Hart Engineering Corporation

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Additional Notes:

Status Codes
1-APP – No Exceptions Taken
2-ANR – Make Corrections Noted
3-R&R – Revise and Resubmit
4-REJ – Rejected
5-IPO – For Information Purposes Only
6-NRR – Not Required for Review
ENG – Submitted to Engineer

Sincerely,
Hart Engineering Corporation

_____ DATE: 03/01/2022

waco Products

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INSTALLATION, OPERATION AND MAINTENANCE MANUAL FOR MANUALLY OPERATED WACO SLIDE & WEIR GATES:

WACO JOB#: 8182

PROJECT: Taunton WWTF Improvements Phase 1

CONTRACTOR: Hart Engineering Corporation

ENGINEER: Beta-Inc

LOCAL SALES REP: The Maher Corporation
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Introduction

This manual describes the recommended methods of storage, handling, installation, mounting, start up, operation, maintenance, and troubleshooting of Waco Products, Inc. equipment. It should be used in conjunction with the related drawings associated with the equipment supplied.

Waco equipment is designed and manufactured to meet or exceed specifications related to water pressure and operating conditions as outlined by the owner and/or design engineer.

General Safety Precautions

It is important to emphasize that safety is always top priority. All on-site workers should assume personal responsibility and accountability for their actions, including knowing and observing safety rules and procedures, wearing the required personal protective equipment (PPE), and abstaining from drugs and alcohol. In addition to adhering to plant/site safety policies and procedures, Waco recommends that the operator / installer keep all hands and appendages away from moving parts at all times.

Equipment should only be installed and operated by properly trained personnel. Failure to read and adhere to the instructions outlined in this manual may result in unnecessary difficulty, failure of equipment to operate, risks to safety, and\or voided warranty.

Liability Statement

Waco Products, Inc. assumes no liability, expressed or implied, for interpretation of instructions as referenced within this manual, or faulty installation of the gates. Waco Products, Inc. responsibility is limited solely to defects associated with manufacturing, and is not responsible for defects related to errors in installation, adjustment, or any other problems which may arise subsequent to manufacturing.

UNLOADING & STORAGE OF EQUIPMENT

Receiving WACO Equipment

WACO has taken care to properly assemble, pack, and load its equipment for shipment. However, damage can possibly occur during any shipment. Therefore, WACO recommends a thorough inspection of any received equipment PRIOR to unloading or signing for a shipment. Visually inspect the shipped goods for damage to the equipment or any pallets, crating, or boxes. If there are ANY signs of damage, including but not limited to broken pallets, crushed boxes or crates, gouged, scraped or bent parts, broken banding or strapping, etc., these are signs that the shipment may have been incorrectly handled and that additional and possibly more serious damage may have occurred. Visually inspect all goods AGAIN after unloading. Compare the goods received to the bill of lading and packing list(s) to make sure all goods signed for are actually received.
It is the responsibility of the Customer to check the shipment against the bill of lading and packing list(s) to make sure that the shipment has arrived complete and undamaged. Verification of complete shipment of equipment and parts on any shipment should be made within three (3) calendar days of delivery. **NO CLAIM FOR MISSING PARTS OR EQUIPMENT WILL BE ALLOWED AFTER THIS TIME.**

If the Customer sees damage(s) including but not limited to the equipment, shipping containers, pallets, or banding it should be brought to the carrier driver's attention immediately **and noted on the carrier's paperwork prior to signing for the shipment.** If such notations are required, WACO should be notified immediately at 410-242-1000 and fax or email copies of the paperwork should be sent to WACO in order to start a claim with the carrier. If possible, photographs of any damages should be made of the received material prior to unpacking if noticed while still on the delivery vehicle, or prior to storage if noticed after unloading. Failure to follow this procedure will void the carrier's responsibility for damage incurred during shipment and WACO will not be able to accept your damage claim.

Unloading WACO Equipment

WACO requires that equipment be unloaded by customer's personnel who are trained and experienced in safe rigging and materials handling procedures. Any questions about unloading or handling of WACO equipment should be made PRIOR to starting any material handling procedure. WACO equipment is packed on custom built pallets or loaded directly to a flatbed truck to ease unloading and movement on the job site. Equipment loaded directly on to a flatbed is supported by spacer blocks to accommodate lifting forks. If directly loaded equipment is to be stored and not immediately installed, these spacer blocks should be removed from the truck and used to support the equipment in a flat and level storage area in the same orientation as it was shipped. Pallets are designed to be used with standard adjustable width forks on forklifts at either a loading dock or from ground level. Pallets may also be moved using cranes by lifting a pallet from suitable beams located through the pallet fork slots and using spreader bars as required above the load to prevent damage to the load from lifting cables or slings. If palletized equipment is to be stored and not immediately installed, the pallets should be used to support the equipment in a flat and level storage area in the same orientation as they were shipped. Equipment should always be lifted and set in

place. At no time should WACO equipment be dropped to the ground nor should it be pushed or dragged while on the ground. Leave equipment on spacer blocks or shipping pallets until ready for installation. Mounting hardware and any field installed loose parts for installation are shipped in a separate crate with packing list identified with the Installer's required information and WACO job number.

It is up to the Customer's discretion whether crates or pallets with mounting hardware, operators, separate stems, stem guides, and other miscellaneous parts are kept with the primary equipment or broken out and stored separately from the equipment or put into a secure area prior to installation. However, once the Customer has signed for a shipment of equipment, the Customer is responsible for all of the equipment shown on the packing list for that shipment.

Storage:

The equipment is made of materials and components that by their nature are suitable for outdoor use for the life of the equipment. Generally, no special storage requirements are necessary to maintain the operability of the equipment other than to prevent abuse and damage prior to installation. WACO recommends that:

1) Store all equipment in a clean, dry, and level area. Equipment should be stored evenly and kept off of the ground.
2) The equipment should remain securely on any shipping blocks or shipping pallets provided, or within any crates or boxes, until such time as equipment is ready for installation.
3) No other material (including other WACO equipment) should be piled or stacked on top of any equipment, crate, or box until installation in order to minimize the potential for damage to the equipment and to promote worker safety, and to ease movement of the equipment on the job site. Material shipped stacked by WACO may be stacked for storage in exactly the same manner as received if using the same blocking in the same locations as received.
4) The equipment should be covered with a tarp.
5) WACO generally recommends keeping all containers holding mounting hardware and other loose field installed parts with the rest of the equipment until ready for installation. However, secure storage is the sole responsibility of the customer, and claims for missing or lost equipment not brought to WACO's attention within three (3) days of receipt will not be accepted.

Handling

When not using a forklift to unload or move gates, the equipment should be handled using lift eyes provided on the gate frame. Gates should be rigged using an appropriately sized spreader bar so that when lifted the force is vertical to the lift points. Failure to rig appropriately may cause damage to the gate. Call Waco with any questions about rigging prior to moving equipment without a forklift.

INSTALLATION INSTRUCTIONS - SLIDE GATES

1. Frame Styles:

Self-Contained Gates are provided as a single assembly of the slide plate, guide frame and operator, unless the size of the assembly exceeds practical shipping size.

Non-Self-Contained Gates are provided with the slide plate and guide frame separate from the operator pedestal and/or mounting bracket. Non-self-contained gate slide plate assemblies may also be shipped separately from the guide frame depending on installation requirements for a particular gate(s). Hardware for installation is shipped in a separate crate with packing list identified with the Installer's required information and WACO job number.

2. Bituminous coating (aluminum gates only):

Each aluminum gate is shipped to the jobsite with a black bitumastic coating applied to the aluminum where it is designed to come in contact with concrete and/or grout. This coating prevents corrosion of the gate frame. Contractor must touch up those areas where this protective coating has been scraped off or marred in handling, storage, or installation prior to pouring concrete or grout.

3. Installing the Frame:

A – General Notes

Generally, complete gates may be set and secured in place with the slide plates remaining in the frames or the slide plate assemblies may be removed and wood braces inserted as required in the guide frames to maintain the frame dimensions while the gates are being installed. Care should be taken to protect the slide plate stem threads when installing or removing the slide plate assembly.

IMPORTANT: If the slide plate assembly has been shipped separately from the frame, then the frame should always be installed prior to inserting the plate assembly. This separate shipment indicates that the mounting requirements prevent slide plate installation prior to setting the gate frame to maintain proper access to mounting bolts or to address clearance issues. See also "*C-Gate Plate Installation"* below.

B – Installation by Frame Type

Embedded Frame Gates are designed for the guide frame to be embedded in the concrete walls of the channel. If the specifications allow, it is acceptable for embedded frames to be set in place with the floor and wall concrete pour. During forming, the gate is installed and held rigidly in place with the side guides plumb, square, and the flush-bottom invert level with the channel bottom elevation. It is imperative that concrete forms or bracing in and around the gate do not affect the proper alignment prior to the pour. It is just as important to make sure that the frame is adequately supported so that the weight or pressure from the concrete pour does not change the gate alignment; gate frames are not designed to be stand-

alone forms. It is the installer's responsibility to verify the proper stiffening of the frame with wood bracing prior to the pour and during curing of the concrete.

For grouted installations, adequate space for the guide frame should be blocked out in the concrete walls and floor when they are poured. Check WACO drawings for minimum block-out dimensions. When the concrete has set and the blocking has been removed, the gate is installed and held rigidly in place with the side guides plumb, square, and the flush-bottom invert level with the channel bottom elevation. Care should be taken to make sure that any forms required do not affect the proper position or alignment of the gate. The space around the perimeter of the guide frame shall be completely filled with non-shrink grout to secure the gate in place.

Wall Mounted Frames are secured with anchor bolts to the interior walls and floor of a channel or the face of a channel, port, or pipe outfall. Gate frames may be either grouted type or gasket back type as indicated on the WACO drawings. Some plans call for a wall-mounted gate to have an embedded invert; in this case the invert area must be blocked out as indicated in Embedded Frame Gates (above) before mounting, and grouted around the invert after bolt installation. **NOTE: Gasket back frames require the mounting surfaces to be plumb, square, and level prior to mounting the gate.** Improper alignment of the gate will occur if the mounting wall is not properly prepared, resulting in poor operating and sealing performance, and excessive load on the operator.

Place and hold the wall mounted guide frame in its mounting position so as to use the frame mounting holes as a template for locating the mounting anchors. The guide frame must be positioned plumb, square and true with the flush-bottom invert located at the proper elevation. Mark the locations for the frame mounting anchors and drill the mounting anchor holes to the anchor manufacturer's required depth. Install the anchor bolts and secure according the anchor manufacturer's instructions **and arranged as per the WACO drawing.** Warning: Always follow anchor manufacturer's recommendations when installing mounting bolts. Improperly installed mounting bolts can result in a loss of load capacity, can prevent nuts or counter-sunk head type bolts from being tightened securely, and can lead to a gate failure.

If the gate has a head (horizontal upper) seal, it is important that this seal be in compression and in full contact with the gate plate surface across the entire width of the gate after installation. If this seal contact is not verified and attained during gate installation, the head seal will leak. During installation and before grouting the head seal, beginning with the gate in the closed position, the installer must examine both the upper and lower lip of the head seal to determine and verify that plate-to-seal contact is maintained and that no gaps exist. A flash light, a strip of paper, or a 0.003" metal shim may be used to aid in the discovery of gaps between the head seal and gate plate. If gaps are observed, it will be necessary to eliminate these gaps by adjusting the jack nuts located on the anchor studs behind the head seal support frame. On aluminum gates there will be both upper and lower bolts for adjustment. Adjust outward only the nuts near and to either side of the gap(s) until all gaps have been eliminated. **Be careful not to loosen the nuts that secure the anchors in the wall.**

Adding compression to the head seal - After completing the above outlined inspection and adjustment procedure, and any and all gate plate to seal gaps have been eliminated, compression must be added to the seal. This is to ensure proper contact with the gate plate throughout its full range of travel. **This step must be completed before grouting the seal support frame.** Add compression to the seal by adjusting outward, by one eighth (1/8) of a turn, only the jack nuts behind the horizontal seal support frame that were previously adjusted to eliminate gaps as described above. **Be careful not to loosen the nuts that secure the anchors in the wall.**

After the head seal adjustment procedure described above has been completed, tighten the front nuts **and before grouting the frame,** verify that head seal to gate plate contact is maintained throughout the full range of travel of the gate plate. If additional gaps are observed, than further adjustment as outlined above will be necessary.

For gasket back frames, tighten the anchor bolts to the anchor manufacturer's recommendation to secure the guide frame and compress the gasket between the frame back and the mounting wall. For grouted type frames, the drawings call for the frames to be spaced away from the wall using double nuts on the bolts on either side of the frame. After securing the anchors in the wall, the frame can be spaced off of the wall face as shown on the WACO drawings, and the double nuts can be used to adjust the final position and alignment of the gate. After this adjustment, the double nuts are tightened securely, and the space between the frame back and wall face is filled with a non-shrink grout.

Special notes for Wall-mounted Non-Self-Contained gate frames: Mount the gate frame prior to locating and mounting stem guides and /or pedestals. Stem guides and pedestals (with or without mounting brackets) can be adjusted or shimmed as required to insure proper alignment of the entire gate system.

C – Gate Plate Installation

As noted above for particular installations or frame types it may be necessary to install or re-install the gate plate within the gate frame. Slide gate plates should be installed from the top down to avoid damage to the head and invert seals. Install the plate into the guides, making sure that the plate aligns properly with the guide seats located on both sides of the frame before applying force to insert the plate. The gate seals usually exert enough pressure on the plate to require more than hand pressure to install the plate. A come-along may be used to pull the gate plate into position by pulling on a plate stiffener ***that is already within the frame guide*** with the other end of the come-along secured to a rigid fixed rigging point below.

If the gate has a head (horizontal upper) seal, the gate plate will need to be lowered back over the horizontal seal. Caution must be taken when performing this maneuver, if the horizontal seal is damaged than the entire horizontal seal will need to be replaced. Use a shim about 8" to 10" in width and slightly less in length to the gate opening width (horizontal seal length less 1-2 inches) to shim the gate plate past the horizontal seal. A 0.032" (1/32") thick stainless steel shim plate is recommended, 0.032 to 0.060 aluminum flashing can also be used. Place and hold the shim over the leading edge of the horizontal seal so that half of the shim width extends above and half of the shim width extends below the leading edge of the

horizontal seal. With someone holding the shim in place and someone else moving the gate plate, move the gate plate slowly and with caution over the shim and past the upper edge of the horizontal seal. Once the gate plate has cleared the top of the horizontal seal successfully the gate plate can be lowered pulling the shim with the gate plate as it moves to remove the shim. This procedure must be followed to prevent binding and damage to the upper seal as the plate is reinserted.

4. Installing the Operator and Setting Position Limits

Prior to operator and/or pedestal installation, verify that the slide gate is in the fully lowered (closed) position, with the bottom of the gate fully engaged with the invert seal.

IMPORTANT: If the gate has an upper seal, do not raise any part of the slide plate beyond the top seal on the gate; this can cause the compressed seal to spring out of its compressed position leading to possible damage to the seal, operation difficulty or failure of the gate, and may void the gate warranty. If the gate is inadvertently raised in this way see 3.C. above, but if in question about the procedure do not attempt to reseat the gate without first calling WACO Products for assistance.

Self-Contained (SC) Frame Slide Gates with manual operators are usually shipped fully assembled with the operator loose. For **Non-Self-Contained (NSC) Frame Slide Gates** or if the operator and/or stem was shipped separately, or should the Contractor have removed the operator and stem during frame installation, the following procedure is used for remounting:

> Lower the stem between the bench (yoke) members of the frame or through the pedestal, wall bracket and/or slab hole and attach the gate stem to the stem pocket with the supplied fasteners. Make sure to install the lower stop collar now, if applicable; do not set the collar adjustment at this time. Set the operator pedestal (if applicable) in place over the stem and wall bracket or slab hole. For slab mounted pedestals, verify the plumb and square location of the pedestal and that the stem in its plumb position will not be contacting the pedestal or slab hole, shim as required, then locate and mark the pedestal base mounting holes and secure to the slab with the provided anchors. Grout under the slab mounted pedestal base as required and shown in the shop drawings and continue with the operator setting procedure once the grout has cured. For wall bracket mounted pedestals, verify that the pedestal as installed will not contact the stem during operation, adjust and shim the wall bracket if necessary, and secure the pedestal using the supplied mounting bolts.

Verify that the gate plate is still in the fully closed (down) position. Lower the operator over the upper threaded section of the stem and rotate it down onto the stem until its base rests squarely and snuggly on the frame bench or pedestal. Install the upper stop collar and rotate down the stem, adjust it until it almost contacts the operator stem drive nut but do not tighten set screw(s) at this time. Grease the gate stem threads over the full length.

Warning: Do not use bare hands to apply grease as freshly cut threads are very sharp.

Setting the Position Limits begins by installing the operator mounting bolts finger tight to stop rotation when turning the handwheel or handcrank which can now be installed and used with the operator to raise the stem to the full open position indicated on the shop drawing. **If the gate has an upper seal,** the lower edge of the gate plate should be approximately ½" below the bottom of the upper seal in the fully raised position.

IMPORTANT: If the gate has an upper seal, do not raise any part of the slide plate beyond the top seal on the gate; this can cause the compressed seal to spring out of its compressed position leading to possible damage to the seal, operation difficulty or failure of the gate, and may void the gate warranty. If the gate is inadvertently raised in this way see 3.C. above, but if in question about the procedure do not attempt to reseat the gate without first calling WACO Products for assistance.

With the gate in the fully open (up) position, mark the location of the bottom of the operator on the stem, remove the finger tightened operator mounting bolts, and rotate the operator up the stem enough to access the lower stop collar. Set the lower stop collar even with the mark indicating the bottom of the operator and secure with the set screws provided. Re-lower the operator in place and use the operator mounting bolts to fully tighten and secure the operator to the bench or pedestal at the pre-drilled hole locations. Using the handwheel or crank, lower the gate to its fully closed (down) position.

With gate still in fully closed position, lower the previously installed upper stop collar until it touches the top of the operator nut, and secure with the set screws provided. After setting the upper stop collar position, install the clear plastic stem cover on top of the operator. Position the supplied indicator tape(s) on the outside of the stem cover, with the zero (fully closed) mark level with the top of the stop collar and with only that part of the indicator tape (about ½" to 1") having the backer strip peeled back. After verifying the zero (fully closed) mark, hold the indicator tape straight to the top of the stem cover and remove the rest of the backer strip upward to completely adhere it to the stem cover. Position of upper stop collar will now indicate relative position of the slide plate at or above the invert elevation.

INSTALLATION INSTRUCTIONS

WEIR GATES

5. Frame Styles:

Self-Contained Gates are provided as a single assembly of the slide plate, guide frame and operator, unless the size of the assembly exceeds practical shipping size.

Non-Self-Contained Gates are provided with the slide plate and guide frame separate from the operator pedestal and/or mounting bracket. Non-self-contained gate slide plate assemblies may also be shipped separately from the guide frame depending on installation requirements for a particular gate(s). Hardware for installation is shipped in a separate crate with packing list identified with the Installer's required information and WACO job number.

6. Bituminous coating (aluminum gates only):

Each aluminum gate is shipped to the jobsite with a black bitumastic coating applied to the aluminum where it is designed to come in contact with concrete and/or grout. This coating prevents corrosion of the gate frame. Contractor must touch up those areas where this protective coating has been scraped off or marred in handling, storage, or installation prior to pouring concrete or grout.

7. Installing the Frame:

A – General Notes

Generally, complete gates may be set and secured in place with the slide plates remaining in the frames or the slide plate assemblies may be removed and wood braces inserted as required in the guide frames to maintain the frame dimensions while the gates are being installed. Care should be taken to protect the slide plate stem threads when installing or removing the slide plate assembly.

IMPORTANT: If the slide plate assembly has been shipped separately from the frame, then the frame should always be installed prior to inserting the plate assembly. This separate shipment indicates that the mounting requirements prevent slide plate installation prior to setting the gate frame to maintain proper access to mounting bolts or to address clearance issues. See also "*C-Gate Plate Installation"* below.

B – Installation by Frame Type

Embedded Frame Gates are designed for the guide frame to be embedded in the concrete walls of the channel. If the specifications allow, it is acceptable for embedded frames to be set in place with the floor and wall concrete pour. During forming, the gate is installed and held rigidly in place with the side guides plumb, square, and the flush-bottom invert level with the channel bottom elevation. It is imperative that concrete forms or bracing in and around the gate do not affect the proper alignment prior to the pour. It is just as important to

make sure that the frame is adequately supported so that the weight or pressure from the concrete pour does not change the gate alignment; gate frames are not designed to be stand-alone forms. It is the installer's responsibility to verify the proper stiffening of the frame with wood bracing prior to the pour and during curing of the concrete.

For grouted installations, adequate space for the guide frame should be blocked out in the concrete walls and floor when they are poured. Check WACO drawings for minimum block-out dimensions. When the concrete has set and the blocking has been removed, the gate is installed and held rigidly in place with the side guides plumb, square, and the flush-bottom invert level with the channel bottom elevation. Care should be taken to make sure that any forms required do not affect the proper position or alignment of the gate. The space around the perimeter of the guide frame shall be completely filled with non-shrink grout to secure the gate in place.

Wall Mounted Frames are secured with anchor bolts to the interior walls and floor of a channel or the face of a channel, port, or pipe outfall. Gate frames may be either grouted type or gasket back type as indicated on the WACO drawings. Some plans call for a wall-mounted gate to have an embedded invert; in this case the invert area must be blocked out as indicated in Embedded Frame Gates (above) before mounting, and grouted around the invert after bolt installation. **NOTE: Gasket back frames require the mounting surfaces to be plumb, square, and level prior to mounting the gate.** Improper alignment of the gate will occur if the mounting wall is not properly prepared, resulting in poor operating and sealing performance, and excessive load on the operator.

Place and hold the wall mounted guide frame in its mounting position so as to use the frame mounting holes as a template for locating the mounting anchors. The guide frame must be positioned plumb, square and true with the flush-bottom invert located at the proper elevation. Mark the locations for the frame mounting anchors and drill the mounting anchor holes to the anchor manufacturer's required depth. Install the anchor bolts and secure according the anchor manufacturer's instructions **and arranged as per the WACO drawing.** Warning: Always follow anchor manufacturer's recommendations when installing mounting bolts. Improperly installed mounting bolts can result in a loss of load capacity, can prevent nuts or counter-sunk head type bolts from being tightened securely, and can lead to a gate failure.

Weir (horizontal) seal - It is important that the Weir (horizontal) seal be in compression and in full contact with the gate plate surface across the entire width of the gate after installation. If this seal contact is not verified and attained during gate installation, the horizontal weir seal will leak. During installation and before grouting the horizontal weir seal, beginning with the gate in the closed (full up) position, the installer must examine both the upper and lower lip of the horizontal weir seal to determine and verify that plate-to-seal contact is maintained and that no gaps exist. A flash light, a strip of paper, or a 0.003" metal shim may be used to aid in the discovery of gaps between the horizontal weir seal and plate. If gaps are observed, it will be necessary to eliminate these gaps by adjusting the jack nuts located on the anchor studs behind the horizontal weir seal support frame. On aluminum gates there will be both upper and lower bolts for adjustment. Adjust outward the nuts near and to either side of the gap(s) until all gaps have been eliminated. **Be careful not to loosen the nuts that secure the anchors in the wall.**

Adding compression to the weir (horizontal) seal - After completing the above outlined inspection and adjustment procedure, and any and all gate plate to seal gaps have been eliminated, compression must be added to the seal. This is to ensure proper contact with the gate plate throughout its full range of travel. **This step must be completed before grouting the seal support frame.** Add compression to the weir seal by adjusting outward, by one eighth (1/8) of a turn, only the jack nuts behind the horizontal weir seal support frame that were previously adjusted to eliminate gaps as described above. **Be careful not to loosen the nuts that secure the anchors in the wall.**

After the horizontal weir seal adjustment procedure described above has been completed, tighten the front nuts **and before grouting the frame,** verify that horizontal weir seal to gate plate contact is maintained throughout the full range of travel of the gate plate. If additional gaps are observed, than further adjustment as outlined above will be necessary.

For gasket back frames, tighten the anchor bolts to the anchor manufacturer's recommendation to secure the guide frame and compress the gasket between the frame back and the mounting wall. For grouted type frames, the drawings call for the frames to be spaced away from the wall using double nuts on the bolts on either side of the frame. After securing the anchors in the wall, the frame can be spaced off of the wall face as shown on the WACO drawings, and the double nuts can be used to adjust the final position and alignment of the gate. After this adjustment, the double nuts are tightened securely, and the space between the frame back and wall face is filled with a non-shrink grout.

Special notes for Wall-mounted Non-Self-Contained gate frames: Mount the gate frame prior to locating and mounting stem guides and /or pedestals. Stem guides and pedestals (with or without mounting brackets) can be adjusted or shimmed as required to insure proper alignment of the entire gate system.

C – Gate Plate Installation

As noted above for particular installations or frame types it may be necessary to install or re-install the gate plate within the gate frame. Weir gate plates should be installed from the top down. Install the plate into the guides, making sure that the plate aligns properly with the guide seats located on both sides of the frame before applying force to insert the plate. The gate seals usually exert enough pressure on the plate to require more than hand pressure to install the plate. A come-along may be used to pull the gate plate into position by pulling on a plate stiffener ***that is already within the frame guide*** with the other end of the come-along secured to a rigid fixed rigging point below.

The gate plate will need to be lowered back over the horizontal weir seal. To avoid damage to the horizontal seal caution must be taken when performing this maneuver. If the horizontal seal is damaged than the entire horizontal seal will need to be replaced. Use a shim about 8" to 10" in width and slightly less in length to the gate opening width (horizontal seal length less 1-2 inches) to shim the gate plate past the horizontal seal. A 0.032" (1/32") thick stainless steel shim plate is recommended, 0.032 to 0.060 aluminum flashing can also be

used. Place and hold the shim over the leading edge of the horizontal seal so that half of the shim width extends above and half of the shim width extends below the leading edge of the horizontal seal. With someone holding the shim in place and someone else moving the gate plate, move the gate plate slowly and with caution over the shim and past the upper edge of the horizontal seal. Once the gate plate has cleared the top of the horizontal seal successfully the gate plate can be lowered pulling the shim with the gate plate as it moves to remove the shim. This procedure must be followed to prevent binding and damage to the upper seal as the plate is reinserted.

8. Installing the Operator

Prior to operator and/or pedestal installation, verify that the weir gate is in the fully raised (closed) position, with the bottom of the gate fully engaged with the invert seal, nominally with about ½" of the plate still below the invert seal when fully raised.

IMPORTANT: Do not raise or lower any part of the weir plate beyond the top or bottom of the invert seal; this can cause the compressed seal to spring out of its compressed position leading to possible damage to the seal, operation difficulty or failure of the gate, and may void the gate warranty. If the gate is inadvertently raised in this way do not attempt to reseat the gate without first calling WACO Products for assistance.

Self-Contained (SC) Frame Weir Gates with operators are usually shipped fully assembled save the operator is shipped loose. For **Non-Self-Contained (NSC) Frame Weir Gates** or if the the operator and/or stem was shipped separately, or should the Contractor have removed the operator and stem during frame installation, the following procedure is used for remounting:

Lower the stem between the bench (yoke) members of the frame or through the pedestal wall bracket or slab hole and attach the gate stem to the stem pocket with the supplied fasteners. Make sure to install the lower stop collar now, if applicable; do not set the collar adjustment at this time. Set the operator pedestal (if applicable) in place over the stem and wall bracket or slab hole. For slab mounted pedestals, verify the plumb and square location of the pedestal and that the stem in its plumb position will not be contacting the pedestal or slab hole, shim as required, then locate and mark the pedestal base mounting holes and secure to the slab with the provided anchors. Grout under the slab mounted pedestal base as required and shown in the shop drawings. For wall bracket mounted pedestals, verify that the pedestal as installed will not contact the stem during operation, adjust the wall bracket if necessary, and secure the pedestal using the supplied mounting bolts.

Verify that the gate plate is still in the fully closed (up) position. Lower the operator over the upper threaded section of the stem and rotate it down onto the stem until its base rests squarely and snuggly on the frame bench or pedestal. Install the upper stop collar and leave at or near the top of the stem. Grease the gate stem threads over the full length.

Warning: do not use bare hands to apply grease as freshly cut threads are very sharp.

Setting the Position Limits begins by installing the operator mounting bolts and securing to the bench or pedestal at the pre-drilled hole locations. The handwheel or handcrank which can now be installed and used with the operator to lower the stem to the full open position indicated on the shop drawing. **Because the gate has an invert seal,** the lower edge of the gate plate should be approximately ½" below the bottom of the upper seal in the fully closed (up) position.

With the gate still in the fully closed (up) position, mark the location of the bottom of the operator on the stem and lower the gate with the operator down enough to access the lower stop collar. Set the top of the lower stop collar even with the mark on the stem and secure with the set screws provided. Lower the gate to its fully open (down) position.

IMPORTANT: Do not raise or lower any part of the weir plate beyond the top or bottom of the invert seal; this can cause the compressed seal to spring out of its compressed position leading to possible damage to the seal, operation difficulty or failure of the gate, and may void the gate warranty. If the gate is inadvertently raised in this way do not attempt to reseat the gate without first calling WACO Products for assistance.

Lower the upper stop collar and rotate down the stem, adjusting it until it contacts the operator stem drive nut and mark the position on the stem. Raise the stem if necessary to access the set screws, move the bottom of the stop collar to the mark on the stem and tighten the set screw(s) to hold position. With the gate still in fully open position, install stem cover on top of operator. Position supplied Mylar indicator tape with zero mark level with top of stop collar and adhere to stem cover. Position of upper stop collar will now indicate relative position of weir plate at or above the invert elevation.

OPERATION - SLIDE GATES

1. Prior to operation, verify that the stop collars have been set, the stem cover with indicator is in position, and that the stem is greased. Do a visual inspection of the gate to make sure that there are no interferences on or within the gate guides and operating area that could adversely affect the gate's operation or allow the gate to contact other equipment or items in the basin/channel when operated.

2. Open the gate by rotating the handcrank or handwheel in a counter-clockwise direction to raise the gate plate. Close the gate by rotating the handcrank or handwheel in a clockwise direction to lower the gate plate. Stop collars, or other specified means of setting full open/closed positions, will prevent the operator from moving past the fully open or closed elevations. Relative elevation can be determined by checking the top of the stop collar within the graduated stem cover.

OPERATION - WEIR GATES

3. Prior to operation, verify that the stop collars have been set, the stem cover with indicator is in position, and that the stem is greased. Do a visual inspection of the gate to make sure that there are no interferences on or within the gate guides and operating area that could adversely affect the gate's operation or allow the gate to contact other equipment or items in the basin/channel when operated.

4. Open the gate by rotating the handcrank or handwheel in a clockwise direction to lower the gate plate. Close the gate by rotating the handcrank or handwheel in a counter-clockwise direction to raise the gate plate. Stop collars, or other specified means of setting full open/closed positions, will prevent the operator from moving past the fully open or closed elevations. Relative elevation can be determined by checking the top of the stop collar within the graduated stem cover.

TROUBLESHOOTING –SLIDE & WEIR GATES

Leakage:

All gate seats and seals are adjusted prior to leaving the factory. WACO gates without p-seals use a self-adjusting seal/seat mechanism that IS NOT FIELD ADJUSTABLE. If it is believed that leakage is an issue, check the leakage specification, and calculate the allowable GPM based on the gate dimensions. Measure leakage to confirm if a problem exists. The Contractor or Owner should check the following items of installation and adjustment prior to consulting the factory or the WACO Representative:

1. Inspect to make sure that gate plate fully contacts all seals and is not obstructed by debris.
   Common debris sources: Installation grout in plate guides; foreign matter from other sources during construction or operation including but not limited to: weld spatter, wood, sewage solids, algae, sawdust, rocks, grit, sand and gravel.
   Solution: Clear guides, operate and retest.

2. Inspect gate frame to assure that sides of frame are still plumb and square to one another. If gate is racked or out of plumb seats and seals will not properly contact plate surfaces.
   Solution: Re-mount gate, adjust alignment; make sure gate is securely positioned prior to re-grouting. Operate and retest.

3. **Gates with p-seals only**:
   a) Check P-seals for damage or contamination. Tears and rips during operation can occur on the invert P-seal from the gate plate itself (if the gate stop collars are not set and a gate edge moves beyond the seal) or on all the seals from debris trapped in and around the seal being dragged over or past the seal. The latter can occur when the gate is insufficiently exercised and material is allowed to build up and compact on the seals. Debris that is allowed to dry and harden during shut-downs or maintenance can also damage and contaminate the seals after the shut-down is complete and the gates are put back into service. Any debris or material contaminant that can get wedged between the seals and gate plate can cause leakage at the point of contact. Severe contamination or build-up can cause the seal to distort or deflect the plate away from the seal.
   Solution: Check the p-seals for contamination, clean as necessary and replace damaged p-seals. Adjust seals, operate and re-test.

   b) P-seals may require tightening against the gate plate IF the leakage is observed between the plate and the seal and there is no contamination of, or damage to, the seal. Check to see if P-seal and/or seal retainer has loosened in the area where the leakage is observed. If so, push the P-seal snugly against the plate and re-tighten the P-seal retainer. If the problem is observed continuously around the seal perimeter, starting from the bottom and working up the side guides and from the center out on top and bottom seals, readjust and retighten all of the P-seal and retainer. This is often required if loosening the seals was necessary to get the gate plate installed, or if replacing the seals on an older gate. Caution: over-tightening P-seals can lead to excessive load on the operator.
   Solution: Readjust P-seals and retainers, operate, and retest.

4. Inspect grout or wall conditions behind the gate frame.

Gasket-back gates: If leakage is occurring on a gasketed frame, check to see if leakage is between the mounting wall and frame. Visual inspection using a flashlight should confirm water leakage points, if any, when water is not available. **Verify that wall condition is sufficient to allow for proper sealing with the gasket and frame**; if not, remove gate, repair wall as required and re-install gate. If the wall condition is good, check frame guides to make sure they are aligned, plumb and square. If frame alignment is good, then gaskets may not be compressed sufficiently.

Solution: Retighten the mounting bolts, being very careful not to warp the gate frame, operate and retest.

If frame appears warped or out of alignment on wall, **but gasket allows leakage, the wall condition may not be sufficient to allow for proper gasket sealing and gate alignment.** Do not continue to tighten the gate on the wall when warpage or distortion of the frame is observed; this is an indication that the wall is not sufficiently plumb and square to allow for proper sealing and operation. If over-tightened, permanent damage to the gate may occur, and if sealing to wall is achieved in this condition the operation of the gate will be impaired. ***Damage from over-tightening will void the warranty on the gate.*** If this is the case, consult the factory for recommendations as a grouted installation may be required to allow for proper sealing and operation of the gate.

Grouted gate: If leakage is occuring behind the frame on a grouted frame gate it is sometimes possible to repair the grout after draining the water from the gate, making sure to allow for cure time after the repair. If the mounting bolts were not properly secured in the wall or on the frame, water pressure can cause the gate to shift and break the grout. Generally, grout problems are indicative of future problems of the same type, and it may be better to remove all of the grout and perform a detailed inspection.

Solution: Remove grout, inspect the frame for plumb and square, check bolts for proper installation and re-grout the installation. After curing, operate and retest.

5. If the performing the above does not resolve the issue, please call your WACO Representative or the factory for further assistance.

Operation:

Most operation issues are indicated as difficulty in turning the manual operator handwheel or handcrank. If the gate performed adequately on start-up, then this is likely to be a lubrication maintenance issue. If maintenance does not resolve operator issues, binding should be addressed. Binding due to several causes can cause the operator to require more than normal force to work properly:

1. Alignment: Check the frame for plumb and square. The threaded stem between the gate stem pocket and the operator mechanism must be plumb. All stem guides must also be located properly to assure that the gate stem remains plumb. Misalignment can cause serious

binding, especially through the operator nut, and can possibly cause permanent damage to the gate if not addressed.

Solution: realign gate components; see Installation

2. Inspect to make sure that gate guides are clean and not obstructed by debris.
   Common debris sources: Concrete or grout in plate guides; compacted as gate operated.
   Foreign matter from other sources during construction; weld spatter, wood and sawdust, concrete, rocks, sand and gravel.
   Solution: Clear guides

3. Inspect stem to make sure it is clean and free of debris. Look directly above and below the operator for signs of dirt or dirt-filled grease accumulation.
   Solution: Clean threaded portion of stem, relubricate as indicated in Maintenance, and make sure stem cover is kept in place to prevent premature fouling of stem.

4. Inspect operator mounting bolts. Loose bolts can cause operator to rack and mis-align during operation putting excessive stress on stem, stem nut, and yoke or pedestal.
   Solution: Relieve stress on stem/operator and reset mounting bolts.

5. **P-Seal style gates only**:
   If binding occurs when the gate is not wet (especially for gates that are normally fully open) pour water over p-seals and plate prior to operation. Do not use boiling water to avoid spot damage to seals and seats; ambient temperature or cold water is fine.

   Sometimes the P-seals located in the thimble can be too tight against the gate plate and cause binding. Loosen the P-seal retainer bolts and adjust the P-seal position back from the plate 1/32 of an inch or so. Be careful not to adjust the seal too loosely or excessive leakage may occur. Re-tighten the retainer.

6. All mechanical operators are filled with lubricant before they leave the factory. Since it is possible (although unlikely) that lubricant can be lost during transit, storage, or installation, the Installer should check lubrication levels. Lubrication of the manual operator mechanism is covered in the Maintenance section.

7. If all of the items above have been addressed and the gate still does not operate properly, the Installer should disconnect the gate stem from the stem pocket by removing the stem bolt. Test to see if the operating mechanism operates at or below the 40 lbs. maximum pull specified, then consult the WACO factory for assistance.

MAINTENANCE –SLIDE & WEIR GATES

Maintenance requirements on the gate should be minimal, however the gate should be inspected at regular intervals to determine what maintenance, if any, is required. Routine preventative maintenance is accomplished by inspecting the gate, determining the maintenance requirements, if any, performing that maintenance, and exercising the gate.

1 – Routine Maintenance

Inspection:

Inspection should include the following:

1) Stem and operator lubrication.
   If lubrication is required, refer to 3-Lubrication
2) Guides and invert for wear and/or debris
   If debris is found refer to Cleaning the Gate
3) Any other conditions which may prevent proper operation of the gate and operator.

Exercising:

Gates have two moving parts; the operator and the gate plate/stem assembly. "Exercising" these moving parts is the best way to assure long, reliable life of your gate.

The gate should be exercised partially (approximately 6" up and down) monthly, and through its full range of motion at least semi-annually. This helps to keep the gate plate guides free of debris build-up, the invert free of silt/solids build-ups, and keeps the stem lubricant properly distributed.

If normal operations of the gate are at least as frequent as this schedule, no additional exercising should be required. However, severe or difficult operating or water conditions may indicate more frequent exercise and should be dictated by operational experience within the first 3 months after start-up.

2 - Cleaning

Gate operation and performance can be adversely affected by any number of foreign agents contaminating the gate plate, frame, guides, seals, stem and operators. These include but are not limited to misplaced concrete or grout, adhesives, sealants, coatings, environmental and chemical agents, dirt, debris or any combination of these. It is therefore important to periodically inspect the gate surfaces and mechanism for impinging agents and remove any materials that may adversely affect the gate.

If work is being performed near or around the gate, it must be protected from potential damage or fouling by foreign agents. This may be accomplished by masking affected areas, or otherwise covering the entire gate to protect it from exposure to such things as brushed or sprayed coatings, cementitious materials, abrasive media and/or corrosive cleaning agents. However, if surfaces become contaminated cleaning may be required.

Cleaning the Gate:

NEVER clean WACO gates with steel tools such as wire brushes, scrapers, or files as these will leave residual iron particles which can "bloom" as rust. Non-ferrous tools made from materials such as stainless steel or plastic are recommended.

1) General Cleaning

   Wash the gate with mild detergents and clean water. No abrasives or acid based detergents (such as citrus cleaners) should be used. The gate may be power-washed with care. When power-washing make sure to prevent damage to the seals which can be damaged by high pressure water. The seals should be masked or temporarily covered with a protective material to prevent this potential damage.

2) Discoloration

   Buffing with a surface conditioning pad such as 3M Scotch-Brite or Norton Bear-tex of 320 grit or finer will usually restore the mill finish of the metal. These cleaning materials should only be used fresh to prevent contamination from previously worked surfaces. Abrasive media with a grit value coarser than 320 can damage the finish of the metal or the seals and should never be used.

3) Bonded Agents

   Bonded agents are those which are adhered to surfaces of the gate. These may include but are not limited to adhesives, coatings, grouts and cements, sludge, algae, and vegetation. These usually require scraping to remove them from the gate. Plastic or stainless steel scrapers (such as putty or spackle knives) or stainless steel wire brushes or pads are effective at removing adhered materials. Care must be taken to prevent damage of the relatively softer UHMW and rubber gate seals by these tools and materials. NEVER use steel cleaning materials instead of stainless steel materials as these will leave residual iron particles which can "bloom" as rust.

4) Non-bonded Agents

   Non-bonded agents are those which contaminate areas of the gate but are not adhered to the gate surface(s). These may include but are not limited to sand, grit, gravel, loose sludges, and general debris or rubbish. Non-bonded agents may be cleaned by brushing, wiping, shoveling, or power washing. Care must be taken to avoid damage to the seals and other gate components.

Cleaning the Seals:

WACO Gates use a UHMW polyethylene and rubber sealing system. A rubber compression cord is used in conjunction with the UHMW to form a self-adjusting seal for the side guides, weir invert seals, or upper seals on slide gates where applicable. On slide gates, a solid rubber seal is used across the invert to seal the gate in the fully closed position.

NEVER clean WACO gate seals with metallic tools. Non-metallic tools made from materials such as wood, plastic, or fabric is recommended. Materials that are harder than the UHMW seal materials or that are abrasive can damage the seal surface leading to leakage points.

The position of the rubber compression cord within the seal system is critical to the functionality of the system. Care must be taken to make sure that none of the cords are moved out of the retaining groove(s) in the UHMW components during cleaning. Dislodging the cords will lead to failure of the seal system.

1) The seal system should be periodically checked for debris or foreign matter that may obstruct the functionality of the gate. Abrasive cleaning materials/tools should not be used to clean the seal system. Only non-metallic type brushes and/or non-metallic type scrapers should be used.

2) The bottom of the side seal system where it contacts the invert seal system should be checked periodically for foreign objects or debris. While clearing any obstructions, only non-metallic type cleaning tools/utensils should be used.

Cleaning the Stem(s):

NEVER clean WACO stems with steel tools such as wire brushes, scrapers, or files as these will leave residual iron particles which can "bloom" as rust. Non-ferrous tools made from materials such as stainless steel or plastic are recommended.

1) Stems should periodically be checked to ensure they are clean and properly greased. Debris, dirt, or grit can contaminate the grease and prevent proper operation and prematurely wear the stem and drive sleeve (drive nut). If grease is contaminated, the stem should be cleaned and fresh grease applied.
2) Dry or hardened grease can also cause improper operation, particularly in cold temperatures. If the grease is hard or dry, the stem should be cleaned and fresh grease applied.
3) Stems should be cleaned with fresh rags, non-metallic bristle brushes, and/or stainless wire brushes. These cleaning materials should only be used fresh to prevent contamination from previously worked surfaces. Degreaser type chemicals should NOT be used as the chemical can get into the operator causing damage to the seals, and may damage or remove protective coatings on the outside of the operator housing.

3 – Lubrication

Stem & Drive Sleeve (Drive Nut) Lubricants:

Thorough lubrication of the threads on the stem and drive sleeve must be maintained. The frequency of lubrication will depend on operation and severity of the operating environment. Lubrication should be checked quarterly at minimum. The stem cover must be removed in order to inspect the grease condition, clean the

stem, or apply grease. If the grease is dry or contaminated then it should be removed and fresh grease applied. (Refer also to Cleaning the Stem.)

1) If the stem is inspected and is dry to the touch it should be lubricated with fresh grease.
2) If the stem yields grease that still feels slippery, but is visibly dirty or feels "grainy" to the touch, the stem should be cleaned and lubricated with fresh grease.
3) Dirty grease or a lack of grease will increase the operating force necessary to open or close the gate and will accelerate the wear in the drive sleeve. Graphite based lubricants are not recommended since the graphite will tend to cause excessive wear on the bronze operator nut over time. The best way to maintain proper clean stem lubricant is to keep the stem cover on the operator at all times and follow the operator exercise schedule (see Exercising).
4) A thin, uniform coating of grease should be applied to all of the stem thread surfaces between the stop collars. After lubrication, exercise the stem (move up and down with the operator) to get the lubricant spread throughout the functional portion of the stem and within the operator's bronze drive sleeve (drive nut).
5) See Recommended Lubricants below for grease selection.

Operator and Actuator Lubricants:

Specific lubricants for the operators and/or actuators are found in the Original Equipment Manufacturers' (OEM) manuals or data sheets for those components. These are copyrighted documents that WACO cannot modify, and must be included in their original form herein. The Installer or Owner of the WACO gates is responsible to read and understand this OEM information in addition to the WACO instructions.

For WACO gate stems and drive sleeves, or where no other lubricants are otherwise specified by WACO or a component OEM, the Recommended Lubricants should be used.

Recommended Lubricants (or equal):

Manufacturer	Product	Temp F	Temp C	Type	NLGI
Fuchs	Renolit CL-X2	-65° to 203°	-54° to 95°	EP	2
Ultralube	Moly	-40° to 387°	-40° to 197°	EP	2
Amalie	Blue Hi Temp	-40° to 350°	-40° to 177°	EP	2
Mobil	MobilGrease CML	-22° to 350°	-30° to 176°	EP	1

4-Recommended Spare Parts

Waco Products does not recommend stocking spare parts due to the excellent durability of equipment when properly maintained. If spare parts are needed for any reason, all seals, seats, stem covers, and stop collars are available from stock for next day shipment.

5-Ordering Parts

Each gate assembly is supplied with an individual name plate designating the WACO job number and the gate identification number. The name plate is located near the top of the gate frame. The shop drawings/parts lists for each gate are included in the pockets at the end of this manual. To order parts, get the gate information from the name plate, reference the matching drawing supplied with this O&M package, and identify the part(s) required from the Bill of Materials on the shop drawing/parts list. To order, contact WACO Products, Inc. directly at:

1330 Knecht Avenue
Baltimore, MD 21229
410-242-1000

WACO accepts purchase orders using credit card or net 30 day terms (with credit approval)

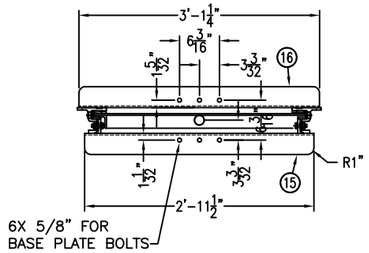
WARRANTY

WACO Products, Inc. warrants that the equipment furnished by this company shall be free from defects in materials and workmanship and agrees to replace or repair any parts found to be defective as such in the sole opinion of WACO Products, for a period of one (1) year from start-up or installation and use, whichever comes first. This warranty excludes damage, breakage, or failure caused by improper use, storage, maintenance or due to abuse. Notice of the defect shall be communicated to WACO Products, Inc. by the Owner including unmistakable evidence of same. Should WACO personnel be required to make a site visit to service the Warranty and find that the problem is not due to a material or workmanship defect, the Owner will be liable for time and materials at normal company rates as a service call for the work. The liability of WACO Products, Inc. shall not in any case exceed the value of the repairing or replacing the defective parts, and in no way shall the company be liable for any other loss, expense, or consequential damages to the Owner or any other party.

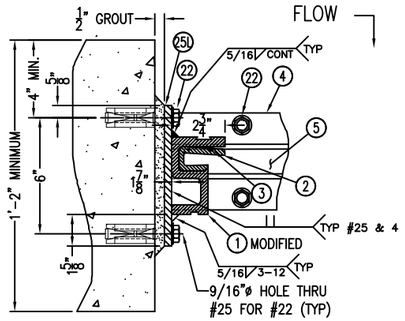
CONTRACTOR TO CONFIRM:
DIMENSIONS & ELEVATIONS

ENGINEER TO CONFIRM:
HIGH WATER LEVEL (SEE NOTE 8)

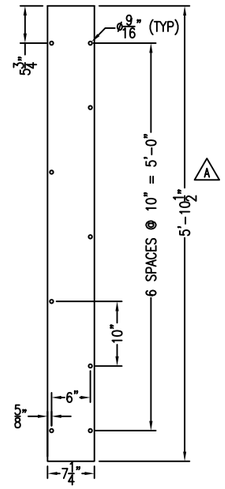
REVISIONS			
STM	DESCRIPTION	DATE	APPROVAL
A	MODIFIED CHANNEL DEPTHS, QUANTITY WAS 2 ADDED FLOW ARROW, ADJUSTED GATE HEIGHT	2-18-22	TL



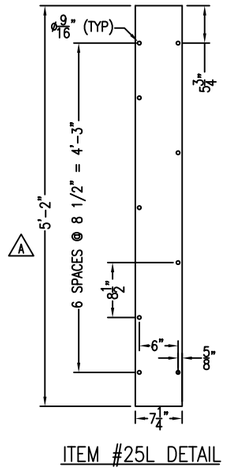
PLAN VIEW
(OPERATOR ITEMS NOT SHOWN)



SECTION C–C



ITEM #25R DETAIL



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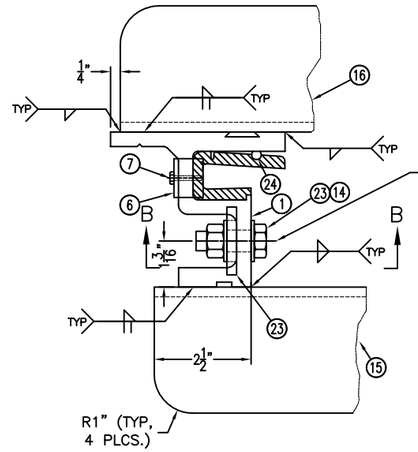
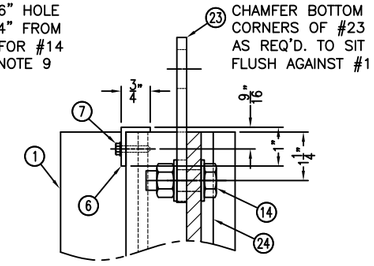
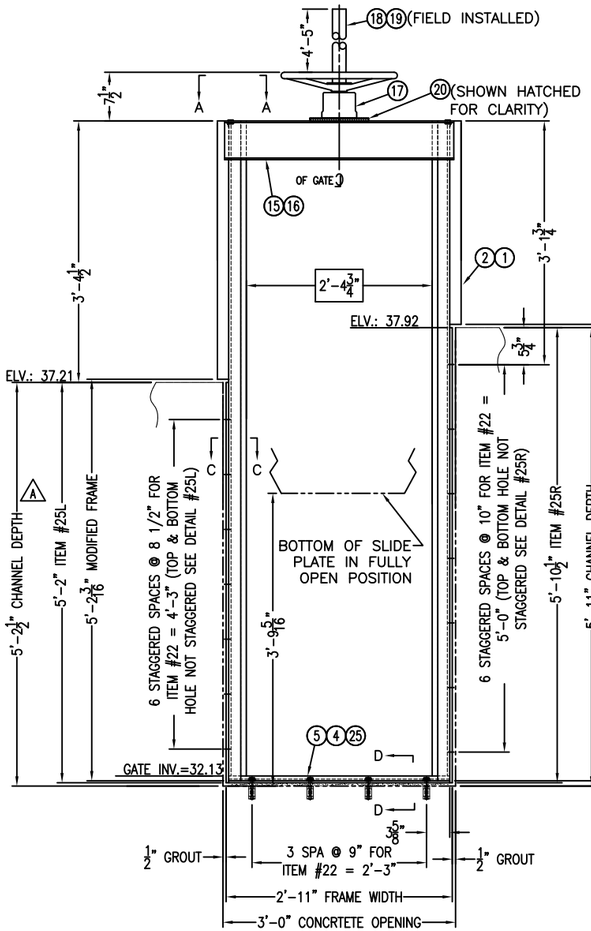


VIEW A–A

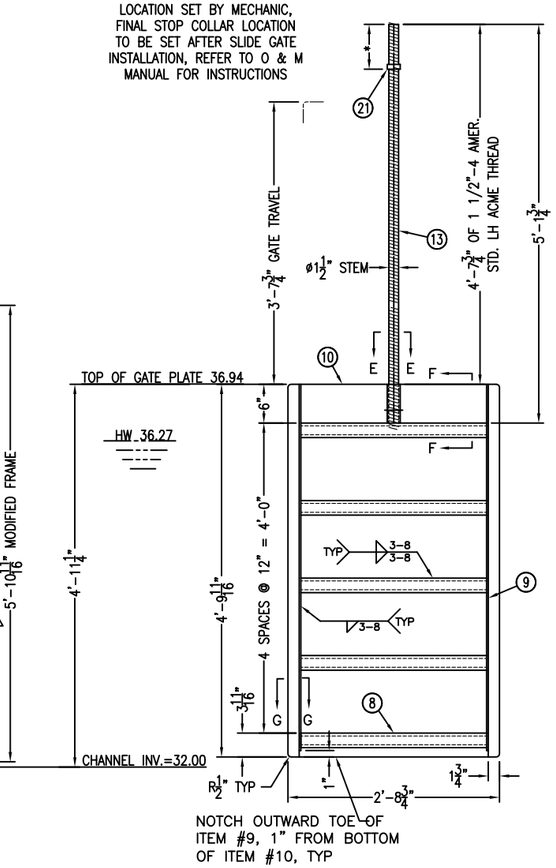


SECTION B–B

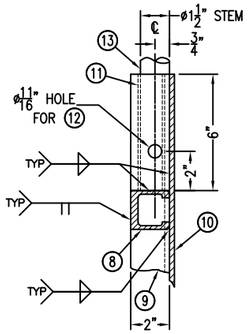


FRAME ASSEMBLY

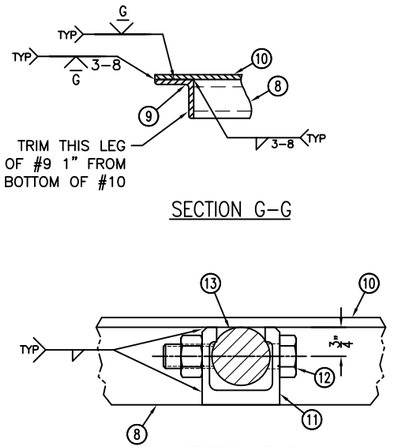
* PRELIMINARY STOP COLLAR LOCATION SET BY MECHANIC, FINAL STOP COLLAR LOCATION TO BE SET AFTER SLIDE GATE INSTALLATION, REFER TO O & M MANUAL FOR INSTRUCTIONS



SLIDE PLATE ASSEMBLY

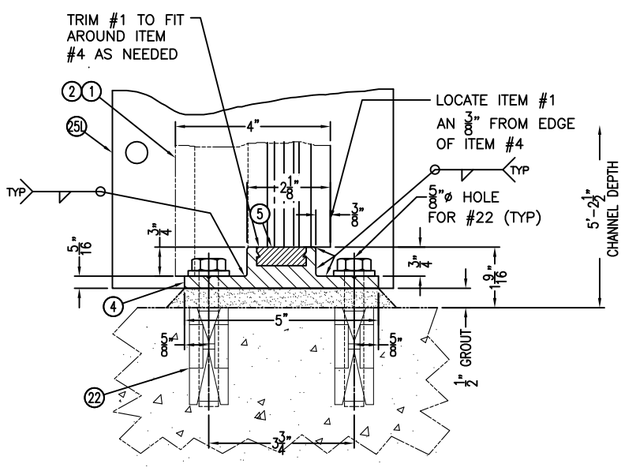


SECTION F–F



SECTION G–G

SECTION E–E



SECTION D–D

NOTES:
1. ALL DIMENSIONS ARE IN INCHES UNLESS NOTED OTHERWISE.
2. CONTRACTOR TO VERIFY ALL DIMENSIONS.
3. ALL BOLT HOLE LOCATIONS ±1/16" WITH NO ACCUMULATION.
4. ALL WELDING TO BE DONE PER AWS D1.6 OR AWS D1.2.
5. WACO NAME PLATE SHOULD BE INSTALLED PROPERLY AND LEGIBLY MARKED WITH JOB AND GATE NUMBER, WA–62.
6. ALL ALUMINUM IN CONTACT WITH CONCRETE TO RECEIVE ONE SHOP COAT OF BITUMINOUS PAINT.
7. CRANK OR HANDWHEEL DIRECTIONAL ARROWS GROUND TO SHOW CORRECT DIRECTION.
8. GATE DESIGNED FOR 5.0 FEET OF MAXIMUM HEAD.
9. CONTRACTOR MUST USE SHACKLES AND SPREADER BAR TO LIFT GATES, DO NOT LIFT FROM SINGLE POINT. REFER TO MANUFACTURER'S O & M MANUAL FOR SPECIFIC HANDLING AND INSTALLATION INSTRUCTIONS. FAILURE TO FOLLOW MANUFACTURER'S INSTRUCTIONS MAY VOID WARRANTY. LIFT LUG, ITEM #23 TO BE REMOVED AFTER INSTALLATION.
10. WORKMANSHIP IAW WACO STANDARD WA–36.

ITEM	QTY	DESCRIPTION	FT.	IN.	MAT'L	MAT'L SPEC	REV	STOCK NO.
A 25L	1	3/8" PLATE 7 1/4" X	5	2	6061–T6			
A 25R	1	3/8" PLATE 7 1/4" X	5	10 1/2	6061–T6			
24	2	5/16"ø CORD	0	6	NITRILE			500013
23	2	LIFT LUG	–	–	–	A–85250		
22	26	1/2" EXP. SHIELD W/HH BOLT & SAE FW	0	3 1/2	ZNC/316 SST			
21	1	STOP COLLAR	–	–	BRONZE			955276
20	1	(WJ) 3/8" ADAPTER PLATE 8"	–	–	–	A–81283–E		
19	1	0' – 3' INDICATOR TAPE	–	–	VINYL			955074
18	1	3' – 6' INDICATOR TAPE	–	–	VINYL			955075
17	1	BS–1015 OPERATOR W/18" HANDWHEEL/STEM COVER	4	5	–	B–85291		
16	1	6" ALUM. ASSOC. CHANNEL 4.03#	3	1 1/4	6061–T6			
15	1	6" ALUM. ASSOC. CHANNEL 4.03#	2	11 1/2	6061–T6			
14	2	1/2"–13 HH BOLT W/ NUT & 2 FW'S X	0	1 1/2	316 SST			
13	1	1 1/2"ø ROD	5	1 3/4	304 SST			638067–12
12	1	5/8"ø HH BOLT W/ NUT, 2X FW & LW	0	3 1/2	316 SST			
11	1	STIFFENER EXTR'N	0	6	6061–T6			175054
10	1	1/4" PLATE 32 3/4" X	4	9 11/16	6061–T6			
9	2	1/4" X 2" X 2" ANGLE	4	9 11/16	6061–T6			
8	5	STIFFENER EXTR'N	2	4 3/4	6061–T6			103147
7	2	#8 SELF DRILLING SCREW	0	0 3/4	304 SST			
6	2	1/8" X 1" X 3/4" SHRP CRNR ANGLE	0	1	6061–T6			
5	1	1/2" X 1 1/4" STRIP	2	10 1/4	NEOPR.	A–77785		
4	1	SLIDE GATE INVERT EXTRUSION A–85230	2	10 1/4	6061–T6	A–85230		175049
3	2	5/16"ø CORD	5	6	NITRILE			500013
2	2	POLYGLIDE EXTRUSION A–82716–C	8	5 15/16	UHMW	1/2" PLATE EDGE		500018
1	2	SLIDE GATE EXTRUSION A–82785–A	8	6 3/16	6061–T6	1/2" PLATE EDGE		175051

LIST OF MATERIALS FOR ONE ASSEMBLY

8182D85931A1	SG–1
GATE SERIAL NO.	GATE TAG I.D.

TOLERANCE UNLESS SPECIFIED:
ANGLES: ± 1°
FRACTIONS: ± 1/16"
DECIMALS:
.XX ± .03"
.XXX ± .010"

8182	HART ENGINEERING CORPORATION	1
JOB NO.	CUSTOMER	REQ'D

6734 SLIDE GATE ASSEMBLY
SG–1
TAUNTON WWTF, TAUNTON, MA

DRAWN:	TL	12–10–21
CHECK:	TL	12–10–21
APPR:	TL	12–10–21
		DATE

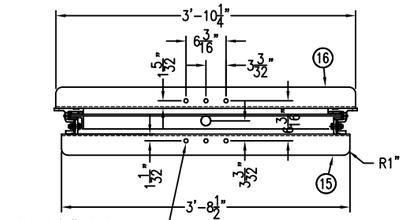
SCALE: NTS WT.

WACO PRODUCTS INCORPORATED
BALTIMORE, MARYLAND 21229–5511

D–85931 A

SHEET 1 OF 1 REV.

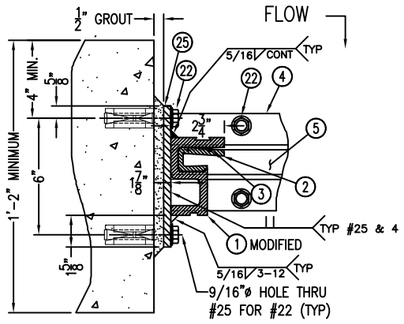
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	MODIFIED CHANNEL DEPTH, ADDED FLOW ARROW	2-16-22	TL



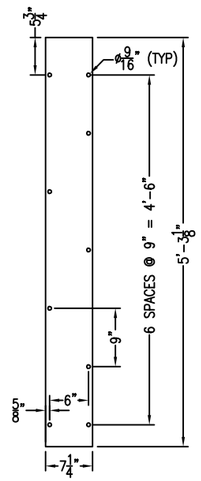
PLAN VIEW
(OPERATOR ITEMS NOT SHOWN)

ENGINEER TO CONFIRM:
HIGH WATER LEVEL
(SEE NOTE 8)

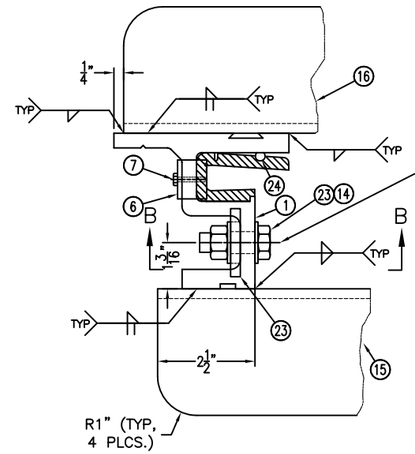
CONTRACTOR TO CONFIRM:
DIMENSIONS &
ELEVATIONS



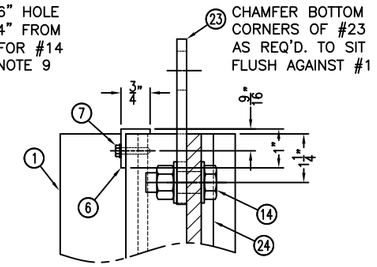
SECTION C-C



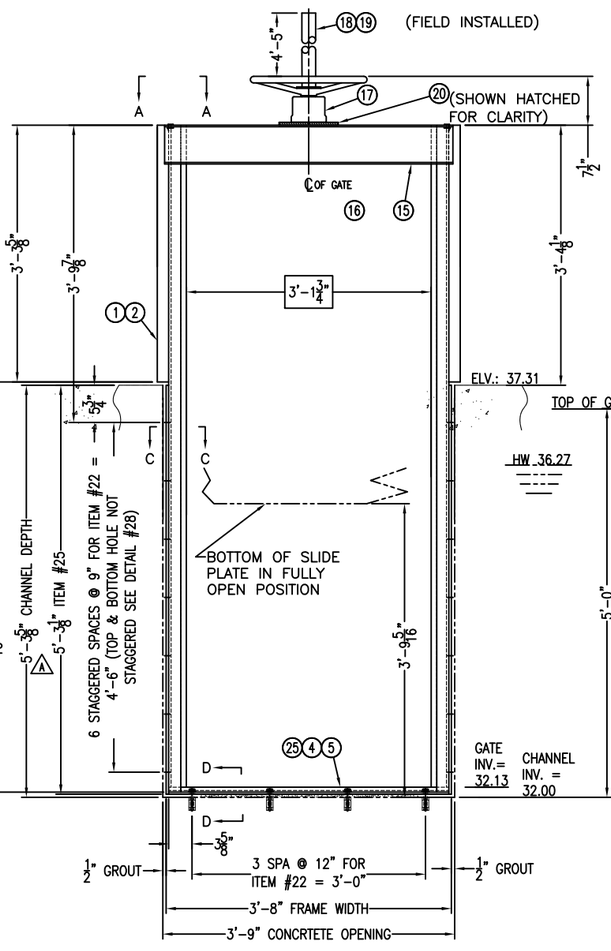
ITEM #25 DETAIL
(LH SHOWN RH MIRROR IMAGE)



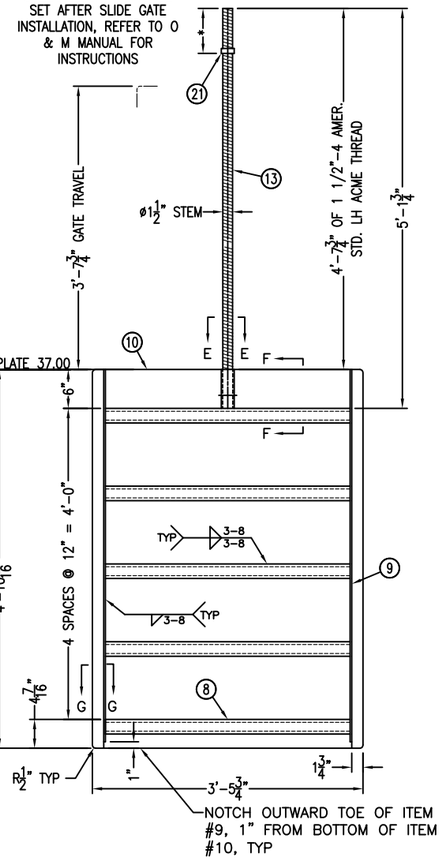
VIEW A-A



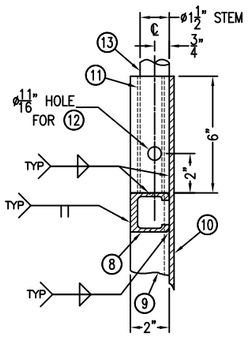
SECTION B-B



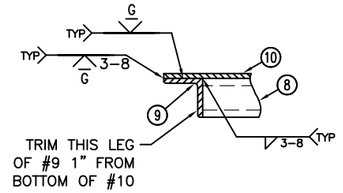
FRAME ASSEMBLY



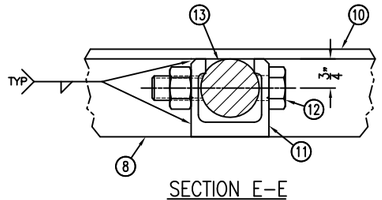
SLIDE PLATE ASSEMBLY



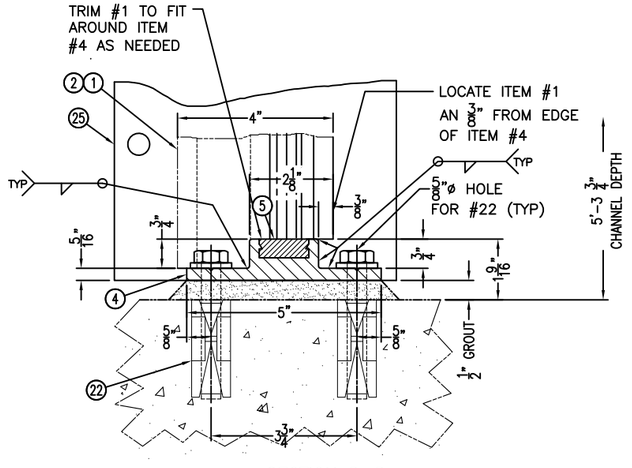
SECTION F-F



SECTION G-G



SECTION E-E



SECTION D-D

NOTES:
1. ALL DIMENSIONS ARE IN INCHES UNLESS NOTED OTHERWISE.
2. CONTRACTOR TO VERIFY ALL DIMENSIONS.
3. ALL BOLT HOLE LOCATIONS ±1/16" WITH NO ACCUMULATION.
4. ALL WELDING TO BE DONE PER AWS D1.6 OR AWS D1.2.
5. WACO NAME PLATE SHOULD BE INSTALLED PROPERLY AND LEGIBLY MARKED WITH JOB AND GATE NUMBER, WA-62.
6. ALL ALUMINUM IN CONTACT WITH CONCRETE TO RECEIVE ONE SHOP COAT OF BITUMINOUS PAINT.
7. CRANK OR HANDWHEEL DIRECTIONAL ARROWS GROUND TO SHOW CORRECT DIRECTION.
8. GATE DESIGNED FOR 5.0 FEET OF MAXIMUM HEAD.
9. CONTRACTOR MUST USE SHACKLES AND SPREADER BAR TO LIFT GATES, DO NOT LIFT FROM SINGLE POINT. REFER TO MANUFACTURER'S O & M MANUAL FOR SPECIFIC HANDLING AND INSTALLATION INSTRUCTIONS. FAILURE TO FOLLOW MANUFACTURER'S INSTRUCTIONS MAY VOID WARRANTY. LIFT LUG, ITEM #23 TO BE REMOVED AFTER INSTALLATION.
10. WORKMANSHIP IAW WACO STANDARD WA-36.

ITEM	QTY	DESCRIPTION	FT.	IN.	MAT'L	MAT'L SPEC	REV	STOCK NO.
25	2	3/8" PLATE 7 1/4" X	5	3 1/8	6061-T6			
24	2	5/16"ø CORD	0	6	NITRILE			500013
23	2	LIFT LUG	–	–	–	A-85250		
22	26	1/2" EXP. SHIELD W/HH BOLT & SAE FW	0	3 1/2	ZINC/316 SST			
21	1	STOP COLLAR	–	–	BRONZE			955276
20	1	(WJ) 3/8" ADAPTER PLATE 8"	–	–	–	A-81283-E		
19	1	0' – 3' INDICATOR TAPE	–	–	VINYL			955074
18	1	3' – 6' INDICATOR TAPE	–	–	VINYL			955075
17	1	BS-1015 OPERATOR W/18" HANDWHEEL/STEM COVER	4	5	–	B-85291		
16	1	6" ALUM. ASSOC. CHANNEL 4.03#	3	10 1/4	6061-T6			
15	1	6" ALUM. ASSOC. CHANNEL 4.03#	3	8 1/2	6061-T6			
14	2	1/2"-13 HH BOLT W/ NUT & 2 FW'S X	0	1 1/2	316 SST			
13	1	1 1/2"ø ROD	5	1 3/4	304 SST			638067-12
12	1	5/8"ø HH BOLT W/ NUT, 2X FW & LW	0	3 1/2	316 SST			
11	1	STIFFENER EXTR'N	0	6	6061-T6			175054
10	1	1/4" PLATE 41 3/4" X	4	10 7/16	6061-T6			
9	2	1/4" X 2" X 2" ANGLE	4	10 7/16	6061-T6			
8	5	STIFFENER EXTR'N	3	1 3/4	6061-T6			103147
7	2	#8 SELF DRILLING SCREW	0	0 3/4	304 SST			
6	2	1/8" X 1" X 3/4" SHRP CRNR ANGLE	0	1	6061-T6			
5	1	1/2" X 1 1/4" STRIP	3	7 1/4	NEOPR.	A-77785		500004
4	1	SLIDE GATE INVERT EXTRUSION A-85230	3	7 1/4	6061-T6	A-85230		175049
3	2	5/16"ø CORD	5	6	NITRILE			500013
2	2	POLYGLIDE EXTRUSION A-82716-C	8	6 11/16	UHMW	1/2" PLATE EDGE		500018
1	2	SLIDE GATE EXTRUSION A-82785-A	8	6 15/16	6061-T6	1/2" PLATE EDGE		175051

LIST OF MATERIALS FOR ONE ASSEMBLY

TOLERANCE UNLESS SPECIFIED:
ANGLES: ± 1°
FRACTIONS: ± 1/16"
DECIMALS:
.XX ± .03"
.XXX ± .010"

8182 HART ENGINEERING CORPORATION 1
JOB NO. CUSTOMER REQ'D
6734 SLIDE GATE ASSEMBLY
SG-3
TAUNTON WWTF, TAUNTON, MA

DRAWN:	TL	12-10-21
CHECK:	TL	12-10-21
APPR:	TL	12-10-21
DATE		

SCALE: NTS WT.

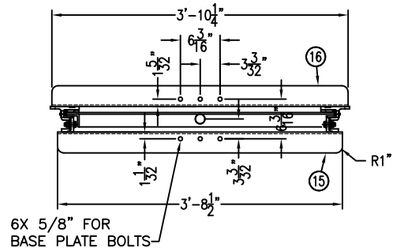
WACO PRODUCTS INCORPORATED
BALTIMORE, MARYLAND 21229-5511

D-85932 A

SHEET 1 OF 1 REV.

8182D85932A1	SG-3
GATE SERIAL NO.	GATE TAG I.D.

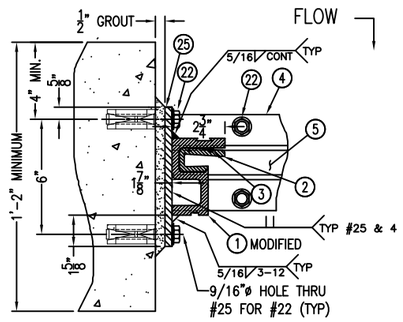
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	MODIFIED CHANNEL DEPTH, ADDED FLOW ARROW	2-16-22	TL



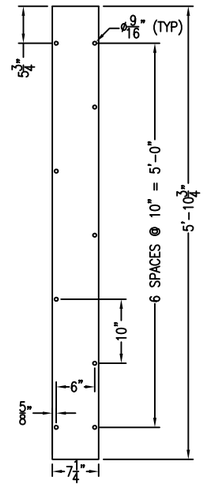
PLAN VIEW
(OPERATOR ITEMS NOT SHOWN)

ENGINEER TO CONFIRM:
HIGH WATER LEVEL
(SEE NOTE 8)

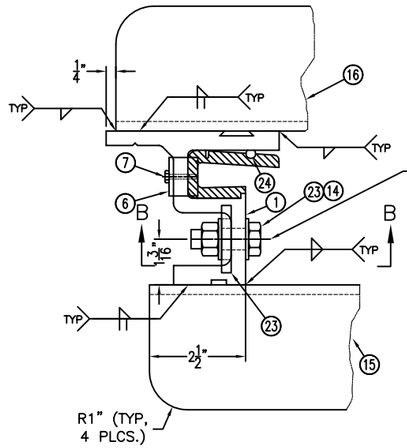
CONTRACTOR TO CONFIRM:
DIMENSIONS &
ELEVATIONS



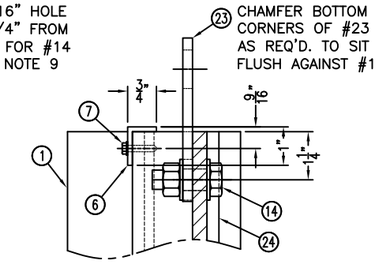
SECTION C-C



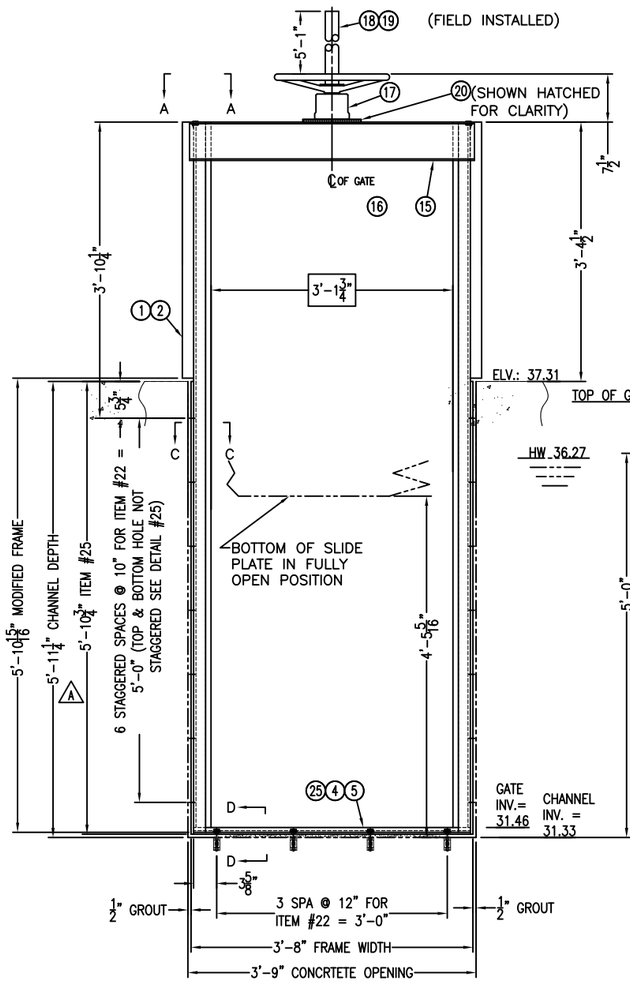
ITEM #25 DETAIL
(LH SHOWN RH MIRROR IMMAGE)



VIEW A-A

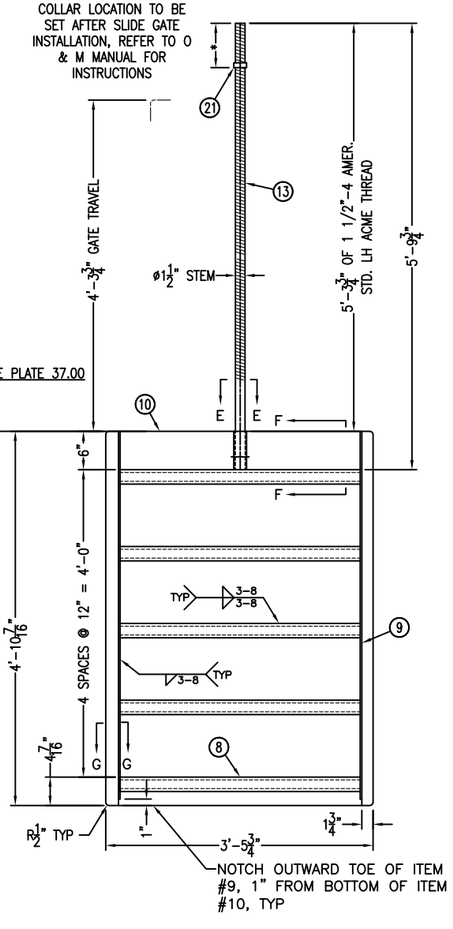


SECTION B-B

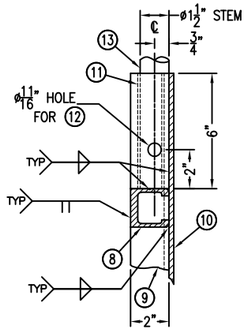


FRAME ASSEMBLY

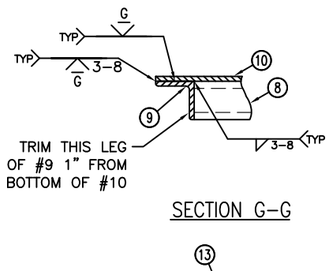
* PRELIMINARY STOP COLLAR LOCATION SET BY MECHANIC, FINAL STOP COLLAR LOCATION TO BE SET AFTER SLIDE GATE INSTALLATION, REFER TO O & M MANUAL FOR INSTRUCTIONS



SLIDE PLATE ASSEMBLY

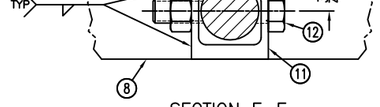


SECTION F-F

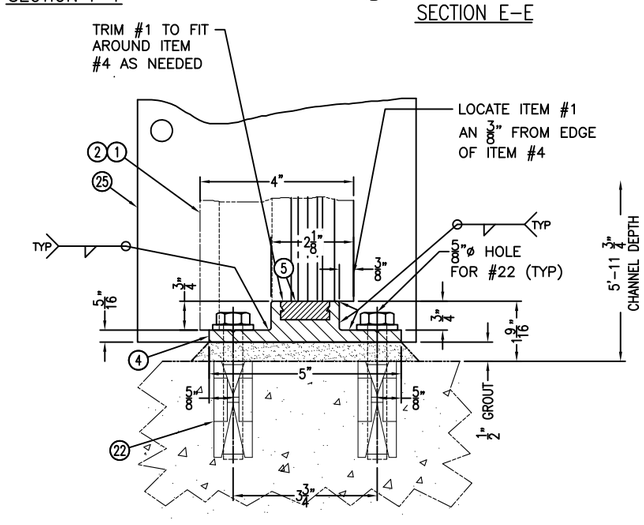


TRIM THIS LEG OF #9 1" FROM BOTTOM OF #10

SECTION G-G



SECTION E-E



SECTION D-D

NOTES:
1. ALL DIMENSIONS ARE IN INCHES UNLESS NOTED OTHERWISE.
2. CONTRACTOR TO VERIFY ALL DIMENSIONS.
3. ALL BOLT HOLE LOCATIONS ±1/16" WITH NO ACCUMULATION.
4. ALL WELDING TO BE DONE PER AWS D1.6 OR AWS D1.2.
5. WACO NAME PLATE SHOULD BE INSTALLED PROPERLY AND LEGIBLY MARKED WITH JOB AND GATE NUMBER, WA-62.
6. ALL ALUMINUM IN CONTACT WITH CONCRETE TO RECEIVE ONE SHOP COAT OF BITUMINOUS PAINT.
7. CRANK OR HANDWHEEL DIRECTIONAL ARROWS GROUND TO SHOW CORRECT DIRECTION.
8. GATE DESIGNED FOR 5.0 FEET OF MAXIMUM HEAD.
9. CONTRACTOR MUST USE SHACKLES AND SPREADER BAR TO LIFT GATES, DO NOT LIFT FROM SINGLE POINT. REFER TO MANUFACTURER'S O & M MANUAL FOR SPECIFIC HANDLING AND INSTALLATION INSTRUCTIONS. FAILURE TO FOLLOW MANUFACTURER'S INSTRUCTIONS MAY VOID WARRANTY. LIFT LUG, ITEM #23 TO BE REMOVED AFTER INSTALLATION.
10. WORKMANSHIP IAW WACO STANDARD WA-36.

ITEM	QTY	DESCRIPTION	FT.	IN.	MAT'L	MAT'L SPEC	REV	STOCK NO.
25	2	3/8" PLATE 7 1/4" X	5	10 3/4	6061-T6			
24	2	5/16"ø CORD	0	6	NITRILE			500013
23	2	LIFT LUG	–	–	–	A-85250		
22	26	1/2" EXP. SHIELD W/HH BOLT & SAE FW	0	3 1/2	ZINC/316 SST			
21	1	STOP COLLAR	–	–	BRONZE			955276
20	1	(WJ) 3/8" ADAPTER PLATE 8"	–	–	–	A-81283-E		
19	1	0' - 3' INDICATOR TAPE	–	–	VINYL			955074
18	1	3' - 6' INDICATOR TAPE	–	–	VINYL			955075
17	1	BS-1015 OPERATOR W/18" HANDWHEEL/STEM COVER	5	1	–	B-85291		
16	1	6" ALUM. ASSOC. CHANNEL 4.03#	3	10 1/4	6061-T6			
15	1	6" ALUM. ASSOC. CHANNEL 4.03#	3	8 1/2	6061-T6			
14	2	1/2"-13 HH BOLT W/ NUT & 2 FW'S X	0	1 1/2	316 SST			
13	1	1 1/2"ø ROD	5	9 3/4	304 SST			638067-12
12	1	5/8"ø HH BOLT W/ NUT, 2X FW & LW	0	3 1/2	316 SST			
11	1	STIFFENER EXTR'N	0	6	6061-T6			175054
10	1	1/4" PLATE 41 3/4" X	4	10 7/16	6061-T6			
9	2	1/4" X 2" X 2" ANGLE	4	10 7/16	6061-T6			
8	5	STIFFENER EXTR'N	3	1 3/4	6061-T6			103147
7	2	#8 SELF DRILLING SCREW	0	0 3/4	304 SST			
6	2	1/8" X 1" X 3/4" SHRP CRNR ANGLE	0	1	6061-T6			
5	1	1/2" X 1 1/4" STRIP	3	7 1/4	NEOPR.	A-77785		500004
4	1	SLIDE GATE INVERT EXTRUSION A-85230	3	7 1/4	6061-T6	A-85230		175049
3	2	5/16"ø CORD	5	4 1/2	NITRILE			500013
2	2	POLYGLIDE EXTRUSION A-82716-C	9	2 11/16	UHMW	1/2" PLATE EDGE		500018
1	2	SLIDE GATE EXTRUSION A-82785-A	9	2 15/16	6061-T6	1/2" PLATE EDGE		175051

LIST OF MATERIALS FOR ONE ASSEMBLY

TOLERANCE UNLESS SPECIFIED:
ANGLES: ± 1°
FRACTIONS: ± 1/16"
DECIMALS:
.XX ± .03"
.XXX ± .010"

8182	HART ENGINEERING CORPORATION	1
JOB NO.	CUSTOMER	REQ'D

6734 SLIDE GATE ASSEMBLY
SG-4
TAUNTON WWTF, TAUNTON, MA

DRAWN:	TL	12-10-21
CHECK:	TL	12-10-21
APPR:	TL	12-10-21
		DATE

SCALE: NTS WT.

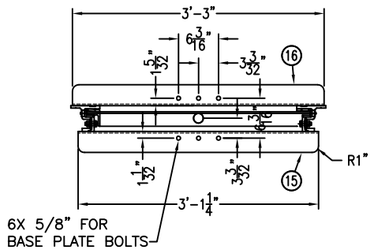
WACO PRODUCTS INCORPORATED
BALTIMORE, MARYLAND 21229-5511

D-85933 A

SHEET 1 OF 1 REV.

8182D85933A1	SG-4
GATE SERIAL NO.	GATE TAG I.D.

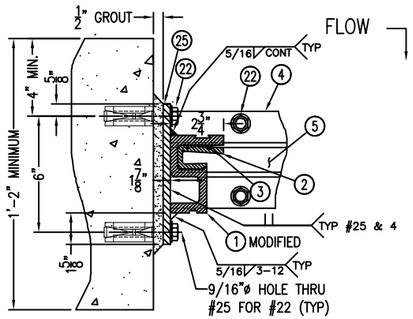
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	MODIFIED CHANNEL DEPTH & WIDTH, QUANTITY WAS 2, ADDED FLOW ARROW	2-16-22	TL



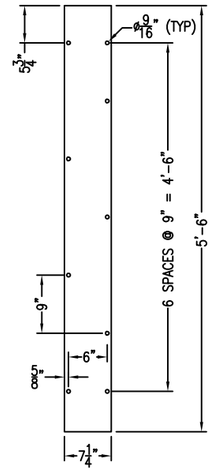
PLAN VIEW
(OPERATOR ITEMS NOT SHOWN)

ENGINEER TO CONFIRM:
HIGH WATER LEVEL
(SEE NOTE 8)

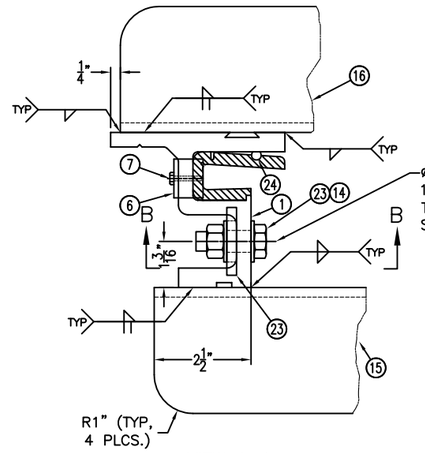
CONTRACTOR TO CONFIRM:
DIMENSIONS &
ELEVATIONS



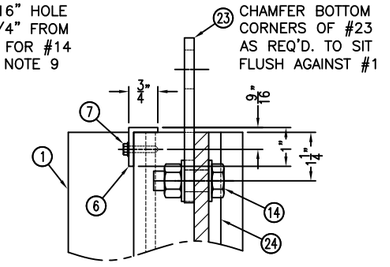
SECTION C-C



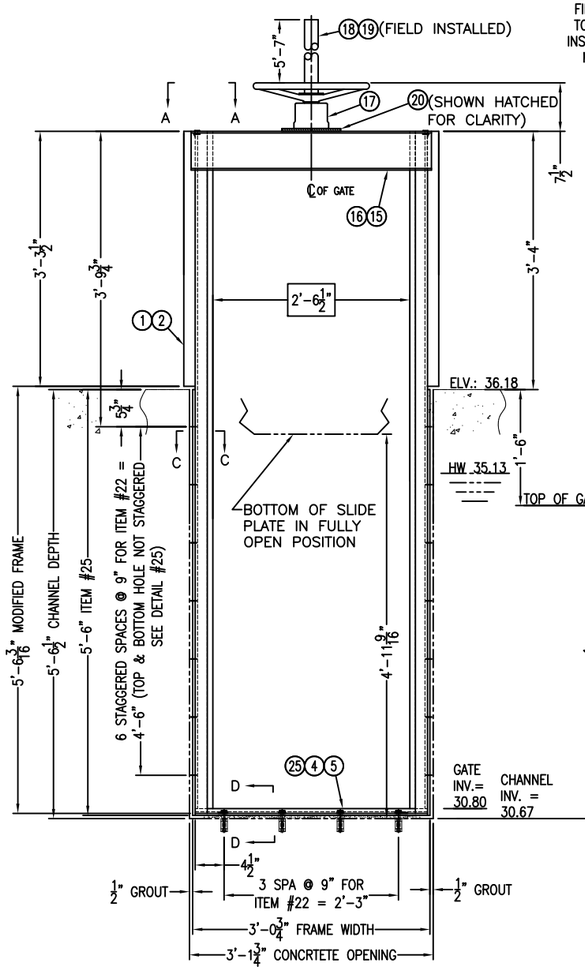
ITEM #25 DETAIL
(LH SHOWN RH MIRROR IMMAGE)



VIEW A-A

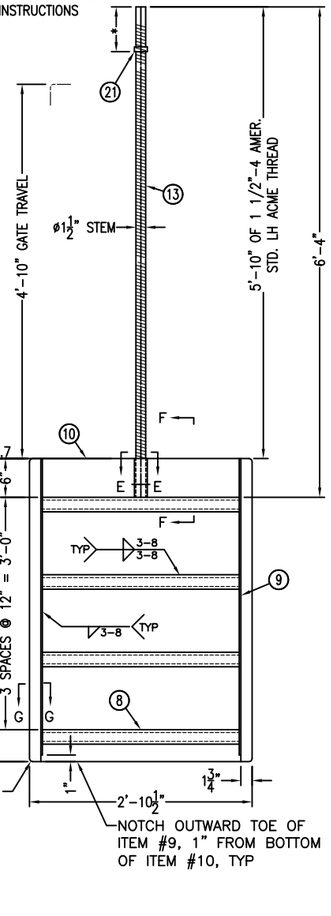


SECTION B-B

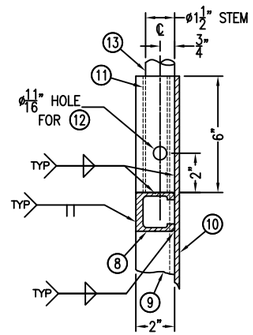


FRAME ASSEMBLY

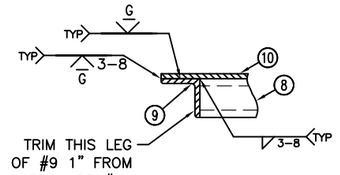
* PRELIMINARY STOP COLLAR LOCATION SET BY MECHANIC, FINAL STOP COLLAR LOCATION TO BE SET AFTER SLIDE GATE INSTALLATION, REFER TO O & M MANUAL FOR INSTRUCTIONS



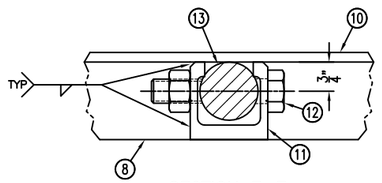
SLIDE PLATE ASSEMBLY



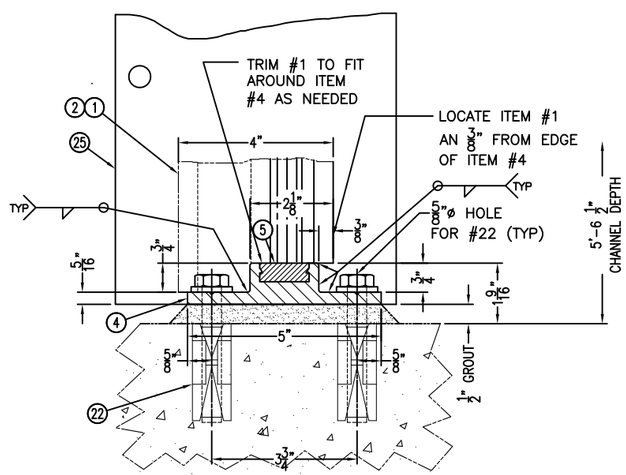
SECTION F-F



SECTION G-G



SECTION E-E



SECTION D-D

NOTES:
1. ALL DIMENSIONS ARE IN INCHES UNLESS NOTED OTHERWISE.
2. CONTRACTOR TO VERIFY ALL DIMENSIONS.
3. ALL BOLT HOLE LOCATIONS ±1/16" WITH NO ACCUMULATION.
4. ALL WELDING TO BE DONE PER AWS D1.6 OR AWS D1.2.
5. WACO NAME PLATE SHOULD BE INSTALLED PROPERLY AND LEGIBLY MARKED WITH JOB AND GATE NUMBER, WA-62.
6. ALL ALUMINUM IN CONTACT WITH CONCRETE TO RECEIVE ONE SHOP COAT OF BITUMINOUS PAINT.
7. CRANK OR HANDWHEEL DIRECTIONAL ARROWS GROUND TO SHOW CORRECT DIRECTION.
8. GATE DESIGNED FOR 5.0 FEET OF MAXIMUM HEAD.
9. CONTRACTOR MUST USE SHACKLES AND SPREADER BAR TO LIFT GATES, DO NOT LIFT FROM SINGLE POINT. REFER TO MANUFACTURER'S O & M MANUAL FOR SPECIFIC HANDLING AND INSTALLATION INSTRUCTIONS. FAILURE TO FOLLOW MANUFACTURER'S INSTRUCTIONS MAY VOID WARRANTY. LIFT LUG, ITEM #23 TO BE REMOVED AFTER INSTALLATION.
10. WORKMANSHIP IAW WACO STANDARD WA-36.

ITEM	QTY	DESCRIPTION	FT.	IN.	MAT'L	MAT'L SPEC	REV	STOCK NO.
25	2	3/8" PLATE 7 1/4" X	5	6	6061-T6			
24	2	5/16"ø CORD	0	6	NITRILE			500013
23	2	LIFT LUG	–	–	–	A-85250		
22	26	1/2" EXP. SHIELD W/HH BOLT & SAE FW	0	3 1/2	ZINC/316 SST			
21	1	STOP COLLAR	–	–	BRONZE			955276
20	1	(WJ) 3/8" ADAPTER PLATE 8"	–	–	–	A-81283-E		
19	1	0' – 3' INDICATOR TAPE	–	–	VINYL			955074
18	1	3' – 6' INDICATOR TAPE	–	–	VINYL			955075
17	1	BS-1015 OPERATOR W/18" HANDWHEEL/STEM COVER	5	7	–	B-85291		
16	1	6" ALUM. ASSOC. CHANNEL 4.03#	3	3	6061-T6			
15	1	6" ALUM. ASSOC. CHANNEL 4.03#	3	1 1/4	6061-T6			
14	2	1/2"-13 HH BOLT W/ NUT & 2 FW'S X	0	1 1/2	316 SST			
13	1	1 1/2"ø ROD	6	4	304 SST			638067-12
12	1	5/8"ø HH BOLT W/ NUT, 2X FW & LW	0	3 1/2	316 SST			
11	1	STIFFENER EXTR'N	0	6	6061-T6			175054
10	1	1/4" PLATE 34 1/2" X	3	10 15/16	6061-T6			
9	2	1/4" X 2" X 2" ANGLE	3	10 15/16	6061-T6			
8	4	STIFFENER EXTR'N	2	6 1/2	6061-T6			103147
7	2	#8 SELF DRILLING SCREW	0	0 3/4	304 SST			
6	2	1/8" X 1" X 3/4" SHRP CRNR ANGLE	0	1	6061-T6			
5	1	1/2" X 1 1/4" STRIP	3	0	NEOPR.	A-77785		500004
4	1	SLIDE GATE INVERT EXTRUSION A-85230	3	0	6061-T6	A-85230		175049
3	2	5/16"ø CORD	4	6	NITRILE			500013
2	2	POLYGLIDE EXTRUSION A-82716-C	8	9 7/16	UHMW	1/2" PLATE EDGE		500018
1	2	SLIDE GATE EXTRUSION A-82785-A	8	9 11/16	6061-T6	1/2" PLATE EDGE		175051

LIST OF MATERIALS FOR ONE ASSEMBLY

8182	HART ENGINEERING CORPORATION		1
JOB NO.	CUSTOMER		REQ'D

6734 SLIDE GATE ASSEMBLY
SG-5
TAUNTON WWTF, TAUNTON, MA

TOLERANCE UNLESS SPECIFIED:
ANGLES: ± 1°
FRACTIONS: ± 1/16"
DECIMALS:
.XX ± .03"
.XXX ± .010"

DRAWN:	TL	12-10-21
CHECK:	TL	12-10-21
APPR:	TL	12-10-21
		DATE

SCALE: NTS WT.

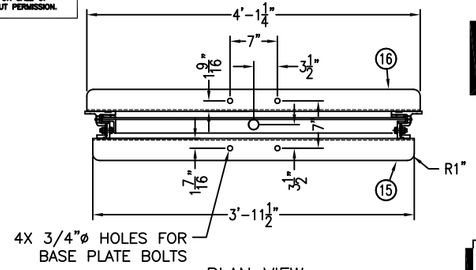
WACO PRODUCTS INCORPORATED
BALTIMORE, MARYLAND 21229-5511

D-85934 A

SHEET 1 OF 1 REV.

8182D85934A1	SG-5
GATE SERIAL NO.	GATE TAG I.D.

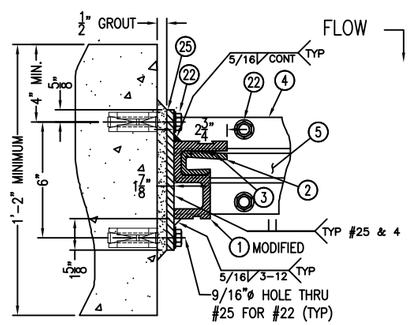
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	MODIFIED CHANNEL DEPTH, BENCH HEIGHT & GATE TRAVEL CHANGED OPERATOR TO BS2200 WITH HANDWHEEL, ADDED FLOW ARROW	2-15-22	TL



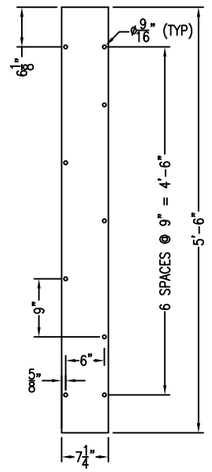
PLAN VIEW
(OPERATOR ITEMS NOT SHOWN)

ENGINEER TO CONFIRM:
HIGH WATER LEVEL
(SEE NOTE 8)

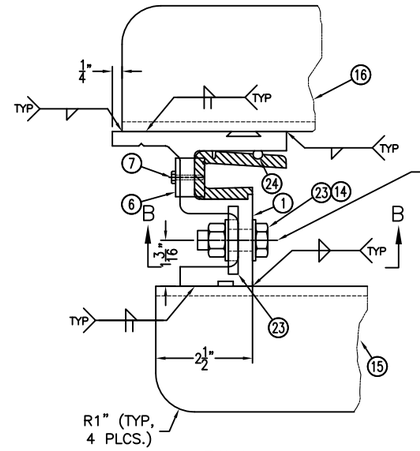
CONTRACTOR TO CONFIRM:
DIMENSIONS &
ELEVATIONS



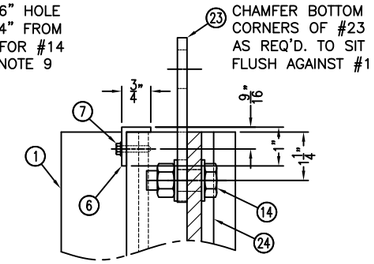
SECTION C-C



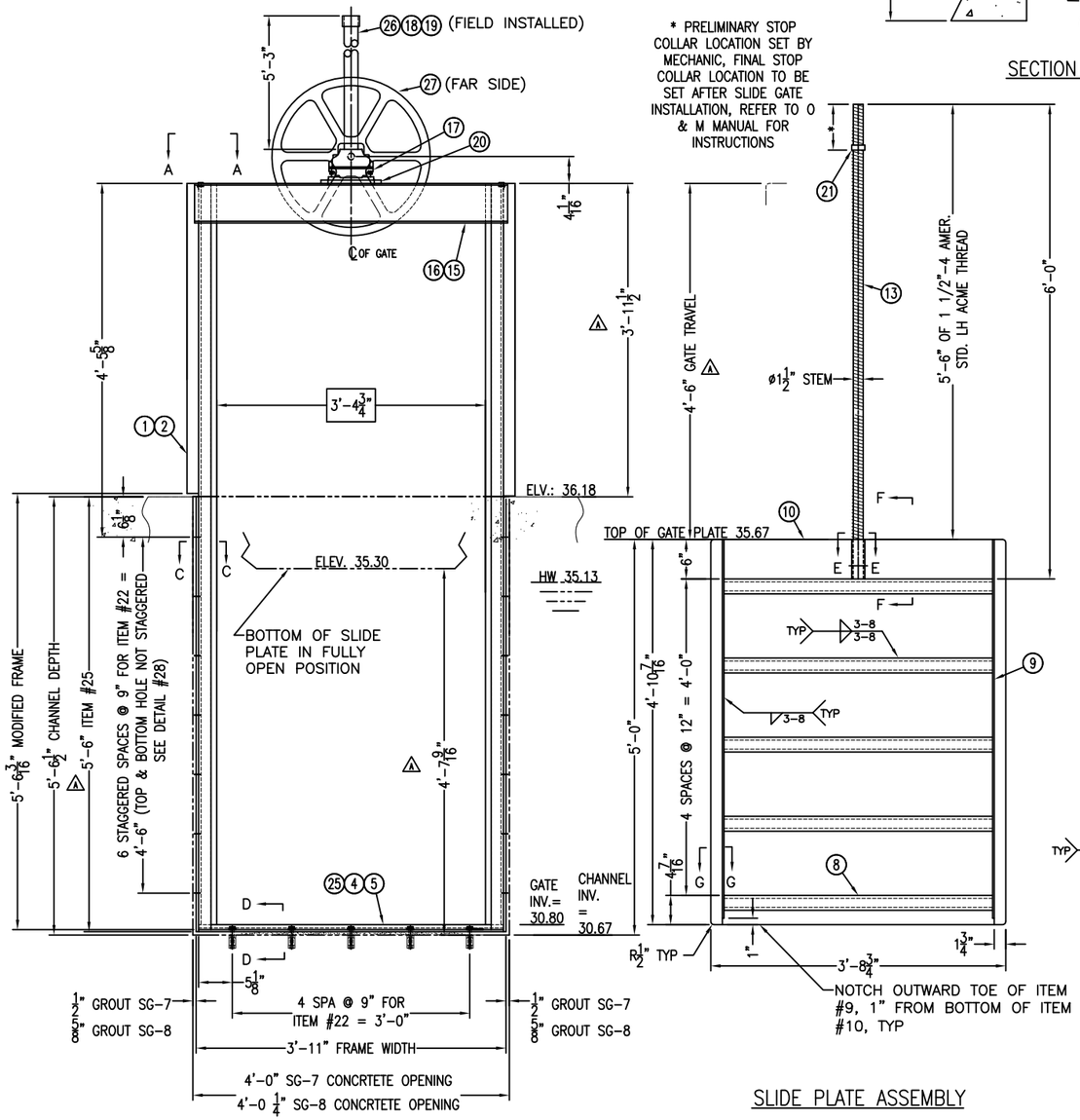
ITEM #25 DETAIL
(LH SHOWN RH MIRROR IMAGE)



VIEW A-A



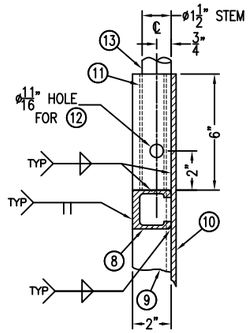
SECTION B-B



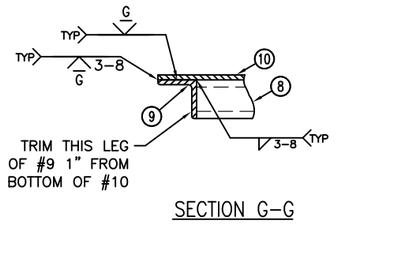
FRAME ASSEMBLY

* PRELIMINARY STOP COLLAR LOCATION SET BY MECHANIC, FINAL STOP COLLAR LOCATION TO BE SET AFTER SLIDE GATE INSTALLATION, REFER TO O & M MANUAL FOR INSTRUCTIONS

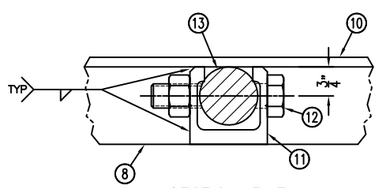
SLIDE PLATE ASSEMBLY



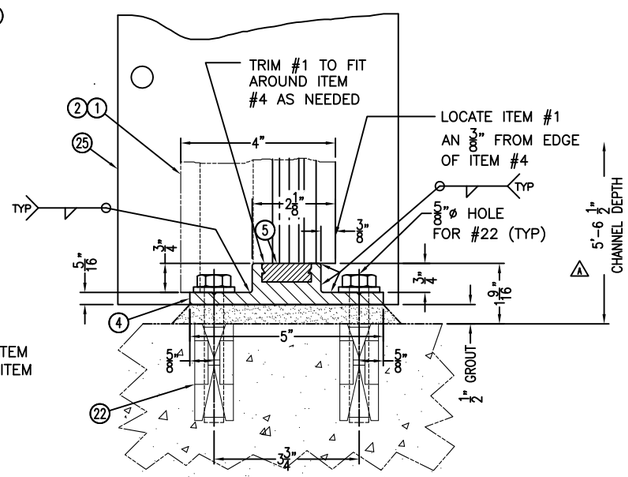
SECTION F-F



SECTION G-G



SECTION E-E



SECTION D-D

NOTES:
1. ALL DIMENSIONS ARE IN INCHES UNLESS NOTED OTHERWISE.
2. CONTRACTOR TO VERIFY ALL DIMENSIONS.
3. ALL BOLT HOLE LOCATIONS ±1/16" WITH NO ACCUMULATION.
4. ALL WELDING TO BE DONE PER AWS D1.6 OR AWS D1.2.
5. WACO NAME PLATE SHOULD BE INSTALLED PROPERLY AND LEGIBLY MARKED WITH JOB AND GATE NUMBER, WA-62.
6. ALL ALUMINUM IN CONTACT WITH CONCRETE TO RECEIVE ONE SHOP COAT OF BITUMINOUS PAINT.
7. CRANK OR HANDWHEEL DIRECTIONAL ARROWS GROUND TO SHOW CORRECT DIRECTION.
8. GATE DESIGNED FOR 5.0 FEET OF MAXIMUM HEAD.
9. CONTRACTOR MUST USE SHACKLES AND SPREADER BAR TO LIFT GATES, DO NOT LIFT FROM SINGLE POINT. REFER TO MANUFACTURER'S O & M MANUAL FOR SPECIFIC HANDLING AND INSTALLATION INSTRUCTIONS. FAILURE TO FOLLOW MANUFACTURER'S INSTRUCTIONS MAY VOID WARRANTY. LIFT LUG, ITEM #23 TO BE REMOVED AFTER INSTALLATION.
10. WORKMANSHIP IAW WACO STANDARD WA-36.

	ITEM	QTY	DESCRIPTION	FT.	IN.	MAT'L	MAT'L SPEC	REV	STOCK NO.
⚠	27	1	24" DIAMETER HANDWHEEL, BORED & KEYED			ALUMINUM	A-86032		
⚠	26	1	STEM COVER WITH END CAP	5	3	ACRYLIC/PVC	A-85867		
	25	2	3/8" PLATE 7 1/4" X	5	6	6061-T6			
	24	2	5/16"ø CORD	0	6	NITRILE			500013
	23	2	LIFT LUG	–	–	–	A-85250		
	22	28	1/2" EXPAN. SHIELD W/HH BOLT & SAE FW	0	3 1/2	ZINC/316 SST			
	21	1	STOP COLLAR	–	–	BRONZE			955276
⚠	20	1	BASE PLATE			6061-T6	B-86033		
	19	1	0' – 3' INDICATOR TAPE	–	–	VINYL			955074
	18	1	3' – 6' INDICATOR TAPE	–	–	VINYL			955075
⚠	17	1	BS-2200 SAMBO VS-20 GEAR BOX						955305R3
	16	1	6" ALUM. ASSOC. CHANNEL 4.03#	4	1 1/4	6061-T6			
	15	1	6" ALUM. ASSOC. CHANNEL 4.03#	3	11 1/2	6061-T6			
	14	2	1/2"-13 HH BOLT W/ NUT & 2 FW'S X	0	1 1/2	316 SST			
	13	1	1 1/2"ø ROD	6	0	304 SST			638067-12
	12	1	5/8"ø HH BOLT W/ NUT, 2X FW & LW	0	3 1/2	316 SST			
	11	1	STIFFENER EXTR'N	0	6	6061-T6			175054
	10	1	1/4" PLATE 44 3/4" X	4	10 7/16	6061-T6			
	9	2	1/4" X 2" X 2" ANGLE	4	10 7/16	6061-T6			
	8	5	STIFFENER EXTR'N	3	4 3/4	6061-T6			103147
	7	2	#8 SELF DRILLING SCREW	0	0 3/4	304 SST			
	6	2	1/8" X 1" X 3/4" SHRP CRNR ANGLE	0	1	6061-T6			
	5	1	1/2" X 1 1/4" STRIP	3	10 1/4	NEOPR.	A-77785		500004
	4	1	SLIDE GATE INVERT EXTRUSION A-85230	3	10 1/4	6061-T6	A-85230		175049
	3	2	5/16"ø CORD	5	6	NITRILE			500013
	2	2	POLYGLIDE EXTRUSION A-82716-C	9	4 15/16	UHMW	1/2" PLATE EDGE		500018
	1	2	SLIDE GATE EXTRUSION A-82785-A	9	5 3/16	6061-T6	1/2" PLATE EDGE		175051

LIST OF MATERIALS FOR ONE ASSEMBLY

GATE SERIAL NO.	GATE TAG I.D.
8182D85935A2	SG-8
8182D85935A1	SG-7

TOLERANCE UNLESS SPECIFIED:
ANGLES: ± 1°
FRACTIONS: ± 1/16"
DECIMALS:
.XX ± .03"
.XXX ± .010"

JOB NO.	CUSTOMER	REQ'D
8182	HART ENGINEERING CORPORATION	2

6734 SLIDE GATE ASSEMBLY
SG-7 & SG-8
TAUNTON WWTF, TAUNTON, MA

		DATE
DRAWN:	TL	12-10-21
CHECK:	TL	12-10-21
APPR:	TL	12-10-21

SCALE: NTS WT.

WACO PRODUCTS INCORPORATED
BALTIMORE, MARYLAND 21228-5511

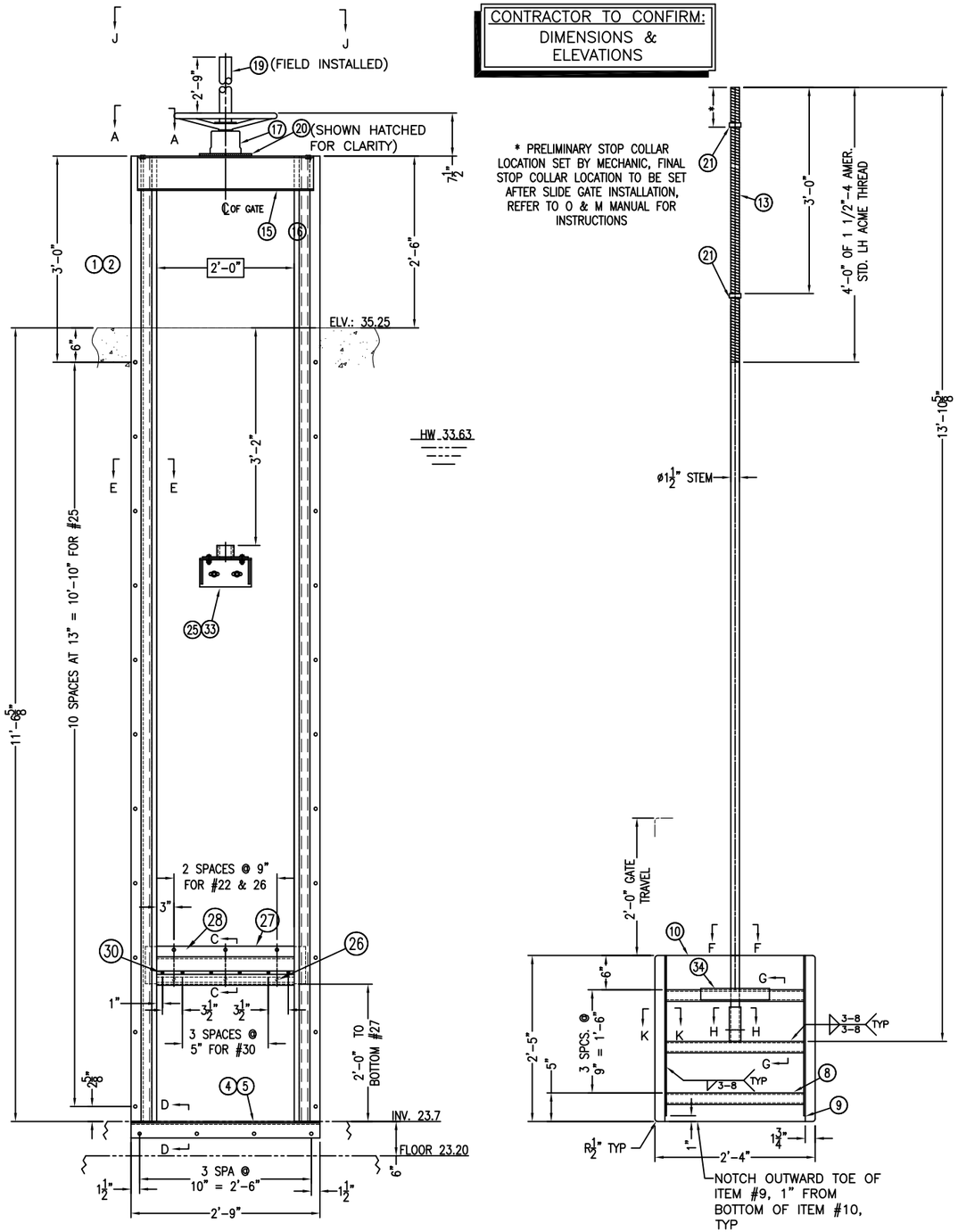
D-85935 A

SHEET 1 OF 1 REV.

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL

ENGINEER TO CONFIRM:
HIGH WATER LEVEL
(SEE NOTE 8)

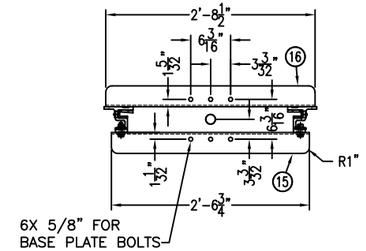
CONTRACTOR TO CONFIRM:
DIMENSIONS &
ELEVATIONS



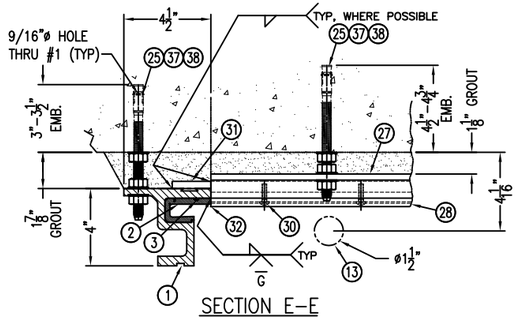
FRAME ASSEMBLY

* PRELIMINARY STOP COLLAR LOCATION SET BY MECHANIC, FINAL STOP COLLAR LOCATION TO BE SET AFTER SLIDE GATE INSTALLATION, REFER TO O & M MANUAL FOR INSTRUCTIONS

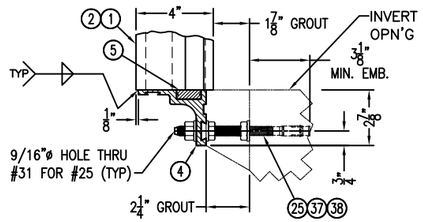
SLIDE PLATE ASSEMBLY



SECTION J–J
(OPERATOR ITEMS NOT SHOWN)



SECTION E–E



SECTION D–D

NOTES:
1. ALL DIMENSIONS ARE IN INCHES UNLESS NOTED OTHERWISE.
2. CONTRACTOR TO VERIFY ALL DIMENSIONS.
3. ALL BOLT HOLE LOCATIONS ±1/16" WITH NO ACCUMULATION.
4. ALL WELDING TO BE DONE PER AWS D1.6 OR AWS D1.2.
5. WACO NAME PLATE SHOULD BE INSTALLED PROPERLY AND LEGIBLY MARKED WITH JOB AND GATE NUMBER, WA–62.
6. ALL ALUMINUM IN CONTACT WITH CONCRETE TO RECEIVE ONE SHOP COAT OF BITUMINOUS PAINT.
7. CRANK OR HANDWHEEL DIRECTIONAL ARROWS GROUND TO SHOW CORRECT DIRECTION.
8. GATE DESIGNED FOR 10.0 FEET OF MAXIMUM HEAD.
9. CONTRACTOR MUST USE SHACKLES AND SPREADER BAR TO LIFT GATES, DO NOT LIFT FROM SINGLE POINT. REFER TO MANUFACTURER'S O & M MANUAL FOR SPECIFIC HANDLING AND INSTALLATION INSTRUCTIONS. FAILURE TO FOLLOW MANUFACTURER'S INSTRUCTIONS MAY VOID WARRANTY. LIFT LUG, ITEM #23 TO BE REMOVED AFTER INSTALLATION.
10. WORKMANSHIP IAW WACO STANDARD WA–36.

ITEM	QTY	DESCRIPTION	FT.	IN.	MAT'L	MAT'L SPEC	REV	STOCK NO.
38	58	1/2" FLAT WASHER			316 SST			
37	58	1/2" HEX NUT			316 SST			
36		NOT USED						
35		NOT USED						
34	1	1/4" X 1 1/2" X 1 1/2" ANGLE	1	0	6061–T6			
33	1	STEM GUIDE	–	–	ALUM.	B–80981C		
32	2	CORNER SEAL	–	–	NEOPRENE	A–81617		524003
31	2	1/2" FLAT BAR X 2"	0	6 1/2	6061–T6			
30	6	1/4" PAN/TRUSS HEAD MACHINE SCREW W/NEOPRENE BACKED FW & LW	0	1	316 SST			
29	2	5/16"ø CORD	2	0 1/2	NITRILE			500013
28	1	HEADER SEAL POLYGLIDE EXTRUSION, WA–63	2	0	UHMW			500021
27	1	HORIZONTAL SEAL EXTRUSION A–85277	2	0	6061–T6			175055
26	3	1/2"–13 HH BOLT	0	1 3/4	316 SST			
25	31	1/2" EXPANSION ANCHOR W/NUT & FW	0	7	316 SST			
24	2	5/16"ø CORD	0	6	NITRILE			500013
23	2	LIFT LUG	–	–	–	A–85250		
22		NOT USED						
21	2	STOP COLLAR	–	–	BRONZE			955276
20	1	(WJ) 3/8" ADAPTER PLATE 8"	–	–	–	A–81283–E		
19	1	0' – 3' INDICATOR TAPE	–	–	VINYL			955074
18		NOT USED						
17	1	BS–1015 OPERATOR W/18" HANDWHEEL/STEM COVER	2	9	–	B–85291		
16	1	6" ALUM. ASSOC. CHANNEL 4.03#	2	8 1/2	6061–T6			
15	1	6" ALUM. ASSOC. CHANNEL 4.03#	2	6 3/4	6061–T6			
14	2	1/2"–13 HH BOLT W/ NUT & 2 FW'S X	0	1 1/2	316 SST			
13	1	1 1/2"ø ROD	13	10 5/8	304 SST			638067–12
12	1	5/8"ø HH BOLT W/ NUT, 2X FW & LW	0	3 1/2	316 SST			
11	1	STIFFENER EXTR'N	0	6	6061–T6			175054
10	1	1/4" PLATE 28" X	2	5	6061–T6			
9	2	1/4" X 2" X 2" ANGLE	2	5	6061–T6			
11	3	STIFFENER EXTR'N	2	0	6061–T6			175054
7	2	#8 SELF DRILLING SCREW	0	0 3/4	304 SST			
6	2	1/8" X 1" X 3/4" SHRP CRNR ANGLE	0	1	6061–T6			
5	1	1/2" X 1 1/4" STRIP	2	9	NEOPR.	A–77785		500004
4	1	SLIDE GATE INVERT EXTRUSION A–64497	2	9	6061–T6			175084
3	2	5/16"ø CORD	3	0	NITRILE			500013
2	2	POLYGLIDE EXTRUSION A–82716–C	14	1 1/8	UHMW	1/2" PLATE EDGE		500018
1	2	SLIDE GATE EXTRUSION A–82785–A	14	0 5/8	6061–T6	1/2" PLATE EDGE		175051

LIST OF MATERIALS FOR ONE ASSEMBLY

GATE SERIAL NO.	GATE TAG I.D.
8182D85936–3	SG–12
8182D85936–2	SG–10
8182D85936–1	SG–9

TOLERANCE UNLESS SPECIFIED:
ANGLES: ± 1°
FRACTIONS: ± 1/16"
DECIMALS:
.XX ± .03"
.XXX ± .010"

JOB NO.	CUSTOMER	REQ'D
8182	HART ENGINEERING CORPORATION	3

6784 SLIDE GATE ASSEMBLY
SG–9, SG–10 & SG–12
TAUNTON WWTF, TAUNTON, MA

DRAWN:	TL	12–10–21
CHECK:	TL	12–10–21
APPR:	TL	12–10–21
DATE		

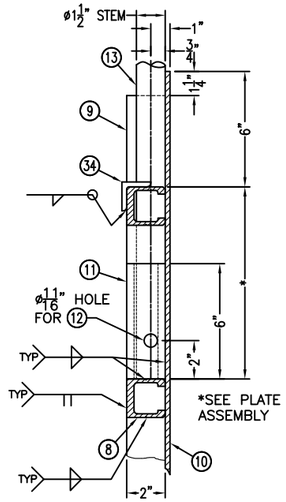
SCALE: NTS WT.

WACO PRODUCTS INCORPORATED
BALTIMORE, MARYLAND 21229–5511

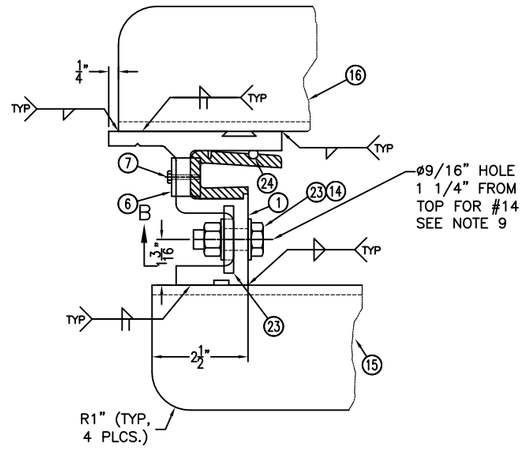
D–85936

SHEET 1 OF 2 REV.

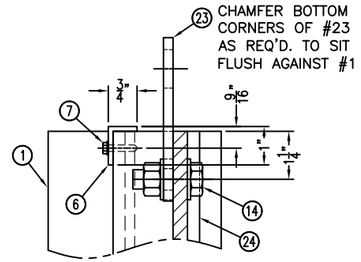
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL



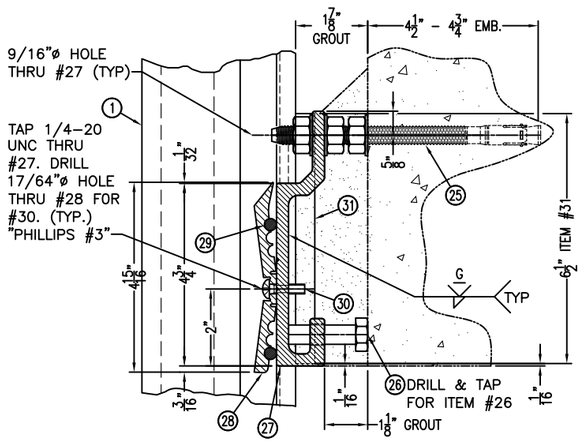
SECTION E–E



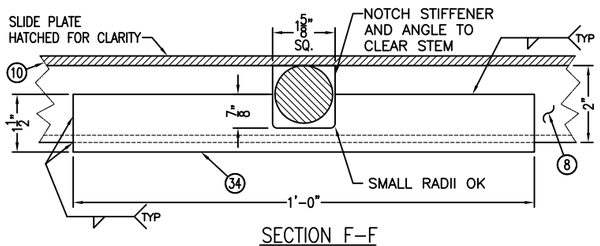
VIEW A–A



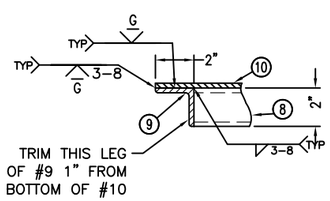
SECTION B–B



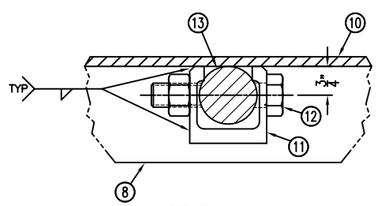
SECTION C–C



SECTION F–F



SECTION K–K



SECTION H–H

LIST OF MATERIALS FOR ONE ASSEMBLY

TOLERANCE UNLESS SPECIFIED:			
ANGLES: ± 1° FRACTIONS: ± 1/16" DECIMALS: .XX ± .03" .XXX ± .010"	8182	HART ENGINEERING CORPORATION	3
	JOB NO.	CUSTOMER	REQ'D
	6784 SLIDE GATE ASSEMBLY SG–9, SG–10 & SG–12 TAUNTON WWTF, TAUNTON, MA		

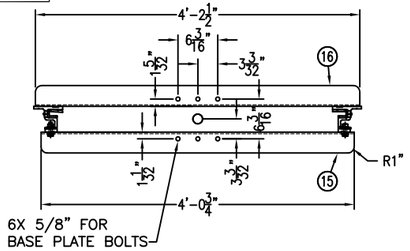
DRAWN: TL	12–10–21	
CHECK: TL	12–10–21	
APPR: TL	12–10–21	
	DATE	SCALE: NTS WT.

WACO PRODUCTS INCORPORATED
BALTIMORE, MARYLAND 21229–5511

D–85936

SHEET 2 OF 2 REV.

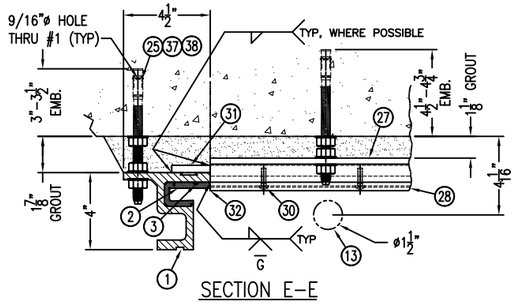
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	TOP OF CONCRETE TO INVERT WAS 8'-0"	2-16-22	TL



PLAN VIEW
(OPERATOR ITEMS NOT SHOWN)

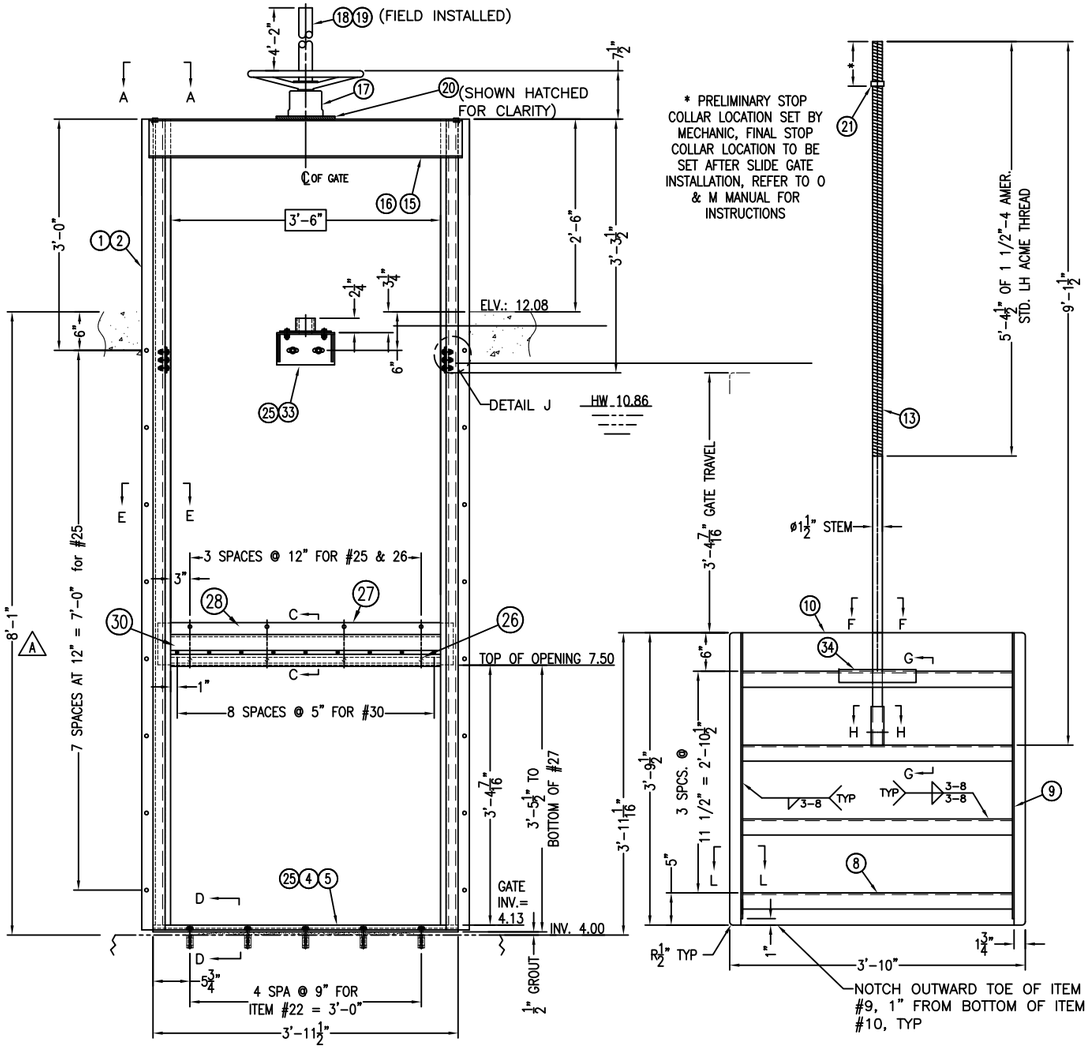
ENGINEER TO CONFIRM:
HIGH WATER LEVEL
(SEE NOTE 8)

CONTRACTOR TO CONFIRM:
DIMENSIONS &
ELEVATIONS



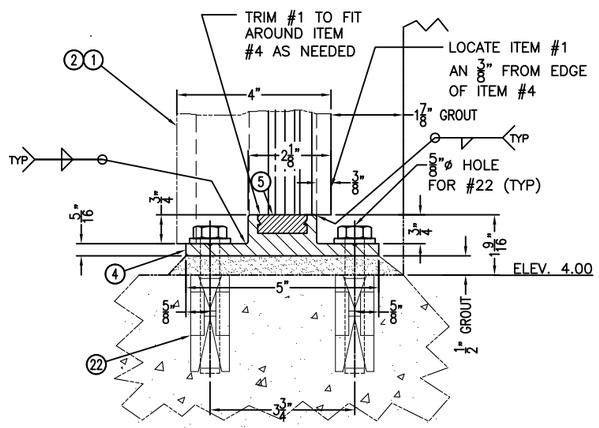
SECTION E-E

NOTES:
1. ALL DIMENSIONS ARE IN INCHES UNLESS NOTED OTHERWISE.
2. CONTRACTOR TO VERIFY ALL DIMENSIONS.
3. ALL BOLT HOLE LOCATIONS ±1/16" WITH NO ACCUMULATION.
4. ALL WELDING TO BE DONE PER AWS D1.6 OR AWS D1.2.
5. WACO NAME PLATE SHOULD BE INSTALLED PROPERLY AND LEGIBLY MARKED WITH JOB AND GATE NUMBER, WA-62.
6. ALL ALUMINUM IN CONTACT WITH CONCRETE TO RECEIVE ONE SHOP COAT OF BITUMINOUS PAINT.
7. CRANK OR HANDWHEEL DIRECTIONAL ARROWS GROUND TO SHOW CORRECT DIRECTION.
8. GATE DESIGNED FOR 7.0 FEET OF MAXIMUM HEAD.
9. CONTRACTOR MUST USE SHACKLES AND SPREADER BAR TO LIFT GATES, DO NOT LIFT FROM SINGLE POINT. REFER TO MANUFACTURER'S O & M MANUAL FOR SPECIFIC HANDLING AND INSTALLATION INSTRUCTIONS. FAILURE TO FOLLOW MANUFACTURER'S INSTRUCTIONS MAY VOID WARRANTY. LIFT LUG, ITEM #23 TO BE REMOVED AFTER INSTALLATION.
10. WORKMANSHIP IAW WACO STANDARD WA-36.



FRAME ASSEMBLY

SLIDE PLATE ASSEMBLY



SECTION D-D

ITEM	QTY	DESCRIPTION	FT.	IN.	MAT'L	MAT'L SPEC	REV	STOCK NO.
38	40	1/2" FLAT WASHER			316 SST			
37	40	1/2" HEX NUT			316 SST			
36	2	1/4" PLATE 2 1/2" X	0	4	6061-T6			
35	6	3/8"-16 HH BOLT W/NUT & LK & 2 FW'S	0	1 1/4	316 SST			
34	1	1/4" X 1 1/2" X 1 1/2" ANGLE	1	0	6061-T6			
33	1	STEM GUIDE	-	-	ALUM.	B-80981C		
32	2	CORNER SEAL	-	-	NEOPRENE	A-81617		524003
31	2	1/2" FLAT BAR X 2"	0	6 1/2	6061-T6			
30	9	1/4" PAN/TRUSS HEAD MACHINE SCREW W/NEOPRENE BACKED FW & LW	0	1	316 SST			
29	2	5/16"ø CORD	3	6 1/2	NITRILE			500013
28	1	HEADER SEAL POLYGLIDE EXTRUSION, WA-63	3	6	UHMW			500021
27	1	HORIZONTAL SEAL EXTRUSION A-85277	3	6	6061-T6			175055
26	4	1/2"-13 HH BOLT	0	1 3/4	316 SST			
25	22	1/2" EXPANSION ANCHOR W/NUT & FW	0	7	316 SST			
24	2	5/16"ø CORD	0	6	NITRILE			500013
23	2	LIFT LUG	-	-	-	A-85250		
22	10	1/2" EXPANSION SHIELD W/HH BOLT & FW	0	3 1/2	ZINC/316 SST			
21	1	STOP COLLAR	-	-	BRONZE			955276
20	1	(WJ) 3/8" ADAPTER PLATE 8"	-	-	-	A-81283-E		
19	1	0' - 3' INDICATOR TAPE	-	-	VINYL			955074
18	1	3' - 6' INDICATOR TAPE	-	-	VINYL			955075
17	1	BS-1015 OPERATOR W/18" HANDWHEEL/STEM COVER	4	2	-	B-85291		
16	1	6" ALUM. ASSOC. CHANNEL 4.03#	4	2 1/2	6061-T6			
15	1	6" ALUM. ASSOC. CHANNEL 4.03#	4	0 3/4	6061-T6			
14	2	1/2"-13 HH BOLT W/ NUT & 2 FW'S X	0	1 1/2	316 SST			
13	1	1 1/2"ø ROD	9	1 1/2	304 SST			638067-12
12	1	5/8"ø HH BOLT W/ NUT, 2X FW & LW	0	3 1/2	316 SST			
11	1	STIFFENER EXTR'N	0	6	6061-T6			175054
10	1	1/4" PLATE 45 1/2" X	3	10	6061-T6			
9	2	1/4" X 2" X 2 1/2" ANGLE	3	10	6061-T6			
8	4	1/4" x 2 1/2" x 2 1/2" ANGLE	3	6	6061-T6			
7	2	#8 SELF DRILLING SCREW	0	0 3/4	304 SST			
6	2	1/8" X 1" X 3/4" SHRP CRNR ANGLE	0	1	6061-T6			
5	1	1/2" X 1 1/4" STRIP	3	11 1/2	NEOPR.	A-77785		
4	1	SLIDE GATE INVERT EXTRUSION A-85230	3	11 1/2	6061-T6	A-85230		175049
3	2	5/16"ø CORD	4	0	NITRILE			500013
2	2	POLYGLIDE EXTRUSION A-82716-C	10	5 15/16	UHMW	1/2" PLATE EDGE		500018
1	2	SLIDE GATE EXTRUSION A-82785-A	10	6 3/16	6061-T6	1/2" PLATE EDGE		175051

LIST OF MATERIALS FOR ONE ASSEMBLY

TOLERANCE UNLESS SPECIFIED:
ANGLES: ± 1°
FRACTIONS: ± 1/16"
DECIMALS:
.XX ± .03"
.XXX ± .010"

JOB NO.	CUSTOMER	REQ'D
8182	HART ENGINEERING CORPORATION	2

6784 SLIDE GATE ASSEMBLY
SG-13 & SG-14
TAUNTON WWTF, TAUNTON, MA

8182D85937A2	SG-14	
8182D85937A1	SG-13	
GATE SERIAL NO.	GATE TAG I.D.	

DRAWN:	TL	12-10-21
CHECK:	TL	12-10-21
APPR:	TL	12-10-21
		DATE

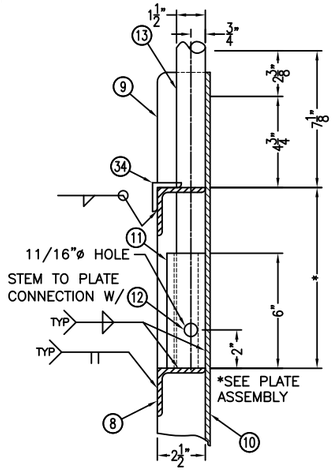
SCALE: NTS WT.

WACO PRODUCTS INCORPORATED
BALTIMORE, MARYLAND 21229-5511

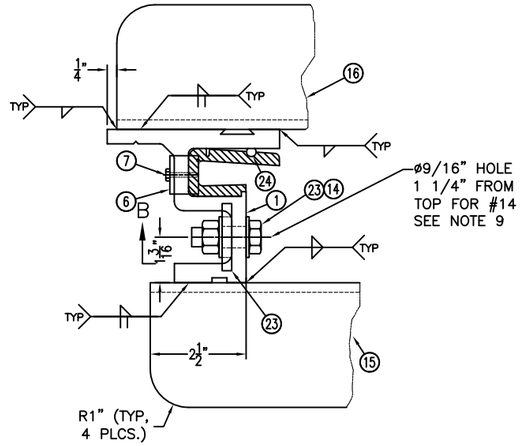
D-85937 A

SHEET 1 OF 2 REV.

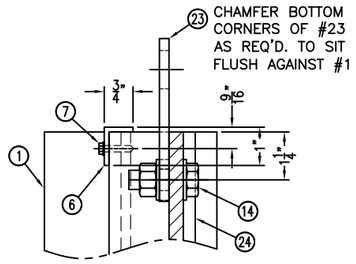
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL



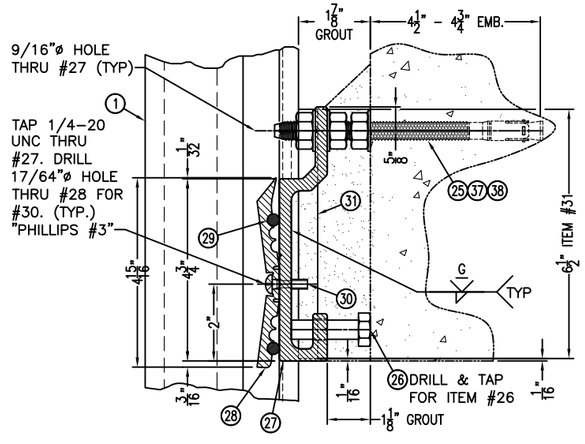
SECTION G–G



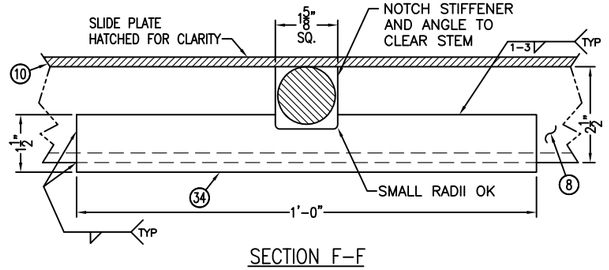
VIEW A–A



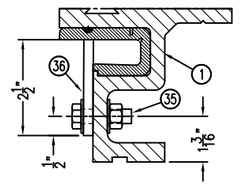
SECTION B–B



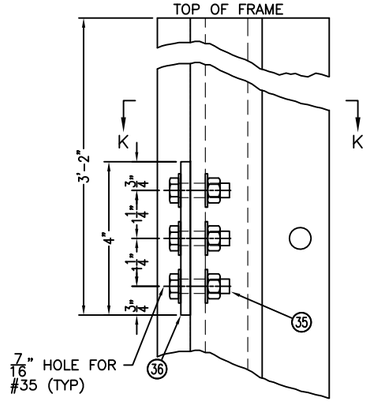
SECTION C–C



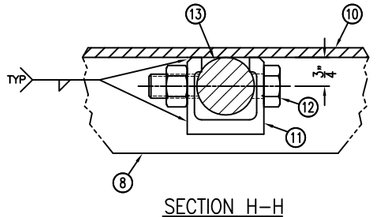
SECTION F–F



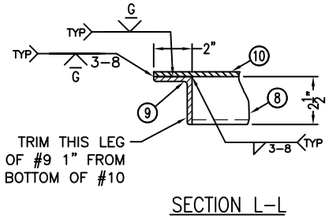
SECTION K–K



DETAIL J



SECTION H–H



SECTION L–L

LIST OF MATERIALS FOR ONE ASSEMBLY

JOB NO.	CUSTOMER	REQ'D
8182	HART ENGINEERING CORPORATION	2

TOLERANCE UNLESS SPECIFIED:
ANGLES: ± 1°
FRACTIONS: ± 1/16"
DECIMALS:
.XX ± .03"
.XXX ± .010"

6784 SLIDE GATE ASSEMBLY
SG–13 & SG–14
TAUNTON WWTF, TAUNTON, MA

DRAWN:	TL	12–10–21
CHECK:	TL	12–10–21
APPR:	TL	12–10–21
		DATE

SCALE: NTS WT.

WACO PRODUCTS INCORPORATED
BALTIMORE, MARYLAND 21229–5511

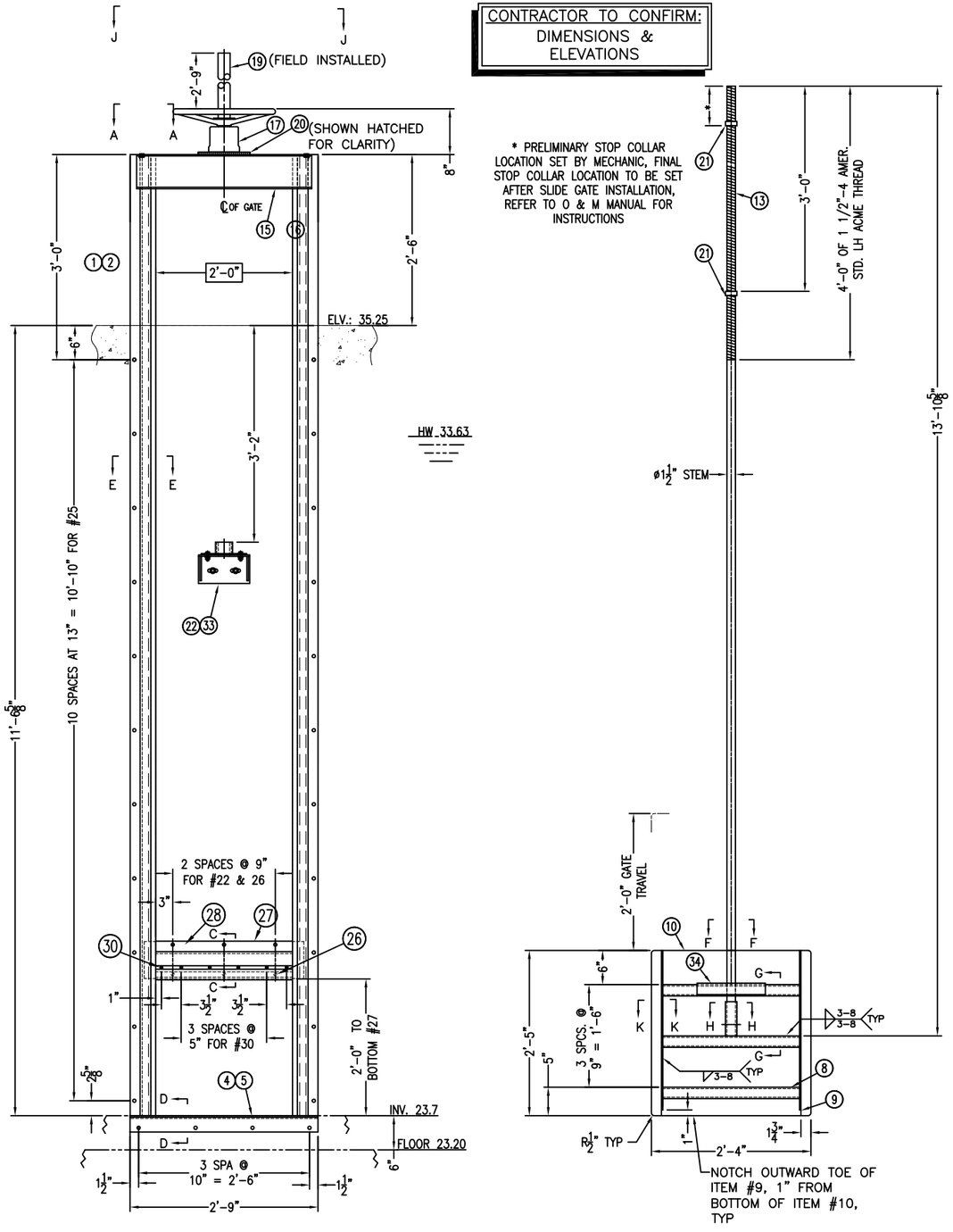
D–85937 A

SHEET 2 OF 2 REV.

REVISIONS			
STM	DESCRIPTION	DATE	APPROVAL

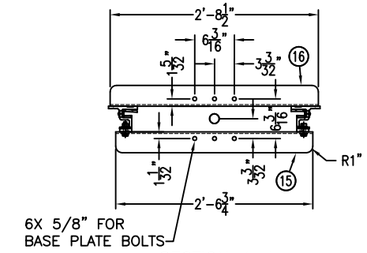
ENGINEER TO CONFIRM:
HIGH WATER LEVEL
(SEE NOTE 8)

CONTRACTOR TO CONFIRM:
DIMENSIONS &
ELEVATIONS



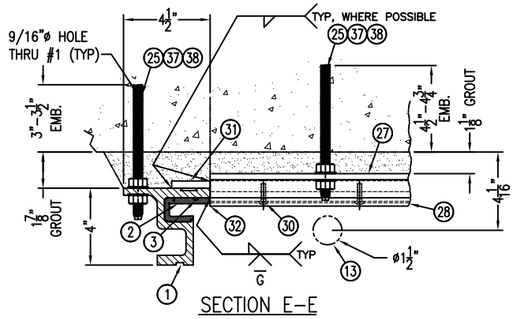
FRAME ASSEMBLY

SLIDE PLATE ASSEMBLY

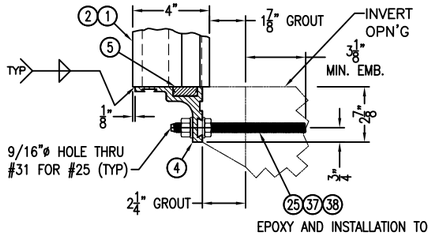


SECTION J–J
(OPERATOR ITEMS NOT SHOWN)

EPOXY AND INSTALLATION TOOLS EXCLUDED FROM WACO'S SCOPE OF SUPPLY. CONTRACTOR TO SUPPLY EPOXY



SECTION E–E



EPOXY AND INSTALLATION TOOLS EXCLUDED FROM WACO'S SCOPE OF SUPPLY. CONTRACTOR TO SUPPLY EPOXY

SECTION D–D

NOTES:
1. ALL DIMENSIONS ARE IN INCHES UNLESS NOTED OTHERWISE.
2. CONTRACTOR TO VERIFY ALL DIMENSIONS.
3. ALL BOLT HOLE LOCATIONS ±1/16" WITH NO ACCUMULATION.
4. ALL WELDING TO BE DONE PER AWS D1.6 OR AWS D1.2.
5. WACO NAME PLATE SHOULD BE INSTALLED PROPERLY AND LEGIBLY MARKED WITH JOB AND GATE NUMBER, WA–62.
6. ALL ALUMINUM IN CONTACT WITH CONCRETE TO RECEIVE ONE SHOP COAT OF BITUMINOUS PAINT.
7. CRANK OR HANDWHEEL DIRECTIONAL ARROWS GROUND TO SHOW CORRECT DIRECTION.
8. GATE DESIGNED FOR 10.0 FEET OF MAXIMUM HEAD.
9. CONTRACTOR MUST USE SHACKLES AND SPREADER BAR TO LIFT GATES, DO NOT LIFT FROM SINGLE POINT. REFER TO MANUFACTURER'S O & M MANUAL FOR SPECIFIC HANDLING AND INSTALLATION INSTRUCTIONS. FAILURE TO FOLLOW MANUFACTURER'S INSTRUCTIONS MAY VOID WARRANTY. LIFT LUG, ITEM #23 TO BE REMOVED AFTER INSTALLATION.
10. WORKMANSHIP IAW WACO STANDARD WA–36.

ITEM	QTY	DESCRIPTION	FT.	IN.	MAT'L	MAT'L SPEC	REV	STOCK NO.
38	58	1/2" FLAT WASHER			316 SST			
37	58	1/2" HEX NUT			316 SST			
36		NOT USED						
35		NOT USED						
34	1	1/4" X 1 1/2" X 1 1/2" ANGLE	1	0	6061–T6			
33	1	STEM GUIDE	–	–	ALUM.	B–80981C		
32	2	CORNER SEAL	–	–	NEOPRENE	A–81617		524003
31	2	1/2" FLAT BAR X 2"	0	6 1/2	6061–T6			
30	6	1/4" PAN/TRUSS HEAD MACHINE SCREW W/NEOPRENE BACKED FW & LW	0	1	316 SST			
29	2	5/16"ø CORD	2	0 1/2	NITRILE			500013
28	1	HEADER SEAL POLYGLIDE EXTRUSION, WA–63	2	0	UHMW			500021
27	1	HORIZONTAL SEAL EXTRUSION A–85277	2	0	6061–T6			175055
26	3	1/2"–13 HH BOLT	0	1 3/4	316 SST			
25	29	1/2"–13 ALL THREAD X	0	7	316 SST			
24	2	5/16"ø CORD	0	6	NITRILE			500013
23	2	LIFT LUG	–	–	–	A–85250		
22	2	1/2" EXPANSION ANCHOR W/NUT & FW	0	7	316 SST			
21	2	STOP COLLAR	–	–	BRONZE			955276
20	1	(WJ) 3/8" ADAPTER PLATE 8"	–	–	–	A–81283–E		
19	1	0' – 3' INDICATOR TAPE	–	–	VINYL			955074
18		NOT USED						
17	1	BS–1015 OPERATOR W/18" HANDWHEEL/STEM COVER	2	9	–	B–85291		
16	1	6" ALUM. ASSOC. CHANNEL 4.03#	2	8 1/2	6061–T6			
15	1	6" ALUM. ASSOC. CHANNEL 4.03#	2	6 3/4	6061–T6			
14	2	1/2"–13 HH BOLT W/ NUT & 2 FW'S X	0	1 1/2	316 SST			
13	1	1 1/2"ø ROD	13	10 5/8	304 SST			638067–12
12	1	5/8"ø HH BOLT W/ NUT, 2X FW & LW	0	3 1/2	316 SST			
11	1	STIFFENER EXTR'N	0	6	6061–T6			175054
10	1	1/4" PLATE 28" X	2	5	6061–T6			
9	2	1/4" X 2" X 2" ANGLE	2	5	6061–T6			
11	3	STIFFENER EXTR'N	2	0	6061–T6			175054
7	2	#8 SELF DRILLING SCREW	0	0 3/4	304 SST			
6	2	1/8" X 1" X 3/4" SHRP CRNR ANGLE	0	1	6061–T6			
5	1	1/2" X 1 1/4" STRIP	2	9	NEOPR.	A–77785		500004
4	1	SLIDE GATE INVERT EXTRUSION A–64497	2	9	6061–T6			175084
3	2	5/16"ø CORD	3	0	NITRILE			500013
2	2	POLYGLIDE EXTRUSION A–82716–C	14	1 1/8	UHMW	1/2" PLATE EDGE		500018
1	2	SLIDE GATE EXTRUSION A–82785–A	14	0 5/8	6061–T6	1/2" PLATE EDGE		175051

LIST OF MATERIALS FOR ONE ASSEMBLY

8182D85942–1	SG–11
GATE SERIAL NO.	GATE TAG I.D.

TOLERANCE UNLESS SPECIFIED:
ANGLES: ± 1°
FRACTIONS: ± 1/16"
DECIMALS: .XX ± .03" .XXX ± .010"

JOB NO.	CUSTOMER	REQ'D
8182	HART ENGINEERING CORPORATION	1

6784 SLIDE GATE ASSEMBLY
SG–11
TAUNTON WWTF, TAUNTON, MA

DRAWN:	TL	12–10–21
CHECK:	TL	12–10–21
APPR:	TL	12–10–21
		DATE

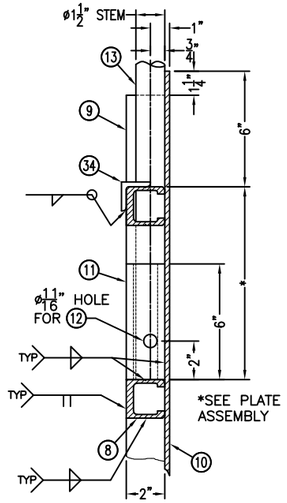
SCALE: NTS WT.

WACO PRODUCTS INCORPORATED
BALTIMORE, MARYLAND 21229–5511

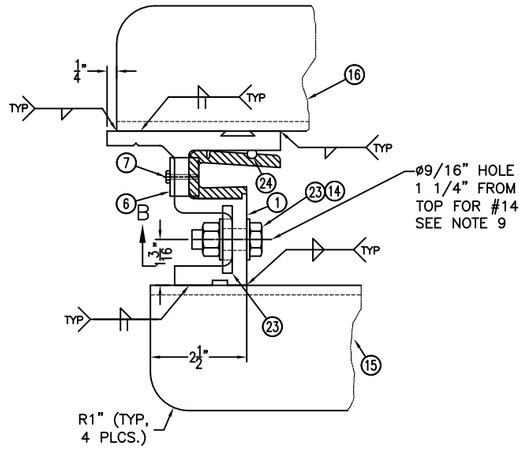
D–85942

SHEET 1 OF 2 REV.

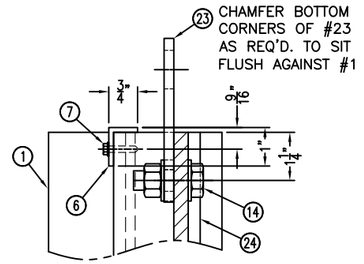
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL



SECTION E–E

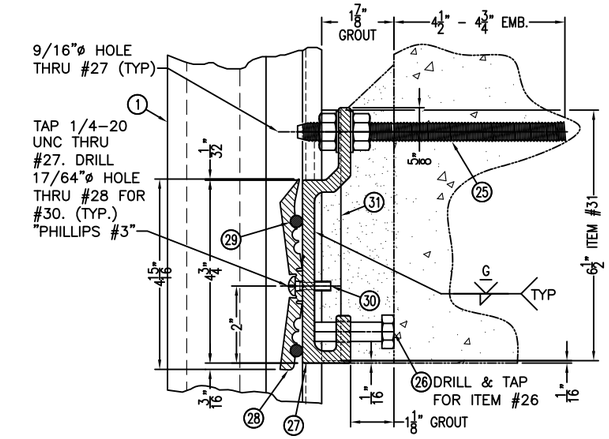


VIEW A–A

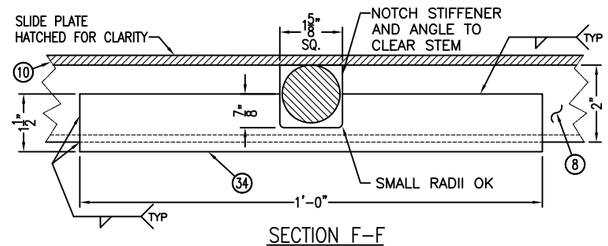


SECTION B–B

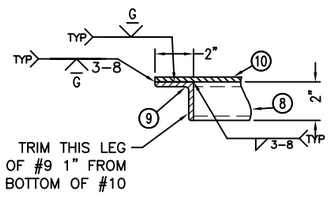
EPOXY AND INSTALLATION TOOLS EXCLUDED FROM WACO'S SCOPE OF SUPPLY. CONTRACTOR TO SUPPLY EPOXY



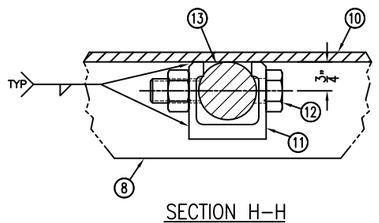
SECTION C–C



SECTION F–F



SECTION K–K



SECTION H–H

LIST OF MATERIALS FOR ONE ASSEMBLY

8182	HART ENGINEERING CORPORATION	1	
JOB NO.	CUSTOMER	REQ'D	

TOLERANCE UNLESS SPECIFIED:
ANGLES: ± 1°
FRACTIONS: ± 1/16"
DECIMALS:
.XX ± .03"
.XXX ± .010"

6784 SLIDE GATE ASSEMBLY
SG–11
TAUNTON WWTF, TAUNTON, MA

WACO PRODUCTS INCORPORATED
BALTIMORE, MARYLAND 21229–5511

		DATE
DRAWN:	TL	12–10–21
CHECK:	TL	12–10–21
APPR:	TL	12–10–21

SCALE: NTS WT.

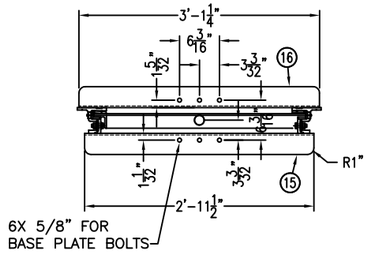
D–85942

SHEET 2 OF 2 REV.

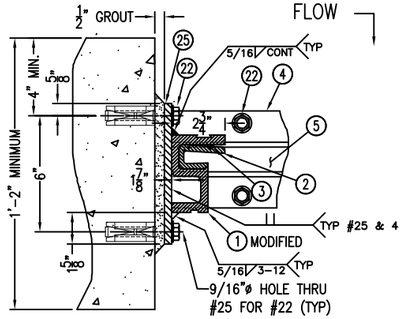
CONTRACTOR TO CONFIRM:
DIMENSIONS & ELEVATIONS

ENGINEER TO CONFIRM:
HIGH WATER LEVEL
(SEE NOTE 8)

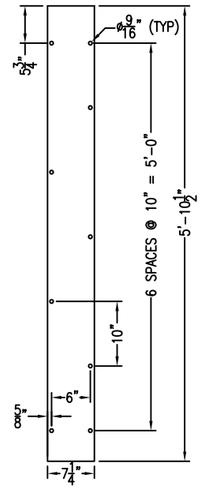
REVISIONS			
ITM	DESCRIPTION	DATE	APPROVAL



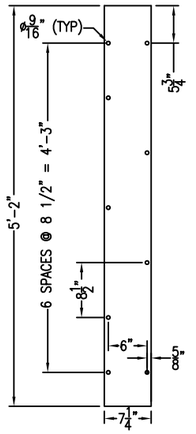
PLAN VIEW
(OPERATOR ITEMS NOT SHOWN)



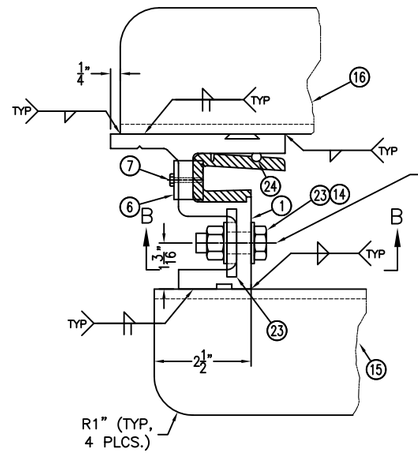
SECTION C–C



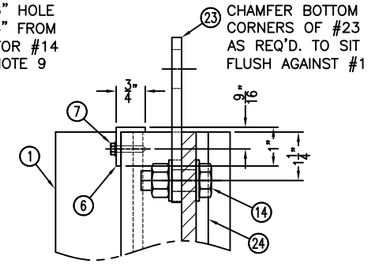
ITEM #25L DETAIL



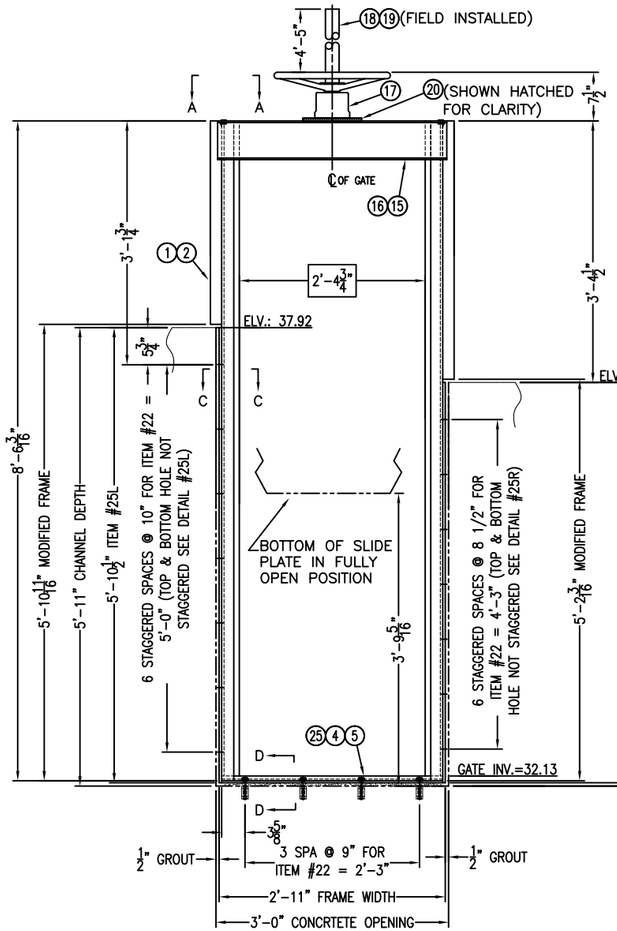
ITEM #25R DETAIL



VIEW A–A

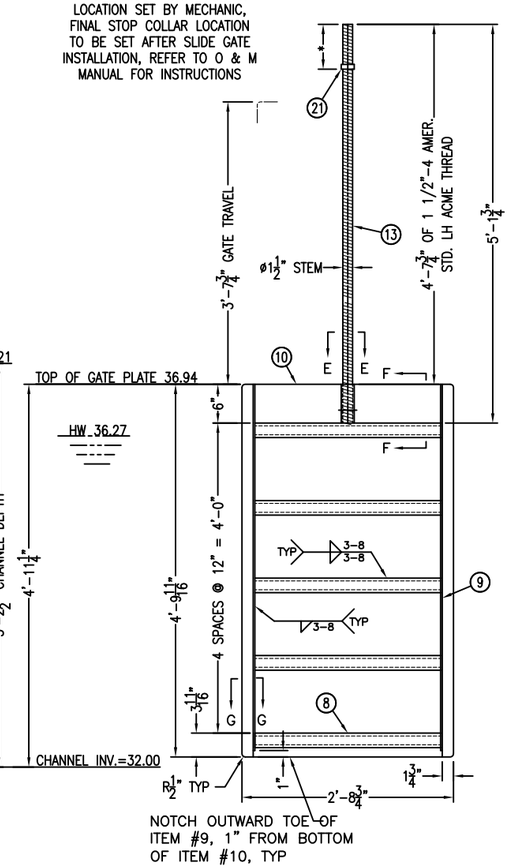


SECTION B–B

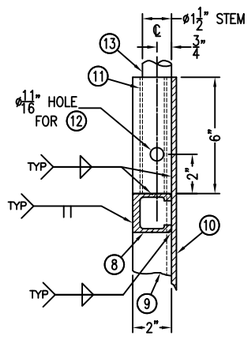


FRAME ASSEMBLY

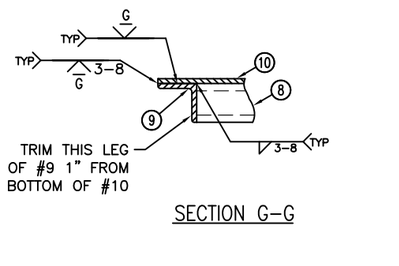
* PRELIMINARY STOP COLLAR LOCATION SET BY MECHANIC, FINAL STOP COLLAR LOCATION TO BE SET AFTER SLIDE GATE INSTALLATION, REFER TO O & M MANUAL FOR INSTRUCTIONS



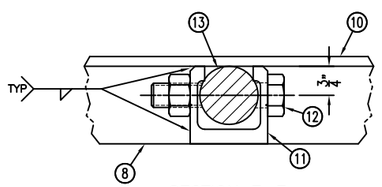
SLIDE PLATE ASSEMBLY



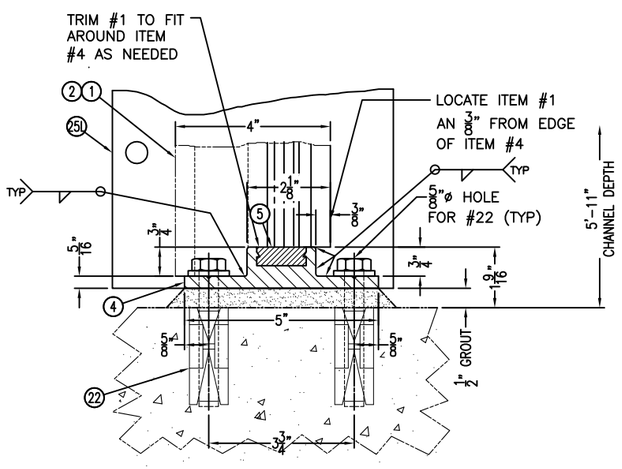
SECTION F–F



SECTION G–G



SECTION E–E



SECTION D–D

NOTES:
1. ALL DIMENSIONS ARE IN INCHES UNLESS NOTED OTHERWISE.
2. CONTRACTOR TO VERIFY ALL DIMENSIONS.
3. ALL BOLT HOLE LOCATIONS ±1/16" WITH NO ACCUMULATION.
4. ALL WELDING TO BE DONE PER AWS D1.6 OR AWS D1.2.
5. WACO NAME PLATE SHOULD BE INSTALLED PROPERLY AND LEGIBLY MARKED WITH JOB AND GATE NUMBER, WA–62.
6. ALL ALUMINUM IN CONTACT WITH CONCRETE TO RECEIVE ONE SHOP COAT OF BITUMINOUS PAINT.
7. CRANK OR HANDWHEEL DIRECTIONAL ARROWS GROUND TO SHOW CORRECT DIRECTION.
8. GATE DESIGNED FOR 5.0 FEET OF MAXIMUM HEAD.
9. CONTRACTOR MUST USE SHACKLES AND SPREADER BAR TO LIFT GATES, DO NOT LIFT FROM SINGLE POINT. REFER TO MANUFACTURER'S O & M MANUAL FOR SPECIFIC HANDLING AND INSTALLATION INSTRUCTIONS. FAILURE TO FOLLOW MANUFACTURER'S INSTRUCTIONS MAY VOID WARRANTY. LIFT LUG, ITEM #23 TO BE REMOVED AFTER INSTALLATION.
10. WORKMANSHIP IAW WACO STANDARD WA–36.

ITEM	QTY	DESCRIPTION	FT.	IN.	MAT'L	MAT'L SPEC	REV	STOCK NO.
25R	1	3/8" PLATE 7 1/4" X	5	2	6061–T6			
25L	1	3/8" PLATE 7 1/4" X	5	10 1/2	6061–T6			
24	2	5/16"ø CORD	0	6	NITRILE			500013
23	2	LIFT LUG	–	–	–	A–85250		
22	26	1/2" EXP. SHIELD W/HH BOLT & SAE FW	0	3 1/2	ZNC/316 SST			
21	1	STOP COLLAR	–	–	BRONZE			955276
20	1	(WJ) 3/8" ADAPTER PLATE 8"	–	–	–	A–81283–E		
19	1	0' – 3' INDICATOR TAPE	–	–	VINYL			955074
18	1	3' – 6' INDICATOR TAPE	–	–	VINYL			955075
17	1	BS–1015 OPERATOR W/18" HANDWHEEL/STEM COVER	4	5	–	B–85291		
16	1	6" ALUM. ASSOC. CHANNEL 4.03#	3	1 1/4	6061–T6			
15	1	6" ALUM. ASSOC. CHANNEL 4.03#	2	11 1/2	6061–T6			
14	2	1/2"–13 HH BOLT W/ NUT & 2 FW'S X	0	1 1/2	316 SST			
13	1	1 1/2"ø ROD	5	1 3/4	304 SST			638067–12
12	1	5/8"ø HH BOLT W/ NUT, 2X FW & LW	0	3 1/2	316 SST			
11	1	STIFFENER EXTR'N	0	6	6061–T6			175054
10	1	1/4" PLATE 32 3/4" X	4	9 11/16	6061–T6			
9	2	1/4" X 2" X 2" ANGLE	4	9 11/16	6061–T6			
8	5	STIFFENER EXTR'N	2	4 3/4	6061–T6			103147
7	2	#8 SELF DRILLING SCREW	0	0 3/4	304 SST			
6	2	1/8" X 1" X 3/4" SHRP CRNR ANGLE	0	1	6061–T6			
5	1	1/2" X 1 1/4" STRIP	2	10 1/4	NEOPR.	A–77785		500004
4	1	SLIDE GATE INVERT EXTRUSION A–85230	2	10 1/4	6061–T6	A–85230		175049
3	2	5/16"ø CORD	5	6	NITRILE			500013
2	2	POLYGLIDE EXTRUSION A–82716–C	8	5 15/16	UHMW	1/2" PLATE EDGE		500018
1	2	SLIDE GATE EXTRUSION A–82785–A	8	6 3/16	6061–T6	1/2" PLATE EDGE		175051

LIST OF MATERIALS FOR ONE ASSEMBLY

GATE SERIAL NO.	GATE TAG I.D.
8182D86030–1	SG–2

TOLERANCE UNLESS SPECIFIED:
ANGLES: ± 1°
FRACTIONS: ± 1/16"
DECIMALS:
.XX ± .03"
.XXX ± .010"

JOB NO.	CUSTOMER	REQ'D
8182	HART ENGINEERING CORPORATION	1

6734 SLIDE GATE ASSEMBLY
SG–2
TAUNTON WWTF, TAUNTON, MA

		DATE
DRAWN:	TL	2–16–22
CHECK:	TL	2–16–22
APPR:	TL	2–16–22

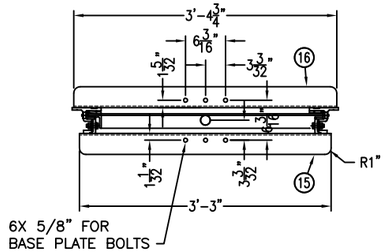
SCALE: NTS WT.

WACO PRODUCTS INCORPORATED
BALTIMORE, MARYLAND 21229–5511

D–86030

SHEET 1 OF 1 REV.

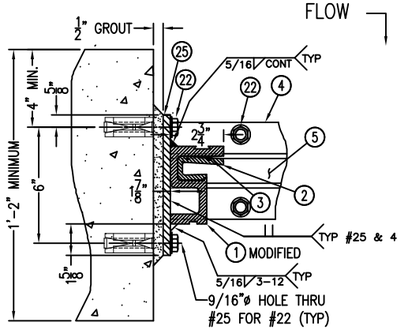
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL



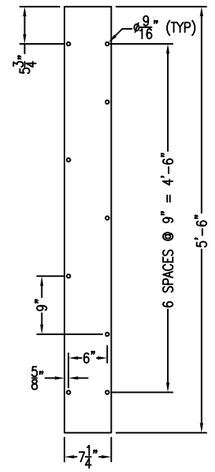
PLAN VIEW
(OPERATOR ITEMS NOT SHOWN)

ENGINEER TO CONFIRM:
HIGH WATER LEVEL
(SEE NOTE 8)

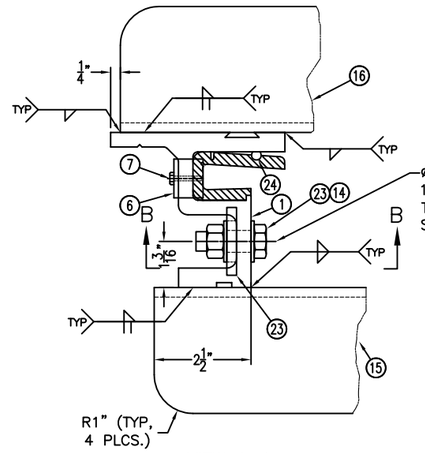
CONTRACTOR TO CONFIRM:
DIMENSIONS &
ELEVATIONS



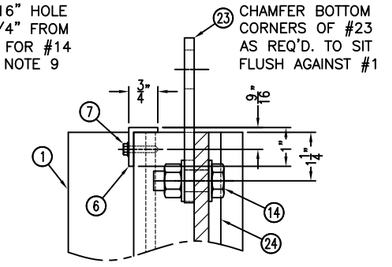
SECTION C-C



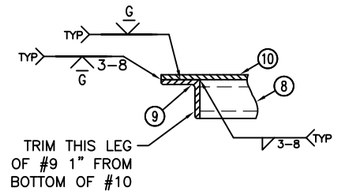
ITEM #25 DETAIL
(LH SHOWN RH MIRROR IMMAGE)



VIEW A-A

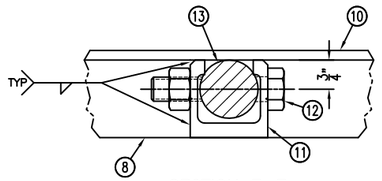


SECTION B-B

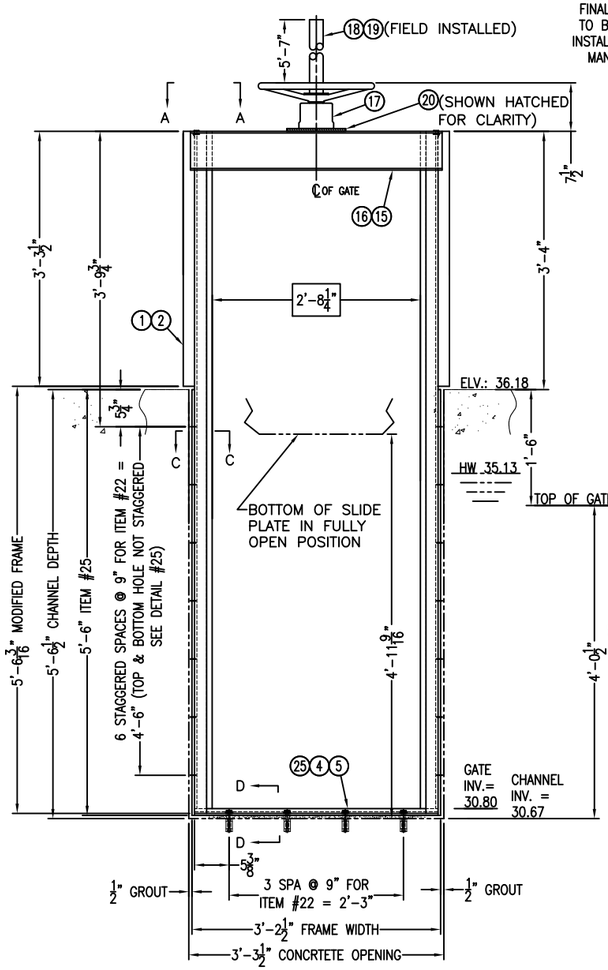


TRIM THIS LEG
OF #9 1" FROM
BOTTOM OF #10

SECTION G-G

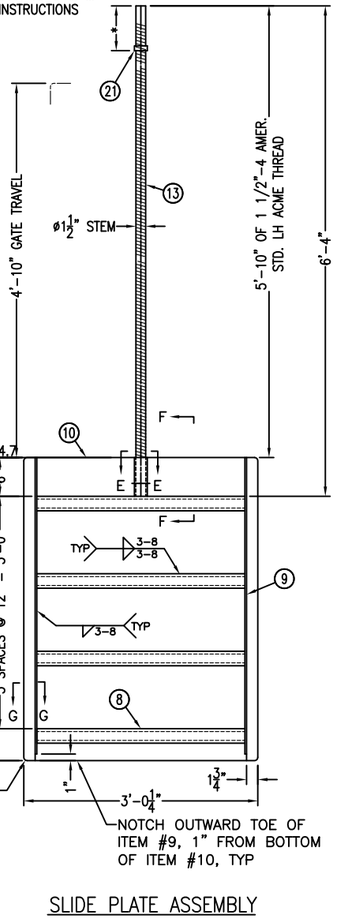


SECTION E-E

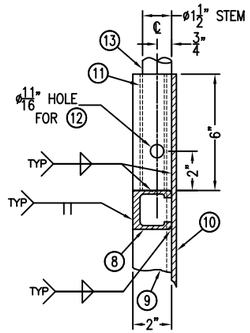


FRAME ASSEMBLY

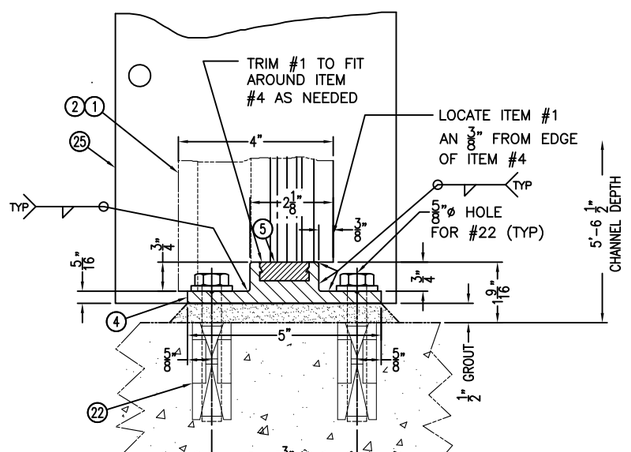
* PRELIMINARY STOP COLLAR LOCATION SET BY MECHANIC, FINAL STOP COLLAR LOCATION TO BE SET AFTER SLIDE GATE INSTALLATION, REFER TO O & M MANUAL FOR INSTRUCTIONS



SLIDE PLATE ASSEMBLY



SECTION F-F



SECTION D-D

NOTES:
1. ALL DIMENSIONS ARE IN INCHES UNLESS NOTED OTHERWISE.
2. CONTRACTOR TO VERIFY ALL DIMENSIONS.
3. ALL BOLT HOLE LOCATIONS ±1/16" WITH NO ACCUMULATION.
4. ALL WELDING TO BE DONE PER AWS D1.6 OR AWS D1.2.
5. WACO NAME PLATE SHOULD BE INSTALLED PROPERLY AND LEGIBLY MARKED WITH JOB AND GATE NUMBER, WA-62.
6. ALL ALUMINUM IN CONTACT WITH CONCRETE TO RECEIVE ONE SHOP COAT OF BITUMINOUS PAINT.
7. CRANK OR HANDWHEEL DIRECTIONAL ARROWS GROUND TO SHOW CORRECT DIRECTION.
8. GATE DESIGNED FOR 5.0 FEET OF MAXIMUM HEAD.
9. CONTRACTOR MUST USE SHACKLES AND SPREADER BAR TO LIFT GATES, DO NOT LIFT FROM SINGLE POINT. REFER TO MANUFACTURER'S O & M MANUAL FOR SPECIFIC HANDLING AND INSTALLATION INSTRUCTIONS. FAILURE TO FOLLOW MANUFACTURER'S INSTRUCTIONS MAY VOID WARRANTY. LIFT LUG, ITEM #23 TO BE REMOVED AFTER INSTALLATION.
10. WORKMANSHIP IAW WACO STANDARD WA-36.

ITEM	QTY	DESCRIPTION	FT.	IN.	MAT'L	MAT'L SPEC	REV	STOCK NO.
25	2	3/8" PLATE 7 1/4" X	5	6	6061-T6			
24	2	5/16"ø CORD	0	6	NITRILE			500013
23	2	LIFT LUG	–	–	–	A-85250		
22	26	1/2" EXP. SHIELD W/HH BOLT & SAE FW	0	3 1/2	ZINC/316 SST			
21	1	STOP COLLAR	–	–	BRONZE			955276
20	1	(WJ) 3/8" ADAPTER PLATE 8"	–	–	–	A-81283-E		
19	1	0' – 3' INDICATOR TAPE	–	–	VINYL			955074
18	1	3' – 6' INDICATOR TAPE	–	–	VINYL			955075
17	1	BS-1015 OPERATOR W/18" HANDWHEEL/STEM COVER	5	7	–	B-85291		
16	1	6" ALUM. ASSOC. CHANNEL 4.03#	3	4 3/4	6061-T6			
15	1	6" ALUM. ASSOC. CHANNEL 4.03#	3	3	6061-T6			
14	2	1/2"-13 HH BOLT W/ NUT & 2 FW'S X	0	1 1/2	316 SST			
13	1	1 1/2"ø ROD	6	4	304 SST			638067-12
12	1	5/8"ø HH BOLT W/ NUT, 2X FW & LW	0	3 1/2	316 SST			
11	1	STIFFENER EXTR'N	0	6	6061-T6			175054
10	1	1/4" PLATE 36 1/4" X	3	10 15/16	6061-T6			
9	2	1/4" X 2" X 2" ANGLE	3	10 15/16	6061-T6			
8	4	STIFFENER EXTR'N	2	8 1/4	6061-T6			103147
7	2	#8 SELF DRILLING SCREW	0	0 3/4	304 SST			
6	2	1/8" X 1" X 3/4" SHRP CRNR ANGLE	0	1	6061-T6			
5	1	1/2" X 1 1/4" STRIP	3	1 3/4	NEOPR.	A-77785		500004
4	1	SLIDE GATE INVERT EXTRUSION A-85230	3	1 3/4	6061-T6	A-85230		175049
3	2	5/16"ø CORD	4	6	NITRILE			500013
2	2	POLYGLIDE EXTRUSION A-82716-C	8	9 7/16	UHMW	1/2" PLATE EDGE		500018
1	2	SLIDE GATE EXTRUSION A-82785-A	8	9 11/16	6061-T6	1/2" PLATE EDGE		175051

LIST OF MATERIALS FOR ONE ASSEMBLY

8182D86031-1	SG-6		
GATE SERIAL NO.	GATE TAG I.D.		

TOLERANCE UNLESS SPECIFIED:
ANGLES: ± 1°
FRACTIONS: ± 1/16"
DECIMALS:
.XX ± .03"
.XXX ± .010"

JOB NO.	CUSTOMER	REQ'D
8182	HART ENGINEERING CORPORATION	1

6734 SLIDE GATE ASSEMBLY
SG-6
TAUNTON WWTF, TAUNTON, MA

DRAWN:	TL	2-16-21
CHECK:	TL	2-16-21
APPR:	TL	2-16-21
		DATE

SCALE: NTS WT.

WACO PRODUCTS INCORPORATED
BALTIMORE, MARYLAND 21229-5511

D-86031

SHEET 1 OF 1 REV.