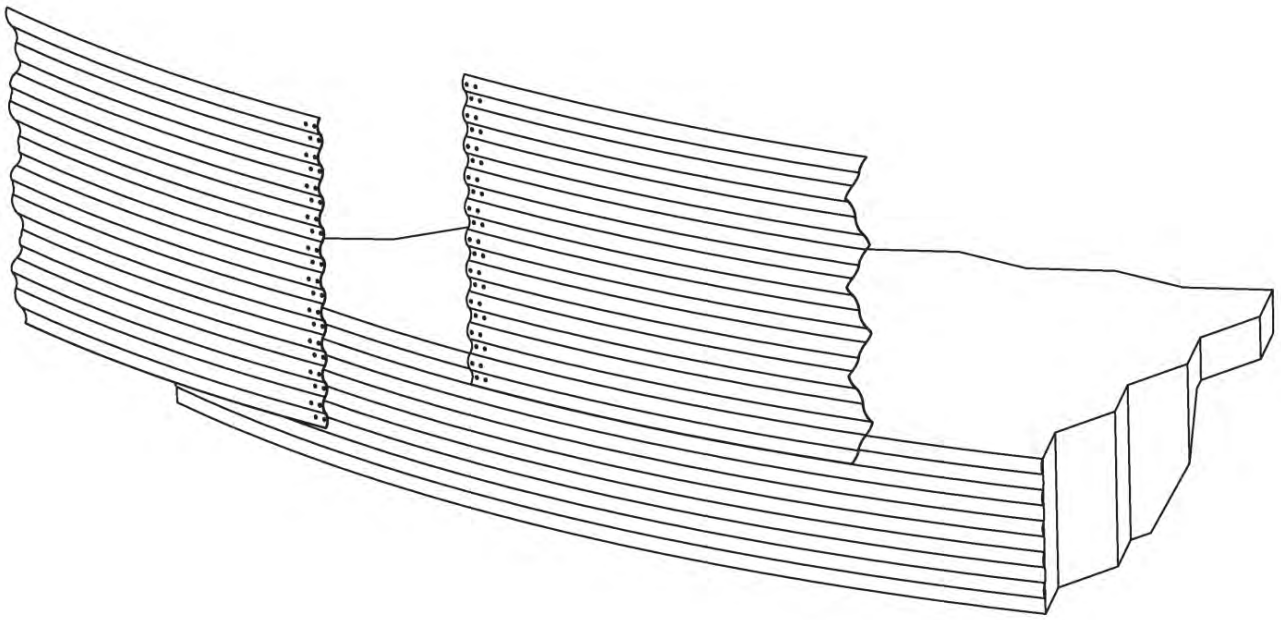
SEALFORM INSTALLATION MANUAL

For 21’ - 48’ Dia. Farm Duty Bins up to 9 Rings



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INTRODUCTION

This product was carefully designed to give years of dependable service and was manufactured with the finest materials available. This manual should be thoroughly read prior to installation of sealform bin mounting system. This manual is to be used as a guideline only. The reliability, safety and good service life of this product depends to a very large extent on the care taken in installing and otherwise preparing this product for its intended use.

NOTE: This manual is for bin diameters from 21' to 48', up to a maximum 9 rings tall.

RECEIVING AND INSPECTION

Carefully inspect materials for damage as soon as they are received. Verify that quantities of parts or packages received correspond to quantities shown on packing slip. Report any damage or shortage to delivery carrier as soon as possible. Sukup Manufacturing Co.'s responsibility for damage to materials ended with acceptance by delivery carrier. Refer to bill of lading. Save all paperwork and documentation.

IMPORTANT: Prior to installation, protect materials from weather.
Do not allow moisture to become trapped between any galvanized parts.

FOUNDATION

Foundations are based on soil bearing capacity of at least 3,700 lbs./sq. ft. Foundation designs use 3,000 lbs./sq. inch ultimate compressive strength after 28 days for concrete and 43,500 psi rebar. Foundation designs provided are suggestions only.

DISCLAIMER: It shall be the sole responsibility of the customer to obtain actual foundation drawings designed by and constructed to the specifications of a licensed professional structural engineer with knowledge of the actual soil and load specific to the project and location. Consideration should also include, but not be limited to, live loads, dead loads, wind loads, soil bearing loads, seismic zone, proper moisture run-off on top of base, and types of aeration applied for the project.

Sukup Manufacturing Co. will not be responsible for any damage to a product, including, but not limited to, any damage that results from poor soil conditions or inadequate concrete type, grade, bearing strength, and construction method. Soil bearing tests must be performed by a competent, independent engineering firm. Concrete foundation construction must be done by a competent concrete contractor.

IMPORTANT: Foundation must be uniform and level, varying no more than 1/4" over a span of 10 feet.

CAUTION: Bins on sealforms should not be filled until concrete has cured for 28 days.

SAFETY: Please refer to safety pages in manual for bin that will be erected on sealform.

GRAIN BIN LIMITED WARRANTY

SUKUP MANUFACTURING CO. (Sukup) warrants, to original retail purchaser within 5 years from date of purchase, that grain bin shall be free from defects in material and workmanship. A part will not be considered defective if it substantially fulfills performance specifications. This includes cosmetic (appearance) issues that will not affect life of the structure. Should any part prove defective within warranty period, part will be replaced without charge F.O.B. Sukup Manufacturing Co., Sheffield, Iowa USA or Distribution Centers - Arcola, Illinois; Aurora, Nebraska; Defiance, Ohio; Jonesboro, Arkansas; Cameron, Missouri; Watertown, South Dakota. To obtain warranty, a copy of original invoice is required.

WARRANTY CERTIFICATION - Warranty registration card should be mailed within two weeks of product delivery to certify warranty coverage.

THE FOREGOING LIMITED WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES OF MERCHANTABILITY, FITNESS OR PURPOSE AND OF ANY OTHER TYPE, WHETHER EXPRESS OR IMPLIED. Sukup neither assumes nor authorizes anyone to assume for it any other obligation or liability in connection with said part, and will not be liable for incidental or consequential damages. REMEDIES STATED HEREIN SHALL BE THE EXCLUSIVE REMEDIES AVAILABLE UNDER THIS LIMITED WARRANTY.

Sukup reserves the right to change specifications, add improvements or discontinue manufacture of any of its equipment without notice or obligation to purchasers of its equipment. This warranty gives you specific legal rights. You may also have other rights which vary according to state or province.

WARRANTY EXCLUSIONS - Labor, transportation, or any cost related to a service call is not provided by Sukup. This Limited Warranty does not apply to damage resulting from misuse, neglect, normal wear, accident or improper installation or maintenance. ITEMS NOT MANUFACTURED BY SUKUP ARE COVERED UNDER WARRANTIES OF THEIR RESPECTIVE MANUFACTURERS AND ARE EXCLUDED FROM COVERAGE UNDER THE SUKUP WARRANTY. SUKUP MANUFACTURING CO. MAKES NO WARRANTY, EXPRESS OR IMPLIED, OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

Foundation recommendations are suggestions only and will vary according to local soil conditions. Soil bearing tests must be performed by a competent, independent engineering firm. Sukup will not assume responsibility for adverse result arising from their use. Sukup will not warrant damage or loss caused, in whole or in part, by inadequate or improper site selection, site preparation, foundation, or any other failure to provide a suitable erection or installation environment for Sukup grain bin or of any product, component, equipment, accessories, parts used in conjunction with Sukup grain bin. Sukup will not warrant damage or loss caused, in whole or in part, by use of bin in a manner other than for which it was designed, or by unauthorized attachments, modifications, alterations, improper or inadequate maintenance, misuse or abuse of the bin.

Sukup is not liable for direct, indirect, incidental or consequential damages, including, without limitation, loss of anticipated profits or benefits. Not responsible for field modifications or erection defects which create structural or storage quality problems.

WARRANTY IS VOID - If not purchased from or constructed by an authorized dealer or a representative of Sukup Manufacturing Co.; If used for substances other than grains and/or free flowing materials.

Prior to installation, purchaser has responsibility to properly store steel bin components. Bin should be stored in dry, temperature and humidity controlled areas to eliminate condensation and other moisture that causes white rust and corrosion. Warranty does not extend to defects, damages or cosmetic (appearance) issues caused by improper storage or handling.

Sukup does not warrant any roof damage caused by excessive vacuum or internal pressure from fans or other air moving systems. Adequate ventilation and/or “make-up air” devices should be provided for all powered air handling systems. Warranty is void if grain is above eave and against roof, as this will block roof vents and cause unwanted loads on roof sheets. Area above surface of grain must allow free movement of air to vents. Sukup does not recommend use of downward flow systems (suction). Severe structural roof damage may occur if fans or other air moving devices are operated during certain high humidity/cold weather conditions. Roof ventilators may frost over and plug or restrict air flow causing excessive vacuum or internal pressures. Roof damage may occur due to improperly installed grain temperature detection cable systems.

Sukup does not warrant failures due to filling bin off-center; unloading from door or off-center floor port; or radial cracks in foundation. If bin has a perforated floor on columns and columns fail, bin can shift sideways causing both sidewall and roof damage.

UNAPPROVED PARTS OR MODIFICATION - All obligations of Sukup under this warranty are terminated if unapproved parts are used, equipment is modified or altered in any way not approved by Sukup in writing, or is not erected or operated according to Sukup installation or operating manuals.

Kit Contents

See table below for sealform kit contents.

	SEALFORM KIT CONTENTS							
BIN DIA.	**21’**	**24’**	**27’**	**30’**	**33’**	**36’**	**42’**	**48’**
SEALFORM KIT #	**BSF219**	**BSF249**	**BSF279**	**BSF309**	**BSF339**	**BSF369**	**BSF429**	**BSF489**
32” WALL SHEET QTY.	7	8	9	10	11	12	14	16
COMP. #	BSF6100	BSF6200	BSF6300	BSF6398	BSF6498	BSF6600	BSF6700	BSF6798
THRUST RING SHEET QTY.	7	8	9	10	11	12	14	16
COMP. #	BSF6170	BSF6290	BSF6380	BSF6470	BSF6560	BSF6690	BSF6780	BSF6860
HARDWARE KIT COMP. #	BSF2191	BSF2491	BSF2791	BSF3091	BSF3391	BSF3691	BSF4291	BSF4891

Table 1 – Sealform kit contents

See table below for breakdown of hardware kit contents. Kit contents are same, only quantity varies according to bin diameter.

HARDWARE KIT CONTENTS									
DESCRIPTION	**COMP. #**	**QTY. DEPENDS ON BIN DIA.**							
		21’	**24’**	**27’**	**30’**	**33’**	**36’**	**42’**	**48’**
Door step	B5015	1	1	1	1	1	1	1	1
Bin bolts, 3/8 x 1”, 100-ct. sack	B5938	2	2	2	3	3	3	4	4
Bin bolts, 3/8 x 1”, 50-ct. sack	B5939	0	1	1	0	0	1	0	1
Flange nuts, 3/8” – 16, 650-ct. bucket	BL5966	0	0	0	1	1	1	1	1
Flange nuts, 3/8” – 16, 200-ct. sack	BL5968	2	2	2	0	0	0	1	1
Flange nuts, 3/8” – 16, 50-ct. sack	BL5969	1	2	1	0	2	2	1	3
Leveling peg, 44”	BSF1244	28	32	36	40	44	48	56	64
Leveling peg strap (U-bolt)	BSF1245	56	64	72	80	88	96	112	128
Anchor bolt, 3/8 – 16 x 7”, bent	J0776	168	192	216	240	264	288	336	384
Lock nut, 3/8”	J1025	168	192	216	240	264	288	336	384
Flat washer, 3/8"	J1117	168	192	216	240	264	288	336	384

Table 2 – Hardware kit contents

NOTE: Thrust ring sheets for bins 21’ to 33’ in dia. are made of 11ga steel and those for bins 36’ to 48’ in dia. are 10ga. Sealform sheets for bins 21’ to 33’ in dia. are made of 20ga steel and those for bins 36’ to 48’ in dia. are 18ga.

Sealform Foundation Cross-Sections & Rebar Layouts

See drawings below and on following pages for design of 36', 42' or 48' sealform bin foundation. For other sizes, contact Sukup Manufacturing Co.

36' Dia. Sealform Foundation

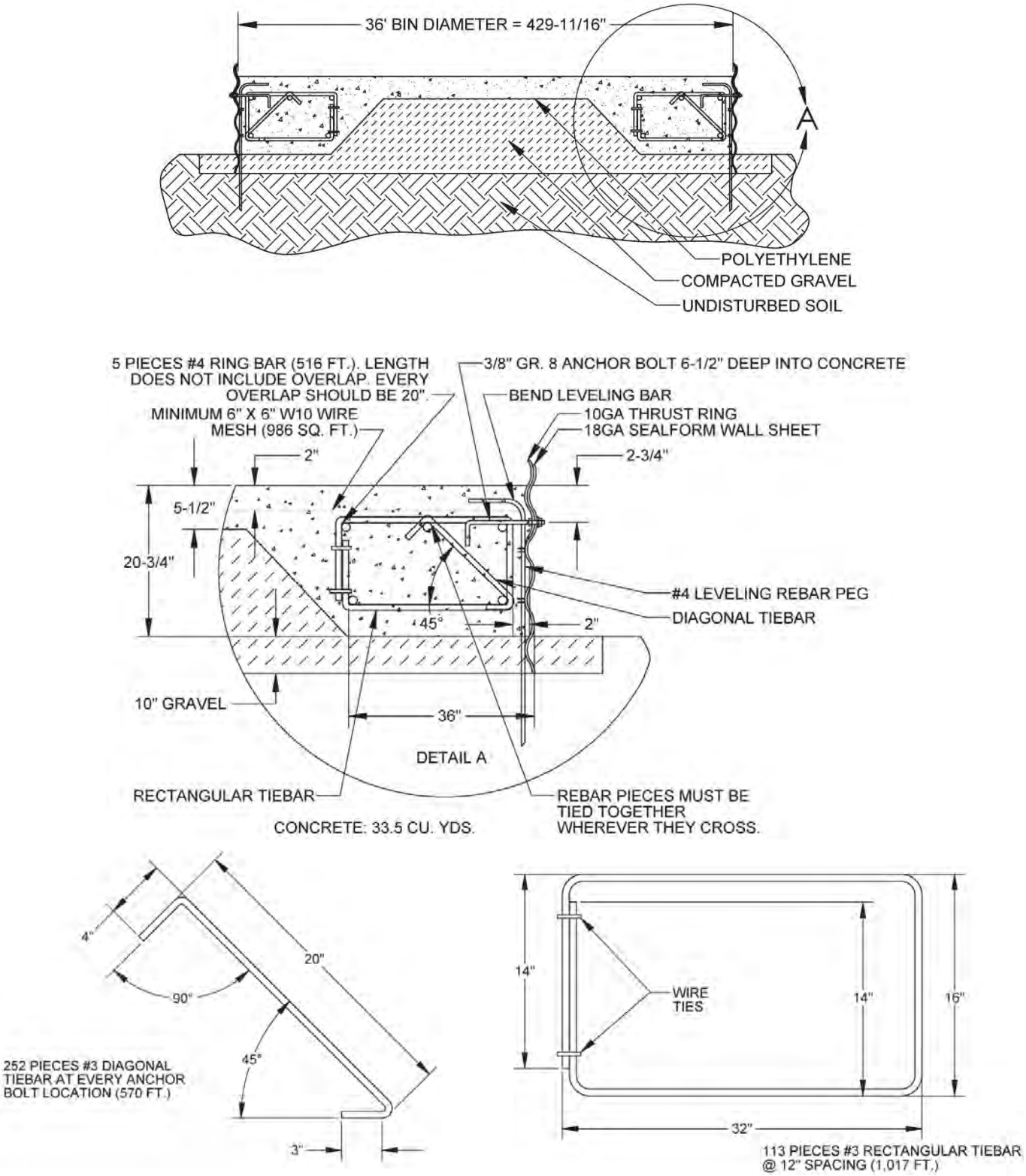

Fig. 1 – Sealform foundation for 36' diameter bin

42’ Dia. Sealform Foundation

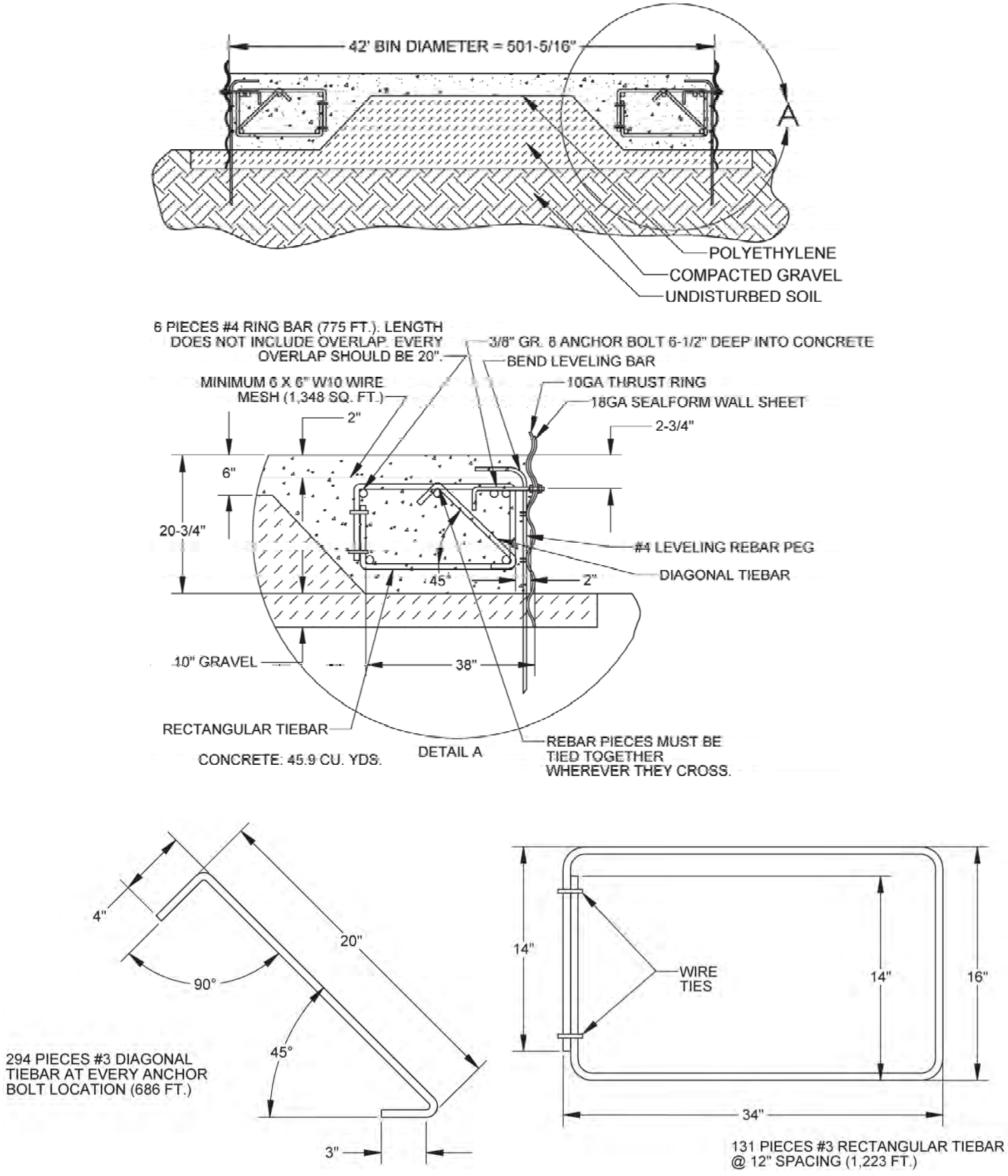

Fig. 2 – Sealform foundation for 42’ diameter bin

48’ Dia. Sealform Foundation

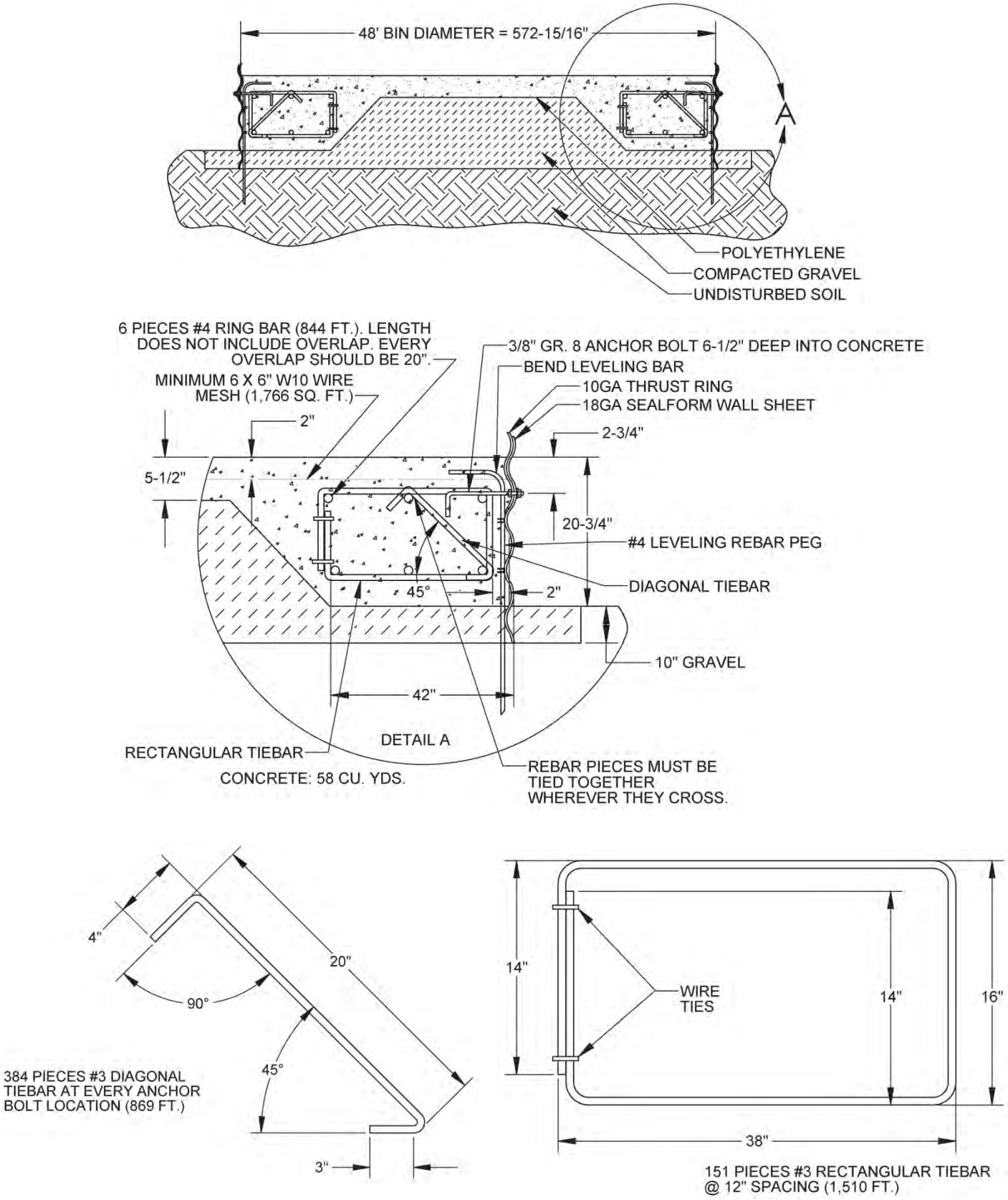

Fig. 3 – Sealform foundation for 48’ diameter bin

Concrete Form Assembly

1. Remove topsoil in an area that is two feet wider than bin diameter. Replace topsoil with compacted gravel as shown in top drawings on previous pages.

2. Use 2 x 6” boards to create a leveling arm with dimensions shown below, depending on size of bin. See Fig. 4. Leveling arm must be straight. Reinforce by attaching a stiffening/splice board to top of leveling arm.

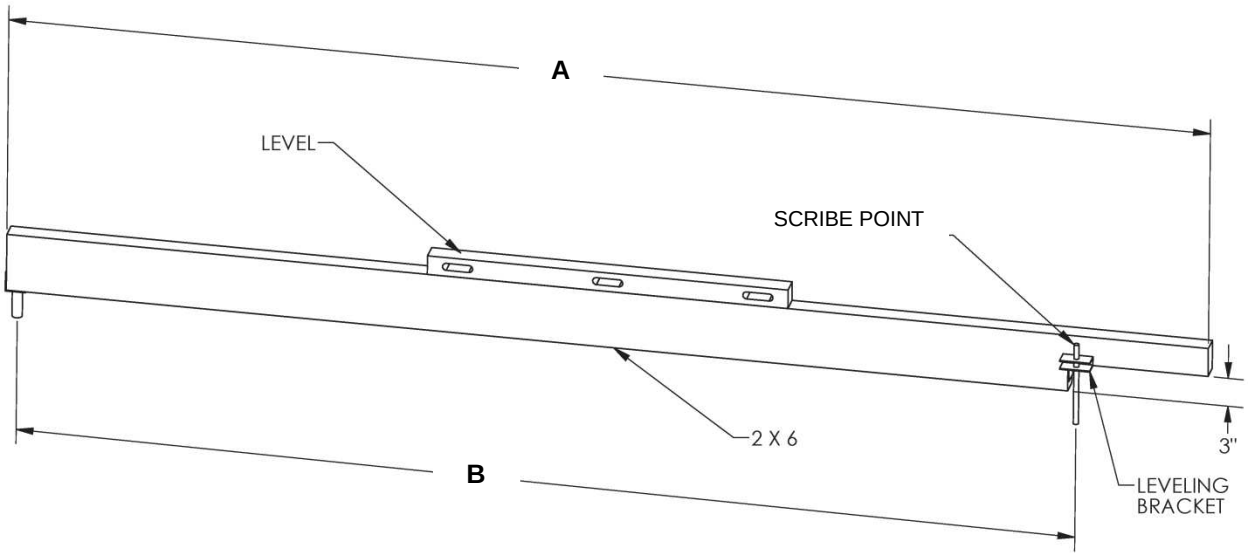

Fig. 4 and Table 3 – Leveling arm dimensions

BIN DIA.	21’	24’	27’	30’	33’	36’	42’	48’
DIM. A	11’	13’	14’	16’	17’	19’	22’	25’
DIM. B	124-1/4”	143-1/4”	161”	179”	197”	215”	250-1/2”	286-1/2”

3. Fasten a scribe point to leveling arm as shown in Fig. 4 and a center pivot as shown in Fig. 5.

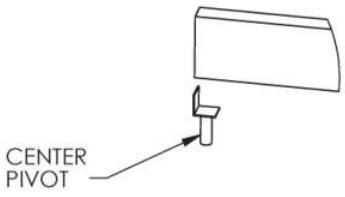

Fig. 5 – Center pivot

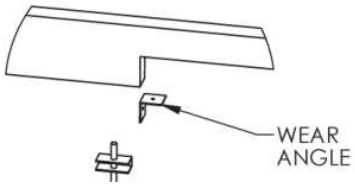

Fig. 6 – Wear angle

4. Drive a 24” piece of #4 rebar into ground where center of bin will be located. Rotate board around center pivot, marking a circle with scribe point. This will be starting point for form assembly.

5. Remove scribe point from board and fasten wear angle as shown in Fig. 6.

6. Assemble thrust rings and sidewall sheets. Make sure thrust ring ends meet at center of sidewall sheets. Leave anchor bolt holes in thrust ring empty at this time. **NOTE:** Thrust ring must go inside of sealform sheets.

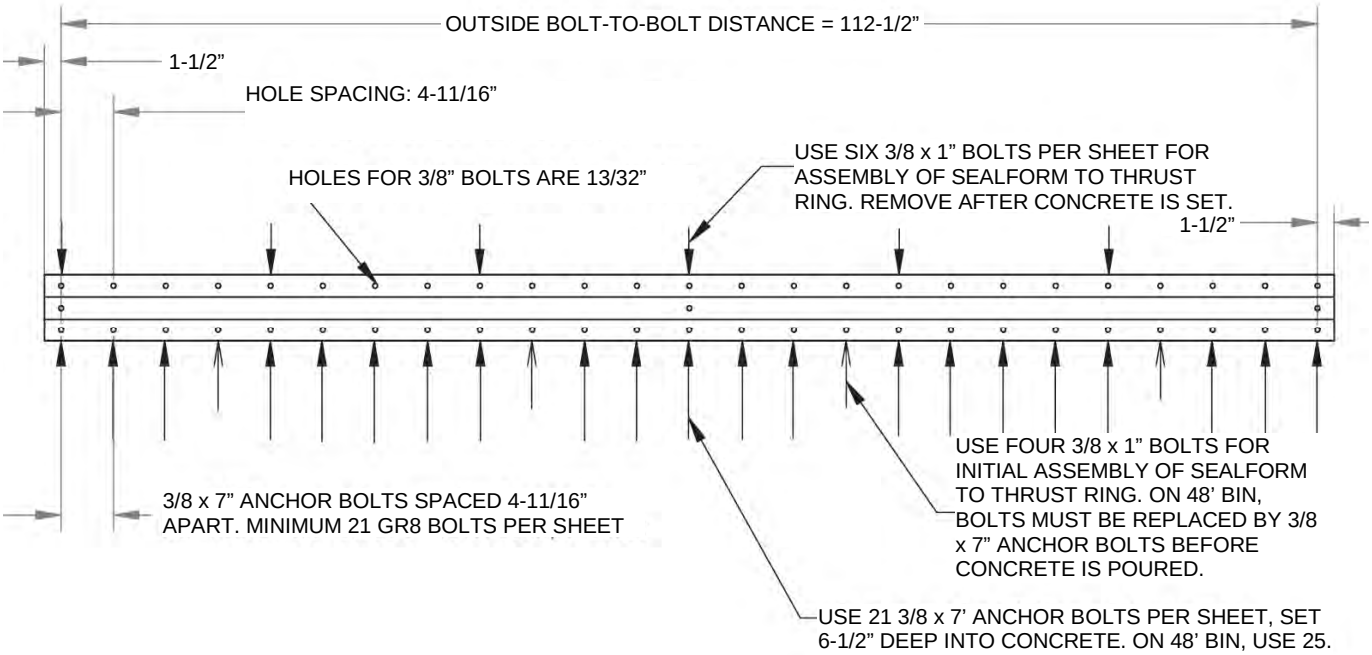

Fig. 7 – Thrust ring panel

7. Use punches to make sure that all top horizontal seam holes in sealform wall sheets and thrust ring panels are aligned. Insert bolts from outside of sealform sheets into thrust ring sheets. Use six 3/8 x 1” bolts in top horizontal seam and four 3/8 x 1” bolts in bottom horizontal seam to attach sealform sheet to thrust ring sheets. **IMPORTANT:** Four 3/8 x 1” bolts in bottom seam must be replaced by 3/8 x 7” anchor bolts on bins 48’ in dia. when other anchor bolts are installed.

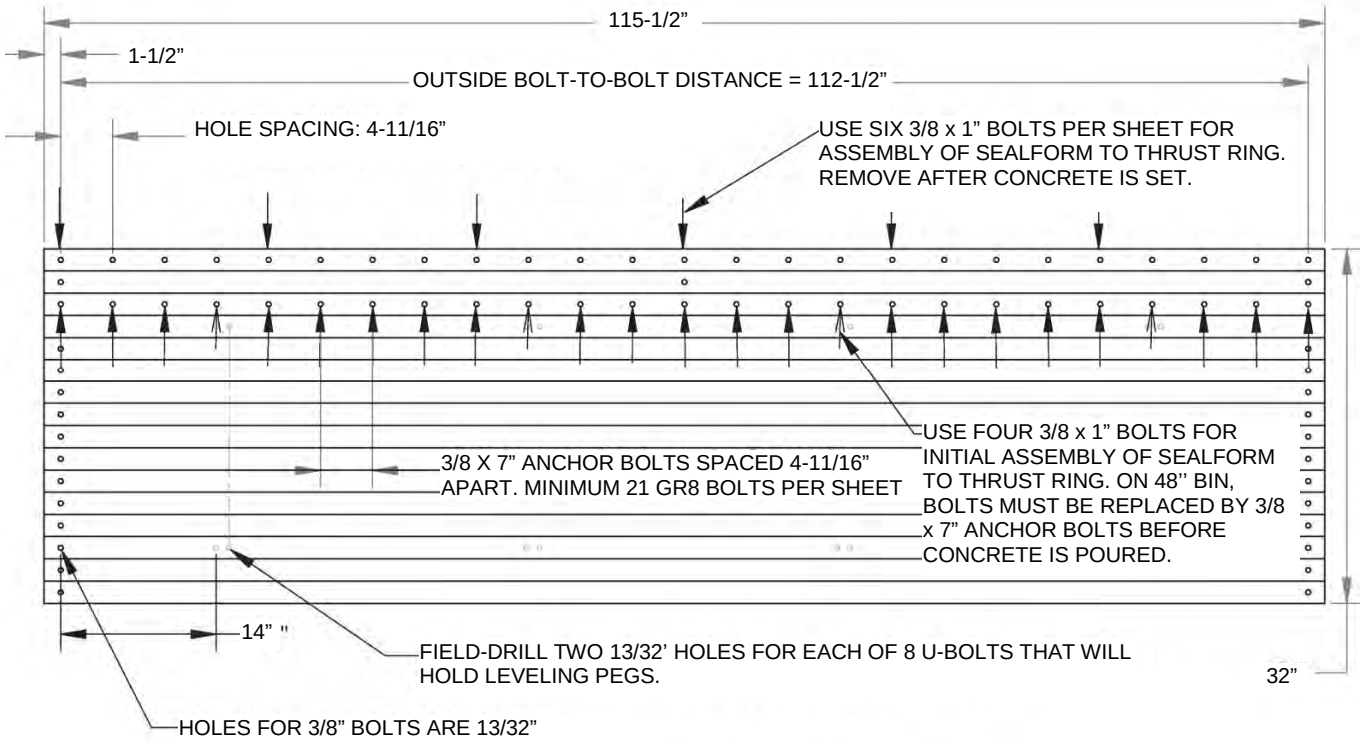

Fig. 8 – Sealform ring panel

8. After sealform and thrust ring sheets are connected as instructed, place all anchor bolts as shown in Figs. 7-9. Make sure to use proper nuts and washers. Do not over-tighten.

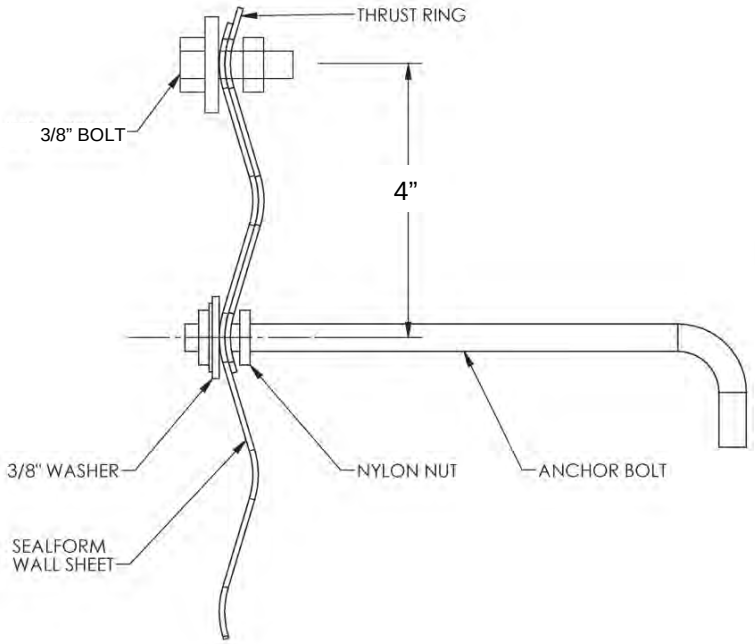

Fig. 9 – Anchor bolt

9. Position sealform ring so leveling arm will rotate freely around entire radius. Install leveling pegs inside of wall sheets using U-bolts as shown in Fig. 10. Drive 44" piece of rebar through U-bolts as shown in Fig. 10. Make sure that rebar can slide freely.

10. Check circularity of form and adjust as needed. Bend or drive leveling pegs down to clear movement of board as it goes around wall sheets. **IMPORTANT:** Leveling pegs must be firmly anchored in ground to keep sealform from shifting.

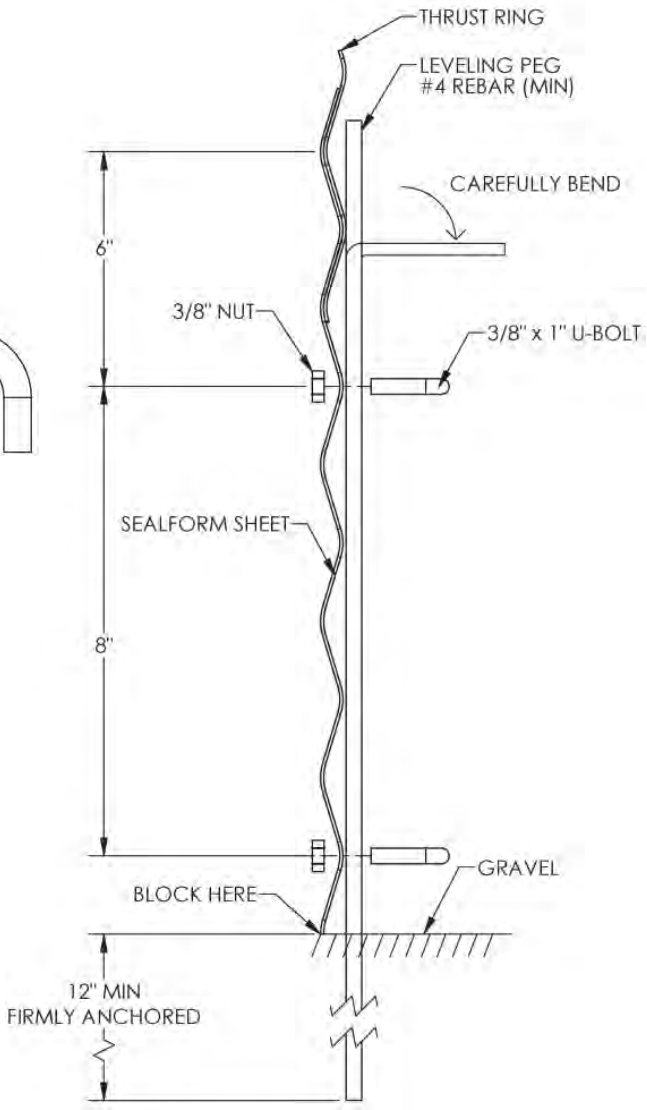

Fig. 10 – Leveling peg installation

11. Use a level at quarter points of circumference to ensure form is level. Adjust as needed and lock sealform in place by tightening U-bolts. If center pivot is too low, adjust its height to match sealform wall sheet height.

12. Repeat leveling procedure at remaining peg locations. If needed, readjust.

13. Once form is level, block up form sheets to prevent any shifting while pouring concrete. See Fig. 10.

14. Position all rebar and wire mesh as shown in Figs. 1-3, depending on bin diameter. Support rebar with small stones or pieces of concrete, ensuring there will be at least 2” of concrete under bottom rebar pieces.

15. Bend leveling pegs as shown in Detail A of Figs. 1-3. Add any additional forming or rebar required for accessories (e.g., aeration, unload auger).

16. Pour concrete carefully so form is not disturbed. Level concrete with board used to mark perimeter, rotating board from center pivot. Double-check that form is level all around before and after pouring concrete. Any shifting of form will cause bin to fit poorly on sealform.

17. Allow concrete to cure for at least three weeks before proceeding with bin assembly.

18. Remove 3/8 x 1” bolts from top six holes in sealform ring.

19. Tighten nuts on all anchor bolts, torqueing to 25-35 ft. lbs. after concrete has cured for 28 days.

20. Assemble bin as instructed in bin erection manual.

IMPORTANT: Do not fill bin before concrete has cured for 28 days. Failure to follow these instructions may result in catastrophic bin failure.

CONTACT INFORMATION

Owner's manuals are available from Sukup Manufacturing Co. Additional copies can be requested using contact information shown below. Please indicate manual number L13928 when requesting Sealform Installation Manual.

SUKUP DEALER INFORMATION

Dealer name: _____

Address: _____

Cell phone: _____

Office phone: _____

Fax: _____

EMERGENCIES – KNOW WHAT TO DO

Have emergency numbers and written directions to your location near your telephone in case of emergency. An area for emergency phone numbers to be recorded has been provided below.

Ambulance • Fire • Police: 9-1-1

Bin rescue team: _____

Emergency medical squad: _____

Address of work site: _____

Directions to work site: _____

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