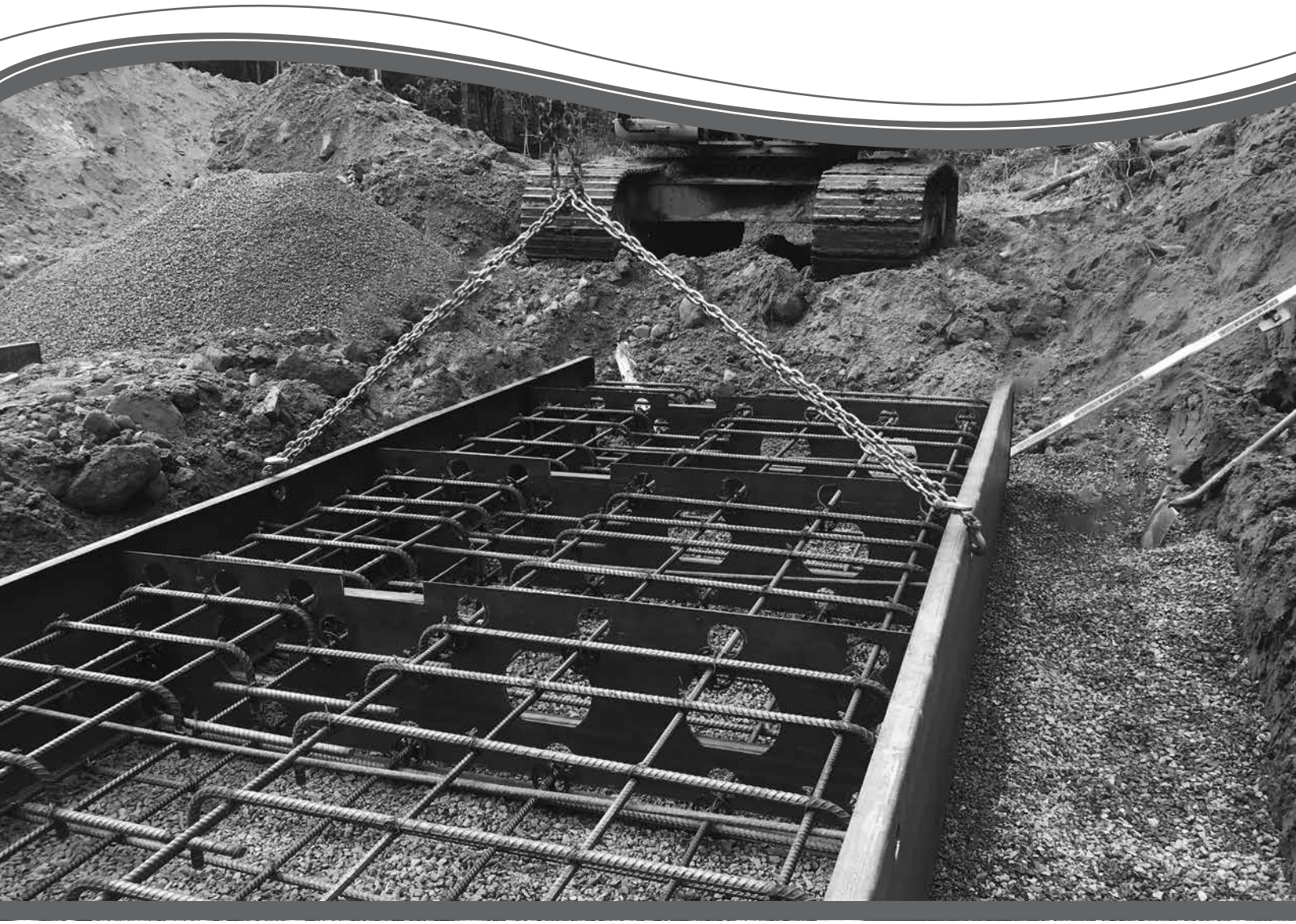
CONTECH®
ENGINEERED SOLUTIONS

Steel EXPRESS® Foundations
Handling and Installation Guide



STEEL
EXPRESS® Foundations

Steel EXPRESS® Foundations Handling and Installation Guide

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Note to Contractor:

If at any time you have any questions, please don't hesitate to call the Winchester Plant Technical Services Team at 859-744-3339 for assistance.

Introduction

AS WITH ANY INSTRUCTIONS, PLEASE READ THROUGH THIS INFORMATION COMPLETELY BEFORE ATTEMPTING ANY FIELD WORK OR ASSEMBLY.

The following is a guideline for the assembly and installation of a Contech Steel EXPRESS Foundation (SEF) system. Prior to assembly, reference any assembly drawings provided, these guidelines, the Structural Plate Design Guide and the engineer's plans and specifications.

For each different structure shipped to the job site, a copy of the assembly drawings, the bill of materials (BOM) and these instructions are enclosed in a keg with a color coded lid. If the order calls for two or more identical structures, only one drawing will be furnished. The drawings provide the specific foundation layout for each structure and must be used to guide assembly.

Steel EXPRESS® Foundations Handling & Installation Guide

This instruction guide is for your crews. Distribute it to help them install Contech® Steel EXPRESS® Foundations correctly. Don't assume experienced workers know all the answers. Review these instructions with your supervisors and crews. It can mean a safer and better job for you and your customer.

We recommend holding a preconstruction meeting with your Contech representative and all interested parties to ensure everyone involved in your project has a high level of understanding on what means and methods will be used to prepare for, install and grout the new structure(s). If you have any questions about these instructions, call your Contech Representative.

⚠ WARNING

1. Failure to follow these instructions can result in serious injury or death and/or damage to foundation units and accessories.
2. Only trained and authorized equipment operators are to be permitted to unload the foundation units and accessories.
3. Wear approved safety hat and shoes, gloves and eye protection.
4. Park the truck and trailer on level ground before you start unloading. It is the responsibility of the consignee to direct the driver to level ground for parking the truck.
5. Keep all unauthorized persons clear of the area when the driver releases the binders from the trailer and during unloading.
6. Know the capabilities and rated load capacities of your lifting equipment. Never exceed them.
7. **Do not stand or ride on the load of foundation units and accessories while it is being unloaded. Do not stand beneath or near the foundation units and accessories while they are being unloaded.**
8. If unloading at multiple site locations, make sure the truck driver secures the remaining load before proceeding to the next location.
9. The contractor shall be responsible for the safety of his/her employees and agents. Adequate safety indoctrination is his responsibility and shall be given to all personnel employed by his firm.
10. Safe practices on construction work as outlined in the latest edition of the "Manual of Accident Prevention in Construction," published by The Associated General Contractors, shall be used as a guide and observed.
11. The contractor shall comply with all applicable city, state, and federal safety codes in effect in the area where he is performing the work. This conformance shall include the provisions of the current issue of the "OSHA Safety and Health Standards (29 CFR 1926/1910)" as published by the U.S. Department of Labor.

⚠ **Notwithstanding the instructions contained in this guide, it is the responsibility of the consignee or consignee's agent to devise safe unloading and handling procedures.**

Falling foundation units and accessories can cause severe personal injury or death. Read and follow all safety instructions before unloading foundation units and accessories.

Tool Checklist

Tools and equipment essential for setting a Steel EXPRESS Foundation unit by the contractor include:

- ☑ *Excavator or crane with lifting strap (depending on size of units)*
- ☑ *Laser transit*
- ☑ *Mini-compactor*
- ☑ *Tape measure*
- ☑ *Stakes*
- ☑ *Mallet*
- ☑ *Braided string line*
- ☑ *Marking paint (if required)*
- ☑ *Shovel*
- ☑ *Hard rake*
- ☑ *4' or 6' level*
- ☑ *Pliers*
- ☑ *1 ¼" Wrench or Socket*

Material Checklist

The following materials are supplied by Contech:

- ☑ Foundation installation drawings
- ☑ Longitudinal steel reinforcing splice bars
- ☑ Tie wires for longitudinal reinforcing bar connections
- ☑ Nuts and bolts to connect the segments
- ☑ Rebar stakes for pinning foundation segment to the ground
- ☑ End members
- ☑ Plastic caps to seal lifting ports

INSTALLATION PROCESS

I. PREPARE SUBGRADE AND MARK POSITION OF THE FOUNDATION ON THE LEVELING PAD

Equipment and tools: Excavator, laser transit, mini-compactor, tape measure, stakes, mallet, braided string line, marking paint (if required), shovel and hard rake.

1. To ensure proper installation of the Steel EXPRESS Foundations, care and caution must be exercised in shaping the foundation subgrade to allow for the installation of the steel components. It is best to overexcavate the width a minimum 2' larger than the EXPRESS Foundation unit. A dense graded granular base material is specified as the leveling pad.

2. Stake the corners and use easily-visible string and marking paint to indicate the precise location to set the foundation according to construction drawings. Prepare a 4-inch thick minimum base layer of compacted granular material the full width and length of the footing prior to placing the prefabricated metal footing forms on the base layer.

II. LIFTING AND SETTING THE EXPRESS FOUNDATIONS FOR THE ARCH UNIT SEGMENTS

Equipment: Crane with lifting straps, 4' or 6' level, tie wire and pliers (in the case of low weight units an excavator may be used).

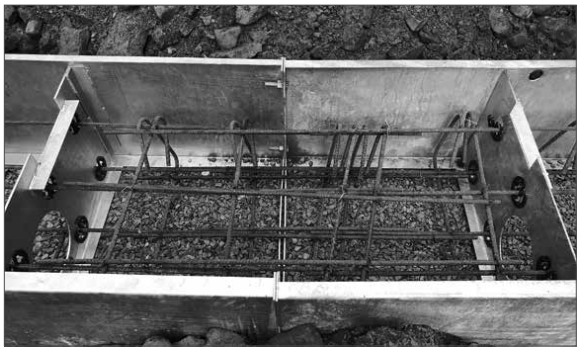
1. Proper equipment with the correct lifting capacity is needed to handle the Steel EXPRESS Foundations. This can be accomplished by using the weights given for the prefabricated steel footing form in the Bill of Materials and by determining the lifting reach for the piece of lifting equipment that will be used to handle the units on site. Site conditions must be evaluated prior to shipping to ensure proper equipment location and to avoid any lifting restrictions. The lifting ports provided in each unit are the only means to be used to lift the elements, all (4) lifting ports should be utilized. Lifting ports are designed for lifting individual segments only. Do not bolt together multiple segments and lift together.

2. The Steel EXPRESS Foundations shall be placed as shown on the plans. Special care shall be taken in setting the elements to the proper line and grade. When tested, variations should not exceed ¼" per ten feet. Once the Steel EXPRESS Foundations are set, insert plastic caps into lifting ports to ensure no backfill/concrete is lost.

   In most cases the keyway is offset in the foundation. Make sure the keyway is oriented as shown on the assembly drawings.

III. LIFTING AND SETTING THE EXPRESS FOUNDATIONS FOR THE ARCH UNIT SEGMENTS, CONT.

3. For multiple Steel EXPRESS Foundations segments, match the connection at line and grade with the previous set section. Once the sections are matched, bolt both sections together with the provided hardware.



4. The Steel EXPRESS Foundations must be connected by splice bar reinforcement to form one monolithic body. Splice bars are supplied by Contech, to be installed by the contractor onsite.

5. Prior to setting foundation segments for other side of bridge, verify span dimensions and elevations using laser measurements or other accurate surveying method. Repeat as necessary with additional segments.

   The distance between footings should correspond to the dimensions shown on the assembly drawings.

6. Bolt end members on the Steel EXPRESS Foundations, using the hardware provided.

7. It is the contractors responsibility to prevent any movement of the Steel EXPRESS Foundations during the installation of the forms, assembly of the structure, and placement of the infill concrete.

   Backfill procedures are described on page 7 of this document. Steel EXPRESS Foundations should be backfilled prior to erecting or placing any structure on the footings.

IV. INFILLING – PRIMARY RECOMMENDATION » *If placing infill concrete after setting arch units follow instructions below.*

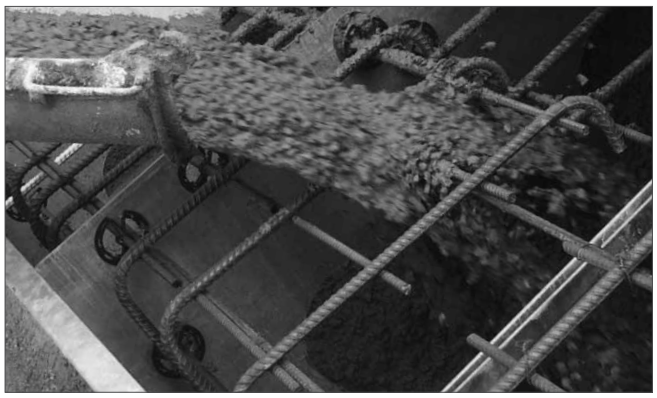
1. Once the Steel EXPRESS Foundations are set, assemble the structure on the provided channels, and place it on the foundations.

2. Once the entire structure is installed, the foundation concrete infill can be placed, vibrated and floated to the top of the foundations. Slope concrete at the arch legs such that water will flow away from the structure

* The primary option does not require grouting of the keyway.

V. INFILLING – SECONDARY RECOMMENDATION » *If placing infill concrete prior to setting arch units follow instructions below.*

1. Block out the entire keyway using the proper size lumber to retain concrete infill and maintain the dimension of the keyway throughout the length of the foundation.



2. Place infill concrete to top of foundation unit in each cell. Be sure to vibrate to consolidate mix and remove any voids. Float off concrete level with the top of the foundation, maintaining a level keyway.

3. Once infill concrete is set, strip keyway forms and sweep clean. After the structure is set on the Steel EXPRESS Foundations, grout the keyway to secure the structure to the footings. Grouting shall not be performed when temperatures are expected to go below 35 degrees for a period of 72 hours. Grout shall be non-metallic, non shrink material, with a minimum 4,000 psi compressive strength.

VI. BACKFILL

Note: These instructions pertain to backfilling around Steel EXPRESS Foundations only. Refer to structure drawings for backfilling requirements around the structure.

1. Do not perform backfilling during freezing weather.
2. The footings shall reach 75% compressive strength prior to any backfilling of the structure.
3. Backfill material should be free of rocks, frozen lumps, and foreign material that can cause hard spots or decompose to create voids. Backfill material should be well graded granular material that meets the requirements of AASHTO M 145 for soil classification A-1, A-2-4, A-2-5 or A-3, at a minimum. Please refer to your plate layout drawing for further clarification on table M145 and soil classifications.
4. Backfill around sides of Prefabricated Steel Footing Forms shall be performed prior to setting structure on foundation.
5. Dumping of backfill material is not allowed any nearer than 3 ft from the prefabricated metal footing forms.
6. The fill must be placed and compacted in layers not exceeding 12 inches uncompacted.
7. The backfill shall be compacted to a minimum 90% density per AASHTO T-180.
8. Hand equipment may be used to compact next to the foundations, within 3'-4'. Small tracked vehicles (D4 or smaller) should remain at least 3'-4' away from the foundation.

CONSIDERATIONS ⚠

I. THERE ARE IMPORTANT CONSIDERATIONS TO EVALUATE WHEN BUILDING A STRUCTURE WITH EXPRESS FOUNDATIONS. THE PROPER EQUIPMENT FOR THE PROJECT CAN SAVE EXPENSE AS WELL AS TIME.

✓Crane / Excavator - selection to be finalized during the preconstruction meeting.

II. MONITORING

1. The contractor shall check settlements and horizontal displacements of the foundations to ensure that they are within the allowable limit provided by the engineer. These measurements should give an indication of the settlements and deformations along the length of the foundations.
2. The first measurement should take place after the placement of all prefabricated metal footing forms, a second after completion of backfilling of the prefabricated metal footing forms, and a third after the superstructure is assembled, prior to pouring cast in place concrete. Further measurements may be made according to local conditions.

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SUPPORT

Drawings and specifications are available at www.ContechES.com. Site-specific design support is available from our engineers.

Contech Engineered Solutions provides site solutions for the civil engineering industry. Contech's portfolio includes bridges, drainage, sanitary sewer, stormwater and earth stabilization products. For information on other Contech division offerings, visit www.ContechES.com or call 800-338-1122.

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