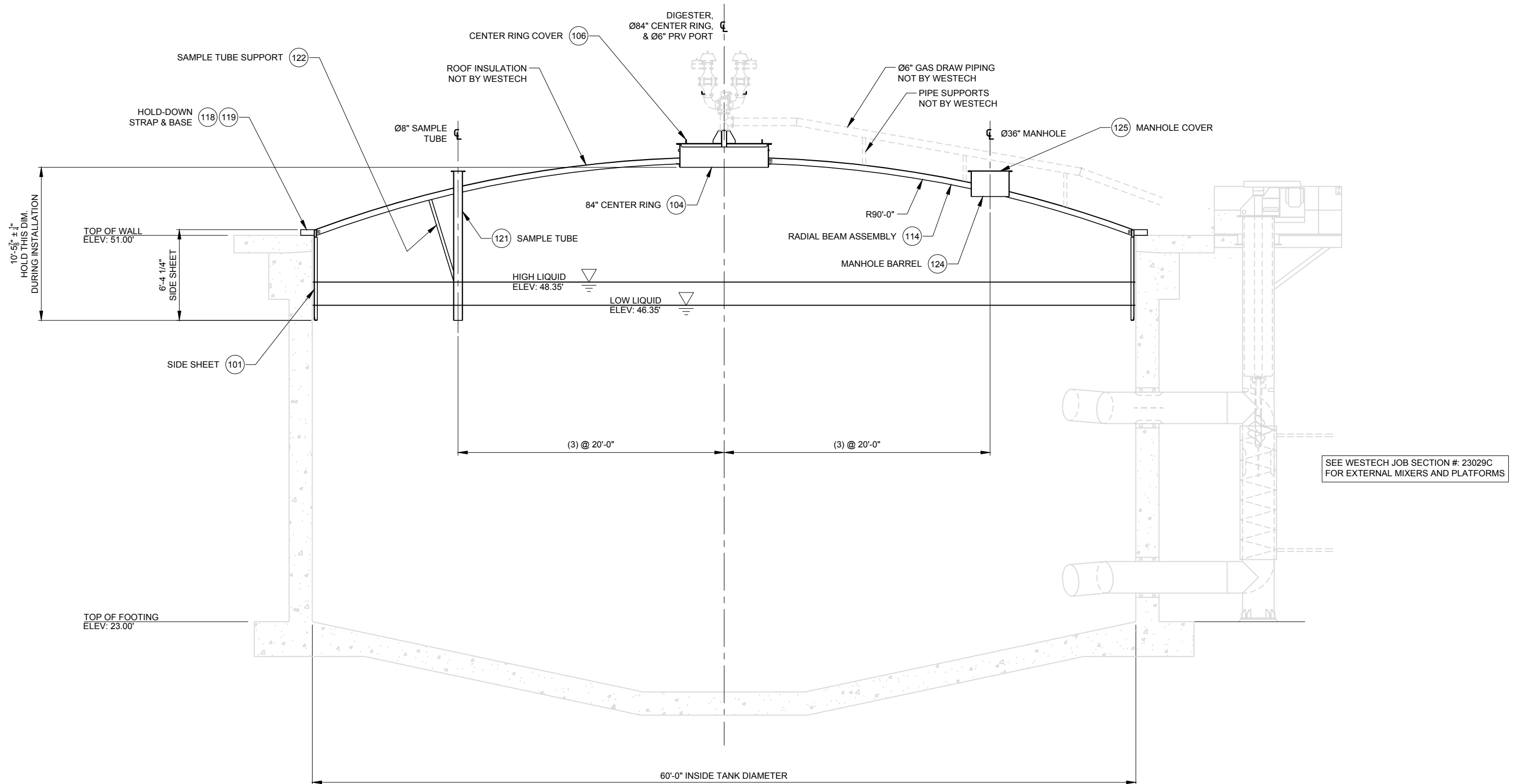
SIMILAR TO DIGESTER NO. 1



**SECTION A-A**  
TYPICAL @ RADIAL BEAM ASSEMBLY

<b>Westech</b>			
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TITLE <b>GENERAL ASSEMBLY</b>			
DCB1 - FIXED DIGESTER COVER			
60'-0" DIA.			
DESIGNER	CHECKER	APPROVER	DATE
RI00	ST20	EK00	2017-07-18
DOCUMENT NUMBER			SHEET
23029A-1011			1 OF 2
REV			REV
			-

REV	REVISION DESCRIPTION	ECN	DESIGNER	APPROVER	DATE



**ILLUSTRATIVE VIEW**

<b>WESTECH</b>			
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TITLE <b>GENERAL ASSEMBLY</b>			
DCB1 - FIXED DIGESTER COVER			
60'-0" DIA.			
DESIGNER	CHECKER	APPROVER	DATE
RI00	ST20	EK00	2017-07-18
23029A-1013	DOCUMENT NUMBER		SHEET
23029A-1012	<b>23029A-1011</b>		2 OF 2
REV	REVISION DESCRIPTION	ECN	DESIGNER
			APPROVER
			DATE
			REFERENCE DOCUMENTS

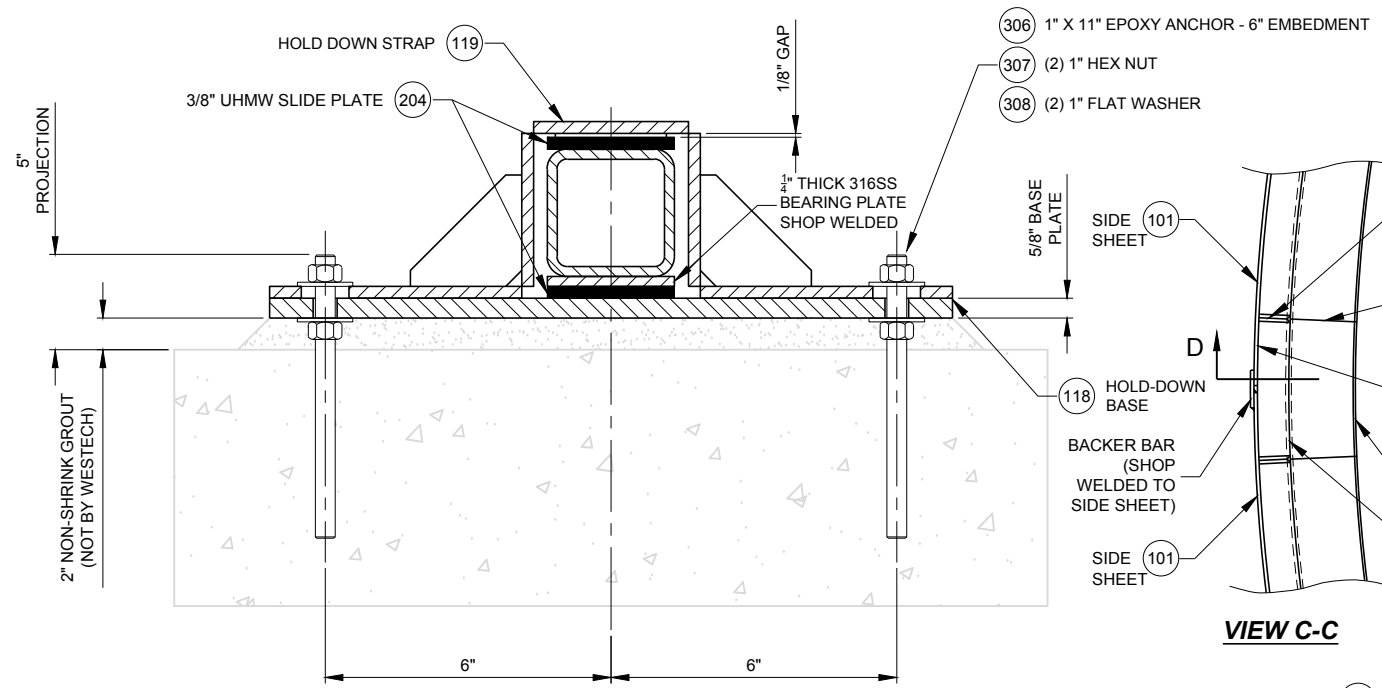
SEE WESTECH JOB SECTION # 23029C FOR EXTERNAL MIXERS AND PLATFORMS

**WESTECH**

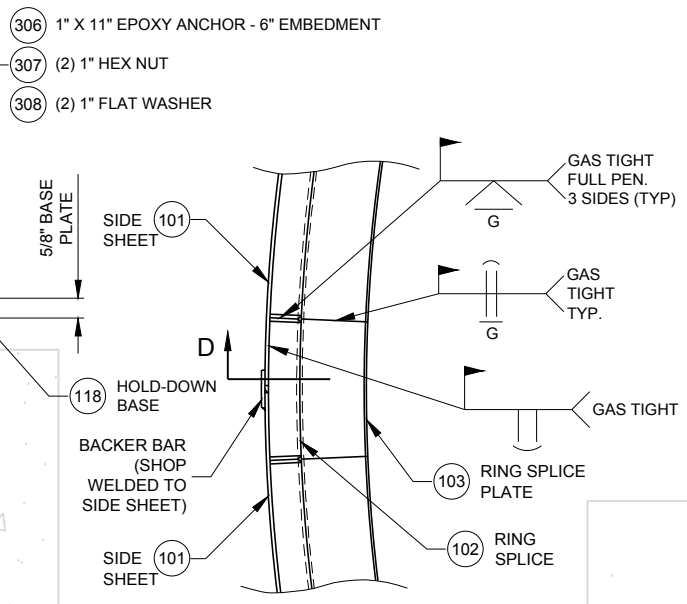
TITLE **GENERAL ASSEMBLY**  
 DCB1 - FIXED DIGESTER COVER  
 60'-0" DIA.

DESIGNER	CHECKER	APPROVER	DATE
RI00	ST20	EK00	2017-07-18
23029A-1013	DOCUMENT NUMBER		SHEET
23029A-1012	<b>23029A-1011</b>		2 OF 2

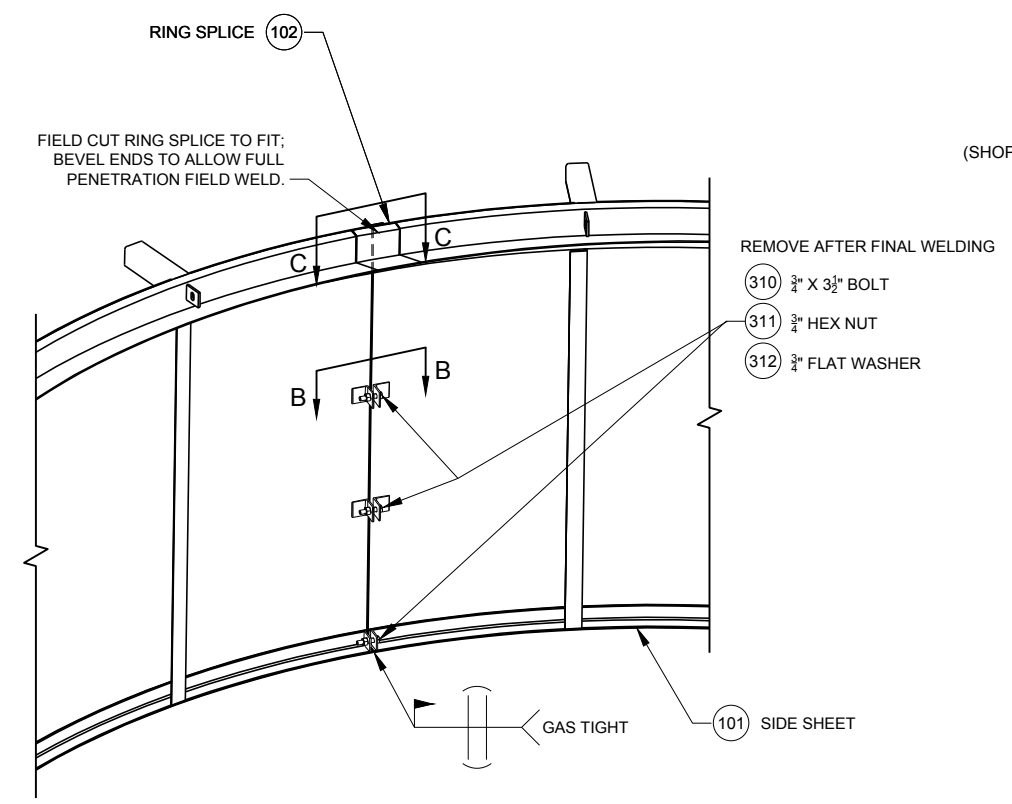
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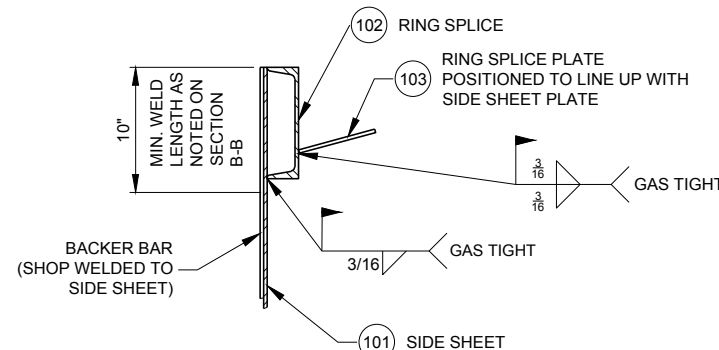
**SECTION A-A**



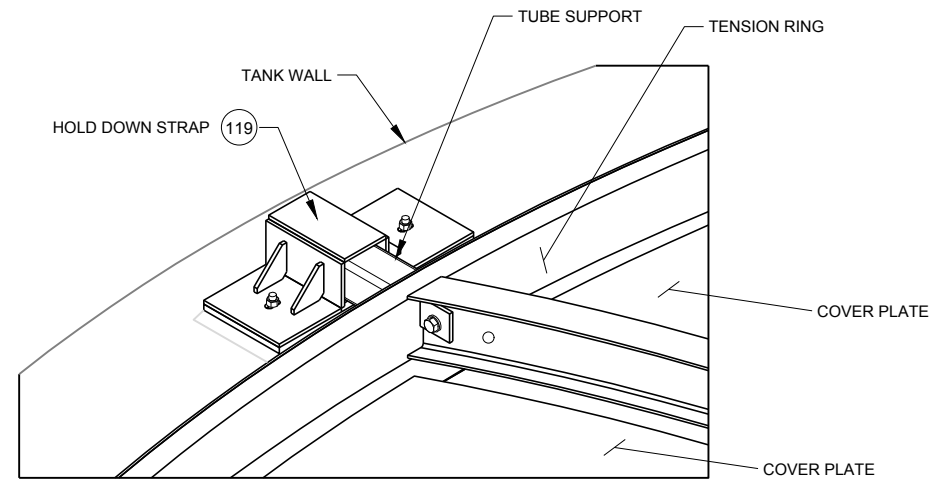
**VIEW C-C**



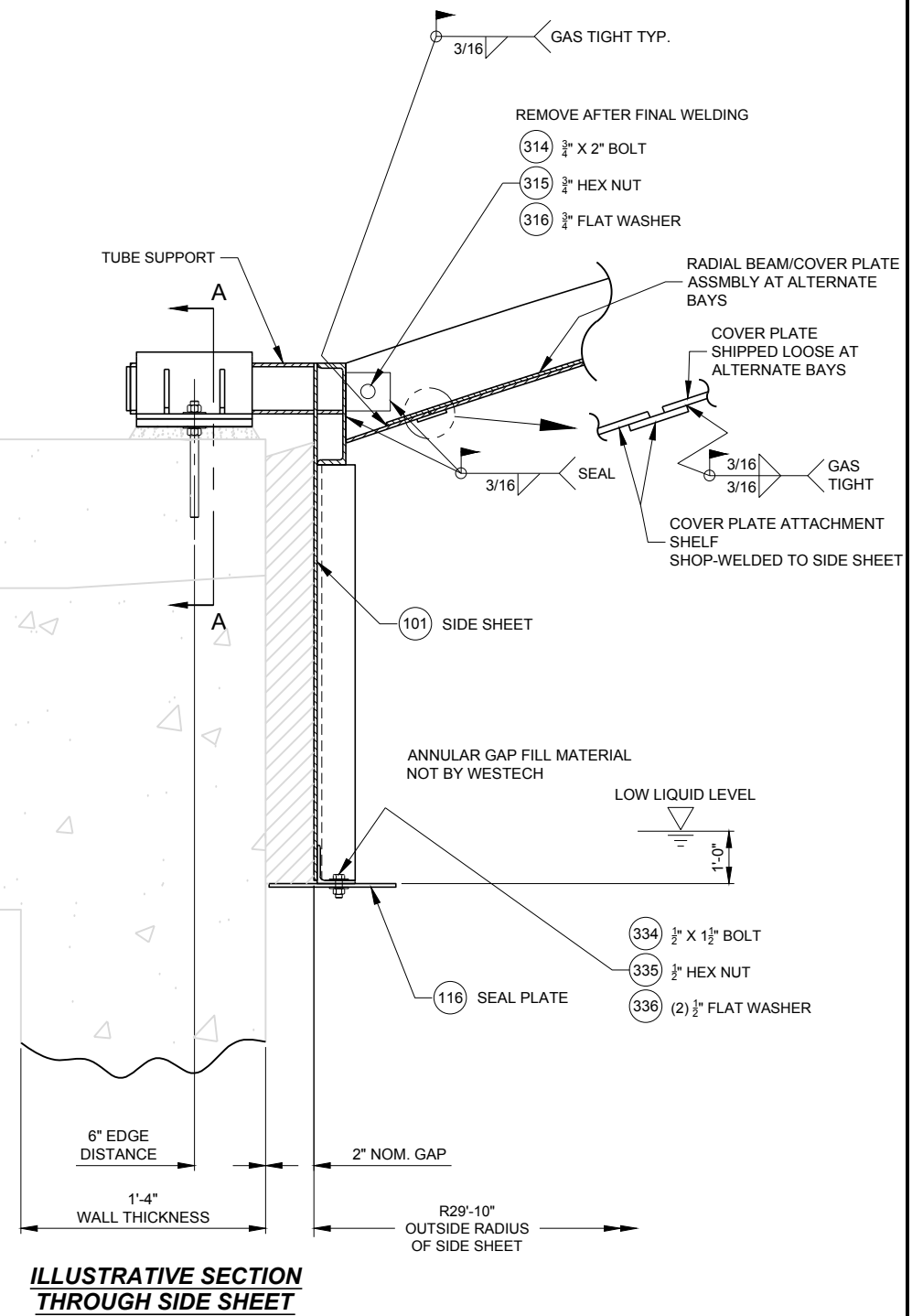
**SECTION B-B**



**SECTION D**



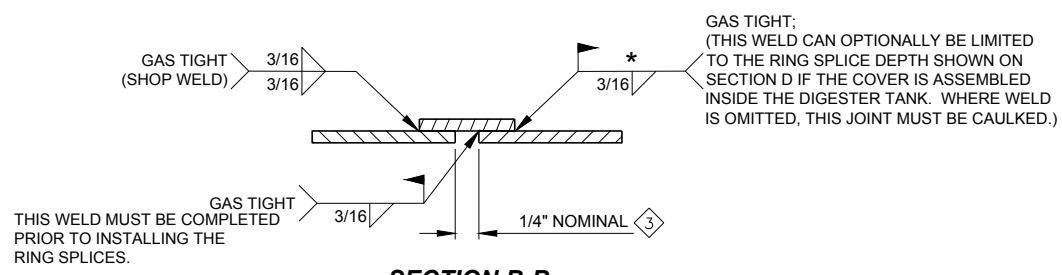
**RADIAL BEAM TO SIDE SHEET CONNECTION**



**ILLUSTRATIVE SECTION THROUGH SIDE SHEET**

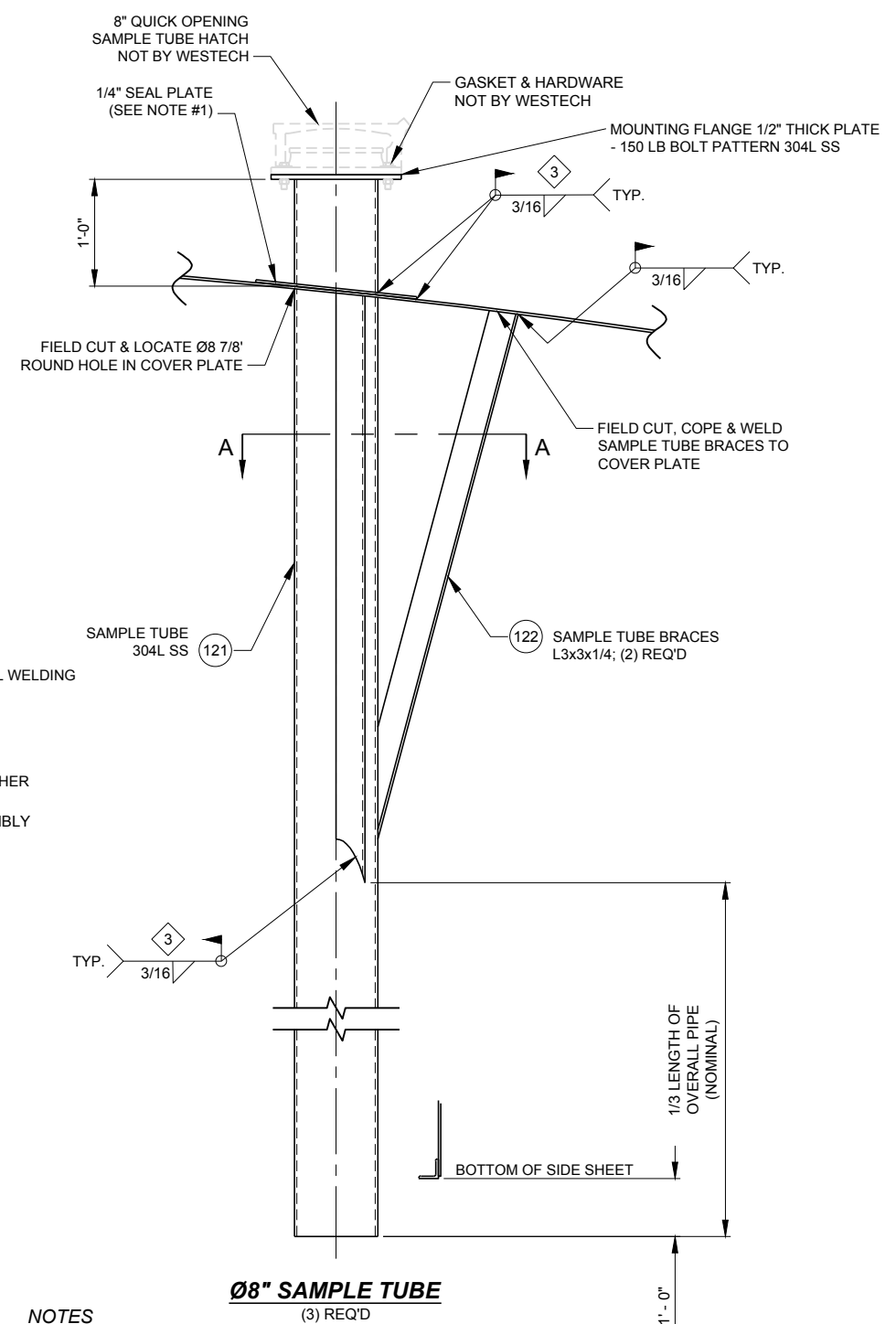
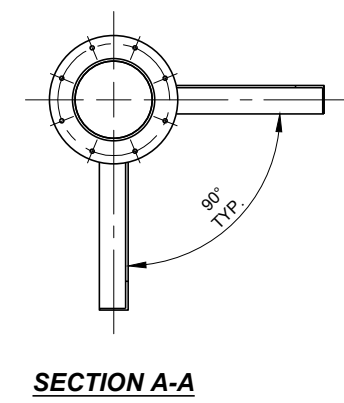
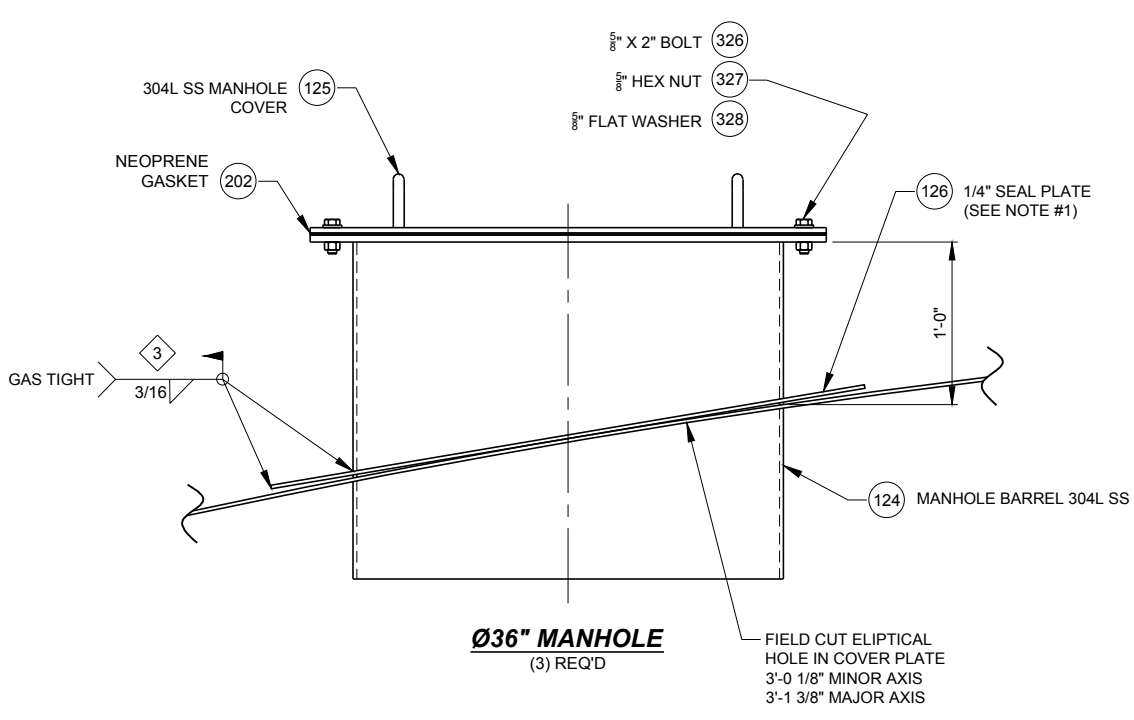
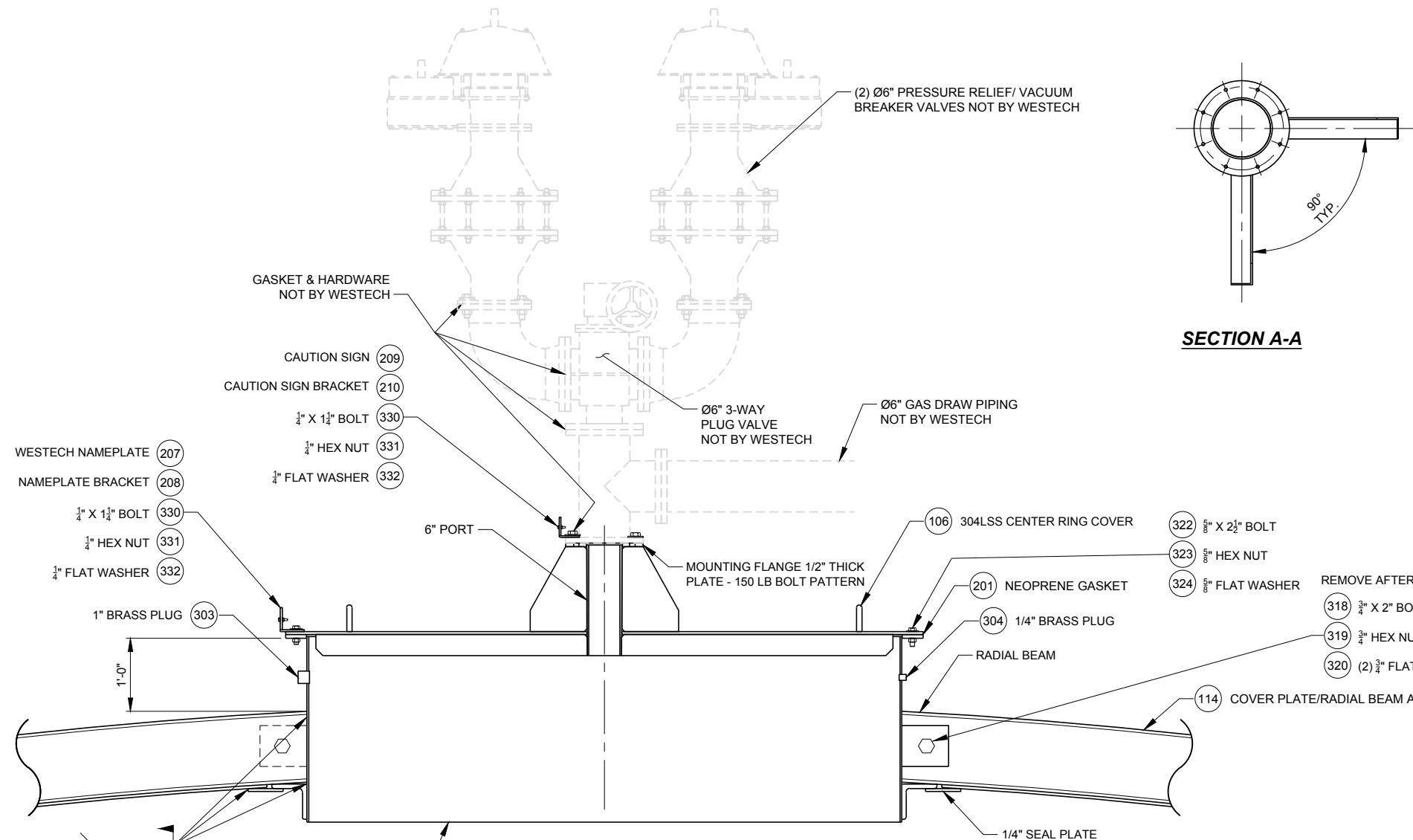
**NOTES**

- ANCHORS TO BE INSTALLED USING HILTI PRODUCTS, ITEMS 339 THRU 342
- ALL MATERIAL IS A36 STEEL UNLESS NOTED OTHERWISE.
- GAP BETWEEN SIDE SHEETS SHALL BE FIELD ADJUSTED TO FIT INSIDE TANK.
- USE ANTI-SEIZE (ITEM 301) ON ALL STAINLESS STEEL FASTENERS



<b>Westech</b>			
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TITLE <b>CONNECTION ASSEMBLY DETAILS</b>			
DCB1 - FIXED DIGESTER COVER			
60'-0" DIA.			
DESIGNER	CHECKER	APPROVER	DATE
R100	ST20	EK00	2017-07-18
DOCUMENT NUMBER		SHEET	
23029A-1012		1 OF 1	
23029A-1011-1.2		REV	
23029A-1012		-	

REV	REVISION DESCRIPTION	ECN	DESIGNER	APPROVER	DATE



- NOTES**
- SEAL PLATES ARE TACK WELDED TO APPURTENANCES; BREAK TACK WELD, FIELD ASSEMBLY, AND FIELD WELD.
  - ALL MATERIALS IS A36 STEEL UNLESS NOTED OTHERWISE.
  - MILD STEEL TO STAINLESS STEEL WELDING.
  - USE ANTI-SEIZE (ITEM 301) ON ALL STAINLESS STEEL FASTENERS.

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TITLE <b>APPURTENANCE ASSEMBLY DETAILS</b>			
DCB1 - FIXED DIGESTER COVER			
60'-0" DIA.			
DESIGNER	CHECKER	APPROVER	DATE
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DOCUMENT NUMBER		SHEET	
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REFERENCE DOCUMENTS		REV	
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REV	REVISION DESCRIPTION	ECN	DESIGNER	APPROVER	DATE