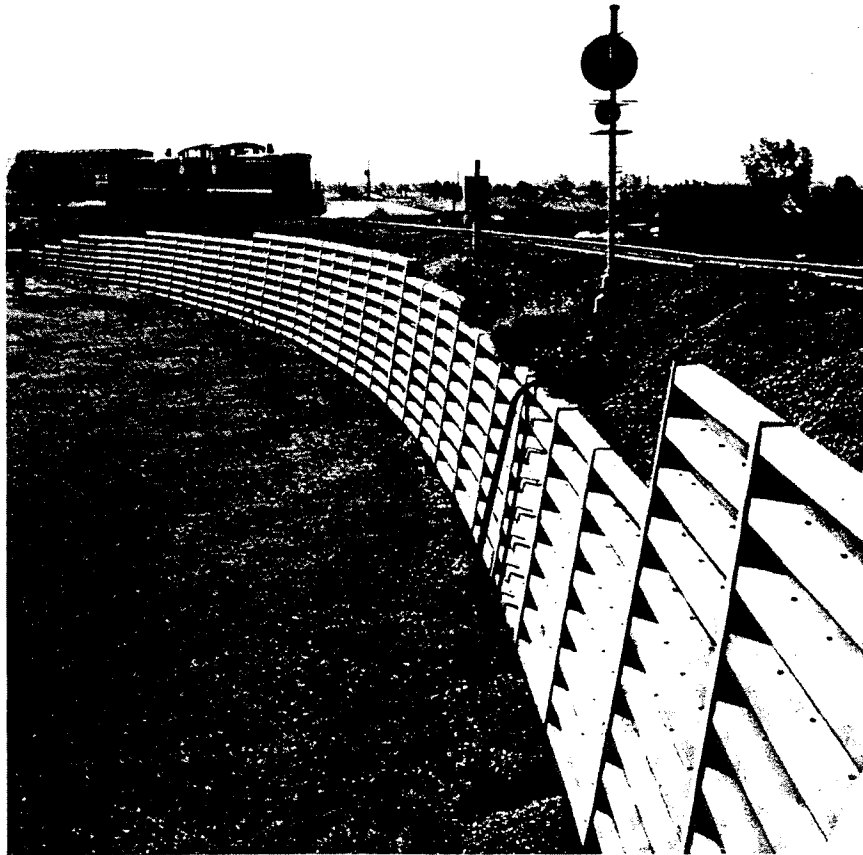




INSTALLATION INSTRUCTIONS



BIN-TYPE RETAINING WALLS

GENERAL INSTRUCTIONS ARMTEC TYPE 2 BIN WALL

Minimum Tools Required

Structural wrenches (Spud Wrenches)
Drift pins
Socket wrenches with ratchet handles
Transit and level (if line and grade must be established)
Carpenter's level
Ordinary chalklines, tapes, etc.

Desirable Additional Tools

Power or impact wrenches
Mobile crane or "cherry-picker"

Tools Necessary if Field Fabrication Required

3/4" Electric drill with bits and reamers
Hacksaw or other metal cutting saw

ERECTION INSTRUCTIONS

Bin Wall Type 2 (BW2)

A. Preliminary Steps

1. Separate the parts and stack like parts together. See drawings for nomenclature of parts.

Bundles and stacks should be positioned so that water will drain off parts.

After parts are stacked and accessible, **all parts should be checked against the bill of material.**

2. The Part Number is stenciled on each stringer and spacer, for thickness identification see Drawing BW40001E. Drawing BW40002E shows the location of each thickness stringer. Note that stringers are counted from the top of the wall, not the bottom. As an example, a 2.539 m high wall will have 6 - 1.6 mm stringers in the front and 4 - 1.6 mm stringers in the rear face. A 4.572 m high wall will have 8 - 1.6 mm and 3 - 2.0 mm stringers in the front and 6 - 1.6 mm and 3 - 2.0 mm stringers in the rear face.

Spacer thickness does not vary within any one wall depth. All spacers for a Design D wall, for example, are 2.8 mm and 3264 mm long.

3. Establish the front and rear lines of the wall and the location of each vertical connector. If wall is on a curve, or contains specially fabricated corners, a supplemental drawing is furnished.

Prepare a bed for each grade place at the proper elevation, as determined from drawing BW40002E. Note that for Designs A and B walls on a 1 to 6 batter, the front grade plate is lower than the rear plate. On all other 1 to 6 batter walls, the rear grade plate is lower.

If the base of the wall is below existing ground, 450 mm - 600 mm wide trenches may be dug for the lower wall members. Trenches must be wide enough, in relation to depth, to allow for proper compaction of backfill adjacent to the members.

If solid rock or other unyielding soil is within 200 mm of the final elevation of the grade places, this must be removed at grade plate locations for an area of approximately 600 mm x 600 mm and replaced with a 200 mm thick layer of uncompacted fill.

B. Assembly

1. Distribute grade plates and vertical connectors to proper locations. Vertical connectors longer than 3758 mm will contain 2 or more pieces. See drawing BW40001E for make up of vertical connectors. Note that on normal walls, rear vertical connectors are 812 mm shorter than front.

On 2 piece (or 3 piece) vertical connectors, erection will often be easier if the entire length is not preassembled. (Except corner vertical connectors which **must be** preassembled. The upper corner connector type on one corner will be the same as lower corner connector on opposite corner.)

2. Attach grade plates to vertical connectors (finger tight) then attach 2 lower spacers (finger tight) to front and rear vertical connectors. Stand up first 2 units and brace. (For Pre-assembly see page 5)

NOTE: In the horizontal overlaps of spacers, double holes are punched, but for inside spacers (fill on both sides) only single bolting is required.

3. Attach 2 stringers (finger tight) in both front and rear. Refer to drawing BW40002E for proper thickness of stringers.

4. Now, check alignment of this first bin. Make sure vertical connectors are plumb (for vertical walls) or on proper batter. The temporary attachment of a stringer stiffener at the top of each face will be advantageous. When alignment of all parts is correct, tighten all bolts except top bolts in top stringers and spacers. On high walls use more than one stringer to ensure that connectors are parallel.

NB - If the Bin Wall is a standard configuration - **The spacers must be parallel to each other and perpendicular at 90 degrees to the stringers for correct installation.**

5. Continue wall assembly, checking subsequent bins for alignment before tightening bolts. The sequence of operations is not critical, and may vary. Some precautions should be observed, however, for ease of assembly. These are:

5-1 Make sure vertical connectors are proper distance apart at top, before tightening any bolts.

5-2 Backfilling, particularly of tall bins, is less difficult if bin sides are not built too high.

5-3 End Transverse Sections require spacer closures over ends of all spacers which **do not have earth on both sides**. Closures should be installed with spacers.

5-4 Some special corners will require stringer ends to be closed with stringer closures. This detail will be shown on special drawings or instructions.

5-5 Double check that all bolts in areas to be backfilled have been finally tightened.

5-6 On spliced vertical connectors, the splice plate should be on the side of the web opposite the spacers.

6. Special corners or other details will be shown on supplementary drawings. Study these thoroughly before starting erection of the special section. Procedures will vary, but in general, it is desirable to erect and fix firmly in position one of the vertical connectors at such a point. The special plates and attachments, plus the second vertical connector will then be supported during assembly.

7. Under some conditions, spacers in end transverse sections require reinforcing with tie rods to the next transverse section. Special details are furnished for this procedure. Rods must be placed before any backfilling of end bins is started.

8. When walls of different design depth join, a split vertical connector is used to connect the stringers of the narrower wall to the spacers of the next bin. The split vertical connector is the length of the lower wall height, and is bolted to the spacers with its longer leg against the spacers. Backfilling in this area must be done with special care, to avoid losing fill material through the open corrugations of the spacers.

C. Backfilling

1. Backfill material -- a good granular material should be used -- see Armtec brochure for Type 2 Bin Wall.

2. If drains are to be used behind or through the wall, install these before starting backfilling.

3. Backfilling should start in the bins first, and generally 1200 mm or more of bin-fill should be in place before commencing filling outside or behind the bin. Next fill the area immediately in front of the wall, to the approximate final grade if possible.

4. Backfill should be placed in maximum 200 mm layers, and each layer must be leveled and thoroughly compacted before the next is placed. Leave **no** voids anywhere, in the bins or outside. Fill all corrugations in spacers and stringers, but do not damage wall members with dumping or compaction equipment. Care must be taken not to use power compactors inside the bins within 300 mm of front stringers.

5. Keep the bin filling well above (1200 mm minimum) the fill level behind the wall. This insures the stability of the wall. However, if the rear face of the wall is close to an earth or rock face and working room is unduly restricted, that area should be backfilled before the rear stringers are installed too high for access.

D. Alternate Methods of Assembly

1. With adequate handling equipment, a fast economical method of erection is to preassemble the transverse sections, wholly or in part. All work is at a good working level and bolting is downhand and therefore faster whether hand or power wrenches are used.

1-1 Sawhorses and timber generally make an adequate assembly table. Spacers are laid (holes up) with ends square and flush, and bolted together through the intermediate holes.

1-2 Vertical connectors are then laid on the spacer ends, checked for parallel, and then bolted tight to the spacers. Attach grade plates loosely to vertical connector bottoms.

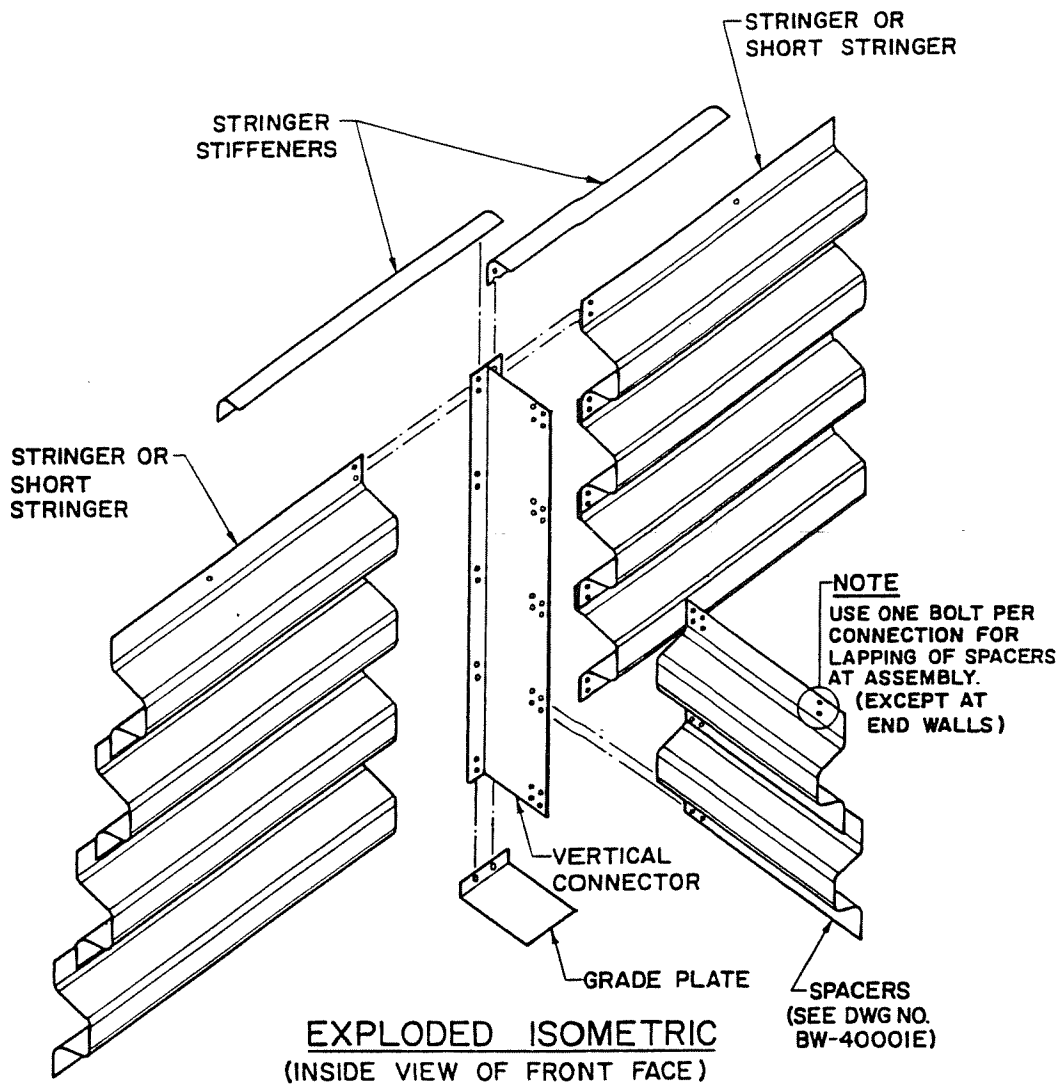
1-3 The assembled transverse section is then set on the prepared foundation and loosely connected to the previous transverse section or bin by 1 or 2 stringers at bottom, front and rear and stringers or stringer stiffeners at the top. Plumb the new transverse section, then tighten bolts. The rest of the stringers are then bolted into place.

2. Under some circumstances, the level preassembly of sections of front and rear walls will be extremely advantageous. If lifting equipment is available, and an adequate working area is accessible, this method should be considered.

2-1 Provide a working platform of sawhorses and timbers.

2-2 Lay out vertical connectors with legs of tees up, and loosely bolt on top and bottom stringers (or stringer stiffeners).

- 2-3 Check that vertical connectors are parallel and square to stringers then continue installing stringers, tightening nuts as you go. Attach grade plates.
- 2-4 Lift completed section of front or rear wall into place on prepared grade plate beds, check for proper batter, and brace.
- 2-5 Lift other face similarly, and tie to already erected face with spacers, starting at bottom.



IMPORTANT - STRINGERS TO BE LAPPED AS SHOWN ABOVE
WITH BOTTOM LIP INSIDE TOP LIP

NOTE

- 1) BACKFILL MATERIAL TO BE WELL-GRADED FREE-DRAINING GRANULAR MATERIAL, WITH LARGEST PARTICLES IN THE 75mm (MAX) RANGE AND NOT MORE THAN 10 PERCENT FINES PASSING THE NO. 200 SIEVE (0.075mm).

PARTS LIST

PART	FUNCTION
Vertical Connector	Connects stringers and spacers
Corner Vertical Connector	Connects stringers and spacers
Stringer Stiffener	Front face top trim
Stringer	Forms front and rear panel sections
Spacer	Forms transverse sections and connects front and rear panels
Grade Plate	Base for vertical connectors
15.9 mm (5/8") Bolts and Nuts	Fasteners
Split Vertical Connector	Used where bins of different depth meet
Spacer Closure	Retains fill at ends of walls
Stringer Closure	Retains fill at special corners

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