IR-2 RIGGING PROCEDURE and JOB HAZARD ANALYSIS
FOR SPECIAL PURPOSE HANDLING FIXTURE
BACKWARD LOWER CORNER BLOCK

1.0 Loads:
   BWD Lower Corner Block     4314 lbs
   Corner Block Adaptor       181 lbs
   Counterweight Fixture      2102 lbs
   Total Load (excluding rigging)  6597 lbs

2.0 Rigging Layout:
   Drawing number SK-HJK061504-1

3.0 Rigging Equipment:
   A 5 ton capacity beam trolley is assembled to the backward end door as shown in drawing number SK-HJK061504-2. The trolley shall have Z motion by rolling on the trolley beam. The trolley shall have X motion by moving the end door. The trolley shall have a 5 ton capacity digital crane scale supported from the hook using two 8.5 ton minimum capacity screw pin shackles. The crane scale shall support a 5 ton capacity manual hoist plus three 1.5 ton minimum capacity manual hoists (come-alongs) and six 6.5 ton minimum capacity screw pin shackles.

   The 10 ton hoist shall support a 4-ft long sling of 10,000 lb minimum working load rating with a 6.5 ton minimum capacity screw pin shackle on its end. The 50 ton main hoist is not used for this operation.

4.0 Removal Procedure:
   Refer to drawing number SK-HJK061504-1. Point A represents the CGZ of the counterweight fixture alone and Point C represents the loaded CGZ including the weight of the Corner Block plus the Corner Block Adaptor plus the counterweight fixture.

   Refer to drawing number SK-HJK080104-8. The Corner Block Adaptor fixture is designed such that the CGZ of the unloaded fixture is located at point A. Point B represents the CGZ of the combined fixture plus the Lower Corner Block Adaptor weight.

4.1 Assemble a 5 ton capacity beam trolley to the appropriate backward end door as shown in drawing number SK-HJK061504-2.
4.2 Connect the 10 ton hoist sling shackle to Point A on the Corner Block Adaptor fixture.
4.3 Lift the fixture and position same to mate with the appropriate Lower Corner Block Adaptor.
4.4 Bolt the fixture to the Lower Corner Block Adaptor.
4.5 Lower the 10 ton hoist and move the sling from Point A on the fixture to Point B.
4.6 Raise the fixture/adaptor assembly using the 10 ton hoist.
4.7 Bring the fixture/adaptor assembly to the backward detector area and lower to the ground between the appropriate end door and the DIRC Stand Off Box.
4.8 Disconnect the 10 ton hoist from Point B on the adaptor fixture.
4.9 Connect the manual trolley/hoist sling shackle to Point B on the Adaptor fixture.
4.10 Raise the adaptor(fixture assembly using the manual hoist.
4.11 Position the Lower Corner Block Adaptor to mate with the appropriate Lower Corner Block.
4.12 Bolt the Lower Corner Block Adaptor to the FWD Lower Corner Block.
4.13 Lower the hoist slightly and move the rigging from Point B on the fixture to Point A on the fixture. The fixture will be cantilevered off of the Lower Corner Block Adaptor at this time.
4.14 Reposition the manual trolley and connect the screw pin shackle to Point A on the fixture.
4.15 Raise the hoist to remove the slack from the sling.
4.16 Gently unbolt the fixture from the Lower Corner Block Adaptor.
4.17 Lower the Adaptor fixture to the ground using the manual hoist.
4.18 Disconnect the manual hoist from Point A on the Adaptor fixture.
4.19 Lower the 10 ton hoist and connect the sling shackle to Point A on the Adaptor fixture.
4.20 Raise the 10 ton hoist and bring the Adaptor fixture back to the detector assembly area.
4.21 Connect the 10 ton hoist sling shackle to Point A on the counterweight fixture.
4.22 Bring the counterweight fixture to the backward detector area and lower to the ground between the appropriate end door and the DIRC Stand Off Box.
4.23 Remove the 10 ton hoist screw pin shackle from Point A on the counterweight fixture and raise the 10 ton hoist out of the way.
4.24 Zero the manual trolley crane scale readouts with the rigging hardware hanging clear of the ground.
4.25 Connect the manual trolley lower screw pin shackle to Point A on the counterweight fixture.
4.26 Lift the counterweight fixture using the manual hoist and place in the proper position to mate with the lower corner block adaptor the crane scale should read 2102 lbs.
4.27 Bolt the counterweight fixture to the lower corner block adaptor.
4.28 Place shims or dunnage under the counterweight block.
4.29 Lower the manual hoist until slack and disconnect the hook from Point A on the counterweight fixture.
4.30 Connect the manual trolley scale sling to Point C on the fixture. Connect the three manual hoists to Points A,B & D respectively on the fixture.
4.31 Raise the manual hoist until the crane scale reads 6597 lbs.
4.32 Gently loosen corner block bolts as described in AP-350-990-16, Procedure for Unbolting/Bolting Barrel Corner Blocks.
4.33 Readjust fixture/corner block position using the manual hoist and come-alongs as needed to minimize side loading on the corner block bolts until all bolts are removed.
4.34 Remove the corner block and lower to the floor.
The following procedures are only needed if the counterweight fixture is needed to remove the other backward lower corner block.

4.35 Disconnect the three come-alongs from Points A, B & D on the fixture and remove them from the manual hoist.
4.36 Remove the crane scale from the manual hoist.
4.37 On the manual hoist, install two 4-ft long slings of 4,000 lb minimum working load rating with 6.5 ton minimum capacity screw pin shackles on each end.
4.38 Connect the two 4-ft long sling shackles to the corner block adaptor at the CGZ location of the lower corner block.
4.39 Raise the manual hoist until the dead load of the corner block is supported from the manual hoist.
4.40 Lower the 10 ton bridge hoist and connect its sling shackle to Point A on the counterweight fixture.
4.41 Gently raise the 10 ton hoist until the dead load of the counterweight fixture is supported from the bridge crane.
4.42 Unbolt the counterweight fixture from the corner block adaptor.
4.43 Remove the counterweight fixture by raising the 10 ton hoist.
4.44 Secure the lower corner block to the end door or lower it to the ground using the manual hoist.

5.0 Installation Procedure:

5.1 The following beginning scenario is assumed:

5.1.1 A 5 ton capacity beam trolley/manual hoist is installed on the appropriate backward end door as shown in drawing number SK-HJK061504-2.
5.1.2 A corner block adaptor is installed on the corner block.
5.1.3 The corner block/adaptor assembly is supported from the beam trolley hoist. The hoist shackles are connected to the adaptor at the CGZ location of the corner block.

5.2 Connect the 10 ton hoist sling shackle to Point A on the counterweight fixture.
5.3 Bring the counterweight fixture to the backward detector area and lower between the appropriate end door and the DIRC Stand Off Box.
5.4 Raise the corner block/adaptor assembly using the manual hoist.
5.5 Bolt the counterweight fixture to the corner block adaptor.
5.6 Lower the corner block/counterweight assembly to the floor.
5.7 Disconnect the manual hoist sling shackles from the adaptor at the corner block CGZ.
5.8 Remove the 4-ft long slings and shackles from the manual hoist.
5.9 Install a 5 ton capacity digital crane scale supported from the manual hoist hook using two 8.5 ton minimum capacity screw pin shackles. The crane scale shall support a 5 ton capacity manual hoist plus three 1.5 ton minimum capacity manual hoists (come-alongs) and six 6.5 ton minimum capacity screw pin shackles.
5.10 Zero the crane scale readouts with the rigging hardware hanging clear of the ground.
5.11 Connect the manual hoist to Point C on the counterweight fixture using a 6.5 ton minimum capacity screw pin shackle.
5.12 Raise the corner block/counterweight assembly using the manual hoist.
5.13 Remove the 10 ton hoist screw pin shackle from Point A on the counterweight fixture and raise the 10 ton hoist out of the way.
5.14 Connect the three manual hoists to Points A, B & D respectively on the counterweight fixture.
5.15 Raise the manual hoist until the crane scale reads 6597 lbs.
5.16 Place the fixture in the proper position to mate the Corner Block to the detector using the manual trolley/hoist. It may be necessary to make slight angular adjustments using the three come-alongs.
5.17 Bolt the corner block to the detector as described in AP-350-990-16, Procedure for Unbolting/Bolting Barrel Corner Blocks.
5.18 Place shims or dunnage under the counterweight block.
5.19 Disconnect the three come-alongs from Points A, B & D on the counterweight fixture and remove them from the manual trolley/hoist.
5.20 Lower the manual hoist until slack and disconnect the hook from Point C on the counterweight fixture.
5.21 Connect the manual trolley scale sling to Point A on the fixture.
5.22 Lift on the manual hoist until the crane scale reads 2102 lbs.
5.23 Gently unbolt the counterweight fixture from the corner block adaptor.
5.24 Gently pull the counterweight fixture to the north where it is accessible using the overhead crane.
5.25 Lower the manual hoist until the counterweight fixture rests on the floor.
5.26 Disconnect the manual trolley hoist from Point A on the counterweight fixture.
5.27 Lower the 10 ton hoist and connect the sling shackle to Point A on the counterweight fixture.
5.28 Raise the 10 ton hoist and remove the counterweight fixture. Take it to the assembly area.
5.29 Lower the 10 ton hoist until the counterweight fixture rests on the floor.
5.30 Disconnect the 10 ton hoist from the counterweight fixture.
5.31 Reposition the overhead bridge and trolley over the lower corner block adaptor fixture.
5.32 Lower the 10 ton hoist and connect the sling shackle to Point A on the corner block adaptor fixture.
5.33 Raise the adaptor fixture using the 10 ton hoist and bring to the backward detector area.
5.34 Lower the adaptor fixture between the appropriate end door and the DIRC Stand Off Box until it rests on the floor.
5.35 Disconnect the 10 ton hoist shackle from Point A on the adaptor fixture and raise the 10 ton hoist out of the way.
5.36 Connect the manual trolley/hoist sling shackle to Point A on the Adaptor fixture.
5.37 Raise the adaptor/fixture assembly using the manual hoist.
5.38 Position the adaptor fixture to mate with the Lower Corner Block Adaptor.
5.39 Bolt the adaptor fixture to the Lower Corner Block Adaptor.
5.40 Lower the manual hoist until the sling is slack. The fixture will be cantilevered from the Lower Corner Block Adaptor at this time.
5.41 Move the manual trolley/hoist connection from Point A on the fixture to Point B.
5.42 Lift on the manual hoist until the crane scale reads 525 lbs.
5.43 Gently unbolt the corner block adaptor from the lower corner block.
5.44 Gently pull the fixture/adaptor assembly to the north where it is accessible using the overhead crane.
5.45 Lower the manual hoist until the fixture/adaptor assembly rests on the floor.
5.46 Disconnect the manual trolley hoist from Point B on the adaptor fixture.
5.47 Lower the 10 ton hoist and connect the sling shackle to Point B on the adaptor fixture.
5.48 Raise the 10 ton hoist and remove the fixture/adaptor assembly. Take it to the assembly area.
5.49 Lower the 10 ton hoist until the fixture/adaptor assembly rests on the floor.
5.50 Unbolt fixture from Corner Block Adaptor.
5.51 Return the 10 ton overhead crane to the backward detector area.
5.52 Disassemble the beam trolley structure from the backward end door.

6.0 Potential Hazards:

6.1 Crushed extremities.
6.2 Personnel in path of load movement or under load.
6.3 Confining work space.
6.4 Unexpected load movement.
6.5 Operator error.
6.6 Equipment failure.

7.0 Hazard Controls:

7.1 Crane Operator shall be a SLAC-certified (EFD) rigger.
7.2 No one will be allowed under a suspended load or in the path of a load.
7.3 Minimize work time in confining spaces.
7.4 Strict controls of crane control box and rigging procedures.
7.5 Inspection of equipment prior to use.
7.6 Inspection of crane functions.
7.7 Current training of personnel.
7.8 Crane maintenance current.
7.9 Review of procedures with rigging personnel.
7.10 Appropriate use of personnel protection equipment.
7.11 Appropriate supervision of tasks.
7.12 Continuous safety oversight is preferred.
8.0 Field Observations and Comments:

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Procedure Reviewed by: Z. Vassilian
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